

Aalborg University



Tourism – Master’s Degree Programme

Master’s Thesis

Terrestrial Astrotourism –
Motivation and Satisfaction of Travelling to
Watch the Night Sky



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Abstract

Terrestrial Astrotourism – Motivation and Satisfaction of Travelling to Watch the Night Sky

Astrotourism goes back many centuries when mankind looked up to the stars, imagined figures and gave them meanings. Monuments were erected and sites given a special connotation due to the affinity humans made with the universe. Nowadays, it has become a rising niche of tourism with much potential, mainly educational, social and to relax, thus being considered a leisure activity. But what motivates people to travel and see these astro-events/activities? What satisfy them the most?

In order to answer to these questions, the following research question was made:

“What are the main motivational dimensions that draw tourists in general to engage in (terrestrial) astrotourism and what are the dimensions that satisfy them the most?”

Hence, this thesis takes a closer look at people’s motivations to engage in such leisure activities and their satisfaction afterwards, focusing on the sub-niche of terrestrial astrotourism. This sub-niche covers all the activities that can be done on the Earth’s surface, like going to observatories, space centres or aurorae gazing. It is believed this sub-niche is the one that attracts people the most as it is the closest, easiest to access and most affordable to tourists.

Under the social constructivism paradigm, the motivations and satisfaction of a variety of people were assessed, using an online survey and semi-structured interviews. Through the dimensions presented by the Leisure Motivation Scale and Leisure Satisfaction Scale adapted from Beard and Ragheb’s work (1980/3), various factors were assessed and the ones that had a higher score in the survey and the most frequent ones among the interviewees were deemed to be the most motivational and satisfying.

It was concluded that, for the survey respondents, the greatest motivational dimension was the *intellectual* one, as the respondents wished to expand their knowledge above all, and were highly satisfied with the *psychological*, *educational* and *aesthetic* dimensions equally, as they found the activities/events they witnessed quite interesting, were able to increase their knowledge, and were delighted with the surroundings. Concerning the interviews, the interviewees were mainly motivated by the *social* dimension, as they engaged in astrotourism, in its majority, to develop close relationships. They were

satisfied the most, however, with the *relaxation* dimension, as they were surprised with the rest and release of stress provided by the activities.

These findings are but the surface of a much robust star. The amount of survey respondents was low and the interviews, although trying to get information from different types of astrotourists, cannot provide a solid assertion of what the motivations and satisfaction reasons of astrotourists are. Still, astrotourism is a growing niche, and these results will undoubtedly help to develop future research on the topic, besides making way for other studies in the same field.

This thesis will hopefully help researchers and scientists, but also entrepreneurs who wish to explore this field, helping them understand what can still be improved. Also, more publicity could be made to raise awareness about this field and its causes, like the decrease of light pollution.

This thesis intends to be an introduction to this alien leisure activity, hoping to demonstrate that there is more to the dark sky than what we can see.

Key words: *astronomic tourism, astrotourism, astrotourist, leisure, motivation, satisfaction, dimensions, factors;*

Acknowledgements

Astronomy is a field that has always fascinated me. The magnificence and beauty of the universe enchant me, making me wanting to know more about it, to go further and uncover its many mysteries. Although my career in Physics has been (momentarily?) put aside, the dark sky still dazzles me every night and has a great influence on me and on my life. I usually say that the Moon is our passport to the Universe, as it is the closest object we know and, yet, it is still a mystery to us, which reflects the way I feel about the entire Universe: it is everywhere, we are a part of it, and still we know *nothing* about it.

I would like to thank my parents for letting me choose who I wanted to be, what I wanted to believe and to do with my life, and for always giving a major support to my wildest dreams. I would like to thank my family for the kindness, but also for bringing occasional doubts which only made me try harder. To my friends who have endured with my passion over the Moon and the Universe for years... It has become something real now 😊

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To Aalborg University. Once again, I thank you for all the amazing things you have taught me, either inside and outside the classroom. Studying Tourism being myself a tourist has taught me a great deal! And how much I loved the experience!

We are feeble, negligible and ephemeral in this vastness of Universe... We better enjoy our lives because that's the only good thing we have.

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1. Introduction

1.1 Looking at the Stars

Since times immemorial, the Universe has been an object of admiration, fascination and fear to men. The secrets it withholds are immense and mankind has always tried to drive meaning out of the sky above (Marín & Jafari, 2007; Karttunen *et al.*, 2016). Different phenomena, like meteor showers and eclipses, were seen with fear and awe, and men across the world started to give them different meanings (Sinclair, 2006). Also, different cultures grouped stars together into constellations that, interestingly enough, were nearly identical, in terms of form and meaning, to other regions, such is the case of the ‘Big Dipper’, which was often associated with a bear or hunters in many Native American tribes, Ancient Greece and North of Europe (Collison & Poe, 2013). Around the world, these constellations served as base for story-telling and for passing on myths and legends, firming the different cultures and creating connections among families; the night sky was also used to tell the time, allowing the measurement of the seasons and the determination of the timing of activities like planting and harvesting (*ibid*).

Nowadays, the night sky holds others meanings and concerns. Mankind has given its first steps into the Universe, discovering and learning about far-away objects, its laws, and finally understanding what our ancestors only dreamt of knowing. However, looking at these bright objects from Earth has become an increasingly difficult task due to the intensification of artificial light (Fayos-Solá, Marín, & Jafari, 2014). Scientists had to start building space telescopes and probes to better study these objects, and the rest of the population had to head for specific locations in order to grasp the sights of the stars like we did so many years ago.

This phenomenon, where people travel to destination areas where dark skies free from artificial light pollution can be enjoyed, is called **astronomical tourism** or simply **astrotourism** (Collison F. , 2012). It is a phenomenon that goes back many centuries, evidenced by the existence of monuments like the Nabta Playa in the Sahara Desert, Stonehenge in the United Kingdom, Machu Pichu in Peru or the Pyramids of Giza in Egypt (Malville, 2008; Ruggles & Cotte, 2010). These and many other monuments have significance in relation to celestial objects or events, either by their concept (ex. position or meaning) and/or the environmental situation (ex. eclipses) (Ruggles & Cotte, 2010).

They are considered today as astronomical heritage sites, as they include both cultural heritage and cultural landscapes relating to the sky (Fayos-Solá *et al.*, 2014).

In recent times, the interest in astronomy and the predisposition to travel to observe astronomical events increased with the success of sci-fi literature (e.g. Jules Verne), the appeal of popular scientific pioneers (e.g. Percival Lowell) and with the advances of space exploration in the 1950s (Fayos-Solá *et al.*, 2014). The high point was in the 1960s with the first human spaceflights, when millions of people travelled to see the space ships departures, culminating the interest with the first landing on the Moon in 1969 (*ibid*). In the 21st century, astrotourism has been developed to include activities from simple stargazing at a nearby site, organised trips to specific locations to observe eclipses or auroras, to visit space centres or travel to space stations.

As it will be understood later on, astrotourism became a niche of tourism that not only increases and develops the economy of the designated locations, but also promotes the education of the astronomy field. Moreover, it increases awareness of the need to minimise the impacts of light pollution (and its consequences), the promotion of energy saving and a better appreciation of the benefits to ‘astro-touristic’ destinations (Fayos-Solá *et al.*, 2014).

Besides these global advantages, individual tourists are becoming more and more interested in pursuing ‘astro-touristic’ activities. The motivations to participate differ from tourist to tourist (Najafabadi, 2012; Pearce P. L., 2011), going from personal development and education, to family time or simple curiosity. However, it would be important to better understand what exactly drives these tourists to astrotourism-related activities or events, hereafter called ‘astro-activities’ / ‘astro-events’, so that more people can be made aware of this niche of tourism and participate more often.

In order to better understand the tourists who engage in this niche of tourism, a categorisation will be provided, adapted from Macionis (2004) and her work in Film tourists. This adaptation will categorise the astrotourist into three types: Specific Astrotourism, who actively researches for the places where the astro-events will happen, Casual Astrotourist, who does not specifically look for the astro-event location, but participates in any activity related to it while at the destination, and Serendipitous Astrotourist, who just happens to be at the destination when an astronomic event occurred.

Because of its many advantages and purposes, of its great potential in terms of tourism, because it is still a relatively unknown topic among scholars and organisations, and because it has a special meaning for the author of this thesis, astrotourism was chosen as the main theme of this thesis.

1.2 Research Question

Astrotourism is still a relatively new niche of tourism. Arguably, the majority of people who pursue astrotourism is either a scientist, a researcher or an amateur astronomer. As such, outside the field, few people know what it is all about. Yet, it can be considered a complete and important niche of tourism, with potential to achieve the masses. However, how can more people, regular people either with some or no interest at all in the field of astronomy, be interested in astrotourism? Why were they encouraged to participate in such activities? What drove them there? Did they go on purpose or it happened by chance? Are they satisfied with such activities? It is this author's belief that if more people knew about the positive outcomes of these activities have, more people would increasingly be more interested in astrotourism and pursue such activities more often.

For these reasons, this thesis will explore what motivated people into astrotourism, what drove them, and if the experience was rewarding and how, in order to transmit those same thoughts to potential newcomers. Also, to make way for future studies that, by embracing this topic, may be able to further explore and give rise to a solid and sustainable niche of tourism.

As such, the **aim** of this thesis is to research people's motivations and satisfaction in astrotourism; the main **objective** is to understand what takes a general tourist to participate in such activities and how satisfying the experience was. Hence, the **research question** of this thesis will be:

“What are the main motivational dimensions that draw tourists in general to engage in (terrestrial) astrotourism and what are the dimensions that satisfy them the most?”

Hence, it is this thesis main goal to understand what takes regular tourists, either having had previous contact with the field of astronomy or not, to participate in a specific branch of astrotourism, in this thesis designated as terrestrial¹ astrotourism. This branch, as it will

¹ This specification on terrestrial astrotourism will only be emphasized in the interviews, since the survey will be free for everyone who has engaged in any type of astrotourism.

be explained later, includes all activities that can be engaged on the Earth's surface, either in specific sites, like observatories or space centres, or not, like star and aurora gazing. It is important to highlight that, in this thesis, both people with or without previous knowledge in the field of astronomy will be consulted as this does not mean that only people with knowledge in astronomy engage in such activities/events (for work or leisure). Also, the reasons for their satisfaction will be assessed in order to understand how satisfied they are with this niche of tourism.

Thus, in order to gain knowledge over these questions, it will be used multiple semi-structured interviews to people who have already been to astro-touristic locations and/or participated in any kind of terrestrial astrotourism. Moreover, an online survey will be distributed in social networks to gather information from as many people who have engaged in astrotourism as possible.

The emphasis on motivational or satisfaction *dimensions* will be later explain in the theory chapter. Briefly, according to the theory used, these dimensions encompass various factors that will assess the respondents' and interviewees' motivations and satisfaction.

Astrotourism is still a developing field that will, hopefully, progress and give understanding of its many advantages in terms of education, family-bond activities and impacts awareness.

1.3 Structure of the Thesis

The thesis will be organised in the following way. The first chapter, as it can be seen, includes the Introduction to the topic, the presentation of the research question and the structure of the thesis. The second chapter will be the Theoretical chapter, in which the relation between astronomy and tourism will be explored, by presenting definitions, the niches within this field, the various sites and activities that can be enjoyed and, finally, the importance of astrotourism. Also within the second chapter, it will be presented the theoretical background used in this study, such as leisure, motivation and satisfaction theory. At the end, the chapter will present the chosen theories used to analyse the data collected in this study. The third chapter will present the methodological section, in which the research design, the philosophy of science and the chosen methods for the analysis will be explained. The fourth chapter will contain the analysis of the data collected, starting by a brief categorization of the public interviewed. Finally, the last chapter will contain the conclusion of this study, future suggestions and the critique to this work.

2. Theoretical Chapter

This first chapter will cover the theoretical issues used in this thesis, starting with a sub-chapter that explores the topic of astronomy and its relation to tourism. The following sub-chapter will address the theoretical aspects of Leisure, Motivation and Satisfaction, which will each of them have a dedicated sub-chapter later on.

The scheme below portrays how this theoretical chapter will be organised as well as the relations between each topic.

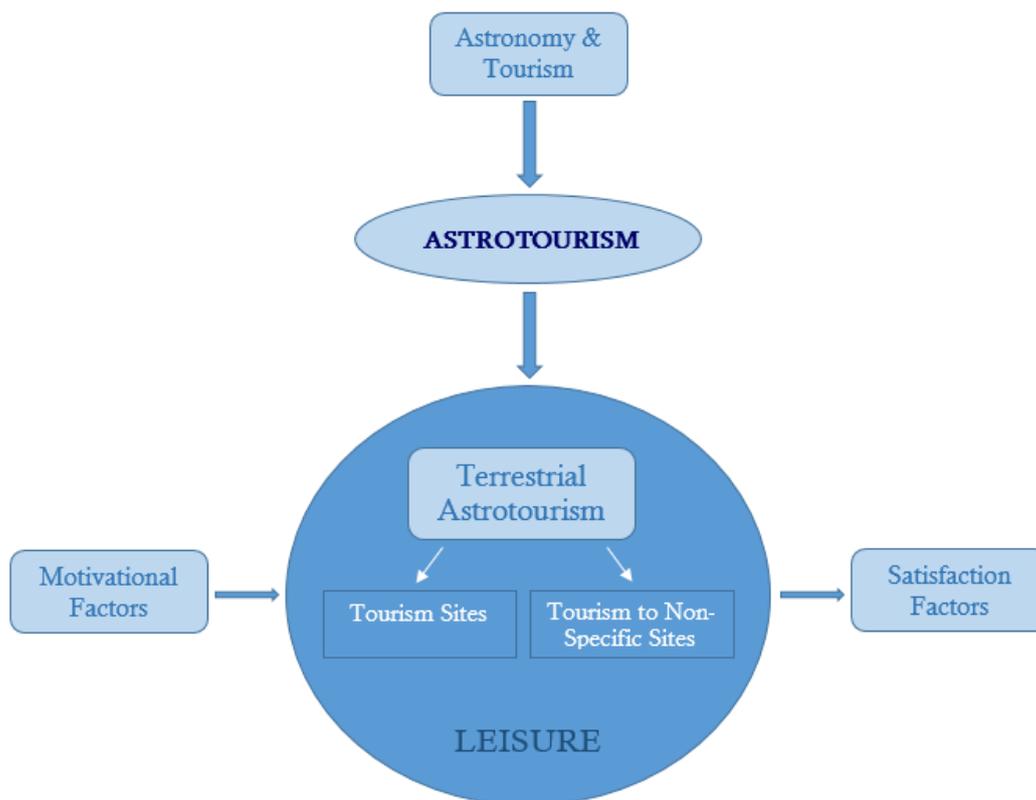


Fig. 1- Theoretical Scheme. Source: Own

Starting with a general introduction about the relation between astronomy and tourism, the reader is introduced to the topic of astrotourism, a merged concept that encompasses both areas. Next, a focus will be made on Terrestrial Astrotourism, i.e. tourism to sites or facilities on the Earth's surface where astronomic activities take place. It will be explored which motivational dimensions draw tourists to these facilities and which dimensions provided a feeling of satisfaction after the visit. These activities will be considered, in this thesis, as leisure activities.

In the following section, the definitions used in the scheme will be explained. Further on, it will be possible to understand which of the various motivational dimensions weigh the

most of the participation in the leisure activity of terrestrial astrotourism, and consequently which satisfaction dimensions are the most highlighted, thus leading to a final conclusion of how satisfying the experience was.

2.1 Astronomy and Tourism

“Astronomy is the oldest science — and the newest.” (Moche, 2009)

Probably some of the first evidence that men looked up to the sky and discerned some meaning are the bone-carved Lunar phases recorded by the *Cro-Magnon* men as early as 30,000 years ago (Karttunen, Kröger, Oja, Poutanen, & Donner, 2016). These calendars may be the oldest astronomical documents (ibid) and have probably helped our ancestors to keep track of time and of the agricultural seasons. Since then men started to pay attention to the locations of the celestial bodies, mainly because of religious rituals and prognostication, making the time reckoning more and more accurate (ibid). Eventually, astronomical research changed man’s view of the world, aided him in navigation and incited his curiosity about Nature and the Universe. Astronomy has hence marked the pace of science, history and of the cultural perception of the world (Marín & Jafari, 2007).

2.1.1 Definitions

Nowadays we can define **astronomy** as ‘the study of the stars and other celestial objects [that] deals with the quantitative investigation of the cosmos and the physical laws which govern it: with the motions, the structures, the formation, and the evolution of the various celestial bodies’ (Unsöld & Baschek, 2002, p.1). It is a science that requires dedication, understanding and mathematical skills that not all of us possess. Still, the beauty of the Universe attracts us all, scientists and dabblers.

Thus, there are those who travel, either long or small distances, to actually observe and enjoy an astronomical phenomenon; they engage in **astrotourism**. In the literature, there are many definitions for this term.

Spennemann (2008) defines it as the travelling of private individuals to specific locations to satisfy their desire to view planets and stars either unaided (‘naked’ eye) or with the aim of optical devices (e.g. optical telescopes). Collison and Poe (2013) state that it is a segment of sustainable tourism (as its resource is the dark sky, which is not depleted or permanently damaged by being observed) that involves public participation in viewing the night sky and various astronomical objects; it is an attraction for visitors to destination

areas where they can enjoy dark skies free from artificial light pollution; the dark night sky is thus the underlying resource. Fayos-Solá, Marín and Jafari (2014) define it as an activity of travellers wishing to use the natural resource of well-kept nightscapes for astronomy-related leisure and knowledge.

However, there are those who also define astrotourism as the “leisure activities of travelers paying to fly into space for recreation” (Fayos-Solá & Marín, 2009, p.5), or ‘in earth orbit experiences; beyond earth orbit (such as lunar and Mars) experiences’ (Space Tourism Society, 2017). However, in this thesis, these definitions will be addressed as ‘space tourism’, as it involves a trip to outer space, which is considered, in this thesis, a branch of astrotourism (see Fig.1).

Lastly, those who travel deliberately to locations in order to participate in a touristic activity related to astronomy are called **astrotourists**, and include scientists, amateur and professional astronomers and the general public. These can either be international (travelled outside of their country of residence) or domestic tourists (within their country of residency), as long as there is, at least, one overnight stay (Bowen & Clarke, 2009).

For this, a distinction of the types of astrotourists will be made, adapted from Macionis (2004) work in film tourists. This distinction will be made to better understand the motivations of the astrotourists and their consequent satisfaction. There will be Specific Astrotourists, tourists who actively search for the places or locations where astronomic events happen either for work or leisure; Casual Astrotourists, tourists who do not specifically look for the astro-event location, but participate in any activity related to it while at the destination, and the Serendipitous Astrotourists, who happen to be at the destination or location when an astro-event occurs.

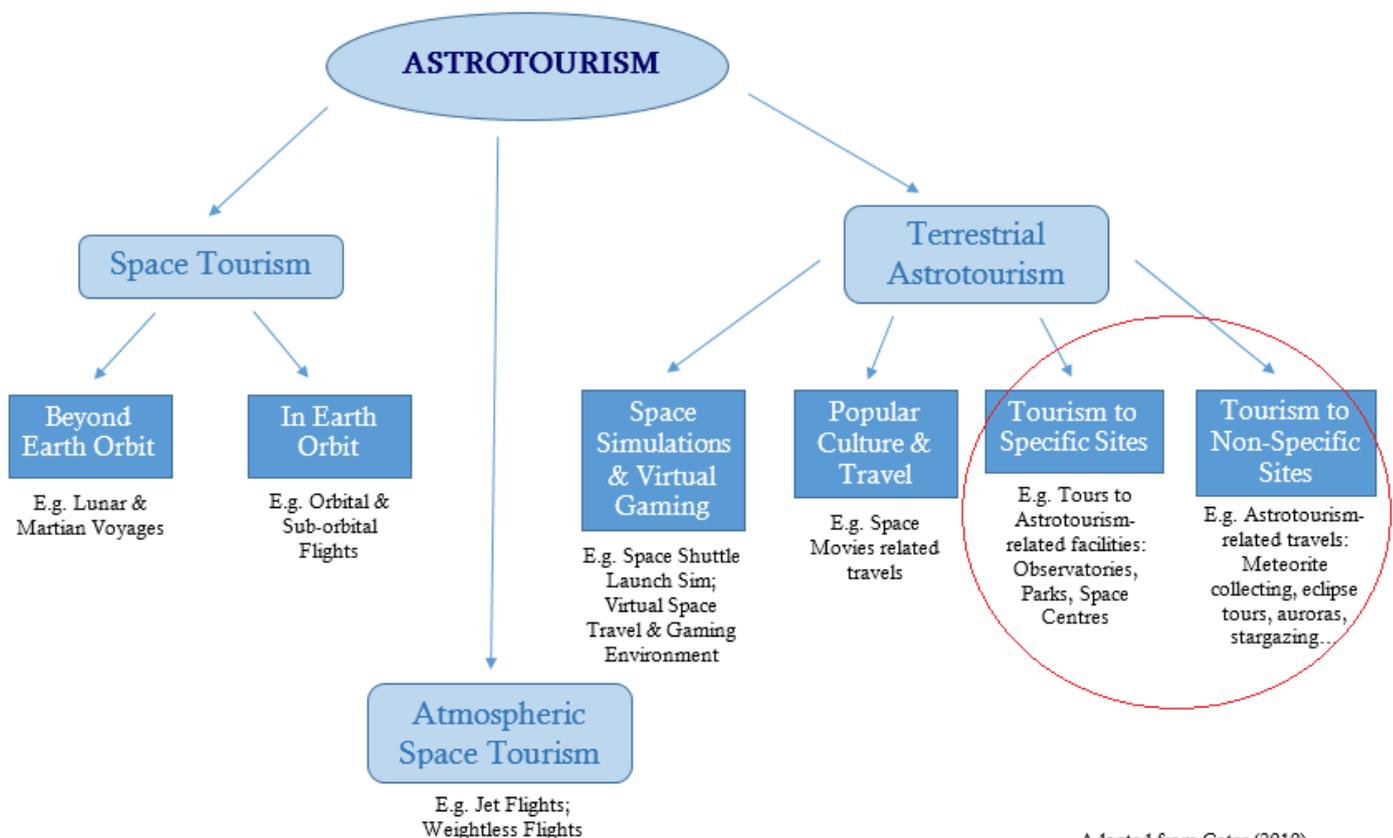
It is this thesis’ objective to understand what motivates any tourist i.e. someone not necessarily linked to astronomy to become an astrotourist and what dimensions satisfied him the most after that experience.

2.1.2 Niche and Sub-Niches

In nowadays society, the tourist consumption has been demanding the creation of more individual and niche markets in order to meet the constant changing desires of tourists (Shaw & Williams, 2004). Tourists are looking for something different, individualised and extraordinary (Rogerson, 2015). Hobson and Dietrich (1994) argue that tourism and traveling experiences can improve the quality of life, thus supporting Krippendorf (1987)

when he mentions that tourism is a possibility to escape everyday life, thus making the individual happier. As such, tourism niches have grown more and more looked-for as many people wish to escape their routines. Astrotourism embodies the recent tendency to have a more meaningful tourism experience; one that is focused on conservation of natural resources (night sky), knowledge and science, inviting not only the lone wolf but the whole family as well (Fayos-Solá, Marín, & Jafari, 2014).

This thesis will be focused on a sub-niche of astrotourism; that will be named **Terrestrial Astrotourism**, as the focus is on activities that can be pursued on the Earth's surface (see Fig. 2). Within this sub-niche, the focus will be on the chosen segments of Tourism to Specific Sites, which includes visits to astrotourism-related facilities, such as Observatories, Space Centres, Satellite or Telescope Parks, Dark Sky Parks, among others, and of Tourism to Non-Specific Sites, which includes meteorite collecting, eclipse tours, auroras tours/gazing, stargazing tours, etc. Both segments are identified in the scheme by a red circle.



Adapted from Cater (2010)

Fig. 2 - Astrotourism branches

The other two segments below Terrestrial Tourism, which are *Space Simulation & Virtual Gaming* and *Popular Culture & Travel* will not be studied as they diverge slightly from the aim of this thesis; the goal is to understand what motivates people into participating in astrotourism, thus seeming fair to start with the public that travel to the easily recognizable and accessible locations related to the topic. The other two main topics, Space Tourism, which includes travelling *Beyond Earth Orbit* and *In Earth Orbit*, and Atmospheric Space Tourism will not be studied as the focus here is on activities on Earth to where people can easily travel.

The reason for choosing the segments of Tourism to Specific Sites and Tourism to Non-Specific Sites also lies on the fact that they are believed to have a larger amount of tourists in the most accessible and cheapest locations (in comparison to Atmospheric/Space Tourism) for tourists, hence the possibility to gather more specific motivational and satisfaction factors.

2.1.3 Sites and Activities

In the following section, a brief description of some examples of Tourism to Specific Sites and Tourism to Non-Specific Sites will be given, as well as activities that may be pursued in those locations.

Around the world, there are numerous organisations, companies or entities that offer their share of interesting activities to the astrotourist. They can be as diverse as watching starry skies, aurorae, eclipses, visits to astronomical observatories, sailing holidays featuring navigation by the stars, pilgrimage routes, or innovative experiences offered by desert tourism (Marín, 2011). The variety depends on many factors, like geography, weather, shareholders, sponsors, etc.

The following examples were chosen as they were considered to receive the greatest amounts of visitors. Some sites and/or activities are more popular among tourists than others, however, they all have tourist-directed programs and events. The map below portrays all examples that will be explained thereafter.

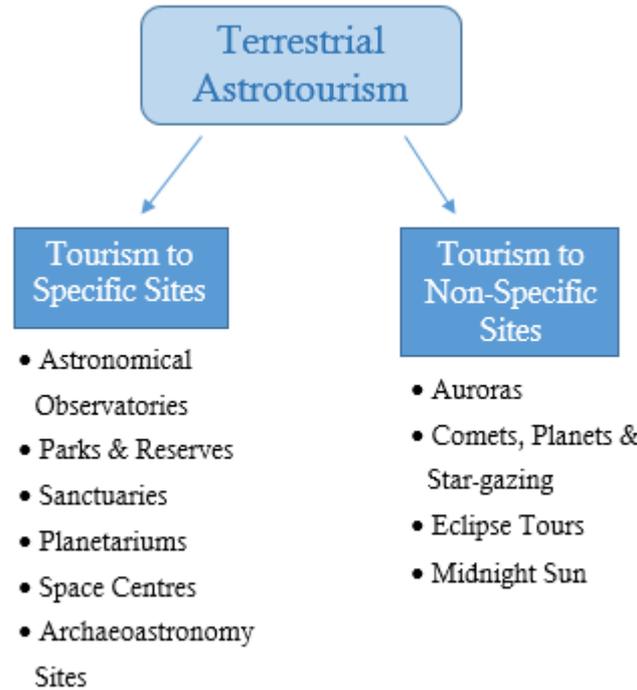


Fig. 3 - Tourism to Specific Sites and to Non-Specific Sites

2.1.4 Tourism to Specific Sites:

In general, the best astronomical sites are located at high altitudes, with little turbulence, like the west coasts of continents or on oceanic islands, or simply sites with less air pollution and low aerosol content (Marín, 2011). Here is a list of the main astrotourism-related specific sites.

Astronomical Observatories are places or buildings used for making observations of astronomical phenomena, normally equipped with a powerful telescope for observing planets and stars (Dictionary, 2017; Robson, 2005). These are normally divided into four categories: space based, airborne, ground based and underground based. For the purpose of this thesis, only the ground based observatories will be addressed.



Fig. 4 - Mauna Kea Observatory, Hawaii

Ground based observatories receive the highest number of visitors (Weaver, 2011), although they are normally set in high altitude places and/or with little light pollution; they allow observations in real time, welcoming

both scientists and the general public for various activities (Robson, 2005), such as seminars, tours of the grounds and building, and ‘aided’ or ‘naked eye’ observations (e.g. Mauna Kea Observatory (MKO), Hawaii, USA; Brorfelde Observatory, Denmark).

Parks and Reserves: Many worldwide parks and reserves reunite almost perfect conditions to observe the night sky.

Some of the most distinguished belong to the International Dark-Sky Association and are named International Dark Sky Parks (IDSP) or Reserves; these are lands possessing an exceptional or distinguished quality of starry nights and a nocturnal environment that is specifically



Fig. 5 - Dark Sky Park in Grand Canyon, USA

protected for its scientific, natural, educational, cultural heritage, and/or public enjoyment (IDA, 2017). “Reserves consist of a core area meeting minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky preservation in the core. Reserves are formed through a partnership of multiple land managers who have recognized the value of the natural nighttime environment through regulations and long term planning” (IDA, International Dark Sky Parks & Reserves, 2017). Some of these Reserves and Parks are Kerry Dark Sky Reserve, Ireland, and Hortobágy National Park, Hungary.

Examples of activities may be astrophotography, orientation, horse ridings, or boat trips under the stars.

Sanctuaries: Besides the Parks and Reserves, there are also Dark Sky Sanctuaries. “A sanctuary differs from a Dark Sky Park or Reserve in that it is typically situated in a very remote location with few (if any) nearby threats to the quality of its dark night skies and it does not otherwise meet the requirements for designation as a park or reserve. The typical geographic isolation of Dark Sky Sanctuaries significantly limits opportunities for public outreach, so a sanctuary designation is specifically designed to increase awareness of these fragile sites and promote their long-term conservation” (IDA, 2017).

Planetariums: A planetarium is a theatre where images of planets, stars, and other celestial bodies are portrayed on the dome-shaped ceiling; planetarium can either be the building itself or the projector that shines light onto the surface of the building's dome, recreating solar systems and constellations (Vocabulary, 2017). Planetariums can host events, activities for schools, families or professionals. An example is the Zeiss Major Planetarium, Germany.



Fig. 6 - Zeiss Major Planetarium, Germany

Space Centres: A space centre is a place dedicated to space-related activities. It can be of public or private ownership and it is where is reunited all the efforts to either study the space or develop the means to do so. It eventually becomes an educational organisation that may offer science education programs and be a space museum. It can offer many attractions, for all ages and group types.



Fig. 7 - Kennedy Space Center, USA

An example is the Space Centre Houston in Texas, USA, where you can have lunch with an astronaut, visit NASA grounds on a tram tour, experience how is it like to live in space, among others.

Archaeoastronomy Sites: There are cultural heritage sites associated with astronomy that also motivates travellers nowadays (Marín, 2011). These are locations and destinations that possess heritage manifestations that are connected to the astronomy of the past men. Examples of such sites are Stonehenge, Chichen Itzá, Giza, Chankillo, Mesa Verde, Persepolis, Almendres, Gochang or Chaco Canyon. These locations enable the development of archaeoastronomy experiences for the general public, as well as offering research opportunities for specialists (Fayos-Solá, Marín, & Rashidi, 2015).



Fig. 8 - Stonehenge, UK

2.1.5 Tourism to Non-Specific Sites:

Astrotourism-related activities do not necessarily need a specific location. Instead, people can engage in astrotourism in an open country, with little to none artificial light. However, although not needing specific locations, there are some events that are only observed in certain parts of planet Earth, such is the case of the midnight sun and the auroras, which are only seen in the Polar circles.

Auroras are natural light displays in the sky, seen mostly in the high latitude regions (Arctic and Antarctic, known as ‘Aurora borealis’ and ‘Aurora australis’ respectively). Simply put, they are collisions between electrically charged particles from the sun that enter the Earth’s atmosphere (Northern Lights, 2017). Aurora displays may appear in various colours, although pale green and pink are the most common. The lights appear in many forms from patches or scattered clouds of light to streamers, arcs, rippling curtains

or shooting rays that light up the sky with an eerie glow (ibid). Since auroras can be observed with the naked eye, it creates great opportunities for observations from almost any location in the high latitudes without major capital investment in infrastructure (Weaver, 2011), thus inviting many tourists. E.g. Northern Norway and Canada.

Comets, Planets & Star gazing: These activities can happen anywhere, although the best locations to admire such phenomena are those where the light pollution is not excessive. Gazing at the sky and track these objects can be done with or without equipment (e.g. telescopes, binoculars), by oneself or in groups. Normally, such activities are more common among amateur astronomer groups, who are usually involved in astronomy-related



Fig. 9 - Meteor Shower at Mount Rainier National Park

activities, such as clubs or events, or have some kind of training in astronomy-related subjects (Berendsen, 2005). There are many groups that can be found online, who usually organise such excursions into seeing the night sky, offering free programs for friends, families and general public. E.g. Comet McNaught (C/2006 P1) was one of the brightest of the last 50 years. It was best seen in the southern hemisphere, mainly in Australia (Small-Body Database, n.d.).

Eclipse tours: Eclipses are astronomical events that occur when an astronomical object is temporarily obscured – partially or completely – either by the passing shadow of another body (e.g. Lunar eclipse) or by having another body passing between



Fig. 10 - Solar Eclipse

it and the observer (e.g. Solar eclipse, Venus and Mercury Transits) (Eclipse, 2017). Although these phenomena happen with some frequency, not always are they *total* (completely obscured) in the region of the planet where the observer is. As such, many people travel to specific locations where the eclipses can be best seen, the transit best enjoyed and take splendid photographs.

The *Midnight Sun* is a natural phenomenon that occurs in the summer months within the Arctic and Antarctic Circles (high latitude regions) when the sun stays above the horizon at midnight. Being an experience so unfamiliar to many, the midnight sun attracts visitors either to see the day that never ends or to take dramatic and expressive photographs (The Midnight Sun, n.d.). Either way, activities like night-time golfing or a boat trip in the golden northern waters are but a few options for travellers.



Fig. 11 - Midnight Sun in Sweden

2.1.6 Importance of Astrotourism

Astrotourism may be one of the most effective ways to bring tourists closer to nature, helping them understand the physical world and its dynamics (Fayos-Solá *et al.*, 2014). It became important as it serves the purpose of meaningful tourism, by contributing to the dissemination of scientific values and capital formation, but also of the conservation of essential resources, like unpolluted nightscapes (*ibid*), and protection and promotion of the Heritage in numerous monuments, like pre-historic stone dispositions or rock art (Kerry Dark Sky, 2017). Furthermore, it creates awareness for the protection of the day-time and nocturnal wildlife in all its forms (on land, river, lake and sea, (*ibid*)) which, because of the increase of artificial light, have faced negative impacts, and changed their nocturnal habits (Weaver, 2011).

Astrotourism also highlights the importance of the history and traditions of the respective place and its impact on the culture and identity of its people (e.g. Machu Picchu, Stonehenge), not forgetting the area's natural landscape and its needs (Ruggles & Cotte, 2010).

Indeed, it all comes down to the protection of wildlife and the importance of minimising light pollution, which ironically enough, has given rise to modern astrotourism, as people travel to far away destinations to simply enjoy the quality of the dark night as our ancestors once did (Fayos-Solá *et al.*, 2014; Kerry Dark Sky, 2017).

Given its importance and the various options of activities that can be chosen, the underlying question remains: why do people engage in astrotourism? Why do they travel to see such exquisite phenomena? What satisfied them the most?

2.1.7 In Conclusion

As seen, astrotourism focuses on travelling for astronomy related purposes or simply doing amateur astronomy activities during the journeys (Fayos-Solá, Marín, & Jafari, 2014). There are many astro-activities or events that can be done in numerous sites, depending on the motivation of each traveller. Visiting ground based observatories with the family, travel to Norway to admire the aurora borealis or simply stargaze far away from the big cities are all common travels nowadays.

Yet, despite being a touristic activity, astrotourism became important to create awareness concerning deeper subjects. Besides its economic advantages, this niche of tourism also educates, contributing to the diffusion of important values like the need to preserve the night sky, the endangerment of nocturnal species by light pollution and the necessity to preserve cultural and historical monuments and landscapes.

Astrotourism and each of its sub-niches are rising and gathering more and more enthusiasts. However, what motivates people to participate in these activities? What did they think about it? How satisfying was it?

In the following sub-chapter, it will be explored the various segments of theory that will be helpful in answering these questions. A brief analysis over the already existing literature on leisure, motivation and satisfaction will be put forward, followed by the theories that will be used to later on analyse the data collected.

2.2 Leisure, Motivation and Satisfaction

Tourism can be described as the practice of travelling for pleasure, education or business (Simková & Holzner, 2014). It is also about tourists' personalities, values, attitudes and lifestyle, and it combines new experiences, meeting new people, places, traditions and other cultures (ibid). As such, it is a field closely related to psychology as the latter examines the motivation to travel, individual needs and satisfaction (ibid).

In the following section, a closer look will be given to the topics of leisure, motivation and satisfaction, and how they all are intertwined, as well as a brief review over the respective past literature. Next, the chosen theories to employ in this study will be presented. These theories will be used to explore the various motivations of astrotourists and their consequent satisfaction in the engaged activities.

2.2.1 Choice of Theory

As mentioned before, the main aim of this thesis is to research people's motivations and satisfaction in astrotourism. Thus, in order to have a deeper understanding of both areas, it seemed only necessary to assess the motivations of those who have already engaged in these types of activities and understand how satisfied they were after the visits, by identifying the major satisfaction dimensions. For that reason, an explorative study on motivational and satisfaction factors was deemed important, considering that astrotourism is not a common leisure activity.

2.2.2 Leisure

Before moving into the main theoretical themes of this thesis, it is important to highlight the role of leisure within astrotourism. It can be argued that astrotourism is a leisure activity, reason being that it is an activity that involves the opportunity both to relax and enjoy a good time alone, with friends or family, and to gain knowledge of a new scientific field and be made aware of issues that not everyone notices but which are still very important.

For this thesis, understanding what leisure is will help understand not only the theories that will be put into practice, but also the various degrees of interest within astrotourism (e.g. being a scientist, an amateur, a fan, or simply a joiner).

Leisure is an opportunity in which the individual has time and freedom to perceive and select experiences that are worthwhile or simply gratifying (Shivers, 1979; Hede & Hall, 2006). According to Iso-Ahola (1982), leisure activities are perceived as potential satisfaction-producers for two main reasons: the intrinsic rewards the activity may provide, like mastery or competence abilities, and the escape from the routine environment. Both ways, a positive leisure activity will lead to a positive experience and hence satisfaction, which is highly important as this is reflected not only in the tourist's intentions to revisit the destination, but also in the recommendations to others (word-of-mouth) (Oppermann, 2000; Bramwell, 1998; Postma & Jenkins, 1997).

Stebbins (2001) defined two types of leisure. **Casual leisure** is a short-lived experience requiring very little or no training, while still being intrinsically rewarding for the individual. Examples of this can be watching television, strolling in a park, conversing with friends, etc. This type of leisure produces immediate, evanescent pleasure with minimal training to experience it. Whereas **serious leisure** is "the steady pursuit of an

amateur, hobbyist, or career volunteer activity that captivates its participants with its complexity and many challenges” (p.54). It is a long-lasting and exigent activity that requires perseverance, thus requiring a mixture of knowledge, skill and/or experience.

Astrotourism can be either one of these types of leisure or a bit of both, since there may be people who do not pursue astrotourism as a die-hard hobby, but still casually engage in some activities. Later on, in the data analysis, this distinction will be useful to define the various participants in this study.

According to Iso-Ahola and Allen (1982), leisure motives are measured before a given leisure experience and after it, as they are different, especially when the leisure experience was positive or negative. In this thesis, these motives will only be assessed after the activity. A **motive** is an internal factor that can be regarded as an awareness of potential satisfaction in a future situation (Deci, 1975 in Ross & Iso-Ahola, 1991). Since motives to engage in a leisure activity are as different as the tourists themselves, the satisfaction levels and standards will be as well (Yoon & Uysal, 2005). This meaning that motivation and satisfaction are both equally important for a leisure activity, before and after respectively, and hence are related to one another.

Leisure motivation can be defined as a need, reason, or satisfaction that stimulates involvement in a leisure activity (Crandall, 1980). Until now, it has been measured considering activity-specific characteristics or through measuring satisfaction with leisure choices (Beggs & Elkins, 2010).

In this study, the leisure activity of astrotourism will be assessed by identifying the motivational dimensions that draw astrotourists the most to those specific leisure activities, as well as the satisfaction dimensions that stood out afterwards.

2.2.3 Motivation

Travel motivation is seen by many writers as one of the major elements in understanding tourists decision-making behaviour. The question ‘why do people travel?’ has been at the centre of attention for many years and numerous theories have been developed in order to answer that question.

Motivation is a psychological concept that refers to the driving force within the individual impelling him/her to action (Mayo & Jarvic, 1981; Schiffman & Kanuk, 2003); it is the stimulus that any given or pursued situation gives to an individual that, due to its

expected desirable or undesirable incentives, will act accordingly to pursue or avoid them, i.e. “a person chooses a certain behaviour for its expected results” (Hsu, Cai, & Li, 2010, p.284). This means that people act or engage in certain activities in order to be satisfied or pleased afterwards.

Hence, **travel motivation** can be described as a set of needs that predisposes an individual towards a tourist activity (Pizam, Neumann, & Reichel, 1979) or to act in a specific touristic goal-directed way (Pearce D. , 1991). To an extended level, **tourism motivation** is perceived as a network of biological and cultural forces that gives value and direction to travel choices, behaviour and experience (Pearce, Morrison, & Rutledge, 1998), corroborating the fact that the tourist’s background and past experiences will, in a certain way, influence his future choices and motivations. For example, people who have any kind of studies in the sciences area or have lived in a place where the night sky could be best enjoyed will arguably have more tendencies to pursue astrotourism than those who have had no contact with the field or no past experiences. If people see the world differently, the motivations that drive them will also be different, as well as their needs and approaches (Pearce F., 2011).

Henry Murray first used the term ‘**need**’ in 1938. The author understood that the individual, rather than his ‘instinct’, follows his ‘needs’, which aim at effects or outcomes. Murray described them as a “potentiality or readiness to respond in a certain way under certain given circumstances” (Cherry, 2016). The need is thus directional because it pushes the individual to reach goals and meet standards (in Pearce, 2011). Thus, in order to appease those needs, the individual initiates a motivated behaviour that will either satisfy or dissatisfy those needs. Indeed, it is the “awareness of potential satisfaction” of a future situation that engages the individual into that action (Iso-Ahola, 1982).

Numerous theories have tried to assess the motivations behind travelling. The following paragraphs will present some of the most prominent theories used to study the motivations of tourists.

In 1977, **Dann** developed the concepts of ‘push’ and ‘pull’ factors, where the push factors are the socio-psychological constructs of tourists predisposing them to travel (e.g. escape, nostalgia, etc.), whereas the pull factors are those that attract them to a given destination (e.g. sunshine, sea, etc.). Dann saw the preference towards the ‘pull’ factors to explain why tourists travel (Dann, 1977; Abubakar *et al.*, 2014). The push-pull framework is

considered a useful approach for examining the motivations underlying tourist and visitation behaviour (e.g. (Crompton J. L., 1979; Dann, 1981; Kim, Lee, & Klenosky, 2003). Two years later, **Crompton (1979)** extended this theory, identifying nine motives for travel: seven of which were socio-psychological (push) and two cultural (pull) being novelty and education. This theory emphasises two stages in a decision to travel, being the push the ones that happen first and the pull ones afterwards, affecting the decision of where one travels (Kay, 2003).

Some authors argue that the motivation to travel can only relate to push factors (e.g. Witt & Wright, 1992), others see push factors in terms of needs (e.g. Pearce, 1982). Perhaps pull factors could be reconsidered as preferences for satisfying motives, drives or needs (Kay, 2003). Indeed, many other authors identify other factors and concepts as relevant to tourist motivation, namely emotions (Gnoth, 1997), novelty (Crompton J. L., 1979), authenticity (MacCannell, 1976; Sharpley, 1994; Gnoth, 1997), hedonism (Krippendorf, 1984) and preferences (McCool & Reilly, 1993; Lang & O'Leary, 1997).

Finally, the **Travel Career Pattern (TCP)** is a model created and adjusted from its previous form - Travel Career Ladder, by Philip Pearce and others in the 80s. It is based on Maslow's Theory of Needs with a concept of a career in tourism, i.e. identifiable stages of the tourists' holiday, having predictable travel motivational patterns that may also start at different levels (Pearce & Lee, 2005; Pearce P. L., 2005). Pearce lists five travel motivations: relaxation, stimulation (safety/security needs), relationship, self-esteem and development and fulfilment. Although a good theory, it was not chosen for this study for its focus on pursuing of fulfilling needs and searching for a predictable travel motivational pattern.

Although there were other influential motivational theories, they were not mentioned here as their prime focus was not to identify the motivational dimensions that lead people into tourism, but rather to connect the motivations with the individual itself (e.g. Iso-Ahola (1982), Plog (1987)).

This being said, in this thesis, the chosen motivational theory will try to identify the dimensions that motivate tourists the most to engage in astrotourism.

2.2.4 Satisfaction

In general terms, **satisfaction** is “the evaluation rendered that the experience was at least as good as it was supposed to be” (Hunt, 1977). It is the affective response to the

comparison between the tourist's expectation and his actual experience (Pizam *et al.*, 1979). For more recent views, satisfaction is an individual's cognitive-affective state derived from a tourist experience (del Bosque & Martín, 2008): cognitive for its post-consumption evaluation (Engel, Blackwell, & Miniard, 1993), and affective due to its emotional response to the consumption experience (Spreng, Mackenzie, & Olshavsky, 1996). Thus, satisfaction is the emotional state of fulfillment after concluding an experience (Correia & Pimpão, 2008) that was pursued by motivation, making them intimately connected.

As such, tourist satisfaction is important to destination marketing as it influences the choice of destination, the consumption of products and services, and the decision to come back (Kozak & Rimmington, 2000). Tourist satisfaction is a function of the product's performance, perception and motivations (Correia & Pimpão, 2008), i.e. satisfaction increases if the quality of the outcome experience excels those anticipated and desired (*ibid.*).

Literature on tourist perceptions and motivations shows a connection between the level of holiday satisfaction and motivation, this being reinforced by Truong's (2005) conclusion that the attractiveness of a destination is associated with its capacity to satisfy tourist needs and motivations. The destination must reunite factors and tangible attractions that the individual considers appropriate to satisfy his desires. However, this view goes against Correia and Pimpão's (2008) statement, where the authors agree that fulfillment does not rely on destination attributes, but rather on a multitude of other factors that need to be divided into the traditional push and pull motives. The authors divide them into the push and pull satisfactions, being **push satisfaction** the individual's internal state of well-being towards his holiday, and in harmony to his main push motivations. The push satisfaction measures the level of internal achievement perceived by the tourist that consists mainly in achieving intellectual, physical and social rewards. **Pull satisfaction** confirms tourists' expectations in terms of the destination attributes (see also Bigné *et al.*, 2001; Correia *et al.*, 2007a; Murphy *et al.*, 2000; Yoon & Uysal, 2005; Ryan & Glendon, 1998). In this thesis, this distinction will not be done as satisfaction will be assessed according to a different theory. Yet, it can be agreed that the satisfaction dimensions later used fall into the category of push satisfaction dimensions.

In the next section, the theory chosen to assess what are the main motivational dimensions that draw tourists in general to engage in (terrestrial) astrotourism will be explored, as well as the theory that will measure how satisfying that experience was by pinpointing the most satisfying dimensions.

2.2.5 In Conclusion

In this thesis, the theory concerning leisure, motivation and satisfaction in tourism was explored. A brief review of the latest literature helped understanding the work behind these fields and how each of them is important to tourism. It is then possible to argue that terrestrial astrotourism can be both a casual or serious leisure type of tourism, depending on the participants. The motivations to travel and pursue these types of activities will be as different as each individual and his needs; there are various motives that draw people into engaging in astrotourism and it will be this thesis goal to find out the most prominent ones. Also, it will be important to identify the dimensions that satisfy astrotourists the most, as this satisfaction is believed to lead to word-of-mouth and future returns.

In the following chapter, the theory chosen to analyse the data collected will be explored. The theory will reunite both motivation and satisfaction fields as it was deemed to be more helpful in understanding the correlation between the two.

2.3 The Theories

Recently it has been agreed that the best theory is one that integrates and summarises previous work and is of a dynamic nature in case adjustments need to be made (Yoon & Uysal, 2005; Pearce P. L., 2011). The following theories might have been created in the 80s, but may be subject to change and reformulations in accordance with the goal of its research (Choi & Fu, 2015).

According to the latest literature, an individual is more likely to continue to participate in leisure activities by having had positive and satisfying leisure experiences (Beggs & Elkins, 2010). As such, it is important to understand what motivated tourists to engage in astro-activities, and which were the positive factors that contributed to their experience.

In order to assess what are the main motives, or factors, that draw tourists into this niche, the **Leisure Motivation Scale (LMS)** theory will be used, followed by a **Leisure Satisfaction Scale (LSS)**, both developed by Beard and Ragheb in 1980/3 and derived

from Maslow's Hierarchy of Needs (Griffiths, 2012). Even though these theories are usually treated separately, in this thesis, they will be seen as two parts of a whole.

During the research for this thesis, this theory stood out from others, as it reunites in major dimensions various motivational/satisfactory dimensions that cover multiple factors which reflect both pre- and post-visit thoughts. That is, the LMS evaluates the various products and services before the purchase (covering both push – intrinsic desires – and pull factors – destination's attractiveness) *and* after the holiday is over, determining which one of the main dimensions stood out in motivating the tourist to pursue such activity or destination. Moreover, the LSS assesses the level of satisfaction of each major dimension and its factors, not only enabling to pinpoint the highest and lowest rated factors, but also to understand how satisfying the experience was. With these findings, it will hopefully be possible to better understand what actually motivates people into these leisure activities and what satisfy them the most so that, hopefully, more people can be encouraged to participate in terrestrial astrotourism.

As mentioned before, instead of using a motivational theory *and* a satisfaction theory, the Leisure Motivation and Satisfaction Scales come as a theory already comprising both strands, being, therefore, beneficial.

2.3.1 Leisure Motivation Scale

The Leisure Motivated Scale measures an individual's motivation to participate in leisure activities (Wang, 2008), in this case, it will be used for terrestrial astrotourism. In 1983, Beard and Ragheb identified 48 motivators and divided them into five main dimensions: intellectual, social, competence-mastery, stimulus avoidance and physical skills.

- The intellectual dimension refers to mental stimulations, being motivated because of a need for learning or discovery, e.g. cognitive learning or the opportunity to use one's imagination;
- the social dimension refers to the need for friendship or interpersonal relationships;
- the competence/mastery explains motivation in terms of the desire for mastery, competition and challenge; and
- the stimulus avoidance dimension refers to escape and restoration one seeks in their leisure activities, to seek solitude or to unwind;

- the physical skills dimension refers pursue the physical fitness, weight control, and well-being (Beggs & Elkins, 2010; Griffiths, 2012).

Just like Ryan and Glendon (1998), the LMS will here be applied to tourism, more specifically, to terrestrial astrotourism, in order to make an assessment of the most influential factors that draw tourists to those activities/events. A list of the motivational dimensions is shown in Appendix 7.1.

2.3.2 Leisure Satisfaction Scale

Leisure satisfaction has been measured considering activity-specific characteristics and through a global approach which measures general satisfaction according to leisure choices (Beggs & Elkins, 2010). The Leisure Satisfaction Scale, developed by Beard and Ragheb in 1980 (ibid), is the most recognised and utilised instrument. This scale is comprised of six main dimensions which are psychological, educational, social, relaxation, physiological, and aesthetic.

- The psychological dimension covers the mental and psychological benefits of the leisure activity like enjoyment, sense of freedom, involvement, and challenge;
- The educational dimension is represented by the intellectual stimulation, how individuals learned about themselves, their surroundings and the skills achieved;
- The social dimension comprehends the rewarding relationships with other individuals through the leisure activities;
- The relaxation dimension covers the release of stress of everyday life and emotional well-being;
- The physiological dimension refers to the participant's satisfaction based on the activities' contribution to physical fitness, weight control, and well-being;
- The aesthetic dimension is represented by how well individuals found the leisure environment to be pleasing, interesting, beautiful and well designed (Beggs & Elkins, 2010; Choi & Fu, 2015).

Under this six main dimensions, numerous factors will be addressed, either directly from the original study of Beard and Ragheb, or adapted to terrestrial astrotourism. The list of dimensions can be seen in Appendix 7.2.

2.2.3 In Conclusion

Being considered as only one theory, the Leisure Motivation and Satisfaction Scales come as an easy and yet complete tool to work with. It measures what were the most highly

rated factors, before and after the tourist activity, thus highlighting the most influential dimensions that draw tourists to, in this case, terrestrial astrotourism. Moreover, it also measures the satisfaction factors, thus allowing a better assessment of the highest satisfaction dimensions afterwards. This evaluation will hopefully shed light on the lowest motivational and satisfactory factors, allowing the implementation of solutions in order to encourage more people into astrotourism.

2.4 Part-Conclusion

Astrotourism is a relatively new niche, being a segment of sustainable tourism, whose main resource is the inexhaustible dark sky. It is an activity that involves travelling to specific locations where astronomical objects and/or events can be observed, with or without optical devices, and enjoyed various activities related to that field. In its majority, these activities convey an underlying educational and awareness statement mainly concerning the artificial light pollution and endangerment of nocturnal species.

Astrotourism can be enjoyed in a multitude of places, from observatories to open countries far away from the artificial lights of the cities.

It will be this thesis main goal to understand which are the main motivational dimensions behind choosing astrotourism as a leisure activity, as well as the satisfaction dimensions of each intervenient. For this, the Leisure Motivation Scale and Leisure Satisfaction Scale will be used in order to identify the most rated motivational and satisfaction factors. Both scales portray a multitude of factors adapted to astrotourism that will be used to assess the dimensions that motivated or satisfied tourists the most. With this assessment, the highest ranked factors will expectantly give a better understanding of people's motivations to pursue astrotourism as a sustainable leisure activity and their level of satisfaction, whereas the lowest ranked factors will be given solutions that will, hopefully, be turned into new motivations and satisfaction goals.

In the next chapter, it will be explored the methodological framework chosen to conduct this thesis. The paradigm used will be explained, followed by its ontological, epistemological and methodological characteristics. Lastly, an explanation of the methods used in this research will be presented.

3. Methodological Chapter

This chapter introduces the methodological choices made to answer to this thesis' research question: *“What are the main motivational dimensions that draw tourists in general to engage in (terrestrial) astrotourism and what are the dimensions that satisfy them the most?”*

This thesis was conducted under the point of view of the **social constructivism** paradigm, whose ontology and epistemology will be shortly explained. Next, it will be presented the methods used for this research.

3.1 Research Design

A research design “is the logical sequence that connects the empirical data to a study’s initial research questions and ultimately, to its conclusions (Yin, 2009, p.26). It provides the framework for the collection and analysis of the data collected and reflects the priorities given to the different dimensions of the research process (Bryman, 2012).

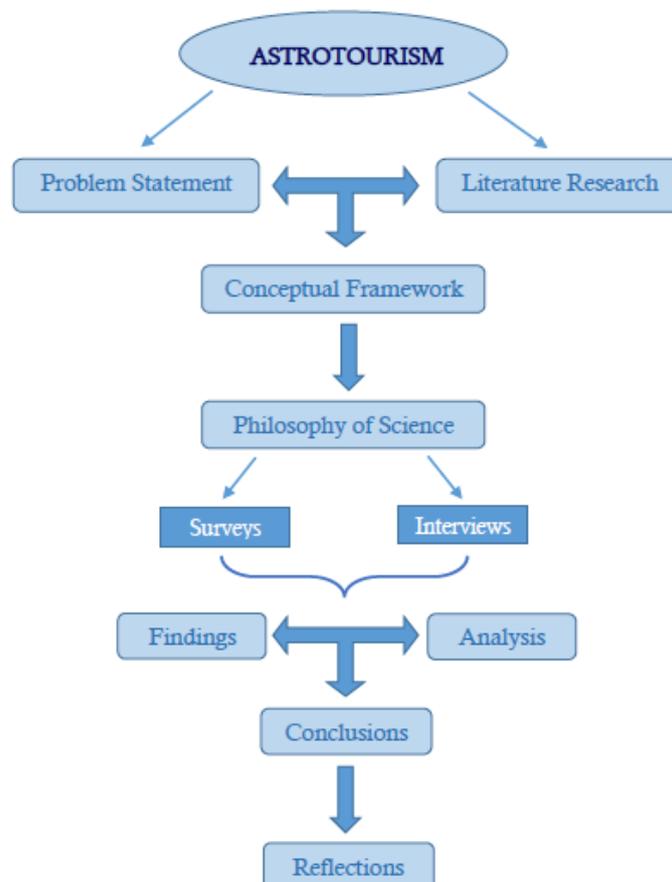


Fig. 12 – Research Design. Source: Own

Hence, the research design elucidates about the process of how this thesis was conducted, from the research question, through the data collection to the conclusion and final reflections. This research design can be better visualised through Fig. 4, which can be seen above.

As it can be seen, from the main idea of astrotourism came the formulation of a problem statement and the research in the literature. It is important to highlight that the problem statement was being formulated while the literature research was ongoing: the latter helped to define the focus of this research and the problem statement helped to conduct the literature research in the way of that same focus. From that exchange came the conceptual framework (terrestrial astrotourism) and consequently the philosophy of science chosen (social constructivism). This conducted the way both the survey and the interviews were undertaken and from which the findings and the analysis resulted. The hermeneutic and dialectic characteristics were clearly visible at this stage. Finally, conclusions could have been drawn that lead to a few reflections, which can be seen in a final chapter after the main conclusion.

3.2 Philosophy of Science

It is this thesis goal to research the main motivations that take regular tourists to become astrotourists, i.e. to engage in astrotourism and, after pursuing the activities related to that field, what satisfied them the most. As mentioned before, each tourist has his own set of motivations and what satisfied one individual might not have satisfied other people. As such, it is wise to use a research paradigm that allows flexibility in understanding different points of view, mentalities and perceptions of reality.

A **paradigm** is a set of beliefs that guides action (Guba, 1990). It is a “worldview built on implicit assumptions, accepted definitions, comfortable habits, values defended as truths, and beliefs projected as reality” (Patton, 2008, p.267) that ultimately defines, for its holder, the nature of the ‘world’, the individual’s place in it and the range of possible relationships between that world and its parts (Guba & Lincoln, 1994). A paradigm can be characterised by answering to three questions, which are the *ontological* one that asks what is the essence of the phenomena in study or the nature of ‘reality’, the *epistemological*, which asks how one can understand the world and communicate it as knowledge and the *methodological* that asks how can knowledge be obtained (Burrell & Morgan, 1979; Guba, 1990).

As mentioned before, this thesis followed the **social constructivism paradigm**. Constructivism states that reality is in the mind of the knower, that the knower constructs reality or, at least, interprets it based upon his/her perceptions (Jonassen, 1991); it is concerned with how knowledge is *constructed*, for it is a function of prior experiences, mental structures and beliefs that the individual uses to interpret objects and events (ibid). As such, constructivism claims that reality is each person's own construction through interpretation of perceptual experiences of the external world (Jonassen, 1991; Guba & Lincoln, 1994). Constructivism also suggests that the categories people use to understand the natural and social world are in fact social products, built in and through interaction (Bryman, 2012).

The following sub-sections will answer to the three aforementioned questions that will better characterise this paradigm.

3.2.1 Ontology

Ontology asks what is the form and nature of reality and, hence, what is there that can be known about it (Guba & Lincoln, 1994). Ontology wants to understand how things 'really' are and work, thus the only questions that matter are those that relate to matters of 'real' existence and action.

Social constructivists usually adopt a relativist ontology (Guba, 1990; Guba & Lincoln, 1994, 2001). Relativism assumes multiple social realities that are the products of human intellect, which may change as the individuals become more informed and sophisticated (Guba & Lincoln, 1994), i.e. relativists believe the world is built of multiple realities that co-exist and are constructed in people's minds based on their sociability and personal experience (Guba, 1990; Guba & Lincoln, 1994; Kukla, 2000). Relativists also claim that there is no ultimate truth to a given problem, nor can any theory be fully tested because of the problem of induction (Guba, 1990). One evidence cannot claim the veracity of a given event, however, it can falsify it straight away.

Hence, in this thesis, it will be acknowledged that there is no single motivation for all astrotourists nor is that the same for everyone. The same applies to the satisfaction factors, as these are not the same for all, nor do they count in the same way. It is this thesis' goal to research astrotourists' motivations and satisfaction, but there is an understanding that these will vary according to each person as each of them has different constructions of

reality. Their social environment and experience will affect their views of the world and thus, their motivations to pursue astrotourism and what they feel as satisfying.

It is important to notice, however, that “all researchers engage in interpretation, both in collecting evidence and when making choices about what questions to research” (Klotz & Lynch, 2007, p.12), meaning that the analysis presented is also a construction created and influenced by this thesis author’s interpretation of the data collected, the choice of theories and questions asked.

3.2.2 Epistemology

Epistemology asks what is the nature of the relationship between the knower and the inquirer and what can be known (Guba, 1990; Guba & Lincoln, 1994). It asks how the researchers know what they know (Klotz & Lynch, 2007).

Constructivists tend to use a subjectivist and transactional epistemology (Guba, 1990; Guba & Lincoln, 1994; Manning, 1997). This means that the researcher and the object of the investigation are interactively linked so that the ‘findings’ are literally the product of the process of interaction between the two as the investigation proceeds (Guba, 1990; Guba & Lincoln, 1994). Knowledge is co-created (Guba, 1990), meaning that the outcomes of the research will be influenced both by the interviewer and the interviewee as it is this relationship between the two that creates the understanding of the given problem. As such, this thesis research is influenced by both the interviewees and survey respondents and this thesis’ author.

Importantly, for constructivists, “the knower interprets and constructs a reality based on his experiences and interactions with his environment” (Murphy E. , 1997). In this case, this thesis’ author has had previous experience with astrotourism, especially terrestrial astrotourism. This means that there is an experienced-based knowledge that may help and/or somehow influence the analysis of the various motivations and consequent satisfaction. Also, there is a better understanding of the world of astrotourism than there would be if this author had no knowledge or had only a theoretical one. Hence, this previous experience may be seen as positive, since the author can better adjust and relate to the interviewees and survey respondents’ answers allowing a better connection. Despite that this author will conduct the interviews and consequent analysis of both interviews and survey with the least possible bias, allowing the interviewees and survey

respondents to transmit their own construction of reality, in this case, their motivations and satisfaction in astrotourism, working only with the data they will provide.

As Guba (1990, p.27) suggests, the inquirer and the inquired must fuse “into a single (monistic) entity”, i.e. the researcher and the interviewee should be connected in such a way that they ought to see the world and the constructions through each other’s eyes, as if they were one. This would allow this author to understand the respondent’s point of view, identify with him, get ‘inside his head’ and construct the world the same way the respondent does. However, achieving this state of symbiosis is rather improbable if not impossible. Yet, it is a goal pursued by constructivists and thus will also be pursued in this thesis.

3.2.3 Methodology

Methodology aims to find knowledge (Guba, 1990). It questions how can the inquirer find whatever there is to be known (Guba & Lincoln, 1994) and how do researchers select their tools (Klotz & Lynch, 2007).

In social constructivism, methodology adopts a hermeneutic, dialectic stance (Guba, 1990; Guba & Lincoln, 1994). Guba (1990) states that hermeneutics aims to identify the variety of constructions that exist, make them consensual and depict them as accurately as possible. Moreover, it aims to find the hidden meaning of the text (Palmer, 1969). In this thesis, the hermeneutics will be represented by an effort to not only describe the data, but also understand the meaning between the lines of what the real motivations of astrotourists are and their subsequent satisfaction. And, as said, there will be an attempt to empathise with them so that the same reality can be seen by the both respondent and inquirer in order to gather the best results possible.

Importantly, hermeneutics is “an approach to the analysis of texts that stresses how prior understandings and prejudices shape the interpretive process” (Denzin & Lincoln, 2005). Meaning that, here, there will be a constant movement back and forth between the various individual parts of the research in order to be a continuous improvement (if possible) or eventual change that derive from a new look at the problem, which can change all the time. Besides, this author’s own construction of the world can influence the way the problem is seen, not mentioning the constant new input throughout the writing process. Some examples of this hermeneutic process have already occurred when there was an initial overview of the literature about astrotourism that not only corresponded to what

this author knew, but also surpassed and enriched it. Another example is the survey that was initially sent online as a test, being later reformulated and improved after some feedback. Also, each interview helped to have a more enriched view over the various types of astrotourism and people's motivations and satisfaction, eventually shaping the interview guide (Appendix 7.5), the final interpretation and the analysis of the data.

The dialectic aspect of this methodology can be explained as the process of comparing and contrasting existing constructions (both the inquirer and the inquired) with the aim of generating one (or a few) constructions on which there is a consensus (Guba, 1990). Meaning that the constructions must be confronted with each other in order to create a consensual reality. Although this seems, once again, somewhat unrealistic, as different people will have different constructions, it will be attempted to find the most consensual construction of what motivates astrotourists and their overall satisfaction. This will be done by comparing and contrasting the data and pinpointing similarities in order to detect patterns which will be then analysed and discussed.

3.3 Chosen Methods

In the following section, the methods chosen for the data collection will be presented and explained. As mentioned, the quantitative method was the online survey, and the qualitative method the semi-structured interview. The reason why these methods were chosen is mainly because astrotourism is still a niche of tourism in development and not much is known about astrotourists' motivations and satisfaction. It seemed natural to start



Fig. 13 - Methodological Scheme

with an overall view of the main motivations and general satisfaction through a wide-ranging survey so that later on a greater focus could be done with the interviews, which provide a more in-depth understanding of the motivational dimensions as well as the satisfaction ones. From both these methods, the analysis was undertaken which ultimately lead to the results. This line of thought can be better seen in the scheme of Fig. 13.

By using both quantitative and qualitative methods, this thesis will then be using a **mixed methods** approach, as both methods are able to cancel out their respective weaknesses (Guthrie, 2010). Neither of these methods is considerably better than the other, as each can be better suited for one context or another, eventually suiting the research question (Guthrie, 2010; Thomas, 2010).

3.3.1 Quantitative Research – Survey

Quantitative research uses surveys to collect data that is analysed and set in numbers which enables the data to be characterised through statistics (Hittleman & Simon, 1997). It is an impersonal, deductive method that helps construct knowledge by establishing relationships between measured variables (Thomas, 2010). By definition, it works with universal generalisations in a single reality. However, as it was seen, with social constructivism, multiple realities will be in study instead, hence the need for qualitative data (see next section). It is important to stress, however, that if the amount of respondents is too low, the survey will be analysed in a more qualitative way, since the reliability of the data will be low as well.

By definition, a survey is a method that selects a sample representative of a larger population, and uses its results to generalise about that population as a whole (Guthrie, 2010). It is a useful method to describe people's general perceptions and attitudes, thus providing a general view of the motivations and satisfaction of astrotourists. Surveys are also useful to describe patterns in large groups, which will facilitate the creation of patterns among the motivational and satisfaction factors in the analysis.

Besides finding patterns, this method provides a larger amount of data (Thomas, 2010) as it encompasses a greater audience than the interviews, again being beneficial for its great coverage. Furthermore, this survey (Appendix 7.3) was distributed online, being targeted to those who have participated in any astro-activity. It was distributed through this author's Facebook and Twitter personal pages, in some astronomy Facebook and Twitter open pages and through other people who shared it in their personal pages. This way,

anyone could answer it at any preferable time, in an environment of their choosing. However, this method is not able to be adaptable to each individual (Thomas, 2010), and can be artificial and superficial. Although the reliability of the answers may be high, the validity of the data may be weak (Zátori, 2013), meaning that even though the respondents may be honest while answering (although it is not possible to know for sure), the sample may not be entirely representative of the population as will be this case. Another disadvantage is the lack of certainty considering the amount of respondents. People may not be predisposed to answer to an online survey or, if it becomes too dull, they might give up answering all together. Nevertheless, this will be tackled by only using the completed surveys, discarding the incomplete or blank ones.

The survey could be answered in less than 3 minutes. All questions were based on the LMS and LSS of Beard and Ragheb (1980), adapted to astrotourism. It comprehended 10 questions of rating importance, using a 5-point Likert Scale, with an extra option – 0 – used in case of “not applicable”, whether for the respondent himself or the activity. These questions were adapted from the factors in the LMS and LSS. The survey aims to cover all possibilities for engaging in astrotourism, whether by purpose or chance. For example, there could be a case when tourists randomly engaged in astrotourism because they were already participating in another type of activities, like mountain hiking or kayaking, whose main purpose was to use their physical skills. In other cases, people purposefully join to enjoy a relaxed moment with the family.

In total 30 surveys were answered. Each question has a correspondent graphic in Appendix 7.4 (SG) that allows a better understanding of the patterns. Each graphic shows the percentages of the amount of points attributed to that factor. For the sake of synthesis, only the 2 or 3 factors of each dimension that had the highest percentages of points were addressed in the analysis, being the others in Appendix 7.4 (SG). The chosen factors were selected for having the greatest amount of 5 and/or 4 points, as it was considered that, although the respondents did not give the totality of points, the factor was still relevant for their motivation/satisfaction in the astro-activity/event.

3.3.2 Qualitative Research – Interview

Qualitative data is the information arisen from researching people’s subjective perceptions; it is scientific knowledge about their personal knowledge by describing narratively their perceptions and views of the world (Guthrie, 2010; Thomas, 2010). This

data is subjective as different people have different thoughts according to their ethical, social, political and cultural environment, which will shape their social constructs as seen before (Guthrie, 2010). Nevertheless, each person's construct is valid as that is the reality they know and, as social constructivist, the intention is to connect and apprehend the interviewees' reality as my own.

The interviews are one of the most common types of qualitative methods. They are discussions, usually one-on-one between an interviewer and an individual (interviewee), that gather deeper information on a specific set of topics (Harrell & Bradley, 2009). Interviews can be conducted in person, over the phone or via Internet (ex. Skype, FaceTime). Interviews allow a better understanding of the interviewees' attitudes, perceptions and opinions, being a source of factual information too; interviews also gather background information, such as past or present behaviour, experience or even expert knowledge of the individual (Harrell & Bradley, 2009; Guthrie, 2010).

In this thesis, the semi-structured interviews were chosen. Falling between a guided conversation and a highly structured questionnaire, semi-structured interviews prime for their flexibility in following the order of the guided questions, allowing in-depth follow up questions, and giving the interviewer some control, but not total, of the interaction (Bryman, 2012; Guthrie, 2010; Harrell & Bradley, 2009). Semi-structured interviews thus allow a collection of in-depth information, solve conflicting information on the spot, determine the emphasis given by the interviewee to a specific issue, allow immediate clarification, and are shaped not only to the individual, but to the topic in question (Harrell & Bradley, 2009).

In semi-structured interviews, a guide is used with questions and topics that must be covered. Although the order is not strict, the questions are standardised so that the researcher covers the correct material (Harrell & Bradley, 2009). In this case, the questions were adapted from both the Leisure Motivation and Satisfaction Scales with emphasis on the topic of terrestrial astrotourism, adding some questions about personal information.

The Interview Guide (Appendix 7.5) was prepared before the interviews. Additional questions were made to deeper investigate some areas or ensure the correct meaning of some answers. All interviewees were informed about the purpose of the interviews and agreed to be recorded. In total, 9 interviews were conducted and their length varied

between 9 and 34 minutes long. Both the English and Portuguese languages were used to undertake these interviews, as the majority of the interviewees was Portuguese and felt more at ease in their mother tongue. The English language was used in the interviews with the Danish woman and the Italian man, being the language in which both interviewer and interviewee could better understand each other.

All interviews were transcribed and translated directly into English. The translation is as precise as possible to also help the reader understand its contents, since this thesis is also written in such language. According to Attride-Stirling (2001), there has to be a focus on the content while transcribing. Therefore, it will not be relevant to transcribe every single detail of the conversation. Words like ‘well’, ‘umh’ and other “empty” words, will not be included in the transcriptions as the purpose is to assess the respondents’ overall insights on the topics.

3.3.2.1 Types of Interviews

As mentioned, there were two types of interviews performed in this research: face-to-face and Skype interviews.

Face-to-face interviews are the most natural choice for a qualitative study (Bryman, 2012). They are spontaneous, immediate and the interviewer can connect with the interviewee right away, observe his/her reactions, face expressions, movement and tone of voice. In total, there were 5 face-to-face interviews and they were all in Portuguese. The transcripts of the interviews can be seen in Appendix 7.8.

Skype interviews are a type of online interviews that is relatively new but can still collect truthful data. There are many advantages of using VoIP (Voice over Internet Protocol) technologies (such as Skype and FaceTime), as it allows participants to contact each other from all over the world in a time efficient and financially affordable way (Iacono, Symonds, & Brown, 2016). Through the web camera, the interviewer can immediately see the interviewee’s reactions and better connect with him/her. Also, the interviewee can be in a place of his choosing, most likely in a comfort zone, where he/she feels relaxed and hence keener to answer the questions. However, Skype calls are not perfect. The quality of the call can vary according to many factors, such as the speed of the internet, the quality of the signal and the computer, weather conditions, etc. These technical problems might discourage the interviewee to continue with the interview. Despite its

negative side, Skype was found as the best alternative to perform the interviews due to the distance between the intervenients, the time available and the capital to travel.

3.3.2.2 Sampling the interviewees

According to Bryman (2012) and Maxwell (2009), purposeful sampling is highly recommended in qualitative studies. It is “a strategy in which particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices” (Maxwell, 2009, p.239).

The selection of the interviewees had only one criterion: the interviewee had to have participated in any activity related to astrotourism. This would include people who purposefully chose the activity or joined it by chance (ex. work, studies, leisure...). Thanks to social media, it was not that difficult to find people who had already “seen auroras” or went “touristing” to a space centre facilities. All interviewees are friends with this thesis’ author, therefore there was an easiness during the interviews, which facilitated the connection and a mutual understanding, besides the flow of the conversation and the emotionally supportive atmosphere (Blichfeldt & Heldbjerg, 2011). However, attention needs to be paid, since the friendship between interviewer and interviewee may influence the latter’s answers, either by omitting or distorting information for fear or embarrassment of saying something less accurate, to be more ‘helpful’, or even to impress the interviewee with boastful information.

3.3.2.3 Interview Guide

As said, a semi-structured interview is conducted by an interview guide (Bryman, 2012; Guthrie, 2010). The interview guide (Appendix 7.5) for this research was based on the theoretical framework of the Leisure Motivation and Satisfaction Scales.

Bryman (2012) suggests a few advices when creating an interview guide. Firstly, the questions must follow a logical order, starting with a few personal questions to ensure a natural flow of the interview. The interview guide is divided into three parts: personal factual questions (Bryman, 2012), motivational dimensions and satisfaction dimensions. These last two compose the theoretical framework. This division helps the interviewer to organise the interview, making sure all questions are asked.

Secondly, the interview questions must be connected to the research question. As mentioned before, the second and third parts of the interview guide are meant to pinpoint which factors motivate and satisfy astrotourists the most, thus answering the research

question. It is important to notice that, sometimes, the interviewees would mix in the same answer both motivational and satisfaction factors. This information is useful to measure the relation between motivational factors and satisfaction ones.

Thirdly, it is important to formulate easily understandable questions. Although extensive, the questions just give the interviewee various options (motivational or satisfaction factors) from which they can choose and develop their answer. The questions are formulated in a simple language, so that the interviewee could better understand the meaning and minimise the possible language barriers.

Fourthly, it is suggested to avoid leading questions, meaning that it is better to start with open, broader questions and then go to more specific ones. This helps the interviewer to pinpoint a topic that can be better explored.

Finally, it is suggested to start with the personal factual questions, like name, gender, occupation, etc. This information helps to reveal hidden context within the interviewees' answers, to better understand who they are and to connect with them. Throughout the interviews, all these steps were kept in mind and definitely helped to drive a good interview and achieve a better state of mutual understanding between interviewer and interviewee.

3.3.2.4 Guthrie's Hierarchy of Qualitative Data Analysis

As a helpful mean to analyse the data, the qualitative data was divided according to Guthrie's (2010) hierarchy. This three-step analysis is drawn from (Benjamin) Bloom's Taxonomy of the Cognitive Domain created in 1956 (Adams, 2015; Clark, 1999; 2015). This taxonomy is used for educational purposes to promote higher forms of learning. However, what Guthrie did was to adapt this taxonomy into a smaller hierarchy in order to facilitate the reading of qualitative data, to make it clearer and more analytical. This hierarchy first describes, then analyses, and later draws conclusions or interprets. Here is a small description of the three steps.

1. Description

Write down the facts of the situation heard about in the open-ended interviews. This description will pass through a filter in such a way that only what is relevant to the research problem and themes will be taken into account. In this thesis, it will be done by transcribing the quotes already treated from the interviews.

2. Analysis

The material will be grouped in order to identify similarities and differences in the data. The various themes from the quote will be pointed out.

3. Interpretation

Key features will be picked out in order to identify patterns. It will be important to keep an open mind to new ideas that may arise from the data. These patterns will be addressed using the motivational/satisfaction factors from the different dimensions.

Again, this hierarchy will only be used as an auxiliary method of analysing the qualitative data, therefore, will only be seen in Appendix 7.7 (TB). For the Description, only one or two examples will be chosen to portray each motivational/satisfaction factor per interviewee. This is meant to facilitate the reader's reading of the tables and to organise the data while conducting the analysis. The main analysis will be presented in the following chapter of the Data Analysis.

3.4 Part-Conclusion

In this chapter, the methodological framework was presented. It was seen that this thesis will be guided under the social constructivism paradigm that suggests that various realities exist in the form of multiple mental constructions and that are based in each individual's socialisation and experience. Hence, each individual has his own construction of reality that is accepted as that is the way the individual sees and perceives the world. Constructivism also encourages the inquirer and the inquired to fuse so that both see the same reality and from there, extract a construction of reality made by both. Finally, this construction, or better saying, these findings will be constantly updated and refined hermeneutically, and compared and contrasted dialectically with the aim of creating a reality that is mutually consensual and understandable by both inquirer and inquired.

This paradigm will guide both the collection of data through the online survey and the semi-structured interviews. The survey's answers will be translated into graphics to better analyse its findings and the interview's will be analysed under Guthrie's (2010) three-step hierarchy of Description, Analysis, and Interpretation.

The following chapter will analyse the data collected throughout the process of this thesis. It will start by analysing the data collected from the online survey and then that of the interviews.

4. Analysis Chapter

The following chapter will present the results of the analysis of both the online survey and the interviews. Each analysis is divided between the Motivational and the Satisfaction Scales, each being organised according to the various dimensions. Each dimension will be introduced by a brief summary of the related theory, followed by the conclusions drawn from the graphics/interviewees' answers. The survey graphics corresponding to each question can be seen in Appendix 7.4 (SG)². In the Interview section, quotes from the interviews will be used in order to corroborate the findings. These quotes can be found in the interview transcripts in Appendix 7.8 or in the respective table of analysis drawn from Guthrie (2010) in Appendixes 7.7 (TB)². At the end of the analysis, there will be a main conclusion that gathers the most prominent findings of both sections' conclusions.

4.1 Survey

As already mentioned, this survey was used to get an overall view of the motivations that take tourists in general to engage in multiple types of astrotourism, and the consequent satisfaction. It was meant to give a general overview of thoughts and ideas that could serve as a basis for the specificity of the interviews.

It is important to highlight that, in this thesis, the quantitative method of the survey is used and analysed in a more qualitative way due to the shortage of respondents. Meaning that, because there was a small number of complete and useful surveys, this sample cannot be representative of its population. This shortage of answers can have many reasons, among them the low amount of people who have actually engaged in astrotourism in the social networks where this survey was put online, the quitting of respondents because of the dullness of the survey, or simply, by clicking and reading the main heading, they realised the survey did not apply to them as they did not participate in any activity or event related to astrotourism. Yet, this scarcity may prove the novelty of astrotourism, meaning that it is still an unknown niche with much potential to grow.

² In order to facilitate the reading, **Appendix 7.4 (Survey Graphics)** will hereafter be called **SG** and **Appendix 7.7 (Interviewees Tables)** will be called as **TB** with the correspondent number of the question / interviewee, e.g. SG1 (graphic of the 1st question of the survey) or TB2 (table of the interviewee n.2).

By the time this survey was closed, there were 518 returned questionnaires, of which 30 were complete and useful, and 16 partially completed and discarded along with the 472 others. Yet, the data from the usable responses was still considered useful since it reflects the thoughts of people who have actually engaged in astrotourism, their motivations and satisfaction, which was deemed more important than the amount of answers.

4.1.1 Respondents' Profile

Of the total number of useful questionnaires, 53% of the respondents were women, while 47% were men (SG1). The majority of the respondents were between the ages of 19 to 30 years old (70%), followed by 31 to 50 (13%) and 51 to 65 (13%) and the age group of less than 18 (3%), not having the survey been answered by anyone with more than 65 years old (SG2). The fact that there was a majority of women respondents and the majority of people between the ages of 19 to 30 may have to do with the fact that this survey was distributed online through this thesis' author social networks, which arguably features more young adults, being largely women.

Also, there was a majority of graduated people (73%) answering this survey (SG3) and, from the total number of respondents, 97% had had previous contact with the astronomy field before (SG4), which may have to do with the fact that, arguably, people who engage in astrotourism have studied or gained some knowledge via academia about astronomy or sciences in general.

When answering to the question of what type of activity have the respondents participated in and being able to pinpoint multiple sites, 69% has been to an observatory, park or reserve, space centre or other facilities of this kind, followed by 66% who has star/planet/comet/aurorae gazing and others of this kind (SG5). All other categories of astrotourism have had someone participating, except for the jet flights / weightless flights. The exact percentages of the amount of people engaging in these activities can be seen in the image below (Fig. 14).

Fig. 14 - Appendix 7.4 (SG), Question 5: In what type of activity did you participate? / Where did you go?

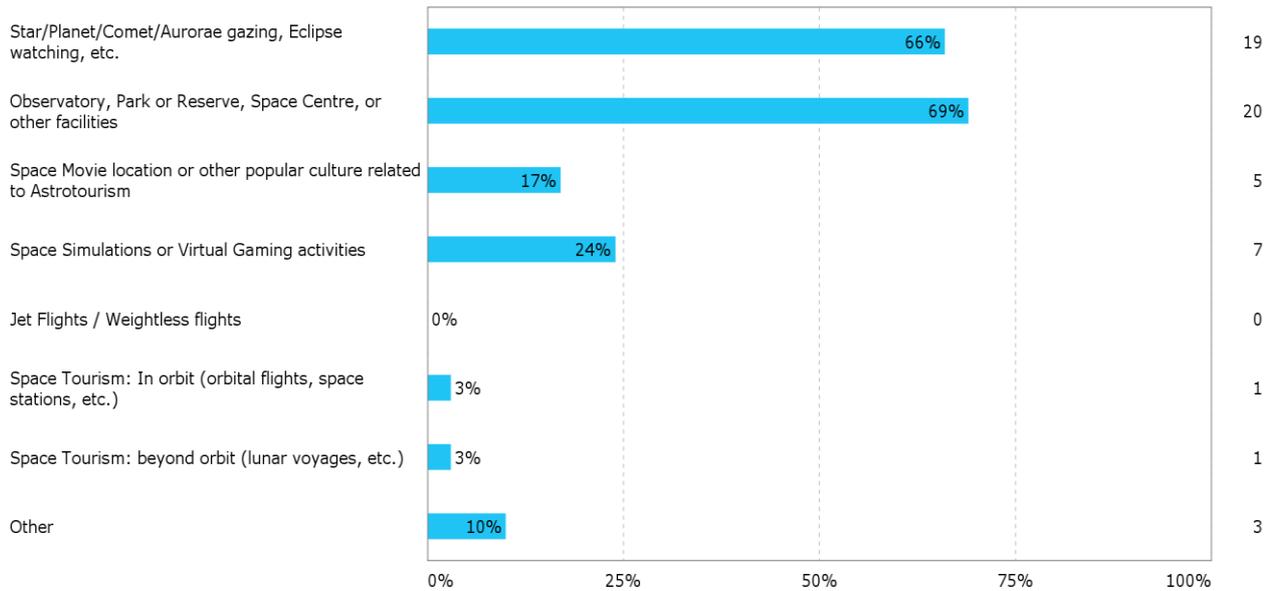


Fig. 134 – Activities/Events participated by the Survey's Respondents

4.1.2 Findings and Discussions

In order to understand what most motivated and satisfied these astrotourists, the dimensions of the Leisure Motivation and Satisfaction Scales were used as main questions, having the respondents to classify each motivational/satisfaction factor according to the Linkert Scale from 1 to 5 (1=strongly disagree, 5=strongly agree) or 0 when not applicable. The template of the survey can be seen in Appendix 7.3. For the sake of synthesis, only the 2 or 3 factors of each dimension that had the highest percentages will be addressed in this analysis; the percentages of the other factors can be seen in Appendix 7.4 (SG).

4.1.2.1 *Motivational Dimensions*

The first question concerned the **intellectual** dimension. The factors that motivated the respondents the most were, 1) to expand one's knowledge, where 60% awarded 5 points and 27% awarded 4 points; 2) to satisfy one's curiosity, where a majority of 53% awarded 5 points to this factor, and 37% awarded 4 points; and 3) to discover new things, where 50% of the respondents gave 5 points to this motivational factor and 27% awarded 4 points (SG6.1). This choosing goes with the line of thought that astrotourism is an opportunity to get to know more about astronomy, sciences and the universe in general. Not everyone knows about this niche of science and, when having the opportunity, people feel motivated to learn more about the issue and explore themes they do not know much about or understand.

The second question concerned the **stimulus avoidance** dimension. The factors that motivated the respondents the most were, 1) to relax mentally, which had greatest amount of 5 points given by 20% of the respondents, and 4 points awarded by 30%; 2) to relieve stress and tension, which, although only having 5 points awarded by 3%, had 4 points awarded by 30%, overall meaning that 33% of the respondents considered this motivational factor to have motivated them greatly; and 3) to relax physically, having been awarded 5 points by 10% and 4 points by 20%, meaning that 30% of the respondents considered this factor highly motivational as well (SG6.2). Based on this data, it appears that astrotourism may be considered an activity that invites relaxation and quietness. People use these activities/events to enjoy a quiet evening and get away from their daily routine and stress, forget what troubles them and focus on something else.

Next, the third question questioned about the **social** dimension. This dimension had multiple factors with balanced percentages. The factor that, overall, motivated the respondents the most was 1) to meet new and different people, which had 5 points awarded by 17% and 4 points by 20%; 2) to interact with others, which had 5 points awarded by 10% but 4 points awarded by 37%; and 3) two factors were tied: to build friendship with others (7% gave 5 points and 27% gave 4 points) and to be socially competent and skilful (10% gave 5 points and 23% gave 4 points) (SG6.3). This shows that astrotourism is also a good activity to meet new people who share the same interests, to build new friendships and also to be socially active, being an activity of reunion, where people interact with new or old friends to talk about a shared experience.

The fourth question wonders about the **competence mastery** dimension. In this dimension, the two tied factors that motivated the respondents the most were to improve one's skill and ability and to be active, which had, both of them, 5 points awarded by 10% of the respondents and 4 points by 30%, meaning that these two highly motivated the respondents the most, although neither of them possessed the greatest amount of 5 points. The third factor that motivated the respondents the most was to challenge one's abilities, which only had 7% of people that awarded 5 points, but a large 37% that awarded 4 points. One may say that, globally, this is the factor that motivates the respondents the most in terms of competence mastery (Fig. 15; SG6.4). Astrotourism becomes a good opportunity to, not only learn new things and gain more knowledge about a field, but to share one's knowledge and teach others. Dealing with such different, unknown or

complicated subjects, helps people to actively challenge themselves and improve their knowledge, capacities and expertise.

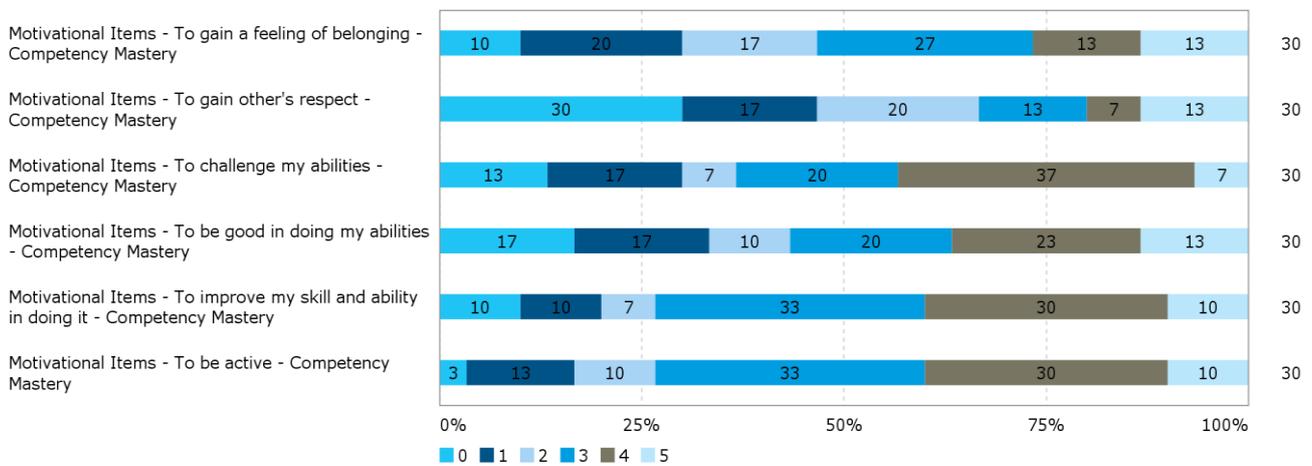


Fig. 15 - Survey Motivational Factors: Competence Mastery

The **physical skills** dimension was not portrayed in this survey, as it was not considered relevant in global terms concerning this theme. It will, nevertheless, be included in the interviews.

Taking into account the factors that motivated the respondents the most, either by having been granted 4 or 5 points, it appears that the factor that stands out the most is to expand one's knowledge of the **intellectual** dimension is awarded 5 points by a majority of 60% of the respondents and 4 points by 27%. This corroborates the fact that astrotourism is still unknown to many who wish to not only better explore this niche of tourism, but also to gain more knowledge about astronomy and the universe in general. The second factor that motivates these respondents the most is to relax mentally of the **stimulus avoidance** dimension (5p. by 20% and 4p. by 30%) and the third to challenge one's abilities of the **competence mastery** dimension (5p. by 7% and 4p. 37%). Although it may appear controversial, people seem to be stimulated to learn while they are relaxed, learning things of outside their daily environment.

4.1.2.2 *Satisfaction Dimensions*

In terms of **psychological** satisfaction, the factors that satisfied the respondents the most were 1) 'the activity was very interesting', where 43% awarded 5 points and 37% awarded 4 points, 2) 'the activity gave me a sense of accomplishment', that, although only 7% of the respondents awarded 5 points, a large 47% awarded 4 points (SG7.1). The

psychological benefits of these activities seem to satisfy greatly these respondents. Besides being its interesting activities, astrotourism gives these people a sense of an effort well put, an accomplishment for what they have learned, felt and perhaps achieved.

Considering the **educational** dimension, the factors that satisfied the respondents the most were 1) 'the activity increased my knowledge about things around me', where both the 5 and 4 points were equally awarded by 40% of the respondents, and 2) 'the activity provided opportunities to try new things', which had 5 points awarded by 30% and 4 points awarded by 27% of the respondents (SG7.2). Undoubtedly, astrotourism is an educational niche. Besides taking people to see the marvels of the universe, it teaches them about what exists around us all, both on Earth and out of it. Also, it allows people to discover all sorts of things about the Universe and themselves.

In terms of the **social** satisfaction, the factors that satisfied the respondents the most were 1) 'the people you met in the activity were friendly', which had 5 points awarded by 17% and 4 points by 30% of the respondents; and 2) 'I had social interaction with others through the activity', which had the 5 and 4 points given 17% of the respondents equally (SG7.3). Either by being with old friends, or having the opportunity to meet new ones, astrotourism seems to offer a good social experience. People can interact with others who share the same knowledge, learn from those who know more or simply enjoy a good time. Although not a dimension that stands out, this shows that these people were more satisfied with other aspects of astrotourism, and not just the social part.

The **relaxation** dimension had the four factors very balanced. Although the factor in which 'the activity contributed to my emotional well-being' had the greatest amount of points (5 points given by 10% and 4 points by 47%), the most prominent factor is 'you engaged in the activity simply because you like doing it' because it had 5 points awarded by a larger percentage of respondents (23%), and 4 points by 33%. The third factor was 'the activity helped me to relieve stress', with 5 points awarded by 17% and 4 points by 37% (SG7.4). The fact that all factors of this dimension were very balanced in terms of percentages, means that this dimension satisfied the respondents greatly, in every aspect. It seems they indeed forgot about their daily lives and embraced a highly relaxing moment that they enjoyed and put them in a good mood.

Just like with the motivational dimension of the physical skills, the **physiological** dimension was not considered satisfying simply because, for a greater part of the respondents, it was a dimension not applicable to astrotourism (SG7.5).

The last dimension, the **aesthetic**, had also a very balanced score. The most satisfying factors were 1) ‘the area or place where I engaged in the activity was interesting’, having 5 points awarded by 27% but 4 points by 53% of the respondents, and 2) ‘the area or place where I engaged in the activity was beautiful’ having 5 points awarded by 30% and 4 points by 37% of the respondents (SG7.6). It appears that these respondents were highly satisfied with the locations where they have engaged in the astro-activity or event. Besides interesting for all possible reasons, it was also beautiful. Still, there is an uncertainty to whether some respondents may be referring to the location *per se* or the conjugation of the site and the dark sky above.

Overall, the respondents were greatly satisfied with their activities, having only 27% awarded 5 points to it, but 63% awarded 4 points (SG8).

The second last question was an open-end one, asking the respondents which was their main motivation to engage in astrotourism. In total there were 18 answers and they were varied. Nevertheless, the main motivations pointed out by the respondents were of the **intellectual** dimension, being to get new knowledge, curiosity and believing astronomy to be interesting. The other dimensions could be **social** (to be with friends), **stimulus avoidance** (to relax) and **competence mastery** (to write about it and to share knowledge) (SG9).

The last question of the survey was an open-end one and was meant for the respondents to add any comments they would wish. There are two comments that stand out from the others (SG10). Both highlight the importance and the opportunities there are with astrotourism, and how it could be further developed. The first states that:

“There is so much happening in astrotourism right now, and I’m delighted that it is being studied in this way by Ana!! There are many opportunities in this field, in terms of economy, sustainability and public engagement.”

This respondent highlights many of astrotourism advantages, mainly the economic one, the fact that it is sustainable and the easiness it has to attract public. These are other reasons for why astrotourism is such an important niche of tourism. The fact that it has a

inexhaustible resource, which is the dark sky, allows many business opportunities, mainly for the countryside, far away from the cities' light pollution, thus increasing the economy of more deserted areas, as the next respondent focus:

“I’m personally looking for volunteers or helping hands to [make] a model astro village here somewhere in Northeast India. Astrotourism is not here in India but since the last 2-3 years I am dreaming of such a role model village where we’ll have a public observatory where one may come [and] enjoy overnight or even in the day and then enjoy the breathtaking [landscapes] as well.”

This respondent is looking forward to start his own astro-business, a ‘model village’ dedicated to astrotourism. It seems that in Northeast India the dark sky is exquisite, thus being the perfect opportunity to start a business and allow visitors to enjoy a ‘breathtaking’ view during night and day.

In terms of satisfaction, it seems that the factors that better reflect the respondents’ satisfaction were ‘the activity was very interesting to me’, from the **psychological** dimension, ‘the activity increased my knowledge about things around me’, from the **educational** dimension, and ‘the area or place where I engaged in the activity was interesting’, from the **aesthetic** dimension, all having been awarded a total of 80% with both 5 and 4 points. Yet, it was the fact that the place of the activity was interesting that was awarded 5 points by 53% of the respondents, thus becoming the factor that satisfied them the most.

4.1.3 Part-Conclusion

As mentioned, the online survey was meant to give a general idea of what people who have previously engaged in astrotourism considered their motivations to engage to be and what their main satisfaction factors afterwards were. This was successfully accomplished, although from a very small sample of respondents. The majority of the respondents has been to ground based facilities, like observatories, park and reserves, space centres, among others, as well as engaged simply on free observations, like star/planet/aurora gazing.

During the assessment of the factors with the highest percentages that, not only would the amount of 5 points be taken into consideration, but also the 4 points awarded. This decision was made because of uncertainty. Although the respondent may not have

attributed 5 points to a specific factor, but only 4, it does not mean he/she has not considered that factor to be important. Just not the top of the scale.

Considering the motivational dimensions, the ones that stood out the most were the **intellectual**, as the respondents pointed ‘to expand one’s knowledge’ to be the greatest motivational factor that drew them to astrotourism, followed by the **stimulus avoidance** (‘to relax mentally’) and **competence mastery** (‘to challenge one’s abilities’). This means that these respondents were motivated not only to learn more about the field of astronomy and improve their capacities, but also to rest.

In terms of satisfaction, the dimensions that stood out were the **psychological** dimension, as the respondents believed the activities to be very interesting to them, the **educational** dimension, as the activities increased their knowledge about things around them and the **aesthetic** dimension as the location was considered very interesting. It is important to highlight, however, the importance of the **relaxation** dimension, which was the one who had the factors most balanced of the survey. Meaning that there is a certain sequence, as the respondents were motivated **intellectually** (and in terms of competences) to the activities and were, consequently, satisfied both **psychologically** and **educationally**. Furthermore, those who were also motivated by the **stimulus avoidance** dimension were also greatly satisfied in terms of **relaxation**. And finally, without having even thought about it, the respondents were all surprised and delighted by the sights they have seen as the satisfaction in the **aesthetic** dimension was also high.

At this moment, it can be verified that astrotourism is a leisure activity, for it allows an educational moment while still enjoying a relaxing moment (besides its social attributes and outcomes).

In the next section, the data withdrawn from the interviews will be analysed and the conclusions will be also compared to those of the survey.

4.2 Interviews

This next section will analyse the data withdrawn from the semi-structured interviews, both face-to-face and via Skype.

4.2.1 Assessment of interviewees’ profile

This sub-section aims to present the interviewees to the reader. In total, there were 9 interviewees, being 3 women and 6 men. As mentioned, the majority was Portuguese,

being 1 woman from Denmark and 1 man from Italy. The age of the interviewees ranged between 24 and 34 years old. All of them were at least “a little bit” interested in Astronomy. They all participated at least in one activity related to astrotourism and they all liked those activities, being satisfied. Appendix 7.6 reunites in a table these answers to questions 1 to 6 and 9 to 13; although these are not directly related to the LMS and LSS analysis, they will be useful to assess the main motivation that drove the interviewees to the events witnessed/activities engaged and their consequent satisfaction.

4.2.1.1 *Specific, Casual or Serendipitous Astrotourist*

As it has been previously addressed, the interviewees were organised according to the already mentioned categories of Astrotourists, drawn from Macionis (2004):

- ★ Specific Astrotourist: who actively researches for places where astronomic events will happen and the various locations either for work or leisure;
- ★ Casual Astrotourist: who does not specifically looks for the astro-event location, but participates in any activity related to it while at the destination, and
- ★ Serendipitous Astrotourist: who just happens to be at the destination or location where an astro-event occurred.

It was concluded, from the 9 people interviewed, the following:

Names	Specific	Casual	Serendipitous	Event	Tourism to	
					Specific Sites	Non-Specific Sites
Gonçalo Dias	X			Aurora Borealis in Norway		Street
Beatriz Duarte			X	Aurora Borealis in Iceland		Bar
Carla Ventura	X			Star gazing at Dark Sky Alqueva	Dark Sky Alqueva	
Tomás Pereira		X		Star gazing at Dark Sky Alqueva	Dark Sky Alqueva	
António Miguel			X	Midnight Sun in Finland		Street
Lourenço Branco	X			Astrophotography in Sintra		Street
Frederico Arez	X			Dark Sky Alqueva + Observations	Dark Sky Alq.+ Observatory	
Fabio Carraro		X (NZ)	X (Russia)	Milky Way in NZ + Stargazing in Russia		Forest + National Park
Maja Nielsen		X		Kennedy Space Center, USA	Kennedy Space Center	

Fig. 16 - Interviewees' Definition, Event witnessed and location

- 4 can be designated as Specific Astrotourists, as all the deslocations towards the astro-events locations were planned beforehand and there was an intent to pursue

these events either for work (Frederico) or leisure purposes (Gonçalo, Carla, Lourenço and Frederico);

- 3 can be designated as Casual Astrotourists, as their main purpose was to go to a specific location of their own choosing due to other reasons (without knowledge that the event/activity was to happen but that there was a chance of it), and with no main intention of it, still ended up participating/witnessing the event as a bonus to their primary leisure activity; and
- 3 can be designated Serendipitous Astrotourists, as they travelled to the destinations which was their primary goal, and happened to be at a (random) location when the event occurred – the interviewees were not in purpue of the specific locations nor were aware the event could even happen. They were just ‘in the right place, at the right time.’

Note: The interviewee Fabio provided two examples of situations when he is considered both a Casual and a Serendipitous Astrotourist. He was Casual when he purposefully went to the Abel Tasman National Park in New Zealand, where he knew there could be some stargazing there, although it was not his main purpose; and was Serendipitous when he went on a tour through the Russian countryside, where he did not even think the star gazing could happen, but did; he was caught off guard. Hence, Fabio’s experiences were classified differently.

4.2.1.2 Casual Leisure or Serious Leisure

Considering the distinction between ‘**Casual Leisure**’ and ‘**Serious Leisure**’, in which

- **Casual Leisure** is a short-lived experience that requires very little or no training that is still intrinsically rewarding for the individual, and which produces immediate yet evanescent pleasure, with little training to experience it. Ex. watching television, strolling in a park, conversing with friends;
- **Serious leisure** is the steady pursuit of an amateur, hobbyist, or volunteer activity. It is a long-lasting and exigent activity that requires perseverance, hence requiring a mixture of knowledge, skill and/or experience.

It can be said that only 2 (Lourenço and Frederico) out of the 4 Specific Astrotourists can be considered **Serious Leisure** tourists, since only these two pursue their respective activities as a hobby, visiting various places and using their skills, knowledge and abilities in a continuous way, frequently engaging in such activities.

The other 2 Specific Astrotourists (Gonçalo and Carla) are not considered Serious Leisure tourists (but rather Casual) as they do not pursue the respective activities as a hobby. They chose to pursue the activity/witness the respective event as one time only adventure. Although it was programmed, it is not frequent, rather sporadic, hence not being a hobby. However, this does not mean they will not pursue the same activity once more in the future; only that they do not pursue it with such frequency to label it as a hobby.

The remaining two Specific, the Casual and the Serendipitous Astrotourists can be considered **Casual Leisure** tourists as the activities engaged or the events witnessed were short-lived and exclusive, that produced immediate and almost fleeting pleasure, and which required little or no training. Although for these tourists the event or activity was not planned, they still belong to this category as there was still a purposeful itineration made in behalf of leisure (among others) and the event/activity ended up being enjoyed as such.

4.2.1.3 Tourism to Specific Sites and to Non-Specific Sites

In Fig. 16, it can also be seen the events/activities engaged by the interviewees. These events/activities were also divided into Tourism to Specific Sites and to Non-Specific Sites, like it was presented in the theoretical chapter. Just to remember, in this thesis:

- **Specific Sites** refer to astronomical sites, normally buildings or other types of manmade constructions, used for educational, scientific, religious or leisure motives, usually located in specific and meaningful places on the Earth's surface. Examples are observatories, dark sky parks, reserves and sanctuaries, planetariums, space centres and archaeoastronomy sites.
- **Non-Specific Sites** refer to random locations on the Earth's surface, where multiple astronomic events can be witnessed or astro-activities engaged without being in specific sites, as these can vary. Examples are auroras, comet, planets and star and eclipse gazing, and the midnight sun.

In this case, the interviewees have witnessed their respective event or engaged in the astro-activities as follow:

- 4 interviewees have engaged in activities in Specific Sites, mainly in the Dark Sky Reserve of Alqueva, Portugal, the Astronomic Observatory of Lisbon, Portugal, and the Kennedy Space Center, Florida, USA;

- 5 interviewees have witnessed their respective events in Non-Specific Sites, mainly outside (street), one in a bar with an outside leisure area and the other in a forest (Russian country side) and in a National Park (NZ) (both these last locations given by the same interviewee Fabio).

Curious enough, all interviewees that went to the Specific sites were considered Specific Astrotourists, except for Maja, who was taken there without her knowledge, and all interviewees that were in Non-Specific Sites happened to be Casual or Serendipitous Astrotourists, except for Lourenço, whose hobby is meant to be pursued outside in random places (with the least light pollution possible).

With these distinctions made, it will now be possible to assess each interviewee motivations and satisfaction factors, attending to the fact that each has had different motivations to witness their astro-event or pursue their astro-activity.

4.2.2 Empirical findings and discussions

In the following sub-section, the data collected from the interviews will be analysed according to the presented theory, thus being divided into the factors of both the LMS and LSS. Both these scales have the premise that **leisure** is the opportunity the individual has with time and freedom to pursue experiences that are worthwhile or gratifying for himself (Shivers, 1979; Hede & Hall, 2006). **Leisure motivation** can thus be defined as the need, reason or satisfaction that stimulates the involvement in a leisure activity (Crandall, 1980), while **leisure satisfaction** is the cognitive-affective state after concluding a leisure activity (del Bosque & Martín, 2008; Correia & Pimpão, 2008).

4.2.2.1 *Leisure Motivation Scale*

The Leisure Motivation Scale measures the individual's motivations to engage in leisure activities (Wang, 2008). In this case, it will assess the different motivational dimensions that drew the interviewees to their different activities or events. As mentioned before, the LMS focuses on five main dimensions: intellectual, social, competence mastery, stimulus avoidance and physical skills. In each of these dimension, there are factors that better characterise the dimension and were used, not only as examples provided to the interviewees for them to elaborate during the interviews, but also as identifiers of patterns that arose in the Interpretation phase of Guthrie's analysis hierarchy. The patterns were found by identifying the most frequent factors pinpointed by the interviewees. The analysis for each dimension will highlight the 3 or 4 most frequent factors followed by

an example provided by the interviewees and the respective theoretic analysis. For the sake of synthesis, only one example referring each factor will be provided (see Appendix 7.7 – TB).

4.2.2.1.1 *Intellectual*

The intellectual dimension refers to mental stimulations motivated by a need for learning or discovery. E.g. to learn about things around oneself, to explore new ideas, to discover new things, to learn about oneself, etc.

One of the most frequent factors to be pinpointed by the interviewees, was the motivation to learn about things around themselves. This can be seen when Tomás explains the importance to learn about the universe that surrounds us:

“I think it is very important for us... to study where we are... And we cannot forget that we are in this space with billions of [stars], and it is important for us to understand the outer space around us. As much observations we make towards outside our sphere, we end up learning always a bit more” (TB9).

In this case, Tomás is referring to learn about things in the universe that surrounds us all, like other interviewees (TB2/5/7); to Tomás, it is important to recognise our place in the universe, to understand what surrounds us, and the observations allow that accomplishment. And that drives him to engage in astrotourism. Other interviewees mention the learning about the location in itself where the event occurred or the activity took place (TB3/8). In the end, there is this understanding that all interviewees pursue these activities or events with a motivation of understanding what surrounds them, either physical (e.g. the world and the universe) or abstract (e.g. human concepts).

Another factor that stood out was the motivation to explore new ideas. This is particularly well identified by António when he says:

“I was not expecting it to be day when I got out of the pub. (...) I had to ask to all Finnish people (...) what the hell that was (...) and they replied ‘yes, this is normal... because we are in the summer, and because we are so high up in Europe, it never gets dark’. (...) I didn't even have that [notion]” (TB1)

António had never thought of the idea that in higher latitudes, during the summer, there would be more hours of sunlight, let alone the phenomenon of a Midnight Sun. Besides going to Finland to meet a new culture and make new friends, António was caught by

surprise when he first witnessed this event, making him wanting to know more about it. He then explored new ideas, mainly concerning a phenomenon he did not know. Other interviewees mention the motivation to explore the novelty (TB6/7/8) of things they barely knew about.

Other frequent factor was that of the motivation to expand one's knowledge. This can be particularly seen in Frederico's words, coming from someone who is an astronomer, but continues to learn nevertheless:

“If you are curious you are so because of something. You feel the urge to look for it and that makes you want to know something else and, ever since I was a child, I've always wanted to know more about stars and planets.” (TB5)

As it can be seen, Frederico does not consider knowledge a stagnate concept, rather a continuous process, that started when he was a child. He feels motivated to expand his knowledge on top of that he already has and that is what motivates him intellectually the most. Other interviewees also emphasise the incentive to learn about something that was unknown (TB1) or not that thought/known about (TB2/6/8).

The last most frequent factor was the motivation to discover new things. This can be seen in Maja's quote:

“When I found out we were going there, I got excited because, as I said, I'm fascinated about all that field of science, and wished to know more about it” (TB8)

Even though she does not understand much about astronomy or space sciences, she was thrilled and interested to know more about how astronauts would go to space and about the whole process behind it. This motivated her, although she was already going to the Kennedy Space Center without her previous knowledge. She felt that besides the little knowledge she had of those themes, she wanted to discover new things she did not know. Other interviewees express their desire to find new things out, particularly about the processes behind the events witnessed (TB1/2/3/6/7).

As said, these were only the factors that were most relevant to the interviewees. In Appendix 7.7 (TB), one can find all the other factors and respective examples (Description), Analysis and Interpretation, where the patterns are best shown.

In conclusion, all interviewees were greatly intellectually motivated. It can be seen that the incentive to learn about things surrounding them, either about the universe or

themselves, to explore new ideas, about science or culture, to expand one's knowledge in every direction and discover new things to complement their already existing knowledge motivated the interviewees. It can be seen a motivation towards the unknown – novelty, and education, two motives that Crompton (1979) pointed as major pull factors.

4.2.2.1.2 *Stimulus Avoidance*

The stimulus avoidance dimension refers to the escape and restoration the individual seeks in his leisure activities, mainly to seek solitude or to relax. Only two interviewees did not point this dimension as a motivational factor (Maja and António). In all the others' examples, it is possible to find similarities in terms of what motivated them.

The first frequent factor is to relax mentally. The majority of the interviewees considered this to be one of the most important motivations to pursue astrotourism. This can be seen in Frederico's quote:

“If I'm just there to relax then this starry night is a beautiful thing [to enjoy] and very relaxing (...) I really like going outside [and] laying on a rock (...) and just look at the sky and that is really relaxing.” (TB5)

Frederico uses the quiet nights of the observations to lie down and contemplate the sky. For him, this is the epitome of mental relaxation, to enjoy the beauty, quietness and greatness of the universe. Some interviewees took this factor even further and stated that their activities allow them to concentrate in themselves (TB4/6/7). The rest emphasise mainly the focus on the psychological part (TB3/4/9).

The next frequent factor was to avoid the hustle and bustle of daily activities/routine. Tomás emphasises this very well, when he talks not only about himself, but also others:

“Every day we are exposed to really high, tremendous, stress levels... and it is even more important to value the break in which ‘everything is over and you can relax. Let's contemplate the landscape, let's contemplate everything that is worth it.’”

(TB9)

Tomás emphasises the need to stop, to take a break of all daily hustles and enjoy what we can, while we can. This is motivation enough for him to engage in astrotourism, as this was a new leisure activity to which he completely surrendered. The opportunity to admire the universe and to understand ‘how little we are’ made him realise he cannot only be

worried with daily problems. And this thought is reflected by others interviewees (TB3/5/6).

Other frequent factor pointed out was that of relieving stress and tension. Astrotourism ended up being a better stress-free therapy than others, as Fabio mentions:

“I decided to take that trip alone (...) [to] kind of [relax] and to concentrate. Yoga for me is not really working because I don't like sitting in one place too much and these kind of things work better for me.” (TB4)

Fabio went to New Zealand and to travel alone and focus on himself. All the walking and the stargazing he did, helped him to put his mind on something else and forget the stress of his job. In a way or another, all the other interviewees pointed this factor as a main motivational factor.

This last factor makes way for the last most frequent factor, which is liking to be alone sometimes. Although not the most pinpointed, some interviewees stated that one of their main motivations to engage in astrotourism was to be alone. This can be seen in Gonçalo's quote:

“Liking to be alone sometimes... For example some of the auroras I saw happened when I decided to go for a stroll alone, just to relieve a bit of stress and of the University.” (TB6)

Gonçalo witnessed some auroras borealis when he decided to get out of the house, forget momentarily the university and its dilemmas, and just be with himself. Although actively searching for auroras on a regular basis, the fact that these appeared when he was not expecting, gave the moment a deeper tone. It was understood that whenever Gonçalo wanted to be alone, he would always go out and look for the auroras, something that ended up having a great emotional meaning to him. Other interviewees mentioned they would engage in their respective activities also to spend some time alone (TB4/5).

In the end, the interviewees also mentioned the motivation to rest (TB3/5/7/9) and even to enjoy their hobby quietly (TB7). With these interviewees stimulus avoidance appears as motivation mainly to relax mentally, to avoid the hustle of the daily routine, to rest and be by themselves. It seems that astrotourism is perceived by the interviewees as a leisure activity of quietness, relief of tension and introspection, corroborating Iso-Ahola's (1982)

work that a leisure activity, in this case astrotourism, indeed is a satisfaction-producer by escaping from the routine environment.

4.2.2.1.3 Social

The social dimension refers to the need the individual has for friendship and interpersonal relationships. It covers everything from building new friendships, interacting with others to develop and consolidate friendships.

The most frequent factor pointed out by the interviewees was that of developing close friendships, either with multiple people or just one, as it is the case of Lourenço:

“Fortunately now I have this friend who is helping me with astrophotography, and we have shared good moments together because... first of all he gives me a ride (...) but it's good because he is also interested (...) now it's something that we share between the two, every time we take a photo, we do a light painting” (TB7)

To Lourenço, astrophotography became a means to fortify a friendship, because not only do they spend more time together, but also like the same hobby and share experiences. For him, this is a crucial motivation since they cherish these moments together, have a new topic and passion to talk about and reinforce their friendship. Other interviewees mention this development considering multiple people, a group of friends (TB3/5/9), or even family (TB8).

Other frequently mentioned factor was that of the interaction with others. Aside developing relationships, a simple interaction with other people would be a sufficient motive for the interviewees to engage in astrotourism. This can be better portrayed by Frederico's quote:

“In the Observatory, (...) one of my greatest motivations was to socialize with the monitors, which is the coolest part. Being there and talking to them, having dinner, (...) and then talk all night long.” (TB5)

To Frederico, socialising with the other volunteers is one of his main motivations to participate in the Nights at the Observatory³. He is motivated to join these activities in order to be with his peers, share opinions and experiences and have a good time.

³ Activity open to the public that the Astronomic Observatory of Lisbon offers every last Saturday of each month. Speeches, guided tours through the Observatory and observations with telescopes are all possible thanks to a group of volunteers.

Moreover, he can also socialise with the public with whom he shares his knowledge. Other interviewees mentioned the motivation to socialise with people of different nationalities (TB1/4) or who know more about the topics (TB3).

The next frequent factor was that of building friendships with others. It is understandable that all these factors are intertwined. However, making new friendships due to these activities or events was something that not only motivated the interviewees, but positively influenced their experiences. This can be seen in António's case. Despite being a Serendipitous Astrotourist, his main social motivation was to make new friends:

“Make new friends (...) Meeting new, different people, of other cultures, and besides, in my exchange program, there wouldn't be only Finnish students, they were from different nationalities, so it was really good” (TB1)

Just like in the previous factor, this motivation to make new friends was positively influenced by the shared moment of witnessing an unfamiliar event, the midnight sun. The event ended up motivating them to know each other, to create friendships, as they were all asking one another what was happening. The same happened to other interviewees (TB2/3/4), who also made new friends by witnessing the same events or engaging in the same activities.

Besides the emphasis on building new friendships, there was also the motivation to meet new and different people. Although some interviewees emphasise this aspect concerning people of different nationalities (TB1/2/4), there were some who emphasised meeting people with a different background, studies or experiences, from whom they could learn. This would motivate Carla immensely:

“I think it was mainly to interact with other people (...) and to meet new people, different people, [who] could teach me more about this topic about which I wanted to know more.” (TB3)

As a Specific Astrotourist, Carla is very much motivated to participate in the Dark Sky activities as she can meet people with different studies from whom she can learn. Moreover, these people share different opinions and it is not just the astronomy that joins them, but also experiences and points of view.

The social dimension seems to attract the majority of the interviewees. Despite some engaging in their activities for the quietness of the moment, it appears that the majority

agree that one of their main motivations to engage in astrotourism is social, to build and develop friendships, to meet new and different people, to be together and share experiences. This reinforces the fact that astrotourism is a proper leisure activity, as its social component motivates greatly the astrotourists, not only because it offers an opportunity to meet new people and learn from them, but also to enjoy time with family and friends while sharing a worthwhile and gratifying experience (Shivers, 1979; Hede & Hall, 2006).

4.2.2.1.4 Competence Mastery

Competence mastery translates into the desire for mastery, competition and challenge. It covers everything from improving and challenge skills, to a feeling of belonging and gain other's respect.

The first most pinpointed factor was that of improving skills and abilities. This is particularly well perceived in Lourenço's evolution with his camera while pursuing astrophotography.

“you're talking to a person that, in November, had never had any experience with photography, because I never had a camera before, and now I believe that, since then, it has being a major leap (...) [now I] truly understand how you take a photograph and all the work after it” (TB7)

Lourenço's hobby has made him strive and improve a lot since he started. From someone who had never taken a photograph, to someone who drives kilometres just to take a good photo of the Milky Way, astrophotography has gained a new surrendered fan. It motivates him to get better constantly, stimulating him to continue. With this hobby, he challenges and improves his skills every day. Other interviewees mention this increasing process of learning more and challenging their skills as well (TB4/5).

Other frequent factor similar to the one above is that of challenging abilities. This and the previous factor can be differentiated as the former requires some kind of evolution from a skill acquired in the past. This factor, however, means to stimulate an ability to act, to use them and change them if needed. This can be best seen in António's quote:

“Mainly in English, because at 16 years old I didn't speak English as I speak now, and if I didn't speak English there, I couldn't even eat. So yes, I would say that my abilities were pretty much developed in that component, throughout those two weeks.” (TB1)

Even though not related to astrotourism, the exchange program in which António participated stimulated him to put his language abilities to practice. For him, he had to speak English if he wanted to eat, and that was enough motivation to develop the language for him. Other interviewees mentioned this challenge when facing new explanations about astronomy (TB3) or when having to transmit a complicated piece of information to an audience that could not understand (TB5).

Other frequent factor pointed out by some of the interviewees was that of gaining a feeling of belonging. Although this motivation was interpreted by the interviewees as an aftermath of witnessing the event or participating in the activity with others, there was an underlying need to belong to the moment, the people or the Earth itself, like Carla mentions:

“mainly about the feeling of belonging, because it is so beautiful, it touches you, touches your emotional part and also the part in which you actively learn something, [a feeling of belonging] to the Earth, like we are on this site observing the stars and so we feel that we belong to this whole, and also to the group of people who are there.” (TB3)

For Carla, the first time she participated in a Dark Sky activity was memorable. Besides learning many new things and developing relationships, she felt a connection to the place itself, to the Earth and the Universe. She felt she belonged to that group of people in which all of them felt a deep connection with the upper dark sky. Her feeling of belonging is also shared by Beatriz (TB2), where she acknowledges the experience she has gained and the way she was living through the place itself, being a part of it, while observing the auroras.

Finally, the last most frequent factor was that of gaining other’s respect. Although some interviewees (TB6/8) interpret this as a ‘having a new conversation topic’, Frederico (TB5) acknowledges that his hobby gives him admiration and respect from other people:

“Something that I really like was to share knowledge and to share things with new people that have never seen the planets in their lives and people who didn't even know that that was a planet (...) is something that really motivates me, sharing knowledge (...) I like giving them that help in order for them to see the sky like I do. (...) It makes me feel really good” (TB5)

To Frederico, sharing his knowledge is something that both motivates him, by helping people to see the universe the way he sees it, and satisfies him, by knowing they understood his explanations. Throughout his interview he mentions some examples of how people are really satisfied and amazed by his explanations, giving him a sense of recognition. Although not his main motivation to engage in astrotourism, helping others and having that rewarding feeling of their respect, is something that he highly appreciates and feels satisfied by afterwards.

In the end, the desire to master competences, skills or abilities is translated into the need to increase one's knowledge (TB3/8), to improve already gained skills or challenge other abilities. Discussing issues with peers or transmitting knowledge to those who do not possess it, has also been a motivation as is gaining other's respect one way or another. Once again, this reflects Iso-Ahola's (1982) work when the author states that leisure activities satisfy the individual due to its intrinsic rewards, like mastery or competence abilities, which can be clearly shown in these examples. After getting them for the first time, some people may feel the motivation to go back and challenge their skills and improve their abilities once again, becoming not only a satisfaction feeling but also a new motivation.

4.2.2.1.5 *Physical Skills*

The last dimension to be considered in LMS is that of physical skills. It refers to the motivation of pursuing physical fitness, weight control, and well-being. Although not common, it can happen that tourists may be engaging in physical activities (which was their prime motivation), when they witnessed an astronomic event and/participated in any astro-activity.

This happened to two of the interviewees, who were surprised by the events witnessed. Beatriz (TB2) was clueless while jumping on a trampoline at the bar where she was. Although not pursuing any fitness goal, rather just enjoying the trampoline, this activity was her main goal when she first saw the auroras and got into a hysterical state:

“[you were jumping on a trampoline, right? Yes.] *But in a state of complete hysteria, I was like at 1000 km/h! I ran in [to the bar], I jumped in the trampoline, I couldn't stay still...*” (TB2)

It is believed that the trampoline helped her relax afterwards. Also, that the moment may have not been that special if she was not in that thrilling state of jumping the trampoline.

Fabio, on the other hand, had a specific motive to put his physical skills to use. He was practicing kayaking and walking several kilometres by day, and resting by night, when he observed the universe and the Milky Way; he was stargazing.

“I was doing a three-day excursion by kayak at the upper part of the Border River (...) during the day we were rowing down the border and then in the late afternoon, we mounted our tents, and we spent 2 nights on the countryside (...)” (TB4)

Indeed, was using his physical skills and abilities to slow down. He was motivated to participate in that excursion to relieve stress and focus on himself and, according to him, the best way to do so is to practice exercise. Although it was not an activity that happened during his stargazing, it was indeed the motivation that drove him there and the resting afterwards allowed him to better appreciate the night sky.

4.2.2.1.6 Part-Conclusion

In this thesis, the Leisure Motivation Scale was adapted to assess the motivational factors that draw tourists into astrotourism. It is a scale divided into five main dimensions: intellectual, stimulus avoidance, social, competence mastery and physical skills. In the interviews, the interviewees were asked about these dimensions and, as a helpful tool for them, were given the different motivational factors (Appendix 7.1) to elaborate their answers. Hence, it was possible to establish the most frequently pointed factors that reflected their motivations in to terrestrial astrotourism.

With the help of the interviewees’ answers to the question ‘which factor do you think motivated you the most to engage in astrotourism’, a table (Fig.17) was built that summarises the main motivational dimensions.

Motivational Dimensions							
TB	Names	Intellectual	Stimulus Avoidance	Social	Competence Mastery	Physical Skills	Greatest Motivator
1	António Miguel			X			Social
2	Beatriz Duarte			X			Social
3	Carla Ventura	X	X	X			Social
4	Fabio Carraro		X	X		X	Stimulus Avoidance
5	Frederico Arez		X	X	X		Competence Mastery
6	Gonçalo Dias		X				Stimulus Avoidance
7	Lourenço Branco	X	X				Intellectual
8	Maja Nielsen	X		X			Social
9	Tomás Pereira			X			Social

Fig. 147 - Summary of the Motivational Dimensions

According to the social constructivism line of thought, it was possible to summarise in this table both motivational dimensions pointed out by the interviews, and this thesis' author understandings of their motivations. Again, reality is constructed by both intervenients, and the final outcome is meant to bridge the gap between what motivated them and what they mentioned as it did.

It is important to stress that, although some of the examples shown for certain motivational (and satisfaction) factors are not associated with astrotourism *per se*, these moments were still part of the entire experience that drove them in to the astro-event/activity.

As it is possible to see on Fig. 17, the **social** dimension appears to be the greatest motivator in terrestrial astrotourism for these interviewees, being the most pointed factor that of 'developing close relationships'. Not only is this dimension a common motivator for several individuals, but considered to be the one that motivated the majority the most. This social dimension reflects the needs for interpersonal relationships and friendship in general. After an analysis of the interviews, it became clear that the majority of the interviewees engaged in astrotourism for its social component, i.e. to be with their friends/family, to make new friends, to share hobbies, experiences and passions together, to share opinions, exchange knowledge and share life experiences. And all this while witnessing meaningful events or participating in memorable activities.

It is important to highlight that, contrastingly, the second most frequent dimension was **stimulus avoidance**, being the highest ranked factor that of 'to relax mentally'. Several

interviewees were motivated by a need to escape the daily life stress or other prominent concerns and seek solitude in order to restore and relax. This is understandable as astrotourism is arguably considered a quiet and introspective leisure activity. The third most frequent dimension is the **intellectual** one, even if with a lower percentage. The highest ranked factor was that of 'to learn about things around themselves'. This dimension represents the needs and interests to learn more and about new things, which translates into curiosity and exploration of the field of astronomy and the universe.

Briefly, one may suggest that there is a certain parallelism with the results of the motivational dimensions taken from the survey, where the main motivational dimension was that of the **intellectual** dimension, followed by **stimulus avoidance** and **competence mastery**.

4.2.2.2 *Leisure Satisfaction Scale*

The Leisure Satisfaction Scale measures the general satisfaction according to leisure choices, in this case, terrestrial astrotourism. This scale comprises six main dimensions which are psychological, educational, social, relaxation, physiological and aesthetics. The analysis of this scale will be done in the same way as the previous one.

4.2.2.2.1 *Psychological*

The psychological dimension covers the mental and psychological benefits of the leisure activity like enjoyment, sense of freedom, involvement and challenge. The majority of the interviewees pointed this factor as one of the most satisfying, recognizing that the activity and/or event was very interesting to them. Like Gonçalo says:

“[it was interesting for you and have given you a sense of accomplishment] *yes. I would say it ends up being like a dream come true*” (TB6)

To Gonçalo, finally seeing the auroras was like realising a dream. He had been waiting for that moment for quite some time, and finally being able to see the auroras, particularly in such troublesome period of his life, had a big impact on him. Undoubtedly, these moments moved the interviewees (TB9), made them more aware of the outer space (TB8) and what surrounds us (TB1), of how much it is still unknown to men, and how much we still have to learn (TB5).

The second most frequent factor was very much highlighted. These events and/or activities have given the interviewees a sense of accomplishment:

“Mainly the sense of accomplishment. It’s hard to be indifferent [to these kinds of things]. (...) it is completely astonishing. (...) I think we feel so small when we observe the sky and it is so beautiful that we can spend hours just looking at the sky without having the needs to do something else” (TB3)

Like so many others, Carla could not be indifferent to these activities. She recognizes what she has learned with them and what there is yet to be known. And the sensation of smallness, awe and ignorance makes her want to know more, as she does, every time she joins these activities. Like other interviewees (TB1/2/5/9), she feels she learns new things and knowing them makes her feel a more complete person.

Besides these two factors, other interviewees attributed their satisfaction to a gained self-confidence (TB5/7/8) and to the usage of their skills and abilities (TB4/8), indeed psychological rewards. In the end, it appears to be important to the interviewees to use their intellect but also to be challenged and learn new things. It satisfies them to be able to cope with increasing knowledge or awareness, to be involved in such deep thoughts but also to be able to enjoy the moment at the same time.

4.2.2.2.2 Educational

As it was understood by the earlier factor, the interviewees gave special meaning to the knowledge gained during these events/activities. The educational factor represents that intellectual stimulation, either by learning about oneself or one’s surroundings, and the skills that were achieved.

The interviewees were highly satisfied with the knowledge they gained about things around themselves, not only about the outer space (TB3/9), in what it consists (TB5), or the means to get there (TB8), but also things about their surroundings on Earth, new people and cultures (TB4), like António mentions:

"Oh, I loved Finland. Not only because of the Midnight Sun, which I think is awesome, but also due to their way of life. (...) It was good to relax, to rest, to see how other people of different cultures live, and (...) because I had never left the country, I really wanted to see how other people lived (...) I didn't know about this situation, I didn't know more things about their culture, and I learned a lot in those two weeks. A lot really. I learned their cooking traditions (...) even their greeting ways" (TB1)

To António the whole experience was a learning one. From new languages, new people, new cultures, to phenomena and ways of life. It was not just the phenomenon of the midnight sun that he did not know existed, but a whole new population, so different from what he is used to, and from whom he learned quite a lot.

Indeed, there was also an opportunity to try new things, like Maja states:

“all the different things you pick up during such a trip of how... how different space shuttles actually look, because when you see them on television, they seem pretty small, and then when you get there, it [is] an entire hangar and it’s just enormous” (TB8)

To Maja, it was not just the acknowledgement of how astronauts go to space and live there, what is needed and how dangerous it is to be up there for men, but the whole experience of being there, to be close to that equipment and see through her own eyes – it felt quite real. Maja experienced something for the very first time, getting out of her own world, thus trying new things.

All interviewees were satisfied by having learned something new (TB2/3/4/6/7), either about themselves (TB5/7/9), other people (TB3/4/5/6/9) or about things around them. All interviewees felt they learned or experienced something new that has touched them one way or another, either about the universe, or about us, here on Earth. That learning has satisfied them quite indeed, and was considered as one of the factors that would make them participate in the activity/event once again.

Once again it can be seen the importance of the educational dimension in leisure activities and all the rewards acquired afterwards (Iso-Ahola, 1982).

4.2.2.2.3 Social (LSS)

The social dimension reflects the rewarding relationships with others through the leisure activities, either by making new ones, or developing already existent ones, and if those friendships are reproduced outside the activities as well.

One of the most frequent factors was that of having social interaction with others during the activity/event. The majority of the interviewees acknowledged how important this factor was and how satisfied they are as well. To Beatriz, having learned so much with the people she met in Iceland, as well as developing relationships with them was equally important:

“I think it’s a bit of everything... because it helped to share, to reinforce the relationships, to enjoy that time...” (TB2)

Beatriz summarises the role of her new friends while they were witnessing the auroras. To her, the time they spent together, enjoying that specific moment was of great importance as it helped sharing a meaningful moment, thus reinforcing their friendship.

In general, the interviewees pointed social interaction as a rather important satisfaction factor. Moreover, they highlighted the importance of friendship during these moments, either new ones (TB1/4/5) or old ones (TB3/5/7), or even family bonds (TB8).

Other frequent factor was the fact that the activity/event helped develop close relationships. Aside the importance of friendship, some interviewees mentioned how these activities were useful to fortify already existing relationships. As Tomás states:

“The relationships were already developed, meaning that it was not unexpected. They had already been consolidated. However, this helped to fortify them even more. It made us closer to each other.” (TB9)

Tomás emphasises the positive outcome of his stargazing activity at the Dark Sky Alqueva by stating that, although he went there with already good friends, the activity strengthened their bond. By sharing this moment, this experience, their friendship became more resolute. The same happened to other interviewees (TB3/5/7/8) who also shared their moment with friends and with whom they got closer.

In general, the social component was very important as the interviewees acknowledge the importance of sharing these moments with their peers. Building new friendships or strengthen others highlight the importance and the meaning of these experiences, and state how the social component was crucial for such a positive outcome. Once again, it is possible to see the importance of the social dimension within a leisure activity.

4.2.2.2.4 Relaxation

The relaxation dimension covers the release of stress of daily life and the individual’s emotional well-being. In general all interviewees pointed this dimension to be one of the most important for their general satisfaction after the activities/events. The majority considers that the activity/event helped them to relax and relieve stress. Since these two factors were considered by the interviewees intertwined so will their analysis.

Maja considered her visit to Kennedy Space Centre not only very rewarding for its educational outcomes, but also to forget reality for a while and enjoy the moment:

“[if] you, for instance, had some problems or some things back home, it didn’t make sense to bring them there. It was like ‘now you’re here, now you have this amazing opportunity to experience this place, let’s take care of all the other stuff later’” (TB8)

Maja realised that her visit could be one in a lifetime, thus leaving all the issues that were troubling her behind, enjoying the moment and thinking of something else; she thus relaxed with that visit.

In general all interviewees considered that their activities helped them relax and relieve stress one way or another, even if acknowledging that the problems were still there after coming home (TB6). Seeing these events for the first time or enjoying these activities by observing the beauty of the night sky gave the interviewees an opportunity to leave their problems behind, even for a small period of time, and calmly enjoy the view of the night sky.

These activities and events also contributed greatly to their emotional well-being. Some acknowledge that the experience moved them quite a lot, either for being exhilarating (TB1/2) or peaceful (TB4/6/9). Others understood that these events are unique, truly magical and important (TB7), like Lourenço says:

“I’m very calm looking at the sky, and you observe the sky. Of course you’re taking a photograph, it’s undoubtedly to observe something that in the daily life you do not have time to, or you take it for granted, and it’s in those moments that you understand what you have been losing” (TB7)

Lourenço acknowledges the importance of these moments but also of the dark sky, being one of the interviewees who acknowledges light pollution the most. Nevertheless, Lourenço understands that daily life consumes his attention and when he enjoys his hobby of the astrophotography, he realises the importance and the beauty of the dark sky, and how much we are missing by not truly looking at it. This thought is also shared by other interviewees (TB3/4/5/9). Looking at the sky is thus an opportunity for them to ‘clean’ their being, and to freely relax.

In the end, the majority of the interviewees seems to agree that relaxation is quite a satisfaction factor. They recognise the positive outcomes of these events/activities and

associate them with the relaxation dimension, both to just relax and relieve stress, but also for its contribution to their emotional well-being. Just like for the motivational dimensions, relaxation seems to be one of the greatest satisfaction-producers, using emotional cleanse, stress release or simply escape for that matter, just like Iso-Ahola (1982) stated.

4.2.2.2.5 *Physiological*

The physiological dimension covers the individual's satisfaction based on the activities' contribution to their physical fitness, weight control and physical well-being.

From all interviewees, only one (Fabio) had a physical motivation that brought him to astrotourism. He joined several excursions that had a main physical component of walking and kayaking. Therefore, he was also the only one could comment on his satisfaction after the activity. However, as a Serendipitous Astrotourist, the physical activity only took him to the locations from where he could enjoy the night sky, having nothing to do with the stargazing in itself. Although he was satisfied with these physical activities, since it diverges from the main goal of this thesis, this analysis will be left out.

4.2.2.2.6 *Aesthetics*

The aesthetic dimension is represented by how well individuals found the leisure environment to be pleasing, interesting, beautiful or well designed. In general, all interviews highlighted the beauty of the locations where they enjoyed their astro-events or activities. Yet, the most frequently mentioned factor was the fact that the location was interesting, as Frederico explains:

“I liked the place the most. I think that making the observations in the castle [of Morão], although there is not a good visibility to see the objects near the horizon, it was compensated by the beauty of the place itself. And the thought that centuries ago, there were people in those walls and they were seeing a better sky than us, but they were seeing this same thing. And for instance, in the mountain, which is a natural landscape, it's something truly amazing.” (TB5)

Frederico not only notices the existence of light pollution, which prevents good observations of astronomic objects near the horizon, but acknowledges the beauty and the importance of the place itself. For him, the place was interesting because of its history, culture and the men that stood there, in that exact place, watching the same thing he did.

This thought is shared by other interviewees (TB3/9), but who give a special attention to the beauty of the place. As Carla states:

“It was mainly because it was done in a beautiful place, it was an open site, the landscape around (...) concerning the patrimony is tremendous, and the natural part around, the natural component, is very, very striking, outstanding. So we cannot abstract ourselves from the fact that we are in a place that was already considered from many years ago [to do this]. A place where people used to see the stars. A cromlech...”

(TB3)

Carla was fascinated by the environment around her. Not only was she overwhelmed by the beauty of the sky, but also by the beauty and importance of the cromlech where she was stargazing. The culture and history of the place itself, and also the thought that many years ago, people chose that same place to connect with the stars, made her realise the deeper meaning of where she was. Other interviewees mentioned the beauty of the place where they engaged in their activities or events, but focused on the set, the village or building where they were.

To the majority of the interviewees, the aesthetics of the locations were quite important and highly satisfying. Not only to appreciate the night sky and the event they witnessed, but also for its particular meaning, historic, cultural or architectural.

4.2.2.2.7 Part-Conclusion

In this thesis, the Leisure Satisfaction Scale was adapted to assess the satisfaction factors of tourists after their terrestrial astro-event or activity. The scale is divided into six main dimensions: psychological, educational, social, relaxation, physiological and aesthetics, each of them cover different factors. In the interviews, the interviewees were asked about these dimensions and given the satisfaction factors (Appendix 7.2) as a tool for them to elaborate on their answers.

With the help of the interviewees' answers to the question 'which factor do you think contributed the most to your satisfaction after this activity', a table (Fig.18) was built that summarises the main satisfaction dimensions.

Attending to the social constructivism line of thought, it was possible to summarise in this table both the interviewees' satisfaction dimensions, and those considered by this

thesis' author. As mentioned, reality is constructed by both intervenients, meaning that the final assessment will be given by both parts.

Satisfaction Dimensions								
TB	Names	Psychological	Educational	Social	Relaxation	Physiological	Aesthetics	Greatest Satisfaction
1	António Miguel		X	X				Social/Educational
2	Beatriz Duarte	X			X		X	Psychol./Aesthetics
3	Carla Ventura	X	X	X				Psychological
4	Fabio Carraro			X	X		X	Social/Aesthetics
5	Frederico Arez		X		X			Educational
6	Gonçalo Dias	X			X			Relaxation
7	Lourenço Branco	X	X		X			Psychol./Educat.
8	Maja Nielsen		X	X			X	Aesthetics
9	Tomás Pereira	X			X			Psychol./Relax

Fig. 158 - Summary of the Satisfaction Dimensions

Although each interviewee had a final 'greatest satisfaction dimension', it is perceived that the **relaxation** dimension was the most pinpointed by the interviewees, being the highest ranked factors those of 'to relax' / 'to relieve stress.' This dimension covers the release of stress of everyday life and the emotional well-being. After the interviews analysis, it could be understood that the majority of the interviewees were highly satisfied due to the relaxation component of their activities/events. Each of them stated that the activity or the event made them forget their daily lives, routines, stress and problems, and helped them to think of something else, the universe, the beauty out there, the people that once saw a better sky than them (alerting them to the dangers of light pollution). They felt relaxed, fresh and emotionally better to go back to the hustle and bustle of their lives.

Following these reasons, the second most highlighted dimensions were both the **psychological**, where the highest ranked factor that of 'the activity was very interesting' and the **educational** ones, being the highest ranked factor that of 'the activity increased my knowledge about things around me'. The interviewees acknowledged that the activities/events involved and touched them in such a way that it cleared their minds. They enjoyed these experiences not only for their psychological positive outcomes, but also educational. The new knowledge they acquired about a bit of everything (e.g. science, culture) satisfied them greatly and made all trips worth it.

Once again, it can be seen a parallelism with the survey's results, where the **psychological** and **educational** dimensions were also pointed as main satisfaction-producers dimensions. **Relaxation** stood out in the survey results as the dimension whose factors were more balanced in terms of percentages, here becoming the highest satisfaction dimension.

5. Conclusion

In these past few years, astrotourism has been growing gradually, being known for its sustainability, its awareness towards meaningful subjects such as light pollution and the protection of the day-time and nocturnal wildlife. Astrotourism offers many activities to families, groups of friends or just curious people who would like to see the dark sky and all its magnificence. Thus, astrotourism can be considered a leisure activity, as it gathers in one single activity the possibility to relax, to socialise with others and to be educated about various subjects. Furthermore, it is a satisfaction-producer, not only for its extrinsic rewards, like knowledge acquired and a good time spent, but for its intrinsic rewards like the opportunity to master different abilities and acquire new competences, not to mention the escape from daily life concerns.

Terrestrial Astrotourism can be pursued either at specific places, like visiting space centres, planetariums and dark sky reserves, or at non-specific places, by witnessing events like eclipse gazing, aurora observations or meteor showers. Although some of these events can be seen on a regular basis by some, there are people who actually travel to observe them, those are called astrotourists. It was on astrotourists that participate in activities and witness events on the Earth's surface that this thesis is focused. What drove regular people to travel and engaged in these leisure activities, like astro-activities or astro-events? And what satisfied them the most? In order to answer to these questions this thesis elaborated the following research question:

“What are the main motivational dimensions that draw tourists in general to engage in (terrestrial) astrotourism and what are the dimensions that satisfy them the most?”

These dimensions are, thus, the ones portrayed in the Leisure Motivation Scale and Leisure Satisfaction Scale, first elaborated by Beard and Ragheb (1980/3). Each scale measures the motivational/satisfaction factors of a tourist, respectively. These factors are grouped in the so called dimensions. The LMS possesses five dimensions: intellectual,

social, competence mastery, stimulus avoidance and physical skills, whereas the LSS possesses six: psychological, educational, social, relaxation, physiological and aesthetics.

Using the different factors as questions, an online survey and a semi-structured interview were created to assess the motivations and satisfaction of various people. Departing from the survey's results, although from a small sample, and using them as a basis for the interviews, it was possible to withdraw some interesting conclusions.

Concerning the **motivational** dimensions:

In terms of the **survey**, the **motivational** dimension that stood out was the intellectual one. It was indeed the dimension whose factors were considered highly motivational to the respondents, mainly to expand one's knowledge, to satisfy their curiosity and to discover new things. Curiously enough, although in the interviews this was not the dimension that stood out the most, these were still the same factors pointed by the interviewees as the ones that highly motivated them to engage in astrotourism. It appears that astrotourism indeed arouses the tourists' curiosity to learn about something new and different of what they are used to.

In the **interviews**, the **motivational** dimension that stood out the most was the social one. Although each individual had its own motivations to engage in astrotourism, as Pearce (2011) and others stated, it was a common motivation among the interviewees to develop close relationships, to meet new and different people or to build friendships with others. Terrestrial astrotourism thus stimulates the gathering of people, either of friends or strangers, to exchange ideas, questions and new experiences. Although the survey respondents did not pointed this dimension to be the greatest motivator, it was not discarded at all.

Concerning the **satisfaction** dimensions:

In the **survey**, the **satisfaction** dimensions that stood out the most were the psychological, educational and aesthetic dimensions. With this sample of respondents, these three dimensions were tied at being the ones that motivated the respondents the most. It seems that not only were the astro-activities/events interesting, but increased the respondents' knowledge about things around them. Furthermore, they were also very much delighted by the location's beauty and its interest. It is worth to stress, however, the importance of the relaxation dimension, as this was the one whose factors were the most balanced,

meaning that the respondents also considered this dimension highly satisfying in every sense. Finally, it can be seen a parallelism with the interview's results, as the second and third dimensions that satisfied the interviewees the most were precisely the psychological and educational ones.

As such, in the **interviews**, the **satisfaction** dimension that won the first place was, surprisingly, the relaxation one. This means that even though the interviewees were motivated by the social component, what satisfied them the most was the opportunity to actually rest, relax and relieve the stress of their lives. By engaging in these activities, the interviewees thought of something else, something new, took a retrospective view over their lives and concluded that there is more to be seen and lived than our non-stop stressful lives. It made them contemplate the universe and themselves, contributing to their emotional well-being and making them forget momentarily their daily lives. As mentioned, the relaxation dimension is also one that stands out in the satisfaction dimensions of the survey, meaning that both groups understood the advantages of astrotourism in this area.

Curiously enough, these dimensions match those concluded by Bansal and Eiselt (2004), as the authors derived from previous studies that tourist motivations can be summarised in five classes: climate (atmosphere or environment), relaxation, adventure, personal and educational. Although this thesis findings cover both motivational and satisfaction dimensions, it is clear that the latter can become motives to travel. Meaning that this thesis' findings concur with those being concluded by other scholars, e.g. Crompton J. , 1979; Lunderberg, 1971; Schoemaker, 1994.

The following table summarises the main dimensions that motivated and satisfied these astrotourists the most, in the survey and interviews.

	Survey	Interviews
Motivation		
Intellectual	1. Intellectual	3. Intellectual
Stimulus Avoidance	2. Stimulus Avoidance	2. Stimulus Avoidance
Social		1. Social
Competence Mastery	3. Competence Mastery	
Physical Skills		
Satisfaction		
Psychological	1. Psychological	2. Psychological
Educational	1. Educational	3. Educational
Social		
Relaxation	(Relaxation)	1. Relaxation
Physiological		
Aesthetics	1. Aesthetics	

Fig. 169 - Main Motivational and Satisfaction Dimensions in Astrotourism

The blue filled cells stress the highest motivational and satisfaction dimensions that drew both survey respondents and interviewees into (terrestrial) astrotourism. The numbers highlight the places in which the other major dimensions were at the end of this research.

What it can be here seen is that the survey respondents were mainly satisfied with the dimensions that are direct consequences of their motivational ones, i.e. they were intellectually motivated and were highly satisfied in the psychological and educational dimensions. However, the interviewees were highly motivated by the social component, which is also a surprise, as one would think they could be motivated by astrotourism to learn more (intellectual), but ended up being satisfied because of the relaxation opportunity of the activities/events. Moreover, as the satisfaction after these activities was clearly positive, perhaps even surpassing the individuals' expectations, these people are prone to transmit word-of-mouth to others, like it happened with the interviewee Carla, bringing more people into astrotourism.

The difference in results between the two methods (quantitative and qualitative) can be explained by the fact that the survey was far more impartial than the interviews, where a connection between interviewer and interviewee could be made, allowing a better exploration of the interviewees inner thoughts thus withdrawing more accurate data. However, the interviewees might not have answered the survey, meaning that both groups

of people are different and motivated and satisfied with different things, just like Yoon and Uysal (2005) stated.

Although in the survey, the respondent's background was not questioned, only if they had previously had any kind of contact with the field of astronomy, which the majority had (Appendix 7.6. 4), in the interviews, the interviewees had different backgrounds and hence past experiences. This can be translated by the fact that four out of nine interviewees were considered Specific Astrotourists. Although the interviewees were chosen before the interviews, the only requirement was that they had to have participated in any astro-activity or witnessed an astro-event. It was understood that two of these Specific Astrotourists were studying scientific fields, being one an astronomer. All of them had had previous contact with astronomy and pursued their activities/events due to that. The Casual and Serendipitous Astrotourists, did not have any significant contact with astronomy, but undoubtedly that their respective experience made them want to engage in astrotourism in the future and pass the word on to others.

Indeed, their satisfaction was high, fulfilling both branches stated by del Bosque and Martín (2008): cognitive for all the knowledge it was acquired during these activities/events, about oneself, the Earth or the Universe, and affective for its emotional outcomes, in this case, derived from the state of wellness of each individual afterwards. It can be said that each individual present in this study reached a state of fulfilment after their respective leisure activity.

With these findings, it can be agreed that astrotourism has the potential to grow even more. Numerous locations around the world possess the perfect dark skies, far away from the unwanted light pollution, and space to build facilities to accommodate tourists who wish to spend the night after the activities. It is believed that this niche is still giving its first steps in the world of tourism, but undoubtedly has the capacity to become quite a powerful one, not only for its advantages and awareness statements, but also for being 'low-cost' for the companies, meaning that the resource is always there, inexhaustible.

Step by step, astrotourism will, hopefully, be an unstoppable niche of tourism.

“That's one small step for a man, one giant leap for mankind”

Neil Armstrong

5.1 Critique

Upon finishing this thesis, it is important to highlight some issues that occurred during the writing process.

Starting with the survey, there were some questions missing that could have helped the better understanding of the respondents' point of views, namely their nationalities, if they studied astronomy or sciences, and the physical skills dimension that, at the time of the creation of the survey, did not seem to be important. However, since the physiological dimension of the satisfaction showed that there were people that were satisfied by these components, it would be important to understand what motivated them in the first place.

Considering the interviews, it is important to understand that these took place *after* the activities/events. The interviewees often confused their motivational factors to engage in astrotourism with their satisfaction ones, making it hard to differentiate what actually took them there (and the same can be applied to the survey respondents). Hence, these motivations might have been different if the interviews had been undertaken *before* the actual activity/event, in order to truly understand what motivated them. As Iso-Ahola and Allen (1982) stated, leisure motives need to be measured *before* and *after* a given experience.

Another aspect is the potential lack of reliability and validity of the data. It needs to be understood that these conclusions can only be applied to the 30 people that answered the survey and these 9 interviewees. Thus, this sample is but a mere idea of what 'astrotouristic' motivations and satisfactions could be. If there were more respondents and interviewees, it could be possible to break the tie between the dimensions whose number of points coincided; hence, these conclusions show only a small percentage of realities that exist in this world. And, as it was seen, under a constructivist point of view, there are many realities that co-exist, meaning that what motivates one person may not motivate others and so forth. These realities are constructed based on people's individual social and personal experience, so everything is relative, even between the Specific Astrotourists, as their knowledge is also different. Like Pearce and Lee (2005) state, there is a wide range of human needs and wants, cultural differences and methodological difficulties to allow an assessment of all motivations and satisfaction reasons. Furthermore, these conclusions are also constructs based on this thesis' author's personal experience, meaning that if this author were any other person, he/she could have gathered

and interpreted the data in a completely different way. Moreover, there is always a latent doubt on whether or not the respondents and interviewees answered to the questions in the most honest way and not just to answer faster, omitting things that might have been important, e.g. in the interviews.

5.2 Suggestions

Astrotourism needs to be better publicised in order to grow. It is a niche with such potential that it could actually be a good idea for travel agencies to better publicise the destinations that promote such tourism. One of the dimensions that was not considered a high motivational one was the Physical Skills; although it has already begun to be added, physical activities could have a greater emphasis on the night observations, like yoga under the stars or horseback ridings, satisfying the Physiological dimension as well. Also, activities to stimulate the Competence/Mastery dimension, like orientation and quizzes could be added to group programs that would also satisfy the Social dimension.

This niche could also be publicised on television or radio with complete packages of activities and accommodation. Schools and municipalities could promote workshops about the activities besides the simple visit to the nearest Observatory. Also, summer camps could promote small initiatives, allowing children to work with telescopes and learning about issues like light pollution. These would make people curious, encourage them to research about these activities and spread word-of-mouth. It was seen that astrotourism is a great idea for family and friends to enjoy a nice evening looking at the stars while learning and bonding.

5.3 Final Thoughts

As mentioned earlier, this thesis illustrates the first steps of a research work within a new niche of tourism. Despite little theoretical background within astrotourism, this thesis hopes to make way for further research and future development of the niche. In terms of literature, it could be interesting to study what are the most popular activities/events within the niche, how the economy of the different sites is affected when there is an activity/event and understand what types of tourists are there (are they scientists or just curious people?), and perhaps create a new strategy for these places in order to develop this niche. It is safe to say that, with this thesis, astrotourism has proven its worth in the various dimensions that push tourists to travel; yet, besides the tremendous dark sky and magnificent landscapes, what pulls tourists to engage in terrestrial astrotourism? This

could be another topic for future research. Moreover, the other sub-niches, like Atmospheric and Space Tourism and their respective focuses demand a research of their own, as they are so vast. Not much is known about the universe and the same goes for astrotourism. There is still so much to be known, yet the sky is *not* the limit.

6 Bibliography

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Dark Sky Park in Grand Canyon, retrieved on 28 April 2017 from:

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7. Appendix

7.1 Leisure Motivation Scale

Intellectual Factors

to learn about things around me
to satisfy my curiosity
to explore new ideas
to learn about myself
to expand my knowledge
to discover new things
to be creative
to use my imagination

Social Factors

to build friendships with others
to interact with others
to develop close friendships
to meet new and different people
to reveal my thoughts, feelings, or physical skills to others
to be socially competent and skilful
to gain a feeling of belonging
to gain other's respect

Competence/Mastery Factors

to challenge my abilities
to be good in doing them
to improve my skill and ability in doing them
to be active
to develop physical skills and abilities
to keep in shape physically
to use my physical abilities
to develop physical fitness

Stimulus/Avoidance Factors

to slow down
because I sometimes like to be alone
to relax physically
to relax mentally
to avoid the hustle and bustle of daily activities
to rest
to relieve stress and tension
to unstructure my time

Physical Skills Factors

To develop physical skills and abilities
To keep in shape physically
To use my physical abilities

To develop physical fitness
To slow down

7.2 Leisure Satisfaction Scale

Physiological

My leisure activities are very interesting to me
My leisure activities give me self confidence
My leisure activities give me a sense of accomplishment

Educational

I use many different skills and abilities in my leisure activities
My leisure activities increase my knowledge about things around me
My leisure activities provide opportunities to try new things
My leisure activities help me to learn about myself
My leisure activities help me to learn about other people

Social

I have social interaction with others through leisure activities
My leisure activities have helped me to develop close relationships
The people I meet in my leisure activities are friendly
I associate with people in my free time who enjoy doing leisure activities

Relaxation

My leisure activities help me to relax
My leisure activities help relieve stress
My leisure activities contribute to me emotional well being
I engage in leisure activities simply because I like doing them

Physiological

My leisure activities are physically challenging
I do leisure activities which develop my physical fitness
I participate in my leisure to restore me physically
My leisure activities help me to stay healthy

Aesthetic

The areas or places where I engage in my leisure activities are fresh and clean
The areas or places where I engage in my leisure activities are interesting
The areas or places where I engage in my leisure activities are beautiful
The areas or places where I engage in my leisure activities are well designed

7.3 Survey Template



AALBORG UNIVERSITY
DENMARK

Greetings!

My name is Ana Matos and I'm a Master's student in Tourism at Aalborg University, Denmark. Presently, I'm writing my final Thesis and I have to thank you for answering to this survey. Your answers will be anonymous and will only be used in this study. This will be a survey about your motivations to participate in astronomical tourism and your satisfaction thereafter. It will take you 3 minutes to fill it in.

Astronomical Tourism (or astrotourism) is basically the traveling to specific locations in order to view the night sky and various astronomical objects/events. If you have ever travelled to enjoy an eclipse, the auroras or went to visit an observatory, space centre or any other place where you could enjoy the wonders of the universe, then this survey is for you.

Thank you very much for your participation!

Ana Matos

1. Gender

- (1) Male
- (2) Female

2. Age Group

- (1) Less than 18 y.o.
- (2) 19 - 30 y.o.
- (3) 31 - 50 y.o.
- (4) 51 - 65 y.o.

- (5) More than 65 y.o.

3. Education Level

- (1) Undergraduate
(2) Graduated

4. Have you ever had contact with the astronomy field before?

- (1) Yes
(2) No

5. In what type of activity did you participate? / Where did you go?

- (1) Star/Planet/Comet/Aurorae gazing, Eclipse watching, etc.
(2) Observatory, Park or Reserve, Space Centre, or other facilities
(3) Space Movie location or other popular culture related to Astrotourism
(4) Space Simulations or Virtual Gaming activities
(5) Jet Flights / Weightless flights
(6) Space Tourism: In orbit (orbital flights, space stations, etc.)
(7) Space Tourism: beyond orbit (lunar voyages, etc.)
(8) Other _____

6. Motivational Factors

The following questions will concern your personal motivations to engage in the activity in which you have participated. If you have been to more than one, then just answer for the overall.

Please rate each motivational factor between 1 and 5 (1=strongly disagree, 5=strongly agree) or 0 when not applicable. Take a deep breath and GO!

6.1 Motivational Factors (Intellectual)

Please rate each factor between 1 to 5 (1=strongly disagree, 5=strongly agree) or 0 when not applicable.

	Intellectual					
	0	1	2	3	4	5
To learn about things around me	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To satisfy my curiosity	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To explore new ideas	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To learn about myself	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To expand my knowledge	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To discover new things	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To be creative	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To use my imagination	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

6.2 Motivation Items (Stimulus Avoidance)

	Stimulus Avoidance					
	0	1	2	3	4	5
Because I sometimes like to be alone	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To relax physically	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To relax mentally	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To avoid the hustle and bustle of daily activities	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To rest	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To relieve stress and tension	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>
To unstructure my time	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>	(7) <input type="checkbox"/>

6.3 Motivational Items (Competency Mastery)

Competency Mastery

	0	1	2	3	4	5
To gain a feeling of belonging	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To gain other's respect	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To challenge my abilities	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To be good in doing my abilities	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To improve my skill and ability in doing it	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To be active	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

6.4 Motivation Items (Social)

Social

	0	1	2	3	4	5
To build friendships with others	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To interact with others	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To develop close friendships	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To meet new and different people	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To reveal my thoughts, feelings, or physical skills to others	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
To be socially competent and skillful	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.1 Satisfaction Items (Psychological)

Psychological

	0	1	2	3	4	5
The activity was very interesting to me	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

Psychological

	0	1	2	3	4	5
The activity gave me self-confidence	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
The activity gave me a sense of accomplishment	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
I used many different skills and abilities in the activity	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.2 Satisfaction Items (Educational)

The activity...

Educational

	0	1	2	3	4	5
increased my knowledge about things around me	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
provided opportunities to try new things	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
helped me to learn about myself	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
helped me to learn about other people	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.3 Satisfaction Items (Social)

Social

	0	1	2	3	4	5
I had social interaction with others through the activity	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
The activity helped me to develop close relationships	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
The people I met in the activity were friendly	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

Social

	0	1	2	3	4	5
I associate with people in my free time who enjoyed the same activity	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.4 Satisfaction Items (Relaxation)

Relaxation

	0	1	2	3	4	5
The activity helped me to relax	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
The activity helped me to relieve stress	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
The activity contributed to my emotional well-being	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
I engaged in the activity simply because I like doing them	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.5 Satisfaction Items (Physiological)**The activity...**

Physiological

	0	1	2	3	4	5
was physically challenging	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
helped to develop my physical fitness	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
restored me physically	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

7.6 Satisfaction Items (Aesthetic)**The area or place where I engaged in the activity was...**

	Aesthetic					
	0	1	2	3	4	5
fresh and clean	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
interesting	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
beautiful	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>
well designed	(1) <input type="checkbox"/>	(2) <input type="checkbox"/>	(3) <input type="checkbox"/>	(4) <input type="checkbox"/>	(5) <input type="checkbox"/>	(6) <input type="checkbox"/>

8. Overall, how satisfied were you with the activity?

- (1) 1
 (2) 2
 (3) 3
 (4) 4
 (5) 5

It's almost done! Thank you for not giving up! The following 2 questions will give you the opportunity to express your opinion.

9. What was your main motivation to engage in Astrotourism?

Any comment you wish to add?

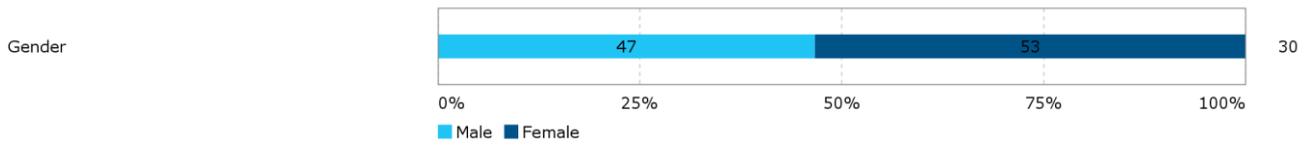
You are a warrior!

Thank you very much for your participation. Your answers will be very useful.

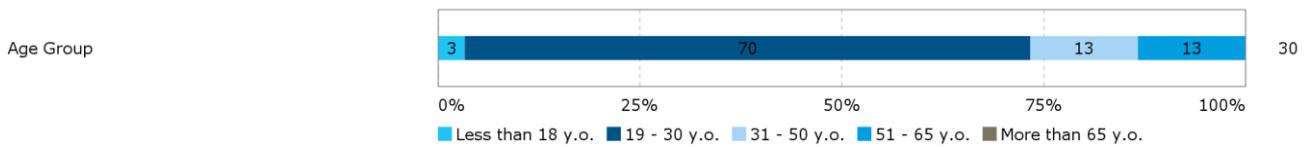
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7.4 Survey Graphics (SG)

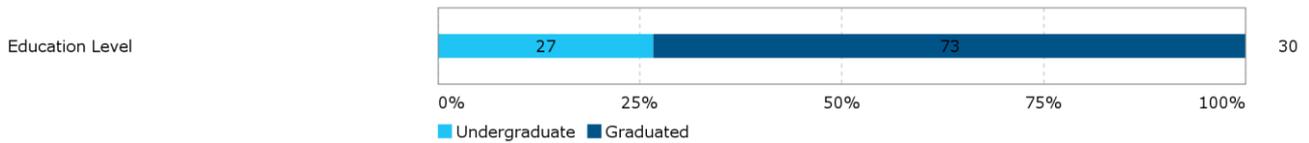
1. Gender



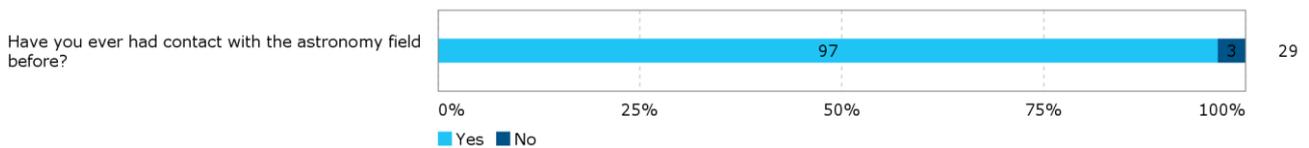
2. Age Group



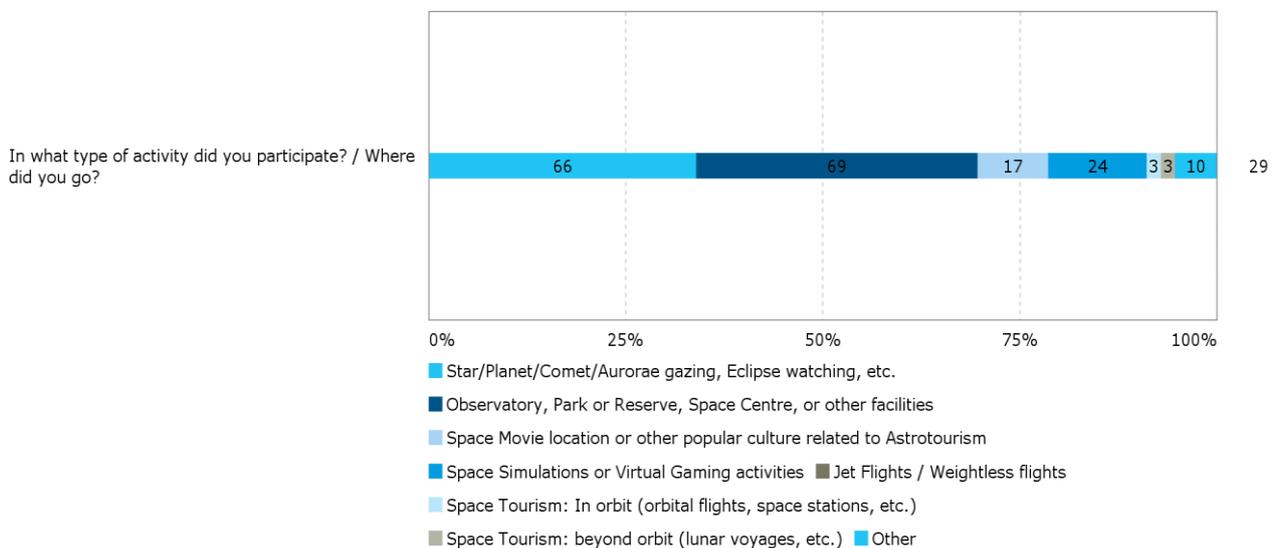
3. Educational Level



4. Contact with Astronomy

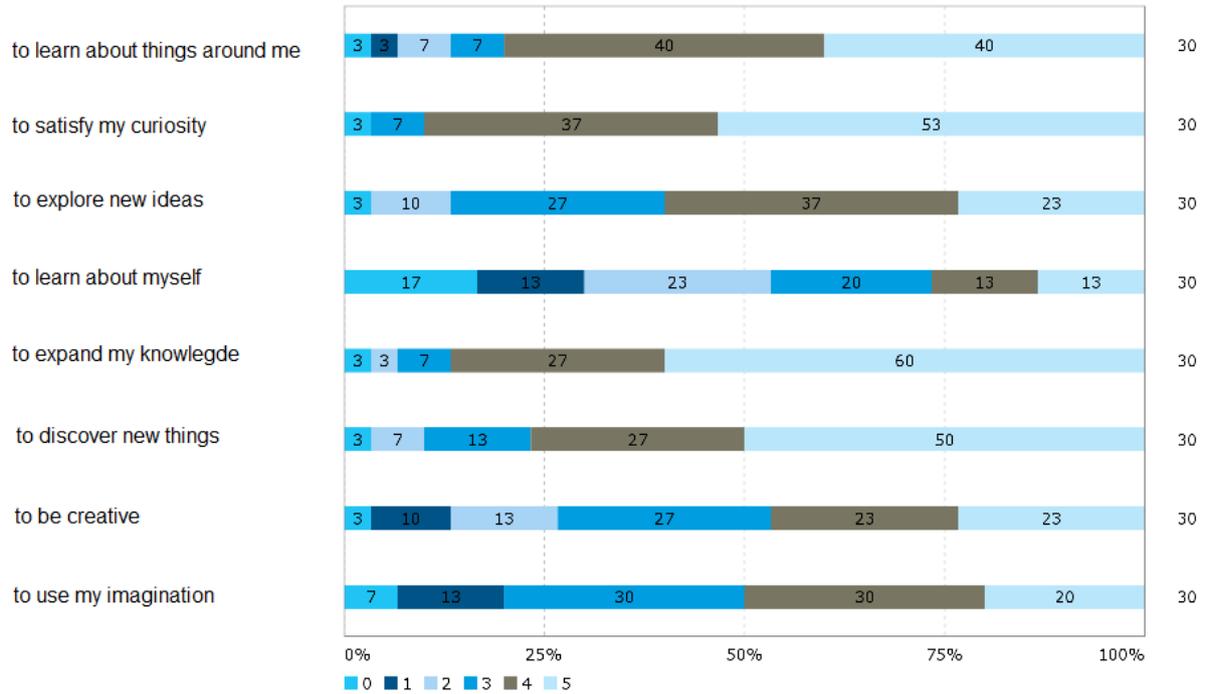


5. Type of activity participated

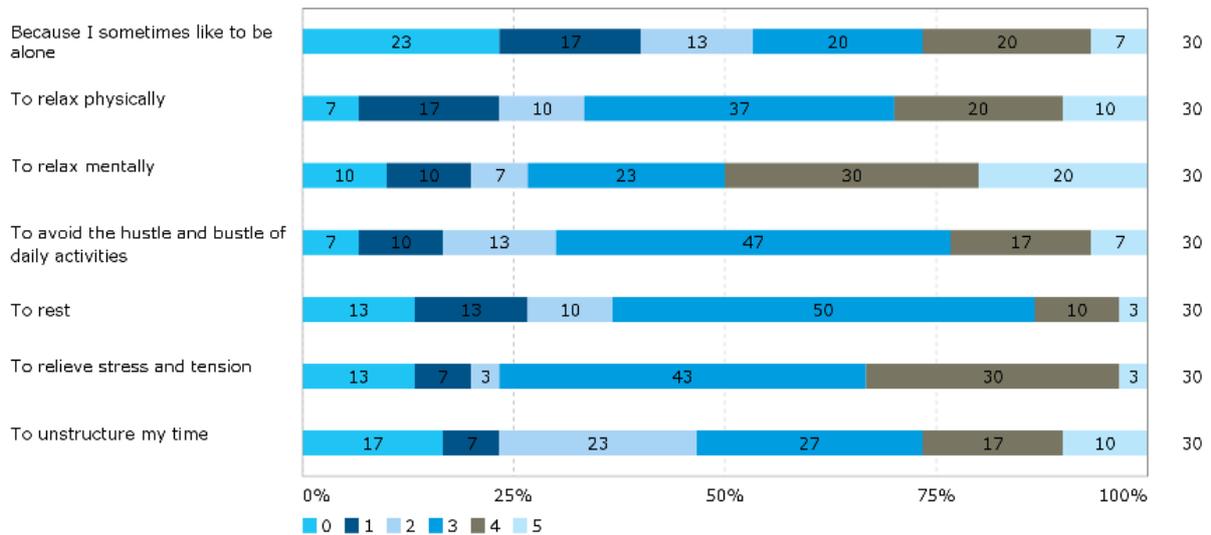


6. Motivational Dimensions

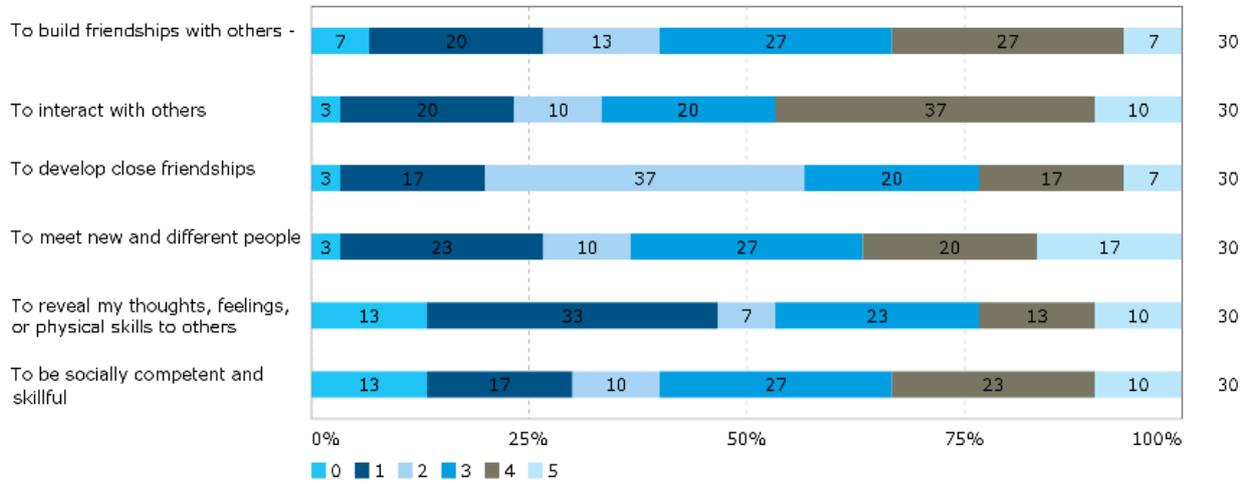
6.1 Intellectual



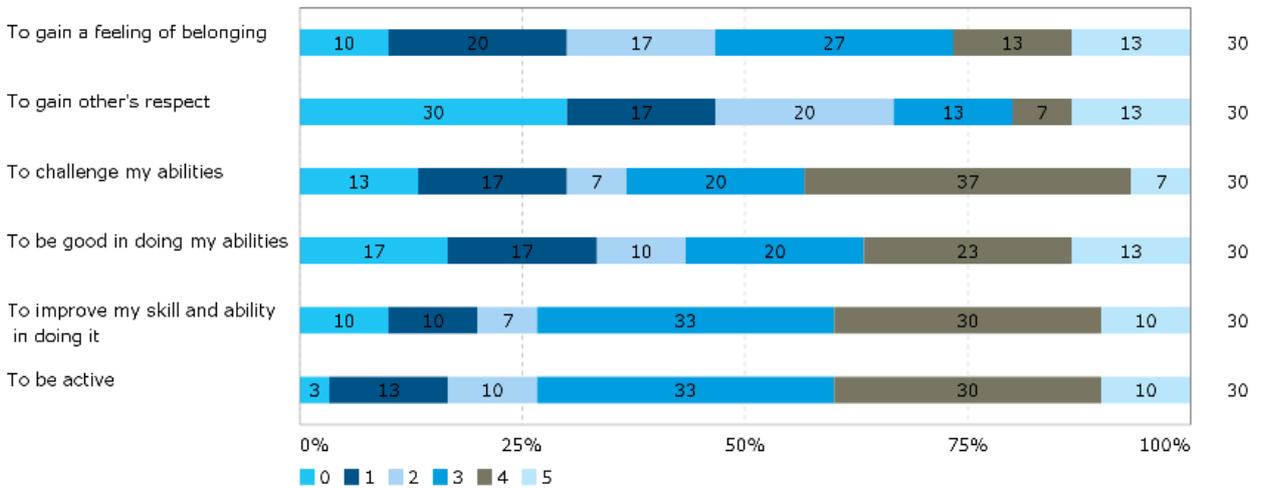
6.2 Stimulus Avoidance



6.3 Social

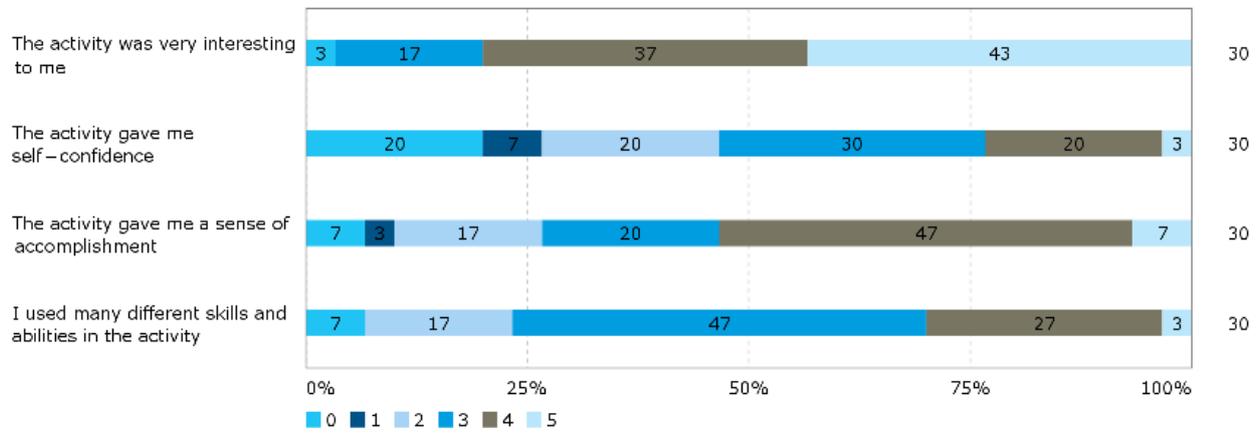


6.4 Competence Mastery

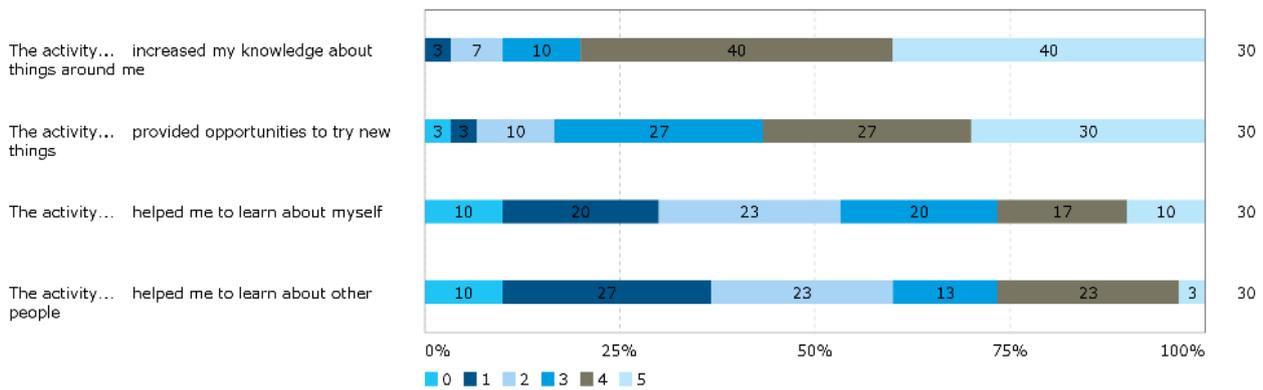


7. Satisfaction Dimensions

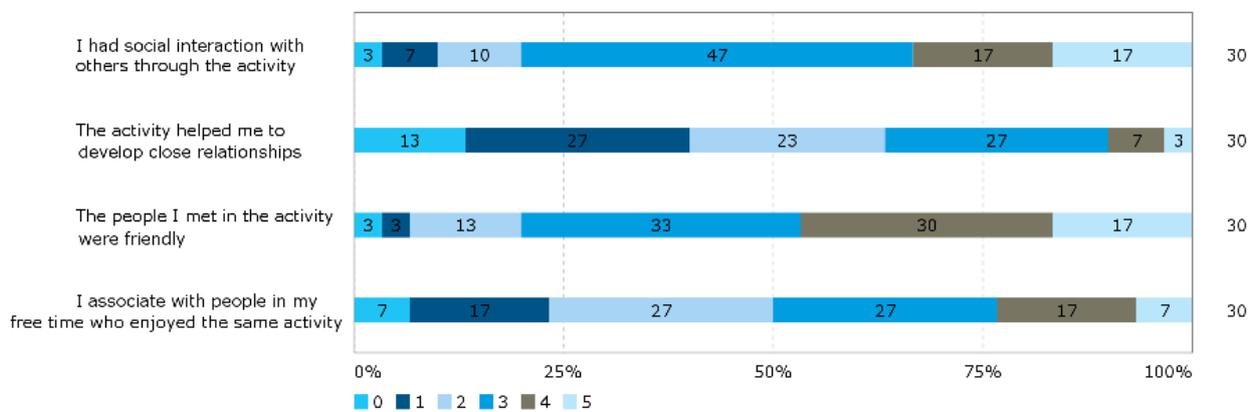
7.1 Psychological



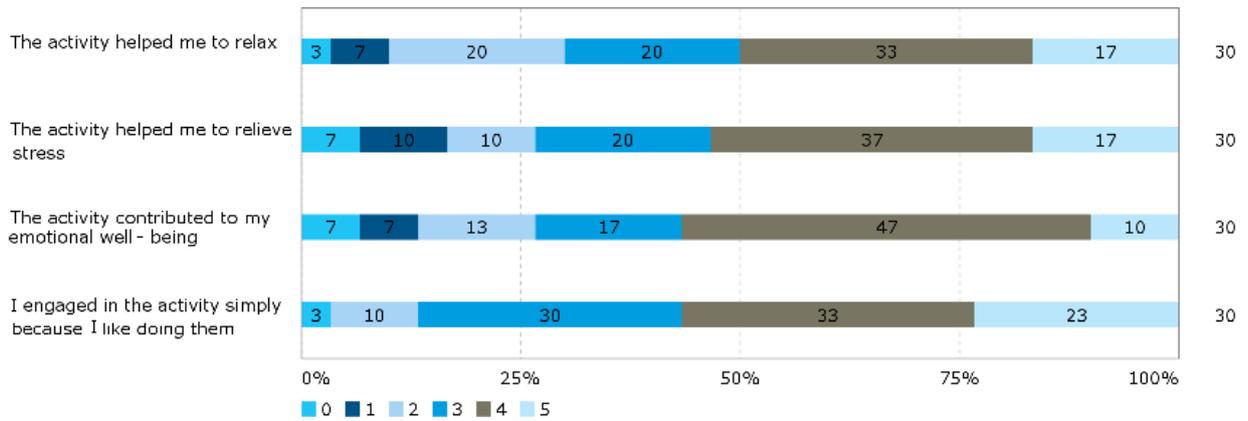
7.2 Educational



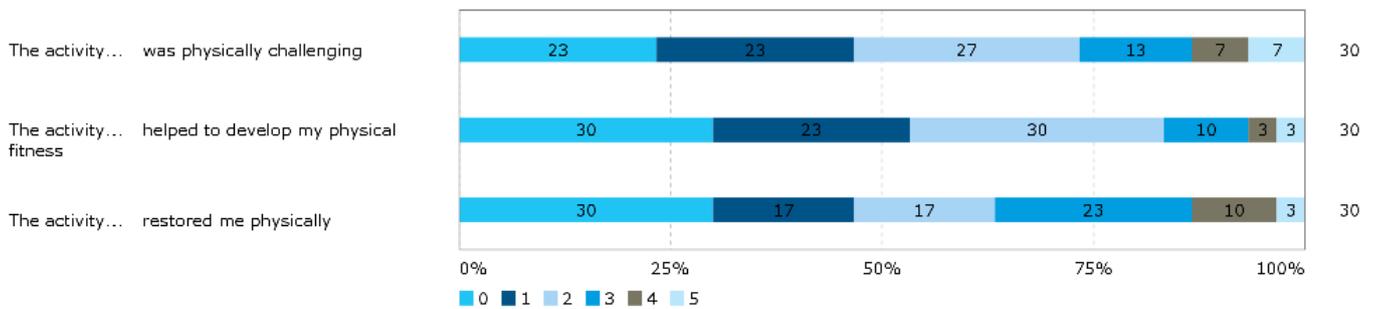
7.3 Social



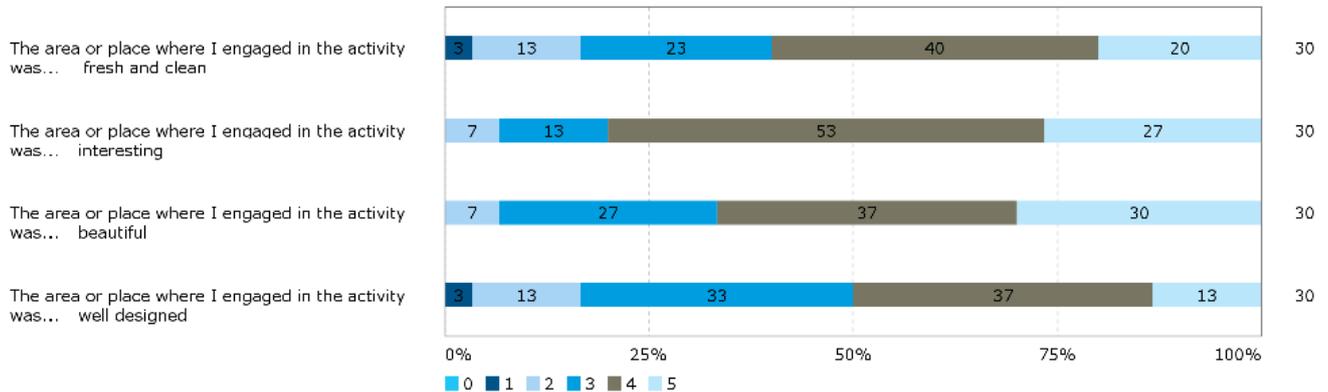
7.4 Relaxation



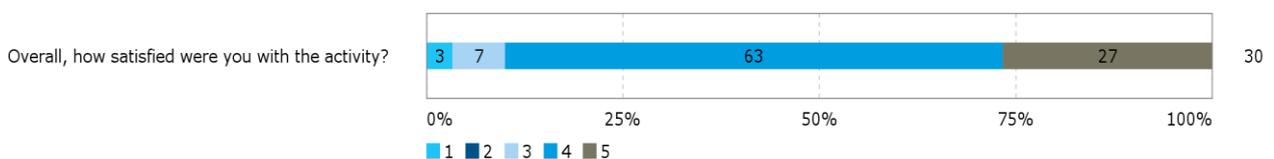
7.5 Physiological



7.6 Aesthetic



8. Overall of the activity



9. Main motivations to engage in Astrotourism

What was your main motivation to engage in Astrotourism?

- .
- Space is wonderful, I wish I could live in mars and commute to planet Earth sometimes.
- Pudim
- My friends went so did I.
- Challenge, get to know new things.
- It is interesting and it is good to discover new things beyond what we can 'see'
- being interested in that area since i was little; stargazing helps me to relax.
- Curiosity
- stars are interesting and belong to our solar system, our world.
- Have something to write a book about
- I was brought to it by other people they liked it.
- To know more about the Universe.
- I was with my family and it was close by so we wanted to go. I was just curious to know more about it and have some fun.
- To expand my knowledge and stimulate my curiosity
- Relax and knowledge.
- explore the uncertain
- I have been interested in astronomy all my life and recently began a travel blog focussing on astrotourism, so I am now re-discovering my first love - especially since it has become a growing niche in tourism.
- Sharing knowledge as well as teaching science so that it reaches all people regardless of age, step or simply because they like the subject
- Northeast India has awesome dark skies. But astronomy is an underrated hobby here, in the sense that it needs motivation and outreach to create awareness among the mass. One doesn't need to do scientific research only if one has a telescope. You can simply use it for your hobby to simply explore the jewels up there.

10. Comments to add

Any comment you wish to add?

- .
- Good Luck! What a wonderful thesis!
- Piaçaba
- No
- When I go star gazing, the Moon(y) is my favorite ahah
- There is so much happening in astrotourism right now, and I'm delighted that it is being studied in this way by Ana!! There are many opportunities in this field, in terms of the economy, sustainability and public engagement.
- no
- I'm personally looking for volunteers or helping hands to made a model astro village here somewhere in Northeast India. Astrotourism is not here in India but since the last 2-3 years I am dreaming of such a role model village where we'll have a public observatory where one may come n enjoy overnight or even in the day and then enjoy the breathtaking landscapes as well.

7.5 Interview Guide

Interview Guide

Motivation

1. Name and Age
2. Current Occupation
3. Are you interested in sciences, mainly in astronomy?
4. Have you ever participated in any activity related to astrotourism? Which one?
5. Why did you participate?
6. Was that the main activity or did it happen by chance?
7. Would you say that your motivation to engage in that activity was to:

Dimension 1 – *Intellectual*

- To learn about things around you
- To satisfy your curiosity
- To explore new ideas
- To learn about yourself
- To expand your knowledge
- To discover new things
- To be creative
- To use your imagination

Care to elaborate?

Dimension 2 – *Stimulus Avoidance*

- Because you like to be alone sometimes
- To relax physically
- To relax mentally
- To avoid the hustle and bustle of daily activities
- To rest
- To relieve stress and tension
- To unstructure your time

Care to elaborate?

Dimension 3 – *Social*

- To build friendships with others
- To interact with others
- To develop close friendships
- To meet new and different people
- To reveal your thoughts, feelings, or physical skills to others
- To be socially competent and skilful

Care to elaborate?

Dimension 4 – *Competence Mastery*

- To gain a feeling of belonging
- To gain other's respect
- To challenge my abilities
- To be good in doing them
- To improve my skill and ability in doing them
- To be active

Care to elaborate?

Dimension 5 – *Physical Skills*

- To develop physical skills and abilities
- To keep in shape physically
- To use my physical abilities
- To develop physical fitness
- To slow down

Care to elaborate?

8. Which dimension do you think motivated you the most to engage in astrotourism?

Intellectual, Stimulus Avoidance, Social, Competence Mastery, Physical Skills

Satisfaction Part

9. How many astrotourism-related activities have you been to?
10. Would you say that you like(d) going to that/those activity(ies)?
11. So you're satisfied with it/them?
12. What did you like the most in the activity?
13. What did you like the least in the activity?
14. Could you say you were satisfied with the activity because it...

Dimension 1 – *Psychological*

- was very interesting to me
- gave you self-confidence
- gave you a sense of accomplishment
- you used many different skills and abilities in the activity

Care to elaborate?

Dimension 2 – *Educational*

- your knowledge about things around yourself
- provide opportunities to try new things
- help you to learn about yourself
- help you to learn about other people

Care to elaborate?

Dimension 3 – *Social*

- You have social interaction with others through the activity
- The activity have helped you to develop close relationships
- The people you met in the activity are friendly
- You associate with people in your free time who enjoy/participate in the activity / astrotourism

Care to elaborate?

Dimension 4 – *Relaxation*

- The activity helped you to relax
- The activity helped relieve stress
- The activity contributed to your emotional well-being
- You engaged in the activity simply because you like doing them

Care to elaborate?

Dimension 5 – *Physiological*

- The activity was physically challenging
- You engaged in the activity to develop your physical fitness
- You participated in the activity to restore you physically
- The activity helped you to stay healthy

Care to elaborate?

Dimension 6 – *Aesthetic*

The areas or places where you engaged in the activity were:

- fresh and clean
- interesting
- beautiful
- well designed

Care to elaborate?

15. Which dimension do you think contributed the most to your satisfaction on this activity?

Psychological, Educational, Relaxation, Physiological, Aesthetics, Social

7.6 Table “Other Questions”

Names	2. Current Occupation	3. Interested in Astronomy	4. Participated in Activities	5. Why Participated	Interview Event	6. Main Act. Or By Chance
Gonçalo Dias, 25	Masters Student of Environmental and Energy Engineering	Yes.	Yes. Observatories & Eclipses	Curiosity. Want to understand the phenomena around him.	Aurora Borealis in Norway	Gone to Norway on purpose, looked for the auroras.
Beatriz Duarte, 30	Landscape Architect	In Sciences, yes. Astronomy not exactly.	Yes. Planetarium & Friend's gathering. Aurora Watching	She was living in Iceland and saw the auroras.	Aurora Borealis in Iceland	By chance.
Carla Ventura, 34	Technician of Educational Services	Yes.	Yes. Cromlech of Xerez & Dark Sky Reserve (various activities)	Curiosity. Unprecedented Activity. Location. Dark night sky. Personal Explanations.	Star gazing at Dark Sky Alqueva	Main Activity
Tomás Pereira, 24	Accessibility Technician	Yes, very much	Yes. One social gathering at Cromlech of Xerez	Recommendation of a friend; Try something new. Introspection	Star gazing at Dark Sky Alqueva	"Planned Incident": Planned trip, not expecting to stargazing.
António Miguel, 30	Masters Student of Journalism	Yes, also had a background in Sciences	Yes. Astronomy Club at School + Lisbon Observatory	Go with the school. Liked the speeches & observations with telescopes; Summer Nights With Astronomy Events	Midnight Sun in Finland	By chance.
Lourenço Branco	Architecture Student	Yes.	Yes. Own observations	Curiosity	Astrophotography in Sintra	Main Activity
Frederico Arez, 25	Physics Student / Astronomer	Yes, very much	Yes. Dark Sky Alqueva, Lisbon Observatory Events; His own activities	Interest & Curiosity	Dark Sky Alqueva + Observations	On Purpose
Fabio Carraro, 31	Exporter Sales Manager	Yes.	Yes. Excursions, 1 in New Zealand and 1 in Russia	He was living in both places but wanted to explore the countryside & spend some time alone.	Milky Way in NZ + Stargazing in Russia	NZ: Not the main actv. But planned; Russia: by chance
Maja Nielsen, 24	Tourism Master's Student	A little bit.	Yes. Kenedy Space Center and Copenhagen Planetarium	Her father took the whole family there	Kennedy Space Center, USA	It was planned but not of her knowledge. For her, it was by chance.

Names	9. How many	10. Liked	11. Satisfied	12. Liked the MOST	12 a) Interpretation	13. Liked the LEAST	13 a) Interpretation
Gonçalo Dias	Some	Yes.	More or less.	"I think I liked the most the fact that I experienced something that, during many years, I have never believed to be possible, which was being in Norway, seeing Aurora Borealis. And I think that my satisfaction is due to the beauty of the moment and what took me there. What I like the most was definitely looking at the sky and seeing everything happening. And it was not in a video. Being there, seeing that happening, in that place..."	*Experiencing the whole event in person. Seeing it in real time; Dream come true.	"I would only point out the problem of being in an area with lots of artificial light, which sometimes makes it difficult"	*Artificial light prevents the full enjoyment of the sky. Need to flee the city in order to see a good night sky.
Beatriz Duarte	Some	Yes	Yes.	"something I love... which is to learn the constellations (...) I like, those associations, the historic explanations (...) the culture associated to astronomy. Not so much from a scientific point of view"	*Learning new things about the sky, constellations & universe; *Learning about the cultural/historical side of astronomy;	"Maybe, the more exhaustive they don't have the capacity to learn, but when it's something more to relax, do you say how many kilograms of air or how gaseous it is... You can compare it with something more funny without having the need to say that are twenty thousand what ever..."	*Activities for the general public should not be scientifically exhausting, rather funny and easily understandable by all;
Carla Ventura, 34	Various	Yes	Yes.	"learning new things as I go. I mean every time I go(...) I learn something new about the sky and about the constellations, to learn how to distinguish them, and to also learn the way in which the sky is moving in relation to us (...) also the company because I was very well the accompanied, and it was always the shared moment among friends	*Learning new things about the sky, constellations & universe; *the company - shared moment with friends	--	--

Tomás Pereira	One	Yes	Yes.	Unity, between you and the other element (the Universe)	*Social component; *Connection with the Universe	"The fact that (...) the cromlech is not in its original place. I think it would be even more interesting to contemplate the cromlech in its original place"	It could be even more special to experience the activity seeing what the ancestors saw & felt in the past
António Miguel	One	Yes.	Yes.	"I liked mainly the fact that it was something completely different of what I had ever seen. I liked the fact that we could stay outside during the night time without being night, I thought of that as super cool... And I liked as well the fact that he could literally do all types of activities during all day, because it was always day. So it was excellent."	*It was novelty; Something never seen or experienced; *Possibility of doing activities all day long.	"not being able to sleep (...) Because they do not have shutters"	After such exhaustive days, not being able to properly rest.
Lourenço Branco	One	Yes	Yes.	"Because going to the Planetarium, I had there someone giving the lecture who understood about the issue, so he already has a more scientific opinion and more elaborated about the topic that drove me there... Whereas in astrophotography, I am by myself. It's me based on the knowledge I have who judges what I am observing and what I am photographing."	*Gaining knowledge vs. Learning by oneself; *Self-challenge; *Challenge one's capacities;	"In Astrophotography, the factor that I like the least is working on the photographs. The patience, the dedication, the hours it takes waiting for the camera to take the damn picture that sometimes doesn't even come out as you wanted... For example, it just takes a mere movement of the camera while it is doing the exposure and there it goes hours of work"	The patience required to take good photographs that with the slightest movement spoil everything. The post-production work can also be tiresome.

7.7 Interviewees Tables (TB)

1. António Miguel

MOTIVATION	Description	Analysis	Interpretation
Intellectual	"I was not expecting it to be day when I got out of the pub. And of course I had to ask to all Finnish people with whom we were what the hell that was, what was going on... And they replied "yes, this is normal, this is normal because we are in the summer, and because we are so high up in Europe, it never gets dark". And I would be like okay... I didn't even have that [notion]"	Back in the day, he did not have the notion that the Midnight sun could happen, so it was a surprise for him. But he went there with his school to learn more about the Finnish culture	(NOT A MOTIVATION) *To discover new things; *To explore new ideas about Finland.
Stimulus Avoidance	-	-	-
Social	"make new friends (...): Meeting new, different people, of other cultures, and besides in my Exchange program, there wouldn't be only Finnish students, who were from different nationalities, so it was really good"	One main motivation was also to meet new people from different countries and experience a true inter-nationality experience.	*To build friendships with others; *To interact with others; *To meet new and different people;
Competence Mastery	"Mainly in English, because at 16 years old I didn't speak English as I speak now; and if I didn't speak English there, I couldn't even eat. So yes, I would say that my abilities were pretty much developed in that component, throughout those two weeks."	He went there to and improved his English. He increased his knowledge about everything	*To challenge his abilities; *To improve his skills and abilities; *To be active.
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	<p>I really liked it because, again, I went to Finland to see different culture. In that new culture it's day at midnight! A greater cultural difference could not exist! We are in a country of sun light, but we never had that "being sun during the night". That was mind-blowing."</p>	<p>He went to Finland to learn about a new culture and was given a bonus of a new, unprecedented experience.</p>	<p>*It was very interesting to him; *It was a welcome surprise;</p>
Educational	<p>"Oh, I loved that. I loved Finland. Not only because of the Midnight Sun, which I think is awesome, but also due to their way of life. (...) It was good to relax, to rest, to see how other people of different cultures live, and I think it was because of that I decided to apply for that Exchange program. Firstly because I had never left the country, secondly I really wanted to see how other people lived, and in this case I went to Finland"</p>	<p>"(...) "I didn't know about this situation, I didn't know more things about their culture, and I learned a lot in those two weeks. A lot really. I learned cooking mores of them, I learned their... even their greeting ways" → He learned about a new culture and way of life; He discovered new events and experiences; He left his home country and faced the outside world.</p>	<p>*His knowledge increased about things around him; *He got the opportunity to try new things; *Helped him to learn more about other people.</p>
Social	<p>"I remember that we got out of the Pub, I would not say that we were that drunk but we got out very happy. We ended up playing hide and seek, it's was night time but we went to play hide and seek, which is great (...) And we went all of us, all nationalities, Greeks, Finnish, Swedes, we went all of us... So yes I would say that yes."</p>	<p>This reflects the easiness of building new friendships.</p>	<p>*He had social interaction with others through the activity; *The activity helped him to develop close relationships; *The people he met were friendly;</p>
Relaxation	<p>"Since I was learning about something that had never crossed my mind, which was being night and seeing the Sun, yes, the simple fact that I was learning, it made me happy. All trip was great."</p>	<p>For him, learning is relaxing. The trip helped him to relax.</p>	<p>*The activity helped him to relax.</p>
Physiological	<p>"It was beautiful. All the houses I saw there looked like they had come out of those Fairy Tales, by Brothers... Grimm. (...) They all looked like doll houses, everyone had its own garden very well-tended. There was not a single piece of paper on the floor, everything was... it looked like a small Fairy Tale. Basically... calm and peaceful people, relaxed. Everyone has its own sauna... in the garden everyone has a sauna..."</p>	<p>The location was fairy-tale like. The houses were very beautiful and looked like doll-houses. Everything was cleaned and well-tended. The people were nice, calm and relaxed. Everyone has its own sauna.</p>	<p>*The place was very interesting, beautiful, well designed, cleaned and well-tended.</p>

2. Beatriz Duarte

MOTIVATION	Description	Analysis	Interpretation
Intellectual	"Yes, I learned. Even about the dust, the magnetic fields, about all those things. And of course, it completely satisfied my curiosity, completely... It exceeded any... And my knowledge as well. Imagination... I love it..."	She learned about the event, the physics behind it, she satisfied her curiosity and improved her knowledge.	*Learn about things around her; *Satisfied her curiosity; *Exceeded expectations; *Expanded her knowledge; *Discover new things;
Stimulus Avoidance	"Yes, but that was also something that alone was wonderful... (...) there was something about stimulus to happiness..."	Experiencing that event alone was by itself important and intense. Stimulus to Happiness	**Feeling the moment by herself was also important; **Stimulus to Happiness
Social	"the collective group exponentially improved the experience. For instance, if alone, that would of course have a strong sentiment, but in this case, with the experience I had, the collective was encouraging. It gained a bigger dimension... [So you were motivated by the sharing...?] Yes, yes. Because we all ended up experiencing the same thing."	Being with a group improved her experience, it had a stronger sentiment. A deep connection was formed due to the sharing of the moment, sharing of an experience.	*Build new friendships with others; *She revealed her feelings and emotions to others; *She met new and different people; *She shared the experience with others, which formed a deeper connection between them.
Competence Mastery	"clearly, I gained a sensation of belonging in some way, right? I mean, you experienced that and we're talking about auroras that, for us from the south, are not that common, in a way I gained that experience, I was on that place, I lived through that place, I was part of it, so..."	She gained a sense of belonging, as she experienced the event with others, from whom she learned. She was part of a group and of a place.	*She gained a feeling of belonging; *Improved her psychological skills;
Physical Skills	"[you were jumping on a trampoline, right? Yes.] But in a state of complete hysteria, I was like at 1000 km/h! I ran in the house, I jumped in the trampoline, I couldn't stay still..."	Motivation was to jump the trampoline.	*Using her physical abilities, although not with a specific intent.

SATISFACTION	Description	Analysis	Interpretation
Psychological	"[the activity was interesting to you, gave you a self-confidence, gave you a sense of accomplishment, and you felt you developed your abilities?] Everything."	She felt all mentioned factors satisfied her psychologically.	*The event was very interesting to her; *Gave her a sense of accomplishment
Educational	"[your knowledge increased?] Yes... [Did you try new things?] Without a doubt... It awoke a feeling and the urge to continue and do new things... [the opportunity to try new things?] Yes. And of course, if I could go back again and do it all over again, I would."	Her knowledge increased and she tried new things; It made her more motivated to participate in more activities of this type. She would go back and do it again.	*She increased her knowledge about things around her from others; *Tried new things; *Motivated to learn more about these events;
Social	"I think it's a bit of everything... because it helped to share, to reinforce the relationships, to enjoy that time..."	She was with others and learned from them; she developed and fortified friendships; She enjoyed very much the time spent there.	*She had social interactions with others; *The activity helped to develop and fortify friendships;
Relaxation	"[it helped you emotionally?] Yes. (...) I think without a doubt it was the case here. And the well-being"	The activity satisfied emotionally and helped her well-being.	*The activity contributed to her emotional well-being
Physiological	-	-	-
Aesthetic	"it was so amazing! [Wonderful?] Yes, it was so great!"	The place where she was amazing and wonderful	*Interesting; *Beautiful;

3. Carla Ventura

MOTIVATION	Description	Analysis	Interpretation
Intellectual	"it was mainly... to learn about things of what's happening around me. more about astronomy the place in itself where you were doing the observation. Next, it was to explore new ideas, from what I have learned to learn more (...) to expand my horizons"	To learn new things around herself, astronomy & the place; to explore new ideas & expand horizons	*to learn things around herself; *to expand her knowledge; *Satisfy Curiosity; *to explore new ideas; *Expand horizons
Stimulus Avoidance	"more than escaping the stressful life, it was the psychological part, it was to relax mentally. And also to rest."	To escape daily routine; Emphasis in the psychological relaxation; rest.	*Relax physically; *Relax mentally; *Avoid daily routine; *To rest; *to relieve stress and tension
Social	"I think it was mainly to interact with other people, besides the person that I already knew; besides developing an old friendship, it was also to interact with other people. And to meet new people, different people, could teach me more about this topic about which I wanted to know more."	To interact with other people; Meet new people; Develop old and new friendships; Meet people to learn from;	*to build friendships with others; *To interact with others; *to develop close relationships; * to meet new and different people; *To learn from more educated people.
Competence Mastery	"mainly about the feeling of belonging, because it is so beautiful, it touches you, touches your emotional part and also depart in which you actively learn something, [feeling of belonging] to the Earth, like we are on this site observing the stars and so we feel that we belong to this whole, and also to the group of people who are there. (...) now I can distinguish different constellations in the sky"	Feeling of belonging to the group and to Earth due to its beauty and emotion attached. Understand her place in the Universe. Have learned more about the field of astronomy.	*To gain a feeling of belonging; *to challenge her abilities; *To improve her skills; *to increase her knowledge.
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
<p>Psychological</p>	<p>"mainly the sense of accomplishment. it's hard to be indifferent [to these kinds of things]. (...) it is completely astonishing. (...) I think we feel so small when we observe the sky and it is so beautiful that we can spend hours just looking at the sky without having the needs to do something else"</p>	<p>Sense of accomplishment due to the things she had learned & the way she has felt while observing the sky - astonishing, beautiful</p>	<p>*Very interesting to her; * Sense of accomplishment</p>
<p>Educational</p>	<p>"you enlarge your knowledge about the things around you right? yes. Exactly about astronomy I learned a lot and that stimulates our curiosity to learn more. So to go to other events like these ones."</p>	<p>Increased her knowledge about astronomy among others. Motivation to repeat the experience due to this new learning.</p>	<p>*Increased her knowledge about things around herself; *Tried new things; *Learn about the outside world;</p>
<p>Social</p>	<p>"[you had a good social interaction you have been with other people, with whom you developed a close relationship]. Yes. I went there I went with people close to me [you are happy with that?] Yes."</p>	<p>Satisfied by having developed old relationships and made new ones. Shared a special moment with friends.</p>	<p>*Had social interaction with others during the activity; *It helped to develop close relationships; *the people she met there were friendly; *she associates with those same friends out of these activities.</p>
<p>Relaxation</p>	<p>"[the activity helped you to relax right?] yes. And it has contributed a lot for my emotional well-being"</p>	<p>To escape daily routine; Emphasis in the psychological relaxation; rest. Contribution to emotional well-being</p>	<p>*The activity helped her to relax & relieve stress; *Contributed to her emotional well-being</p>
<p>Physiological</p>	<p>--</p>	<p>--</p>	<p>--</p>
<p>Aesthetic</p>	<p>"exactly it was mainly because it was done in a beautiful place, it was an open site, the landscape around in itself concerning the patrimony is tremendous, in the natural part around, the natural component, is very, very striking, outstanding. So we cannot abstract ourselves from the fact that we are in a place that's was already considered from many years ago. A place where people used to see the stars. A cromlech..."</p>	<p>Beautiful site & landscape; importance of the patrimony (tremendous) and natural park (striking, outstanding). Aware of the importance of the place for the ancestors.</p>	<p>*The place was beautiful & interesting (site & surroundings);</p>

4. Fabio Carraro

MOTIVATION	Description	Analysis	Interpretation
Intellectual	-	-	
Stimulus Avoidance	"I decided to take that trip alone (...) [to] kind of [relax] and to concentrate. Yoga for me is not really working because I don't like sitting in one place too much and these kind of things work better for me. Especially when I'm extremely tired I'm kind of more philosophical..."	He went to NZ, he was travelling alone to relax and concentrate. To forget about the preoccupations of daily life stress	*He wanted to be alone; *To relax mentally; To relieve stress and tension; *To concentrate on himself.
Social	"Yes, about Russian for sure because I was in a group where we were 19 people and I was the only foreigner. (...) we got some time together all day and the first night was very nice because we were sitting around the fire and we spent the time with jokes or songs"	In Russia, the excursion was to socialise and make new friends.	*To build friendships with others; *To interact with others; *To meet new and different people;
Competence Mastery	"the first one in Russia for sure it was a possibility to connect with the Russian culture for the reasons I was explaining before. If I was the only foreigner and I must say it was a very Russian trip, with everything on sight, very Russian food for instance... So yeah that's was the full immersion in the Russian countryside way of life"	In Russia, he got the chance to better know the Russian culture, food and language.	*To improve his skills (learning Russian);
Physical Skills	"one part of the excursion was also kayaking (...) So basically I was walking, the first day I was walking and kayaking the whole day and the second day I was walking 25 kilometres mainly on sand..."	In NZ, the excursion had several physical components, which he planned to do: kayaking and walking.	*To develop his physical skills and abilities; *to slow down.

SATISFACTION	Description	Analysis	Interpretation
Psychological	"Yes, I am fully satisfied by both of them both of them achieved the purposes I had to go there. I would say that both of them are even better than I thought them to be. I would go there again anytime."	Both trips satisfied him greatly, exceeded his expectations	*Both trips were very interesting to him; * Gave him a sense of accomplishment and of belonging. *He used many different skills and abilities in both activities (physical & intellectual)
Educational	"Yes, about Russian for sure because I was in a group where we were 19 people and I was the only foreigner. So already from the cultural point of view I was surrounded by 18 Russians which only 2 probably spoke English (...) it was also one opportunity to practice [the language]"; "in Russia for sure it was a possibility to connect with the Russian culture (...) I was the only foreigner and I must say it was a very Russian trip, with everything on sight, very Russian food for instance... So yeah that's was the full immersion in the Russian countryside way of life"	"the one in New Zealand I realized how tiny the world is. I knew that the stars were a lot and in Russia already. I saw they were a lot but it's not even comparable to the quantity I saw in New Zealand and I really didn't thought they were so many. And what I said before as a joke, I really understood why the Milky Way it's called like that" → He learned about a new culture and improved his language skills; He understood the dimension of himself and the Universe; Understood why the Milky Way makes a path of stars	*It increased his knowledge about things around himself; *Gave him the opportunity to try new things; *It helped him to learn about new people;
Social	"I decided to take that trip alone (...) [to] kind of [relax] and to concentrate. Yoga for me is not really working because I don't like sitting in one place too much and these kind of things work better for me. Especially when I'm extremely tired I'm kind of more philosophical..."	Satisfied with how much about the Russian culture and way of life he learned. He relaxed after all trips.	*He had social interactions with others during the event; *The event helped to develop close relationships; *The people he met were friendly;
Relaxation	"I was walking, the first day I was walking and kayaking the whole day and the second day I was walking 2.5 kilometres mainly on sand..."	He walked a lot and enjoyed kayaking; He's a physical person.	*The events helped him to relax and to *relieved stress; *they contributed to his emotional well-being;
Physiological	"the park in New Zealand is very well maintained. They have this special stuff that check and clean it all year long, all day long, that's one is very well maintained, from the natural point of view it's just perfect"	In NZ, the park was very well maintained, and the landscape was also amazing	*The activities leading to the events helped him to restore physically; *And develop his fitness.
Aesthetic			*The place was fresh and clean; Interesting & Beautiful

5. Frederico Arez

MOTIVATION	Description	Analysis	Interpretation
Intellectual	<p>"if you are curious you are so because of something. You feel the urge to look for it and that makes you want to know something else and, ever since I was a child, I've always wanted to know more about stars and planets. It's something from my childhood basically. (...) [to learn new things] and I also wanted to understand them"</p>	<p>Motivation to learn comes from childhood; He wanted to understand and learn more about the different phenomena.</p>	<p>*To learn about things around him; * to satisfy his curiosity; to explore new ideas; *To expand his knowledge; *To discover new things;</p>
Stimulus Avoidance	<p>"if I'm just there to relax then this starry night is a beautiful thing and very relaxing (...) Every year I go to the mountains and something that I really like is going outside laying on a rock (...) and just look at the sky and that is really relaxing."</p>	<p>He uses these activities to relax and, when he goes to the mountain, to escape the daily stress; Being alone and contemplating the Universe</p>	<p>*He likes being alone sometimes; to relax mentally; to avoid the daily stress; to rest;</p>
Social	<p>"In the Observatory, (...) one of my greatest motivations was to socialize with the monitors, which is the coolest part. Being there and talking to them, having dinner, (...) and then talk all night long."</p>	<p>To be with his peers, to share and exchange knowledge, to socialise;</p>	<p>*To interact with others; * to develop close friendships; *To reveal his thoughts, and feelings to others;</p>
Competence Mastery	<p>"something that we really like was to share knowledge and to share things with you people that have never seen the planets in their lives and people who didn't even know that that was a planet. In telling them about the constellations and people seeing the constellations is something that's really motivates me, sharing knowledge they don't know"</p>	<p>Sharing his knowledge motivates him. Allowing people to see and understand more about the Universe.</p>	<p>*To gain other's respect; *To challenge his abilities; *To be good in doing them;</p>
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	"[it was very interesting for him] and [gave him a sense of confidence, of accomplishment] I went there and I learned something new." ⁴⁴		*The activities are very interesting to him; * Gave him a sense of accomplishment & self-confidence
Educational	"Yes even though I am an astronomer, when I am the one to organise the activities, I always learn something new. It's not as if because I am an astronomer I already know everything, no. (...) I also found out my limitations in terms of effectively explaining things to people, because I needed to explain these things to normal people..."	He understands that his knowledge is relative and he keeps learning every time. Not only on how to transmit knowledge to people, but also about the field.	*The activities increase his knowledge about the things around him; *Help to learn about himself, his limitations
Social	"was something that touched me. I was like "this person felt good with something I did, with my work. She felt good." ⁴⁵	In general, he feels really satisfied with not only being able to socialise with his peers, but also with the public.	*He has social interactions with others through the activities; *The activity helps him to develop relationships; People are friendly; *He associates with those same peers in his free time.
Relaxation	"[Do you relax and do the activities contribute to your emotional well-being?] Yes. Both as an organiser and as a member of the public.	He relaxes both as an organiser and as a member of the public	*The activities help him to relax and relieve stress; *Contribute to his emotional well-being; *He participates in the activities, because he likes doing them;
Physiological	-	-	-
Aesthetic	"I liked the place the most. I think that making the observations in the castle [of <i>Morão</i>], although there is not a good visibility to see the objects near the horizon, it was compensated by the beauty of the place itself. And the thought that centuries ago, there were people in those walls and they were seeing a better sky than ours, but they were seeing this same thing. And for instant, in the mountain, which is a natural landscape, it's something truly amazing."	He likes not only the place and the surrounding landscape but also the view of the sky.	*The places are interesting and beautiful. Memorable.

6. Gonçalo Dias

MOTIVATION	Description	Analysis	Interpretation
Intellectual	"I would say that's my necessity of understanding the natural phenomena drove me to observe the Aurora Borealis. It has awakened within me... the fact that I observed them, awoke in me the need of reading more about the issue and the process through which they occur."	He wanted to learn more about these phenomena. After seeing them for the first time, he fell in love and had to learn more.	*To learn things around him; * To satisfy his curiosity; *To explore new ideas; *To expand his knowledge; *To discover new things.
Stimulus Avoidance	"[you want to witness that event because you like being alone, you wanted to relax physically or mentally, to avoid the stress and tension of daily life] for all the reasons you mentioned. Liking to be alone sometimes... For example some of the Auroras I saw happened when I decided to go for a stroll alone, just to relieve a bit of stress and of the University"	He wanted to be alone, to run away momentarily from the stress and hustle of the university and personal problems.	*He likes being alone sometimes; *To relax mentally; *To avoid the hustle and bustle of daily activities; *To relieve stress and tension.
Social	-	-	-
Competence Mastery	"Maybe I have some knowledge about which I can turn into a simple conversation that I didn't have before. It ends up being a conversation topic, which may catch the attention of others who have shared the same situation."	He now has a new topic of conversation that can catch the attention of others who have experienced the same, but not just those.	*Reveal his thoughts, feelings about the issue to others
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	"[it was interesting for you and have given you a sense of accomplishment] yes. I would say it ends up being like a dream come true"	He finally accomplished something that he has been waiting for years.	* It was very interesting to him; *It gave him a sense of accomplishment.
Educational	"I would not say that I learned a lot about myself, but it has increase my knowledge concerning the phenomenon, and also to the way how the people in the country see that and what they think about it."	He learned a lot about the phenomenon, about the culture of the country and how the natives see and think of the phenomenon.	*It increased his knowledge about things around him (both the phenomenon & the culture of a country); *It was an opportunity to try new things; *It helped him to learn more about other people.
Social	-	-	-
Relaxation	"I would say that there is not a very proper reason, besides doing something that I like that distracts me of the daily life problems. It is just because of that. It didn't solve anything. When I got home the problems were still there. "	The event helped him to relax & relieve stress. Distracted him of his daily problems although he was conscient that they didn't disappear.	*The event helped him to relax & relieve stress; *It contributed to his emotional well-being. *He engaged in the activity simple because he liked doing them.
Physiological	-	-	-
Aesthetic	"besides considering it's beautiful there (...) yes except the light pollution, I would say it is one of the cities in the world that I enjoy the most... due to the almost total absence of buildings. And the fact that everyone has its own garden and everything is very green I think it's very beautiful."	He was satisfied not only because of the beauty of the event, but also of the place where he saw it. The country has many positive factors.	*The place was interesting, beautiful and well designed. *Importance of the event and of the place of observation.

7. Lourenço Branco

MOTIVATION	Description	Analysis	Interpretation
Intellectual	<p>"yes because I need to understand what I am photographing. And also to understand why what appeared in my photo is like that... The moon phases, the example I gave you earlier about the movement of the stars, why did that happen, if I catch the comet passing..."</p>	<p>He wants to understand what he sees in the photograph some the more he photographs the more he wants to know about the phenomena.</p>	<p>*To learn about things around you; *To satisfy his curiosity; *To explore new ideas; *To expand his knowledge; *To discover new things; *to be creative.</p>
Stimulus Avoidance	<p>"Above all to run away of the civilization because I have to escape the light pollution, but above all in order for me to be with myself and look at the sky (...). I can be with a friend who also is interested in the field, but that's it. The main goal is to escape that [daily life stress] and to focus on myself... on the night sky."</p>	<p>He uses astrophotography to enjoy the night sky away from the light pollution, to escape daily life stress and focus on himself and on the night sky.</p>	<p>*To relax mentally; *To avoid the hustle and bustle of daily life; *To rest; *To relieve stress and tension; *To enjoy his hobby quietly.</p>
Social	<p>"fortunately now I have this friend who is helping me with astrophotography, and we have shared good moments together because... first of all he gives me a ride, he is my ride and I am just the photographer, but it's good because he is also interested (...) now it's something that we share between the two, every time we take a photo, we do a light painting"</p>	<p>He is accompanied by a friend who is also interested in the topic and together they share these moments.</p>	<p>*To develop close relationships; *To interact with a friend.</p>
Competence Mastery	<p>"you're talking with a person that, in November, had never had any experience with photograph, because I had never had a camera before, and now I believe that, since then, it has being a major leap to understand how a Canon or Nikon, all those cameras [work]. (...)"</p>	<p>He developed his knowledge in many areas: astronomy and photography. There has been a high development since he started this hobby.</p>	<p>*To challenge his abilities; *To be good in doing them; *To improve his skills and abilities.</p>
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	"[that is interesting to yourself and gives you a sense of accomplishment.] Yes exactly. Something that among my friends I am the only one who does this, and it gives me great satisfaction."	Among his friends he is the only one who does astrophotography and it satisfies him.	*It is very interesting to him; *Gives him self-confidence; *and a sense of accomplishment; *Pride
Educational	"[you increase your knowledge about things around you and it gives you opportunity to try new things] Yes. (...) that I am committed... when I really want to learn something, I commit myself to it, and I think that patience and dedication prove their worth. It's more like when I get my mind into something I don't quit."	He learned more about himself, although also had the opportunity to learn new things.	*He increased the knowledge about things around himself; *Provided opportunities to try new things; *Learned about himself.
Social	"[you end up developing a good relationship with him right?] Yes. (...) we are childhood friends. We grew up together, our parents are friends, we were together in the same High School"	He has developed a better relationship with a long-time friend;	*It has helped him develop a close relationship; *He associates with that person outside the activity
Relaxation	"I'm very calm looking at the sky, and you observe the sky. Of course you're taking a photograph, it's without a doubt to observe something that in the daily life you do not have time, or you take it for granted, and it's in those moments that you understand what you have been losing"	He relaxes a lot; Taking these photographs makes him realize the true beauty of the sky, something that not everyone realizes it is there.	*The activity helps him to relax and relieve stress; It contributes to his emotional well-being. *He engages in the activity simply because he likes doing them
Physiological	-	-	-
Aesthetic	"the places where I have been to are a little bit limited, they are almost the same, it's here in the area of Sintra, of course I always get the light pollution from Lisbon, or Cascais, or even the Cape of Roca, I get some light pollution (...) but I have already taken some when I was in Azores. I had the opportunity I was in this dark location"	The places where he has been to are still limited and still have much light pollution; Nevertheless they are beautiful and far away locations	*Interesting; *Beautiful; *With Light Pollution

8. Maja Nielsen

MOTIVATION	Description	Analysis	Interpretation
Intellectual	<p>"When I found out we were going there, I got excited because, as I said, I'm fascinated about all that field of science, and wished to know more about it... it was the kind of course I was interested in"</p>	<p>She was motivated to go to learn more about the field and how the 'Space' science worked</p>	<p>*To learn about things around her; *To explore new ideas; *To expand her knowledge; *to discover new things; *To use her imagination</p>
Stimulus Avoidance	-	-	-
Social	<p>"we were there on a family trip, with my younger brother, he's 5, my dad, his wife's parents, so I guess I formed a closer relationship, especially with my dad wife's parents... Also getting these experiences with my dad and my younger brother... And now we have all these experiences we can talk about..."</p>	<p>She developed family bonds and created and shared experiences with her family</p>	<p>*To develop close friendships; *To develop family bonds</p>
Competence Mastery	<p>"I don't really learned a new skill, but I learned a few facts about space travel and got a new perspective on that... Before that my idea of space travel and all that seemed foreign to me, like... I know we, as human kind, have been to space a few times, but it didn't occur to me how we actually got there... And that people have been to space in these... [shuttles]"</p>	<p>She was motivated to learn more about how did humans got in to space. She ended up having a different and new perspective.</p>	<p>*To gain other's respect; to improve her knowledge</p>
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	"I think I've gained some confidence from that visit, perhaps (...) in a surprising way, because as I mentioned I was around 15 or 16, so I wasn't really that used to speaking in English outside the classroom, so I've gained more confidence being in the US and speaking English with these Americans"	By developing her English, the environment helped her to gain confidence.	*Gained self-confidence; *Used different skills in the activity
Educational	"all the different things you pick up during such a trip of how... how different space shuttles actually look, because when you see them on television, they seem pretty small, and then when you get there, it feels an entire hangar and it's just enormous"	She realised how things are in reality concerning that field. She learned about the field, the instruments and its importance.	*She gained knowledge about things around her; *It provided the opportunities to try new things.
Social	"we were there on a family trip, with my younger brother, he's 5, my dad, his wife's parents, so I guess I formed a closer relationship, especially with my dad wife's parents... Also getting these experiences with my dad and my younger brother... And now we have all these experiences we can talk about..."	She developed family bonds and created and shared experiences with her family	*She had social interactions with others (family) during the activity; *The activity helped her to develop close relationships; *She associates with that same people out of the activity
Relaxation	"you, for instance, had some problems or some things back home, it didn't make sense to bring them there. It was like "now you're here, now you have this amazing opportunity to experience this place, let's take care of all the other stuff later". "	She left her problems back at home, and tried to enjoy the holidays/activity as best as she could.	*The activity helped her relax & relieve stress;
Physiological	"[the activity was a bit tiresome and time consuming and you always felt a bit tired]"		*The activity was physically challenging. *The activity was tiresome .
Aesthetic	"I wouldn't call it beautiful, but everything single piece of equipment they had on display, it all seemed to serve a purpose, they had a lot of things on display and you could see an amazing amount of things... so, I really think that they did a great job at actually showing you all these different kinds of stuff"	The equipment on display was mesmerizing. She was really impressed by it.	*the place was interesting and impressing

9. Tomás Pereira

MOTIVATION	Description	Analysis	Interpretation
Intellectual	<p>"I think it is very important for us... to study where we are... And we cannot forget that we are in this space with billions of constellations, and it is important for us to understand the outer space around us. As much observations we make towards outside our sphere, we end up learning always a bit more (...) However, the motivation of going and learn about something exterior to your sphere, was something that makes you grow; to get to know yourself out of a social sphere."</p>	<p>To understand his position in the Universe & learn more about himself and the space outside. Learn about his sphere of knowledge and understanding; Get to know himself</p>	<p>*To learn things about around him; *to explore new ideas; *Learn about himself; *Expand his knowledge; *Discover new things.</p>
Stimulus Avoidance	<p>"Every day we are exposed to really high stress levels, tremendous... and it is even more important to value the break in which "everything is over and you can relax. Let's contemplate the landscape, let's contemplate everything that it's worth it."</p>	<p>Value the break & relax. Contemplate the outside world and forget the daily hustles.</p>	<p>*To relax mentally; *To run from the hustle & bustle of daily activities; *To rest; *To relieve stress and tension.</p>
Social	<p>"The biggest motivation of course was social because I was with a group of friends" (...) "(the relationships with others) were already well developed, we may have consolidated them more, because it is an experience in which you can look at the past and see that while we were all together. [it] has proven to be something that fortified our relationship, our experiences [together]"</p>	<p>To be with friends and consolidate even more those friendships. Share a meaningful experience & fortify bonds</p>	<p>*To develop close relationships; *To reveal your feelings to others; *Share meaningful experiences & fortify bonds.</p>
Competence Mastery	<p>"to defy ability <i>per se</i>, not really. I think you end up improving yourself and feel that feeling of belonging as a human being. You expand a lot your knowledge network. Also the feeling of belonging was very important."</p>	<p>To improve himself & gain new knowledge. Feeling of belonging with the group.</p>	<p>*Gain a feeling of belonging; *Improve his skills & himself</p>
Physical Skills	-	-	-

SATISFACTION	Description	Analysis	Interpretation
Psychological	"it was without a doubt interesting, self-confidence no, because I think... it doesn't apply at all. It may move you, the fact that you are observing the universe but after I think it will go through very concrete psychological terms... such as state of mind...so I think it didn't... It would depend on your mental state at that moment. But a sense of accomplishment yes, without a doubt"	Interesting experience; Sense of accomplishment	*Interesting to him; *Sense of accomplishment
Educational	"[Did you increase your knowledge about the things around you?] Yes. You end up learning more about yourself. I think that every time you contemplate something new, that 'new' always shows you something new that you didn't know about yourself. So I think I did learn something new about myself, yes. [and about the outer space as well]"	Learning about the stars & Universe; Learning about himself; Aware of dialectic relationship that exists between him and the experience - Learn about himself and the surroundings.	*Gained knowledge about things around himself; *Learned about himself; *Learned about a dialectic/exchange of knowledge between himself and the surroundings.
Social	"the relationships were already developed, meaning that it was not unexpected. They had already been consolidated. However, this helped to fortify them even more. It made us closer to each other."	The relationships were even more fortified; They got closer to each other.	*Social interaction with others through the activity; *Fortify already existent relationships; *He associates with the same friends from the activity outside it.
Relaxation	"[did it help you to relax? Have you relieved stress?] Yes. Because it is an escape from reality"	Escape the daily routine & relax; Relieved Stress	*The activity helped him to relax & relieve stress; *Escape the daily routine & present status
Physiological	-	-	-
Aesthetic	"[the place was] perfect. (...) It was a quiet place. The fact that it was a quiet place also helps you open your horizons. It would be impossible to do that in Lisbon. The fact that you are literally in the middle of nowhere, in which you don't have anything around you, and you only have that, it pulls you even more into that. And of course the place was unique and amazing."	The place was very beautiful, quiet and far away from the big cities, conveying quietness, and stimulating the emotional part. It was unique and amazing.	*The place & area were beautiful and interesting; Propitious to an intense experience.

7.8 Interviews Transcripts

6.8.1 António Miguel

I: Interviewer (Ana)

A: Interviewee (António)

I: so thank you for coming today.

A: you're welcome it's a pleasure.

I: you can start by saying your name and your age please.

A: okay. My name is Antonio Rui Costa Miguel, and I am 30 years old.

I: what is your present occupation?

A: I'm working student. I'm doing my Master's degree in Journalism in the faculty of Humanitarian and Social Sciences (FCSH Nova) and I am working at NOS [Portuguese Mobile phone Company].

I: And are you interested in Sciences?

A: yes I had a background [in sciences]. I started my University path in chemistry so yes I am a bit interested in Sciences.

I: and in astronomy?

A: in high school I was a member of the astronomy club of my school. So yes I really like astronomy.

I: so would you say that you are an interested person in [astronomy], almost as an amateur astronomer?

A: maybe not that hard-core as an amateur astronomer, but yes I am interested in the field.

I: And if you ever participated in any activity related to Astrotourism?

A: Astrotourism per se no, but I remember doing observations in the Ajuda's National Observatory when we used to go there every Friday.

I: would you go with your school?

A: I would go with the school. With my physics and chemistry teacher.

I: so you are quite interested in participating in those activities, right?

A: yes we would always go to the speeches of Dr. Rui Agostinho, who is the director of The Observatory.

I: what would motivate you the most to go to those activities? Why would you like to go?

A: I would like to listen to the guests speaking about the most varied topics, it was very interesting. Sometimes it would be Rui Agostinho himself to do the speeches, and after

that we had the observations when the weather was propitious, and it was what I like the most, to see through the telescopes. It was not as if I was born for it, but at least it was good to see something...

I: okay and what other events have you witnessed?

A: I remember... connected to astronomy?

I: yes.

A: I remember that I have been to some Summer Nights that various amateur astronomers would organize during the summer in various sites of the country. In my case it was in Odeceixe, and we would watch whatever we could, Mars sometimes Jupiter and other constellations.

I: so you would take your telescope and do observations right?

A: Yes, basically exactly. But I think it was the maximum of my "astronomical activity", the observations.

I: but earlier you were telling me about an event that you witnessed, which happened to be the first time you would see such a thing... the Midnight Sun wasn't it?

A: Yes in Finland. Exactly.

I: and the event happened by chance or... You can repeat what you were telling me earlier... Was it on purpose?

A: I went to Finland in a High School Exchange program. I had no idea that there was a Midnight Sun. I didn't even think of it. What happened was we were there we walked in this local pub, and when we got out it was day. And it was midnight something. And basically everyone was looking at their watches, like "Ah... it's day!" So it was like this how I witnessed for the very first time this event. It was on the very first day as well.

I: But you actually saw the sun?

A: yes I really saw the sun. It was like daytime.

I: but you saw the sun near the horizon?

A: after two o'clock in the morning, more or less... you could see the sun setting and setting, it would be like sunset, with its luminosity, and then it would start rising again. It would never really get dark. And this was in June.

I: amazing. What about in terms of motivation. In terms of intellectual motivation, what motivated you the most to witness that activity? You've already told me that you went there with your school but what did you think that has motivated you to observe that event? So did you learn new things around you, it satisfied your curiosity, your explored new ideas or horizons...

A: what happened was I was not expecting it to be day when I got out of the pub. And of course I had to ask to all Finnish people with whom we were what the hell that was, what was going on... And they replied "yes, this is normal, this is normal because we are in the summer, and because we are so high up in Europe, it never gets dark". And I would be like okay... I didn't even have that...

I: Notion?

A: that notion back in the day, I was 16 years old...

I: something that has nothing to do with this conversation but today, in the school where I gave my presentation I commented that in Denmark during the summer time, the Sun would set at 11:30 in the evening and they were all like "What?", and I was like go look for it at home. Because of course at that age we don't have that notion... but so you ended up learning about things around you?

A: Umh-Umh [yes].

I: and you expanded your horizons...

A: Yes, I have to agree. I didn't know anything about it and then someone started to explain it to me... because it had to do with the latitude, because it was a high latitude, simply the Earth rotates like this [gestures of the Earth rotating]...

I: exactly.

A: so it was like this that I found out [about it].

I: okay what about stimulus avoidance? You went on the journey to somehow alleviate the stress or tension... well sometimes it might not apply to your case, so don't worry if it doesn't apply. I believe that in this case, it doesn't apply because you went there with your school...

A: Yes.

I: but would you say that you relaxed somehow physically or mentally?

A: Oh, I loved that. I loved Finland. Not only because of the Midnight Sun, which I think is awesome, but also due to their way of life. And I went to this little village, really really small, it had around a thousand inhabitants, and it was surrounded by Forest, those typical Nordic Forests. So anything quieter than that doesn't exist. It was good to relax, to rest, to see how other people of different cultures live, and I think it was because of that that I decided to apply do that Exchange program. Firstly because I had never left the country, secondly I really wanted to see how other people lived, and in this case I went to Finland, and Finland is a country so... I have already known that Finland was more advanced than us in various ways, and I could prove that. It is indeed far advanced than us.

I: so you would say that your motivation to go ended up being social? You interacted with other people, you got to meet new and different people...

A: Yes, make new friends...

I: meeting new people...

A: Meeting new, different people, of other cultures, and besides in my Exchange program, there wouldn't be only Finnish students, who were from different nationalities, so it was really good to do that...

I: okay good. And all of you together witnessed the event?

A: all together. Finnish, Swedish, Estonians, Greek, Germans, and Polish as well, everyone. We were all there in the same school. And every one of them witnessed the same event at the same time. In the end of July.

I: and what did they feel?

A: The Swedes were used to it. The Estonians as well, I think. The Poles were not used to having the light at 2 o'clock in the morning, but... the ones really impressed were ourselves and the Greeks. We could not sleep in the first days because they don't even use shutters, so...

I: and what about competence mastery, did you end up having a feeling of belonging, did you challenge your abilities and skills?

A: Mainly in English, because at 16 years old I didn't speak English as I speak now, and if I didn't speak English there, I couldn't even eat. So yes, I would say that my abilities were pretty much developed in that component, throughout those two weeks.

I: so in terms of social factors that have nothing to do with the event in itself, you developed more and end up learning more about the event, right? Because you asked for explanations...

A: yes they explained it in English why did that happen.

I: of course, win-win! And so I would say that in terms of physical motivations there was none right? You didn't develop any type of physical ability that has motivated you to go?

A: No. No. I went there because I wanted to go, I wanted to know new people and a new culture.

I: So to summarize these motivational part, which factor do you think motivated you the most to engage in does activity? Was it intellectual, social or competence mastery?

A: Social probably. At 16 years old, I was always thinking of something else... it was more social I have to admit.

I: And moving to satisfaction. You will ready told me that you have been to various activities. In general, what did you like the most in those activities, being able to see the universe and to discover more about the universe, what did you like the most?

(BAD CONNECTION)

I: in general in those activities related to astronomical events, what did you like the most?

A: what I like the most? I liked mainly the fact that it was something completely different of what I had ever seen, I liked the fact that we could stay outside during the night time without being night, I thought of that as super cool... And I liked as well the fact that he could literally do all types of activities during all day, because it was always day. So it was excellent. It was until we were completely dead, tired and went to bed. Basically... because since it was always day, we could stay outside all the time.

I: and what did you like the least?

A: not being able to sleep.

I: it makes sense.

A: because they do not have shutters. Basically it's day all day long. I even had to cover the window with the Portuguese flag because it was the only darker thing I had. Hoping that the light wouldn't got through that.

I: but you know that in the winter time it changes. It's always night.

A: yeah I spoke about that with them... "If it's like this during the summer, how is it during the winter?" And they would answer " Oh in the winter time, at 11 o'clock in the morning it's already night" and I would be like "Ahh... okay." "And the days are all grey", "Ah ok, it must be really depressing", and they would be "yes, we have one of the highest suicide rates". And I would be like "okay"...

I: Poor them! So in psychological terms... Are you satisfied because the activity was interesting to you and gave you some self-confidence, a sense of accomplishment, you used many different skills and abilities?

A: Well, using different skills and abilities in the event itself, not really. I mean the only event was being sunny. But, I really liked it because, again, I went to Finland to see different culture. In that new culture it's day at midnight! A greater cultural difference could not exist! We are in a country of sun light, but we never had that "being sun during the night". That was mind-blowing.

I: in the end, in educational terms, it was very productive, right? Because you increased your knowledge about things around you and it has given you opportunities to try new things and to learn more about other people?

A: yes. Clearly. I would say so. It was exactly that. I didn't know about this situation, I didn't know more things about their culture, and I learned a lot in those two weeks. A lot really. I learned cooking mores of them, I learned their... even their greeting ways, here in the South we kissed a lot, and besides they don't even know what to do when they receive two pieces they stay like [frozen]. They freeze.

I: There they give hugs.

A: they are trying to figure out what to do.

I: they hug the other person.

A: Yeah. Sometimes not even hugging. But... it was like that. It was excellent, I learned a lot.

I: and in Social terms, you are satisfied because you ended up having a social interaction with others doing that event, and you develop close relationships and it was also good in Social terms right?

A: I remember that we got out of the Pub, I would not say that we were that drunk but we got out very happy. We ended up playing hide and seek, it's was night time but we went to play hide and seek, which is great... to the forests near the pub. And we went all of us, all nationalities, Greeks, Finnish, Swedes, we went all of us... So yes I would say that yes.

I: what about relaxation terms, are you satisfied because the activity... all that situation helped you to relax and somehow country did to your emotional well-being?

A: yes. Because that... Since I was learning about something that had never crossed my mind, which was being night and seeing the Sun, yes, the simple fact that I was learning, it made me happy. All trip was great.

I: that is good. And so we can say that, in physiological terms, nothing applies, and in aesthetics terms, the location you have been to, the Village, was beautiful, was interesting? Did you like the landscape?

A: It was beautiful. All the houses I saw there looked like they had come out of those Fairy Tales, by Brothers...

I: Grimm?

A: Brothers... help me...

I: Grimm.

A: The Brothers Grimm. Exactly. They all looked like doll houses, everyone had its own garden very well-tended. There was not a single piece of paper on the floor, everything was... it looked like a small Fairy Tale. Basically... calm and peaceful people, relaxed. Everyone has its own sauna... in the garden everyone has a sauna... the type of things.

I: and which factor do you think I'm driving to the most see your satisfaction after that activity, Was it more psychological educational relaxation or social or aesthetics?

A: I would say it was educational and social. It was educational because I didn't know about that and they explained it to me, and social because I was with my friends and with new friends, barely knew them but they were already friends, and all of us witnessed, in all of us... we were all playing hide and seek. Because yes. We were 16, we were not children anymore...

I: do you still keep contact with some of them?

A: yes, I do. With one of the Finnish girls. She has even stayed here at my place...

I: great. Would you like to...

A: sorry would I like what?

I: to go back? To Finland and see the Midnight Sun? Wait a second because I can't hear you.

A: sorry [BAD CONNECTION] Yes but when it was dark.

I: okay you have already been back in the winter.

A: Yes I went for the new year in Helsinki. The same friends with whom I keep in touch she invited me to spend the New Year's Eve in Helsinki so I went there but it was everything dark.

I: And would you like... So you already told me that you would like to repeat the experience...

A: I can't hear you.

I: you were telling me that you would like to go back, to repeat the experience?

A: yes I would like to undoubtedly. This time I would probably go further north. I would really like to go to Lapland, that's really the north of Lapland. Not the South.

I: Did this somehow... Did you recommend as experience to someone? Have you commented, spoken about or advised about it...

A: When I got back no one could listen to me anymore... My parents, my friends from Portugal who didn't go there, yes every one of us. At least the Portuguese group

recommended the experience, in a general way everyone loved it. Yes, we did. Mainly the part of the sun... because even our friends who don't know about it like we do...

I: wait, the part of what?

A: and they were really surprised, like "really, at midnight there was light?" and we were like "yes". And then we would explain that's was because of the latitude because that was far north, is the solar rays are oblique, so... the same explanation that was given to me I gave to my friends from Portugal.

I: okay, so thank you for coming today.

6.8.2 Beatriz Duarte

I – Interviewer

B – Beatriz Duarte (Interviewee)

I: Hello, thank you very much for having come today. Just tell me your name and your occupation.

B: So, my name is Beatriz Ribeiro Duarte and I'm a landscape architect.

I: Okay, and do you have any interest for sciences, or for astronomy, for instance?

B: Well, the interest in science... of course the interest in botany and that field is big, more because of the vegetal nature rather than animal. Concerning astronomy, I like it, but sometimes, it has more to do with the ... it's not the exoteric, but more about the historic, cultural... For instance, since the ancient times... More in that way. Not so much the transcendent, the readings of astrological maps but...

I: We just have to know that the difference between astronomy and astrology is... slightly different...

B: Yes, that is right. But that's why I was saying that at the science level...

I: Sciences

B: Yeah, so astronomy not so much, but when I was younger I think so... I think the planets are always impressive... and the stars.

I: Yes!

B: Yes.

I: Okay, so tell me. Have you ever participated in any activity related to astrotourism?

B: Like the Planetarium? Does it count?

I: Yes. It does.

B: Yes, I have. Not so long ago. When I turned 30.

I: Great. Ok.

B: In my holidays.

I: That's so funny!

B: Yes.

I: And in what other activities have you participated?

B: I remember, but I was younger... During the summer, there used to be those events of *Ciência Viva*, in the Alentejo's southwest during the night, to observe the stars... And there was... well, this is not tourism per se, but the grandfather of a friend of mine has telescopes and I loved how long we would talk about it... and it was a part of it...

(MOBILE CALL INCOMING)

I: So you were telling me about your friend's grandfather that had telescopes...

B: Yes, and he would tell us a lot about the planets in a scientific and pragmatic way, and then I used to do that, since I was a child...

I: And you told me about this activity where you actually saw something, right?

B: Oh yes, exactly. It was not on purpose, but I lived in Iceland for 5 months, and I was there from April to September, and what happens is that, during the summer, supposedly the auroras are not visible due to the clarity. In April, during a few nights I was there, I know there were some, but I couldn't make it and see them, and in the meanwhile, precisely two days before I came back to Portugal, there they were. They showed up in an evening that was just the craziest of nights. And I had never seen it, so it was like the best.

I: But what happened? Did you go to any location or...?

B: No, we were at this... Well, Iceland is very much *suis generis*. So, we were at this bar that was also a camping park, so a kind of strange thing. And curiously, outside they had an enormous trampoline, an inflatable one?

I: Yes, yes.

B: And I was there, playing, jumping and jumping... and suddenly I look up to the sky and saw something... but you don't know what it is exactly, and then I started to run like a hysteric person!!! "Please, somebody tell me if it is or not... Northern Lights, Northern Lights!". And then people started to come. For the Icelandic, that's an everyday thing so they probably thought of me as an hysteric, but then everybody came and it was amazing, a beautiful night...

I: Can one actually see the colours or...?

B: Normally... well, it depends on the intensity degree, all those I've seen were green. So, on that night there was only... I don't know if it has something to do with the dust or something more about their composition... But still amazing. They call it "the dancing lights", because that is of such a softness, it's marvellous, I couldn't describe... And then we went home, because it stills continues... and I went home and I couldn't sleep. I was so hysterical, and I was... the house had both windows facing it and I was like seeing it through this window and then through the other. It was amazing, amazing, beautiful, beautiful, beautiful...

I: Was it like a sensation from another world? Different from everything you...

B: [Different] from everything, everything... It was one of the best sensations I have ever had till this day.

I: Okay. So in terms of motivation... I'm going to ask you a few questions about various factors.

B: Okay

I: And you're going to tell me, which of the factors, or which factor, motivated you the most, within this larger factor, or if there was none that applied to you.

B: Okay.

I: In intellectual terms, would you say that you learned about stuff around you, that you satisfied your curiosity, explored new ideas, expanded your knowledge, found new things, were creative, or used your imagination?

B: From all these, I have to choose one?

I: Yes... But, you can speak generally.

B: At the intellectual level, right?

I: Yes.

B: So ... But more about this event in specific?

I: Yes, yes. What did you feel?

B: Clearly... Well, you're in a country of auroras, there was some kind of transmission of knowledge but not in a formal way or verified, I mean, you were asking me about the colours earlier...

I: Yes.

B: I know that that has... Not always does that have different colours, it depends a bit of... But ...

I: But undoubtedly, did you learn something new, right?

B: Yes, that's right. Yes, I learned. Even about the dust, the magnetic fields, about all those things. And of course, it completely satisfied my curiosity, completely... It exceeded any... And my knowledge as well. Imagination... I love it... Because I was almost going home, and having experienced that event that could have not happened, it was really magical. So, it might not be the intellectual part as much, but in the intellectual part was...

I: What stood out the most?

B: Yes.

I: And what about stimulus? You participated in that activity of seeing the auroras because you like being alone, or wanted to relax physically or psychologically, or to avoid the daily stresses or to relax more and... well in the end it was to unstructure your time, no?

B: So cool. So, let's see. About stimulus... let's see...

I: So, you were in a bar right? You were in a trampoline...

B: Yes, but that was also something that alone was wonderful... If there was here, speaking about stimulus, there was something about stimulus to happiness, almost as an input to...

I: It doesn't need to be exactly as it is there. Okay?

B: Because, for instance, that event was so special, so unique, it was not to get out of the daily routine... No, that was special.

I: It was momentary, but ended up being important right?

B: Yes. But without a doubt the greatest stimulus was, and if I were to return... happiness.

I: Great. And in social terms? Were you able to build new friendships with others, interact with others, developed friendships...

B: Yes... Yes...

I: Did you meet new people, did you revealed your thoughts and feelings, emotions...?

B: Yes... yes...

I: Was it a moment of hysteria...?

B: Yes, it was beautiful... And it was great, I was with friends, special friends...

I: So it was a reunion of various things, right?

B: I was also with the right people. (...) So socially, it was...

I: It was motivational?

B: You know, the collective group exponentially improved the experience. For instance, if alone, that would of course have a strong sentiment, but in this case, with the experience I had, the collective was encouraging. It gained a bigger dimension...

I: So you were motivated by the sharing...?

B: Yes, yes. Because we all ended up experiencing the same thing.

I: Ok. And in terms of competency mastery? Do you think you gained a feeling of belonging, other's respect, challenge your abilities, improved your skills or were you simply active...? This doesn't mean that these motivations have to apply to you. Just tell me if they were applicable or not.

B: I think that... clearly, I gained a sensation of belonging in some way, right? I mean, you experienced that and we're talking about auroras that, for us from the south, are not that common, in a way I gained that experience, I was on that place, I lived through that place, I was part of it, so...

I: In terms of physical activities? Tell me, if this applies or not, did you develop any kind of physical activities for this purpose?

B: Besides jumping in a trampoline...?

I: For instance, yes!

B: You serve this purpose because you were jumping on a trampoline, right?

I: But in a state of complete hysteria, I was like at 1000 km/h! I ran in the house, I jumped in the trampoline, I couldn't stay still... But that was not on purpose, I could have done like those people who go and see the sun rise – I don't know if it counts as well – for instance to the Pico island. Is that included in this type of experiences...?

I: Yes. We can say so. It's an astronomical event...

B: Because, imagine... There are people that climb the mountain and have had that physical preparation...

I: Exactly.

B: So the final purpose is not just to see the sun rise, but there was more to it.

I: It's a good example.

B: In my case, there was no physical preparation... It was just "Huhu!"

I: Great, great! What about your satisfaction... Or, alias, before anything else, what do you think, from these motivational factors, which one do you think motivated you the most to participate in this activity? Intellectual, stimulus avoidance, social, competence mastery or physical skills?

B: What I think... From these factors, the one which motivated me the most I think was... the stimulus of happiness. Without a doubt.

I: Okay, Okay...

B: Do you think it's that?

I: Yes, well... In this case, the topic is stimulus avoidance.

B: Ah because it's the stimulus that...

I: Yes, exactly, it's the stimulus where you're trying to run away from something...

B: Ah yes, to avoid... Then wait, wait.

I: Maybe the social factor?

B: Ah, yes. Maybe competency... I'm sorry I was distracted...

I: Don't worry.

B: Maybe, even more... This one... the competence...

I: That you've acquired...

B: Yes. This of course thinking that I was doing this with that purpose. Imagine, if I had the purpose of going there, which motivation would have been? It would be this one.

I: Okay.

B: Yes.

I: Good, good. What about satisfaction? Practically, we've spoken about a bit of everything, but let's just see... You've told in the beginning that you've been to others astrotourism-related activities. You've seen planets through telescopes, to observe the stars... and in general you liked those activities, right?

B: Oh yes, so much.

I: Okay. So you're satisfied with them?

B: Yes.

I: And what did you like the most in the other activities?

B: For instance, something I love... which is to learn the constellations. For instance, I remember learning the constellations and having a story related to the *Os Lusíadas* in which... I'm going to tell the story, but I'm not sure if it is really like this because this happened some years ago, when we were studying so this was a long time ago... But the story tells that there is this stanza in *The Lusiads*, in which Camões says that when they were passing the equator, the Big Dipper and the Small Dipper, at that point, touch the

water. And he mentions that the story of the Big Dipper and the Small Dipper was a mother who had a daughter with Zeus, the god of water, or that was Neptune?

I: Neptune.

B: Neptune. And Neptune's wife, in a way to manifest herself while angry, put them both in the sky, the farthest away from the water, so that they would never have that contact and, supposedly, the romantic Luis Vaz de Camões makes it as if it was the reunion of love and... and all that mystic of the Discoveries and stuff... So I've learnt these things, and memorised them, more the historic ones... But I remember, for instance, that pragmatic association of the constellations with their purpose, for instance the Hunter, I can see perfectly the shape with the sword or that thing to hunt, on his waist, so those kinds of things... I like, those associations, the historic explanations...

I: The cultural part of it?

B: Yes, the culture associated to astronomy. Not so much from a scientific point of view, but it's what I like the most.

I: Exactly. Good.

B: Because I think that's the nicest way to learn, you know?

I: Exactly. And the public normally likes those kinds of things.

B: So as you can see, it was those experiences that stayed with me... Sometimes even more than just looking through the telescope and say "Oh there's rings there!"

I: Exactly.

B: Because nowadays there are plenty of images. You see them a lot, and these little...

I: Curiosities?

B: (...) Inputs you have are the ones that make it ... "Ahhh!"

I: Exactly. So can we say that what you liked the least was maybe...

B: Of the experiences?

I: Yes.

B: Maybe, the more exhaustive part... Because when it's too scientific for a public... Not that they don't have the capacity to learn, but when it's something more to relax, do you say how many kilograms of air or how gaseous it is... You can compare it with something more funny without having the need to say that are twenty thousand what ever...

I: Exactly, for instance, what you're telling me now it's good because I have a friend that volunteers in... He is the chief of the volunteers at the Lisbon Astronomical Observatory and since a long time ago, I and other volunteers, we are in a constant fight saying "Look, João, you could make the lectures less scientific because that bores people and make them more dynamic, more towards the public, not that scientific...!"

B: What happens is that... it is weightless... Of course you can say the kilograms or the mass, if is gaseous...

I: Of course.

B: But if you compare it with something ridiculous or...

I: People find it funny.

B: Or simply compare with something else, you already have something a term...

I: Yes, it is something different... Dynamic and more funny

B: Yes, yes... Sometimes, more applied to reality...

I: Exactly. What about... the auroras you've seen...

B: Yes.

I: In psychological terms, can you say that the activity was interesting to you, gave you a self-confidence, gave you a sense of accomplishment, and you felt you developed your abilities?

B: Everything.

I: Everything?

B: [Satisfied me] the most?

I: Yes. Of these four.

B: So... Of these four.

I: Yes.

B: So...

I: If it's all of them, it's all of them.

B: Let's see. They were super interesting as well, a sense of accomplishment is like...

I: Accomplishment is like your self realisation.

B: Maybe... "Using many different skills" – No. I mean, this is more about learning...

I: Yes, learning...

B: Learning... I think the other three.

I: Ok. What about educational factors. Did you learn something new, did your knowledge increase?

B: Yes...

I: Did you try new things...

B: Without a doubt... It awoke a feeling and the urge to continue and do new things...

I: So the opportunity to try new things?

B: Yes. And of course, if I could go back again and do it all over again, I would.

I: Ok great.

B: It would be a non-stop of auroras.

I: Exactly. And in social terms what satisfied you the most? Being with others and learn with others, to develop relationships, and the people you met there...

B: Yes. I think it's a bit of everything... because it helped to share, to reinforce the relationships, to enjoy that time...

I: Okay. And in terms of relaxation, do you feel you relaxed or somehow you relieved stress or helped you emotionally somehow...

B: Yes..

I: And...

B: Yes. I think the emotional part complements the other ones, right?

I: Yes.

B: But I think without a doubt it was the case here. And the well-being.

I: okay. Good. In physiological terms, we've seen that you didn't see the auroras with the intention of...

B: Of seeing them!

I: Of seeing them or through a... physical activity.

B: Yes!

I: It was more about the leisure...

B: Yeah...

I: And in aesthetic terms, the place where you were... was Iceland, in a bar or camping place, right?

B: Yes, but it was so amazing!

I: Wonderful?

B: Yes, it was so great!

I: Which of these factors do you think contributed the most to your satisfaction about the activity? Psychological, educational, relaxation, physiological, aesthetics or social?

B: I think that psychological and relaxation.

I: Okay.

B: But more the psychological, in a more complex way...

I: Okay then. Do you want to add something else to our interview?

B: No, I don't think so!

I: Okay, very well, thank you very much for coming and your answers will be really useful!

B: Ok thank you!

I: Thank you.

6.8.3 Carla Ventura

I: Interviewer (Ana)

C: Interviewee (Carla)

I: So, thank you very much for coming today. So you can start by saying your name and age?

C: my name is Carla and I am 34 years old.

I: and what is your current occupation?

C: I'm a technician of Educational Services.

I: okay are you interested in sciences, in astronomy for instance?

C: Yes, as a curious person.

I: and if you ever participated in any activity related to Astro Tourism?

C: yes I have and I've seen more than once... the first time I was in the Dark Sky Reserve of Alqueva, there was really multiple events happening organized by O'Porto University, which was observation of the Stars, photograph, celestial photography, astronomical photography, there were various activities related to the observation of the night sky. and this happened in July, so one of the greatest times of the year to observe the sky, mainly in Alentejo.

I: and can you choose one of those activities that you have been to. can you tell me why you went to that activity?

C: well they were multiple. Within two days, there were several activities but one of the activities that I have participated was direct observation. Meaning that there were various telescopes around the Cromlech of Xerez, in Alentejo, so it was an open field. moreover there was this attention of turning off the lights of the Monsaraz village, so that I would be even more dark. So that all the Villages around did have any light, and so what happened was that we could observe the sky in multiple places, you had each telescope aiming its own object, and we could observe the Stars, the planets, and always with a specialised technician next to each telescope. in order to provide any explanations we might have needed.

I: okay and what motivated you to go there?

C: first of all the Curiosity to know more about the sky, secondly because it was a completely unprecedented initiative. I've always considered that the sky in Alentejo is... I mean, Alentejo is one of the greatest places to see the sky during the night, so since I have always considered to be one of the greatest places [to watch the night sky], from the moment I knew about this activity through a friend, I decided I wanted to go and see.

I: so you went with a friend?

C: exactly, it was through her that I knew about this activity and we went there.

I: would you say that the motivation to participate in that activity for instance in terms of intellectual factors, what motivated you to go to that activity? did you want to learn new things about the things around you, earlier you mentioned that already...

C: Yes.

I: [Did you go to] satisfy your curiosity, to explore new ideas, to learn a bit about yourself or about everything else...?

C: it was mainly... to learn about things of what's happening around me. more about astronomy the place in itself where you were doing the observation. Next, it was to explore new ideas, from what I have learned to learn more, I mean I started to be much more interested in this type of events. I know that in Constância they have similar activities, in the Observatory of Constância, and also to expand my horizons. so these were doing things that drove me to this activity.

I: in terms of stimulus avoidance, were you motivated because, for example, you like being alone, you wanted to relax physically or mentally, you wanted to relax and escape the stressful daily life?

C: more than escaping the stressful life, it was the psychological part, it was to relax mentally. And also to rest.

I: and in Social terms, what motivated used in most? for example, build new friendships develop and strengthen friendships with others...?

C: yes.

I: Or to reveal your thoughts, feelings or emotions to others?

C: I think it was mainly to interact with other people, besides the person that I already knew, besides developing an old friendship, it was also to interact with other people. and to meet new people, different people, could teach me more about this topic about which I wanted to know more.

I: so it was more to learn more with other people?

C: . yes exactly.

I: well in the end this belongs to the other topic I wanted to talk about, which is the competence mastery. so you ended up learning and gain some kind of feeling of belonging, right?

C: Yes. mainly about the feeling of belonging, because it is so beautiful, it touches you, touches your emotional part and also depart in which you actively learn something, but I think it ends up being difficult not to feel that you belong there, isn't it? or to the Earth, like we are on this site observing the stars and so we feel that we belong to this whole, and also to the group of people who are there.

I: OK and you ended up improving your capacities your abilities and you acquired new capacity right?

C: yes yes. for example now I can distinguish different constellations in the sky.

I: Great, so you learned something! and I don't know if this applies to you but in physical terms did you developed any kind of ability or physical ability... or were you motivated buy any physical component to go to that activity?

C: no. the location was very accessible, no there was not a physical component that had motivated me to go.

I: okay. which factor do you think motivated you the most to go and participate in that activity? was it more intellectual terms, social, stimulus avoidance...

C: I would say it was mainly, the social part. first the social part, and then in second the intellectual, and then third stimulus avoidance.

I: what about satisfaction. you already told me that you have been to other activities... what did you enjoy the most singles activities? what did you like the most in terms of Astro tourism?

C: in first place, learning new things as I go. I mean every time I go to one of these activities I learn something new about the sky and about the constellations, to learn how to distinguish them, and to also learn the way in which the sky is moving in relation to us, in this case what we can see as the sky is moving above us. I think it was one of the things that I liked the most. and also the company because I was always very well the accompanied, and it was always the shared moment among friends.

I: okay, what about psychological terms, did you end up being satisfied because it was interesting for you, it gave you self confidence, was it the sense of accomplishment...?

C: yes without a doubt. mainly the sense of accomplishment. it's hard to be indifferent [to these kinds of things].

I: can you elaborate a bit about that?

C: yes it is completely astonishing. Completely... I think we feel so small when we observe the sky and it is so beautiful that we can spend hours just looking at the sky without having the needs to do something else. Just looking at the sky.

I: . oh I can believe that. What about in educational terms, you've told me that you have learned something new so Indian you are satisfied because you enlarge your knowledge about the things around you right?

C: yes. Exactly about astronomy I learned a lot and that stimulates our curiosity to learn more. so to go to other events like these ones.

I: did it help you to learn more about yourself?

C: Yes, because any of these observations was always in Far Away places far away from my home, so it makes me leave my comfort area my work my home, and somehow it makes me to reflect, to leave behind. my daily routine and I end up seeing my daily routine and my own questions and my personal life from an outside perspective. so it helps, to remove everything that is on my head in order to see these beautiful things with a greater objectivity.

I: in Social terms are you satisfied because you've already told me that you had a good social interaction you have been with other people, with whom you developed a close relationship, so would you like to elaborate a bit more about that?

C: No, any of those times I went there I went with people close to me, so...

I: you are happy with that'

C: Yes.

I: in terms of relaxation, the activity helped you to relax right? as you've said already.

C: yes. and it has contributed a lot for my emotional well-being

I: in physiological term we have already understood, that the physical activity was not a component of this event. what about aesthetic , terms, the activity was realised in a beautiful place obviously, right?

C: exactly it was mainly because it was done in a beautiful place, it was an open site, the landscape around in itself concerning the patrimony is tremendous, in the natural part around, the natural component, is very, very striking, outstanding. So we cannot abstract ourselves from the fact that we are in a place that's was already considered from many years ago. A place where people used to see the stars. A cromlech...

I: Ok, which factor do you think contributed the most to your satisfaction after this activity?

C: Of all of them?

I: yes the psychological one, social, what do you think...?

C: I think it was a psychological one without a doubt.

I: Although the social one also had...

C: yes the social one was very important without a doubt.

I; .. but the psychological..

C: yes the psychological and educational as well but I think the psychological one was the strongest.

I: so you so you could get out of your daily routine to be transported to another place.

C: Yes.

I: would you go back?

C: oh yes of course. without a doubt.

I: would you like to repeat this experience?

C: yes.

I: and other experiences?

C: similar experiences, yes. besides I am going to repeat this experience. . if everything goes well this year

I: Ok. so thank you very much

C: Thank you.

6.8.4 Fabio Carrarro

I: Interviewer (Ana)

F: Interviewee (Fabio)

I: Hi there. Thank you for coming today. Can you just tell me your name and how old are you?

F: My name is Fabio and I will be 32 in October.

I: What is your current occupation?

F: I am in exporter sales manager. My areas of responsibility are the French speaking countries and Eastern Europe.

I: very well. Are you interested in Sciences or in astronomy by any chance?

F: yes but I am quite a random astronomer meaning that I really love this part of the Science Program I had during my school years. I usually read Muse about music coverage and stuff like that but I cannot say that I'm really a specialist about it. It is an interest just an interest, like a hobby. But I never attended any specific courses or stuff like that about astronomy.

I: if you ever participated in any activity related to Astrotourism?

F: I didn't, meaning that they were not specifically planned for Astrotourism. but in a couple of excursions the naturalistic type I did, I had the possibility to watch the sky from interesting places because I was spending time over night in a kind of remote places. Basically I had a possibility to see something that we cannot, normally, we from Western Europe cannot see.

I: Can you tell me more about those events? What did you do?

F: yeah in particular I'm thinking about two excursions I did, one in New Zealand last year and one in Russia 2 years ago. In New Zealand, it was in the Abel Tasman National Park and I was spending the night in a kind of hostel in a boat which is about 40 kilometres from the coast. This natural park is quite far away from any big city, the closest cities are around 60 kilometres and are not really cities because it's like 50000 inhabitants.

I: it's like a village.

F: yes it's kind of a big village. It is considered a city just because in New Zealand this is the average size cities, except for Oakland basically. So there is no light pollution over there and also from the southern hemisphere the view of the skies are completely different.

I: They are.

F: Yeah I had never seen anything like that in Europe. And the Excursion in Russia was...

I: But what did you do in New Zealand? You were saying that you watched the sky?

F: You mean what I was doing during the excursion or specifically about...

I: Yes pacifically about the event when you watched the stars. So you went in that excursion but then what happened, what did you see?

F: So basically this boat where we were sleeping had the upper deck completely open so we were laying there all night, on the deck because of the weather - it was summer - so the weather was warm. There I really understood why the Milky Way it's called like that. The light that all those stars are irradiating in the surrounding area, they really create the way. You can clearly see that in some parts there are no stars at all, but you can see the sky white, because of there are so many stars nearby that they are irradiating even more light than the star by itself. Like we are used to see.

I: what about in Russia? What did you do in Russia?

F: in Russia, I was doing a three-day excursion by kayak at the upper part of the Border River and the closest city was about 2 hours by car so 100 kilometres. So basically during the day we were rowing down the Border and then in the late afternoon, we mounted our tents, and we spent 2 nights on the countryside which in Western Europe, we cannot realize the Russian countryside really means that nobody is living there. It's really just nature. There was a place where I had the clearest view of the sky because for example even from the mountains in Italy you don't have a so clear view of the sky, because of the light pollution. So even if you are around 1500 meters above the sea you still don't have that clear view of the sky like I had in Russia and probably I think the fact that I was in a northern latitude, that also helped. Because that is more North than Moscow. So I was not in the Arctic circle, it was still a little bit far away but not that much.

I: Good amazing still. Right now we're going to pass on to the questions about your motivations to pursue both those events. I'm going to ask you about five main motivational factors. And you are going to tell me if they motivated you somehow or are not applied in this case because...

F: you are listing five motivations, right?

I: yes.

F: I have to answer yes or no?

I: you will explain to me if these motivations apply to you in this case because for instance, there will be a physical motivation, a physical component: for instance you were kayaking so that is a physical motivation to go into astrotourism.

F: I was just asking because... to make it clear, if I had to find those motivations or...

I: No, I'm going to give you [the motivational factors], and you will talk to me about them. So the first motivational factor will be the intellectual one. Would you think that you learned new things about you, you satisfied your curiosity, you learned stuff about yourself and the world outside, did you discover new things, what do you think about the intellectual part of your motivation to watch these events?

F: I have to split it into those two events, right?

I: Sorry?

F: I have to split my answer into these two events.

I: Okay.

F: Yes, about Russian for sure because I was in a group where we were 19 people and I was the only foreigner. So already from the cultural point of view I was surrounded by 18 Russians which only 2 probably spoke English, was already very interesting from the cultural point of view and the language point of view, because at that time I still didn't speak very much Russian, and so it was also one opportunity to practice [the language] 24 hours a day. And also we got some time together all day and the first night was very nice because we were sitting around the fire and we spent the time with jokes or songs. So that was also funny because they were playing Russian songs which I had never heard of, and I was the only one who didn't know them. And also some jokes which are some kind of - I would say they are popular somehow in every country but every country at the same time, make them a little bit about themselves. For example I think in all European countries, there are these jokes about a little kid which is not, let's say...

I: it's little Jack!

F: very responsible.

I: Oh yeah exactly

F: And in Portugal, you have it as well, we have a lot of it in Italy and I realize that this is very popular one in Russia as well. About the one in New Zealand, basically I decided to take that trip alone but then I met some very nice people doing basically the same thing by themselves and for example one part of the excursion was also kayaking. And we were sharing kayaks by groups, by couples, I was sharing mine with a French girl with whom I'm still in contact. We then had the possibility to spend some time in New Zealand a couple of days later. But basically the rest of the excursion, I was doing it by myself so it was also a way to...

I: relax? Mentally maybe?

F: yeah kind of and to concentrate. Yoga for me is not really working because I don't like sitting in one place too much and these kind of things work better for me. Especially when I'm extremely tired I'm kind of more philosophical... So basically I was walking, the first day I was walking and kayaking the whole day and the second day I was walking 25 kilometres mainly on sand...

I: Wow! You developed your physical fitness then!

F: yes you know me I'm always fit.

[Laughs]

I: good. Basically answered three topics of mine so that's good.

F: Oh sorry.

I: No that's good.

F: I hope I didn't make them too much...

I: Oh no don't worry it's good. Would you say that you, in terms of competence mastery...

F: sorry I couldn't hear you in this moment.

I: Sorry? What?

F: The connection was like coming and going so I didn't hear you.

I: okay. In terms of competence mastery, would you say that you felt some kind of feeling of belonging you gained other people's respect, you challenge your abilities or you improved some abilities of yours, when you were doing these activities? In both cases. Even if it's not related to astrotourism, but since you are a casual astrotourist, it happens to actually be kind of connected, don't you think?

F: Well the first one in Russia for sure it was a possibility to connect with the Russian culture for the reasons I was explaining before. If I was the only foreigner and I must say it was a very Russian trip, with everything on sight, very Russian food for instance... So yeah that's was the full immersion in the Russian countryside way of life. About the second one...

I: well you challenge your abilities, didn't you? Eventually?

F: Yes from the physical point of view, yes. But the second one I can say, the star watching activity was a little bit in my plan, it was not the main purpose of that trip but I knew that I could do it. In Russia it was really casual because I didn't think about it but I realized it was also possible. In New Zealand somehow it was part of the program, even if not the main part of the program.

I: So, from these factors which were basically intellectual, to relax physically or mentally, social factors or physical skills, or competence mastery, what do you think motivated you the most to go into these trips? Maybe the social part in Russian...

F: The one in Russia probably yes [the social part]. That and also that I really wanted to see the Russian nature. Because I go there many times for work and of course I always work in the city. So I never had never before the possibility to really see the countryside; I saw some suburbs but the countryside was the first time. So a little bit of nature exploration and social because I knew I was going to spend time just with the Russian people and that was the main purpose. The one in New Zealand yet was a little bit, as I said I was spending it alone so it was a little bit more of exploration...

I: Focus on yourself?

F: Yeah somehow more spiritual. Not from a religious point of view but somehow spiritual.

I: basically to get out of the city and the tension and the stress. That's good.

F: Yes that also because basically I was just leaving my job there and I basically realized one week before the trip that I wouldn't be able to get the working Visa which allowed me to stay longer in the country, so basically I had to take a break also.

I: So basically you're satisfied with both events.

[Skype Bad connection]

I: so you were satisfied with both activities aren't you?

F: Yes sure, 100%.

I: Could you say one thing that you liked the most? Between those two or in both what did you like the most in terms of watching the stars and the Milky Way in terms of the astro[tourism] part?

F: Let's say that the one in Russia was very nice and at that time, it was the best experience I had about star watching in my life because I was never before in such a remote place and so until 2015 that was my best experience about star watching. But it got far...

I: far behind.

F: yeah yeah it's a little bit far behind from the one in New Zealand because the view of the sky over there, it's just overwhelming. It is really overwhelming and when I walked there on the upper deck of the ship after the sunset, I think I could not speak for 2 minutes. I didn't imagine it to be that...

I: amazing, beautiful?

F: yeah amazing. And it was not a full moon night but I think you could walk everywhere because it was like walking on the street with the street lights. It was incredible and then any picture can't even...

I: do justice.

F: I was some pictures about it because of the advertisement of that trip they were putting some pictures to explain to start watching activities but it didn't even get close to the real effect you get by watching with your own eyes.

I: by the way you said you were motivated to do that trip because of the advertisement you saw? Or had it had any influence on your choosing to go to that particular tour?

F: let's say that the advertisement made me choose between different options of that trip because it's a very popular park in New Zealand, it's probably the most famous worldwide, so they are offering very different kinds of trips there, from daily trips to a full week over there with different activities. The advertised help me choosing the right one for me. But I took the decision to go there by myself and then to choose between the seven or eight possibilities they were offering. I used the advertisement to choose from what they were providing.

I: Did you like something less in those activities? What did you like the least? Or no? Were you expecting something...?

F: if I really have to be picky just because I have to answer this question, I would say for the excursion in Russia I had to spend a little bit too much time to get there, but let's say that I already knew because Russia is a Soviet country if you want to one to enjoy the real Russian countryside, you know that you are going to spend hours to go there. So let's say I wouldn't I wouldn't mention that because that was boring but... I know it was going to be like that.

I: No worries. So, in terms of a satisfaction, speaking of psychological satisfaction, would you say that that activity, that event satisfied you? Because it was interesting, it gave you self-confidence, gave you a sense of accomplishment, for instance? What would you say in that area?

F: Yes, I am fully satisfied by both of them both of them achieved the purposes I had to go there. I would say that both of them are even better than I thought them to be. I would go there again anytime.

I: Good, but did you gain some kind of sense of accomplishment? After seeing those... a few minutes ago you were mentioning that, particularly the view from New Zealand, it was the best experience you had in your life right?

F: Both start watching for sure... They are for sure in the top 5.

I: Would you say that you learn something new in terms of Astrotourism not in terms of the new languages you've learned? In terms of astronomy, would you say that you got some kind of knowledge about things around you, like the world and our position in the universe?

F: Yes, the one in New Zealand I realized how tiny the world is. I knew that the stars were a lot and in Russia already I saw they were a lot but it's not even comparable to the quantity I saw in New Zealand and I really didn't thought they were so many. And what I said before as a joke, I really understood why the Milky Way it's called like that. I think in Europe we don't have that possibility because - okay you see one part of the sky, with a bigger concentration of stars but that's it, you see more stars from the part of the sky. The perception of why it is called 'Way', I had it's only a New Zealand.

I: Amazing. in terms of social factors but in terms of satisfaction, you already told me that you had quite a good time with your friends, so you had a lot of social interaction, you met new people so that's good as well.

F: the one in Russia I also went there with a friend and all the other people were just random people, because basically this agency was posting the event on the internet and anybody could join. The biggest group that came there were 5 people, which already knew each other, and most of them were couples, I don't mean couples as boyfriend and girlfriend but maybe two friends or maybe two girlfriends. And there was also people which were coming there by themselves because like I said no one from my friends likes this kind of things, I just came and I didn't know anybody else.

I: In terms of relaxation, you obviously relaxed after those tours, and do you think that you already told me again that you kind of developed your fitness due to kayaking, and I believe the areas where you have been in both New Zealand and Russia, were also very beautiful, interesting and cleaned, weren't they?

F: Yeah, the park it in New Zealand is very well maintained. They have this special stuff that check and clean it all year long, all day long, that's one is very well maintained, from the natural point of view it's just perfect, just to mention you are not allowed to take in anything that you are not going to take out. For example if you get there with a little pack of chips or Pringles and stuff like that they're going to check what you have and if you take it in, you will take it out. For example, just seen a couple of places where you can sleep, there's some containers for garbage, the rest you don't change the environment. They even decided the specific containers to not put the containers for garbage, so you must keep it with you, until those special places which are probably full, on the trail which is almost 60 kilometres long.

I: Okay, so that is good isn't it?

F: The one in Russia basically is the same but not that important just because no one is living there in that part so... the river didn't even pass through very big industrial cities. There's near by the sea the quality of the water is not that good because it's the longest river in Europe, and passes through the most industrialised areas of Russia, but in the upper part where I was kayaking it was still uncontaminated and all the surrounding areas are just bushes and there is no constructions or industries or anything so...

I: Which factor do you think satisfied you the most in both activities? Like psychological part, the educational, relaxation, physiological, so physical, the aesthetics or the social part? You can say some of them.

F: In the first one probably the social one even if it was not my main purpose where I decided to go there, because first I wanted to see the Russian countryside which I was completely satisfied with. But after the experience I would put it in the second place and on the first place the social one because I met very nice people, with which I'm still in contact now even if we met there for the first time, and for example there is this couple that just married before the trip, which invited me for dinner tomorrow night.

I: Good, good!

F: Yeah I made some very good friends over there, even if we see each other twice a year because I am not very often here unfortunately, but we still keep in contact almost every week so for the first part the social part.

I: in general would you go back again?

F: Yes.

I: would you like to do any more activities about astrotourism?

F: Sorry should I answer about the second one?

I: It's okay, but if you want...

F: okay so I just wanted to say that the second one was a little bit a mix of everything. Because I was going there mainly for relaxation and exploring the nature, but then I was very happy about all the other experiences, people I met there so the second one is a little bit... overall experience was very good.

I: Okay. If you could and had the opportunity would you do any more activities about related to Astro tourism?

F: Sure. Just not in Italy because I know they are not going to be that good but if I can find. Something good sure.

I: okay so thank you very much for this. See you.

6.8.5 Frederico Arez

I: Interviewer (Ana)

F: Interviewee (Fred)

I: Hello thank you for coming today. Can you just give me your name and your age first?

F: My name is Fredrico Arez and I'm 25 years old.

I: And what is your present occupation?

F: I am a physics student.

I: so you are interested in science?

F: Exactly.

I: And in astronomy?

F: Yes.

I: Okay and have you ever participated in any activity related to astrotourism?

F: yes I have already participated.

F: In which one?

F: So I've been to Dark Sky Alqueva, I went to one of Nights in the Observatory has a – how they say - as a member of the public... That has a name that I don't remember now... and I've been to some observations on the streets where there was a person with his telescope and I got closer to see what he was doing.

I: And all those activities ended up being on purpose and some not so on purpose, right?

F: yes exactly.

I: So would you say that the motivation to participate in those activities was due to something specific?

F: well mainly curiosity but this curiosity... well if you are curious you are so because of something. You feel the urge to look for it and that makes you want to know something else and, ever since I was a child, I've always wanted to know more about stars and planets. It's something from my childhood basically. Concerning those activities where people were standing outside with their telescopes, I got closer because I wanted to see what they were seeing in the telescope and I was curious so I wanted to satisfy my curiosity, to satisfy my childhood curiosity.

I: And learn about the things around you, right?

F: Yes, and I also wanted to understand them. They would explain and I would see them on that instant and then they would explain to me why did those things happen, so there was this urge of wanting to know more, to increase my knowledge.

I: and in any way did you ended up using your imagination? Earlier you were telling me about that.

F: yes.

I: Did it help to increase that motivation?

F: Yes, I mean I've already organised various activities in the Observatory and many times people have these [predefined] ideas... But, for instance, when you tell someone that has never seen a planet on his life and you tell them 'this is Jupiter'. The first thing they're going to think is the image of Jupiter they've seen online and they think that that will be what they will see through the telescope but then they get to the telescope and they are like "Only this? So small!" And that happened to me as well. The first time I saw Saturn I was expecting to see something that I had saw in a book and then I had the curiosity to know how it was really really really Saturn and then when I saw it, I was amazed "Wow! You can really see the rings!"

I: Ok, and in those activities in terms of stimulus avoidance, you ended up going because you like being alone sometimes, you ended up being relaxed physically or mentally, to relieve stress, any of those activities had that effect on you?

F: It depends. For example, in order for you to learn something, you need to be predisposed to learn. If you are too tired mentally, then you will only going to see and not to satisfy any rational need. And when I was predisposed to learn, then I wanted to learn. I wanted to understand how things worked. But if I'm just there to relax then this starry night is a beautiful thing and very relaxing... There are people who fall asleep.

I: Does it happens to you? Do you feel you relax?

F: Yes, I relax a lot. For example, I go to the mountain very often and... Every year I go to the mountains and something that I really like is going outside laying on a rock, in Penhas Douradas, and just look at the sky and that is really relaxing.

I: So you isolate yourself from the population from the noise?

F: Yes. I go to those activities either to learn more or to relax.

I: Okay, and what about in social terms, did you end up socializing with other people? Do you develop new friendships? Do you reveal your thoughts, emotions or skills?

F: It depends, if it's to relax then it depends on the type of relaxation I want. To really relax then I just go there to observe, not to socialize, just because I want to relax. However, that doesn't prevent that when I'm relaxing there, I'm not meeting someone with whom I like to talk and share some interests, so I don't eliminate the possibility of satisfying my other needs. It may happen that if something new happens and I can relax at the same time, good, or it might happen that even though I go there to relax, I end up not satisfying that need but satisfying other, for example "well I might not have relaxed, but I did this instead, which was also good".

I: So you end up socializing with other people while you are at those activities?

F: Yes, socializing ends up to be something that happens by chance, like "by chance, I socialized". It might not have been the main goal, but it ended up happening and if it has happened, okay in a way I wanted it to happen. Otherwise I go with my mind closed and just want to relax; then I'm just going to see the stars and I will just relax and see the stars.

I: And in those times when you were in the Observatory?

F: In the Observatory, I would go in the NOAL and one of my greatest motivations was to socialize with the monitors, which is the coolest part. Being there and talking to them, having dinner, you tie up things in an instant and then talk all night long. But also, in the NOAL, something that we really like was to share knowledge and to share things with you people that have never seen the planets in their lives and people who didn't even know that that was a planet. In telling them about the constellations and people seeing the constellations is something that's really motivates me, sharing knowledge they don't know.

F: Exactly, so in any of those activities, did it happen that you had any motivation to develop or use your physical skills and abilities, or it never happened? For instance, when you were in the mountain, did it happen by chance you were passing by, in the mountain, you went for a walk and then you saw the stars? In this case, it doesn't apply, so don't worry. What about competence mastery, have you gained a feeling of belonging, being there, right? You ended up gaining others' respect and you can challenge your abilities and being good in showing them... Do you feel any kind of feeling of accomplishment?

F: Yes, and if I learned more than I feel it was worth it. For instance, if they tell me this constellation has this story I would be like "oh I didn't know that!", so I leave the place feeling I know more and I like that.

I: But you will keep that knowledge to other people do you feel good about yourself?

F: Yes, something that I really like is to give a guided tour through the sky and showing people the constellations for instance I usually organized and activity in the mountain...

I: What mountain is that?

F: Serra da Estrela. In Penhas Douradas, there is a hotel where I take my telescope and I go there and make observations when the owner asks me. And the public's reaction is always ["wow"]... I start by doing a guided tour through the sky and speak about the constellations and the stories and everything and how to find Polaris and the amount of people who doesn't know and thinks that Polaris is Vega...

I: Exactly I know! It has happened to me as well, but it was Jupiter!

F: Really? To me...

I: Many people tell me "Polaris is that one!" and I am like "That is Jupiter", "how do you know that?"...

F: I'm like, "so let's start by finding Polaris. So can anyone tell me where it is? Who can tell me where it is and there was this English lady who said "it's this one on top of us" and I was like "No, that is Vega", "oh but I've been told it was the brightest star in the sky". "No, no it's not. Furthermore, Polaris is over there. And there aren't any bright stars over there". And they were like "no there aren't" "so where is it?" and then I would teach them where it is and then they would be amazed... I would show them where it was and how to find Polaris and people would be all radiant and they would start saying "oh North is that way, because Vega is on top of our heads". North is in that direction so when Vega rises, then North would be to East and they would be like "oh yes of course" and then there would be people that didn't know, they hadn't realized, that the sky...

I: Moved?

F: It moved during the night really.

I: Really?

F: Yes. It's not that they are dumb, they just didn't realise... They had never seen it throughout a long period of time and never really thought about it... This seems like they are stupid but it's not that. No, they have never, during their daily lives, thought of this like "let's think about this thing", because during the day people who work in economics, they worry about economics, people who work with first-year students, they worry about first-year students. But when you give them something else to worry about, they start worrying about it.

I: I sometimes find people that cannot identify a constellation in the sky. And I'm like "Ok, but can you link these two points?" "yes" "then link these two points with the other two. Doesn't it make a square somehow?" "oh yes, it does." After a minute or so they're asking me again where the square I've told them about was.

F: Yes.

I: So they cannot identify different shapes in the sky. And at some point, they would be very fascinated by me when I sometimes would draw the constellation and they would say "oh but I can't see a bear over there", "okay of course there is not a real bear there." But...

F: I like to fool around with people with Hercules, I show them Hercules, and I make fun of the Greeks saying they liked to decapitate the constellations, because Hercules doesn't have a head, Perseus doesn't have a head as well, but has Medusa's head by his side. Sagittarius doesn't have a head as well, you see only a triangle but... Orion doesn't have a head as well, you see a little triangle up there. So I make fun and people find it funny... But the amount of things there is to show to the public, when you organize an activity... When I first showed Saturn to this old man, he started to cry because he was a mathematician and he started to cry when he saw the rings and he went to the front of the telescope to see if there was a sticker on it and I was like "no this is really Saturn" and he was like "I can't believe this" and I told him "I'm going to occlude the image and then I would put my hand over the lens and he was like "yeah there is nothing" and then I would say "I'm going to switch the tube" and he was like "no it is really wow beautiful, beautiful, the dynamics of it all!" He found it beautiful for different reasons, in a more mathematics way "wow so amazing the colours!"

I: Okay, so which factor would you say that motivates you the most to go to this activities?

F: Allowing people to see the very beautiful things over there... Watching the sky is something really... People look up, see bright little points and then look down again so... Sometimes they cannot see the beauty because no one has ever taught them how to see it. But if you explain to them, it's the same thing of going to a museum where there are paintings and each artist has its own style, each artist paints in his own way and sometimes you get there and you don't understand them. Why does one paint everything horizontally and not vertically? And sometimes people don't understand, but if there is someone over there that understands the matter and explains everything... Then you start to understand the beauty behind it. So you have people who see the beauty in the sky naturally, and say "wow this is really amazing", and then there's those people who need help to start enjoying it.

I: And you give that help?

F: yes, I do I like giving them that help in order for them to see the sky like I do.

I: You feel good about yourself?

F: Yes. It makes me feel really good.

I: What about satisfaction? You have participated in various activities concerning astrotourism, and in general have you like all those activities or was there something else that you didn't enjoy that much?

F: If there was something that I didn't enjoy as much, it had to do with the organisation of the activity rather than the activity in itself. For instance, back in the observatory, the first observation that I went to, I was a member of the public and I went to two observations that the Observatory does to the general public... And I went to the first one and I saw these [astronomic] objects for the first time and I was like "wow!", and then when I went to the second one, it was the same objects. And I was like "are there only these to see? The exactly same people from the last time are here again, why aren't there any different objects?" So my problem was with the organisation rather than with the activity itself because the first time I went there I really liked to see the objects I saw. But the satisfaction [was] total. I love[d] it.

I: So, it was very interesting to you?

F: Yes, very interesting.

F: Did it give you a sense of confidence, of accomplishment?

F: Yes. I went there and I learned something new.

I: And in educational terms, although you are an astronomer, did it increased your knowledge?

F: Yes even though I am an astronomer, when I am the one to organise the activities, I always learn something new. It's not as if because I am an astronomer I already know everything, no. Sometimes I'm seeing a constellation and I have a doubt about the drawing of the constellation and then I research online what is the total image of the constellation and while I'm seeing that, sometimes I find new things out. For example, there are these stars that if they explode that can kill everyone on Earth and I'm like "so interesting, so funny, I'm so glad with the end of mankind." [laughs]

I: But it still will take a bit to get to us.

F: Yes. And then even as an organizer I like to research about things and learn about those things.

I: And you end up knowing yourself as well?

F: yes.

I: And know your limitations?

F: Yes.

I: And does it give you a will to continue?

F: Yes, exactly, for instance: when it is to explain a theory... I did this activity up there on the mountain, where I had to explain the cycle of life of stars, so I had chosen this nebula, which is called The Swan Nebula, where the stars are formed, and I started by explaining how the stars are born and die, and I got this example of a supernova which is

the Veil Nebula, that you can't see in Lisbon but you can in the mountain... I had to get this filter in order to see the see the Nebula, which is enormous, it has the Moon's size in its whole, but you can only see some parts... And only with the filter, in a night without the Moon, you can barely see some trace elements of the nebula. And then I wanted to explain to everyone and I ended up learning with that, like "I have this discourse, in which I have a whole astronomy book of explanations and I have to compress this into one hour of explanations for these people, in the night, with cold, in the middle of the mountain." So then I understood that my limitations were "how do I make people understand this, without fall asleep or without being too dense for them." So I started with something cool like I gathered them all in the hotel and people were asking if we were going to see the stars and I said "yes". So, I took everyone to this room where I had this projector with the computer and I asked them to sit down. And then I projected the formulas of the star evolution and then I said "here you have it, the starts!" and everyone was like "oh!" [feeling sad]. And I was like "see how beautiful it is! You have all the stars you can imagine right here. Look if we vary the radius, we'll have..." and people were like scared and then I said "I'm joking with you. Let's go outside to the telescope and see the real thing!" and then everyone liked it.

I: So you ended up having a social interaction during all those activities?

F: Yes and I also found out my limitations in terms of effectively explaining things to people, because I needed to explain these things to normal people... I mean I could explain these things to a physicist, but not to people – not with less intelligence, but with less understanding of the field. Less knowledge.

I: And during all those activities were you satisfied with the people that you met, with the people who you have encountered and developed relationships? With the people of those different activities?

F: There was this lady that I will never forget. She was the one who said that Vega was the North Star. At the end of the night, she came to me and said "oh I will never forget this observation, I loved it, and it will be forever in my heart" and that was something that touched me. I was like "this person felt good with something I did, with my work. She felt good."

I: Very well. And in general, did those activities help you to relax? Did they help you to relieve stress and did they contribute to your emotional well-being?

F: Yes.

I: Made you forget the world, the external preoccupations?

F: Yes. Both as an organiser and as a member of the public. As an organizer there is always that stress that I have to organise things, there is that initial stress where I must not forget things to say and I must not forget this example, because it's a good one. But then when I start, it was like a fluid discourse, natural. My mother used to be there, in the first row, she loved it. She would tell me that it went well, that I did good, that I had spoken really well and people had praised me a lot. And as I started to talk, the stress would just be gone, and even after an hour, I would have stayed there continually and that's nice. I ended up saying there half an hour more with some members of the public, who were interested in finding out more and then I would aim the telescope to another object after another like "let's see if we can see a different nebula!" and they would ask me for one more and one more and so on.

I: So cool. And in aesthetic terms, did all those activities satisfy you in terms of beauty? Were the buildings and monuments beautiful?

F: Yes. I went to this Dark Sky Alqueva, it was in the Castle of Morão. Where the telescopes were set inside the castle, and they would turn off the light of the village in front of it during the night, and it was extremely beautiful to see the walls and see the stars disappear behind them, and then Hugo Martins who took a picture where you see the Milky Way right on top of one of the castle towers and I was like "amazing wow! This is really beautiful".

I: Did you enjoy being at Alqueva?

F: Yes. I liked it very much.

I: What did you like the most?

F: I liked the place the most. I think that making the observations in the castle, although there is not a good visibility to see the objects near the horizon, it was compensated by the beauty of the place itself. And the thought that centuries ago, there were people in those walls and they were seeing a better sky than ours, but they were seeing this same thing. And for instant, in the mountain, which is a natural landscape, it's something truly amazing.

I: Something that I have forgotten to ask. You told me that this is a childhood passion. What did it make you follow the field of astronomy? To study this?

F: I've always liked physics a lot. When I went to agronomy first, I was the best student at the module of physics. Everyone was getting average grades and I would give them explanations and encourage them to have higher grades. I would explain everything to them and I liked doing that, I liked to explain how things work. And so, when I was in the middle of my course I thought to myself "I like Agronomy, but that module of physics, even though it was just mechanics, I want to know more. What about electromagnetic and thermodynamics and quantic mechanics? Well quantic mechanics is complicated, but is really cool." So it was the urge to know how the universe works, from its smallest thing to the biggest thing people can imagine; because I work as a physicist and I can explain a bit of everything, from the smallest things that the chemists study to the biggest thing that people's imagination can achieve. It was that what made me go to physics.

I: And all these activities, you go because you like them, because it has some kind of interest?

F: Yes, without a doubt.

I: Very well. So which factor do you think contributed the most to your satisfaction after these activities? Maybe the psychological, relaxation or social?

F: Can you repeat the question please.

I: Which factor do you think contributed the most to your satisfaction in general?

F: To share my knowledge, and while I was sharing my knowledge, I also felt relaxed so I ended up relaxed by sharing my knowledge. I mean in the mountain during those observations I was not tired by the end of it, because I would relax...

I: Because you were doing something that you like.

F: Yes I was relaxed.

6.8.6 Gonçalo Dias

I: Interviewer (Ana)

G: Interviewee (Gonçalo)

I: thank you for coming today you can start by telling me your name and age please?

G: Gonçalo Dias. Does it need to be the full name?

I: no.

G: 25.

I: and what is your current occupation?

G: I'm finishing my Master's dissertation in environmental and energy Engineering.

I: so we may say that you are interested in Sciences?

G: yes. I have always had some interest in sciences, ever since I was small.

I: and are you interested in astronomy?

G: yes. it is not my field of knowledge that I focus myself the most but it's something that is very much related with which I study. For instance, solar energy is directly related to that.

I: okay. and if you were before dissipated in any activity related to Astro tourism?

G: yes I have been to Observatories, I have participated in some activities... for example observing eclipses, and something like that.

I: and have you ever participated in an activity that was most important?

G: we can say they are old days on my curiosity rather than in its relevance. I try... I always give more importance to things that are related to my future and my curiosity is limited to the observation and to question things in itself... Not exactly... there is not exactly an event that was that special...

I: but earlier you were telling me an event that you have witnessed right?

G: yes.

I: and tell me more about that event. Tell me more about what you saw.

G: how should I consider this an event? Besides all those eclipses and observing the constellations, etc. I would say that if you go to Norway there is always this factor of being in a place where you can see the sun at midnight ... which is something that for someone who doesn't live in a latitude higher than Arctic Circle is very interesting... and I think it's something that influences the culture of the country itself, I better understood the culture of the Scandinavian countries and as such I give much importance to those events and to the way how they [Scandinavians] relate themselves to the astronomic events...

I: so you saw Auroras and the Midnight Sun, right?

G: I wasn't lucky enough to be there at that time of the year, but I would like to.

I: so you only saw aurora borealis, right?

G: yes.

I: and let's talk about motivation. Was that an event that happened by chance or was it on purpose?

G: I can't hear you.

I: what about now, can you hear me?

G: yes... it was the bit by chance, but also one of the main motives that drove me to visit that place.

I: what happened for you to see the Auroras? Describe me what happened.

G: I follow web pages on Facebook that send you notifications of when auroras happen, and basically I just got out of the house multiple times until I saw one.

I: Good one. And in intellectual terms. Do you think that the fact that you saw those Auroras, made you learn about things around you, did it satisfy your curiosity, you explored new ideas, you expanded your horizons, what can you tell me about the intellectual motivation that drove you to see the auroras... or all that context.

G: I would say that's my necessity of understanding the natural phenomena drove me to observe the Aurora Borealis. It has awakened within me... the fact that I observed them, awoke in me the need of reading more about the issue and the process through which they occur. I wouldn't say that I am an expert in the matter just yet, but maybe I am slightly more enlightened now.

I: so you've learned more things... anyway in terms of stimulus avoidance, did you want to witness that event because you like being alone, you wanted to relax physically or mentally, to avoid the stress and tension of daily life...

G: yes I would say for all the reasons you mentioned. Liking to be alone sometimes... For example some of the Auroras I saw happened when I decided to go for a stroll alone, just to relieve a bit of stress and of the University.

I: you well deserve it.

G: I would say that besides considering it's beautiful, there is also the distraction component and entertainment.

I: so it was a moment that you took to be alone by yourself?

G: yes I would say so.

I: so is social component does not apply here, right because you weren't with anyone, so you could not developed any type of new friendships or get to know new people...

G: no. I didn't make new friendships. I could have been with people, but I ended up being with them another times. My friends from there were all occupied with something else. Auroras have not been a novelty from them for a long time now.

I: I believe that. What about competence mastery. Would you say that you gave some kind of feeling of belonging, you've gained others' respect you challenge your abilities somehow? if you improved your skills? In terms of motivation, you wanted to do that...

G: I would say that in terms of developing skills, not so much. Maybe I have some knowledge about which I can turn into a simple conversation that I didn't have before. It ends up being a conversation topic, which may catch the attention of others who have shared the same situation. But I wouldn't say that there was some kind of intention in terms of knowledge or development of any capacity...

I: , but for example you were telling me that somehow you made some research about the issue right?

G: yes exactly. Yes I did mention that. But it ends up being something more like trivia. Normally I would give more relevance being an expert in the field. Since I do not consider myself that... I would have to develop my abilities far better.

I: In terms of physical skills... I think that this does not apply, your motivation was to relax not to develop your physical skills...

G: yes. It is not directly related to it but I ended up going out and walk a bit.

I: Exactly.

G: I should have done that without the Aurora, although there was the extra stimulus of its appearance. Maybe if it was in a day that I wouldn't leave the house... but I left the house and I saw an aurora borealis.

I: in what which factor do you think motivated you the most to witness that event? Was perhaps intellectual stimulus avoidance social or competence mastery?

G: stimulus avoidance, I would say.

I: and so we move to the satisfaction part. You ready told me that you have been to various activities and in general you are satisfied with those activities right?

G: yes. I would only point out the problem of being in an area with lots of artificial light, which sometimes makes it difficult, but besides that I am very satisfied. If I had a means of transportation to go to the middle of the forest it would be much better. It was the place with the best visibility.

I: exactly so what do you like the least was the fact of light pollution right? And can you tell me what you like the most?

G: yes... I liked... I think I liked the most the fact that I experienced something that, during many years, I have never believed to be possible, which was being in Norway, seeing Aurora Borealis. And I think that my satisfaction is due to the beauty of the moment and what took me there. What I like the most was definitely looking at the sky and seeing everything happening. And it was not in a video. Being there, seeing that happening, in that place...

I: so you felt the impact of the moment.

G: exactly. I think that that has a lot to do with stimulus avoidance I guess...

I: What about in terms of psychological satisfaction. We can say that it was interesting for you and have given you a sense of accomplishment somehow?

G: yes. I would say it ends up being like a dream come true.

I: of course that is very good.

G: and in psychological terms, it is motivator because it gives you the notion of what we cannot accomplish in our lives... Because the fact that we are born in this place or with more or less money that we cannot go to other countries and see beautiful things.

I: what about the educational satisfaction? It gave you more knowledge about things around you, it gave you opportunities to try new things and to learn more about yourself?

G: I would say so. I would not say that I learned a lot about myself, but it has increase my knowledge concerning the phenomenon, and also to the way how the people in the country see that and what they think about it.

I: interesting. Because they are tired of seeing Auroras, right?

G: it's not just the fact that they are tired of it... of course they... although it is something frequent in their daily lives, they can appreciate it as well. It is not for nothing that they say they are cold, what there is, is lesser clothes. You just need to dress more clothes. The cold doesn't exist.

I: exactly.

G: they really appreciate their country.

I: so in Social satisfaction it doesn't apply here because again it was an event that you witnessed alone right?

G: Yes.

I: and in terms of relaxation, the event helped you to relax, you relieved stress... if it contributed to your emotional well-being?

G: I would say so. Especially in the time when it happened.

I: really?

G: yes it was really relaxing.

I: good then. That is what matters. What do you want to elaborate a bit more about that?

G: I would say that there is not a very proper reason, besides doing something that I like that distracts me of the daily life problems. It is just because of that. It didn't solve anything. When I got home the problems were still there.

I: exactly the thesis.

G: and the rest.

I: yes and the rest. So into the physiological terms it doesn't apply as well. You didn't have any physical motivation. And in Aesthetics terms, the place where you were was interesting beautiful what can you tell me about that? Are you satisfied with the place where you were observing the Auroras?

G: yes except the light pollution I would say it is one of the cities in the world that I enjoy the most... due to the almost total absence of buildings. And the fact that everyone has its own garden and everything is very green I think it's very beautiful.

I: in what tractor do you think contributed the most to your satisfaction after these activity? Psychological, educational, relaxation or Aesthetics?

G: I would say relaxation.

I: so it was an event very important do you, not only because of your passion for Norway but also for the event itself?

G: yes without a doubt. I would say that today I am someone happier because I saw that. And without a doubt it's something that makes me look at the past at an assignment that didn't go that well and thinking that it was still worth it having gone to Norway.

I: Okay very well. So would you like to go back? Would you do the same experience again?

G: yes I'm still learning Norwegian to go back again

I: great that's a good motivation. And have you mentioned it to vent to someone else? Have you publicized it somehow?

G: yes I shared it on Facebook and people from my family saw it and liked it and commented on it.

I: did they say that would like to do it themselves?

G: I would say it wouldn't be the first thing that they would consider to do because they do not usually fly abroad, but... if they had the possibility and availability, why not?

I: okay so thank you very much for coming and see next time.

6.8.7 Lourenço Branco

I: Interviewer (Ana)

L: Interviewee (Lourenço)

I: thank you very much for coming today. Can you tell me your name and your age?

L: Lourenço Branco. 22 years old.

I: You need to talk louder. And what do you do right now? What is your current occupation?

L: At this moment I'm a student of architecture, where I'm doing my final year of the master's degree.

I: and are you interested in Sciences?

L: yes I am.

I: and in astronomy?

L: Yes, very much.

I: if you ever participated in any activity related to astrotourism?

L: with Astrotourism unfortunately no. I would love that, but I still haven't had the chance. Because of timing issues and I also don't know where to get information about that. But no, not yet.

I: but you had already some kind of connection to Astrotourism right? Or with the astronomy field?

L: yes yes.

I: what did you do?

L: for astronomy, when I can, I have a telescope at home and every time I can I try to do some kind of observations. I look at the Moon or to one star or another, and when I can get it a planet or other. But it also depends on the telescope and... I don't have that much experience, but when I can, I do it.

I: And so you are interested in another type of astrotourism that you were telling me earlier, isn't it? Astrophotography?

L: Yes, correct.

I: you want to elaborate on that?

L: yes I really like astrophotography. It fascinates me, the photographs that I see online from the universe. I saw this picture of the Milky Way and living where I live, it doesn't have the same opportunity. Something that in the old days it would be common, something that is common to see in the sky, I can't see it now. So I have never truly seen the Milky Way in its pure state because I'm always surrounded by light pollution. And that is something that fascinates me in astrophotography because I think I can - if I edit the picture - I can see and reveal that secret and I'm talking about the Stars...

I: And what would you say that was your main motivation to participate in a astrotourism, sorry in astrophotography?

L: Above all to run away of the civilization because I have to escape the light pollution, but above all in order for me to be with myself and look at the sky.

I: so that ends up being part of stimulus avoidance right? Where you like to be alone to run away...

L: I wouldn't say alone because I can be with a friend who also is interested in the field, but that's it. The main goal is to escape that...

I: daily life stress?

L: exactly. And to focus on myself... on the night sky.

I: and in order to relax psychologically as well?

L: of course.

I: what about intellectual terms? You like to learn more about that... I mean what also drives you to participate in astrophotography ends up being for you as well, to learn about things around you?

L: of course.

I: and to satisfy your curiosity, to explore new ideas...

L: yes because I need to understand what I am photographing. And also to understand why what appeared in my photo is like that... The moon phases, the example I gave you earlier about the movement of the stars, why did that happen, if I catch the comet passing...

I: so in order to learn about new things?

L: exactly.

I: and for instance, in Social terms. Somehow are you motivated by astrophotography to build new friendships with others, to interact with others who like the same thing...

L: initially that is not the main goal, fortunately now I have this friend who is helping me with astrophotography, and we have shared good moments together because... first of all he gives me a ride, he is my ride and I am just the photographer, but it's good because he is also interested... He serves as well as a model for my photographs, and something that I really enjoyed learning with astrophotography was to do the light rails, the light paintings, which happened out of the nowhere. We were doing a long exposure photo, and he showed me this lamp, his mobile flashlight, and we understood that that's was how it was done. "Let's do a drawing or two..." and it was funny that now it's something that we share between the two, every time we take a photo, we do a light painting.

I: very well. What about competence mystery. Do you end up challenging your ability right?

L: very much. you're talking with a person that, in November, had never had any experience with photograph, because I had never had a camera before, and now I believe that, since then, it has being a major leap to understand how a Canon or Nikon, all those cameras [work].

I: so you end up improving your skills.

L: yes very much. Truly understand how you take a photograph and all the work after it. It is not just taking the photograph, it is also the post-production. Like I have told you before, we have to edit all the photographs in order to highlight the most important elements, and with that I also learned a lot... how to work with the software and other things.

I: somehow did your activities with astrotourism had any physical motivation? Or it doesn't apply?

L: can you be more specific please?

I: if you develop any kind of physical ability? If any physical motivation drove you to do astrophotography?

L: physical components? No.

I: and what factor do you think motivated you the most to participate... to engage in astrophotography? Would you say it was an intellectual factor, stimulus avoidance, and social or competence mastery?

L: I think I would say stimulus avoidance of course, and maybe intellectual. To actually understand...

I: what is the universe?

L: yes a bit. It is easier to say that way.

I: but you can talk about it. There is no problem. What about satisfaction. Earlier you were telling me you have not participate in any other activities, but you would like to...

L: does the planetarium count?

I: yes, in the end it does.

L: then yes I have been to one. They have these lectures, and also the night sky spectacle in the dome, and also do the astronomical observations after it. If it counts...

I: Yes, sure. And between going to the Planetarium and after photography, what did you like the most?

L: they are different things. Because going to the Planetarium, I had there someone giving the lecture who understood about the issue, so he already has a more scientific opinion and more elaborated about the topic that drove me there... Whereas in astrophotography, I am by myself. It's me based on the knowledge I have who judges what I am observing and what I am photographing.

I: And was there anything that you least liked? Or you like the least? In both activities?

L: In Astrophotography, the factor that I like the least is working on the photographs. The patience, the dedication, the hours it takes waiting for the camera to take the damn picture that sometimes doesn't even come out as you wanted... For example, it just takes a mere movement of the camera while it is doing the exposure and there it goes hours of work... If you're trying to do the perfect photography of the same place to get one single star and you move the camera once, you waste hours of work. And that is... it takes patience.

I: yes I can believe it. But in general you are satisfied?

L: yes I am. I really like it, and I am improving step by step and I hope to get better, and to take good pictures in the future.

I: so basically in psychological terms, you have already told me that is interesting to yourself and gives you a sense of accomplishment.

L: Yes exactly. Something that among my friends I am the only one who does this, and it gives me great satisfaction.

I: and self-confidence right? A sense of accomplishment, and you end up feeling good because you are learning new things...

L: exactly.

I: and feeling good because you are the only one among on your friends who knows about this.

L: exactly. People around me do not have this interest.

I: But it's always good... And in educational terms, you have already mentioned that you increase your knowledge about things around you and it gives you opportunity to try new things right?

L: Umh-umh [Yes].

I: Have you learned more about yourself?

L: that I am committed... when I really want to learn something, I commit myself to it, and I think that patience and dedication prove their worth. It's more like when I get my mind into something I don't quit.

I: and in Social terms, already told me that you have your friend's help. And you end up developing a good relationship with him right?

L: yes.

I: if you've known him for a long time now?

L: yes yes we are childhood friends. We grew up together, our parents are friends, we were together in the same High School...

I: and have you ever met new people?

L: that like the same thing? No. I knew others that's like photography, but it's a different type of photography, portraits, and landscapes... not in the area of astrophotography. No.

I: what about relaxation. The activity, astrophotography, somehow helps you to relax to relieve stress?

L: completely.

I: ... and your well-being?

L: yes. Completely. I'm very calm looking at the sky, and you observe the sky. Of course you're taking a photograph, it's without a doubt to observe something that in the daily life you do not have time, or you take it for granted, and it's in those moments that you understand what you have been losing...

I: In physiological terms, we already saw that it doesn't apply, what about aesthetics? Where you go take those photographs the places are really pretty, interesting?

L: yes. the only thing is that my astrophotography is still... the places where I have been to are a little bit limited, they are almost the same, it's here in the area of Sintra, of course I always get the light pollution from Lisbon, or Cascais, or even the Cape of Roca, I get some light pollution, but in itself it has been on the road... In the future I want to go to this place called Dark Sky Reserve of Alqueva, in order to run away from the light pollution, and take really good photographs.

I: good.

L: but I have already taken some when I was in Azores. I had the opportunity I was in this dark location, during the night there was no Moon...

I: so you run away from the light pollution?

L: exactly. That is the main goal. Of course the... There is people... and I have seen some tutorials about photographs with the light pollution, but it is not the same thing... Because you will need to wait for the post production in order for the Photoshop to give you the final [photograph], and when you are there taking the photograph you are not seeing what the camera shows you. So when you run away from all that, you see the Milky Way, a planet, any astronomical event that you may want to observe, and there you can record what you are seeing.

I: And which factor do you think contributed the most to your satisfaction after the various astrophotographies? Would you say that it was more psychological, educational, relaxation, aesthetics or social?

L: I think it's the psychological part without a doubt, I have that feeling of accomplishment, that I committed myself and I did it, and the results are good. I would also say educational of course because I like it. I like that and I like to understand what happens around me, and the other one would be relaxation. Without a doubt. because like I told you I don't know many people who are interested in astrophotography and when it's me doing with my friends, we run away from everyone and we go to this place where it's just us looking at the sky.

I: so it is an activity that you will continue doing?

L: yes, without a doubt.

I: would you like to pass the message onto others, in order for them to start doing astrophotography? Is it worth it?

L: Yes of course. But it also has its limitations, because you have to have the equipment, and everything like that... and it's not everyone that can start, the equipment is expensive and, of course, I wouldn't recommend it to impatient people, because not only does it depend on your dedication, but also on the weather conditions, if it's raining... for instance, when it's full Moon, you can take a good picture to the Moon, when there is much humidity in the sky is not recommended, because like you said earlier, the atmosphere full of humidity diverts the image... It shakes a little bit... It's what I say, I recommend of course, but without a doubt you need to like doing it, and you need to have the notion that you are committing to something...

I: Okay thank you very much for coming. L: You are welcome.

6.8.8 Maja Nielsen

I: Interviewer (Ana)

M: Interviewee (Maja)

I: So thank you very much for being here today. So just say your name and present occupation...

M: My name is Maja and I'm currently studying for my Tourism Master's degree, working on my thesis...

I: Good, good. Are you in any way interested in Sciences, mainly in astronomy or something?

M: Oh, a bit. I'm a bit fascinated by it. But I've never really had like a scientific inclination, if you can say so, I... My talents have never been in that area so... And I haven't explored that much, but I think it's a fascinating field, and I wish I could understand more, but I just don't!

I: Ok, Ok! And have you ever participated in any activity related to astronomy, some kind of touristic experience within that field?

M: I was in the US when I was, I think, fifteen or sixteen, and I went to visit the Kennedy Space Centre with my family.

I: Great, great. Can you tell me why you participated? Why did you go there?

M: I think it was mainly because of my dad and my dad's father-in-law... They were very interested in space travel and... and all these things so they just said that when we'd land in Orlando, we... "This is just a must, we need to go there" So we just went.

I: So it was not your main goal to go there, it happened by chance? More or less? But eventually became part of your trip, right?

M: Yeah, to me, it happened by chance. But I'm sure my dad and his father-in-law had it planned out from the beginning.

I: Okay, okay, that's good. I should interview your dad as well.

M: I can give you his number.

I: So, in terms of motivations to go there... I'm going to give you five main motivational factors...

(INCOMING CALL)

I: So, in terms of motivations, I'm going to talk to you about five main factors that might have contributed to your motivation in the visit. So, speaking about intellectual factors, would you say that that activity helped you to learn about things around you, satisfied your curiosity, discovered new things, being creative, use your imagination... what intellectually has that activity done to motivate you to go?

M: When I found out we were going there, I got excited because, as I said, I'm fascinated about all that field of science, and wished to know more about it... it was the kind of course I was interested in... in seeing all these space shuttles they had in display, some

of the space ships... and also while there, we went to this advantage point, a viewing sight where you could go up and have an extremely tall tower and could see where they actually launched some spaceships for the all... area cleared out. Like an arrow saying "that way to the spaceships". I thought of that insanely interesting.

I: So basically, you've learned new things and eventually you satisfied your curiosity and expanded your knowledge.

M: Yeah, I did.

I: What about stimulus avoidance: do you think that you were motivated to go to that visit, to that space centre, to kind of relax physically or mentally, to rest, or because you wanted to relieve some kind of tension? You were in holidays, right? In terms of stimulus avoidance, what do you think about that?

M: It was a holiday, but we had a very tight schedule, we ended out seeing something almost every day, so... I wouldn't say I was relaxed or felt I could rest there or have a physical or mental... rest, because I was actually extremely tired by that point during the trip, but that didn't seemed like a factor at the time... It was all about taking in all these new experiences, and I could rest later on.

I: Ok. What about social factors? Did you interacted with others, you built friendships, you met new people, how was it about your social life in that period?

M: We really didn't meet any new people and I didn't really formed new friendships, but as I said we were there on a family trip, with my younger brother, he's 5, my dad, his wife's parents, so I guess I formed a closer relationship, especially with my dad wife's parents... Also getting these experiences with my dad and my younger brother... And now we have all these experiences we can talk about...

I: Yes, that's really good. What about competence mastery? Do you think you've gained some kind of a feeling of belonging, gained other's respect, you challenged your abilities, or improved your skills and abilities, you were active. You can be honest, no worries. I'm just trying to see if all these factors fit in your activity.

M: Well, I certainly feel like I've gained some kind of respect afterwards because I can say to other people that I've actually been to Kennedy Space Center, and I don't really know anyone else who's been there... So people generally are "Oh really? How was that?" and so I guess I feel a bit special, if you can say that... I don't really learned a new skill, but I learned a few facts about space travel and got a new perspective on that... Before that my idea of space travel and all that seemed foreign to me, like... I know we, as human kind, have been to space a few times, but it didn't occur to me how we actually got there... And that people have been to space in these...

I: Shuttles...

M: Yeah, exactly.

I: That's good it gave you a new perspective. Physical skills, do you think you've used many of your physical skills, or abilities, did you developed it? If it doesn't apply, it doesn't. Don't worry.

M: Well, I got very much into walking. We walked so, so much! I felt like my endurance for waling really skyrocketed.

I: Ok, no worries. So what factor do you think motivated you the most to engage in this particular activity? Would you say it was the intellectual factor, the stimulus avoidance, the social, or competence mastery?

M: I feel... definitely the first you mentioned...

I: Intellectual.

M: And then also social one. Both because I really liked gained new knowledge and learn new things and I things every time you encounter something new, you should invest your time in it and get the most out of it... Because you might not go back there... And for the social part, because I love spending time specially with my dad and having this experience with him, and seeing him being really excited about something and then engage in that situation...

I: Ok. Good. You were satisfied with your activity, right?

M: Very much, yes.

I: Ok. In total, have you ever done any other activities of this sort, about astrotourism? Have you ever gone for stargazing or to an observatory?

M: I've been to an observatory or something like...

I: A planetarium?

M: Yeah! The one in Copenhagen. When you start you go into this really big room and you almost lie down on the chair and then you see an image of the night sky and they point out all the different star constellations... I've been there and... but I don't know if I'd call that tourism, but I've been several times, when there's an eclipse... with my family, we go outside and see that with those ridiculous glasses, I've done that a few times... I think that's about it that I've experienced.

I: But still if you've been to Copenhagen to a Planetarium, I mean you live in Aalborg so, that's still more than one hundred kilometres away so that would be considered tourism. In terms of the Kennedy Space Center, and these other activities you've mentioned, what did you like the most in those activities?

M: I definitely think that Kennedy Space Center stands out because it was in the US, I mean that's pretty far from Denmark, so I don't expect that perhaps I'll get the chance to go there again so... But also I very clearly remember the time when I went to the Planetarium. Because it was... There was something about laying down in those chairs and see the constellations. That seemed kind of surreal, I don't know how to explain it.

I: For instance, about the Kennedy Space Center, you were mentioning earlier that you enjoyed having a good time with your family, so would you say that was the main factor that satisfied you the most?

M: I think it has a lot to do with... I also enjoyed the whole learning experience and the experience of being there. But I think it was the people that I went with had a lot to do to do with my [experience]. When I look back now, with my [indecipherable] with the whole experience...

I: Good, good. Can you recall anything that you were not that satisfied with? What did you least liked?

M: There was this... not a rollercoaster, but you could get into this space shuttle thing and they would simulate when the space ship went to...

I: the space?

M: (...) was fired out of the... And that was it... I remember being kind of frightened about that. I thought it was just too much like... with my senses and the sounds and the movements and everything... But otherwise, there wasn't really anything that I disliked.

I: Okay. Good. In terms of psychological satisfaction, would you say that that experience to the Kennedy Space Center was interesting, gave you a sense of self-confidence somehow, gave you a sense of accomplishment, or made you use different skills and abilities? Were you satisfied with this part of the psychological effect?

M: I think I've gained some confidence from that visit, perhaps in a bit of... – I don't know if you can say it – in a surprising way, because as I mentioned I was around 15 or 16, so I wasn't really that used to speaking in English outside the classroom, so I've gained more confidence being in the US and speaking English with these Americans and... Just a small thing as realising that I could go to this cafeteria and order a coke by myself and they actually understood me. I think that gave me some sort of confidence in my languages skills...

I: What about the educational factor, did you learn new things about the things around yourself, it gave you opportunities to try new things or helped you to learn about yourself and other people?

M: Yeah, it did. As I mentioned with that simulation thing, I learned that I'm not cut out to be an astronaut, because I just freaked out... And then also all the different things you pick up during such a trip of how... how different space shuttles actually look, because when you see them on television, they seem pretty small, and then when you get there, it feels an entire hangar and it's just enormous.

I: So you were more aware of what all that universe was?

M: Yeah.

I: What about your social satisfaction, would you say that, of course you've already told me that you've interacted with others throughout the activity and that you were able to develop close relationships even though you didn't meet anyone new, but still you associate with that same people in other times... Did you feel relaxed after your visit? Was it helpful to relax, did it contributed to your emotional well-being or some sort?

M: I don't really remember. I remember that, as I said, we were on a new activity everyday so... Every night we'd got home from [out] and I was just extremely tired, and just like my whole body just felt sore. So irony is that I went to a holiday and when I got home I felt like I needed a holiday.

I: But still, it was good to escape from your present world?

M: Oh yeah.

I: Did you forget about some stuff and then engaged in a whole new universe?

M: Yeah, because it was just... the activity was just so time consuming and so on, and you, for instance, had some problems or some things back home, it didn't make sense to

bring them there. It was like “now you’re here, now you have this amazing opportunity to experience this place, let’s take care of all the other stuff later”. So...

I: In terms of physiological factors, I mean you’ve already told me that the activity was a bit tiresome and time consuming and you always felt a bit tired. What about the aesthetics? Did you like what you saw? Was it beautiful, interesting, you were satisfied with all those... places, props, the shuttles?

M: I wouldn’t call it beautiful, but everything single piece of equipment they had on display, it all seemed to serve a purpose, they had a lot of things on display and you could see an amazing amount of things... so, I really think that they did a great job at actually showing you all these different kinds of stuff. For instance, (...) need to build a space ship, how does a space ship look like, and all those different things... My dad has a picture of me and my brother sitting on this... on the top of a rocket, a space ship, and on the chairs lying down... and all that feeling of what it meant and... And also the size of all that! I was really impressed by the size of all those things, because they’re just enormous...

I: Oh I can imagine! So, in terms of satisfaction, which factor do you think contributed the most to your average satisfaction? The psychological factors, educational, social, relaxation aesthetics, physiological...

M: I really think the aesthetics of it, I really think that if they didn’t have all these things on display and if it wasn’t possible to get in to it, just the top compartment to actually feel like what it’s like to seat in those chairs and so on... If they didn’t have those things I fear that being there would might be like those “Uh, ok, let’s move on. Let’s go to the next thing”. But they had all these things on display and you got to interact with them in a way. It made it all stand out.

I: So, besides the social part, also the greatness of the place, and the physical interaction, right?

M: Yeah.

I: Ok, very well. Would you say that, if you could you would go back again? Would you return?

M: If I went to the US again... It depends on with whom I’m going with, if I’m going with my boyfriend, for instance, or with my family, the children... Then I would definitely see me going there and showing “See where mommy has been?” Like showing it off to other people, because I really had a great experience there. In that case, I could see myself going, but if it was just myself, I might not. Probably won’t.

I: Would you engage in another type of astrotourism-related activity, for instance, would you go and see an aurora, or would you go and look for some kind of eclipse, total eclipse view, or would you go chasing planets and stars?

M: I’ve seen this tourism programmes in Denmark, called the ***, the biggest where this host goes all around the world and explores the biggest and wildest examples of different things, and he went to this place in northern Finland where they have this hotel with igloos.

I: Oh, yeah, I know.

M: You can rent them... they have a glass ceiling where you can lay in your bed and see the northern lights or something, I would love to go there. I would love to see the northern lights so... Especially those igloos things. I was really taken aback by the sight of it all.

I: Well, I think it's all. Thank you very much for participating.

M: You're welcome.

I: Thank you!

(25:44:03)

6.8.9 Tomás Pereira

I: Interviewer (Ana)

T: Interviewee (Tomás)

I: Thank you very much for coming, before anything can you tell me your name and age?

T: Tomás Gomes Pereira, 24 years old.

I: And what is your current occupation?

T: I'm an accessibility technician.

I: Are you interested in science and astronomy?

T: Yes. Very much

I: In any field in particular or...? In general?

T: In general.

I: and if you ever participated in any activity related to Astrotourism?

T: an activity per se no, but in a social gathering that by chance that [astrotourism] was one of the components, yes.

I: what activity was that?

T: we went to the Cromlech of Xerez to observe the constellations and the stars.

I: what was the main objective? I mean, you went there by purpose or it happened by chance?

T: we went due to a recommendation of a girl in the group that had already been there to observe the stars. And we agreed that that would be a great opportunity to also look inside ourselves and contemplate ourselves, and to see something different which not everyone looks for. Meaning that it ended up being a planned incident, but which made the whole trip be worth it.

I: And what would you say, in terms of motivational factors... What motivated you the most in intellectual terms? I mean you ended up learning more about the things around you, you satisfied your...

T: yes. I think it is very important for us, not only to study where we are, but also where we are. And we cannot forget that we are in this space with billions of constellations, and it is important for us to understand the outer space around us. As much observations we make towards outside our sphere, we end up learning always a bit more. The biggest motivation of course was social because I was with a group of friends. However, the motivation of going and learn about something exterior to your sphere, was something that makes you grow, to get to know yourself out of a social sphere.

I: what about stimulus avoidance. Would you say that you went there also to relax physically and mentally? To be alone to avoid the stress of the daily activities? What drove you there?

T: Every day we are exposed to really high stress levels, tremendous... and it is even more important to value the break in which "everything is over and you can relax. Let's contemplate the landscape, let's contemplate everything that it's worth it."

I: and you already told me that you were motivated to go to that activity because of its social component.

T: Yes.

I: you ended up building and fortifying relationships with others?

T: they were already well developed, we may have consolidated them more, because it is an experience in which you can look at the past and see that while we were all together. Even today when we see something about Astrotourism, we send that post to each other, since it has proven to be something that fortified our relationship, our experiences.

I: and in terms of competence mastery, would you say that you ended up gaining some kind of feeling of belonging others' respect, you challenged your abilities while you were there?

T: to defy ability per se, not really. I think you end up improving yourself and feel that feeling of belonging as a human being. You expand a lot your knowledge network. Also the feeling of belonging was very important.

I: Would you say that one of the motivations that took you there were physical?

T: no, absolutely not.

I: and which factor do you think motivated you the most to go to that activity? Intellectual, social...

T: Social.

I: in terms of satisfaction, you have already been to other activities like this one?

T: no, I had never been. It was the first time I went, and I think it has marked me a lot. It gave me such a great feeling of contemplation and belonging, you ended up wanting more and more.

I: So you are satisfied with the activity?

T: Yes.

I: could you tell me something that you liked the most in that activity?

T: Unity.

I: between the people?

T: no, between you and the other element.

I: between you and the universe?

T: yes, in this case yes. Between you and universe.

I: something that you liked the least?

T: (private joke) the thing I liked the least... The fact that, damn how is it called, the cromlech is not in its original place. I think it would be even more interesting to contemplate the cromlech in its original place.

I: and so in terms of satisfaction, psychological satisfaction, was it interesting for you, has it given you self-confidence, a sense of accomplishment...?

T: no. it was without a doubt interesting, self-confidence no, because I think... it doesn't apply at all. It may move you, the fact that you are observing the universe but after I think it will go through very concrete psychological terms... such as state of mind, so I think it didn't... It would depend on your mental state at that moment. But a sense of accomplishment yes, without a doubt.

I: and for example in terms of educational factors. Did you increase your knowledge about the things around you?

T: Yes.

I: did you get to know yourself and others?

T: you end up learning more about yourself. I think that every time you contemplate something new, that 'new' always shows you something new that you didn't know about yourself. So I think I did learn something new about myself, yes.

I: and about the outer space as well?

T: Yes, as well.

I: What about the social factors? So you already told me that this was the greatest motivational factor to go there, were you satisfied with the social component of the interactions you had?

T: Yes.

I: Did you develop...

T: yes, the relationships were already developed, meaning that it was not unexpected. They had already been consolidated. However, this helped to fortify them even more. It made us closer to each other.

I: what about relaxation, did it help you to relax? Have you relieved stress?

T: Yes. Because it is an escape from reality.

I: Okay, very well. And you participate in the activity because obviously you liked doing it [escape from reality]?

T: Yes.

I: in physical terms, it is not applied. What about Aesthetics? The place was...

T: Perfect.

I: Can you develop with more about that?

T: It was a quiet place. The fact that it was a quiet place also helps you open your horizons. It would be impossible to do that in Lisbon. The fact that you are literally in the middle of nowhere, in which you don't have anything around you, and you only have that, it pulls you even more into that. And of course the place was unique and amazing.

I: okay. Which factor do you think contributed the most to your satisfaction after this activity, psychological terms, social, relaxation, educational...

T: I will not you choose one in particular, I will choose two, which will be the psychological and the relaxation ones. Because I think there cannot be one without the other. Although you get to know more about yourself by contemplating the universe, at the same point, you end up relaxing. I mean the both of them cannot be dissociated. They have to be together.

I: Okay? Would you like to go back?

T: Yes, without a doubt.

I: Would you do another activity like this one again?

T: Yes, without even thinking about it.

I: thank you very much for coming.

T: you're welcome. I'm perfect!