Part II
Niche and distinctive new tourism market groups

7 Astronomy tourism: A rising star among niche markets

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The objectives of this chapter are to:

- ☐ Draw boundaries of astronomy tourism and review the debate on its definition;
- ☐ Explore the mobility, drivers and determinants of this niche market;
- ☐ Understand the main products, suppliers and consumers of astronomy tourism;
- ☐ Expatiate seven segments in the market and depict portraits of each group;
- ☐ Conclude frontiers of the industry and future research directions.

Keywords: Astronomy tourism, special interest, niche tourism, market segmentation

Introduction

Astronomy and its related travels have a major historical presence. As one of the oldest sciences, astronomy has been one of the pivotal drivers for global travel since the *Age of Sail* (Stavrianos, 1995). In previous centuries, explorers, astrologers and astronomers, have travelled across continents and oceans to observe such astronomical events as aurora, solar eclipses, lunar eclipses, and meteor showers. Constellation diagrams and nautical charts were drawn and became available to the public, and in turn, they became roadmaps for modern adventurers to pursue worldwide expeditions. Astronomy tourism, the topic of this chapter, can be arguably regarded as travelling for the many purposes related to undertaking astronomy-related activities. The aims of the present review are to explicate the definitional determinants and tourism characteristics of this new and developing tourist market.

Astronomy tourism can be looked at as a form of special interest tourism (Soleimani, et al., 2019); an emerging market in which tourists travel to a particular destination where the physical settings (atmospheric visibility, geographic location, and low urban light pollution) are optimal for observing and/or photographing celestial objects and periodic astronomical phenomena and events in either nocturnal or diurnal skies. Additionally, visiting observatories, planetariums or astronomy-related historical sites and travelling for star parties to participate in astronomy-related activities away from one's residential place can also be included.

A distinction can be drawn between the present focus on astronomy tourism and space tourism. The essential difference is that space tourism only takes place in orbital space, suborbital space or outer space (Crouch, 2001, 2009; Cater, 2010). Astronomy tourists, by way of contrast, are usually 'grounded', though just occasionally special flights may be taken to gain access to periodic and key events. While these comments serve as a useful introduction to the distinction, additional differences also exist. These definitional issues are pursued in the first part of the chapter. Following the explication of these key distinctions, consideration of the dark skies as a tourism asset is undertaken. In subsequent sections of the chapter, the drivers and determinants of astronomy tourism as an emerging market are considered. This discussion is followed by a classification of products, suppliers and tourists, thus characterising the state of astronomy tourism. The future frontiers of this kind of tourism and the research which can assist its sustainable development are highlighted in the final section of the chapter.

Definitional debate

Astronomy tourism was initially defined as 'terrestrial space tourism' and classified as one form of the 'space tourism' by Crouch (2001). In his early and pioneering contributions, he classified space tourism into three submarkets in terms of the height of the interface of space tourists' activities: orbital space tourism, high-altitude or suborbital space tourism, and terrestrial space tourism. Thereafter, his research team built a tourists' decision-making model to identify the choice behaviour of potential space tourists (Crouch et al., 2009).

Using the term 'celestial ecotourism', Weaver (2008) described the same kinds of interests from a nature-based ecotourism perspective. He insisted that observatories were the largest single component in terms of visitation, while aurora tourism was the most developed as a specialized commercial tourism industry in the high latitudes of Europe and North America. However, due to the strong ecotourism perspective, only natural attractions and resources were embraced within the scope of 'celestial ecotourism', and hence many astronomy-related cultural and constructed attractions that created decontextualized settings were excluded from this attempt at describing the market. Neglected aspects of what can usefully be included in astronomy tourism – but not considered by Weaver – are visiting planetariums, watching space shuttle launches on site, participating in star parties or astronomy conventions, and sightseeing at astronomy-related heritage sites. The boundary of Weaver's 'celestial ecotourism' was contested and then expanded by Collison and Poe (2013). In an empirical study, they renamed the phenomenon as 'astronomical tourism' (Collison and Poe, 2013) and suggested that astronomy tourism should generally contain five segments and specific tourism products:

1. Visits to astronomy observatories;
2. Regions with aurora viewing;
3. National or local parks offering astronomy programs with dark skies;
4. Amateur astronomy institutions that offer tours and public programs;
5. Other providers of astronomical travelling sites/facilities including bed and breakfasts (B & Bs) and private/organizational observatories with resources and services for solar observing or observation of the night sky.

From the spectrum of ecotourism and sustainable tourism, Collins and Poe's research provided a descriptive analysis of astronomy and night sky darkness programs at Bryce Canyon National Park in the United States. Akin to this, a recent case study on an IDA (International Dark-sky Association) dark sky reserve and its corresponding tourism program in Portugal was