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'Looking Up': Exploring Night Skies and Astro-Tourist Sensory Experiences

Deborah Slater & Philip R. Stone

Only in the darkness can you see the stars.

Martin Luther King Jr

Introduction

We live not only amongst the stars, but stars live in each of us. What appears an eternal and unchanging night sky, many of the stars that sparkle have already died. Starlight left behind means we gaze upon a celestial past knowing that we all will eventually return to the elements that bore us. When we look up, a transcendental astral experience awaits us as our senses attempt to capture our ethereal existence. Of course, the otherworldly night sky and its illuminated stars has occupied our imaginations since the dawn of humankind. The night sky has inspired stories of the great beyond, of nirvana and of the after world, to symbolize the gods, to help us navigate the seas, and to erudite our scientific landscape. The night sky has also inspired astrology as a divinatory practice to discern terrestrial events and celestial objects and their influence upon human affairs. Originating in calendrical systems to predict seasonal shifts and interpret celestial cycles as symbolic of divine communication, different world cultures have employed astrology and its zodiacal signs (the twelve astrological constellations) from ancient times. Recognised as being pseudoscientific since the 18th century (Hanegraaff, 2012), and despite it being devoid of intellectual value, astrology and astral omens continue to influence secular societies using horoscopes and the 'reading' of the stars. Yet, in a contemporary world that appears to spin ever faster, the need to 'look up' and wonder has increasingly captured public imaginations and, in turn, modern tourism.

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However, exploring stargazing within the visitor economy and the 'astro-tourist' experience that draws upon sensory perceptions has hitherto been neglected. The aim of our conceptual chapter, therefore, is to address this gap within scholarship and to offer a theoretical blueprint that identifies the nature of astro-tourism and the parameters of astro-tourist experiences. This includes the significance of the senses and its interplay with spirituality, as well as dynamic placemaking between outer-space embodiment and existentialism. We argue astro-tourism relies less on physical places but on *placelessness* and specific sensory dimensions. Indeed, looking up at the night sky includes a tri-partite relationship between the dark, space, and the senses. It is these sensorial aspects that give significance to the astro-tourist experience and its out-of-this-world sensory-scape. Firstly, however, we begin by examining the increasing commodification of outer space and the potential role of 'space tourism' as bedrock for subsequent discussions.

'Space Tourism': Commodification of Travel to Outer Space

Tourism is defined as the movement of people. Of course, why, and how people 'move,' either regionally, nationally, or internationally, depends upon numerous determinants and motivations. Nonetheless, adopting this mobility paradigm (Urry, 1990) means that tourism is a form of contemporary consumption produced by neo-liberalism, and where touristic experiences are consumed. Indeed, Sharpley (2018: 1) suggests that tourism can be 'all things to all people.' Yet, tourism is where we can escape people and place, but we cannot escape ourselves. Therefore, the tourist experience is influenced by the social fabric that surrounds us and, importantly, by our consequential relationship with the place we visit. In short, 'fundamental to the study of tourism is the study of the tourist experience' (Sharpley and Stone, 2011 :2). It is unsurprising, therefore, that attention has focussed on diverse tourist experiences inherent within diverse types of niche tourism or special interest tourism (Novelli, 2005; Sharpley and Stone, 2012), and the role such tourism has within destination development (Ali-Knight, 2010). However, limited attention has been paid to astro-tourism, as a specific micro-niche of broader space tourism, and the increasing commodification of travel to outer space (Zhang and Wang, 2022). Moreover, an industrialization

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of space has accelerated in recent years causing significant environmental degradation in near earth orbits (Liu, *et al.*, 2023), and which can only get worse with the advent of mass space tourism (Peeters, 2018). Consequently, the human 'footprint' of space exploration and its resultant 'space junk' means that 'humans are messy, and not just here on Earth (Bohannon, 2015: online).

Though astro-tourism as a form of contemporary consumption remains conceptually fragile, Cater (2010) offers some typological clarification of the several types of 'space tourism'. However, Cater's taxonomy is based upon aeronautic terminology and products rather than the tourist experience and, thus, remains ambiguous for modern tourism practice. Nonetheless, space tourism has gradually entered the public imagination as a distinct form of pioneering travel, especially since Dennis Tito's inaugural commercial spaceflight in 2001. As the first commercial space traveller, then aged 60 years old, Tito paid $20million to the Russian space agency to secure passage to the (now defunct) space station, Mir (Britannica, 2023). Now, aged 82 years, Tito has indicated that he wishes to participate in the first-ever commercial voyage to the Moon, aboard Elon Musk's pioneering SpaceX Starship (Kluger, 2022). In terms of his impending adventure that will take him out of this world, Tito commented:

> '...flying in space actually is a lot easier than a lot of other things... I mean, I'm beyond the age of skiing, but space is a lot easier than that' (Dennis Tito quoted in Harwood, 2022: online).

It is this perceived sense of ease, rather than danger and risk inherent in space travel, which is driving the internationalisation, privatisation, and commercialisation of aerospace in the early 21st century (Denis *et al.*, 2020). Despite the risks, space tourism might be defined as a 'segment of commercial space travel for purposes of leisure and recreation' (Zhang and Wang, 2022: 372). Hence, space tourism is classified into sub-orbital, orbital, and beyond-orbital travel, and based upon spacecraft trajectories as well as the distinct experience each journey provides for participants (Spector, 2020). Over the past decade, recreational space travel, either on government-owned vehicles such as the Russian Soyuz or the International Space Station (ISS), or on spacecraft funded and developed by private companies, has gained new prominence. Following Dennis Tito's

initial mission, Mark Shuttleworth (a South African computer millionaire) made the journey to the ISS in 2002, followed by American businessperson Gregory Olsen in 2005. In 2006, the first female fee-paying space traveller, Iranian-born American entrepreneur Anousheh Ansari joined the ranks of 'space tourists' and since then, a raft of other business and social elites have entered suborbital space. With the advent of government-backed competitions (particularly the USA) to create and develop sustainable spacecraft for touristic travel, and with new US-initiated guidelines for regulating the fledgeling space tourism industry (CSLAA, 2004), there has been a range of market competitors in space tourism. Indeed, various spaceflight companies have emerged around the world over recent years, including Virgin Galactic (founded by Richard Branson), Blue Orbit (founded by Jeff Bezos), and SpaceX (founded by Elon Musk) (Baker, 2023). Undoubtedly, as the space tourism industry evolves, and outer space is commodified and becomes affordable, space tourists will grow in number. Suborbital and orbital flights will inevitably give way to grander celestial adventures, including lunar excursions and even trips to Mars and beyond. Whilst we are not at that stage yet, space tourism has the potential of truly opening the frontier of space.

However, Cohen (2017) speculatively highlights four paradoxes in the long-term development of space tourism. Adopting a critical sociological perspective, Cohen (2017: 22) notes future development will be curtailed by 'firstly, the limitations on human cosmic expansion; secondly, the subversion of 'adventure' in space tourism; thirdly, the banalisation of the sublimity of the experience of space tourism; and finally, the deflowering of the pristinity of other celestial bodies by space exploitation and tourism development.' In short, space tourism development has the hallmarks of other touristic products in that, through mass consumption, become routine and consequently degrade the actual environmental qualities and authentic experiences that (some) tourists initially seek (Sharpley and Stone, 2012). Ironically, it is here that space tourism has more potential for mass consumption here on earth rather than having the peril of travelling to outer space. In other words, the future use of virtual reality (VR) and artificial intelligence technologies, hitherto yet to be developed, may completely fuse the social fabric of our living world with virtual worlds (Stone, Forthcoming). Indeed, future places 'will not only be physical or (re)imagined spaces but will agglutinate with technology so much that liminal seams of the physical world and

virtual worlds will become indistinguishable' (Stone, Forthcoming: no pagination). Consequently, space tourism of the future might create seamless virtual touristic experiences that will take the Self to another world beyond the stars yet be firmly ensconced within a safe and socially sanctioned virtual environment.

Despite increasing commodification of outer space and growing touristic opportunities, and notwithstanding virtual reality simulations, space tourism has potential to progress within earthly realms. Indeed, outer space offers contemporary tourists today a chance to gaze upon night skies and sensorially (re)connect with the reverence of nature, both here on earth but also beyond. Therefore, drawing upon the study of astro-tourism by Slater (2020), we now turn to the multi-faceted sensory astro-tourist experience. Consequently, we bring space tourism to earth and, in doing so, consider why people seek out specific places to view space. We also highlight the astro-tourist experience as a response to postmodern alienation and/or a search for (spiritual) connectedness within the context of existentialism. Subsequently, our focus now turns to examining astro-tourism as a meaning-making mechanism to locate ourselves in dark/black (outer) space.

Conceptualising Astro-Tourism: Space(s) and Dark Sky Places

The famous astrophysicist Albert Einstein had an incredible knowledge of outer space, yet he never visited it. That is true also of those stargazers who might be termed 'astro-tourists.' Indeed, because of prohibitive determinants guarding present-day space tourism for most people, astro-tourists are those individuals who are unlikely ever to visit outer space but have a keen interest in it. With a common 'cosmic gaze' delineating their nocturnal activities, an astro-tourist is defined by Slater (2020: 244) as a 'visitor to a truly dark place who wants to observe/gaze at the cosmos, at objects and/or other celestial related phenomena that they would not *normally* [original emphasis] get to see.' Moreover, Slater (2020: 245) goes on to define astro-tourism as 'a natural environment sub-niche tourism activity which involves gazing beyond the horizon at cosmic and

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celestial phenomena in a *place* [original emphasis] that has optimal cosmic space gazing conditions.'

It is here that a sense of place has importance in the astro-tourist experience, though the actual destination is less important (Slater, 2020). Crucially, that sense of place relies much upon *dark skies* rather than the destination – that is, a night sky free from synthetic light pollution – which in turn, creates pristine conditions for stargazing and resultant sensory experiences. With light pollution a consequence of modern urban living, whereby excessive artificial light disrupts clarity of the night sky, the loss of an atramentous sky spoils 'looking up' (Smith *et al.*, 2023). Additionally, the explosive growth in satellite 'constellations' is causing issues for astro-tourism, as deep-space astronomical observations are not only obstructed when satellites cross a telescopes' field of vision, but satellites also scatter and reflect sunlight from their solar arrays (Sutter, 2023). The loss of dark skies across the world has become so acute that astronomers have coined the term *noctalgia* (meaning 'sky grief') to describe how humanity is slowly losing access to the night sky (Venkatesan and Barentine, 2023).

With concerted efforts now to conserve the darkness of dark skies, designated dark sky areas are places, typically in rural settings, where astro-tourists and professional astronomers can access clear skies. For example, in the UK, the countryside charity Campaign for Rural England (CPRE) has mapped the 'blight' of light pollution in England, Wales, and Scotland. They report that only 21.7% of England has pristine night skies, completely free from light pollution, whilst Wales has 57% and Scotland with 77% (CPRE, 2016). Meanwhile, in the USA, the National Park Service in an alliance with the International Dark-Sky Association (IDA) use the Bortle Dark Sky Scale (a nine-point rating scale that determines night sky brightness) to designate Dark Sky Parks (NPS, 2023). With dark sky sanctuaries, parks, reserves, communities, and urban night sky places (as designated by the IDA), now appearing across the world, they often exist in the most remote (and often darkest) destinations where conservation is most fragile. These include Hai Kalahari Heritage Park in South Africa, the Pitcairn Islands, Stewart Island in New Zealand, Galloway Forest Park in Scotland, Brecon Beacons National Park in Wales, Northumberland National Park in England, Ramón Crater in Israel, Iriomote-Ishigaki National Park in Japan, Aenos National Park

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in Greece, Rhön Biosphere Reserve in Germany, and Valle de Oro National Wildlife Refuge in New Mexico (IDA, 2023). As Lerwill (2022: online) notes, 'dark sky tourism is no longer a niche sector' and that the UK's first and biggest Dark Sky Park – Northumberland National Park and neighbouring Kielder Water and Forest Park – 'generates an estimated £25m in astro-tourism revenue'. Similarly, May (2022: online) reports on the 'astronomical arise of dark-sky tourism' in Australia and New Zealand and suggests that the Mackenzie region in New Zealand's South Island has witnessed a 300% increase in visitor arrivals since it was designated an International Dark Sky Reserve in 2012. However, while the dark as a physical manifestation is important for observational access to the night sky, so too is the philosophical notion of 'darkness' within nocturnal activities and, consequently, the ontological facets of 'being in space' for the astro-tourist experience.

From Dark Skies to Darkness: Ontological Perspectives of 'Being in Space'

In the absence of light, darkness will mobilise sensations of tactility and the non-visual senses; yet as Jakle (2001: vii) notes, 'landscape has been conceptualised in terms of daytime use.' However, astro-tourism and inherent experiences therein possess divergent qualities whereby the idea of deep *darkness* is revalued against excessive illumination. Of course, negative connotations of 'darkness' have long been dominated by socio-cultural associations with evil, danger, and the primitive. For most, being in the dark or the idea of darkness, both physically and cognitively, is viewed as oppressive as well as apprehensive. While the dualism of light/dark is open to subjective interpretation, the figurative darkness often represents sadness, wickedness, ignorance, or simply mystery. With the negation of light, the idea of darkness raises the dichotomic dilemma of representing knowledge, a morality beyond the light, and an obscure order that transcends it (McGarrity, 2004).

However, as Edensor (2013: 447-448) argues in his autoethnographic account of contemporary gloomy landscapes and, subsequently, his reconnection with darkness:

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> '...[these accounts] endeavour to revalue those attributes of darkness that have been sidelined in the quest for bright spaces: the potential for conviviality and intimacy to be fostered in the dark, the aesthetics and atmospherics of darkness and shadow, the affective power of the star-saturated sky, the possibilities for looking at the world otherwise and apprehending it through other senses.'

The spread of illumination throughout history has been articulated through religious beliefs and enlightenment principles, where perils in the pre-illuminated era drew upon conceptions of darkness as negative. Darkness was something to be socially controlled by religious hegemony, or logically rationalised through scientific endeavours. Yet, the sensing of the world, informed by values of clarity, transparency, and even Romantic aesthetics, means that darkness has been banished (Edensor, 2013). Therefore, the complexity and variety of ways in which we sense nocturnal space means there is a resurgence of desires to become reacquainted with the dark.

Hence, one way to resonate with the dark and to have a reconfigured encounter with darkness is to 'look up' at the night sky. Indeed, by 'looking up, we discover that the place of outer space represents vastness, nature, history, and our own spiritual existence (Ettlinger, 2007). Martin Heidegger (1927: 102) encapsulated the dominance of outer space in his 'Dasein' (being there) concept where humans are situated in a particular place and within a particular time. Despite being criticised of being too individualistic and neglecting social and historical contexts in which individuals exist, Dasein represents our existential being. Thus, with Dasein as a reflective filter, 'individuals live to experience, but experience is dynamic and has multiple meanings dependent upon understanding and its ability to transform the individual' (Slater, 2020: 83). In other words, our existence and experience, including that by looking up at night skies, is source of attachment to space, as outer space is integral to being and living in time.

Importantly, space and spatiality are social and cultural quasi-material productions focussing on time-space or space-time (Massey, 2005; Harvey, 2002; Castells, 2004; Lefebvre, 1947). Moreover, Massey (2005: 47-57) argues that 'space and time are integral to one another... [that they are] distinct but co-implicated... [and] together rests the liveliness of the world.' In short, Massey suggests that rationality of time/space can enable spiritual reconnections to the spatial and,

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in turn, to us. Meanwhile, with outer space as tourism's final frontier, our earthly dark sky encounters suggest our quest for knowledge of 'where we came from' is akin to a search for humanity and existentialism. As US President George W. Bush stated in terms of exploring outer space, 'the cause of exploration and discovery is not an option we choose; it is a desire written in the human heart' (as quoted by NASA, 2004). Thus, outer space and our gaze upon it can never be neutral. In other words, spatiality, and our movement through it is profoundly ideological as space has a great deal to do with an individual's own position within it. As stargazing navigates relationships of the known and the unknown, of celestial domains and cosmic terrains, and of personal well-being, sublime connections are forged (Slater, 2020). Indeed, regardless of the actual place in which astro-tourism occurs, intimate connections with space through the mind, body, and spirit can reinforce intense emotions which are sublime (after Edmund Burke, 1729-1797). For some people, the vastness of outer space can offer a 'secular epiphany' whereby the 'sense of insignificance that nature can provide is liberating; without reassuring vastness of geologic time and space, we are simply alone, with our brief and gnawing consciousness' (Gayton, 1996: 167/75). It is this sense of being in space and the fullest sublime feeling that casts the Universe's extent and duration. Subsequently, our painful lack of significance and/or splendid connections with nature create new perspectives (Schopenhauer,2010).

While astro-tourism may offer a sublime, if not romantic interplay of beautiful nature and inner anxieties of the Self's existence, including our existential authenticity (Wang, 1999), sublime outer space also raises the notion of liminality. Whilst a contested term, liminality often refers to a threshold or boundary in which rites of passage are performed to reach a state of betweenness (Shields, 1991). The idea of liminality is not only associated with a sense of anthropological identity or with behaviour, but also with places that might be deemed transitional, unsettling, uncanny, or dreamlike. As Shields (1994: 84/3) notes, 'liminality represents liberation from the regimes of normative practices' and exists on the 'periphery of cultural systems of space and carry an image and stigma of their marginality.' In terms of astro-tourism, within the margins of dark sky places, the terrestrial dark sky offers individuals' 'liminal headspace' to counter the world(s) above. During these liminal encounters, and resultant sensory arousal, gazing at outer space offers a sense of attachment to our existential being. These bonds of attachment result not from the

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physical place, but from the emotional and spiritual connectedness of 'looking up.' It is here that the notion of *placelessness* (after Relph, 1976) enters the realms of astro-tourism, as a homogenising location for stargazing is not as important as is the ability to clearly see the night sky in all its crystal darkness that, in turn, offers a transcendental astro-tourist experience (Slater, 2020). Consequently, the emergent 'sensing' of an astro-tourism location may mean it is a geographical locus for astro-touristic experiences, but it is not the destination in the astro-tourist journey.

Astro-Tourist Experiences: A Sensorial Approach

The idea of sensing place draws upon an innate ability to rely upon our human senses to mediate our surroundings. Our sensing of place is corporeal involving interactions with our environment, in a specific time and, therefore, is a learnt cultural behaviour (Rodaway, 1994). In short, sensing implies an integration of the mind and body and suggests that there is a sensory relationship between the mind, body, and the environment (Tuan, 1977). Indeed, sensing place entails 'a collection of symbolic meanings, attachment, and satisfaction with a spatial setting' (Stedman, 2002: 563). Of course, sensing a place is 'one of the most abstract and illusive concepts' (Barker, 1979: 164), yet deep senses of emotion often result in *topophilia* where emotional significance ensures an affective bond between people and place (Tuan, 1974).

Within the astro-tourist experience, topophilia connections are forged and 'sense-scapes' emerge (Slater, 2020; Porteous, 1985). Indeed, Ogunseitan (2005) argues that four domains exist in which to achieve a cacophony of connections within any sense-scape. Firstly, there must be 'scene diversity' whereby distinctive scenes merge to offer visual and other tactile incitements. Secondly, the 'tangible coherence' of colours, smells, sounds, light, and touch should be present and mixed in a consistent and satisfying manner. Thirdly, 'ecological familiarity' should exist which allows tourists to feel safe and identifiable with spaces of protection. Finally, Ogunseitan (2005) suggests that 'psychological challenges' should be present, driven by differing degrees of nature, desires, and invigoration. Therefore, by devising sense-scapes within the astro-tourist

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experience, our senses can be spatially ordered or place related, such as 'smell-scapes,' 'soundscapes,' 'taste-scapes,' or the geography of touch. Specifically, an examination of the five senses (sight, sound, touch, taste, and smell) can help develop an understanding of the astro-touristic experience and, consequently, may shed light on stargazing experiences at dark sky sites.

Sight

The most important of all our senses, sight is the mainstay of the 'tourist gaze' (Urry, 1990). Notwithstanding issues of power and hegemony inherent within the tourist gaze (after Foucault 1963), the mediation of what tourists' see – that is, gaze upon – is socially and culturally constructed as a form of 'visual consumption'. For instance, an astro-tourist might render photos of the cosmos in which distant stars and galaxies reside, which not only depicts the cosmic geography but also the idea of alien beauty. Indeed, such an astro-tourist gaze might create anticipation and the desire to see further into the beyond and to experience out-of-this-world imaginaries. While Urry (1990) identified distinct types of tourist gazes, the 'romantic gaze' (within the context of astro-tourism) assumes a semi-spiritual relationship with objects that make up the Universe. Moreover, a 'reverential gaze' of the night sky might involve intense and emotional consumption of astro-tourism that, in turn, offers sacred or mystical significance.

Importantly, these tourist gazes and the sensory use of sight to discern both the dark sky as well as the darkness, may clash with other senses to create a sensory kaleidoscope of emotions and affect. Indeed, to appreciate the darkness at a dark sky site, the human eye is required to discern aspects of place and landscape in limited light. As the human eye has a convex lens to focus light, thereby creating an image captured by the retina; a lack of light can mean a loss of peripheral vision, resulting in problems with depth perception (that is, the ability to judge distance). Consequently, this can lead to different perceptual vision, of what is being seen and experienced, resulting in the intensification of the other senses, such as sound.

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Sound

As with light pollution, noise pollution is a manifestation of the modern age that has, to some at least, reached 'an apex of vulgarity within our time' (Schafer, 1994: 3). Of course, sound is pressure waves, in which the air acts as a medium to carry disturbances of the waves by oscillating and propagating pressure. However, in the quietness of dark sky sites, typically located in remote rural, desert, or alpine destinations as noted earlier, 'the experience of sound contributes powerfully to an individual's sense of place' as a 'soundscape' consists of an event heard, rather than events seen (Gammon, 2011: 121). While outer space has no sound, sounds heard 'looking up' within quiescent dark sky places may elicit emotional responses hitherto intensified by the lack of illumination.

Subsequently, a dark sky site can create its own mood, and include sounds natural to its landscape (for example, a forest) which, in turn, renders emotional attachment to the night sky. Moreover, at night, darkness can exacerbate sounds of the landscape as nocturnal animals and insects are heard, but not seen. Conversely, the lack of any noise can make an experience 'sound deafening,' even overwhelming and, subsequently, add to a sense of isolation and solitude. In conjunction with seeing the cosmos above, we can wonder at the universe and witness stars millions of years in delay (Lanthy, 2012). While our vision may be impaired during such astro-tourist experiences, our residual senses become more sensitive and, thus, open to distortion (Slater, 2020).

Touch, Smell, & Taste

Touch is the most fundamental means of contact with our physical world. The power of touch creates connections, including emotions such as anger, fear, disgust, love, gratitude, sympathy, happiness, and sadness (Hertenstein, 2023). Of course, we cannot touch outer space; yet, from an astro-tourist perspective within dark sky sites, space might seem within 'touching distance.' In other words, Gammon (2011: 122) suggests that 'through touch a deeper connection with place is sought, as if to channel the great deeds of the past or to somehow get closer to the

spirit of the place.' Furthermore, in the book 'Touching the Stars with the Monkey and the Butterfly' by Christopher Stokes (2022), two friends (the monkey and the butterfly) discover the importance of everything in life, no matter how small it may seem. With the monkey dreaming of 'touching' the stars, the butterfly does not notice them anymore, but learns that nothing should be taken for granted. A cautionary tale of living and life, Stokes uses the allegorical notion of touching the stars that appear out of reach and teaches us that we do not need wings to fly. Similarly, Harmon (2014) takes a small boy to an imaginary place whereby he can touch the stars, and the inherent adventures therein. It is here that stargazing invokes our sense of reaching out, and the peril and possibilities of doing so, and to discover the beyond and yearn at the wonder of nature.

While touching the stars is out of reach, the imagination to do so is not. However, for the senses of smell and taste within the astro-tourist experience, these may relate more to the touristic experience of the dark sky destination, and the journey to get there. Indeed, one might be able to smell the rural domain in which a dark sky site is located (for example, the distinct aroma of a forest) and thus resonate with the overall celestial experience. Likewise, Schultz *et a*l., (2004) suggest it is possible to 'taste' the moisture of the night air with 'its mossy undertones', thereby offering interconnections of the astro-tourist experience and broader nature-based tourism. Positive emotions are often associated with natural environments (Kals and Müller, 2012) whereby each sense is relational to the other and, thus, interconnected, implicit, and unconscious (Schultz et al., 2004). It is this amalgamation of the senses through embodiment that can create the sense of place for the astro-tourist experience. Moreover, sensorial aspects of the astro-tourist experience represent more than the sum of its parts, offering in turn, emotional value that provide mental nutrients to engage with astro-tourism and its deeper interrelationships with spirituality and existentialism.

Conclusion

Outer space is the final frontier where the universe is under no obligation to make sense to us. Since the dawn of humanity, we have wondered at the vastness of space and its timelessness

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as infinity. Indeed, the celestial sky has been the middle ground between light and darkness, between science and superstition, and between our sense of being and the worlds beyond our own. Yet, over recent years, we know more about the universe than we have ever done. With an ever-increasing interest in the night sky, astro-tourism has occupied our imaginations with nocturnal gazes that are both reverential as they are exploratory. However, the astro-tourist experience has been neglected in the social science literature, particularly in terms of the sensory aspects of 'looking up.'

This chapter has addressed this inherent gap and, in so doing, outlined how a fledgeling space tourism industry is brought to earth through astro-touristic experiences. Specifically, astro-tourism is part of a broader nature-based touristic activity which is reliant upon dark skies to explore the cosmic landscape. Notwithstanding professional astronomy, astro-tourism allows astro-tourists an opportunity to become embodied through sense-scapes. As a result, sensing the cosmos here on earth offers a conduit to experience an alien environment, where emotional attachment to our sense of being is fundamental and our existentialism is scrutinized. However, while the sensorial aspects of astro-tourism have been conceptually outlined in this chapter, the research task remains to discover different types of astro-tourists: including those with varying educational attitudes and/or leisure behaviour, those with amateur scientific interests in stargazing, those who are interested in outer space as a place for the occult, astrology, or extra-terrestrial life, or those who seek adventure or enjoy the sociality of stargazing. Hence, an empirical-based taxonomy is needed to ascertain astro-tourist experiences and, consequently, shine typological light on those who gaze upon dark skies (but, see Slater, 2020). In the meantime, the night sky marks our present as well as telling us our past and predicting our future. In turn, by 'looking up' at the night sky and all its celestial wonders, it offers us an embodied tourist experience which can awaken a certain reverence, but the stars will forever remain inaccessible.

References

Ali-Knight, J. (2012) *The role of niche tourism in destination development.* Unpublished PhD Thesis, Edinburgh Napier University, UK. Retrieved from http://researchrepository.napier.ac.uk/id/eprint/5376 [Accessed: 21 Sept 2023].

Baker, D. (2023) The 10 Largest Space and Exploration Companies in the World. *History-Computer*, Retrieved from http://history-computer.com/10-largest-space-and-exploration-companies [Accessed: 22 Sept 2023].

Barker, J. (1979) Designing for a sense of place in a Mississippi small town. In W.Prenshae & J. McKee (Eds) *Sense of Place Mississippi.* Jackson: University of Mississippi Press, pp.162-178.

Bohannon, J. (2015) Video: Watch 60 years of space junk accumulate in 1 minute. *Science.* Retrieved from https://doi.org/10.1126/science.aae0154 [Accessed: 21 Sept 2023].

Britannica. (2023) History & Society: Dennis Tito. *Britannica Online*, Retrieved from http://britannica.com/biography/Dennis-Tito [Accessed 21 Sept 2023].

Castells, M. (2004) An Introduction to the Information Age. In F.Webster (Ed) *The Information Society Reader.* London: Routledge, pp. 138-149.

Cater, C.I. (2010) 'Steps to Space': Opportunities for Astrotourism. *Tourism Management*, Vol 31(6): 838-845.

Cohen, E. (2017) The paradoxes of space tourism. *Tourism Recreation Research*, Vol 42(1): 22-31.

CPRE, (2016) *Night Blight 2016: Mapping England's Light Pollution and Dark Skies*, June, Campaign to Protect Rural England, Retrieved from www.oldsite.cpre.org.uk/resources/countryside/darkskies [Accessed: 11 October 2023].

CSLAA, (2004) *Commercial Space Launch Amendments Act of 2004.* Public Law 108-492, Dec 23, H.R. 3752, 108th Congress, USA.

Denis, F.G., Alary, D., Pasco, X., Piscot, N., Texier, D., & Toulza, S. (2020) From new space to big space: How commercial space dream is becoming a reality. *Acta Astronautica*, 166: 431-443.

Edensor, T. (2013) Reconnecting with darkness: gloomy landscapes, lightless places. *Social & Cultural Geography*, Vol 14(4): 446-465.

Ettlinger, N. (2007) Preclarity unbound. *Alternatives*, Vol 32(3): 319-340.

Foucault, M. (1963[1994]) *The Birth of the Clinic: An Archaeology of Medical Perception.* London: Vintage (Reprint edition).

Gammon, S.J. (2011) 'Sporting' new attractions? The commodification of the sleeping stadium. In R. Sharpley & P.R. Stone (Eds) *Tourist Experience: Contemporary Perspectives*. London: Routledge, pp.115-126.

Gayton, A. (1996) *Landscapes of the Interior: Re-Explorations of Nature and the Human Spirit.* Gabriola Island, BC: New Society Publishers.

Hanegraaff, W.J. (2012) *Esotericism and the Academy: Rejected Knowledge in Western Culture.* Cambridge: Cambridge University Press.

Harmon, J. (2014) *Touching the Stars*. Scotts Valley, CA: Create Space Independent Publishers.

Harvey, D. (2002) *Spaces of Capital: Towards a Critical Geography.* New York: Routledge.

Harwood, W. (2022) Dennis Tito, world's first space tourist, plans flight around the moon aboard SpaceX Starship. *CBS News*, 12 October, Retrieved from http://cbsnews.com/news/dennis-tito-spacex-starship-moon-space-tourist/ [Accessed 21 Sept 2023].

Heidegger, M. (1927) *Being and Time.* London: SCM Press.

Hertenstein, M. (2023) quoted in R. Chillot 'The Power of Touch', *Psychology Today*, first published 11 March 2013, reviewed on 9 February 2023, Retrieved from http://psychologytoday.com/intl/articles/the-power-of-touch [Accessed: 11 Oct 2023].

IDA, (2023) Under One Sky, *International Dark-Sky Association*, Retrieved from https://darksky.org [Accessed: 27 Sept 2023].

Jakle, J. (2001) *City Lights: Illuminating the American Night.* Baltimore: John Hopkins University Press.

Kals E. & Müller, M.M. (2012) Emotions and Environment. In S.D. Clayton (Ed) *The Oxford Handbook of Environmental and Conservation Psychology*, Oxford: Oxford Academic Books, pp.128-147.

Kluger, J. (2022) The World's First Space Tourist Plans a Return Trip – This Time to the Moon. *Time Magazine*, 17 October, Retrieved from http://time.com/6222212/dennis-tito-moon-space-tourism/ [Accessed 21 Sept 2023].

Lanthy, K. (2012) Adventures in the Dark: Night-time Activities Around the World. *BootsnAll*, Retrieved from www.bootsnall.co.uk/articles/advertures-in-the-dark.html [Accessed: 11 Oct 2023].

Lefebvre, H. (1947[2008]) *Critique of Everyday Life*. London: Verso Books.

Lerwill, B. (2022) Why travellers are embracing dark sky tourism. *National Geographic*, Retrieved from https://www.nationalgeographic.co.uk/travel/2022/01/why-travellers-are-embracing-dark-sky-tourism-for-2022 [Accessed: 22 Nov 2023].

Liu, L., Jia, P., Huang, Y., Han, J., & Lichtfouse, E. (2023) Space industrialization. *Environmental Chemistry Letters*, Vol 21: 1-7.

Massey, D. (2005) *For Space.* London: Sage.

May, N. (2022) Seeing Stars: the astronomical rise of Australian dark-sky tourism. *The Guardian*, 11 Sept, Retrieved from https://www.theguardian.com/travel/2022/sep/12/seeing-stars-the-astronomical-rise-of-australian-dark-sky-tourism [Accessed: 22 Nov 2023].

McGarrity, A. (2004) *Darkness and Paradox as the Beginning and End of Understanding.* In C. Hartney & A. McGarrity (Eds) The Dark Side. Proceedings of the 7th Australian and International Religion, Literature, and the Arts Conference, 2002. University of Sydney, RLA Press, Retrieved from https://openjournals.library.sydney.edu.au/SSR/article/view/198 [Accessed: 27 Sept 2023].

NASA, (2004) *The Vision of Space Exploration*, Feb, Retrieved from https://nasa.gov/pdf/55583main_vision_space_exploration2.pdf [Accessed: 9 October 2023].

Novelli, M. (2005) *Niche Tourism: Contemporary Issues, Trends and Cases.* Oxford: Butterworth-Heinemann.

NPS, (2023) *Dark Sky Park Designation*. USA National Park Service, Retrieved from http://nps.gov.voya/learn/nature/dark-sky-park-designation.htm [Accessed: 25 Sept 2023].

Ogunseitan, O.A. (2005) Topophilia and the Quality of Life, *Environmental and Health Perspectives*, Vol 113(2): 143-148.

Peeters, P. (2018) Why space tourism will not be part of sustainable tourism. *Tourism Recreation Research*, Vol 43(4): 540-543.

Porteous, J.D. (1985) Smellscape. *Progress in Human Geography*, Vol 9(3): 356-378.

Relph, E. (1976) *Place and Placelessness.* London: London Press.

Rodaway, P. (1994) *Sensuous Geographies: Body, Sense and Place.* London: Routledge.

Schafer, M.R. (1994) *Soundscape: Our Sonic Environment and the Tuning of the World.* Rochester: Destiny Books.

Schopenhauer, A. (2010) *The Essays of Schopenhauer: The Art of Literature.* Las Vegas: IAP.

Schultz, P.W., Shriver, C., Tabanico, J.J., & Khazian, A.M. (2004) Implicit connections with nature. *Journal of Environmental Psychology*, Vol 24(1): 31-42.

Sharpley, R. & Stone, P.R. (2011) Introduction: thinking about the tourist experience. In R. Sharpley & P.R. Stone (Eds) *Tourist Experience: Contemporary Perspectives.* London: Routledge, pp. 1-8.

Sharpley, R. & Stone, P.R. (Eds) (2012) *Contemporary Tourist Experience: Concepts and Consequences.* London: Routledge.

Sharpley, R. (2018) *Tourism, Tourists & Society.* 5th edition, Huntington: ELM Publications.

Shields, R. (1991) *Places on the Margin: Alternative Geographies of Modernity.* London: Routledge.

Slater, D.A. (2020) *Towards an Understanding of the Astro-Tourist: A Conceptual and Empirical Study.* Unpublished PhD Thesis, University of Central Lancashire (UCLan), UK, Retrieved from https://clok.uclan.ac.uk/34463 [Accessed: 22 Sept 2023].

Smith, K.T., Lopez, B., Vignieri, S., & Wible, B. (2023) Losing the darkness. *Science*, Vol 380 (6650): 1116-1117.

Spector, S. (2020) Delineating acceptable risk in the space tourism industry. *Tourism Recreation Research*, Vol 45(4): 500-510.

Stedman, R. (2002) Toward a Social Psychology of Place: Predicting behaviour from place-based cognitions, attitudes, and identity. *Environment and Behaviour*, Vol 34(5): 561-581.

Stokes, C. (2022) *Touching the Stars with the Monkey and the Butterfly.* Independently Published, ISBN: 979-8434537551.

Stone, P.R. (Forthcoming) *Vertopia:* The Future of Dark Tourism Places and Our Digital Dead. In P.R. Stone & D.W.M. Wright (Eds) *The Future of Dark Tourism: Enlightening New Horizons*, Bristol, Channel View Publications, Chapter 1.

Sutter, P. (2023) The loss of dark skies is so painful, astronomers coined a new term. Yahoo!News, 18 Sept, Retrieved from http://news.yahoo.com/loss-dark-skies-painful/astronomers-100035142.html [Accessed: 25 Sept 2023].

Tuan, Y.F. (1974) *Topophilia: A Study of Environmental Perception, Attitudes, and Values.* Englewood Cliffs, NJ. Prentice Hall Publishers.

Tuan, Y.F. (1977) *Space and Place: The Perspective of Experience.* Minneapolis: University of Minneapolis Press.

Urry, J. (1990) *The Tourist Gaze.* London: Sage Publications.

Venkatesan, A. & Barentine, J.C. (2023) *Noctalgia* (sky grief): Our Brightening Night Skies and Loss of Environment for Astronomy and Sky Traditions. *Arxiv*, 28 Aug, Retrieved from https://doi.org/10.48550/arXiv.2308.14685 [Accessed: 25 Sept 2023].

Wang, N. (1999) Rethinking Authenticity in Tourism Experience. *Annals of Tourism Research*, Vol 26(2): 349-370.

Zhang, Y, &Wang, L. (2022) Progress in space tourism studies: a systematic literature review. *Tourism Recreation Research*, Vol 47(4): 372-383.