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On the world-picture: a cross-disciplinary analysis of astronoetics and astro-green criminology

Reece Burns[1] & Jack Lampkin[1]
[1]*Edge Hill University*
[2]*York St John University, UK*

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ABSTRACT: In 1968, humanity marked the beginning of the Earthrise era, capturing – for the first time – the pictorial sight of our planet in its cosmic position. The result enabled a newfound immense depth to the discourse of globalisation, and, more centrally, the practical and extraordinary power of the world-image. The concept of the world-picture, which is the equivalent of the German phrase *Weltbild* as developed by Hans Blumenberg, Martin Heidegger, Wilhelm Dilthey, and Martin Buber, is concerned with the world as a system of representation that is infused with the practical power of pictorial realities and the connection to a complex nexus of existential significance. This article illustrates an extension to this concept by utilising Blumenberg's field of *Astronoetics*, which examines the theoretical intricate balance between centrifugal curiosity and centripetal care and its implications for terrestrial human welfare and extraterrestrial voyages. This article also examines how astronoetics can inform and enrich the recently formed subdiscipline of *Astro-Green Criminology*, which investigates the criminal and harmfulness of human agency towards outer space. The article concludes by arguing the value of reigniting the astronoetic tradition as a catalyst for change and a conceptual tool to confront illegal and harmful outer-space activities. The article finalises by inviting green criminologists to embrace astronoetics as an innovative, creative, and insightful approach that disentangles the complexities of our phenomenological meaning of outer-space – the fundamental source from which the multitude of cosmic transgressions originate.

KEYWORDS: Space Criminology, Astro-Green Criminology, Astronoetics, Phenomenology.

SOBRE LA IMAGEN DEL MUNDO: UN ANÁLISIS INTERDISCIPLINAR DE LA ASTRONOÉTICA Y LA CRIMINOLOGÍA ASTRO-VERDE

RESUMEN: En 1968, la humanidad marcó el comienzo de la era Earthrise, captando -por primera vez- la visión pictórica de nuestro planeta en su posición cósmica. El resultado permitió dar una nueva e inmensa profundidad al discurso de la globalización y, más centralmente, al poder práctico y extraordinario de la imagen-mundo. El concepto de imagen-mundo, que equivale a la expresión alemana Weltbild desarrollada por Hans Blumenberg, Martin Heidegger, Wilhelm Dilthey y Martin Buber, se refiere al mundo como un sistema de representación impregnado del poder práctico de las realidades pictóricas y la conexión con un complejo nexo de significado existencial. Este artículo ilustra una ampliación de este concepto utilizando el campo de la *astronoética* de Blumenberg, que examina el intrincado equilibrio teórico entre la curiosidad centrífuga y el cuidado centrípeto y sus implicaciones para el bienestar humano terrestre y los viajes extraterrestres. Este artículo también examina cómo la *astronoética* puede informar y enriquecer la subdisciplina de reciente creación de la Criminología Astro-Verde, que investiga la criminalidad y nocividad de la agencia humana hacia el espacio exterior. El artículo concluye invitando a los criminólogos verdes a adoptar la *astronoética* como un enfoque innovador, creativo y perspicaz que desenreda las complejidades de nuestro significado fenomenológico del espacio exterior, la fuente fundamental de la que se originan la multitud de transgresiones cósmicas.

PALABRAS CLAVE: Criminología espacial, criminología astro-verde, *astronoética*, fenomenología.

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AUTOR/A CORRESPONDENCIA: Reece Burns, Reece-Burns@outlook.com

SUMMARY: 1. Introduction, 2. The World-Picture, 3. From Green Criminology to Astro-Green Criminology, 4. The 'Astronoetic' in Astro-Green Criminology, 5. Conclusions.

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1. Introduction: Astronoetics

In his posthumous *Die Vollzähligkeit der Sterne* (1997), otherwise known as *The Full Complement of the Stars*, Hans Blumenberg coined the term '*astronoetics*' ('astronoetik'), which, despite lacking an adequate and precise definition, concerns the balance between centrifugal curiosity (to explore the outer space) and centripetal care (to preserve our home planet) (Harries, 2001; Johnson, 2020). Blumenberg's astronoetics, as opposed to the more prevalent notion of astronautics (the science and engineering of travelling and exploring outer space), advances the theory of praxis by emphasizing the importance of speculative and contemplative engagement with the cosmos, which both precedes and succeeds any astronautical activity (Harris, 2019). Where astronomy aims to grasp and comprehend the infinite complexity of the cosmos, and astronautics attempts to explore the cosmos within the boundaries of technoscience, astronoetics explicates the value of the intelligibility of that research itself, that is – the *meaning* of space exploration, and its implications for ethics, representations and human reason (Crowell, 2020).

Blumenberg, interestingly, coined the term *astronoetics* during a grant proposal that sought to 'explore the dark side of the moon by the power of thought' (Burton, 2022: 338). Despite the seeming absurdity and futility of this claim, however, Blumenberg aimed to emphasize 'the journey of imagination' and the alternating contrast of viewpoints and magnitudes that are embedded in everyday ordinary experience (Burton, 2022: 338). Astronauts, of course, acquire the experience of space travel, but most people experience space from the movement of meaning that is contingent on the mediation of the epistemology of cosmology, and dominant philosophical assumptions (Ellis, 2000). We shall, in consequence, argue that the criminological analysis of outer space (as well as the ordinary experiences and interactions with outer space) are based, perhaps implicitly, on astronoetics, and that the identification of certain astronautical activities as harmful and unlawful is also astronoetically driven.

Blumenberg (1975: 3) begins his earlier *Die Genesis der kopernikanischen Welt*, which translates to *The Genesis of the Copernican World*, by explicating the fragile balance between the indispensable and the sublime, that is – 'the combined circumstance that we live on Earth and are able to see stars – that the conditions necessary for life do not exclude those necessary for vision, or vice versa – is a remarkably improbable one'. He continues by suggesting that 'the medium in which we live is, on the one hand, just thick enough to enable us to breath and to prevent us from being burned up by cosmic rays, while, on the other hand, it is not so opaque as to absorb entirely the light of the stars and block any view of the universe' (Blumenberg, 1975: 3). The unique and delicate balance for us to perceptually transcend our 'atmospheric cave' enables humans to theoretically contemplate a multitude of worlds, and to ascertain the value in human connection within the cosmic environment.

For Ambroży (2020), it is precisely this twofold transcendence that creates a rich stimulus for imagination, and the necessity to look both beyond ourselves, but also back at ourselves. The astronoetic contemplation, then, is equally phenomenological because it concerns the meaning of conscious awareness and the obscure, but intricate, self-interpretation of our lived experience that shapes our everyday cognition (Burns, 2023; Heidegger, 1927). Immanuel Kant, for instance, explicated that the presupposed view of the 'distant there,' with respect to outer space, reveals a deeper understanding of human nature. Arne Næss, similarly, frames the human being and the cosmos as a unitary wholeness, that is, nature and the cosmos constitute not only the conditions of our habitable planet, but also the existential scenes of human life (Valera, 2018).

Throughout human history, cultures have structured and manifested meaning from the position and patterns of the night sky. The Pythagoreans, for example, conceived of the cosmos as a harmonious system that could be mathematically and divinely explained; they also, intriguingly, believed that the individual's soul, upon death, reverts to their respective stars (Holmes, 2013). Ancient Chinese philosophy, moreover, embraced an anthropocosmic (the unity of heaven and human) ethics, which organises time (or, *shi*) in relation to the movement of the cosmos. In contrast to the linearity of Christian chronology, Chinese anthropocosmic ethics established the sexagenary cycle, enabling the individual an intricate and sophisticated relationship with the temporal changes of the cosmos (Chen and Bu, 2019).

Furthermore, the Polynesian civilisation, renowned for their status as master voyagers, navigated the sea using a star compass, intricate knowledge of the moon, and observations of luminous planets such as *Kōpō* (Venus) and *Pareārau* (Jupiter), in addition to knowledge of other natural phenomena. Indeed, the anthropologist Ben Finney (1985) extended anthropology to the domain of outer space by highlighting the analogical significance of Polynesian

cosmology for interstellar migration. Notably, he sought to illustrate how human meaning and experience can construct predictive models of human space communities (see also Winder, 2019). These examples, of course, are not exclusive but are, nevertheless, explanatory for a rich astronoetic tradition that has been embedded throughout human history. It is essential to note, however, that the cosmos is not devoid of value for the everyday ordinary experience, nor is it a domain restricted to the techno-science of astronautics. Astronoetics is a meaning-making process by which various ontologies of representations are entangled, which can contest illegitimate ideologies, and which confer meaning to an otherwise meaningless void, seemingly detached from human propensity and ethics (Turan, 2013).

During the late 16th century, the Renaissance philosopher Giordano Bruno (1548-1600), who was famous for both his eccentric claims and his barbaric death, contested the dominant claims of the Church by arguing the infinitude of the universe (Granada, 2001). Bruno, in relation to astronoetics, for instance, believed in the plurality of worlds, that is, the existence of an infinite number of habitable worlds. There are, as he argues, 'no ends, boundaries, limits, or walls which defraud or deprive us of the infinite multitude of things' (Bruno, 1584: 32). In his influential *On the Infinite Universe and Worlds* (1584), Bruno suggested that it is precisely the lack of human reconciliation with the vastness of nature that creates an absence of union with the universe. The human, in consequences, lacks the phenomenological power of self-transcendence and intellectual freedom, which disconnects a relationship to the cosmic whole in favour for small, but teleologically protected, reality. Bruno's claims, however, concretised the cosmic revolution that was to be reignited in the 18th century, and also, undoubtedly, influenced astronoetics.

We can confer, then, that the phenomenological meaning of outer space provides not only powerful and meaningful experiences but also intersubjective teleological systems. According to Hubbard (2008), the contemporary predisposition to enforce order and structure on outer-space reflects the predisposition of order and structure that humans enforce on the natural world. The new techno-science fuelled 'space frontier,' and its imperialistic vison, for example, aims to exploit outer-space resources from celestial bodies to complement – and in some instances, substitute – the ruthless neoliberal extractivism from Earth's natural world (Takemura, 2019; 2022). The so called 'Space Race,' led by the global powerful, are also accelerating an excessively competitive cosmic environment and militarising astronautics for outer-space supremacy, which will, undoubtedly, exacerbate harms and vulnerability for less developed nations (Cross, 2019). Additionally, non-human life is frequently overlooked in space exploration and space law, with monkeys, dogs, cats, fruit flies, mice and many more viewed as objects of exploitation and unworthy of sufficient protection (Damjanov, 2018).

The intelligibility of contemporary astronautical activities, then, mirrors the ecocidal preconditioned propensity to disregard nature, which passively constructs a societal intellectual repression that legitimises the treadmill of production's positioning within outer space (Lampkin and White, 2023). Astro-centrism, in consequence, is deeply embedded in anthropocentrism, which, as astro-green criminology (AGC) has demonstrated, is intertwined with new epistemological frontiers and ideologies of power, which we shall discuss in more detail in the following sections (see, for instance: Lampkin, 2021). The socio-ethical dimension of the teleology of outer space, then, obtains substantial societal repercussions. Blumenberg's suggestion for the critical point of examination between centrifugal curiosity and centripetal care is, we argue, valuable for the existential pathway for astro-green criminology and, more recently, *space criminology* (Lampkin and White, 2023; Sachdeva, 2023).

The remainder of this paper will be structured as follows. First, we shall discuss Earthrise and the notion of the world-picture, as elaborated by Martin Heidegger and Hannah Arendt. Here, we explicate the value of the perception of the Earth from outer space as a source to understand human propensity and meaning. Secondly, we shall discuss the value of astro-green criminology as an extension to the subfield of green criminology. In this section, we review the broad key issues that astro-green criminology has taken as its primary concern. Lastly, we conclude by arguing the value of reigniting the astronoetic tradition as a catalyst for change and a conceptual tool to confront illegal and harmful outer-space activities. We begin, then, with the examination of the world-picture.

2. The World-Picture

In 1968, humanity marked the beginning of the Earthrise era, capturing – for the first time – the pictorial sight of our planet in its cosmic position. The term 'Earthrise' denotes the first, and most famous, photograph of the Earth by the Apollo 8 astronaut, Bill Anders (Attenborough, 2020). Described as one of the most influential photographs of the 20th century, Earthrise illustrated the Earth as a fragile blue sphere, reflecting light (e.g., Earthshine) over a lunar landscape (Logan et al., 2020). The left side of the photograph depicts the Namib Desert of Namibia, the oldest desert on Earth at 55 million years old; whilst the right side

shows the Saharan deserts of West Africa, and beyond, the nearby country of Saudi Arabia. The somewhat luminous deserts of Earth, however, contrast against the darkness of outer space – a vast alien landscape with which Earth appears isolated and fragile (Cox and Cohen, 2014).

Figure 1: Earthrise.

Source : NASA. https://www.nasa.gov/imagearticle/earthrise-3/

Earthrise, as Turner (2010: 274) explicates, instilled a wave of wonder throughout human culture, and symbolised a slow process of recognition, that is, 'humans finally understood that they inhabited a planet, and not just a landscape'. This welcome, but unfamiliar, planetary Earth, which evidently is not the centre of the universe as the Ptolemaic system claimed, disclosed a realistic and solitudinous view of the cosmos, which, for some, instigated a collective will to preserve our unique and habitable planet (Logan et al., 2020; Zakariya, 2017). In contrast, however, Earthrise and the pictorial imagination produced significant implications for new modes of thinking (and harming) our planet, which, in many ways, subverted the aims of Blumenberg's astronoetics.

Heidegger (1954: 85), who was much more pessimistic than Blumenberg, famously argued that 'the fundamental event of the modern age is the conquest of the world as picture'. Heidegger, of course, was not alone in this view. His student, Hannah Arendt (1906-1975), renowned for her magnus opus *The Human Condition* (1958), disputed the image of Earth as a source of deep anxiety with respect to human experience (Lazier, 2011; McClure, 2017; Turner, 2010). For Arendt, the important question was not to concern centrifugal curiosity, nor to question human efficiency in space travel; rather, astronoetically motivated, it was to ask: what does it mean to view Earth from the beyond? In her view, the answer is to be found within the human desire to escape from the imprisonment to the Earth (Arendt, 1958). Earthrise, as well as launching artifacts into outer space, reveals a human relationship to our world – that is, the desire to escape from our physical and ontical world simultaneously reinforces the desire to escape the existential responsibilities of human existence on Earth (Lazier, 2011). Earth, in consequence, is, implicitly, not thought of that which is worth preserving and protecting, but as that which is worth leaving. In Arendt's (1958: 29) view, then, modern humans are 'possessed by a rebellion against human existence', which is politically and ideologically motivated.

Earthrise, however, is not exempt from political and ideological motivations. For Blumenberg, and others like Heidegger, Wilhelm Dilthey, and Martin Buber, Earthrise established a newfound immense depth to the discourse of globalisation, and, more centrally, the practical and extraordinary power of the *world-picture*, which requires significant elucidation before elaborating (Lazier, 2011; McClure, 2017). The concept of the world-picture, which is the equivalent of the aforementioned German phrase *Weltbild*, is concerned with the world as a system of representation that is infused with the practical power of pictorial realities and the connection to a complex nexus of existential significance. But what, exactly, does 'world' and 'picture' mean in this context? According to Heidegger (1954), who is renowned for his ambiguity, *world* denotes a name for an ontology of a teleological system, which is not limited to the cosmos or nature, but also of a history that is entangled in that particular world. *World*, in other words, represents intersubjective meaning through which our human agency exists (Heidegger, 1927).

The term *picture*, moreover, does not simply refer to a copy or imitation, such as a photograph or artwork; rather, it means that 'we are in the picture', which is, admittedly, still obscure (Heidegger, 1954: 81). Here, Heidegger intends to reveal the juxtaposition of picture – that is, how picture is received, how picture is prepared to be received, and how picture reproduces the teleological relationship with which it represents. Picture, in consequence, represents a normative realm, which, as Arendt (1958) suggests, implicitly controls the human condition. *World-picture*, therefore, concerns the ontology of a teleological system that is mediated and intertwined with the existential claims of picture; it elucidates the human being as *subiectum* (subject) who, unknowingly, adopts and safeguards the meaning and conduct of the world as picture (Backman, 2005).

As discussed, Earthrise is not exempt from political and ideological motivations, particularly as a world-picture, in both a literal and figurative sense. For

Cosgrove (2001), Earthrise gifted humanity the *Apollonian eye*, which, in influence of Apollo, the mythological Greek God of Sun, denotes a powerful gaze above the Earth, detached from the human body, and a manifestation of a singular mastering view (see also, Stougaard-Nielsen, 2008). The Apollonian eye, however, is a paradox. The picture of Earth as a globe symbolises a unified and harmonious 'one-world' that inspires collective centripetal care; but it also, as Heidegger reminds us, signifies the quantifying, manipulating, and dominating of that which is a whole, converting picture into power for the purposes of the human condition. The world-picture of Earthrise, in consequence, provided an extraordinary existential power towards that which is destructive for both terrestrial and extraterrestrial welfare, that is, *globalisation* (Arendt, 1958; Cosgrove, 2001; Heidegger, 1954; Lazier, 2011; Stougaard-Nielsen, 2008).

As Stougaard-Nielsen (2008) notes, Earthrise is the genesis of globalisation; it is, implicitly, mediated and intertwined with world-spanning ideas, such as: new technologies, the internet, neoliberal capitalism, and the international exchange of goods and capital (see also, Steger, 2021). According to Lazier (2011), the language of globalisation (e.g., global environment, global economy, and global humanity) did not exist before the world-picture of Earthrise. Humanity, of course, operated transnationally prior to Earthrise, as evidenced by the large amount of literature on the history of capitalism (see, for example, Beckert, 2014; Patel and Moore, 2017). The *discourse* of globalisation, however, accelerated after the event. Ultimately, the onset of these terms, dramatically enhanced the Western pictorial imagination, which, for some, represented a hegemonic reality and an imperialistic vision within competing globalisms (Stougaard-Nielsen, 2008). To be 'global' was not to concern centrifugal curiosity, nor centripetal care, but rather social and political geographies, connectivity, and the ability to surpass spatial and temporal barriers (Hoover and Echchaibi, 2021).

The spread and intensification of globalisation discourse, in consequence of Earthrise, enabled the planet to become an object of appropriation, which is supported and reinforced by a collective acceptance of ecocidal rationality (Johnson, 2020). Globalisation eliminates market barriers, enables international financial institutions, the flow of capital and geopolitical relationships, however, it is also a primary anthropogenic origin to the control and dominance of Earth's abundant natural resources (Liu et al., 2022). The 'race for resources', that is, the access of nations to resources through trade dominance, is challenged for its deep connection between global hegemony and control of natural resources (Bunker and Ciccantell, 2005). The environmental consequences of global hegemony, however, have been (and are) largely ignored. There is, worryingly, severe damage to the planet's atmospheric composition, degradation of the oceans and the cascading effects on the entire hydrosphere, soil contamination, mass extinctions, and an accelerated climate change that underpin collective human existence in the Anthropocene (White, 2020), and to which we are now looking beyond into outer space for answers.

More subtly, the political teleology of the world-picture transformed the Earth into an object of aesthetic consumption, comprising the 'one-world' narrative as a commodity for corporate public relations. The Earth as a 'globe' appears, for instance, in promotional advertisements for airlines, telecommunications, Wi-Fi connections, corporate logos, and financial institutions to implicitly internalise a networked teleology, unrestricted by spatial and temporal dimensions (Cosgrove, 2001). The Earth, itself, is a site of semiotic contestation. The intersubjective meaning of the Earth as a globe is deeply associated with technology, dependence, and control, internalising, as Arendt and Heidegger propose, the human being as the *subiectum* for the world-picture. What began, then, as an astronoetic venture of the world-picture of Earthrise, shifts into the intertwinement of the global economy and daily life, the source of complicity in the damaging of terrestrial and extraterrestrial welfare. Recently, the area of astro-green criminology has arisen to address such complicity, by directly theorising the motivations for criminal and (otherwise) harmful anthropogenic activities which are destructive towards the Earth, Earth's orbits, atmosphere and climate, as well as also considering the contamination of other extra-terrestrial bodies.

3. From Green Criminology to Astro-Green Criminology

The term 'green criminology' was first coined by Michael Lynch (1990). Although issues of environmental justice were contemplated before this point (for more detail see Goyes and South, 2017), Lynch (1990), and also South's (1998), initial calls for a 'green' version of criminology, led to an explosion in practical and theoretical research within the area in the twenty-first century (South and Brisman, 2020). Founders of green criminology have explicated that the subfield is to be perceived as an umbrella term, that is, a *loose perspective* (South, 1998) and a platform from which to research environmental harms and crimes. While one could argue such harm-based approaches are too broad, others claim that the diverse and inter-

disciplinary nature of green criminology is in fact one of its strengths, particularly as many address non-conventional causations of harms and crimes (Lampkin, 2020; South and Brisman, 2020). This has, then, led to the creation of several green criminological deviations that provide, if-you-like, *mini-umbrellas* - these are, essentially, green criminological approaches to the study of more specific areas. For instance, there are now green-criminological sub-specialisms like green-cultural criminology (Brisman and South, 2013), southern-green criminology (Goyes, 2019), and dark-green criminology (McClanahan, 2020), which help green criminologists to focus on narrower issues within what is undeniably an unapologetically broad discipline.

Consequently, the plethora of subdisciplines under the parent umbrella of *green criminology* can undoubtedly be seen as a critical response to the vast nature of what could be classified as environmental harm and crime (essentially, any action or omission that negatively impacts the Earth in some way). Astro-green criminology is one such subdiscipline which focuses on the environmentally harmful ways in which humans interact with the cosmos. The term 'astro-green criminology' was first coined by Takemura (2019) in his pioneering article *A New Perspective Against Space Capitalism*. It was not, however, defined until Lampkin (2021: 242) did so two years later. He, succinctly, described AGC as 'the theoretical and practical study of space-related environmental harms and crimes that are facilitated by human actions. These harms can be Earth-based, atmospheric, or extraterrestrial and may create human victims, non-human victims, and ecological victims both on Earth and in outer space.'

Due to the 'newness' of the term, AGC is currently operating at a nascent and highly theoretical stage, which is the antithesis of the more well known fields such as astronautics. This stage is, however, and as we shall further discuss in the next section, of crucial importance to the astronoetic predisposition that underpins outer-space crimes and harms. The body of literature that has emerged within AGC to address key issues (such as space junk, spacecraft emissions pollutions, space mining, space tourism, etc.) originates, at its most fundamental level, through a disconcerting balance between centrifugal curiosity and centripetal care, which neglects to consider the value in human connection within the cosmic environment and the extent to which outer-space harms are legitimised in everyday human propensity. There are, of course, several important academic publications that have attempted to fill this astro-green criminological void (Eski & Lampkin, in press; Lampkin, 2021; Lampkin & McClanahan, 2023; Lampkin & Takemura, in press; Lampkin & White, 2023; Lampkin & Wyatt, 2023; Rothe & Collins, 2023; Takemura, 2019; 2022).

The aforementioned preliminary nature of astro-green criminology as an area of interest within criminology, then, is precisely why it is worthy of future research and engagement. We hope that many academics now, and in the future, engage with AGC, particularly in a growing era of both public and private space expansionism. In fact, we see criminologists as a critical component of space expansionism. Although it is clear that natural scientists, astro-physicists, astro-biologists, astronomers, engineers, aerospace professionals, space lawyers, private corporations and publicly funded bodies (like NASA, and the European Space Agency, for instance) are the ones *doing* space exploration, development and expansionism, astro-green criminologists can offer valuable data, research, debate and discussion regarding the impacts that such activities are having on Earth, Earth's orbit and atmosphere, as well as on extraterrestrial environments. In that sense, astro-green criminology can be seen as the space industry's *critical friend*. The intention is not, necessarily, to stop or prohibit space development and expansionism, it is to provide a balanced, critical narrative to the space industry, through publishing research (of either a theoretical or practical nature) on issues that impact human health, non-human health, and natural world's within (mainly) our solar system (but also, possibly, beyond).

Although some radical green criminologists may criticise the 'critical friend' approach as being too accepting of space-related environmental harms (and we acknowledge there are strong arguments for the prohibition of space exploration for the preservation of Earth environments), it must also be recognised that space expansionism and, particularly, developments in satellite technology, have enabled incredible and vital monitoring of Earth climate and weather systems, meaning environments on Earth can be analysed and monitored, and catastrophes prepared for or averted. (Applied) green criminology, too, benefits from satellite technology. For instance, Global Positioning System (GPS) monitoring has been used to track deforestation (and wildlife poaching) rates. It has also been deployed to map illegal fishing activities, illegal sand mining and illegal shipping, at both a local and global scale across the world (White, 2023). It is clear, then, that outer space technologies can be a force for good on Earth, if developed responsibly, and for the right reasons (i.e. for climate monitoring, as opposed to space warfare technologies that are inherently dangerous for life on Earth).

To provide an example of how astro-green criminology may contribute to an informed and environmentally conscious space industry, we will now

discuss conducting research on the impact of space industry emissions from rocket launching on local (ground level) and atmospheric air and ozone pollution and depletion (Lampkin & Carpio- Domínguez, in press). Green criminologists researching astro-green issues are well placed to research such issues due to their experience of researching environmentally harmful and criminal endeavours over the last 35 years (since Lynch's original call for a *green* criminology in 1990). Undoubtedly, some will criticise this way of thinking by stating that the natural sciences also have the capability to study air pollution, and we do not deny that this is the case. However, what concurrently cannot be denied is the lack of attention to environmental harm and contamination with the global space industry; of which the impact of rocket launching is a good example. Although we (as a species) have been launching rockets towards space since the creation of the German V2 heavy rocket developed by Werner von Braun in the 1930s-1940s (Lampkin and White, 2023), the present state of understanding regarding the ecological impact of rocket launching remains, according to natural scientists, very weak (Ross and Vedda, 2018), almost a hundred years later. While green criminology has been criticised as being too reactive to instances of environmental harm, as opposed to taking a more solutions-based, reactive approach (Lampkin, 2020), an astro-green focus for criminology provides (astro)green criminologists with an opportunity to discuss, research, theorise and analyse environmental harm before the space industry expands exponentially, as is predicted for the coming decades (Deudney, 2020).

Green criminology is the right forum to approach zemiological space issues. This is because much of what is happening in space is beyond the remit of national jurisdiction, and space law (as an adjacent discipline) is frantically grappling with harmful and deviant actions in (or related to) outer space, as we speak. Orthodox criminology, that is, a discipline which has traditionally focussed primarily on the criminal law, is arguably not the best approach to studying potentially harmful outer space issues. To take a definition from a prominent undergraduate student textbook, *Criminology* is defined as the study of 'crime, criminals and criminal behaviour' (Carrabine et al. 2020). As there is no criminal jurisdiction in outer space, such basic interpretations of the remit of criminological enquiry are too limiting to include outer space within its natural scope. Therefore, more critical and radical approaches to the interpretation of criminological study that are broader and more inclusive (i.e. of harm alongside crime), are the most well-suited to studying astro-environmental problems that are, inherently, legal.

To continue the earlier example regarding ecologically harmful emissions produced from rocket launching, emissions of this kind are perfectly legal and, consequently, are 'beyond the purview of the (mainstream criminological) discipline' (Stretesky et al. 2014: 1), with its restricted focus merely on crime, criminals and criminal behaviour. However, should rocket emissions cause a harmful atmospheric impact leading to an acceleration of climate change, mainstream criminology would be criticised for not doing enough to research, identify or prevent cascading social and environmental harm which may, according to White (2020), lead to an increase in crime anyway (as issues like increases in global temperature have been found to correlate with paralleled spikes in crime rates due to heightened stress, aggression and strain). Criminology would thus be, again, reacting to crime as it happens, rather than taking a (seemingly) more effective, responsible and precautionary approach.

This is not to say that criminologists (without environmental interests) cannot become involved in other areas of outer space research. In 2023, Lampkin and White (2023) published their seminal work *Space Criminology: Analysing Human Relationships with Outer Space*, at almost the same time as Sachdeva's (2023) foundational manuscript, *Crimes in Space: Perspectives from Law and Justice*. These two books can be seen as attempts to introduce criminologists to issues of outer space that are not solely fixed on space environmentalism (i.e. astro-green criminologies). Instead, the issues discussed often focus on problems of corruption, fraud, tax avoidance, state-corporate crimes, discrimination, theft, intellectual property, interpersonal violence and the peculiarities of living and working in outer space (or on outer space projects, but on-Earth). A classic example of a non-environmental space criminological issue is the case of US astronaut Judith Lapierre who was verbally and sexually abused by Russian astronauts during an isolation experiment in 1998-1999 (Hermida, 2006). Consequently, if such matters of inter-personal violence happen in controlled environments on-Earth, there is nothing to say they will not occur during the extreme and isolated conditions required for human habitation off-Earth. Clearly, then, criminologists should be engaging with outer space issues.

With that in mind, criminologists can be seen as very late to the outer space scene. Other areas of social science have been engaging with outer space for some time now. Astro-sociology, for instance, is a relatively well established field with a growing body of research interest. Driven by American academic Dr Jim Pass (2024) and others, 'astro-sociology is the study of astro-social phenomena (i.e. the social, cultural, and behavioural patterns related to outer space)' (Pass,

2020: 144). Similarly, there are clusters emerging within astro-politics (Salla, 2014), astro-theology (Peters, 2018), astro-archaeology (Gorman, 2019) and space art (Malina, 1991). Why, then, has there been a prolonged absence of space criminology and astro-green criminology within the academic literature?

4. The 'Astronoetic' in Astro-Green Criminology

In light of this question, our purpose of a cross-disciplinary analysis of astronoetics and astro-green criminology is to elucidate the implicit and harmful background conditions that constitutes humanity's cosmic indifference, which Blumenberg, Heidegger, and Ardent so vehemently expressed. Where astro-green criminology primarily concerns and critiques outer-space as the new frontier of appropriation and exploitation, astronoetics concerns the subjective registers of ordinary meaning and experience, and the intelligibility that preconfigures complicity within such appropriation and exploitation. More succinctly, the 'astronoetic' in astro-green criminology seeks to elucidate the theoretical centrifugal curiosity (or lack thereof) within the legitimisation of outer-space harms and crimes.

The theoretical centrifugal curiosity, as discussed, presents a twofold transcendence and a rich journey of imagination, that is – to look both beyond ourselves, but also back at ourselves (Ambroży, 2020). Here, we recognise that humanity's ability to perpetuate harm beyond the spatial and temporal conditions of our world is deeply entangled with the phenomenological relationship with outer-space, which differs tremendously throughout time and culture (see, for instance: Chen and Bu, 2019; Finney, 1985; Holmes, 2013; Winder, 2019). It is for this reason that we explicate the value of the theory of praxis, because the existential scenes of human life – irrespective of conscious awareness – determines our modes of thinking and harming our planet and beyond (Valera, 2018). Moreover, the theoretical centrifugal curiosity presents an opportunity of self-realisation with respect to the contemporary deep-seated anthropocentricism, which is, perhaps, a pathway for future research. That is, the contemplation of outer-space ethics and human actions (looking beyond ourselves) provides a mirror to the absurdity of the contemporary human condition and the ecocidal disregard of nature (looking back at ourselves).

The notion of cosmic indifference, which shapes the foundation for recognising the significance of astronoetic deliberations within astro-green criminology, is also intricately linked to world-picture, the cornerstone of our argument. The world-picture of Earthrise has substantial implications towards the acquiescence of outer-space harms and crimes, and the sense of place within the cosmic environment. Heidegger, upon viewing Earthrise, for instance, frighteningly expressed that 'we don't need any atom bomb. *The uprooting of man has already taken place*. The only thing we have left is purely technological relationships. *This is no longer the Earth on which man lives*' (Wolin, 1992: 105-106). For Heidegger, the pictorial image of the Earth annihilated our 'world' (the intersubjective meaning through which our human agency exists) and has been replaced by the mediation of controllable and manipulatable images (see also: Belisle, 2020).

As we have argued earlier, the world-picture of Earthrise and its semiotic capacity has reconstructed the human being as *subiectum*, which has hallowed the astronoetic venture in preference for globalisation and the complicity of terrestrial and extraterrestrial welfare within daily life. In the modern day, the world-picture of Earthrise – and its implicit existential commitments – has quietly progressed and instilled itself into new technologies, such as Google Earth and Solar System Simulators. These technologies, despite their obvious benefits, elucidate an extraordinary power that is alien to any culture throughout human history. That is, the power to reduce Earth into an immersive virtual dimension, whereby any individual, with their personal Apollonian eye, can effortlessly manipulate the planet's cosmic essence – pinching, spinning and expanding its horizons, exploring and transcending its depths in artificial time, reordering its velocity, and even rewriting the fundamental principles of physics at whim. The individual, encapsulated with seemingly infinite algorithms and complex representations, is emersed within both a 'here-and-now and (within) a global everywhere-at-once' (Belisle, 2020: 116).

5. Conclusions

Our argument, of course, is susceptible to critique because one need only explicate the benefits and usefulness of such technology for the contemporary human condition. Astronoetically motivated, however, we argue that this critique is premised on short-termism and neglects to consider the long-term consequences of destroying the intricate thread between human existence and outer-space, as Heidegger warned. Many cultures throughout human history (e.g., the Pythagoreans, Polynesians, and those of Ancient Chinese thought) conceived outer-space as a map of meaning and order, which they embraced to structure their ways of living. These cultures, then, adopted a particular astronoetic world-picture, which, in alignment with Arne Næss' suggestion, positioned the human being and the cosmos in a unitary wholeness. Many indigenous and antiquitous cosmologies, in contrast to an exploitative modern

cosmology, offer substantial value towards outer-space harms and crimes prevention and can further the study of an astronoetic astro-green criminology, which we recommend for future research.

In a paradoxical twist of modern cosmology, particularly within the Western world, we have reeled outer-space 'closer' through developing and fostering practices like space mining, space tourism, and innovative artificial visualisations. Yet, despite these practices, we have become as distant to outer-space as ever before. We have, as Blumenberg indicated, encapsulated ourselves within our atmospheric cave and have lost the astronoetic tradition of the night sky.

For this reason, we argue that the value of our proposal to integrate astronoetics with astro-green criminology lies within the existential and meaning-making process of outer-space and ontologies of representation which can contest illegitimate ideologies, such as space capitalism. Due to its loose perspective and ability to address many non-conventional causations of harms and crimes, green criminology is well positioned to not only reignite the astronoetic tradition, but also to develop the subfield as a catalyst for change and a conceptual tool to confront illegal and harmful outer-space activities. We, therefore, invite green criminologists to embrace astronoetics as an innovative, creative, and insightful approach that disentangles the complexities of our phenomenological meaning of outer-space – the fundamental source from which the multitude of cosmic transgressions originate. It is only through a radical transformative shift in our ways of thinking that we can hope to rectify and overcome the destructive issues that plague the cosmic environment.

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