The Postgraduate Reflexive Sky Journal: Teaching the Inspiration of Astronomical Phenomena at the University of Wales Trinity Saint David

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Abstract: This paper reports on how the founding ideas of the conferences on the Inspiration of Astronomical Phenomena have been taken forward and incorporated into the curriculum of the MA in Cultural Astronomy and Astrology (CAA) at the University of Wales Trinity Saint David. The MA had a number of foundational origins prior to its launch in October 2002. One was a major colloquium in the history of astrology at London University's Warburg Institute in 1984, which initiated a new wave in the historiography of astrology. A second was the Oxford/SEAC conference in 1999, with its emphasis on archaeoastronomy. The third was the Second INSAP conference in Malta in January 1999. INSAP does something that no other academic network or institution allows, other than the University of Wales Trinity Saint David, namely the exploration of, and presentation of, creative work, inspired by awe or wonder of the sky, or enchantment aroused by the stars, planets and heavens.

All students on the MA CAA are required to undertake an assignment which involves observing a feature of the sky for up to a month. They keep reflexive records of their observations, including photographs, drawings, items of text, or poems that they produce. They then use this as a primary source which they write up within an academic framework. In so doing, they observe the sky, create artwork, and then report on both. Significantly, students are reporting critically on their own artwork, rather than someone else's. We therefore encourage students to produce work which is simultaneously, observational, creative, artistic and academically rigorous.

Introduction: Education, Astronomy, Theory and Practice

This paper deals with education in Cultural Astronomy. It reports on an innovatory piece of assessment in the MA in Cultural Astronomy and Astrology at the University of Wales Trinity Saint David, a 2000-word

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essay based on a Reflexive Sky Journal, and follows other papers on the programme.[1] The exercise requires students to observe the sky directly, without artificial aids such as telescopes or binoculars, and to report on and analyse their experiences. The paper introduces the rationale for the assignment in educational theory and the concepts of enchantment, awe and wonder, documents the practical requirements, and summarizes three examples. We take our cue from the sentiments expressed by Shazrene Mohamed's statement that 'The Sky is for Everyone'.[2] Or, equally we adopt Jörg Matthias Determann's claim that, historically, the 'the sky, was

[1] Bernadette Brady and Alison Bird, 'A Niche Degree: A Case Study of an MA (in Cultural Astronomy and Astrology)', *DISKUS*, Teaching and Learning (2013), Vol 14, pp.55–69; Nicholas Campion, 'An Innovatory Course – Cultural Astronomy and Astrology at Bath Spa University College', *British Association for the Study of Religions Bulletin* 99 (June 2003): pp.25–27, https://basrblog.files.wordpress.com/2014/07/basr-bulletin-june-2003.pdf; Nicholas Campion, 'Teaching Cultural Astronomy: On the Development and Evolution of the Syllabus at Bath Spa University and the University of Wales, Lampeter', in *African Cultural Astronomy: Current Archaeoastronomy and Ethnoastronomy Research in Africa*, ed. by Jarita Holbrook, Rodney Medupe and Johnson Urama (Berlin: Springer, 2008), pp.109–19; Nicholas Campion, 'Teaching Cultural Astronomy: An Update from the University of Wales Trinity Saint David, 28th Annual Conference of the European Society for Astronomy in Culture (SEAC), Stara Zagora, Bulgaria, September 6–10, 2021; Nicholas Campion, 'Developing a Curriculum in Cultural Astronomy: a report on developments at the University of Wales Trinity Saint David', 29th Annual Conference of the European Society for Astronomy in Culture (SEAC), Timosoara, September 5–9, 2022; Nicholas Campion and Jarita Holbrook, 'Cultural Astronomy: A Conversation about Degree Programs & Research Questions from Both Sides of the Pond', *Spark: The American Astronomical Society Education Newsletter* (Washington DC: AAS, 6 (June 2008): pp.9–11. https://aas.org/publications/spark; Nicholas Campion and J. McKim Malville, 'Masters Level Education in Archaeoastronomy at the University of Wales Trinity Saint David', in Clive Ruggles, ed., *Archaeoastronomy and Ethnoastronomy: Building Bridges Between Cultures*, Proceedings of International Astronomy Union Symposium 278 (the 9th "Oxford" International Symposium on Archaeoastronomy), Lima, Peru, 4–14 January 2011, (Cambridge: Cambridge University Press), pp.357–63.

[2] Shazrene Mohamed, 'The Sky is for Everyone', in *The Sky is for Everyone: Women Astronomers in Their Own Words*, Virginia Trimble and David A. Weintraub, eds (Princeton, NJ: Princeton University Press: 2022), pp.411–22.

in principle accessible to almost anybody'.[3] As Determann writes, 'Astronomers of different identities existed for as long as humans have looked up to the sky and wondered about the universe'. Anyone can therefore be an astronomer.

The assignment was devised by two members of staff, Dr Darrelyn Gunzburg and Dr Bernadette Brady. Each member of staff brings their own academic specialities to their teaching which, in the case of Drs Gunzburg and Brady, are the history of art and anthropology, together with the personal experience of visual astronomy. Direct engagement with the sky and celestial phenomena as part of the academic and learning process is justified in the MA by Ed Krupp's statement concerning his experience of Stonehenge:

> One should make a point of being there. Celestial events take place in context. When you see what actually happens in the landscape, you learn a great deal more about it. It is, of course, possible to determine the alignment of a building with instruments, but nuances of light and shadow details of the horizon, difficulties in practical observation, and many more subjective aspects of a site can only be appreciated in person.[4]

The Sky Journal assignment was developed both because we regard it as necessary for students to conduct direct observation of the sky and because students are also required to conduct field work amongst human subjects using interviews and or questionnaires.[5] Bearing in mind the recent extension of anthropological research to what Irving Hallowell termed the 'non-human other', we now talk about the students extending the methodologies involved in interviewing human subjects, to 'interviewing the sky'.[6] A central methodological approach we have applied since 2003 is phenomenology, a methodology which has a variety of approaches, but

[3] Jörg Matthias Determann, *Diversity, Equity and Inclusion in Modern Astronomy* (Amsterdam: Springer Verlag, 2023), p.11.
[4] Ed Krupp, HASTRO History of Astronomy e mail list 8 August 1995, cited in Clive Ruggles, *Astronomy in Prehistoric Britain and Ireland* (New Haven, CT, and London: Yale University Press, 1999), p.151.
[5] See David Silverman, *Doing Qualitative Research: A Practical Handbook* (London: Sage Publications, 2002).
[6] See Irving A. Hallowell, 'Ojibwa Ontology', in Dennis Tedlock and Barbara Tedlock, eds., *Teachings from the American Earth: Indian Religion and Philosophy* (New York: Liveright, 1975), pp.141–78.

which we define as the attempt to engage with any phenomenon, be it human attitudes or actions, or natural occurrences, as free as possible from preconceptions or biases.[7] Clark Moustakis saw the basis of phenomenological research as the experience of the *hyle*, or material object, but with the consequent internal experience through consciousness. Appropriately for the sky journal assignment, Moustakis used the observation of the Moon as his example, citing other authors (I have retained his intext citations),

> Intentional experience *refers* to real entities, objects that actually exist. [Friedrich] Frege pointed out long ago that when somebody is thinking about the moon, it is not just the idea of the moon but of an actual, intentional experience in which the moon is the appearing reference or phenomenon (Follesdal, 1982, p. 32).
>
> Every intentional experience is thematic. The interactions of appearing phenomena and acts of consciousness are brought together with at least one team or reference (Husserl, 1931, p. 304). This is the positive character of intentional experience; at least one thesis is always positive in the concrete make up of experience.
>
> Another aspect of intentional experience is its *hyletic* character – what the experience includes in the way of sensations and feelings. The *hyle* are experiences that we undergo when we see objects that we perceive or features of objects such as the colors and shapes (Dreyfus and Hall, 1982, p. 39). These contribute to the sense or meaning of any intentional experience. Meaning is at the heart of a transcendental phenomenology of science.[8]

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[7] Harvie Ferguson, *Phenomenological Sociology: Experience and Insight in Modern Society* (London: Sage Publications, 2006); Jonathan A. Smith, Paul Flowers and Michael Larkin*, Interpretative Phenomenological Analysis: Theory, Method and Research* (London: Sage, 2009).

[8] Clark Moustakas, *Phenomenological Research Methods* (Thousand Oaks, CA: Sage Publications,1994), p.56, citing H.L. Drefus and H. Hall, *Husserl, intentionality and cognitive science* (Cambridge: MIT Press, 1982), p.42; D. Follesdal, 'Brentano and Husserl on intention objects and perception', in H.L. Drefus and H. Hall, *Husserl, intentionality and cognitive science* (Cambridge: MIT Press, 1982), pp.31–41 (p.32); and Edmund Husserl, *Ideas: General Introduction to Pure Phenomenology*, (London: Collier-MacMillan, 1972 [1913, trans. W.R. Boyce Gibson trans.1931]), p. 304.

The goal of the assignment is therefore to engage with the visual sky, with what it looks like and how it is subjectively experienced. The assignment has three key, interlocking requirements. Students:

1. observe one feature of the sky for a month,
2. compile a personal journal consisting of reflexive records of their observations, including photographs, drawings, items of text, or poems that they produce. In so doing, they observe the sky, create artwork, and then report critically on both.
3. use their journal as a primary source which they write up within an academic framework, using additional primary and secondary sources in order to critically examine their own experience.

Significantly, students are reporting critically on their own artwork, rather than someone else's. We therefore encourage students to produce work which is simultaneously, observational, creative, artistic and academically rigorous. These are the official directions for the first phase, observation:

> A Sky Journal is a piece of research using the sky as the primary document. You will observe the sky for a month and focus on one or several particular features recorded either by drawing or photographing the changes in these sky features or sky and landscape features. For example:
>
> i. The moon and its phases, and or its rising and setting positions
> i. The visibility of planets and their movement against the stars or their rising and settings.
> ii. Sun rises or sun sets – nature, colour and visibility and/or horizon location.
> iii. The observation of one or more constellations and their shift from one night to the next.
> ii. The sky's relationship to a landscape.
> iii. Clouds in a day sky

A key part of the exercise is to observe the changes that take place either during an observation, or from one observation to another. The sky as a dynamic entity may then be different to that portrayed in astronomy texts. The experience is not superior to the structures and mathematics of scientific astronomy, but it is different.

The third stage, critical analysis, is framed within quotes from two primary sources. The directions read:

> Rather than merely reporting on or summarising this data, you are required to analyse it and consider its significance in relation to ONE of the following quotations:
>
> 1. 'To think is to walk among clouds.' (Alexandra Harris, *Weatherland: Writers & Artists under English Skies*. (London: Thames & Hudson, 2015), p.245).
>
> OR
>
> 2. 'Be clearly aware of the stars and infinity on high. Then life seems almost enchanted after all'. (Vincent van Gogh, and Ronald de Leeuw. *The Letters of Vincent Van Gogh* (London: Penguin Books, 1997), p.392).

Students are then free to go on and use additional primary or secondary sources, exactly as they would do in any other academic writing. For these purposes academic sources are defined strictly as those written either as an analysis by a current or retired academic, or those published an academic journal.

Pedagogy: Experiential Learning

Wider educational theory which frames the Sky Journal is rooted in Jean Piaget's theories of experiential learning, in which learners construct knowledge on the basis both of experience and their own backgrounds and cultures.[9] The theory is reinforced by John Dewey's concept of learning as active experience.[10] Piaget and Dewey were concerned with children's

[9] Jean Piaget, *Psychology and Epistemology: Towards a Theory of Knowledge* (New York: Grossman, 1971). See also the summary in Karl Aubrey and Alison Riley, *Understanding and Using Educational Theories* (London: Sage, 2022), p.11. See also *David A Kolb, Experiential Learning: Experience as the Source of Learning and Development* (Englewood Cliffs, NJ.: Prentice-Hall, 1984); Peter C. Brown, Henry L. Roediger III, and Mark A. McDaniel, *Make it Stick: The Science of Successful Learning* (Cambridge, MA: Harvard University Press, 2014).

[10] John Dewey, *My Pedagogic Creed* (New York and Chicago: E.L. Kellogg, 1987).

education but their theories are equally applicable to adults. Dewey argued that adult-created educational structures tend to be 'foreign to the existing capacities of the young' and 'are beyond the reach of the experience the young learners already possess'.[11] As Aubrey and Riley stress, the emphasis is on learning as 'active experience', nurtured by 'habits of criticism and free inquiry', and students being 'actors' rather than 'spectators'.[12] As applied to school children, Aubrey and Riley define active experience as

> Learning as an active process which involves the interests and experiences of the individual children rather than being restricted to single subject teaching sessions. An active experience teachers act as facilitators, enabling the learners to make connections between different experiences through socially interactive techniques such as discussions and debates, which stimulate enquiry and discovery.[13]

A key feature of learning through experience is experimentation, which Aubrey and Riley define as,

> A scientific, reflective and interactive approach whereby children learn by discovery and enquiry to make sense of their world rather than being docile receivers of information.[14]

Piaget and Dewey wrote about early years learners – young children – but the value of experiential learning which they espoused can apply to any age group. 'Action research' it is argued, is highly valuable across the student body: as Peter Reason writes, it emphasises action within the world, rather than interpretation, and therefore representation of it.[15] Action research requires engagement with objects of study beyond observation and recording them. Participatory action research is a highly politicised variant rooted in the work of Paulo Freire and his 1970 book,

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[11] John Dewey, *Experience and Education* (New York: Kappa Delta Pi, 1938), p.19, cited in Aubrey and Riley, *Understanding and Using Educational Theories*, p.11.
[12] Aubrey and Riley, *Understanding and Using Educational Theories*, p 11.
[13] Aubrey and Riley, *Understanding and Using Educational Theories*, p.23.
[14] Aubrey and Riley, *Understanding and Using Educational Theories*, p.23.
[15] Peter Reason and Hilary Bradbury, eds, *The Sage Handbook of Action Research: Participative Inquiry and Practice,* 2nd edn (Los Angeles, CA: SAGE, 2008), p.3.

The Pedagogy of the Oppressed, which argued that education should be designed to facilitate collective liberation.[16] In the sky observation exercise the intent is for the reflexive and creative elements of the assignment to engage the individual student with the sky. For reflective methodology, in which researchers must be aware of their own internal processes, students rely on Kim Etherington's work.[17] A good researcher, as Phillips and Pugh wrote, is not one who knows the right answers but one who is struggling to find out what the right questions might be.[18] Students may not be able to change the sky, but they can change themselves, becoming more aware of their place within the greater ecology of the universe. This is often talked about as self-awareness but it could equally well be understood as liberation from previously accepted norms. We draw on other pedagogical theories such as participatory action research, in which the learner learns through direct experience rather than being instructed, as developed by Orlando Fals-Borda, building on Paulo Freire's work.[19] Social constructivism also comes into play: it explicitly emphasises the extent to which knowledge, and therefore personal development, is socially constructed and situated, and therefore depends on interaction with others. As Thomas Schwandt wrote,

> The constructivist or interpretivist believes that to understand this world of meaning one must interpret it. The enquiry must elucidate the process of meaning construction and clarify what and how meanings are embodied in the language and actions of social actors. To prepare an interpretation is itself to construct a reading of these meanings; it is to offer the inquirer's construction of the constructions of the actors one studies.[20]

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[16] Paulo Freire, *The Pedagogy of the Oppressed* (New York: Bloomsbury, 2000 [1970]).
[17] Kim Etherington, *Becoming a Reflexive Researcher: Using Ourselves in Research* (London: Jessica Kingsley Publishing, 2004).
[18] Estelle Phillips and Derek S. Pugh, *How to get a Phd: a Handbook for Students and their Supervisors* (London: McGraw-Hill Education, 2010), pp.48–9.
[19] Paulo Freire, *The Pedagogy of the Oppressed* (New York: Bloomsbury, 2000 [1970]); Orlando Fals-Borda, ed., *Action and knowledge: breaking the monopoly with participatory action research* (Rugby: Practical Action Publishing, 1991).
[20] Thomas A. Schwandt, 'Constructivist, Interpretivist Approaches to Human Inquiry', in Norman K. Denzin and, Yvonna S. Lincoln, eds, *The landscape of qualitative research: theories and issues. Thousand Oaks* (London and New

The reflective component of the sky journal exercise therefore allows students to consider the ways in which they have constructed their world views. Kim Etherington defined the various components of reflexive research, including the following requirement:

> Reflexivity requires self-awareness but is more than self-awareness and that it creates a dynamic process of interaction within and between ourselves and our participants.[21]

We also need to consider the nature of the social actor and consider non-human actors. In this respect we can consider the nature of the 'other' as Irving Hallowell's non-human other, a category which can include any non-human phenomenon.[22] The idea is actually not so new. Most traditional cosmologies consider the sky to be a social phenomenon to the extent that we can talk about the social sky.[23] One of the most influential figures in western astronomy wrote two texts on the subject. One, known from the Arabic as the *Almagest*, dealt with mathematics and motion. The other, known from the Latin as the *Tetrabiblos*, dealt with the effects of mathematics and motion in the social world (the interpretative scheme now known as astrology, although not described as such by Ptolemy).[24] Therefore the Sun, Moon, clouds and other sky phenomena that the students examine constitute a non-human other in Iwaniszewski's sky-as-a-social-field.

Awe, Wonder and Enchantment

Engagement with the sky also has the capacity to engage the same sense of awe, wonder and enchantment in adults as Piaget and Dewey find present in small children. The root of the word enchantment is the Latin

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Delhi: Sage Publications, 1988), pp.221–59 ; J. McKinley, 'Critical Argument and Writer Identity: Social Constructivism as a Theoretical Framework for EFL Academic Writing', *Critical Inquiry in Language Studies* 12, no 3 (2015) pp.184–207. https://doi.org/10.1080/15427587.2015.1060558.

[21] Etherington, *Becoming a Reflexive Researcher*, p.36.

[22] Hallowell, 'Ojibwa Ontology', pp.141–78.

[23] Stanislaw Iwaniszewski, 'The sky as a social field', in Clive Ruggles, ed., *Archaeoastronomy and Ethnoastronomy: Building Bridges Between Cultures*, Proceedings of International Astronomy Union Symposium 278 (the 9th "Oxford" International Symposium on Archaeoastronomy), Lima, Peru, 4–14 January 2011 (Cambridge: Cambridge University Press), pp.30–37.

[24] Claudius Ptolemy, *Tetrabiblos*, trans. F.E. Robbins (Cambridge, MA: Harvard University Press, 1940), I.1.

cantare, 'to sing', from which are derived the English chant, as in the plain chants recited in medieval cathedrals, enchant, as in bewitch, charm or delight and the Spanish *encantar*, meaning 'to love'. The great fifteenth-century Italian philosopher Marsilio Ficino reminds us that 'song is a most powerful imitator of all things. It imitates the intentions and passions of the soul as well as words'.[25] And what does song do? It enchants. And as Patrick Curry writes, 'The heart of true enchantment is sheer existential wonder'.[26]

The contemporary concern with enchantment as an existential phenomenon is largely a reaction to the widespread view that modern western society became disenchanted as a result of the scientific and industrial revolutions. According to this model, the experience of life as qualitatively rich and meaningful was suppressed by an over-emphasis on technology and quantification of human experience and a view of existence as essentially meaningless. The poet, playwright and philosopher Friedrich Schiller came up with the phrase, *die Entgötterung der Natur*, the 'disgodding of nature' referred to what he saw, and disapproved of, as the 'progressive removal of mind, or spirit, from phenomenal appearances', the world of phenomena experienced through the senses.[27] In 1918 Max Weber adapted Schiller's phrase as *die Entzauberung der Welt* ('the disenchantment of the world') to describe the spiritual plight of humanity in the modern era, using it as a leitmotif for cultural discontent: 'The fate of our times', he wrote, 'is characterized by rationalization and intellectualization and, above all, by the "disenchantment of the world"'.[28] Weber added that disenchantment,

> means that principally there are no mysterious incalculable forces that come into play, but rather that one can, in principle, master all things by calculation. This means that the world is disenchanted.

[25] Marsilio Ficino, *Three Books on Life*, eds Carole C. Kaske and John R. Clark (Center for Medieval and Early Renaissance Studies, Binghamton: State University of New York at Binghamton, 1989), III.21, p.359.
[26] Patrick Curry, *Enchantment: Wonder in Modern Life* (Edinburgh: Floris Books, 2019), p.13
[27] Morris Berman, *The Reenchantment of the World* (Ithaca and London: Cornell University Press, 1991), p.69.
[28] Max Weber, 'Wissenschaft als Beruf' ('Science as a Vocation'), in *Gesammlte Aufsaetze zur Wissenschaftslehre* (Tubingen: 1922), pp.524–55. Originally a speech given at Munich University, 1918, published in 19l9 by Duncker & Humboldt, Munich.

> One need no longer have recourse to magical means in order to master the spirits, as did the savage, for whom such mysterious powers existed. Technical means and calculations perform the service. This above all is what intellectualization means.[29]

However, disenchantment was by no means a universal feature of modern society and powerful voices have spoken in favour of the experience of enchantment. In 1869 in his great novel, *War and Peace*, Leo Tolstoy put these words into the mouth of his great character Pierre:

> Don't I feel in my soul that I am a part of the vast, harmonious whole? Don't I feel that I constitute one link, that I make a degree in the ascending scale from the lower orders of creation to the higher ones…. We must live, we must love, we must believe that we have life not only today on this scrap of earth but that we have lived and shall live for ever, there, in the Whole'.[30]

That the universe is full of awe and wonder is a standard trope of modern astronomy. The great science populariser Carl Sagan wrote that,

> the universe has a reeling and ecstatic grandeur, not only that it is accessible to human understanding, but also that we are, in a very real and profound sense, a part of that Cosmos, born from it, our fate deeply connected with it.[31]

Fred Hoyle, one of the best known of British astronomers in the latter part of the twentieth century, wrote that

> our everyday experience even down to the smallest details seems to be so closely integrated to the grand-scale features of the Universe that it is well-nigh impossible to contemplate the two being separated'.[32]

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[29] Max Weber, *From Max Weber: Essays in Sociology*, eds H.H. Garth and C. Mills Wright (London: Kegan Paul, Trench, Trubner & Co., 1947), p.139.
[30] Leo Tolstoy, *War and Peace*, trans. Rosemary Edmonds (Harmondsworth, Middlesex: Penguin Classics Version, 1982), Book Two, Part Two, Chapter 12, p.455.
[31] Carl Sagan, *Cosmos: the Story of Cosmic Evolution, Science and Civilisation* (London: Warner Books 1994), p.12.
[32] Fred Hoyle, *Frontiers of Astronomy* (BiblioBazaar, 2011), p.304.

Awe has recently become a topic of psychological and sociological research, beginning with the 2003 paper by Dacher Keltner and Jonathan Haidt.[33] The 2018 paper by Summer Allen, prepared for the John Templeton Foundation, set out to examine the concept, recognising that, while we can acknowledge that it has a central meaning, it can have a range of manifestations based on individual conditions, as in psychological predispositions, or social and collective, as in culture.[34] Further research was conducted by Megan P. Cuzzolino. She interviewed scientists who, she found, used words such as astonishment, amazement, reverence and wonder, and described experiences of the vastness of the universe, of being 'in flow', and as 'a reaction to something deeply profound or significant'.[35] Cuzzolino observes that a feeling of awe can arouse curiosity and, therefore critical inquiry into the nature of the world.[36] Hence awe is not an alternative to science, but a sometimes essential part of the process that encourages and sustains such an inquiry. [37]

Daniel Silva Luna and Jesse M. Bering, meanwhile, considered responses to what they call 'evocative science subjects'.[38] For us, this includes astronomy. Luna and Bering studied attendees at a science communication event and noticed that, while the professional science communicators believed that attendees should express awe, they actually expressed a range of emotions, including boredom and irritation. This

[33] Dacher Keltner and Jonathan Haidt, 'Approaching awe: a moral, spiritual, and aesthetic emotion', *Cognition and Emotion* 1,7 no 2 (2003): pp.297–314. See also 'The Science of Awe', A white paper prepared for the John Templeton Foundation by the Greater Good Science Center at UC Berkeley, https://ggsc.berkeley.edu/images/uploads/GGSC-JTF_White_Paper-Awe_FINAL.pdf; *Greater Good Magazine: Science-Based Insights for a Meaningful Life*, 'Podcast: the Science of Awe, https://greatergood.berkeley.edu/podcasts/series/the_science_of_awe [accessed 29 December 2024].

[34] Summer Allen, 'The Science of Awe', Greater Good Science Centre, UC Berkley and John Templeton Foundation, September 2018.

[35] Megan P. Cuzzolino, '"*The Awe is in the Process*": The nature and impact of professional scientists' experiences of awe', *Science Learning in Everyday Life* 105 (2021): pp.681–706 (p.691).

[36] Cuzzolino, "*The Awe is in the Process*", p.691.

[37] Cuzzolino, "*The Awe is in the Process*", pp.683, 691.

[38] Daniel Silva Luna and Jess M Bering, 'The construction of awe in science communication', *Public Understanding of Science* 30, no. 1 (2021): pp.2–15 (p.10).

breadth of responses, Luna and Bering concluded, were 'products of one's unique situational and sociocultural experiences… not just push-button reactions'.[39] UWTSD students, in line with phenomenological methodology, are therefore encouraged to express whatever they feel. They typically report experiences of awe and enchantment but might also relate their observations to whatever other mundane experiences dominate their days.

The experience of the sky, of course, can rarely be entirely separate from the experience of the land that frames the sky. Alexander Smalley and Mathew White therefore considered the manner in which experiences of the sky vary in line with more immediate contexts of the natural or urban environment.[40] Students are therefore encouraged to take immediate environmental factors into account. For example, if the observations are taking place from a city at night, then street lights will be a necessary part of the experience, rather than an impediment to it. The question then arises as to whether technology is an impediment to enchantment. We advise our students to look at the sky without the aid of any mediating technology because we want them to have the direct experience. However, it is still the case that technology can aid enchantment, as I have argued elsewhere.[41] The enchanting effects of the Overview Effect, the inspiring sight of the Earth from space, are actually dependent on technology, in this case the mechanics of space flight.[42]

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[39] Luna and Bering, 'The construction of awe', p.10.

[40] Alexander Smalley and Matthew White, 'Beyond Blue-sky Thinking: Diurnal Patterns and Ephemeral Meteorological Phenomena Impact Appraisals of Beauty, Awe, And Value In Urban And Natural Landscapes', *Journal of Environmental Psychology,* 86 (2023): pp.2–12.

[41] Nicholas Campion, 'Enchantment and the Awe of the Heavens', in Enrico Maria Corsini, ed., *The Inspiration of Astronomical Phenomena VI*, Astronomical Society of the Pacific Conference Series Vol. 441 (2011), pp.415–22. See also John McCarthy, Peter Wright, Jayne Wallace and Andy Dearden, 'The experience of enchantment in human–computer interaction', *Pers Ubiquit Comput* 10 (2006): pp.369–78. DOI:10.1007/s00779-005-0055-2.

[42] Frank White, *The Overview Effect: Space Exploration and Human Evolution,* 4th edn (NP: Multiverse Publishing, 2023), pp.3–5.
; See also H.A.T van Limpt-Broers, M. Postma, E. van Weelden *et al.*, 'Neurophysiological evidence for the overview effect: a virtual reality journey into space', *Virtual Reality* 28, no.140 (2024). https://doi.org/10.1007/s10055-024-01035-7.

Sky Journal Case Studies

Three students gave me permission to report on their sky journal essays. The footnotes from now on in all three case studies are the students' own. The purpose of these extracts is to show the students' interplay of their own sky journals, recording their observations and experiences, with their reflections and reference to additional primary and secondary sources.

Student Case Study 1

The first example is from a student who wishes to remain anonymous and who reported on observations of Jupiter in the evening sky, as seen from the eastern coast of Sicily during October and November 2023, together with the Moon at times when it was rising in the evening. Student 1 began by examining the theoretical framework, investigating concepts of awe and wonder, citing Gallaher *et al.*:

> Bruce Jantz described 'thaumazein' and 'admiratio' as two different aspects of wonder in reference to the experiences of astronauts in space.[43]
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> According to Janz, thaumazein is common in the current understanding of phenomenology, and its name derives from Thaumas, a Greek God. This deity related to mystery and transcendence in Greek mythology. Citing Plato's (427-347 BC) *Theaetetus*, which is a dialogue about the essence of knowledge, Janz referred to a statement made by Socrates (c. 470 – 399 BC): 'philosophy begins in wonder'.[44]
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> Jacob Hoerger, quoting a character from the 2014 movie *Interstellar*, wrote that 'we used to look up in the sky and wonder at our place in the stars'; 'Now we just look down and worry about our

[43] Shaun Gallagher, Lauren Reinerman-Jones, Bruce Janz, Patricia Bockelman, and Jörg Trempler, *A Neurophenomenology of Awe and Wonder: Towards a Non-Reductionist Cognitive Science* (New York: Palgrave McMillan, 2015), cited in Bruce Janz, 'Awe, Wonder, And Creativity', *Log* 42 (2018): pp.145–52 (p.149).

[44] Plato, *Theaeteus*, trans. Harold North Fowler (Cambridge, MA, and London: Harvard University Press, 1929), 155 D-E, cited in Bruce Janz, 'Awe, Wonder, And Creativity', *Log*. 42 (2018): pp.145–52 (p.149).

> place in the dirt'.[45] With this direct quote, Hoerger appears to have summarized the ideas I feel compelled to deal with whenever I engage in any sort of prolonged sky observation. On day one I wrote in my sky journal:
>
> 'Jupiter visible to the East above the Calabrian mountains. First quarter Moon to the South (culminating), clear skies, no wind, warm temperature. Sense of quiet, Jupiter looks bright and sharp in a completely dark sky'.[46]
>
> On October 5th I wrote:
>
> 'Partly cloudy skies, Jupiter is not visible. The gibbous Moon is well visible at around 50 degrees of altitude, to the Southeast. Its luminosity is quite powerful and it creates a vivid reflection upon the strait'.

The student then continued with their commentary, documenting their observations and citing Plato and Max Weber.

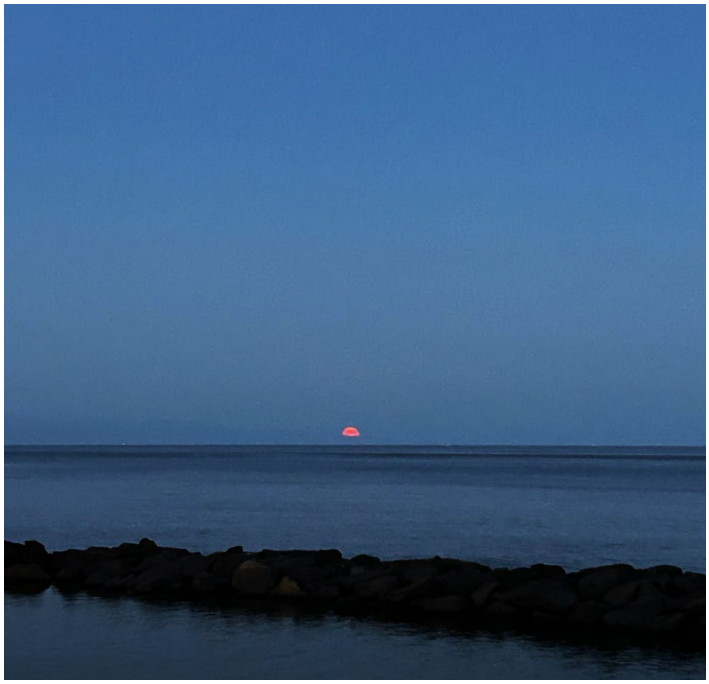
> I had not had a chance to observe Jupiter over the last couple of days, but I wanted to believe that the Moon was in the Southern portion of the Eastern sky to somehow comfort me. I went back around an hour later, and the same cloud had expanded, covering a larger section of the sky. It would not be possible to observe Jupiter that evening, so the best I could do was to appreciate what I could actually see. Therefore, I began 'inviting' details from the sky, rather than searching for anything in particular. Both Jupiter and the Moon would come back to the East the next day, and I could be sure about it. In that instance, I recognized a faint connection with Plato's ideas on eternity. In the *Timaeus*, he wrote about the 'moving image of eternity'.[47]
>
> The interpretation of the sky through an understanding of symbol and divinity is a practice that has accompanied humanity for millennia, though this concept may appear quite foreign in a modern

[45] Jacob Hoerger, 'Missing the Night Sky', *The New Atlantis* 48 (2016): pp.115–131 (p.115).
[46] Student 1: Sky Journal, October 22, 2023.
[47] Plato, *Timaeus*, 37 D-E, Loeb Classical Library.

> disenchanted society of a Weberian type. Max Weber addressed the modern tendency to relegate the mystical aspect of life to contained parts of society, while the large community appears to be unable to embrace contemplation.[48]

The student then records an experience of transcendence.

> A peak contemplative experience occurred to me at the Full Moon of late October… On October 29th I had the opportunity to observe the moonrise from the coast.
>
> Both the Moon and Jupiter are clearly visible while they rise above the horizon. There is a sense of culmination, a perception of divinity, as if I were going through a peak experience in my journalling.[49]



[48] Max Weber, *From Max Weber: Essays in Sociology*, trans. H. H. Gerth and C. Wright Mills (New York: Oxford University Press, 1946), p.155.
[49] Student 1, Sky Journal, October 29, 2023.

Fig. 1. Student 1: ‘Moonrise over the Ionian Sea, Sky Journal, Messina, October 2,9 2023’.

The student then concluded with what I am calling total astronomy: an experience of celestial bodies that is inseparable from the *hyle*, as Moustakis had recorded, and the consequent internal experiences.

> **Conclusion**
> My point of interest was Jupiter, but I was surprised to find out that soon I became more alert to other characteristics and phenomena of the evening sky, such as cloud coverage, the Moon and other stars. The vision of the sky was constantly contrasted with feelings and surrounding conditions, such as light, temperature and wind. At times it felt like observing a faraway dimension while being rooted in a purely Earthly environment. The main themes which emerged relate to time and space. Infinity and eternity interacted with each other among my thoughts, while keeping in mind Van Gogh’s reference to the value of sky observation and the enchantment which can potentially derive from it. This experience made me reconsider the notion that modern society appears to be detaching from the sky, at least from an emotional point of view.
> The sensations and ideas which I recorded in my journal helped me reexamine the Weberian concept of disenchantment, as well as the ancient Socratic idea of wonder. I would conclude that contemporary society, according to how I currently perceive it, appears to walk along the fine boundary between these two philosophical concepts.

Student 1’s final reflection was therefore on society, together with wider philosophical discussions concerning human engagement with the wider cosmos.

Student Case Study 2: Lisa Stockley

Student 2, Lisa Stockley, observed the Moon for a month (Figs 2 and 3). Lisa comes from a pagan background, in which Robert Graves’ model of the triple moon as maiden, mother and crone, is ubiquitous. Lisa’s observations, however, prompted a reconsideration of Graves’ model.



Fig. 2. Lisa Stockley: ‘Waning moon and yew tree, taken from my back garden. 7 October 2023 6:57am’.

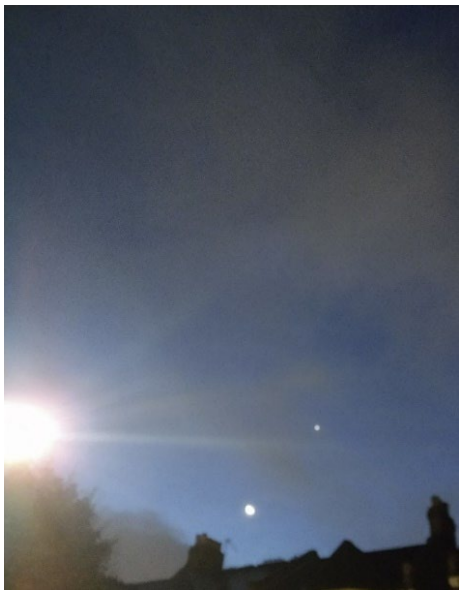


Fig. 3. Lisa Stockley; ‘View of moon and Venus with rising sun, taken from the street in front of my house. 10 November [2023] 6:15 am’.

The act of regularly observing the moon had an impact on my relationship with lunar symbolism. Throughout my adult life, I have followed a pagan spiritual path, practiced astrology and read tarot cards, all of which have had an impact on my connection with the moon as a symbolic and mythological phenomenon. On 29th October I wrote in the journal:

'I felt a lack of connection to the moon for years, turned off by my discomfort with ideas of the triple goddess, Robert Graves and his endless influence. It's only in the last year or so I've begun to feel a deeper connection with the moon, born of noticing, watching, observing it each night. My mind defaults to meaning-making, nonetheless. I sense something of the sacred, of the soul, when I gaze upwards'.

For example, I have never been comfortable with ideas of the moon as strongly linked to the triple goddess in the work of Robert Graves.[50]

This concept of the triple goddess is still ubiquitous in modern pagan practice, despite being questioned by many practitioners, as for example River Enodian who expresses some of my own frustration.[51] The more I observed the moon, the less my perception of it was clouded by awareness of this symbolism and the more I was able to find a more authentic sense of the moon, and the night sky, as meaningful. I felt that I was actually sensing something of the sacred rather than experiencing an intellectual overlay from my awareness of the symbolism. For example, on 31st October I noted that "the moon is becoming a symbol of peace at the beginnings and endings of my days". My inner experience of the moon was changed by my regular observation, allowing me to let go of outdated symbolic concepts and form a more authentic connection.

[50] Robert Graves, *The White Goddess*, (London: Faber and Faber, 1948), p.377.
[51] River Enodian, 'Why I Absolutely Loathe And Despise The "Maiden-Mother-Crone" Model', *Tea Addicted Witch* blog, https://www.patheos.com/blogs/teaaddictedwitch/2018/07/maiden-mother-crone-model/ [accessed 28 November 2023].

In her conclusion Lisa reflected on the way in which a direct experience of the sky superseded her previous literary-based model in Robert Graves' triple goddess.

> **Conclusion**
> This essay has analysed the Sky Journal kept in October and November 2023, noting links between observation, experience and enchantment. I was able to see the moon as a celestial phenomenon more clearly, for example by observing the cycles of the moon as it changed. These observations also had an inner effect, changing my perceptions of the symbolism I had previously associated with the moon. Despite initial scepticism, experiences of enchantment and connection were recorded, being "both caught up and carried away"[52], as I experienced on 19th October: "Today I just gazed up into the depths, really seeing depths instead of a two-dimensional backdrop to land…an awareness of the cosmos, the distance, of being part of it". My overall experience was one of enchantment, an enchantment formed by being "clearly aware" of the night sky, just as Van Gogh noted.

Case Study 3: Paul Flagg

Student 3, Paul Flagg, opened his essay with thoughts about the relationship between the individual and the immensity of the universe, citing Chanda Prescod-Weinstein:

> The simple act of taking a moment to observe the sky encourages us to immerse ourselves in the experience and to then reflect upon it. For me, simply looking up at the sky serves as a reminder of how small we are in comparison. By 'we', I not only mean us as individuals but the planet we inhabit and which supports our existence. The realisation that 'we are a small piece of the universe that has evolved alongside the unfolding of the great cosmic timeline',[53] as Chanda Prescod-Weinstein articulates, reminds me that I can tap into that sense of wonder at any given moment.

[52] Jane Bennett, 'The Wonder of Minor Experiences', *The Enchantment of Modern Life: Attachments, Crossings, and Ethics* (Princeton, NJ: Princeton University Press, 2001), pp.3–16 (p.5).
[53] Chanda Prescod-Weinstein, 'Our Love of Looking Up', *New Scientist* 251.3348 (2021): p.26.

Paul observed the sky in general and his journal is characterised by his use of photographs from urban locations and others which challenge conventional ideas that enchantment cannot be experienced through technology, as from a plane (Fig. 4). Paul quoted Clive Ruggles, addressing light pollution:

> A substantial proportion of the world's population (especially in Western industrialised countries) may never in their lifetimes see (or even get the opportunity to see) a truly dark night sky; light pollution has served to remove them from 'their' sky as a source of inspiration.[54]

Paul's photographs made a virtue of such non sky-based phenomena and, citing John McCarthy, Peter Wright, Jayne Wallace and Andy Dearden on enchantment and technology, he wrote that

> Enchantment engages with paradox and ambiguity, putting 'being' in play in an open world. This contributes to creating depth in a system or object that allows it to contain within it the possibility for complex, layered interpretation even the kind of interpretation that surprises the person interpreting.[55]

Fig. 5 therefore includes street lights and traffic as part of the layered, and no less enchanted, experience of the sky from a night-time cityscape.

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https://www-proquest-com.ezproxy.uwtsd.ac.uk/magazines/our-love-looking-up/docview/2890440267/se-2 [accessed 14 November 2023].

[54] Clive Ruggles, 'Indigenous Astronomies and Progress in Modern Astronomy', in *Accelerating the Rate of Astronomical Discovery - sps5*, ed. by Ray Norris and Clive Ruggles (from the IAU General Assembly, Rio de Janeiro, Brazil, 11–14th August 2009). *Proceedings of Science*, pp.1–18 (p.14) <DOI:10.48550/arxiv.1010.4873>.

[55] John McCarthy, Peter Wright, Jayne Wallace and Andy Dearden, 'The experience of enchantment in human–computer interaction', *Pers Ubiquit Comput* 10 (2006): pp.369–78 (p.373). DOI: 10.1007/s00779-005-0055-2.

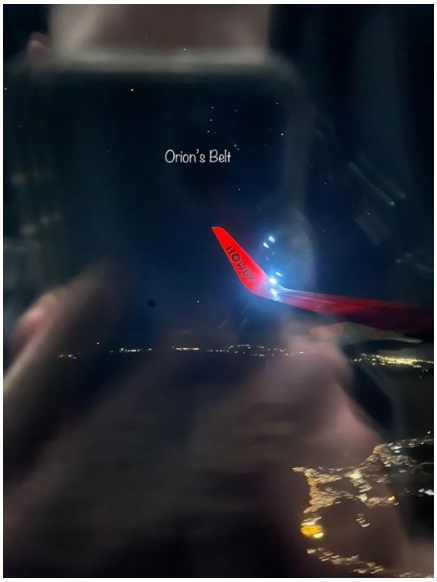


Fig. 4. Paul Flagg: 'Orion's belt as seen from Spirit Flight NK299 from Boston to Fort Lauderdale. 10 November 2023, 10:19 PM'.

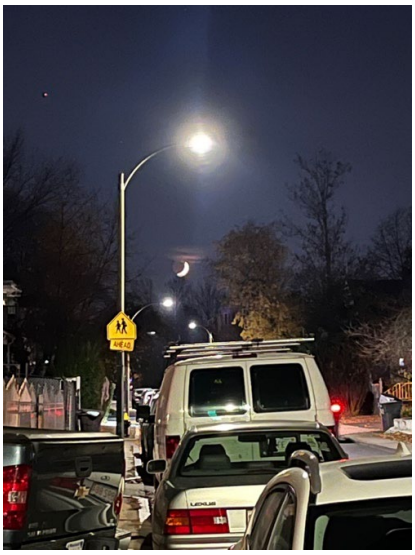


Fig. 5. Paul Flagg: 'Waxing crescent moon as seen from Allston neighborhood in Boston. Photo by Paul Flagg, 16 November 2023, 6:04 PM'.

Paul concluded with a profound statement concerning the fact that, however great the distance between two people, they still observe the same moon.

> I live in Boston and my partner lives in North Carolina. Sometimes when I am on the phone with him at night, I ask whether he has seen the moon. I might even point out where Jupiter is in relation to it. He may not realise it when I ask, but in those moments, I feel connected to him and to the rest of the world because I know that we are looking at the same moon, despite the physical distance between us.

He then cited Marcelo Gleiser: 'When we turn our attention to the wonders of our world we feel the inviting embrace of the life collective'.[56]

Conclusion

The essay based on a reflexive sky journal is an innovatory postgraduate assessment which takes astronomy back to its first principles, the direct observation of the sky, without technological aids. Drawing on experiences while making their observations, which may include awe, wonder and enchantment, students are encouraged to record their reflections. They then frame as a primary source and analyse in the context of primary and secondary sources, exactly as they would in an essay in history or anthropology, and taking account of theoretical perspectives. The whole exercise is justified pedagogically through learning by doing and experience. Each of these three students observed the sky, recorded their observations, reflected in their feelings and framed their analysis within secondary sources, and each came up with an original conclusion. Student 1 questioned Max Weber's widely accepted disenchantment theory. Student 2 (Lisa) found an experiential connection with the Moon, discarding a personal theoretical/mythical framework, Robert Graves' model of the triple Moon goddess. Lastly, student 3 (Paul) explored his relationships, finding a way to connect with a partner at a distance. Paul also questioned the standard Weberian understanding that technology is inimical to enchantment, taking photographs from a plane window. He thus reinforced recent arguments that technology can actually aid enchantment, including its manifestation in the Overview Effect.

[56] Marcelo Gleiser, *The Dawn of a Mindful Universe: A Manifesto for Humanity's Future* (New York: HarperOne, 2023), p.207.

The assignment has a double purpose. One is obviously to facilitate the students' educational experience. The second, as evident in this paper, is for the best student work to contribute to our understanding of how the sky – and astronomy – can inspire awe, wonder and enchantment.