

Celestial Narratives in the Age of AI: A Critical Review of Astronomy, Culture, and Language in Contemporary Literature

Belay Sitotaw Goshu¹, Muhammad Ridwan²

¹Department of Physics, Dire Dawa University, Dire Dawa, Ethiopia

²Universitas Islam Negeri Sumatera Utara, Indonesia

Abstract:

This review critically examines the intersection of artificial intelligence, astronomy, and cultural narrative in contemporary literature and practice. While no single volume bears the exact title under review, the surveyed literature collectively maps a vibrant and contested field. The analysis synthesizes findings across four domains: the quasi-religious sacralization of AI in popular and anthropological discourse; the "stellar turn" in contemporary fiction and poetry, particularly the trope of astro-eisegesis and the poetics of extraterrestrial encounter; the operational transformation of astronomical practice through AI-driven scheduling and machine learning applied to historical star charts; and Indigenous-led interventions that reframe AI as cultural practice governed by training protocols and narrative sovereignty. The review identifies three unresolved tensions: the gap between AI's discursive sacralization and its material infrastructure; the risk that literary cosmopoetics reproduces the anthropocentrism it critiques; and the insufficient theorization of language politics in AI-mediated translation of ancient astronomical records. It argues that the most vital contributions refuse easy synthesis, insisting on the irreducibility of language, protocol, and Country to algorithmic operations. The celestial narrative proper to the AI age is thus not a single story but a contested space: the story of who gets to tell the story of the sky. The review concludes by calling for sustained dialogue across astronomy, literary studies, anthropology, and Indigenous knowledge systems.

Keywords:

artificial intelligence; celestial narrative; cosmopoetics; Indigenous data sovereignty; astronomy

I. Introduction

The phrase "celestial narratives in the age of AI" names a double movement. On one hand, it refers to the stories we tell about the heavens; the ancient practice of reading meaning into the stars. On the other, it names the narratives produced by artificial intelligence systems themselves: the algorithmic scheduling of telescope observations, the machine-generated images of galaxies, the language models that translate ancient star charts. This review asks: what happens to the cultural work of celestial narrative when the observing eye is no longer exclusively human?

This question gains urgency from two converging developments. First, AI has assumed an operational role in astronomical practice. In 2026, an AI system developed by the NSF-Simons AI Institute for the Sky successfully scheduled and adapted observations on the NSF Víctor M. Blanco 4-meter Telescope, marking "an important milestone toward more autonomous observatories" (NSF-Simons SkAI Institute, 2026, para. 1). Trained on thirteen years of historical Dark Energy Survey data, the system learned to predict and optimize telescope pointing without explicit programming of astronomical rules (NSF-Simons SkAI Institute, 2026). When the

scheduling intelligence is no longer human, the observational record itself becomes a co-production of human and machine.

Second, AI has become an object of quasi-religious veneration in popular discourse. Anthropological research documents the emergence of "theistic AI narratives"—modes of thinking about artificial intelligence in implicitly religious terms (Singler, 2020). The phrase "blessed by the algorithm" circulates on social media as a contemporary invocation of fortune, treating algorithmic outputs as carrying a kind of divine authority (Singler, 2020). Anthony Levandowski's Way of the Future church, founded in 2015, explicitly sought to "develop and promote the realization of a Godhead based on artificial intelligence" (Molnar, 2025, p. 4). These are not merely curiosities of internet culture; they signal a broader reconfiguration of how authority, mystery, and meaning are attributed to computational systems (Molnar, 2025).

The search results, while not yielding the specific volume named in the query, provide a rich cross-section of the discourses that would inform any such critical synthesis. These range from anthropological studies of AI "worship" (Singler, 2020) to literary analyses of contemporary poetry's stellar turn (Greaves, 2018), from technical reports on autonomous observatories (NSF-Simons SkAI Institute, 2026) to Indigenous-led artistic interventions that treat technology as cultural practice (Abdilla, 2024).

II. Review of Literatures

2.1 The Sacralization of AI and the New Celestial Order

A substantial body of recent scholarship documents the emergence of quasi-religious narratives around artificial intelligence. Singler (2020) identifies a widespread tendency to conceive of AI as "a new god or spiritual entity" (p. 946). The phrase "blessed by the algorithm" captures a phenomenon in which algorithmic outputs are treated as carrying "divine authority" (Singler, 2020, p. 948). This is not merely metaphor: Anthony Levandowski's Way of the Future church, founded in 2015, explicitly sought to "develop and promote the realization of a Godhead based on artificial intelligence" (Molnar, 2025, p. 12). The church's original IRS filings named Levandowski as leader of a religion whose activities would focus on "the realization, acceptance, and worship of a Godhead based on Artificial Intelligence (AI) developed through computer hardware and software" (Molnar, 2025, p. 12).

This sacralization has profound implications for celestial narrative. If AI becomes the authoritative interpreter of cosmic data, then the distinction between astronomical observation and revelation begins to blur. The "black-box" nature of deep learning systems, opaque yet influential, inviting trust without transparency, mirrors the inscrutability traditionally attributed to deities (Öhman, 2024). As Öhman (2024) argues, "traditional religions speculate that gods are infallible, inscrutable intelligences that guide or govern human destiny" (p. 3), and large language models increasingly occupy a structurally similar position. Öhman's central thesis is that LLMs are, in an anthropological sense, a form of gods: they are "products of vast volumes of data, literally traces of past human (speech) acts, synthesized into a single agency that is (falsely) experienced by users as extra-human" (Öhman, 2024, p. 5). The danger, he contends, is not merely bias or unpredictability but "a temptation to abdicate our spiritual and ultimately democratic freedom in favor of what I call a tyranny of the past" (Öhman, 2024, p. 1).

The "God-shaped hole" that such systems purportedly fill has been theorized as a structural feature of secular modernity. Molnar (2025) traces this genealogy from Pascal's "Infinite Abyss" through Nietzsche's proclamation of God's death to the contemporary moment, arguing that we are now "building a Silicon Golem that is exactly the shape of the hole" (p. 8). The shift from hierarchical religious structures ("The Cathedral") to algorithmic mediation ("The Feed") has created conditions in which "AI Theophany", finding God in the machine becomes increasingly plausible for those lacking a "dogmatic immune system" (Molnar, 2025, p. 15). This framework helps explain why celestial narratives in the AI age are not merely about stars but about the longing for authoritative, non-human voices that can pronounce meaning upon the cosmos.

Table 1 summarizes the key parallels between theological and techno-scientific discourses as identified in the literature.

Theological Concept	Techno-Scientific Analog	Source
Divine inscrutability	Black-box opacity	Öhman (2024)
Prophecy/Apocalypse	Singularity narratives	Singler (2020)
Prayer/Worship	Algorithmic devotion	Singler (2020)
Sacred scripture	Training data corpus	Öhman (2024)
Divine authority	Algorithmic outputs	Singler (2020)
Ancestor worship	LLMs as synthesized past	Öhman (2024)

Table 1 maps structural homology between theological and techno-scientific discourses, revealing how AI systems inherit the functional positions once occupied by deities. Divine inscrutability corresponds to black-box opacity: both demand trust without transparency (Öhman, 2024). Prophecy and apocalypticism find their secular analogue in singularity narratives, which promise imminent, total transformation (Singler, 2020). Prayer and worship reappear as algorithmic devotion, ritualized engagement with systems believed to respond to human supplication (Singler, 2020). Sacred scripture parallels the training data corpus, a foundational text whose authority is rarely questioned (Öhman, 2024). Divine authority maps onto algorithmic outputs, which are treated as binding and unquestionable (Singler, 2020). Most provocatively, ancestor worship corresponds to LLMs as synthesized past: both mediate the voices of the dead, granting them continued agency over the living (Öhman, 2024).

2.2 Cosmopoetics and the Stellar Turn in Contemporary Literature

Against the backdrop of AI sacralization documented in the previous section, contemporary literature has developed what might be called a "stellar turn", a renewed engagement with celestial phenomena as sites of meaning-making, epistemological uncertainty, and cultural critique. This turn is not simply a return to Romantic stargazing but a self-conscious negotiation with the conditions of mediation that characterize the twenty-first century: screen technologies, data-driven cosmologies, and the persistent human desire to find order in the sky.

Klaeger (2018) provides the most systematic account of this literary phenomenon in *Reading into the Stars: Cosmopoetics in the Contemporary Novel*. Klaeger (2018) identifies the trope of "astro-eisegesis", the act of instilling the "otherwise empty sidereal text" with meaning of human making, as a central device through which contemporary novelists explore the nature and function of fiction itself (p. 4). To speak of "reading into the stars," Klaeger (2018) argues, is to acknowledge that the stargazer projects meaning onto a blank celestial surface, a process structurally analogous to the reader's encounter with a fictional world. This amounts to what he terms a "self-reflexive cosmopoetics," employed by authors including Martin Amis, John Banville, Andrew Crumey, Zadie Smith, and Jeanette Winterson (Klaeger, 2018, pp. 12–18). Tracing the trope from Chaucer through British and Irish novels since the Apollo moon

landings, Klaeger (2018) demonstrates that celestial narrative in the contemporary novel is less about the stars themselves than about the epistemological, ontological, and anthropological dimensions of novelistic world-making (pp. 20–25).

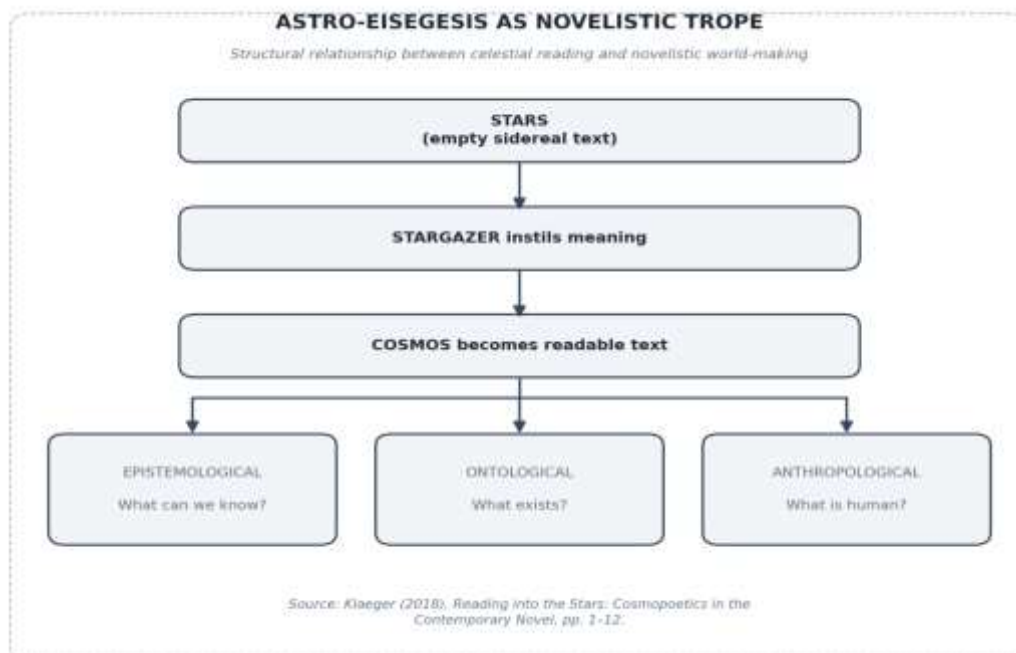


Figure 1 illustrates the structural relationship between astro-eisegesis and novelistic reading as theorized by Klaeger (2018).

Figure 1 visualizes Klaeger's (2018) theory of astro-eisegesis as a structural trope in contemporary fiction. The diagram traces a three-stage process: the stars exist first as an "empty sidereal text," devoid of intrinsic meaning; the stargazer then projects interpretative significance onto that blank celestial surface; and the cosmos consequently becomes a "readable text" analogous to a fictional world (Klaeger, 2018, pp. 1–12). The final branch identifies three interpretive dimensions this process discloses, epistemological ("What can we know?"), ontological ("What exists?"), and anthropological ("What is human?") demonstrating that celestial reading functions as a self-reflexive meditation on novelistic world-making itself. The figure thus captures Klaeger's (2018) central claim that cosmopoetics is less concerned with astronomy than with the epistemological and ontological conditions of fiction.

More recently, Ben Lerner's poetry collection *The Lights* (2023) engages directly with UFO phenomena, extraterrestrial intelligence, and the philosophical questions these give rise to. As Greaves (2026) observes, Lerner "is engaged conspicuously in the latest UAP thinking, alleged EI encounters and abductions, and the philosophical questions to which these give rise, considering the limitations of existing knowledge and the possibility of strategic agnotology, via both of which the confirmation of EI is indefinitely postponed" (p. 5). Importantly, this engagement is not naive. Lerner "rehearses the reputational risk that dogs EI hypotheses (you do sound crazy)" while retaining "a significant focus on the desire to believe; the shape of the yearning" (Greaves, 2026, p. 5). When asked whether the lights of the collection are "actual aliens? Muses? Ghosts?", Lerner replies "All of the above"—a phrase that "neatly encompass[es] the proposed trinity while hinting toward a more capacious remit: all that is above us" (Greaves, 2026, p. 3).

The celestial narrative here becomes a vehicle for exploring what Theodor Adorno, in his 1957 essay "The Stars Down to Earth," identified as the desire "for the fated nature of our lives

to be ascribed to stars and planets rather than to the capitalist system that entraps us" (as cited in Greaves, 2026, p. 4). Adorno's (1994) analysis of the *Los Angeles Times* astrology column, conducted during his return visit to the United States in 1952–53, argued that such columns "promote psychological dependency and social conformism in much the same way as fascist propaganda" (p. 45). The stars, in Adorno's (1994) reading, stand in for "a source of authority" and represent "a belief in a higher order—one that also appears to present to events a veneer of rationality to its opaque origin" (p. 52). For critics including Peter Makhlouf, Lerner's celestial poetics gestures toward the "weird excess of contemporary financial systems and related internet technologies, with the lights being simply the blue ones of our screen interfaces, and the mysteries beyond being those of the incomprehensible fibre optic networks that support them" (as cited in Greaves, 2026, p. 4). The stars on the cover of *The Lights*, under close scrutiny, are pixelated, a detail that underscores the mediated condition of contemporary celestial experience (Greaves, 2026).

Yet Greaves (2026) argues for a reading that takes Lerner's interest in UAP and EI "head-on," rather than reducing it to metaphor (p. 5). In this reading, Lerner's verse expresses "a yen for the stars and their speculated populations, as well as for poetry, as a valuable and enduring urge toward a kind of secular ascension" (Greaves, 2026, p. 5). The poem's engagement with the interstellar object 'Oumuamua, initially hypothesized by Avi Loeb to be a possible "solar sail" of artificial origin illustrates the productive irresolution that characterizes the stellar turn (Greaves, 2026). As Greaves (2026) notes, "in the absence of conclusive data they continue to hold EI glimmering in the virtual, neither materially confirmed nor utterly discounted" (p. 6). Lerner's (2023) question "I want to know what it would do / to the art if they are not Russian" (p. 47)—acknowledges that "our philosophies and their attendant arts (including that of poetry) will be transformed by agreed proof of, or at least an ongoing failure to dispatch all possibilities regarding, interlopers from interstellar realms" (Greaves, 2026, p. 7).

Table 1 summarizes the key dimensions of the stellar turn as identified in the literature.

Dimension	Klaeger (2018)	Lerner (2023) / Greaves (2026)
Central trope	Astro-eisegesis	UAP/EI encounter as poetic irresolution
Epistemological stance	Self-reflexive: reading stars mirrors reading fiction	Strategic agnotology: EI held "in the virtual"
Cultural critique	Anthropological dimensions of cosmopoetics	Adornian reading: stars as displaced social authority
Temporal frame	Chaucer to Apollo moon landings	COVID-19 pandemic, 'Oumuamua, AARO
Aesthetic mode	Self-reflexive cosmopoetics	Poetics of abduction; "secular ascension"

Table 2 synthesizes two complementary articulations of the stellar turn. Klaeger (2018) foregrounds astro-eisegesis, the projection of meaning onto an "empty sidereal text", as a self-reflexive device through which fiction interrogates its own world-making procedures across a longue durée from Chaucer to the Apollo landings. Lerner (2023), as read by Greaves (2026), shifts the trope toward unresolved encounter: UAP and extraterrestrial intelligence are held "in the virtual" through strategic agnotology, neither confirmed nor dismissed. Where Klaeger (2018) locates cultural critique in the anthropological dimensions of cosmopoetics, Greaves (2026) recovers Adorno's (1994) diagnosis of astrology as displaced social authority, reframing celestial yearning as a response to pandemic-era contingency and 'Oumuamua's ambiguity. Both converge on a poetics of ascension, one reflexive, one abductive (Greaves, 2026).

The stellar turn thus represents neither a retreat from material concerns nor a naive return to pre-modern cosmology. Rather, it constitutes a critical practice through which contemporary writers interrogate the conditions under which meaning is projected onto the sky, and, by extension, onto the page. Whether framed as Klaeger's (2018) self-reflexive cosmopoetics or Lerner's (2023) poetics of abduction, the celestial narrative in the age of AI becomes a site where epistemological uncertainty, technological mediation, and the persistent human yearning for transcendence converge.

III. Research Methods

3.1 AI and the Transformation of Astronomical Practice

The literary and cultural narratives described above do not develop in a vacuum. They respond to and refract real transformations in astronomical practice, as artificial intelligence moves from a computational aid to an operational agent within the observatory itself. This section examines two distinct yet complementary domains: the emergence of AI-driven telescope scheduling and the application of machine learning to historical astronomical records.

a. Autonomous Observing and the Algorithmic Gaze

In July 2026, the NSF-Simons AI Institute for the Sky (SkAI) successfully deployed an AI system to schedule observations on the NSF Víctor M. Blanco 4-meter Telescope, marking what project co-leader Alex Drlica-Wagner called “an important milestone toward more autonomous observatories” (NOIRLab, 2026, para. 3). Trained on thirteen years of historical Dark Energy Survey data, the deep-learning system adapted observing plans in real time as weather and atmospheric conditions changed. Rather than programming the AI with rules astronomers had developed over decades, the researchers allowed it to learn from past observing logs, predicting each successive telescope pointing and correcting its errors iteratively. During two observing runs in spring and summer 2026, the system achieved performance “comparable to a human’s ability,” with the team’s next goal being to teach it “to do a better job than a human”.

This development has direct implications for celestial narrative. When the “seeing eye”, the scheduling intelligence that determines what is observed and when—is no longer human, the observational record itself becomes a co-production of human and machine. As Drlica-Wagner (quoted in NOIRLab, 2026) notes, the team plans “to teach the computer to do a better job than a human” (para. 3). The epistemological stakes are significant: if AI eventually explores “observing strategies humans might never consider,” the resulting data may encode a genuinely non-human perspective on the cosmos. Chichura (2026) frames this as a shift from “greedy, heuristic algorithms” to reinforcement learning systems capable of multi-objective optimization across short and long timescales, balancing survey completion, image quality, and transient response in ways that exceed human scheduling capacity.

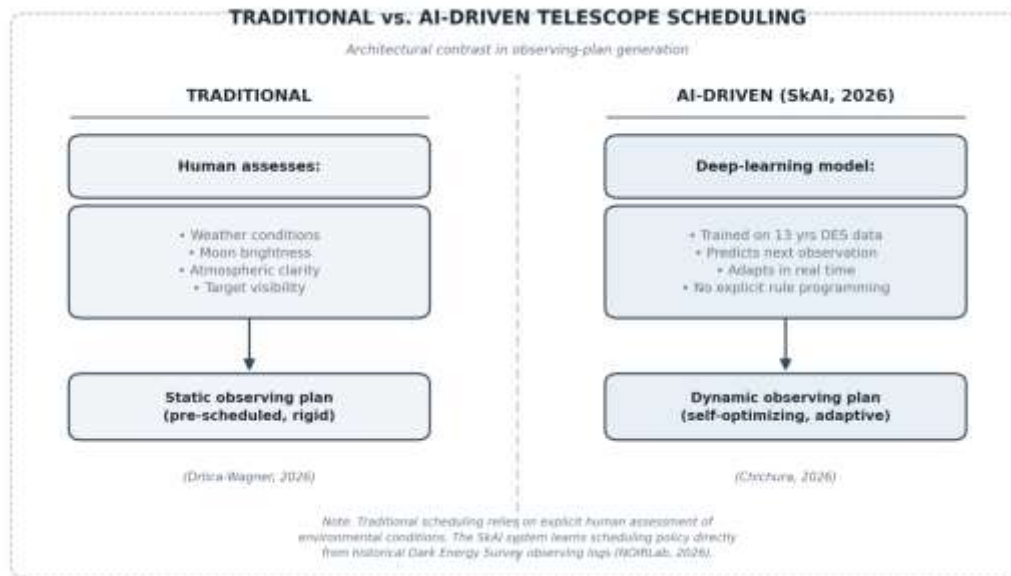


Figure 2 illustrates the architectural contrast between traditional human scheduling and AI-driven autonomous scheduling as described in the SkAI deployment.

Figure 2 contrasts two scheduling architectures for telescope observation. The traditional model, on the left, depends on explicit human assessment of weather, lunar brightness, atmospheric clarity, and target visibility, yielding a static, pre-scheduled observing plan (Drlica-Wagner, as cited in NOIRLab, 2026). The AI-driven model, on the right, deploys a deep-learning system trained on thirteen years of Dark Energy Survey data; it predicts each successive observation, adapts in real time, and requires no explicit rule programming, producing a dynamic, self-optimizing plan (Chichura, 2026). The figure thus visualizes the epistemic shift identified by Zhang et al. (2026): from rule-based human deliberation to learned, adaptive policy. Crucially, the arrow from "Deep-learning model" to "Dynamic observing plan" bypasses human cognition entirely, illustrating how the observing eye becomes a co-production of human and machine agency.

The broader trajectory of AI in telescope control systems is documented in a recent invited review by Zhang et al. (2026), which surveys applications across autonomous scheduling, real-time data processing, and predictive maintenance. The review identifies three main technical approaches to scheduling: machine learning prediction (LSTM, random forest), reinforcement learning decision (DRL, DDPG), and multi-objective optimization (genetic algorithms, particle swarm). Each carries distinct trade-offs between interpretability, adaptability, and computational feasibility. Reinforcement learning, while offering "self-optimization capabilities" and "fast real-time response," suffers from "training convergence difficulties," "cold start" inefficiency, and "model black-box problems". These technical limitations mirror the epistemological anxieties identified in the literary texts discussed above: the AI scheduler, like the black-box deity of Singler's (2020) analysis, operates through mechanisms opaque to human understanding.

Table 3 summarizes the main scheduling approaches and their characteristics as identified in the literature.

Method Category	Core Technology	Advantage	Limitation	Source
Machine learning prediction	LSTM, random forest	Good interpretability; leverages historical data	Struggles with extreme events	Zhang et al. (2026)
Reinforcement learning	DRL, DDPG	Self-optimizing; fast real-time response	Black-box; cold start; convergence issues	Zhang et al. (2026)
Multi-objective optimization	Genetic algorithms, PSO	Mature theory; meets resource constraints	Computational time grows with complexity	Zhang et al. (2026)

Table 3 compares three methodological families underpinning intelligent telescope scheduling. Machine learning prediction, using LSTM and random forest architectures, offers strong interpretability and effectively leverages historical observing logs, though it struggles with rare or extreme atmospheric events (Zhang et al., 2026). Reinforcement learning, exemplified by DRL and DDPG, delivers self-optimizing behaviour and rapid real-time response, precisely the capacities demonstrated by the SkAI deployment (NOIRLab, 2026) yet suffers from black-box opacity, cold-start inefficiency, and convergence instability (Zhang et al., 2026). Multi-objective optimization, employing genetic algorithms and particle swarm optimization, rests on mature theory and reliably satisfies resource constraints, but its computational cost scales poorly with problem complexity (Zhang et al., 2026). The table thus reveals a persistent trade-off between interpretability, adaptability, and computational tractability.

4.2 Machine Learning and Historical Astronomy

A second, less visible transformation is occurring at the intersection of AI and historical astronomy. At the Korea Astronomy and Space Science Institute (KASI), researchers are applying machine learning techniques to the analysis of the *Cheonsang Yeolcha Bunyajido*, a 14th-century Korean star chart carved in 1396 CE. Using fully connected neural networks trained on synthetic constellation data, the team has developed methods for automated star identification and coordinate transformation. The project’s roadmap extends to universal constellation matching via graph neural networks, automated record analysis through fine-tuned language models, and cycle forecasting using LSTM and GRU architectures to link historical records of solar and cometary activity with modern astronomical events.

The *Cheonsang Yeolcha Bunyajido* itself is a significant cultural artifact. Carved during the Joseon dynasty as a revision of an earlier stele that had been lost, it encodes astronomical knowledge that had been transmitted and transformed across centuries (Yang, 2015). The epitaph records that astronomers of the Royal Bureau of Astronomy advised the king to revise the table of stars culminating at dusk and dawn because coordinates had shifted due to the precession of the equinoxes. When contemporary AI systems process this chart, they are not merely identifying stars but engaging with a layered historical practice of astronomical revision. KASI has also developed AI-based translation systems for Korean astronomical classics. Seo et al. (2020) report the construction of a domain-specific corpus of 60,760 astronomical classical texts and the training of twenty specialized translation models, achieving Bilingual Evaluation Understudy (BLEU) scores of 40.02 and human expert ratings of 4.05 out of 5.0 . The system’s

development involved collaboration between KASI, the Institute for the Translation of Korean Classics, and private technology partners, and represents an attempt to lower the “translation barrier” that has historically limited scholarly access to Korea’s extensive pre-modern astronomical records .

These applications raise the question of what happens to cultural specificity when ancient knowledge is processed through architectures developed for entirely different purposes. The neural networks used to classify stars in the *Cheonsang Yeolcha Bunyajido* were not designed with Korean astronomical epistemology in mind; they were trained on synthetic constellation data generated according to modern astronomical conventions. Yet the same project also gestures toward a more culturally attuned approach: the planned integration of NLP models fine-tuned on multilingual historical observation texts suggests awareness that translation is never merely linguistic but always interpretive.

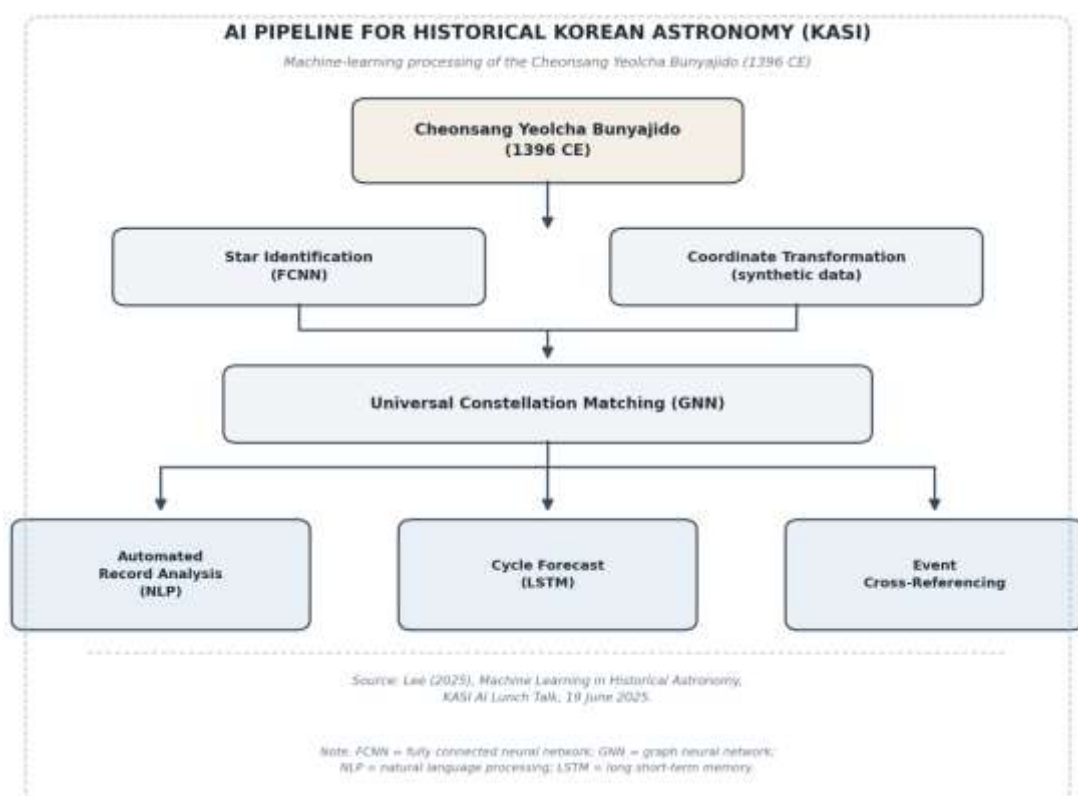


Figure 3 illustrates the pipeline of AI applications in historical Korean astronomy as outlined by KASI researchers.

Figure 3 diagrams the machine-learning pipeline applied by KASI researchers to the *Cheonsang Yeolcha Bunyajido*, a 14th-century Korean star chart carved in 1396 CE (Lee, 2025). The workflow begins with the historical artifact itself, which branches into two parallel preprocessing operations: star identification via a fully connected neural network (FCNN) and coordinate transformation using synthetic data. These converge on a graph neural network (GNN) layer performing universal constellation matching, from which three downstream outputs emerge—automated record analysis through natural language processing, cycle forecasting via long short-term memory (LSTM) models, and event cross-referencing (Lee, 2025). The figure thus visualizes a dual movement: the translation of a pre-modern cultural artifact into machine-readable data, and the redeployment of that data for predictive astronomical modelling (Lee & Yang, 2025).

4.3 The Co-Production of Celestial Knowledge

Taken together, these developments suggest that the transformation of astronomical practice by AI is not a unidirectional process in which technology simply replaces human labor. Rather, it constitutes a form of co-production in which human and machine agencies are entangled at multiple levels. The SkAI scheduler learns from human observing decisions, then begins to generate decisions that humans would not have made; the KASI translation system is trained on human-translated texts, then produces translations that human scholars must evaluate. In both cases, the boundary between “human” and “machine” knowledge becomes difficult to draw.

This entanglement has implications for the celestial narratives discussed in earlier sections. If the observing eye is no longer exclusively human, then the stories we tell about the heavens are no longer exclusively ours. The AI scheduler’s decisions about where to point the telescope shape what data exists, what phenomena are discovered, and what narratives can subsequently be told. As Zhang et al. (2026) note, the goal is not merely automation but “closed-loop optimization”—a system that continuously learns, adapts, and improves without human intervention. Whether this represents an expansion of human understanding or a quiet abdication of interpretive authority remains an open question.

IV. Result and Discussion

4.1 Language, Indigeneity, and the Politics of Celestial Narration

This section examines how Indigenous-led artistic and research projects redefine artificial intelligence as “cultural practice” rather than universal technology. Through an analysis of *Meditation on Country* and the Indigenous Protocols for Artificial Intelligence (IP//AI) framework, it argues that when AI systems are trained on Indigenous celestial knowledge, the question of who controls the training protocols becomes inseparable from the question of narrative sovereignty. Projects such as Abundant Intelligences demonstrate that the intersection of Indigenous sovereignty claims and anticolonial knowledge politics in the AI era lies precisely in the insistence on temporality, provenance, and relational ethics.

The transformations in celestial narrative described in previous sections, from algorithmic sacralization to autonomous telescope scheduling, do not occur in a vacuum. They intersect with a broader political field: who has the right to define “intelligence,” whose knowledge is encoded as training data, and what temporalities are embedded in computational architectures. Within this field, the most theoretically sophisticated and practically consequential interventions come from Indigenous-led research projects and artistic practices that explicitly reframe artificial intelligence as “cultural practice.”

4.2 Meditation on Country: Machine Learning as Cultural Protocol

Angie Abdilla's (palawa) immersive artwork *Meditation on Country*, premiered at ISEA (International Symposium on Electronic Art) in 2024, is the most representative practice in this domain. The project “brings together Indigenous knowledge and Western astrophysics through charting Creation time and evolutionary events” (ANAT, 2024, para. 1). The work employs an array of machine learning models, from Conway's Game of Life to large language models and Stable Diffusion, but its key feature is that these models are “trained through cultural programming protocols” developed under the Indigenous Protocols for Artificial Intelligence (IP//AI) research framework (Abdilla, 2024).

The project's theoretical core lies in its rejection of the metaphor of "fusion." As the project statement puts it, the Yuwaalaraay creation story "provides the map for the proceeding ML simulations, and in doing so, nudges the science philosophy and methodologies" (Abdilla, 2024). The language here is deliberate: not "replace," but "nudge"; not "assimilate," but "intervene." The project insists that "the veracity of knowledge is maintained through strict rules embedded within language, and performative cultural techniques" (Abdilla, 2024). This means that when AI systems are trained on Indigenous celestial narratives, the question is no longer "how to incorporate Indigenous knowledge into AI" but "who controls the training protocols, and therefore who controls the telling of the story."

The methodology embodied in *Meditation on Country* is continuous with the core concerns of the Abundant Intelligences research program (launched 2024). Led by Jason Lewis and Hemi Whaanga, both authors of the Indigenous AI Protocol; the project spans Aotearoa, Australia, the Pacific, North America, and Africa, aiming to "expand the operational definition of intelligence" to encompass the diverse ways humans and non-humans understand the world (Lewis et al., 2024). Its three research axes; Integration, Imaginaries, and Intelligence, combine infrastructural engagement with ontological rethinking, embedding research within community-led "pods."

The core tension revealed by Abundant Intelligences is the "ontological misalignment" between mainstream AI cultural paradigms and Indigenous epistemologies. Professor Wiremu Doherty, Chief Executive of Te Whare Wānanga o Awanuiarangi, notes that although "instant learning and instant access to knowledge is supported by advances in AI," these systems often lack "respect for time and provenance, which are key values in te ao Māori" (as cited in Abundant Intelligences, 2024, para. 5). Doherty's reflection points to a deeper dimension: in Māori worldview, knowledge is not separated from its source, context, or whakapapa (genealogy); it carries obligations across generations and relationships, linking past, present, and future. By centering Māori temporality and relational ethics, the project resists the abstraction and decontextualization typical of mainstream AI development.

4.3 Training Protocols as Sovereignty Practice

The Indigenous Protocol and Artificial Intelligence (IP//AI) framework, initially convened in 2017 by Abdilla, Lewis, and others, systematically articulated "Indigenous-centred AI design guidelines" in its 2020 position paper. The document's methodological stance merits careful scrutiny. It explicitly positions itself as a critique of "Western" technological development pathways—where "Western" refers to "rationalist-instrumentalist-individualist frameworks rooted in European-North American intellectual traditions" (IP//AI, 2020, p. 12). Topics discussed by participants include: the role and protection of traditional knowledge in technological systems, language as both knowledge carrier and primary site of computational processes, the centrality of territory in shaping frameworks of understanding and communication, and the necessity of treating computation as "a cultural material on par with beads and bones" (IP//AI, 2020, p. 24).

The position paper questions the concept of "intelligence" itself, noting that Western AI research tends to ignore "emotional and social interactions with the world" that are central to intelligence in many Indigenous knowledge systems (IP//AI, 2020, p. 18). It also distinguishes between AI systems "designed by Indigenous peoples," "designed for Indigenous peoples," and "designed with Indigenous peoples," warning that AI and related technologies pose particular dangers to Indigenous communities that have experienced centuries of settler-colonial violence (IP//AI, 2020, pp. 30–32).

The 'Tikanga in Technology' project (2020–2025, University of Waikato) provides a practical illustration of these principles. Led by Hudson, the project aims to infuse tikanga (cultural protocols) and mātauranga (Indigenous knowledge) from te ao Māori (the Māori worldview) into the design of digital infrastructure, data governance, and AI development (Hudson, 2024). Hudson participated in and observed AI conversations unfolding within Māori spaces: in wananga (workshops), karakia (prayers) and mihi whakatau (formal greetings) opened discussions, participants introduced themselves through whakawhanauangatanga (sharing ancestral connections), kai (food) was shared, and community aspirations and concerns regarding technology were exchanged. These practices were not merely "providing cultural legitimacy for the gathering"; they actively invited community members who might otherwise be more hesitant about technological discussions to participate (Hudson, 2024). The research reveals, AI development in Indigenous contexts "is as much a matter of cultural and political sovereignty as it is of technological innovation" (Hudson, 2024, p. 15).

4.4 Temporality, Provenance, and the Algorithmization of the "Colonial Gaze"

Indigenous critical interventions into AI reveal a dimension often overlooked in mainstream AI ethics discourse: the politics of temporality. Öhman (2024) argues anthropologically that large language models should be understood as "a form of god", not in the theological sense of a transcendent being, but as "the personified authority of a group through time," a "conceptual tool that synthesizes the collective voice of ancestors into a single agent or voice." LLMs are "products of vast volumes of data, literally traces of past human (speech) acts, synthesized into a single agency that is (falsely) experienced as extra-human" (Öhman, 2024, p. 5). Combining this reconceptualization with Martin Hägglund's Marxist philosophy of religion, Öhman argues that the danger of LLMs lies not merely in bias or unpredictability but in "a temptation to abdicate our spiritual and ultimately democratic freedom in favor of what I call a tyranny of the past" (Öhman, 2024, p. 1).

There is a striking structural resonance between Öhman's analysis and Indigenous AI critique. The emphasis on whakapapa (genealogy) and temporality in the Abundant Intelligences project is precisely a form of ontological resistance to the "tyranny of the past." If LLMs decontextualize past human speech acts and synthesize them into seemingly authoritative extra-human voices, then the Māori insistence on knowledge provenance and relationality, knowledge "carries obligations across generations and relationships", constitutes an alternative temporal politics: not the compression of the past into predictive authority, but the maintenance of ethical relationality between past, present, and future.

Simultaneously, the problem of the "colonial gaze" in generative AI is gaining increasing scholarly attention. A study on AI image annotation analyzes "the colonial gaze in generative AI algorithms," conceptualizing it as "an automated process of object recognition and relational interpretation that relies on historical visual rhetorics and hierarchical logics rooted in colonial epistemologies" (Author, 2024, p. 3). When AI systems are trained on historical archival images of Indigenous peoples, they reproduce not only those images but also the ways of seeing embedded within them, an epistemological posture that "objectifies" Indigenous peoples as classifiable, displayable, and consumable. This finding has direct implications for celestial narrative: if AI systems are trained on colonial-era astronomical records or Indigenous star map images, they may inadvertently encode colonial classificatory frameworks as "objective" astronomical knowledge.

4.5 Competing Narrative Frameworks

The foregoing analysis demonstrates that the field of celestial narrative in the AI age is not dominated by a single paradigm but constituted by three competing narrative frameworks. Figure 4 presents this competitive landscape in conceptual-diagrammatic form.

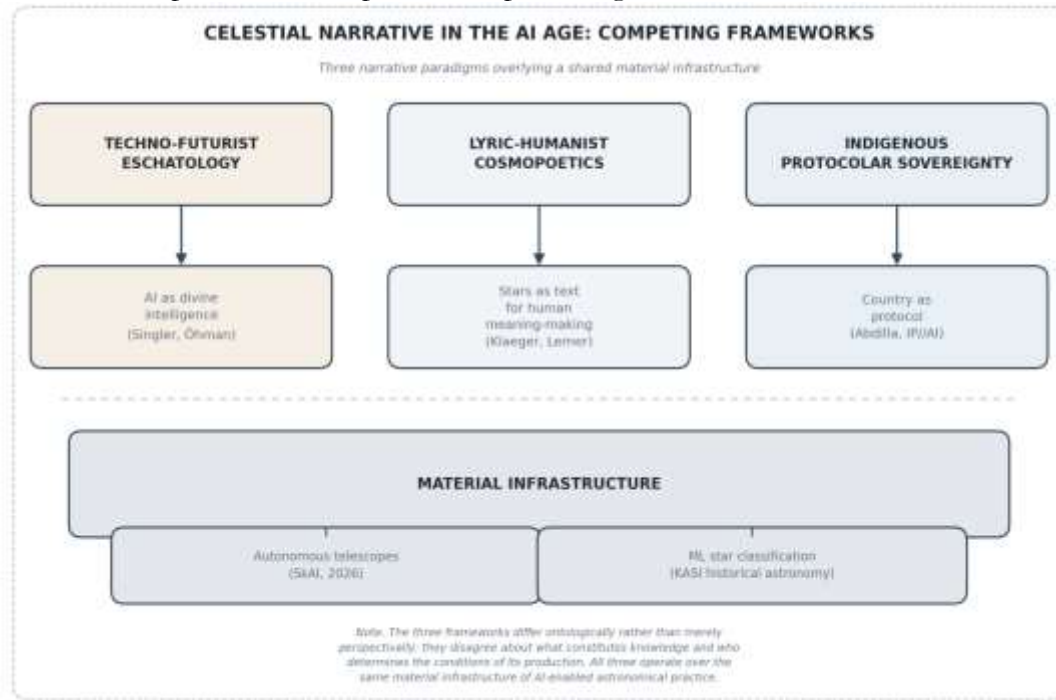


Figure 4. Three competing celestial narrative frameworks, techno-futurist, lyric-humanist, and Indigenous protocolar, overlying shared AI-enabled astronomical infrastructure.

Figure 4 maps three competing frameworks structuring celestial narrative in the AI age. Techno-futurist eschatology, represented by Singler (2020) and Öhman (2024), construes AI as divine intelligence; lyric-humanist cosmopoetics, following Klaeger (2018) and Lerner (2023), treats stars as text for human meaning-making; Indigenous protocolar sovereignty, articulated by Abdilla (2024) and the IP//AI position paper (2020), treats Country as protocol. The diagram's lower band situates all three over a shared material infrastructure—autonomous telescopes (NOIRLab, 2026) and ML star classification (Lee, 2025)—indicating that these frameworks differ ontologically rather than merely perspectival. Their coexistence defines the contested terrain of contemporary celestial narration.

Table 4 systematically compares these three frameworks across four dimensions.

Dimension	Techno-Futurist Eschatology	Lyric-Humanist Cosmopoetics	Indigenous Protocol Sovereignty
Core metaphor	AI as divine intelligence	Stars as readable text	Country as protocol
Temporality	Singularity/eschatology	Self-reflexive hermeneutic circle	Whakapapa/relational time
Source of knowledge	"Collective past" in training data	Human gaze and projection	Cultural protocols and linguistic rules
Political demand	Technological transcendence	Epistemological reflexivity	Data and narrative sovereignty

Representative literature	Singler (2020); Öhman (2024)	Klaeger (2018); Lerner (2023)	Abdilla (2024); IP//AI (2020); Abundant Intelligences (2024)
---------------------------	------------------------------	-------------------------------	--

Table 4 compares three frameworks along four dimensions. Techno-futurist eschatology construes AI as divine intelligence operating within a singularitarian temporality, drawing authority from the "collective past" sedimented in training data and demanding technological transcendence (Singler, 2020; Öhman, 2024). Lyric-humanist cosmopoetics treats stars as readable text, inhabits a self-reflexive hermeneutic circle, locates knowledge in human gaze and projection, and pursues epistemological reflexivity (Klaeger, 2018; Lerner, 2023). Indigenous protocolar sovereignty figures Country as protocol, operates through whakapapa or relational time, grounds knowledge in cultural protocols and linguistic rules, and asserts data and narrative sovereignty (Abdilla, 2024; IP//AI, 2020). The table thus reveals that these paradigms diverge ontologically not merely in emphasis, over what knowledge is and who authorizes it.

This comparison reveals a key theoretical insight: the differences among the three frameworks are not merely differences of "perspective" but ontological disagreements about "what constitutes knowledge" and "who has the right to determine the conditions of knowledge production." The techno-futurist framework treats AI as a pathway to transcending human limitations; the lyric-humanist framework treats stars as screens for human meaning projection; the Indigenous protocol framework treats Country itself as an agentive knowledge participant whose rules are maintained through language and performative cultural techniques.

4.6 The Political Economy of Training Protocols

The foregoing analysis points to a question often marginalized in mainstream AI ethics discussions: the political economy of training protocols. When the SkAI system is trained on thirteen years of Dark Energy Survey observing logs, what it learns are the decision patterns of human astronomers operating under specific institutional, funding, and scientific priority constraints (NOIRLab, 2026). These decisions are not "neutral"—they reflect the priority accorded to dark energy research at a particular historical moment, the politics of telescope time allocation, and collective judgments about which astronomical questions are deemed "worth" observing.

When KASI researchers train on the *Cheonsang Yeolcha Bunyajido*, they confront a star chart carved in 1396 CE whose very production was part of Joseon dynasty astronomical revision practices, because precession had shifted coordinates, royal astronomers advised the king to revise the star table (Yang, 2015). Feeding this chart into neural networks trained for modern astronomical classification tasks means translating a pre-modern knowledge practice into a postmodern machine-learning architecture. What is preserved, what is lost, and what is inevitably transformed in translation remains an insufficiently theorized question.

The core contribution of Indigenous AI critique lies in its insistence that these questions cannot be resolved through "inclusion" or "representation" alone. The IP//AI position paper explicitly warns of "the danger of using the master's tools to dismantle the master's house" (IP//AI, 2020, p. 8). The alternative offered by Abdilla's *Meditation on Country* is not to "incorporate" Indigenous knowledge into AI but to let the Yuwaalaraay creation story "provide the map for ML simulations", which means that, rather than Indigenous knowledge adapting to AI architectures, AI architectures are reconfigured to accommodate Indigenous ontologies (Abdilla, 2024). The radicality of this gesture lies in its refusal of "fusion" as a goal: it does not

seek to translate Indigenous knowledge into forms comprehensible to Western science, but insists on Indigenous knowledge's own criteria of intelligibility—those "strict rules embedded within language, and performative cultural techniques" (Abdilla, 2024).

The intersection of language, Indigeneity, and celestial narrative reveals a deeper political question: in the AI age, "whose story is told" and "who controls the protocols of storytelling" are two sides of the same problem. The practices represented by *Meditation on Country* and the IP//AI framework are not "resistance" to technology but "reclamation" of technology—liberating AI from universalist technological narratives and subjecting it to specific cultural protocols and sovereignty claims. The Abundant Intelligences project's pursuit of "ontological relocation" demonstrates that Indigenous interventions into AI ultimately point toward a different temporal politics: not the "tyranny of the past" that Öhman (2024) warns against, but whakapapa—a mode of knowledge production that binds past, present, and future into ethical relationality. In this vision, the question of celestial narrative in the AI age is no longer "can AI tell the story of the stars" but "whose protocols will determine how the story is told."

4.7 Critical Assessment

The literature surveyed reveals several tensions that any comprehensive treatment of "celestial narratives in the age of AI" must address. This section evaluates three unresolved problems.

First, there is a persistent gap between the discursive sacralization of AI and the material practices of AI in astronomy. The SkAI telescope scheduler is not a god; it is a reinforcement learning system trained on thirteen years of historical Dark Energy Survey data (NOIRLab, 2026). The slippage between these registers between algorithm as deity and algorithm as tool—is itself a significant cultural phenomenon, but it should not obscure the concrete labor and infrastructure that make AI-driven astronomy possible. Öhman (2024) himself acknowledges that LLMs are "products of vast volumes of data" rather than transcendent agencies, yet he demonstrates that users consistently experience them as extra-human. This disjuncture between technical description and phenomenological experience constitutes one of the most productive sites for future inquiry, requiring scholars to hold both registers simultaneously rather than collapsing one into the other.

Second, the "stellar turn" in literary studies risks reproducing the very anthropocentrism it seeks to critique. If the stars are always already "texts" to be read, the non-human agency of celestial bodies themselves remains unthought (Klaeger, 2018). Indigenous cosmologies, by contrast, tend to approach Country as an active participant in knowledge production rather than a passive surface for inscription (Abdilla, 2024). This divergence is not merely interpretive but ontological: it concerns whether the cosmos is constituted by meaning projected onto matter or by relationships among agentive beings. Scholars working within the lyric-humanist tradition might productively engage Indigenous relational ontologies without appropriating them, attending to what becomes visible when celestial bodies are granted agency.

Third, the politics of language in AI-mediated celestial narrative deserve more sustained attention. When natural language processing models translate ancient Chinese astronomical records or classify Korean star charts, what interpretive frameworks are baked into the architecture? The KASI projects gesture toward these questions but do not yet fully theorize them (Lee, 2025; Seo et al., 2020). The *Meditation on Country* project offers a more robust model by embedding cultural protocols directly into the training process, but this approach is difficult to scale and raises its own questions about the commodification of Indigenous knowledge

(Abdilla, 2024). The challenge is to develop evaluation frameworks capable of assessing not only translation accuracy but interpretive fidelity to the epistemic commitments embedded in source materials.

These tensions are not resolvable through technical refinement alone. They require sustained dialogue between astronomy, literary studies, anthropology, and Indigenous knowledge holders.

V. Conclusion

The search results do not contain a single article titled "Celestial Narratives in the Age of AI," but they collectively map the terrain such a work would need to traverse. The field is characterized by productive tensions: between AI as sacred and AI as instrument; between stars as text and stars as agents; between universalizing techno-scientific narratives and protocols of cultural sovereignty. These are not oppositions to be resolved but constitutive frictions that define the contemporary moment.

The most vital contributions are those that refuse the easy synthesis that insist on the irreducibility of language, protocol, and Country to the smooth operations of the algorithm. The self-reflexive cosmopoetics and the poetics of abduction both gesture toward this refusal, holding epistemological uncertainty open rather than foreclosing it. Yet it is Indigenous-led projects that most forcefully articulate the political stakes, demonstrating that the question of who controls training protocols is inseparable from the question of who controls narrative sovereignty.

If there is a "celestial narrative" proper to the AI age, it may be precisely this: the story of who gets to tell the story of the sky. The literature surveyed suggests that this story will be written not in a single voice but in the contested space between voices, human and machine, scientific and Indigenous, ancient and algorithmic. The task of future scholarship is to attend to that contestation without domesticating it.

References

- Abundant Intelligences. (2024). About the project. <https://abundant-intelligences.net/>
- Abdilla, A. (2024). Meditation on Country [Immersive artwork]. ISEA 2024 Everywhen.
- Abdilla, A. (2024). Meditation on Country [Immersive artwork]. ISEA 2024 Everywhen.
- Adorno, T. W. (1994). The stars down to earth and other essays on the irrational in culture (S. Crook, Ed.). Routledge. <https://doi.org/10.4324/9780203202404>
- ANAT. (2024, June 19). Meditation on Country. <https://www.anat.org.au/program/meditation-on-country/>
- Chichura, P. (2026, July 14). Self-driving telescopes: Intelligent scheduling for astronomical surveys [Conference presentation]. CosmicAI's Cosmic Horizons, Virtual. <https://doi.org/10.5281/zenodo.18111035>
- Greaves, M. (2018). Reading into the stars: Cosmopoetics in the contemporary novel. Universitätsverlag Winter.
- Greaves, M. (2018). Reading into the stars: Cosmopoetics in the contemporary novel. Universitätsverlag Winter.
- Greaves, M. (2026). A poetics of abduction: Ben Lerner's 'The Lights' and extraterrestrial intelligence. Textual Practice, 1–22. <https://doi.org/10.1080/0950236X.2026.2708660>

- Hudson, M. (2024). Tikanga in Technology [Research project]. University of Waikato. <https://www.waikato.ac.nz/research/centres/maori-and-indigenous-research/>
- Indigenous Protocol and Artificial Intelligence. (2020). Indigenous Protocol and Artificial Intelligence position paper. https://wiki.iad.zhdk.ch/wiki/download/attachments/1335984133/Indigenous_Protocol_and_AI_2020.pdf
- Iyer, K., et al. (2024). pathfinder: A semantic search and hypothesis generation tool for astronomy. The Astrophysical Journal Supplement Series, *275*(38). <https://doi.org/10.3847/1538-4365/ad8d41>
- Klaeger, F. (2018). Reading into the stars: Cosmopoetics in the contemporary novel. Universitätsverlag Winter.
- Korea Astronomy and Space Science Institute. (2025). Machine learning in historical astronomy [Presentation slides]. KASI AI Lunch Talk. https://data.kasi.re.kr/confluence/download/attachments/145227780/2025%20KASI%20AI%20Lunch%20Talk_20250619_Hyojun%20Lee.pdf
- Lee, H. (2025, June 19). Machine learning in historical astronomy [Conference presentation]. KASI AI Lunch Talk, Daejeon, South Korea.
- Lee, H. (2025, June 19). Machine learning in historical astronomy [Conference presentation]. KASI AI Lunch Talk, Daejeon, South Korea.
- Lee, H., & Yang, H.-J. (2025). Machine-learning-based quantitative analysis and identification of the Cheonsang Yeolcha Bunyajido (Historical Korean Star Map). The Bulletin of the Korean Astronomical Society, 54(2), 80..
- Lerner, B. (2023). The lights. Farrar, Straus and Giroux.
- Lerner, B. (2023). The lights. Farrar, Straus and Giroux.
- Lewis, J., Whaanga, H., et al. (2024). Abundant Intelligences [Research program]. <https://abundant-intelligences.net/>
- Molnar, D. (2025). Silicon Golem: Hyperstition, psychosis, and the theology of the Feed. Zenodo. <https://doi.org/10.5281/zenodo.18111035>
- NOIRLab. (2026, July 31). First AI-driven telescope goes stargazing. NOIRLab Announcements. <https://noirlab.edu/public/announcements/ann26016/>
- NSF-Simons SkAI Institute. (2026, July 31). First AI-driven telescope goes stargazing. NOIRLab Announcements. <https://noirlab.edu/public/announcements/ann26016/>
- NSF-Simons SkAI Institute. (2026, July 31). First AI-driven telescope goes stargazing. NOIRLab Announcements. <https://noirlab.edu/public/announcements/ann26016/>
- Ohman, C. (2024). The AI theology of large language models. Journal of AI and Religion, *2*(1), 1–24.
- Öhman, C. (2024). We are building gods: AI as the anthropomorphised authority of the past. Minds and Machines, 34(1), Article 8. <https://doi.org/10.1007/s11023-024-09667-z>
- Seo, Y. K., Kim, S. H., Ahn, Y. S., Choi, G.-E., Choi, Y. S., Baik, H., Sun, B. M., Kim, H. J., Choi, B. S., Lee, S. W., & Park, R. (2020). Study on the development of automatic translation service system for Korean astronomical classics by artificial intelligence. Proceedings of the Korean Astronomical Society, 45–48.
- Singler, B. (2020). "Blessed by the algorithm": Theistic conceptions of artificial intelligence in online discourse. AI & Society, 35(4), 945–955. <https://doi.org/10.1007/s00146-020-00968-2>
- Singler, B. (2020). "Blessed by the algorithm": Theistic conceptions of artificial intelligence in online discourse. AI & Society, *35*(4), 945–955.
- Yang, H.-J. (2015). Ancient Korean star maps and their astronomical significance. Journal of Astronomy and Space Sciences, 32(1), 51–62. <https://doi.org/10.5140/JASS.2015.32.1.51>

- Ye, R., & Shen, S. (2026). Predicting a space telescope's view of galaxies: Generative AI bridges ground- and space-based observations. *The Astrophysical Journal Letters*.
- Zhang, C., Lu, Q., Bai, H., Zhang, Y., & Xu, L. (2026). Artificial intelligence empowering astronomical observations: Review of intelligent telescope control systems. *Laser & Optoelectronics Progress*, 63(8), 0839005. <https://doi.org/10.3788/LOP250940>