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Centering Indigenous Voices and Resisting Colonialism In Space Exploration: An Overview Of The Ongoing Webinar Series By Space Enabled

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Indigenous perspectives and an anticolonial framework are essential to an equitable and genuinely sustainable future in space. Often imagined as an extension of manifest destiny and western expansion, space exploration requires a reframing if it is to achieve its potential to be a catalyst for ways of living and forming community that do not reproduce the same destructive systems of western capitalism. By understanding the ways in which past and present systems of coloniality intersect with the space sector and centering the experiences of Indigenous peoples in space exploration, a new way of conceptualizing space exploration can potentially emerge. Centering these issues highlights both near-term policy questions around lunar exploration as well as longer term questions about how to envision interactions with potential extraterrestrial life and sustained human communities on other worlds. To explore these ideas, the authors organized a series of webinars throughout 2021 hosted by the Space Enabled Research Group at the MIT Media Lab, with more events to come. The webinars address topics such as: 1) Indigenous perspectives on space exploration and the impact of a colonial mindset on the field; 2) near-term policy questions for lunar exploration; and 3) the role of astrobiology and opportunities for an anticolonial perspective to open up new ways to imagine potential futures in space. In this paper, the organizers of the webinar series present some of the key outcomes from the webinar series and the discussions it generated, and offer lessons learned from these concepts for the space community.

I. INTRODUCTION

Space exploration has often echoed the language of colonialism, and increasingly there is a recognition that these parallels go beyond semantic similarities. The structures of coloniality,^{*} built up by Europe's domination of the globe through the colonial era, have a direct impact on space exploration and how humanity both imagines and actively works toward constructing futures on other worlds.

This can be seen through the continued encroachment on the lands of Black² and Indigenous³ people to be put at the service of space exploration, a framework for lunar exploration that prioritizes private industry and profit, and more attention paid to

methods of resource extraction than environmental preservation.

"Space, as it is conceptualized today in North America, cannot be removed from its relationship to American Western expansion," writes Dr. Natalie Treviño in *The Cosmos is Not Finished*. "But more than just a metaphoric and narrative connection: these two places are linked by a variety of social, political, and cultural structures as conceptualized through the colonial matrix of power."^{4†}

There are real moral stakes involved in establishing the systems that will govern future communities on other worlds, and how humans will have an impact on those environments and potential ecosystems.

^{*} Coloniality is distinct from colonialism as a term in that it describes the present-day structures born out of the process of colonial/modern Eurocentered capitalism becoming a global power.¹

[†] The colonial matrix of power is a term derived from the scholar Anibal Quijano, describing how the domains of control over the economy (including land, labour, and resources), authority, gender and sexuality, and knowledge interconnect.⁵

With human exploration of the Moon for sustained periods of time becoming a near-term reality, and human exploration of Mars possible within our lifetimes, a critical need to address the impact of coloniality on space exploration has become apparent.

As a response to this need, the Space Enabled Research Group directed by Professor Danielle Wood at the MIT Media Lab has been facilitating a webinar series on Indigenous & Anticolonial Views on Human Activity in Space. The webinar series invokes alternate perspectives on how to approach space exploration from Indigenous thinkers, theorists, concerned members of the space community, and more. By facilitating dialog on these topics, the Space Enabled Research Group aims to spark discussion on what those alternate possibilities could look like and build a community capable of advocating for alternate practices within space-related fields.

The first two of these webinars have taken place, with a final webinar planned to be followed by an interactive workshop. In this paper, the organizers of the webinar series provide an overview of the first two webinars, lessons learned, and next steps for the completion of the series and future work.

II. PRE-PLANNING

Before deciding the format for the event series, the organizers had a discussion of what the goals and priorities for the project would be. The four primary goals landed on are as follows:

- Bring Indigenous cultural leaders into the conversation around anticolonialism in space.
- Invite contemporary viewpoints from members of Indigenous groups currently involved in the space industry.
- Convey the sense of immediacy concerning these questions.
- Explore the connection between anticolonial work in space and the ongoing efforts to address colonial issues on Earth.

There were also two secondary goals, broken out from the main objectives not because of any lesser importance, but due to a recognition that both were too broad to be comprehensively discussed in the webinar series. They are as follows:

- Educate people about the history of colonialism on Earth.
- Discuss ethical questions around astrobiology.

These six total objectives prioritize engaging with existing work and bodies of knowledge on these topics, bringing Indigenous perspectives to the forefront, and illustrating their importance for just futures both in space and on Earth.

Once these core objectives were identified, the organizers broke out the various topics to be address into three different webinars. The desire was to start

with a broad discussion about the relevance to engaging in discourse around the impacts of colonial systems in space and centering Indigenous voices, and to dive into specific issues pertaining to lunar exploration in the short term, exploration of Mars, and long-term futures in space. Those naturally fell into a three-event sequence, as follows:

- Framework for Anticolonialism in Space (addressing objectives 1 and 4)
- Lunar Exploration and Near-Term Issues (addressing objectives 1, 2, and 3)
- Mars and Beyond (addressing objectives 1, 2, and secondary objective 2)

For the structure of the webinars themselves, the organizers landed on a mix of brief presentations, facilitated discussion, and Q&A. The exception to this was the first event, where a longer keynote talk with Dr. John Herrington and an individual Q&A was included.

Two out of the planned three events have been held thus far and based on the lessons learned from those events added a fourth workshop which will conclude the event series.

III. OVERVIEW OF WEBINARS 1 AND 2

III.I Panel Discussion with Dr. Herrington: Indigenous & Anticolonial Views of Human Activity in Space

Our first event included a keynote talk and Q&A with astronaut Dr. John Herrington, the first Native American astronaut and member of the Chickasaw Nation, a facilitated discussion bringing in Dr. David Uahikeaikalei'ohu Maile, a Kanaka Maoli scholar, activist, and practitioner from Maunawili, O'ahu; and Dr. Natalie Treviño, space theoretician and award-winning educator who recently graduated from the Centre for the Study of Theory and Criticism at Western University in London, Ontario. Both speakers gave introductory remarks, and all three speakers engaged in another Q&A towards the end of the event. Professor Danielle Wood served as the Moderator.

Dr. Herrington's keynote provided an overview of his life story and journey to become a NASA astronaut. Dr. Maile spoke to the importance of grounding anticolonial efforts on Earth to anticolonial efforts on Earth, such as resistance to the Thirty Meter Telescope on Mauna Kea. Dr. Treviño connected her work in connecting scholarship on coloniality to the Western world's vision for space exploration. The discussion resulted in a connection of real-world experience in space alongside both theoretical framings and tangible connections between colonial systems on Earth and space-related projects.

III.II Indigenous & Anticolonial Views on Human Activity in Space: Panel Discussion on Near-Term Issues of Lunar Exploration

The second event in the series narrowed in focus to discuss near-term issues related to lunar exploration. For this event, the organizers opted to have the three speakers give a brief overview of their work and prioritize time for facilitated discussion and Q&A, without a longer keynote speaker. This event brought together Dr. Parvathy Prem, a planetary scientist at the Johns Hopkins Applied Physics Laboratory; Dan Hawk, the instigator of many projects to involve Indigenous peoples in space activities, including as founder of the United First Nations Planetary Defense; and Dr. Richard Shope, president of the World Space Foundation and previously an educator with NASA's Jet Propulsion Laboratory. Professor Danielle Wood once again moderated.

The discussion weaved together Dr. Prem's work as a planetary scientist with conversations about the nature of preservation and resource management on the Moon, with Dan Hawk bringing forward an Indigenous mindset to both topics. "We have to look at how we deal with [lunar] resources," said Hawk. "Nothing should be wasted. That's a Native American philosophy."⁶

Conversation also addressed an incident from 1998 when the Lunar Prospector mission brought the ashes of planetary scientist Dr. Eugene Shoemaker to the Moon's surface, an action that sparked a response from the Navajo Nation at the time. NASA responded with an apology and engaged more with Diné communities through efforts such as Dr. Shope's work. Dr. Shope shared his experiences in developing educational programs and outreach opportunities with Diné youth, sparking conversations about how to involve Indigenous peoples in space activities and to ensure Indigenous beliefs are respected in interactions with the Moon -- a topic of increasing relevance.

IV. DISCUSSION OF COMMON THEMES

Throughout discussions in both webinars, there were common themes to highlight. Those included the interconnected *nature of anticolonial struggles on Earth and in space*, the *importance of an Indigenous perspective*, and the *need for collective action moving forward*.

IV.I Interconnected Struggles in Space and on Earth

The importance of grounding conversations on anticolonial efforts in space with those ongoing struggles on Earth was something Dr. Maile spoke to directly, referencing ongoing conflicts for Indigenous peoples to maintaining sovereignty over their lands, and struggles such as those for Palestinian liberation. "I believe we must frame the politics and ethics and practices of anticolonialism in outer space around the

understandings of colonialism and anticolonialism on Earth," said Dr. Maile.⁷

One specific example brought up was the construction of the Thirty Meter Telescope on Mauna Kea. With a scientific objective of this telescope being the identification of potentially habitable and life-harboring exoplanets, Dr. Maile made the point that "*indeed, conquest of non-human life on other planets is made possible through the conquest of Indigenous life on our planet.*"⁸

IV.II Importance of an Indigenous Perspective

Beyond the intrinsic importance of involving all voices in the exploration of space, both webinars illustrated the importance of an Indigenous perspective on space exploration. Dr. Prem provided a solid grounding for this connection, stating "planetary science, as I see it, is at its core about building relationships to places."⁹

Indigenous peoples have a unique contribution to the space sciences in this regard, as the communities that have the most complex relationships with their lands and practices for coexisting with their natural environments. That set of practices, skills, and beliefs from long term histories and connections with lands is termed Indigenous Knowledge.¹⁰ That through line, connecting his ancestry to his work in space, was something Dr. Herrington spoke to as well.¹¹

Rather than thinking of science and engineering as fields of study in opposition to Indigenous practices, this points out how practices that fit both labels have clearly been put into practice for thousands of years. The comments in the second webinar on how an Indigenous mindset to resource management could be beneficial for lunar exploration echo this -- Indigenous Knowledge can be complementary for ventures in space and point towards an alternate path than the current emphasis on resource extraction.

IV.III Collective Action as a Path Forward

Both events pointed towards a need for collective action within the space community to engage in this shift of perspective. That message was reinforced by the variety of disciplines and backgrounds speakers came from, already illustrating how those in academia and government agencies, education and the sciences, theorists and engineers all have a place in these conversations and the broader push to resist colonial structures in space-related fields.

"*This is just the tip of the iceberg to engage everyone who is on this call,*" said Dr. Shope towards the end of the second webinar. "*If these issues are really important to you, find some space within your life where you can take some action.*"¹²

Much of these conversations discuss how to avert or adjust practices currently in place regarding space exploration, but part of the work of making space and

anticolonial work within that field a collective effort is expanding the view of what space can be -- something that is liberatory to this work, and not constricting. This point was brought home by Dr. Treviño's comments in the first webinar, who stated:

*"Space is that thing that we all have in common," she said. "We are cosmological beings, and we have the opportunity to reconfigure ourselves in relation, not just to the world in which we exist, but the worlds in which we exist, including outer space."*¹³

V. LESSONS LEARNED

Based on the two webinars held thus far, there are several lessons learned to present based both on practices that were found effective and areas for improvement. There's been extensive work done on best practices for virtual events and learning, so the focus in this paper will be on lessons related to discussing these particular issues.

V.I Webinar Structure and Planning

Discussions on anticolonial perspectives on space require a unique mix of interdisciplinary conversation, across areas of study that often don't have much overlap, and cultural sensitivity -- especially when creating a space to highlight Indigenous voices in a field where they are often left out.

With all this in mind, the organizers designed the structures of the webinars to give ample room to be led by the speakers, while creating spaces for them to find the intersections between their work naturally. An important part of this was engaging speakers prior to the event, allowing them to find synergies in their comments during discussion. This was essential to the success of both events thus far. For example, this structure allowed Dr. Herrington to be exposed to the scholarly work of Dr. Maile and Dr. Treviño, and for both of them to have exposure to Dr. Herrington's story and his technical expertise.

With that groundwork in place, there was a baseline level of familiarity among the speakers, both in forging personal connections and overlap in topics of discussion. Dr. Wood, who facilitated both events, provided assertive and insightful facilitation that was able to provide direction to conversation. Because of both the prep work and the strength of the facilitator, both events were able to provide dynamic and natural conversations touching on the themes laid out.

One area that was found challenging was in balancing time for speakers and making appropriate space for the audience to engage with them. It was important to allocate ample time for speakers' comments, out of respect for their scholarship and importance in the space community, but also recognize that anticolonial efforts in space need to be community-oriented efforts. For both events, there was a section of audience Q&A to ensure participants could

voice their thoughts and questions, but both sessions felt as if they were cut off early. One aspect of the Q&A that was not anticipated was the level of depth and knowledge on these topics that audience members brought with them. Many folks in attendance were experts in their own right on certain aspects of space policy. Recognizing this project had tapped into a broader community of experts who also had much to contribute to the topics at hand impacted planning for the remainder of the series.

All discussions, both among panelists and participants in the audience, were limited by the use of English as the language for these events without the use of translation services. When discussing issues that are inherently transnational and cross-cultural, using any single language will be a barrier to participation for many. The use of English also inherently biases conversations towards English-speaking speakers as well as participants -- it's a barrier not just of access and who gets to engage, but also the ideas that participants are able to be exposed to in these conversations.

A desire expressed by participants, especially during the second seminar, to find ways to translate conversation into action. This was expressed both by Dr. Shope during his final remarks and several participants. This also helped us realize that a webinar is a challenging format for taking nuanced discussion and giving participants actions or lessons to take with them to their home institutions, research projects, and personal lives. This was where the idea for adding an event structured to be a workshop rather than a discussion-oriented webinar came from.

V.II Balancing Perspectives

Beyond the lessons learned on the structure and preparation for hosting webinars on these topics, the organizers also reflected on the contents of the conversations hosted.

It was fruitful to encourage interactions between various disciplines and backgrounds, and saw this play out based on the speakers brought together. In the first webinar, the discussion between Dr. Herrington, who had extensive practical experience as an engineer and astronaut, and Dr. Treviño and Dr. Maile, with expertise in theory and academia, put a strong theoretical foundation for how colonial systems impact space exploration in conversation with personal anecdotes and stories from doing the work of an astronaut as a Native American. In the second webinar, having the perspectives of a planetary scientist from Dr. Prem alongside Dr. Shope's experience as an educator and Dan Hawk's work in the space industry resulted in a robust conversation around both the Lunar Prospector incident -- as one of the best historical examples of Indigenous perspectives on the

Moon clashing with scientific missions -- and the current approach to future exploration.

In both of those conversations, the organizers also found it important to highlight Indigenous viewpoints intentionally. That involved making a collective effort to seek out Indigenous perspectives and to do so purposefully, with a recognition that Indigenous viewpoints are not monolithic and comprise a host of often differing worldviews; that speakers were not a stand-in or meant to represent a holistic or singular “Indigenous viewpoint.”

A part of that was not only being prepared for, but encouraging critical viewpoints and contrasting ways of practice among speakers, both Indigenous and those that are not. The three Indigenous speakers brought in across the two events each came from different backgrounds -- Dr. Herrington as an astronaut, Dr. Maile as an academic, and Dan Hawk as space advocate and business owner. Other speakers included Dr. Treviño, an academic and theorist, Dr. Prem, a planetary scientist, and Dr. Shope, an educator. Each brought a different perspective to the table, and the areas where they didn’t necessarily align were often where the most fruitful parts of conversation came from.

Part of intentionally bringing in this array of perspectives is also recognizing that, due to the nature of a curated discussion, some voices and positions will always be left out. For example, there are some perspectives that wouldn’t necessarily be appropriate to bring into conversations meant to highlight Indigenous voices. But recognizing this as a conscious choice is important to also making sure that voices that perhaps could and should be engaged are not left out.

For example, one voice that was lacking in the webinars hosted so far was that of policy makers and members from the private sector. Those are areas where many of these discussions may meet more critical reception, but they are also some of the most essential voices to engage with, and the parties that most directly work with the systems these conversations are attempting to grapple with. Engaging with such groups is important to find where advocates for an anticolonial perspective can find common ground, and also identify areas where they may not be able to.

V.III Reflections on Series Objectives

Ultimately, the organizers found the webinars thus far to meet the main objectives set out. By bringing in speakers such as Dr. Herrington, this project was able to engage one of the most important Indigenous voices involved in space exploration, addressing the first objective. The series has not engaged Indigenous cultural leaders that aren’t connected to space-related fields, which could further serve this objective in future events. Dr. Maile and Dan Hawk provided

contemporary Indigenous viewpoints that, alongside Dr. Herrington and potential speakers for future events, will meet this secondary goal.

Discussions particularly in the second webinar illustrated the immediacy around these questions, with some of the very near-term questions around lunar exploration, meeting the third objective. Dr. Maile’s work very explicitly drew a connection between anticolonial work in space and anticolonial efforts on Earth, a theme the organizers intend to sustain throughout the rest of the series, meeting the fourth objective.

We also found ways in which the main objectives, even if technically met, left next steps unclear. The third objective, to make the urgency of these issues, was apparent from the conversations held. But, when the urgency of an issue is emphasized, the natural response is to want to know what steps to take to address it. Because of the limitations of the webinar format discussed above, the event series in its original format was not designed to give an answer to that.

For the secondary objectives, historical overviews of colonialism on Earth were touched on in the first webinar, in particular highlighting contemporary issues connected to space-related fields. Questions around potential life on other worlds were also briefly discussed, which will be a more central focus of the next webinar.

Building on the lessons learned from these first two events, the organizers have adjusted for the future work of this webinar series to move beyond the current list of objectives and seek to give participants more actionable practices to take home with them, working towards building a sustained community around these concerns.

VI. PLANS FOR FUTURE WORK

The webinar series was initially planned as a three-part project, with the third focusing on questions related to longer-term futures in space. This included focusing more on astrobiology and potential interactions with possible life, as well as long-term human habitation on Mars and beyond. Originally, the organizers wanted to bring in voices involved in speculative fiction, especially those involved in Indigenous futurisms, to highlight the role fiction can play in imagining alternative futures to normative colonial narratives of exploration. Ultimately, it was decided this would be out of scope for the third webinar, which is focusing on Martian exploration and astrobiology. It’s a topic the organizers hope to bring attention to potentially through other events and work.

After the second seminar, the organizers decided that in addition to this third seminar, a fourth event structured more explicitly as an interactive workshop would be added. Participants were eager to engage in good faith with speakers and the ideas they were

discussing and were looking for actionable ways to make change in their institutions in order to promote a more anticolonial approach to space exploration, one that was inclusive of Indigenous perspectives.

To that end, the organizers have begun early brainstorming for what that workshop could look like. The priorities for that workshop are to create a community event that builds towards actionable output. One potential format could be small, facilitated “break-out” discussions each focused on developing best practices to address those specific concerns to share with the wider group. Ultimately, the hope is this workshop -- and the event series as a whole -- can be a starting point for long-term, sustained action.

Because this work requires a fundamental shift in how to think about the work of space exploration, it will have to be a long-term effort, one that involves continued conversation around complex issues while also ensuring those conversations are tied back to concrete policy questions as they arise.

VII. CONCLUSION

This moment, on the cusp of a long-term presence for humans on other worlds becoming a reality, is ripe for discussions around how to not repeat the mistakes embedded in the past and present structures that govern Earth. That is because the choices made during

this initial phase will set the tone for humanity’s future endeavors. And without specifically addressing the need for an anticolonial perspective, the current dominant structures will be the default.

The questions brought up in this webinar series connect to complex decisions that will need to be addressed. Among others, those decisions include how to manage lunar resources equitably and sustainably, prioritize cultural considerations in how humanity interacts with the Moon, address potential impacts to extraterrestrial microbiomes through exploration and life detection missions, and ensure Indigenous voices are brought to the forefront in these discussions.

What has been clear from the depth of knowledge presented by the speakers and the willingness of audience members thus far to engage is that space-related fields are eager to engage in conversations about how to build anticolonial practices into this work. Ultimately, that will require building community around these issues to make this work long-term and sustainable. The authors invite members of the International Astronautical Congress to join Space Enabled for the remaining events in the series and engage in the broader long-term effort of advocating for an anticolonial perspective when engaging in space activities.

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³ Sara Kahanamoku et al, National Academy of Science Astro202 Decadal Review: Maunakea Perspectives <<https://doi.org/10.6084/m9.figshare.c.4805619>>

⁴ Dr. Natalie Treviño, 2020, The Cosmos is Not Finished – The University of Western Ontario

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⁸ Dr. David Maile, 2021, Panel Discussion with Dr. Herrington: Indigenous & Anticolonial Views of Human Activity in Space – Space Enabled Research Group at the MIT Media Lab

⁹ Dr. Parvathy Prem, 2021, Indigenous & Anticolonial Views on Human Activity in Space: Panel Discussion on Near-Term Issues of Lunar Exploration – Space Enabled Research Group at the MIT Media Lab

¹⁰ Indigenous Knowledge, an overview – Science Direct <<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/indigenous-knowledge>>

¹¹ Dr. John Herrington, 2021, Panel Discussion with Dr. Herrington: Indigenous & Anticolonial Views of Human Activity in Space – Space Enabled Research Group at the MIT Media Lab

¹² Dr. Richard Shope, 2021, Indigenous & Anticolonial Views on Human Activity in Space: Panel Discussion on Near-Term Issues of Lunar Exploration – Space Enabled Research Group at the MIT Media Lab

¹³ Dr. Natalie Treviño, 2021, Panel Discussion with Dr. Herrington: Indigenous & Anticolonial Views of Human Activity in Space – Space Enabled Research Group at the MIT Media Lab