

Title: The night sky is part of the land: the ongoing colonization in astronomy research and space exploration.

Speakers: Hilding Neilson

Series: Colloquium

Date: September 29, 2022 - 2:30 PM

URL: <https://pirsa.org/22090093>

Abstract: It has been argued astronomy and astrophysics as a research field developed with the first telescope. At the same time that Galileo observed the phases of Venus and the moons of Jupiter, European Powers will colonizing the Americas and other parts of the world. This began a relationship between astronomy and colonization that continues today in terms of astronomers and nations building giant telescopes on Indigenous lands. In the future as private actors develop a new space industry we will see the export of this colonialism to Space, to the Moon and one day even to Mars. We are already seeing this today with the development of satellite constellations, some of which are visible by the unaided eye and with the multinational Artemis Accords for lunar exploration. In this talk I will review the relation between astronomy and colonization in the past, present, and future; and I will discuss steps educators and astronomers can take to address this in the classroom and how the field of astronomy and space exploration can be inclusive of Indigenous rights and voices.

Zoom link: <https://pitp.zoom.us/j/95620288526?pwd=dW9ReW5FUVP3TWFMUVUxZjV5VFhNdz09>

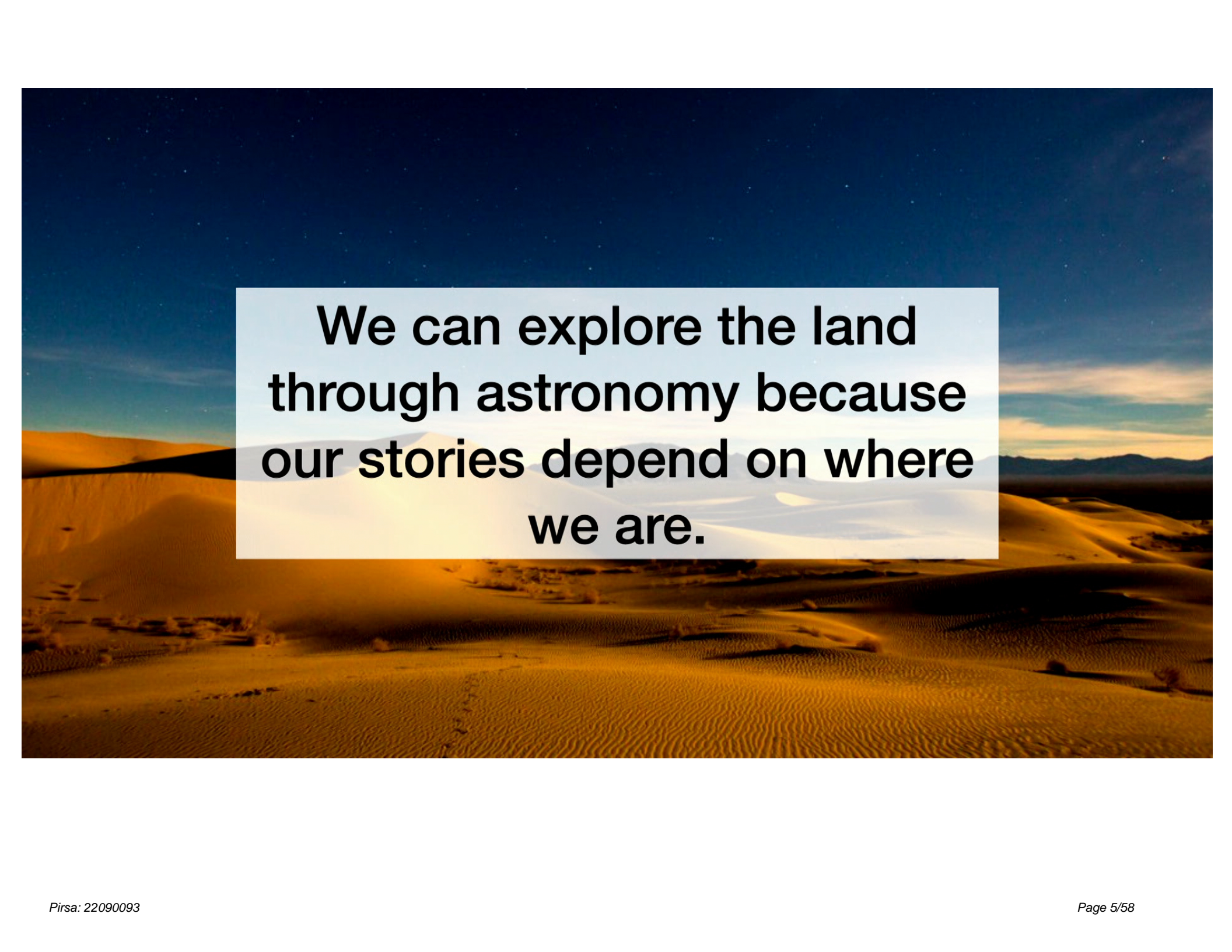
Space is part of the Land

**Hilding Neilson, Dept of Physics & Physical Oceanography
Memorial University of Newfoundland and Labrador
Sept 29, 2022**

**Indigenous Peoples have been on
this land since time immemorial.**





A wide-angle photograph of a desert landscape at night. The foreground and middle ground are filled with rolling sand dunes, illuminated by a warm, golden light from the setting or rising sun, creating long shadows and highlighting the ripples in the sand. The sky above is a deep, dark blue, filled with numerous stars and the faint, milky band of the Milky Way galaxy stretching across the upper portion of the frame. In the distance, dark silhouettes of mountains are visible against the horizon. A semi-transparent white rectangular box is centered over the image, containing the text.

**We can explore the land
through astronomy because
our stories depend on where
we are.**

How might our stories change in Australia? or the Arctic?



For instance... the Moon

Northern Hemisphere



Southern Hemisphere

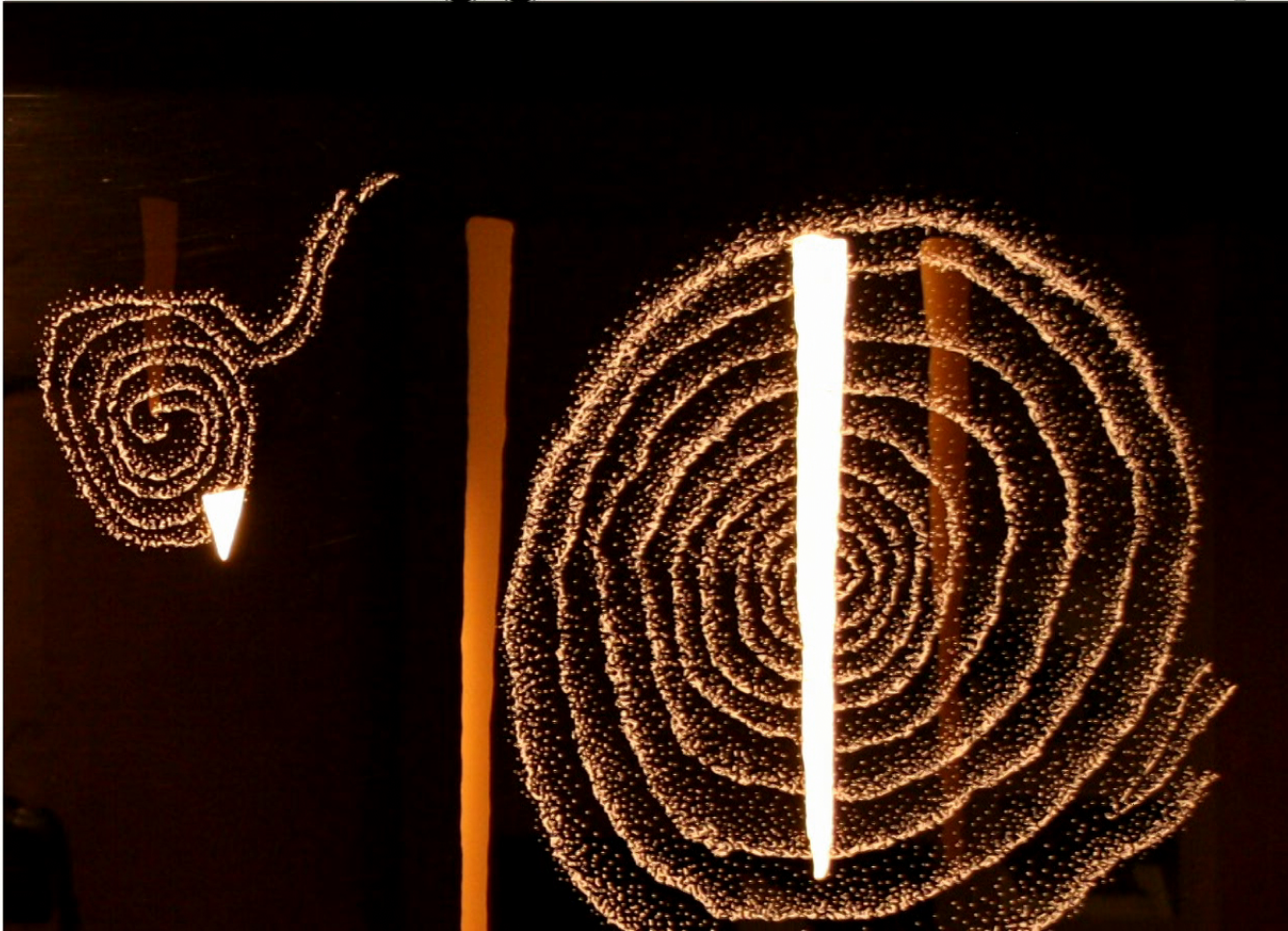


Indigenous knowledges built upon axioms

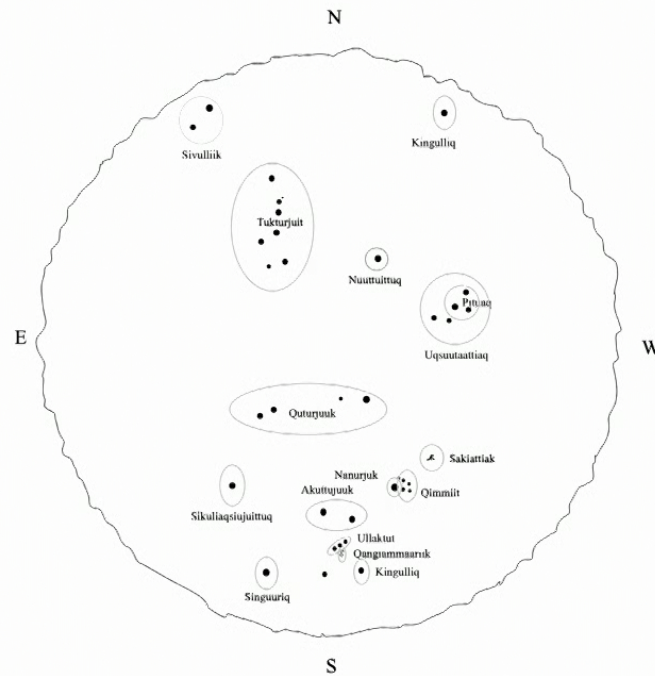
- What's above reflects below
- Knowledge is relational
- Considers multiple variables that interact concurrently
- Knowledge is (w)holistic
- Nature is holy, sacred, unity, familial
- (There is no pan-Indigenous knowledge system)

**These axioms complement
Western Traditional Science.**

The Sundagger is one example

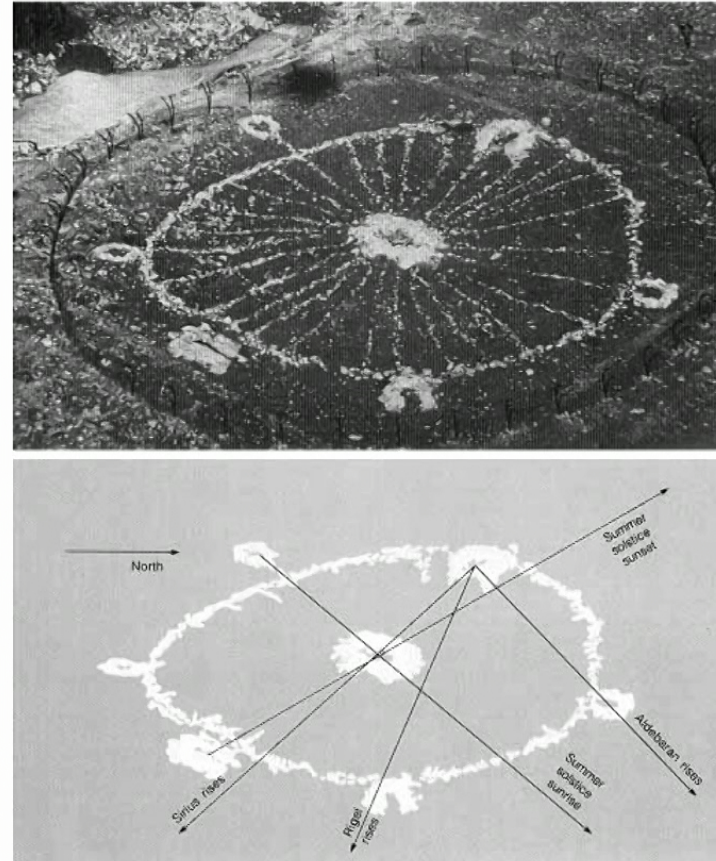


Singuuriq is the flickering star.

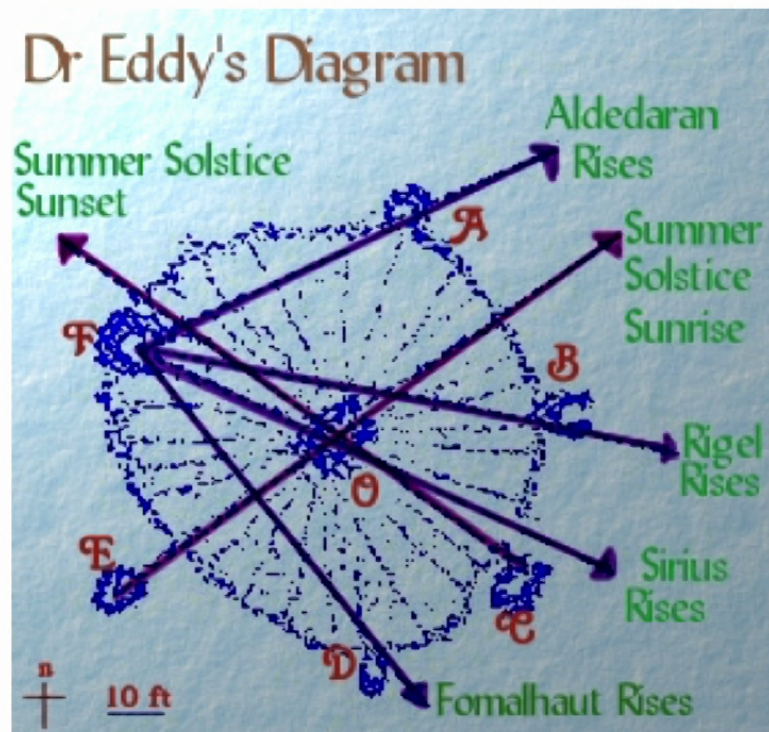


Night Sky Above Igloodik (Central Nunavut) at Winter Solstice

**The Big Horn
Medicine Wheel
is an observatory,
calendar, sacred
place, etc.**



Ceremony and time-keeping



- Jack Eddy (Archaeoastronomer) showed that wheel connect with dawn-time rising of important stars near the summer solstice
- Fomalhaut rises at dawn for about 4 weeks before Solstice
- Aldebaran about 2 days before
- Others for a month after

Muin and the Seven Bird Hunters





Indigenous knowledges built upon axioms (Lipe, 2017)

- What's above reflects below
- Knowledge is relational
- Considers multiple variables that interact concurrently
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- Nature is holy, sacred, unity, familial
- (There is no pan-Indigenous knowledge system)

Indigenous astronomy knowledges and methods provide valuable insights into our place in the Universe. But, Astronomy/Physics ignores them.

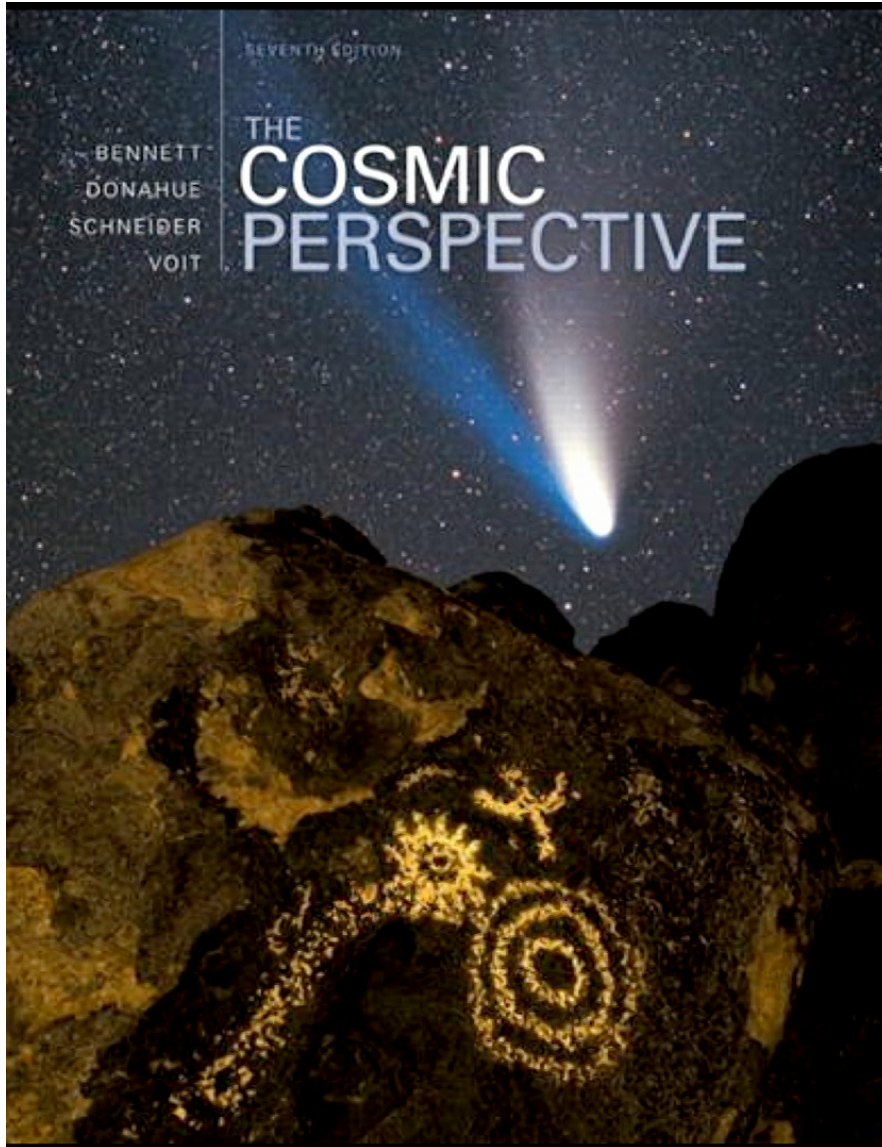
Sky is linked to Colonization and our place on the land



Sky is linked to Colonization and our place on the land



Our view of the night sky is colonized.



Our textbooks are colonized.

Textbooks are hundreds of pages, maybe 2 pages relate to Indigenous knowledges.

This erasure of Indigenous knowledges is not unique to astronomy, but is a result of colonization.

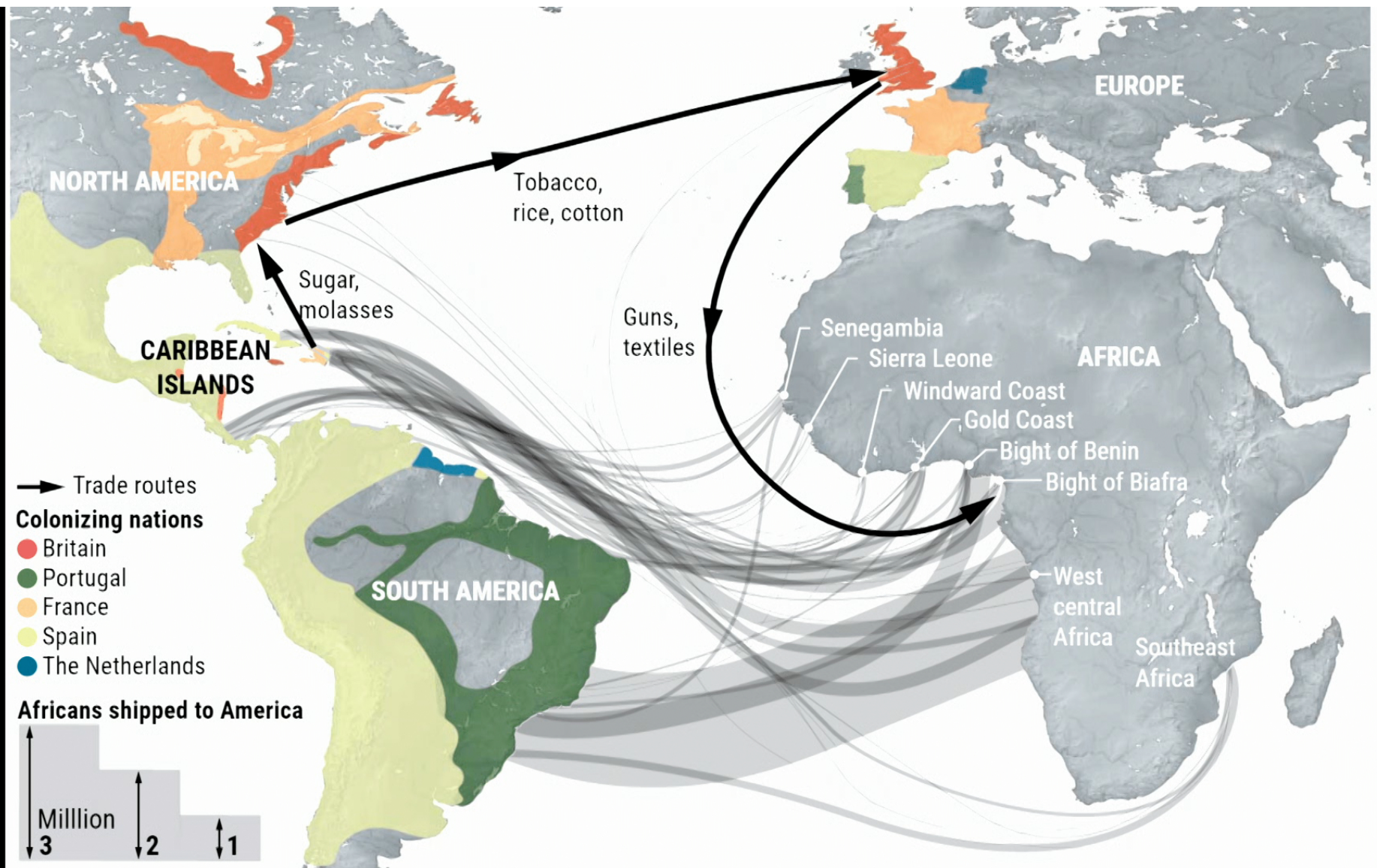


James Cook, Corner Brook, Newfoundland & Labrador

James Cook observed the 1767 Annular Eclipse off the coast of Newfoundland.



Then led the expedition to observe the Transit of Venus in 1769 with secret orders to “discover” Australia.



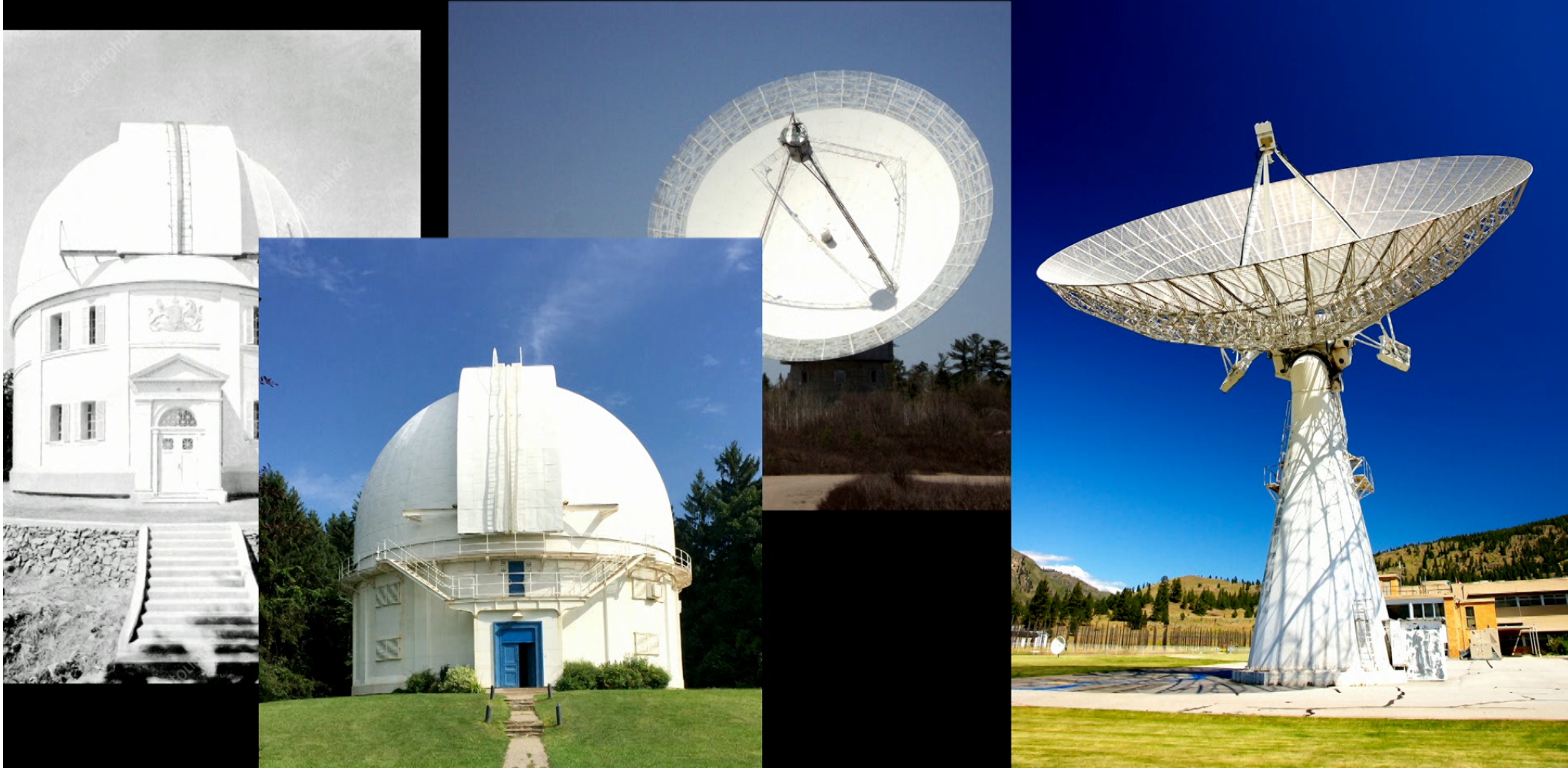
The first telescope in what becomes Canada was in Louisbourg in Mi'kma'ki in about 1750.



Joseph-Barnard Chabert



Observatories in Canada are built on Indigenous lands



So are observatories in the US



Kitt Peak leased from 1958 to forever

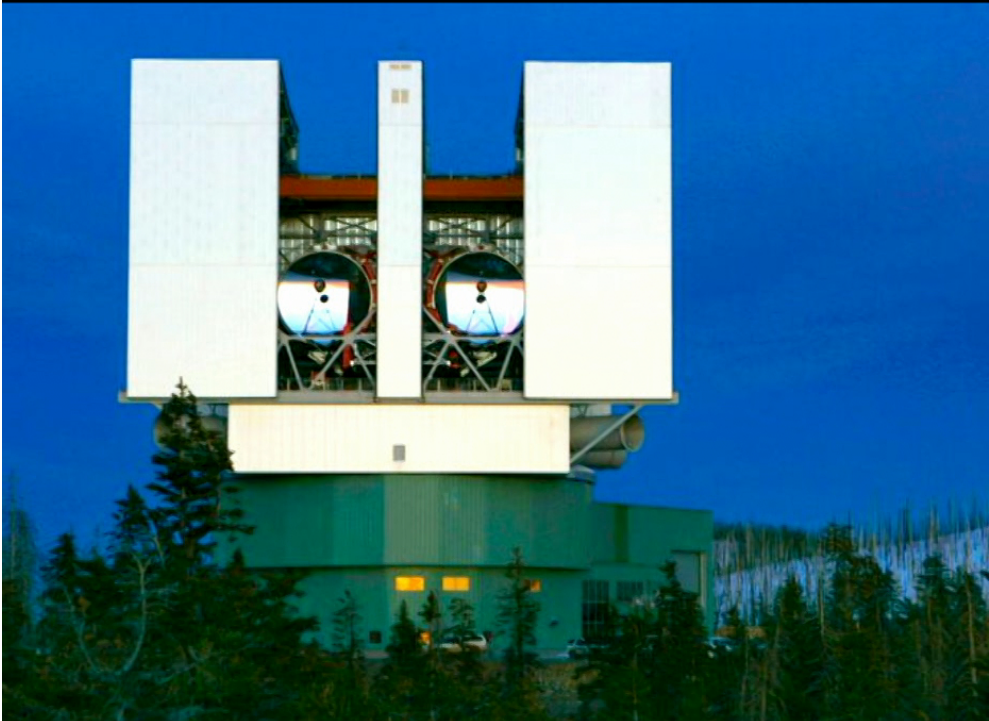


<https://www.optica.org/en-us/history/multimedia/photos/w/waller-img2/>

- NSF signed lease for 200 acres of land
- NSF pays Tohono O'odham nation \$2500 / year to use mountain
- Yet in 2005 they filed a lawsuit over VERITAS claiming "NSF had violated the National Historic Preservation Act by not consulting with the tribe and the Arizona Historic Preservation Office"

<https://astrobites.org/2019/08/16/a-tale-of-two-observatories/>

Nearby Mt. Graham faced protests over the “Columbus” Telescope



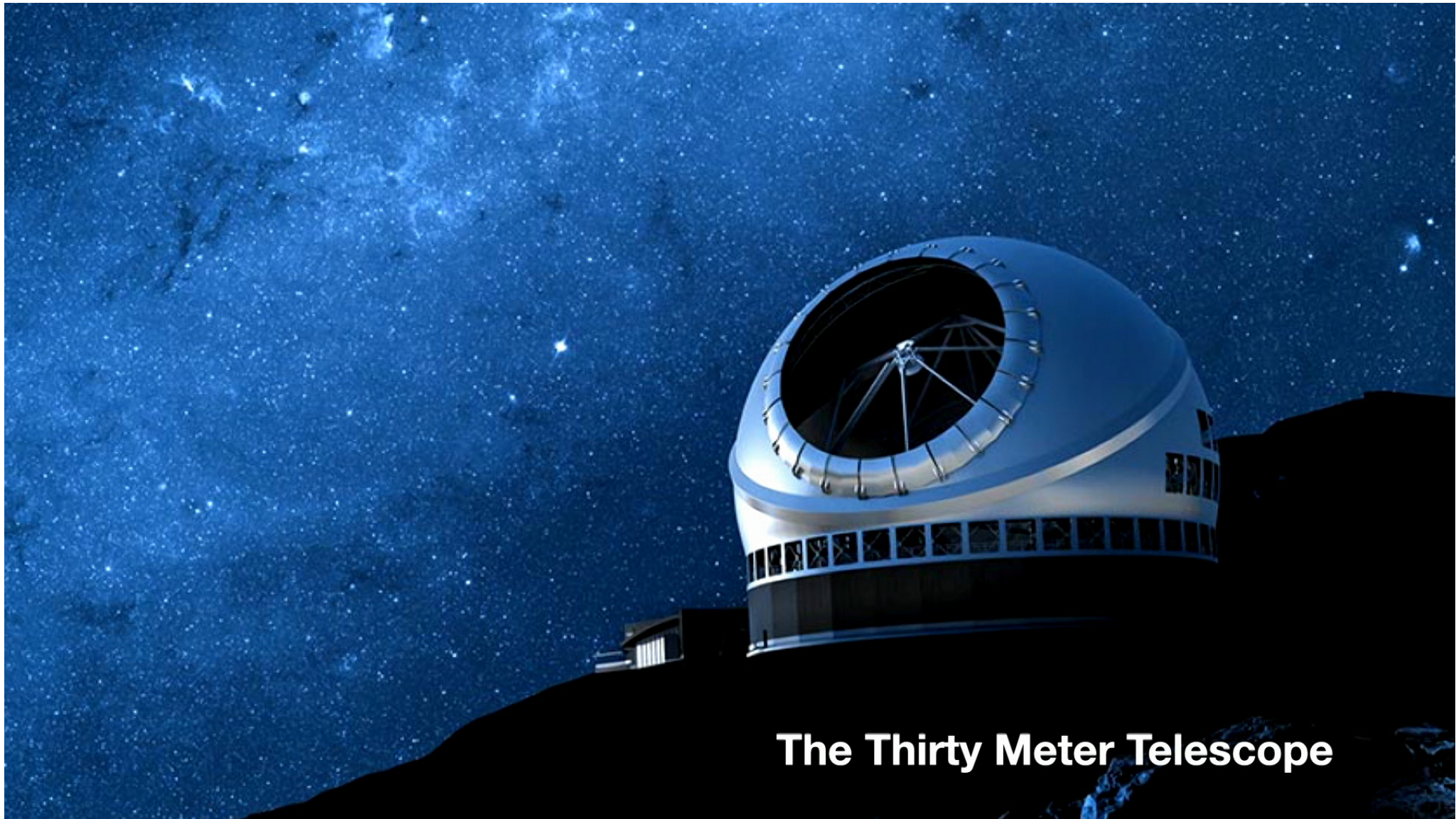
- Apache Survival Coalition fought numerous lawsuits to stop construction in the 1980s
- The US Government passed legislation “compelling the US Forest Service to allow three telescopes”

<https://astrobites.org/2019/08/16/a-tale-of-two-observatories/>

All telescopes / observatories in Canada are on Indigenous lands. So are Canadian astronomical facilities in other nations.

Mauna Kea is a center for astronomy





The Thirty Meter Telescope

But, Mauna Kea is Native Hawaiian lands.

The Fight for Mauna Kea Is a Fight Against Colonial Science

The protests by Native Hawaiians against the Thirty Meter Telescope are a cry for respect for indigenous autonomy.

By Keolu Fox and Chanda Prescod-Weinstein

JULY 24, 2019



<https://www.thenation.com/article/archive/mauna-kea-tmt-colonial-science/>

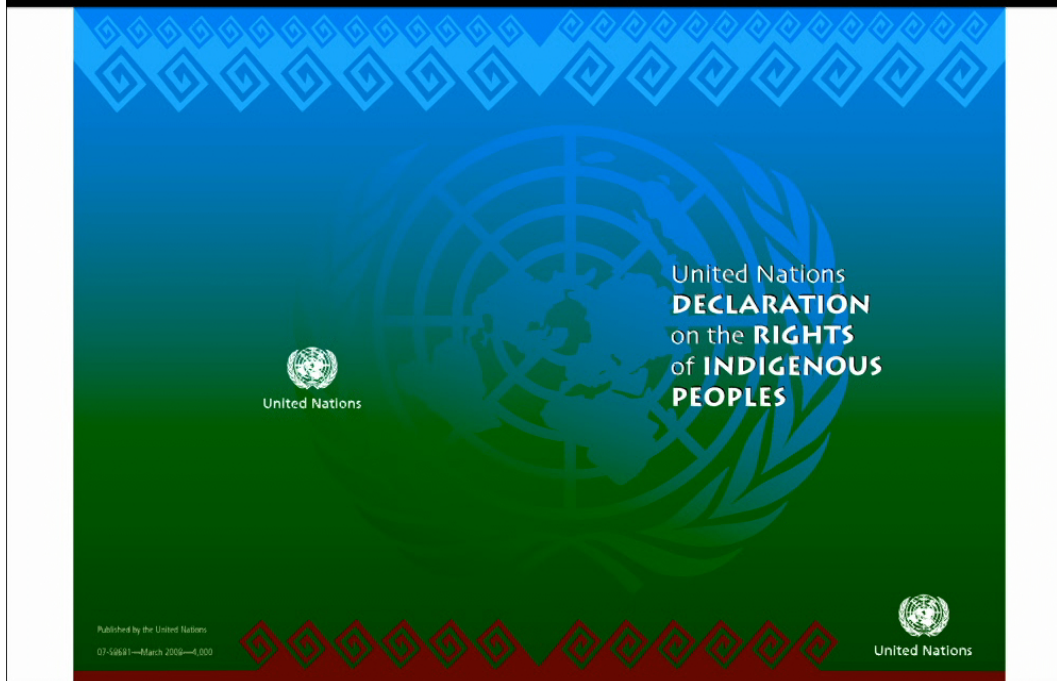
This battle isn't new

- 20 years ago Keck attempted to build “Outrigger” telescopes but faced lawsuits from the Office of Hawaiian Affairs
- Showed they did not meet environmental requirements.
- But, also a question of consent.



The construction of TMT is a question of consent and Indigenous Rights.

The Canadian Astronomy Community has agreed to not build facilities without Indigenous Consent following UNDRIP.

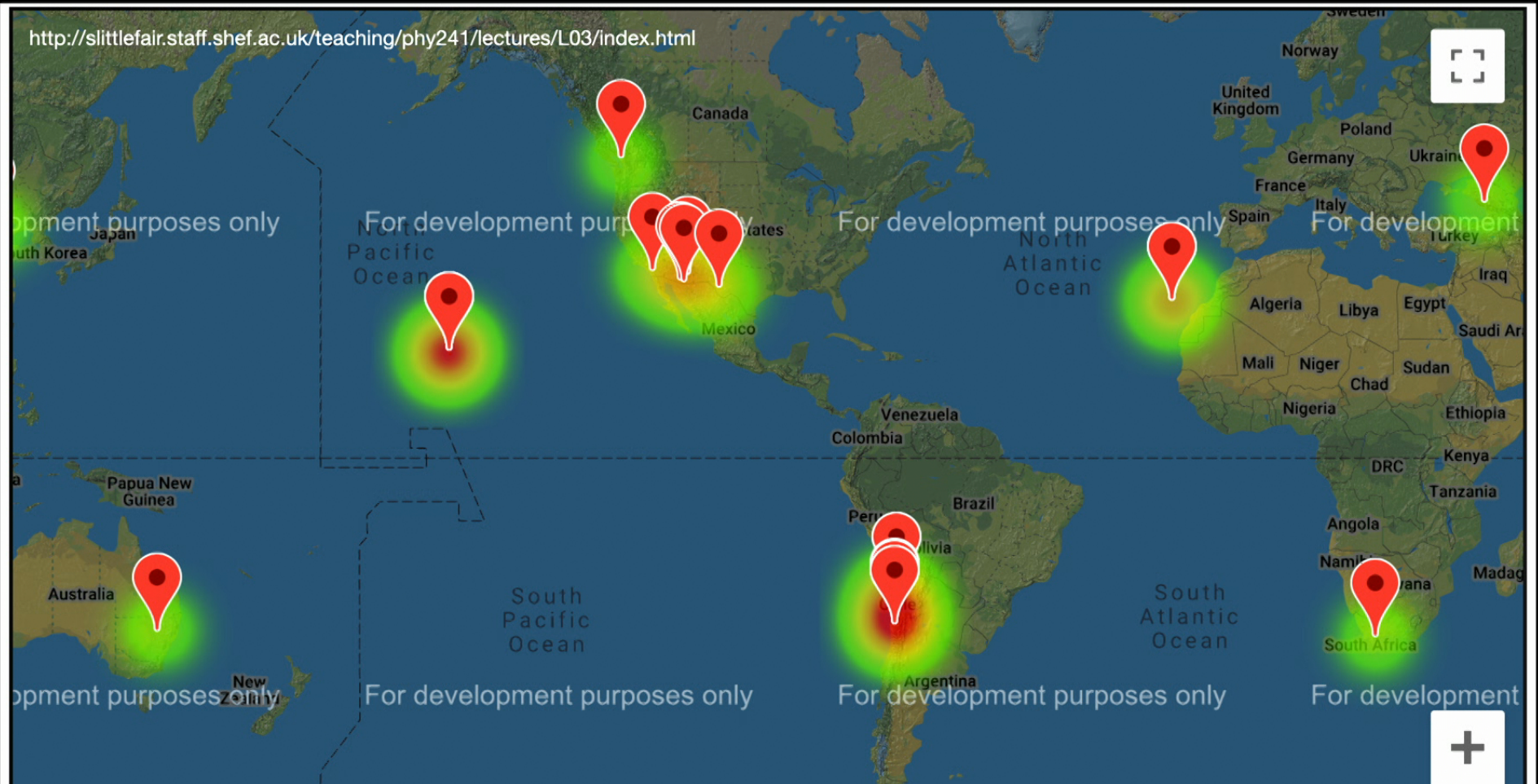


https://casca.ca/?page_id=75

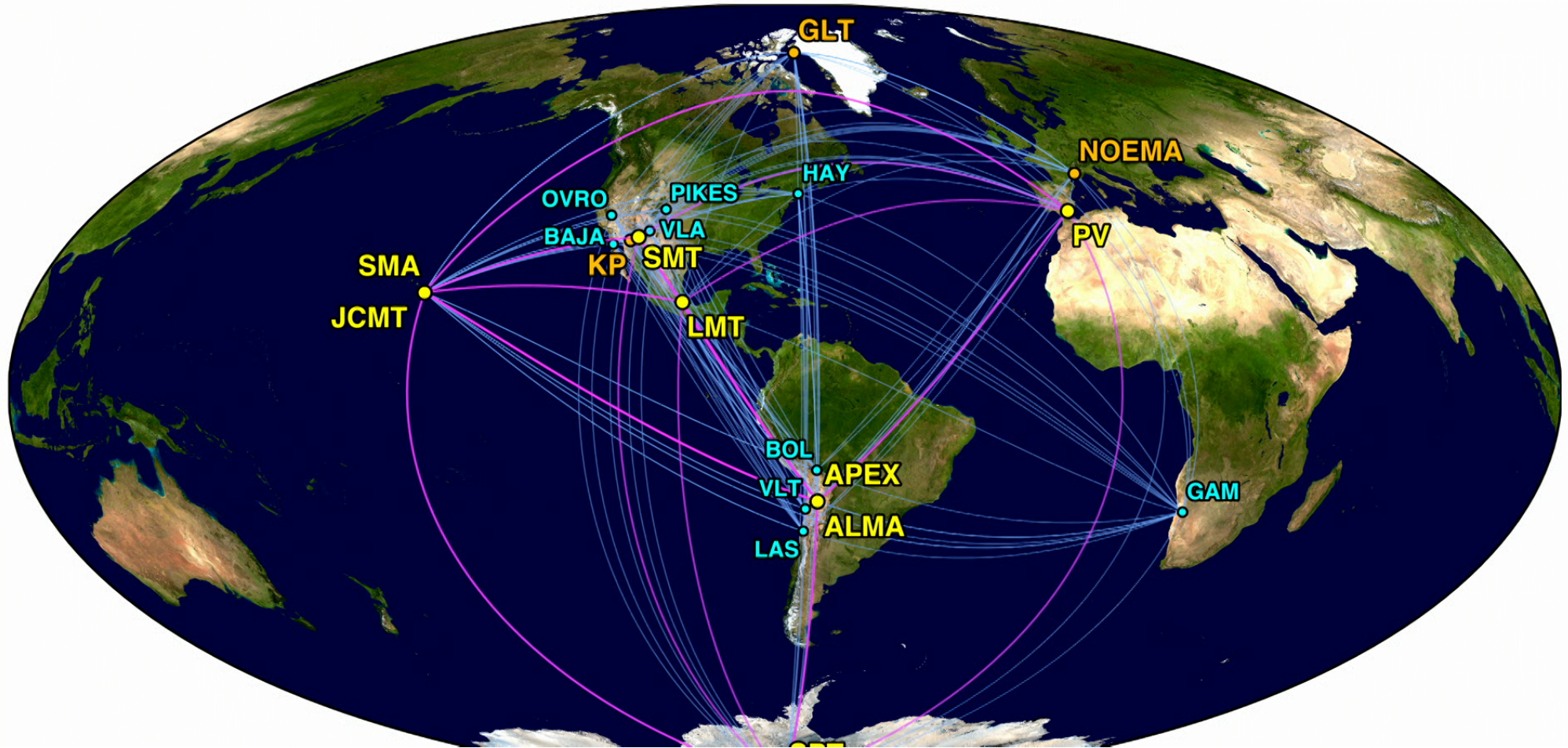
We can't manufacture consent.
The NSF has been running consultation sessions.



Most of the largest telescopes are on Indigenous Lands



Most radio telescopes are on Indigenous Lands



How do we decolonize astronomy? We can't.

- We can't decolonize astronomy while building telescopes without consent.
- We can't decolonize while manufacturing consent.
- We can't decolonize while pretending token initiatives are good enough (cost of initiative << cost of operation as one definition).
- Astronomy can't decolonize without creating space for Indigenous Rights, Peoples, and Knowledges.

Colonization is not only telescopes.

Light pollution is also colonization.

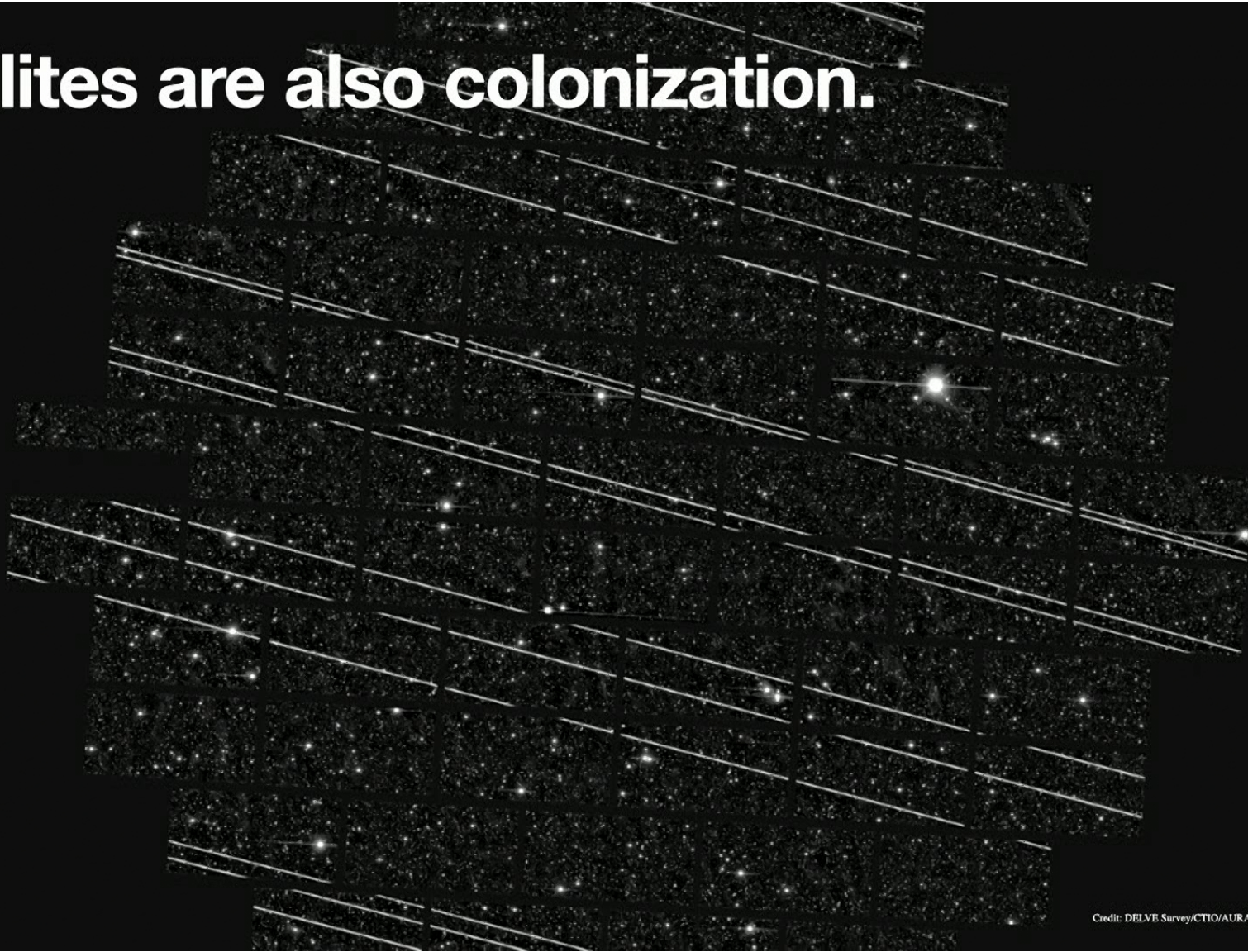


Light pollution erases connections with the sky.



<https://inhabitat.com/light-pollution-and-the-return-of-night/lightpollution2/>

Satellites are also colonization.



Credit: DELVE Survey/CTIO/AURA/NSF

**If light pollution erases Indigenous stories
then satellites rewrite them.**

But, so is the sky itself



An artist is using a SpaceX rocket to launch a 'star' into orbit and astronomers aren't happy

18 Nov, 2019 23:28 / [Home](#) / [World News](#)

'Man who polluted heavens': Astronomers furious over Musk's Starlink satellites clouding their vision



2018, 11:39 AM



Tech

MUSK TRY HARDER Fury as Elon Musk accused of 'blocking the SKY' as fears grow that he'll trap us on Earth

SATCON2

- Recommendations from 4 working groups
- One being Community Engagement for which Indigenous peoples were one party of interest along with planetariums and amateur astronomers.
- Indigenous participants chosen by invitation by the astronomy community.

12-16 July 2021 | An Online Workshop

SATCON2

Toward the Implementation
of Mitigations to Minimize
the Impact of Satellite
Constellations on Astronomy

Co-chairs:

Jeffrey Hall (Lowell Observatory)
Constance Walker (NSF's NOIRLab)




noirlab.edu/satcon2

SATCON2 is funded by the NSF and hosted
by the NSF's NOIRLab and the AAS

The background image shows the double star Albireo in Cygnus and was taken on 26 December, 2019. Two out of ten 25-minute exposures recorded Starlink satellites moving across the field. Credit: Rafael Schmitt

The case for space environmentalism

[Andy Lawrence](#) , [Meredith L. Rawls](#), [Moriba Jah](#), [Aaron Boley](#), [Federico Di Vruno](#), [Simon Garrington](#), [Michael Kramer](#), [Samantha Lawler](#), [J](#)

[Nature Astronomy](#)

6968 Accesses |

Abstract

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Fig.5. An observation made using the Hubble Space Telescope in November 2020. The streak seems likely to have been made by Starlink 1619, only a few km above Hubble, thus creating a wide out of focus trail. (Image credit: Mikulski Archive for Space Telescopes (MAST). Science PI: Simon Porter.)

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Neither work engaged with Indigenous peoples in an equitable way. The discussions are designed to manufacture Indigenous support of astronomers.

A satellite view of Earth from space, showing the Arctic region with green landmasses and white ice. The Earth's curvature is visible on the left side of the frame.

**In lands with
Treaties, there is no
height limit. Treaties
include the
environment above.**

**Likewise, on lands
without Treaties,
space is part of
unceded lands.**

This is true from Space to the Moon to Mars.

What do we give back to space and the night sky?

- Our current view of the sky is de-humanized.
- According to Alice Gorman much of space is seen as 'dead'
- We need to rethink this view.

What do we give back to space and the night sky?

- We can give back by ending/minimizing light pollution
- We can return to the stories we tell of the night sky
- Our research and teaching need to include Indigenous knowledges and methods.
- The Moon, Mars, Space all have intrinsic rights that we respect



Wela'lioq