

The Future of Extractivism

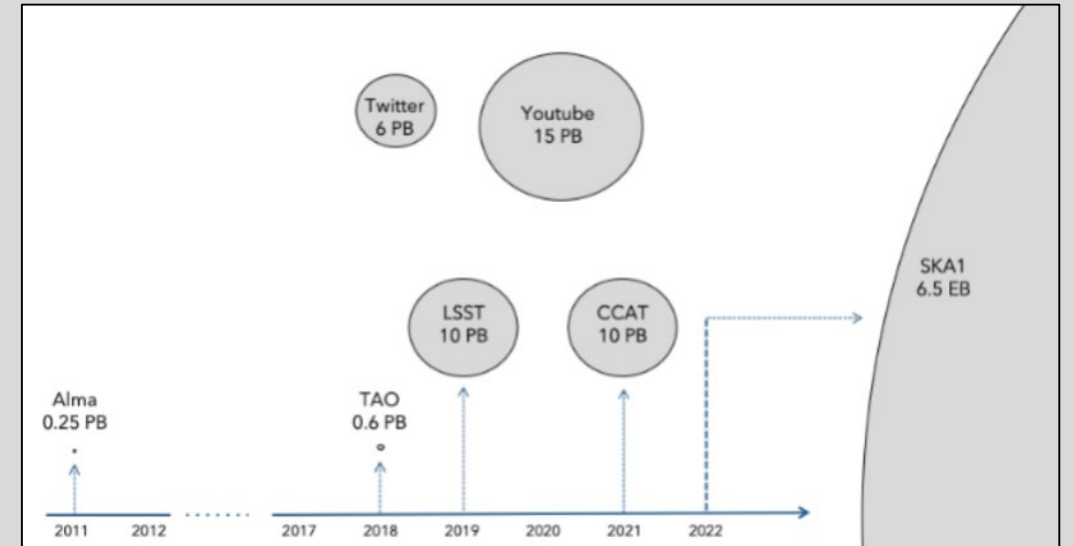
Astronomy Data in Chile

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Astronomy-Driven Datafication

- Most data circulating in Chile come from **astronomical observatories**
- Around **19 mega observatories** in the Atacama Desert – mainly US and Europe
- **16.5PBs of data per year** (comparable to social media's)
- **Why Chile?** Natural conditions, policy incentives and political stability
- Success of Chilean astronomy - **10% of observation time**



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Thanks to astronomy
data, Chile can become
the Silicon Valley
of data science

(Ibsen & Cossio, 2017, 32:50)

Initiatives

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Chilean Virtual Observatory (ChiVO)

An astronomy data server and
standardisation platform by
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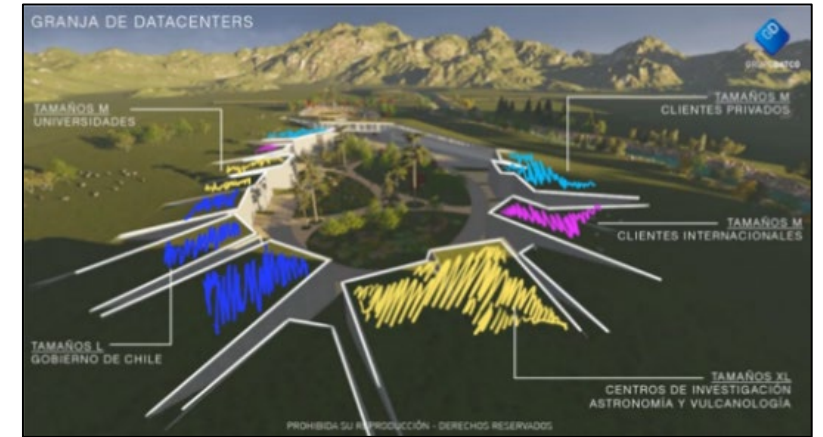
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Datagonia

A farm of data centres in Patagonia with observatories as main clients by Grupo Datco

Extractivism

- From: 'A type of extraction of natural resources in large volumes or with high intensity that is essentially oriented towards exporting raw materials, without processing, or with a minimal degree of processing' (Gudynas, 2015, p. 13).

Extractivism

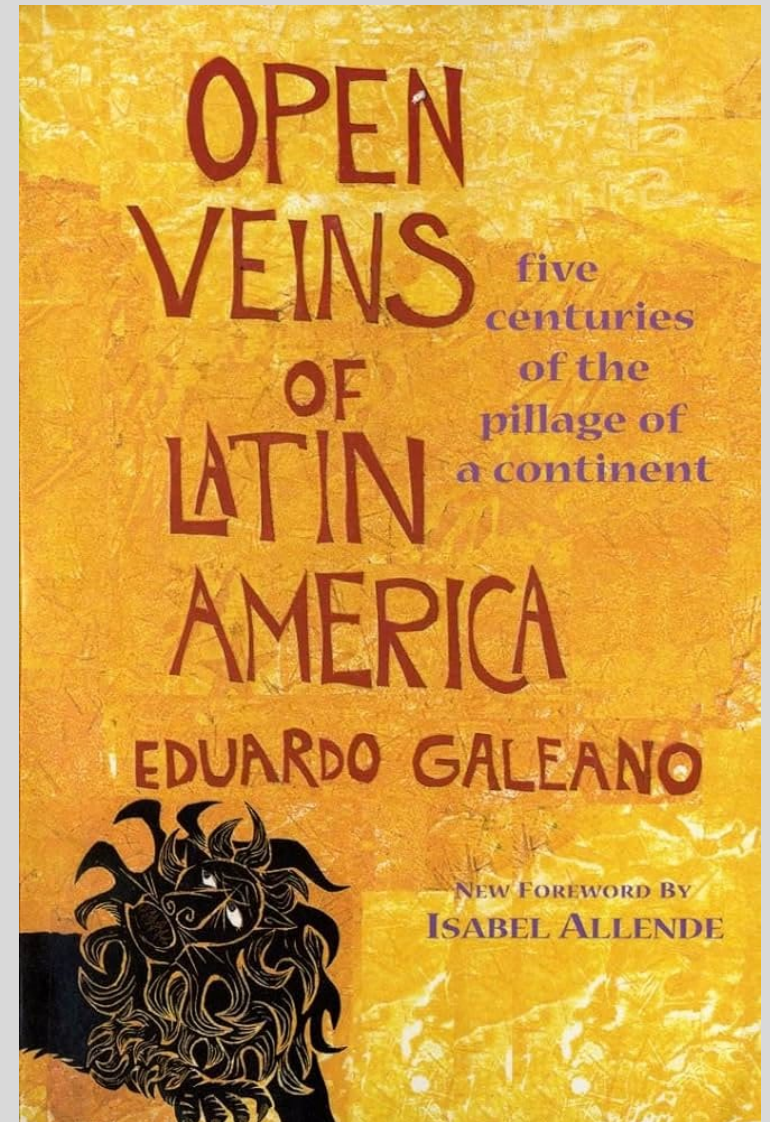
- From: 'A type of extraction of natural resources in large volumes or with high intensity that is essentially oriented towards exporting raw materials, without processing, or with a minimal degree of processing' (Gudynas, 2015, p. 13)
- To: 'The act of extraction removes all of the relationships that give whatever is being extracted meaning. Extracting is taking. Actually, extracting is stealing—it is taking without consent, without thought, care or even knowledge of the impacts that extraction has on the other living things in that environment. That's always been a part of colonialism and conquest' (Simpson & Klein, 2013, para. 11)

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- Extractivism is a crucial driver of **coloniality** – the afterlife of colonialism (Quijano, 2007)

'Latin America is the region of open veins. Everything, from the discovery until our times, has always been **transmuted into European—or later United States—capital**, and as such has accumulated in **distant centers of power**'

(Galeano, 1997, p. 2)



Methods

- Fieldwork: December 2018 - May 2019
- **34 interviews:** Astronomers, engineers, policymakers and Indigenous activists
- **5 events** hosted by observatories and the government
- News articles, press releases and technical handbooks
- Discursive-material analysis (Carpentier, 2017)



Map of cities and observatories visited during fieldwork

Forms of Data Extractivism in Chilean Astronomy

My interpretation of participants' views

Technoscientific Data Extractivism

- Information produced by the observatories is being exported in **raw** rather than **processed** form
- Enabled by **outward-faced infrastructure**
- 'Once again, we're only delivering **raw material**, because **the real analyses** are being done in Europe, Japan and the United States' – participant



[ALMA website](#)

Infrastructure built so that data are not processed in Chile

'The ALMA Archive at the OSF (Operation Support Facilities) is designed to provide up to a year of temporary storage for the instrumental data ... and the monitoring data. The instrumental data are then transferred to the main archive at the SCO (Santiago Central Offices), where the pipeline is run and from where the data and pipeline products are distributed to the three ARCs (ALMA Regional Centres). At this stage, a sizeable fraction of the data are processed at the ARCs and then mirrored back to SCO'

(Remijan et al., 2020, p. 180).

Doc 8.5, ver. 1.0 | 15 March, 2021

ALMA Cycle 8 2021 Technical Handbook

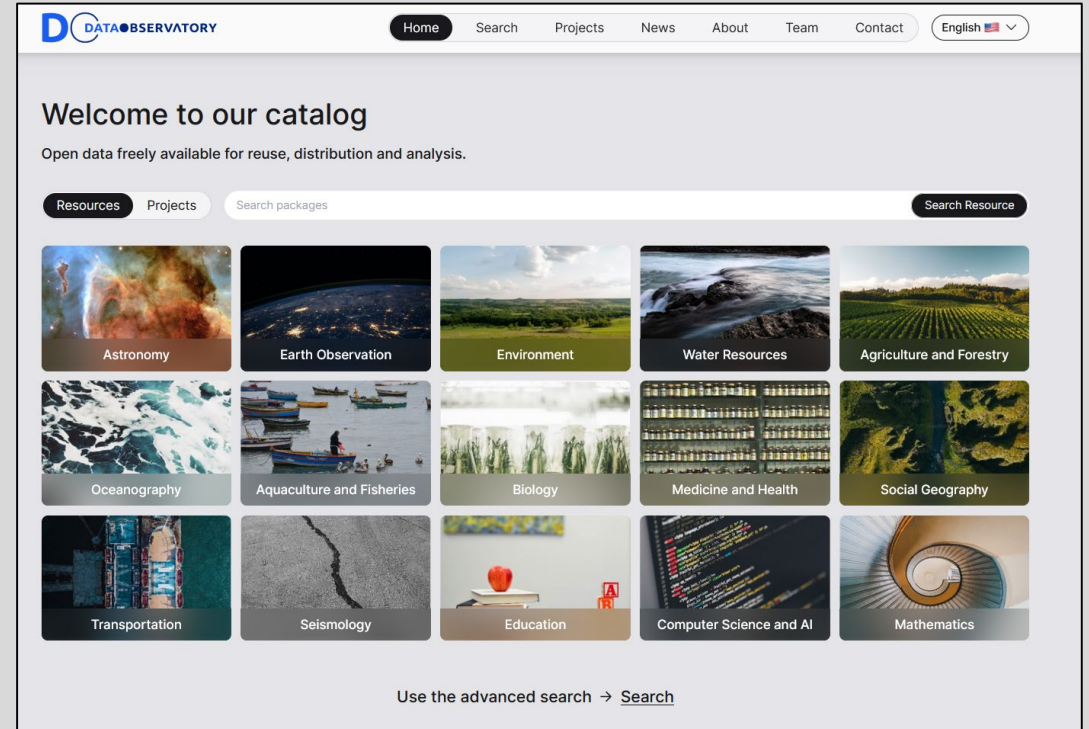


www.almascience.org

ALMA is a partnership of ESO (representing its member states), NSF (USA) and NINS (Japan), together with NRC (Canada), MOST and ASIAA (Taiwan), and KASI (Republic of Korea), in cooperation with the Republic of Chile. The Joint ALMA Observatory is operated by ESO, AUI/NRAO and NAOJ.

Competitive Data Extractivism

- **Economic** focus.
- Astronomy data as a **boost for the Chilean productive matrix.**
- Move up in **the value chain.**
Example from participant:
Chinese companies hiring data scientists from Chile
- **Local elites** (not global structures) are to blame.
- 'They [mining companies] can put the rock outside and sell it ... We are different in astronomy. **We always have to add value**'.



'Spill overs' of astronomy data - <https://dataobservatory.net/>

XIX, XX, XXI CENTURIES

BEGINNINGS

MEGA-TELESCOPES ERA

LAST DECADE

1847 1854 1927

1959 1961 1963

1996 1997 1998

2006

2010

2013

2017

2019

2020+

SALITRE



COPPER



¿KNOWLEDGE?



Territorial Data Extractivism

- Data extraction relies on the **knowledge of communities** and their interactions with the territories in which they live
- Lickan Antay communities do not know who the observatories are, what they do, etc. No integration of their ancestral knowledges.
- **Conflicts:**
 - ALMA built on the top of Chajnantor sacred mountain (2003)
 - Gas infrastructure threatening chululos (2018)



Used with permission (Iriarte Walton, 2008, p. 162)

'When you talk about extractivism you imagine a well, the extraction of water, the extraction of minerals, a machine, digging wells, a machine making holes. But ALMA's would be a more superficial form of extractivism. An extractivism of the knowledge of the territory. If you want to go in that direction, clearly it is an extractivist company, but not in a literal way because it does not extract anything. But it is extractivism from the perspective of knowledge, of occupying the territory to be able to do these studies, to produce knowledge ... Because the thing about extractivism is that it does not give back. It only takes. So from that perspective, yes [it is extractivism] because they take away the knowledge without leaving anything. None of it remains here for us'

Lickan Antay leader

Astronomy Data and Extractivism

- Continuation of **colonial patterns of extraction via scientific means**
- Technoscientific, competitive and territorial extractivism are part of datafication in Chile
- Part of an extractivist assemblage (mix of people and things) made up of scientists, policy-makers and animals; astronomical observatories, data servers, fibre optic cables and data; local communities, chululos and territorial forms of coexistence

Also...


- The unique access to astronomy data is giving rise to an **obedient stance** in astronomy data-intensive research in Chile.
- Focus on establishing **collaborations** with Global North partners.
- **Crucial questions get bracketed off**: How? For whom? For what purpose? No sense of collectivity.

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The coloniality of collaboration: sources of epistemic obedience in data-intensive astronomy in Chile

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ABSTRACT

Data collaborations have gained currency over the last decade as a means for data- and skills-poor actors to thrive as a fourth paradigm takes hold in the sciences. Against this backdrop, this article traces the emergence of a collaborative subject position that strives to establish reciprocal and technical-oriented collaborations so as to catch up with the ongoing changes in research. Combining insights from the modernity/coloniality group, political theory and science and technology studies, the article argues that this positionality engenders epistemic obedience by bracketing off critical questions regarding *with whom* and *for whom* knowledge is generated. In particular, a dis-embedding of the data producers, the erosion of local ties, and a data conformism are identified as fresh sources of obedience impinging upon the capacity to conduct research attuned to the needs and visions of the local context. A discursive-material analysis of interviews and field notes stemming from the case of astronomy data in Chile is conducted, examining the vision of local actors aiming to gain proximity to the mega observatories producing vast volumes of data in the Atacama Desert. Given that these observatories are predominantly under the control of organisations from the United States and Europe, the adoption of a collaborative stance is now seen as the best means to ensure skills and technology transfer to local research teams. Delving into the epistemological dimension of data colonialism, this article warns that an increased emphasis on collaboration runs the risk of reproducing planetary hierarchies in times of data-intensive research.

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KEYWORDS

Epistemic disobedience; data collaborations; data colonialism; astronomy; coloniality; data-intensive research

Introduction

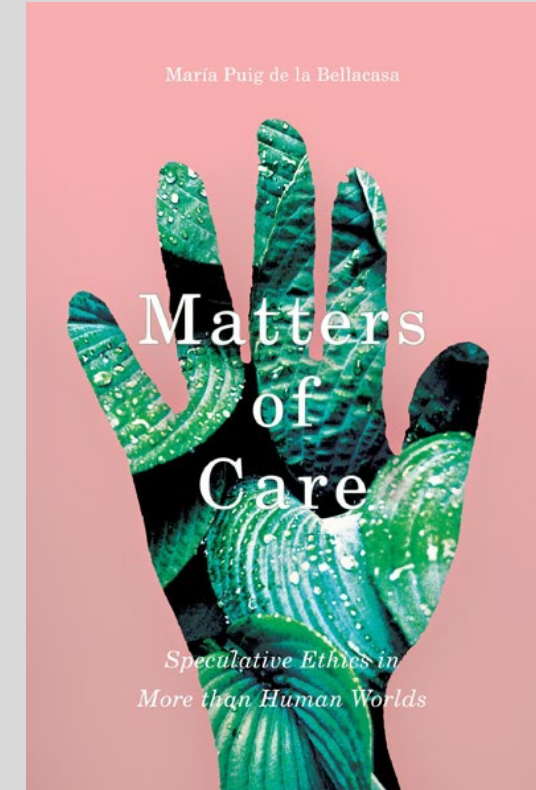
Over the last few years, actors from both the public and private sector have proposed the idea that data collaborations offer means of solving a myriad of issues, from water distribution to epidemiological crises, in both the North and the South (e.g., Verhulst, 2017). In the sciences, the increasing relevance of data sharing has transformed collaboration into a crucial aspect of the 'fourth scientific paradigm' (Hey et al., 2009), which is how US computer scientist Jim Gray refers to the stage of research characterised by the

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Reflexive Questions

- **Where** do the data I am using come from?
- How can the observatories and astronomy attend to **the needs and visions of the local communities** (not only local authorities!)?
- How to produce, manage, store and analyse data in **non-extractive ways**? How to apply this to the design of **data infrastructure** as well?
- How can the observatories and astronomy sustain **dialogue** and **care**?



Thank you!

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