

Astronomy in Chile



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In this talk..

- Observatories in Chile
 - What makes a good site for an Observatory
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- The astronomy community in Chile:
 - Astronomers & Science in Chile
 - Telescopes and data access for chilean astronomers
 - SOCHIAS
-
- Job opportunities in astronomy in Chile

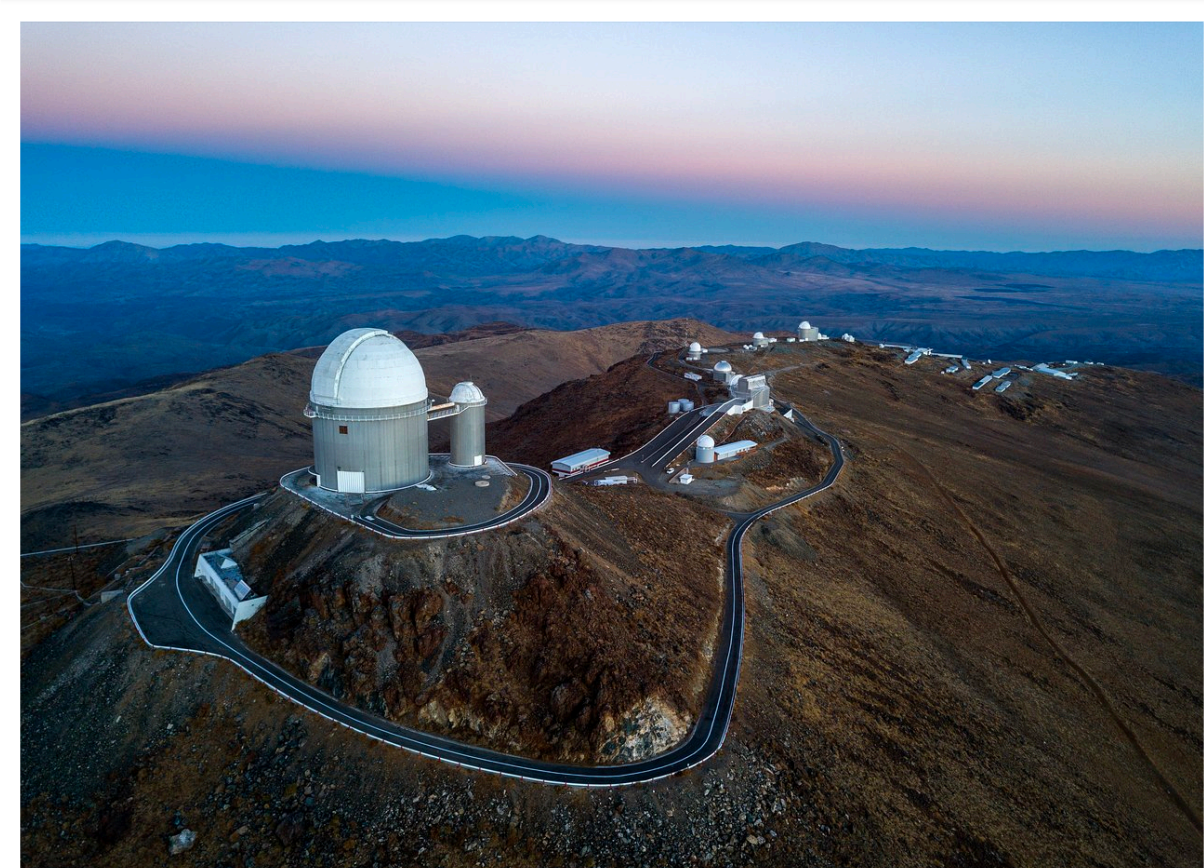
Observatories in Chile

1849: first astronomical observatory built in Chile (Cerro Santa Lucía)

1852: National Astronomical Observatory was born

1902: Foster Observatory built (Cerro San Cristóbal)

Second half of 20th Century: Observatories built at La Silla (1969), Cerro Tololo (1969), Las Campanas (1971) and later Cerro Paranal/VLT (1999), Cerro Pachón/Gemini-Sur (2003) and Chajnantor/ALMA (2007)



Universidad de Chile (Cerro Calán)



1927

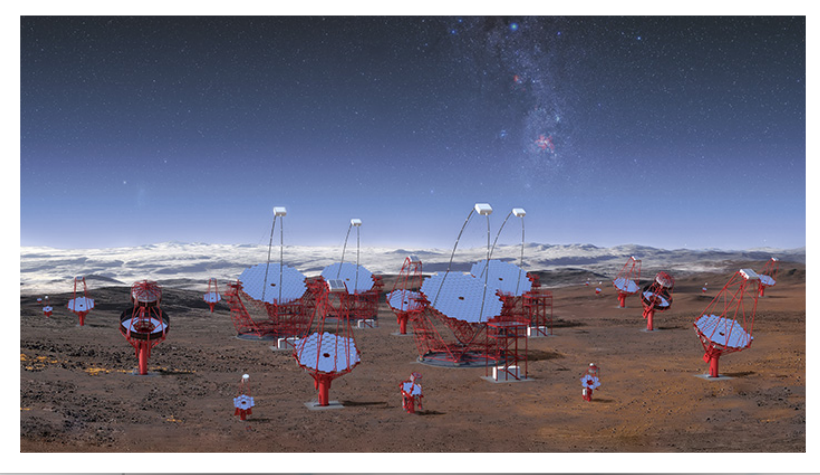
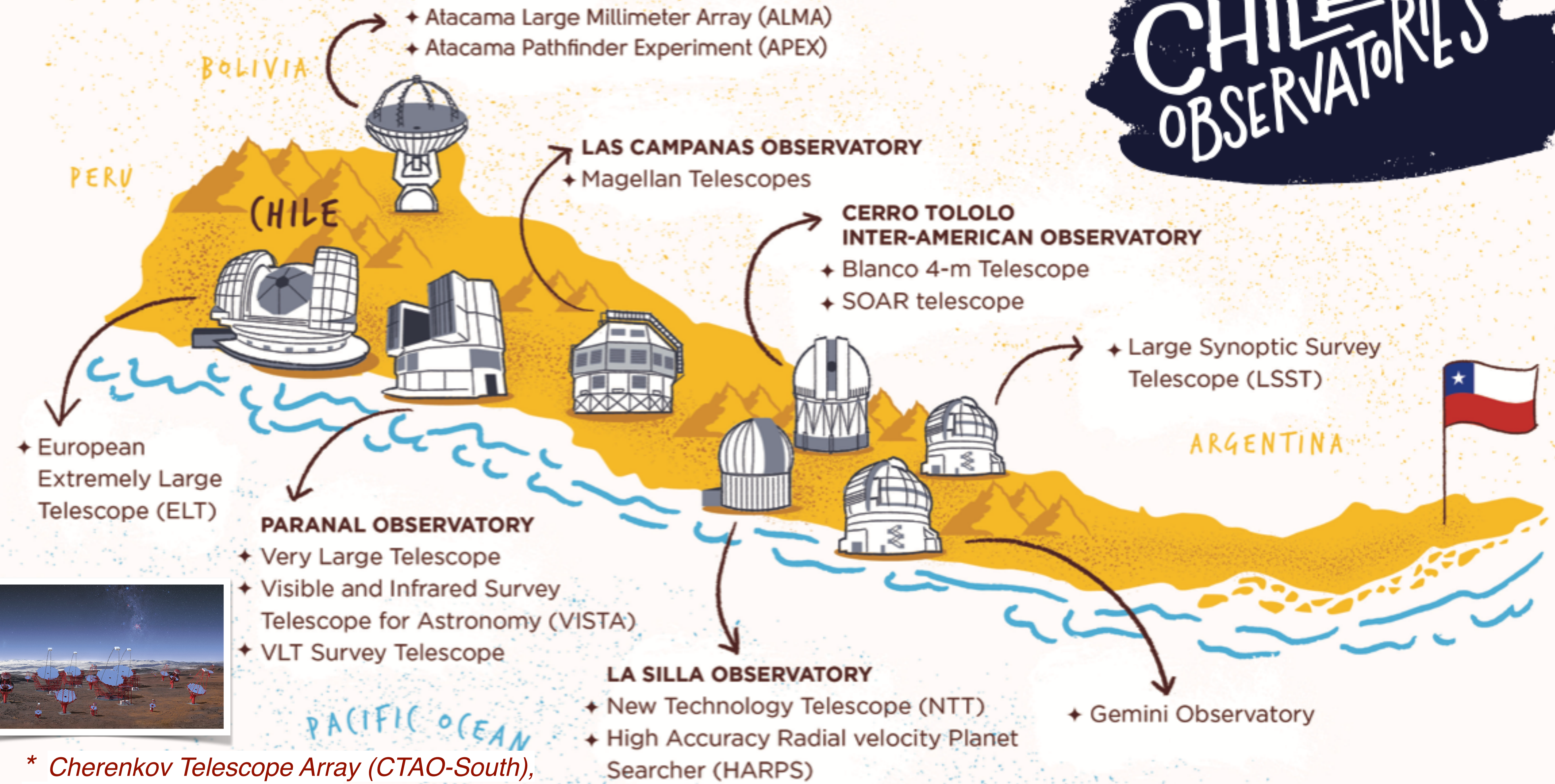
1928

Pontificia Universidad Católica de Chile



1965 The 1st Astronomy Department (Universidad de Chile)

CHILE OBSERVATORIES



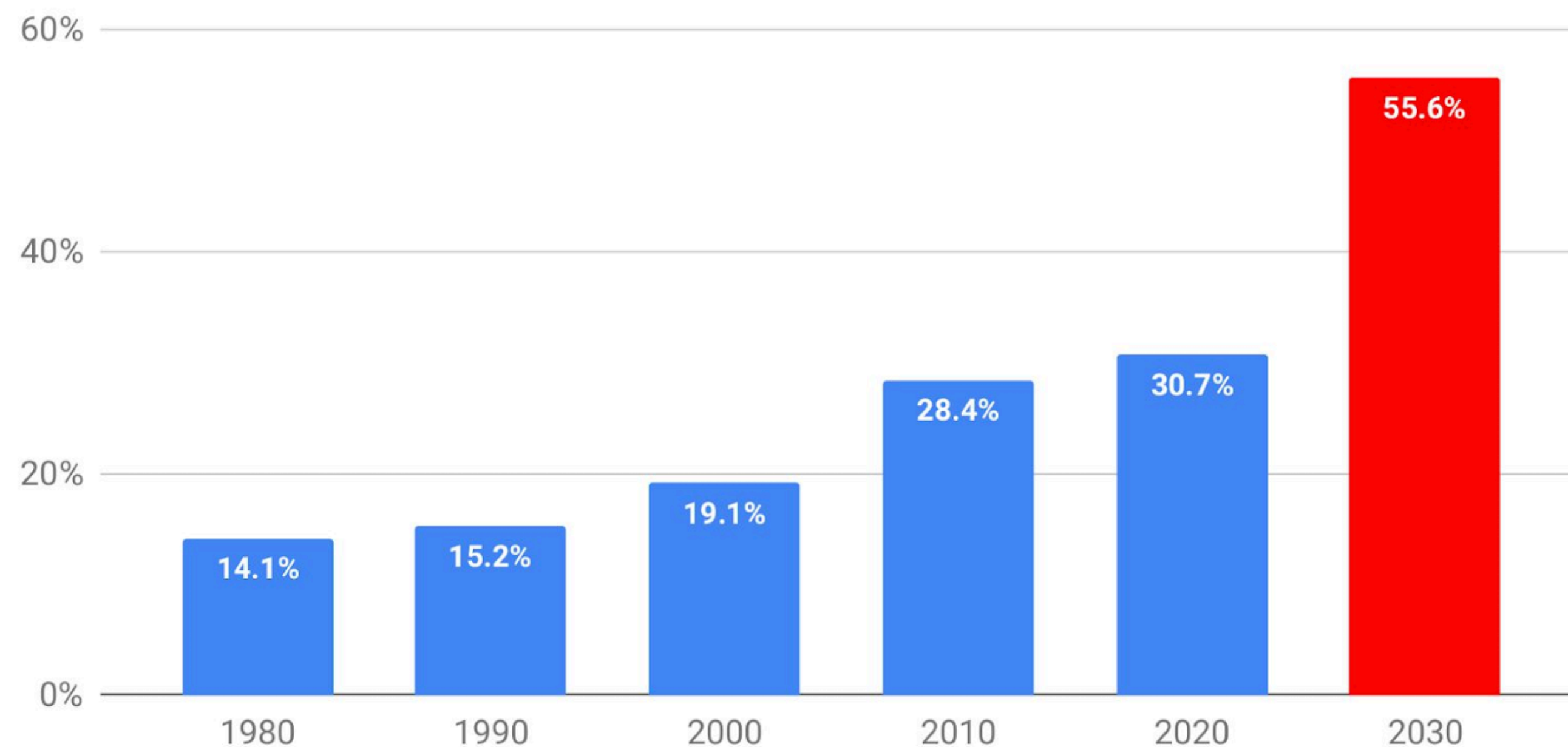
* Cherenkov Telescope Array (CTAO-South),
150 GeV to 300 TeV

Observatories in Chile

- It is estimated that Chile will host more than 50% of the global astronomical infrastructure by 2030 *

Capacidad astronómica instalada en Chile al final de una década

Cálculo de Eduardo Unda-Sanzana (CITEVA, U. de Antofagasta)



- Considerando sólo $D \geq 2$ m: 55.6%
- Considerando sólo $D \geq 4$ m: 59.3%
- Considerando sólo $D \geq 6$ m: 60.2%
- Considerando sólo $D \geq 8$ m: 61.1%
- Considerando sólo $D \geq 10$ m: 64.4%

* <https://sochias.cl/wp-content/uploads/2020/05/2020-05-14-Sobre-la-capacidad-astron%C3%B3mica-instalada-en-Chile.pdf>

Observatories in Chile

Why is Chile such an important place for Astronomy?

First we must consider what makes a good observatory.

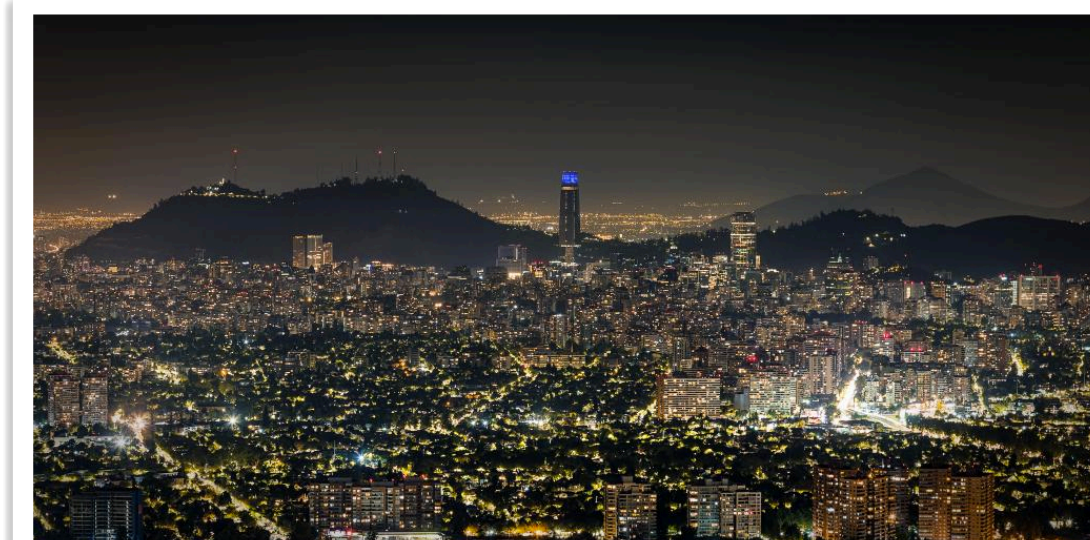
Observatories in Chile

Why is Chile such an important place for Astronomy?

First we must consider what makes a good observatory.

Atmospheric conditions

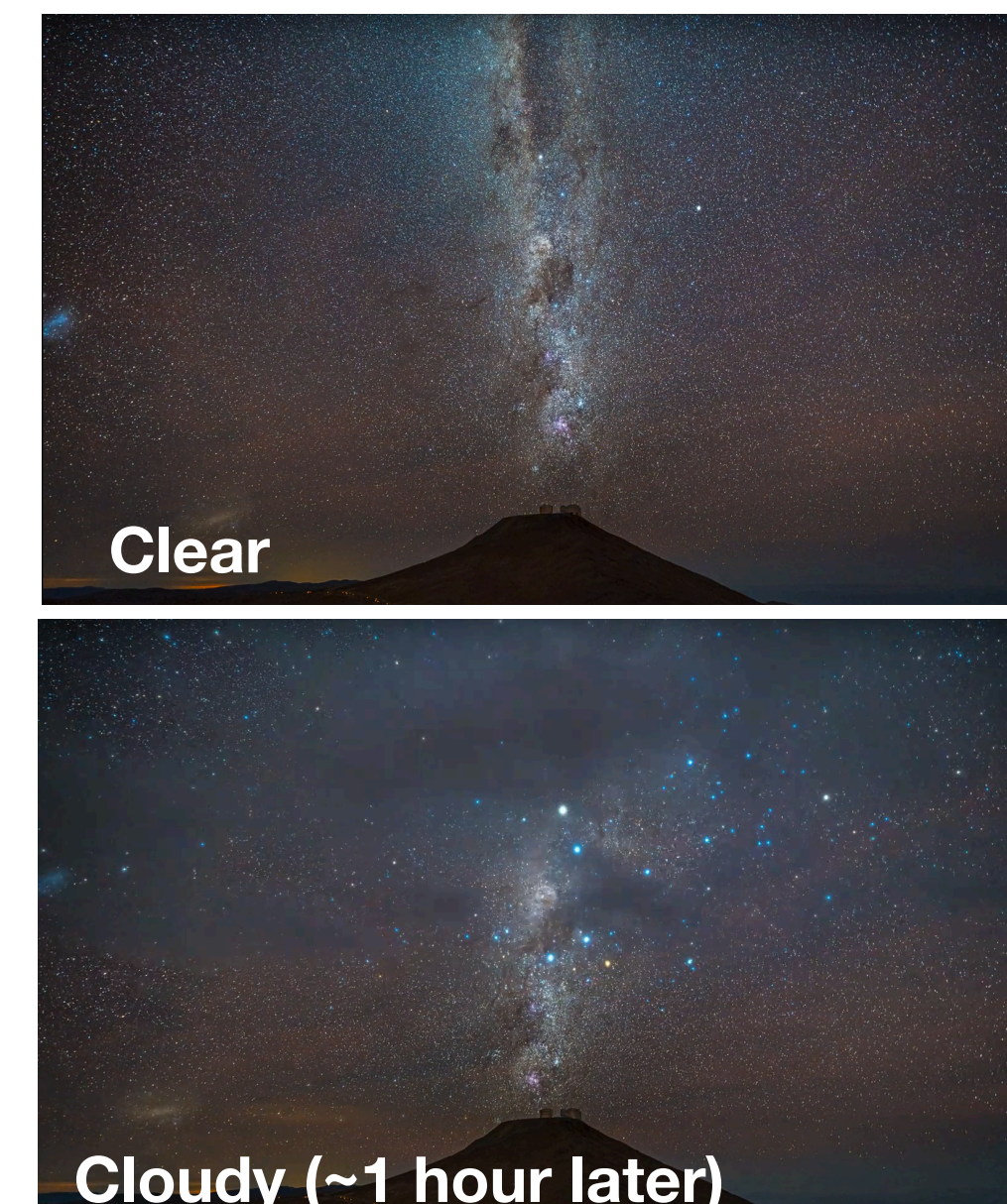
- **Sky background:** Dust particles and molecules in the atmosphere scatter light from the moon and the surface of the Earth (street lights etc), making the sky glow



- **Atmospheric Extinction:** Dust and molecules in the atmosphere scatter and absorb the light from astronomical objects, making them appear dimmer.



- **Transparency variations:** Clouds can absorb and scatter the light from astronomical objects.



Boris Haeussler, <https://www.youtube.com/watch?app=desktop&v=0Uwv4UXhXCc>

- **Seeing:** Turbulence in the atmosphere degrades the resolution of the image recorded by a telescope.

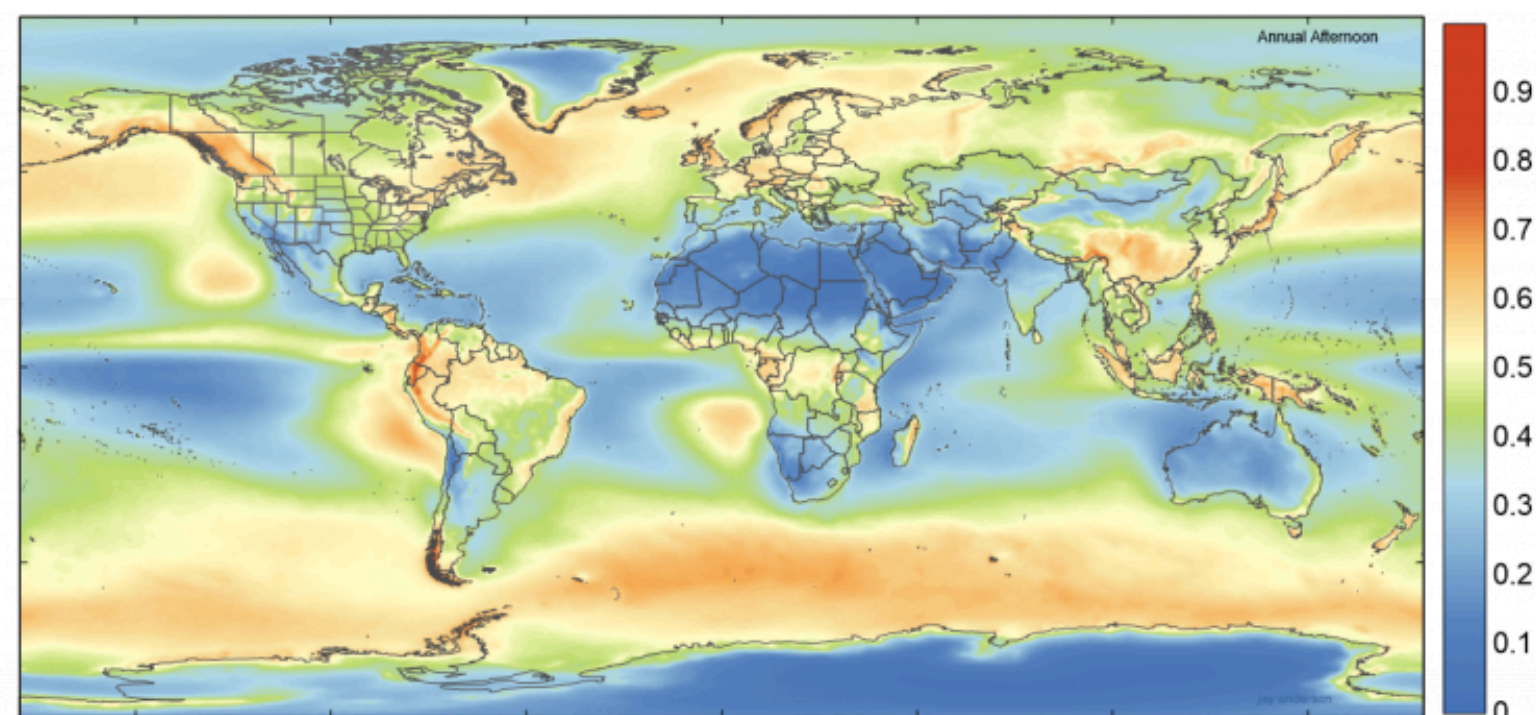
Observatories in Chile

Why is Chile such an important place for Astronomy?

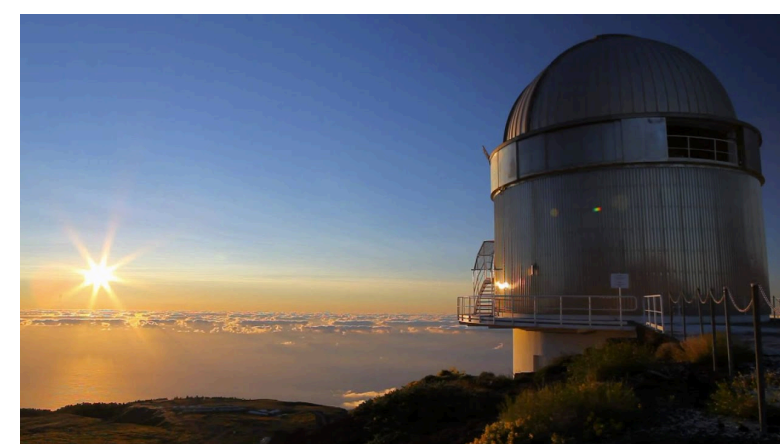
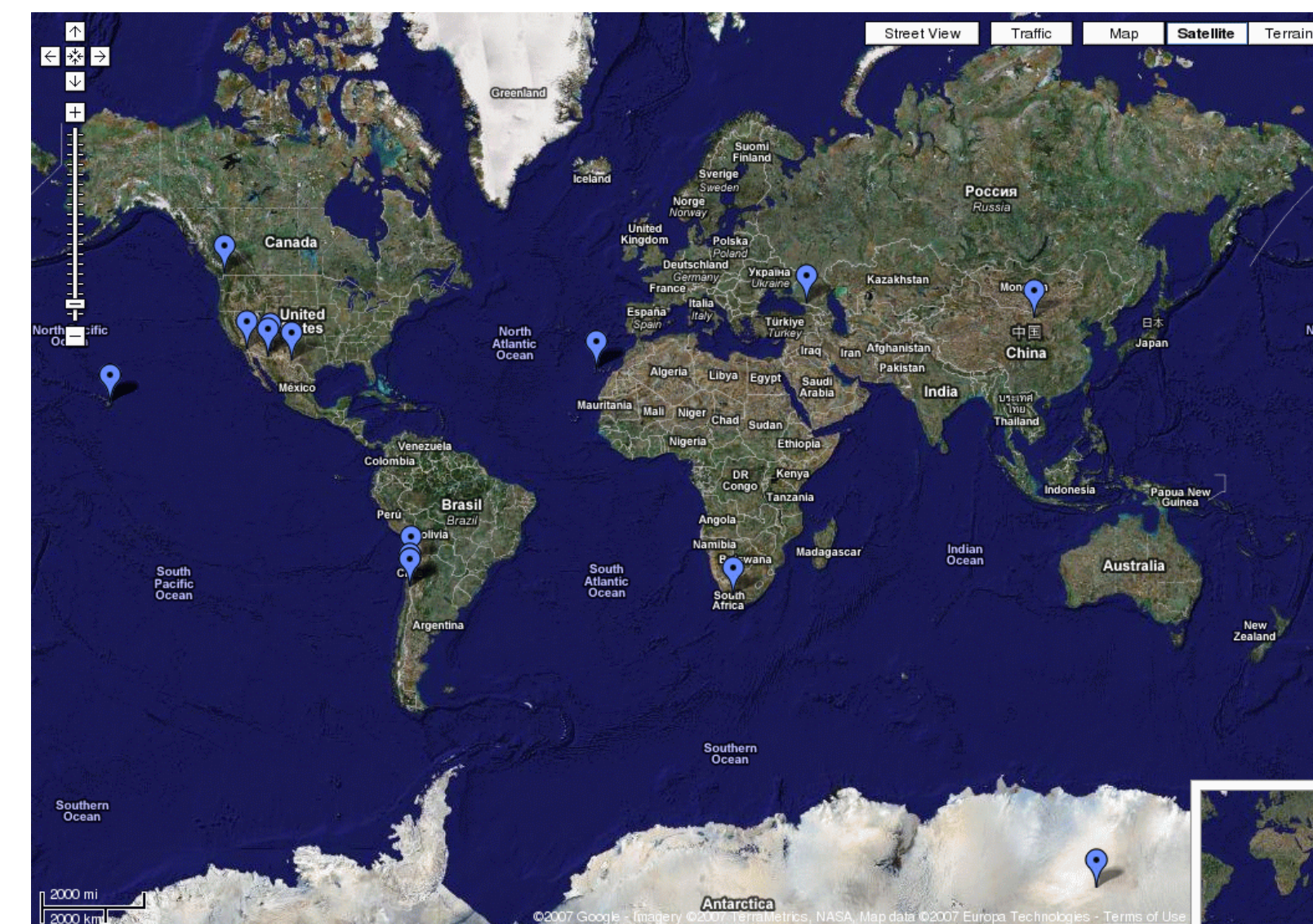
First we must consider what makes a good observatory.

Site/Location

- **Latitude:** Southern hemisphere
- **Cloud cover:** a site with minimal cloud coverage
- **Light pollution**
- **Seeing & Height above sea level**



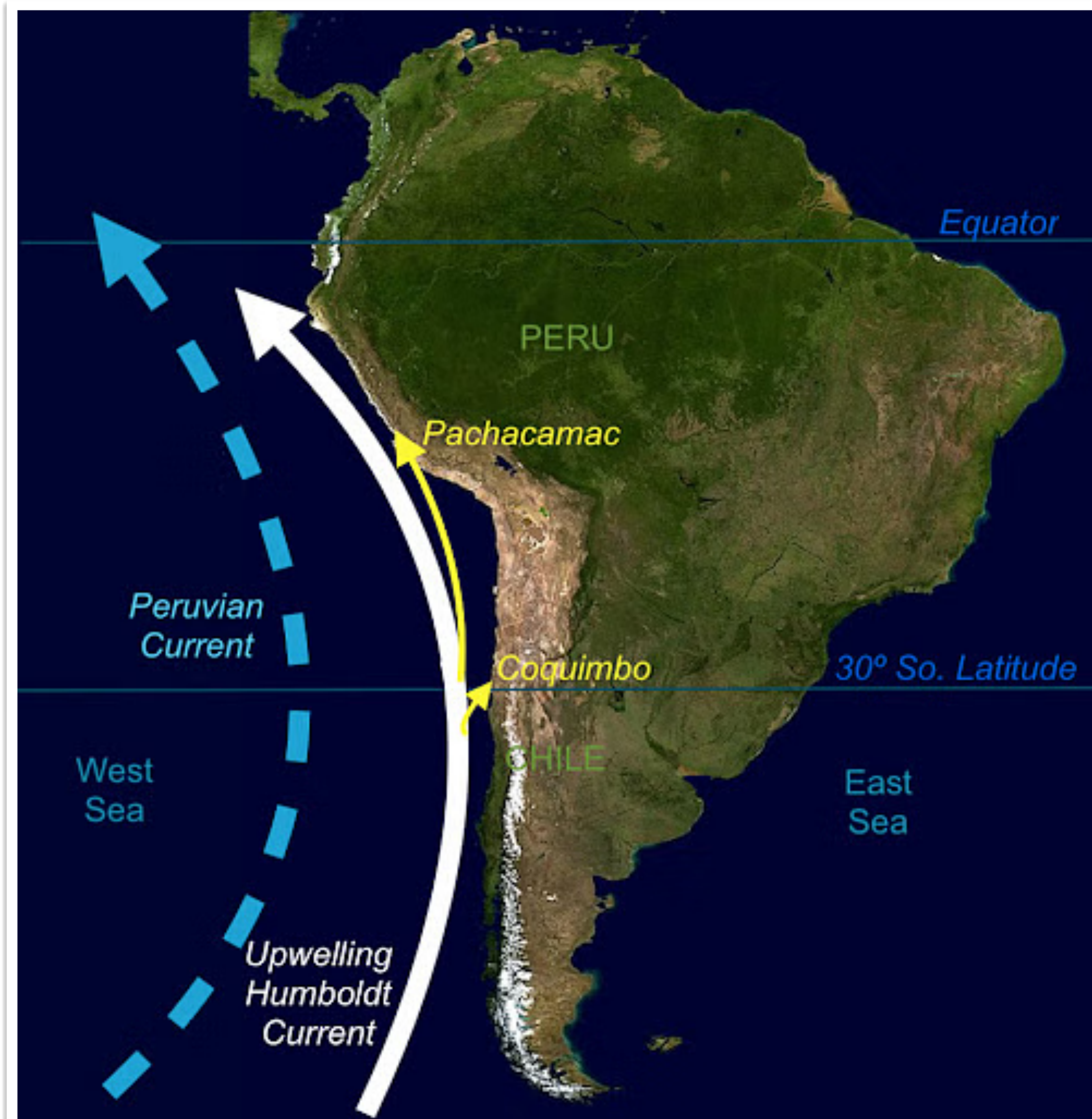
Locations of the 23 largest telescopes (mirrors between 4-10.4m)



- **Other factors:** rainfall, wind speed, accessibility, auroral activity, etc

Observatories in Chile

Why is Chile such an important place for Astronomy?

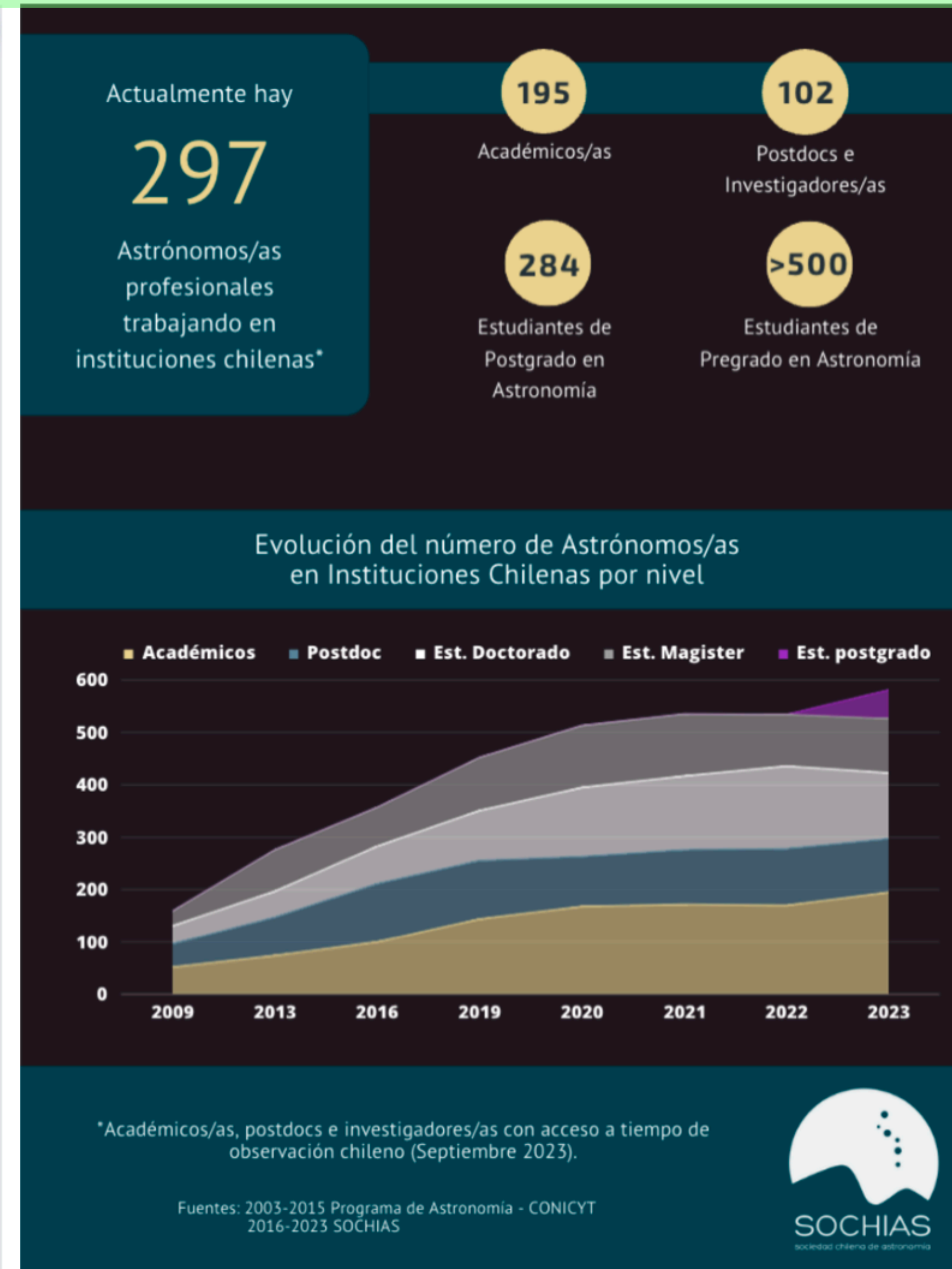


The **Humboldt Current**, sometimes known as the **Peru Current**, is a cold, low-salinity ocean current that moves north along South America's western coast. It has a significant cooling effect on the climates of **Chile, Peru, and Ecuador**. It is also significantly responsible for the aridity of northern **Chile's Atacama Desert**.

Its climatological and geographical characteristics have made the northern Chilean region a global leader in astronomy. The clarity of its skies, added to the high Andean mountain range provide unique conditions on Earth.

The Astronomical community in Chile

Astronomers & Science



<https://sochias.cl/astronomia-en-chile/censos-de-astronomos/>

The Astronomical community in Chile

Chilean Telescope & Data Access

“The international observatories operating in Chile have access to the best skies and observational conditions in the world, and make a percentage of their observation time, or equivalent in the case of survey telescopes, available to astronomers who work in Chilean institutions”

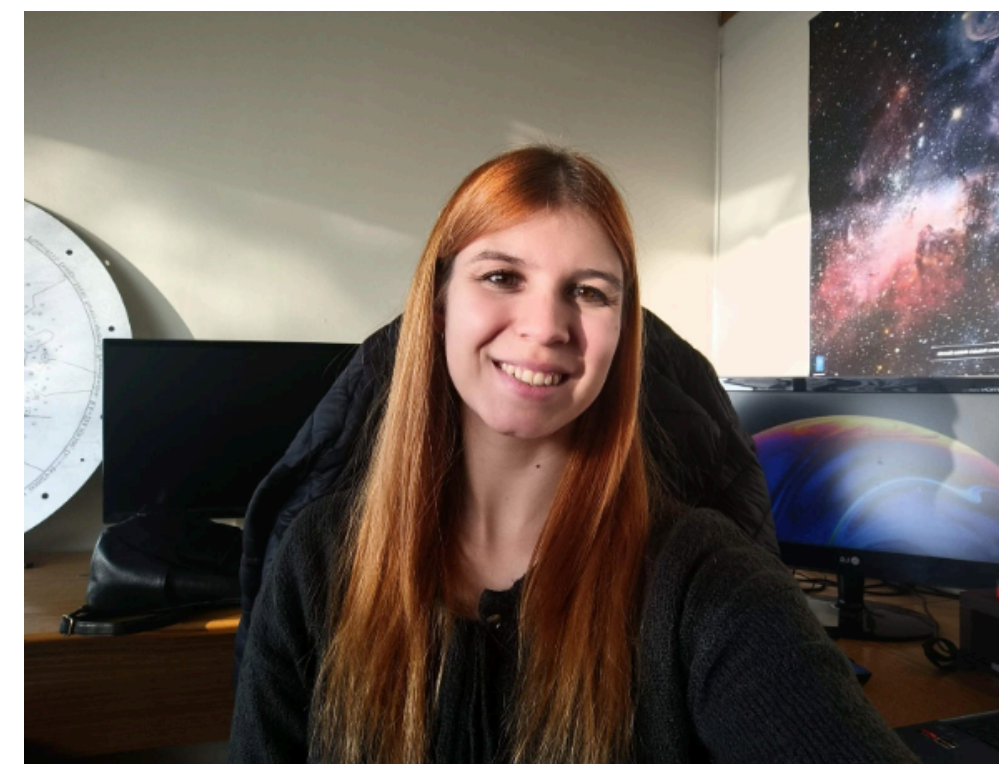
- Generally each observatory offers 10% of the telescope time to Chilean astronomers
- SOCHIAS maintains the “Lista Blanca” with the names of all astronomers in Chile who are eligible to access Chilean time



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“Sociedad Chilena
de Astronomía”
(SOCHIAS 2025),
305 members



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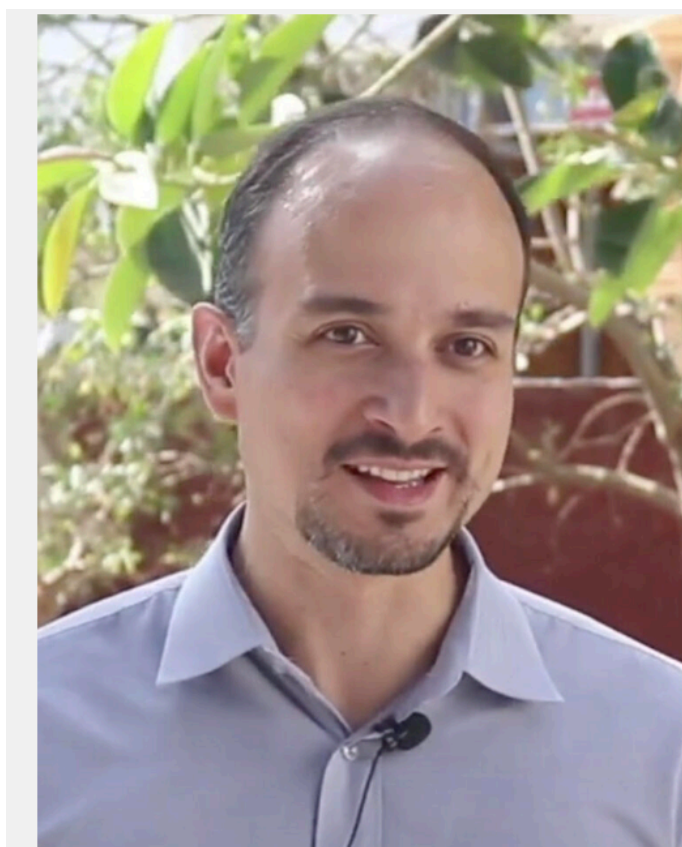
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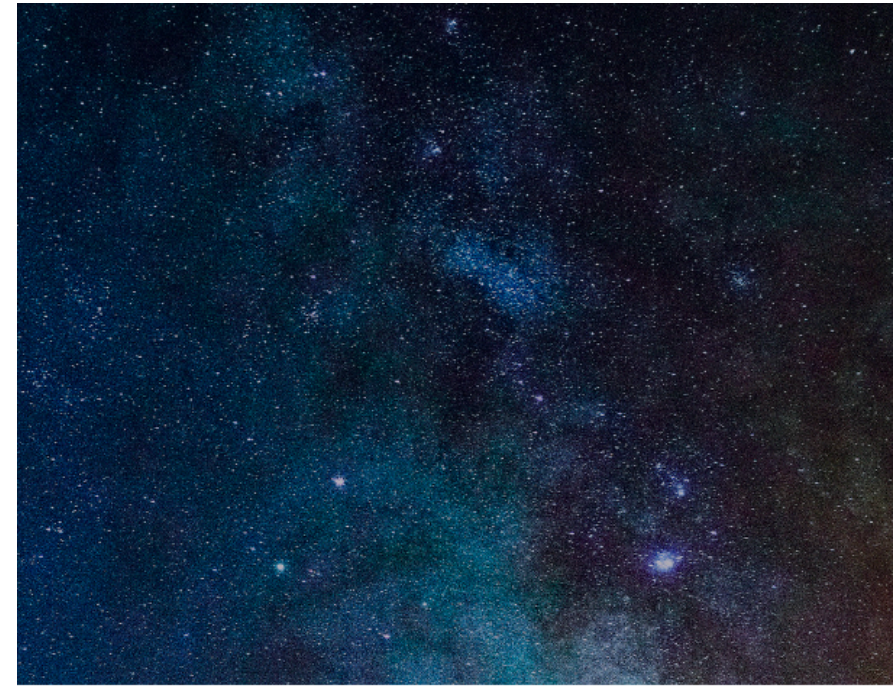
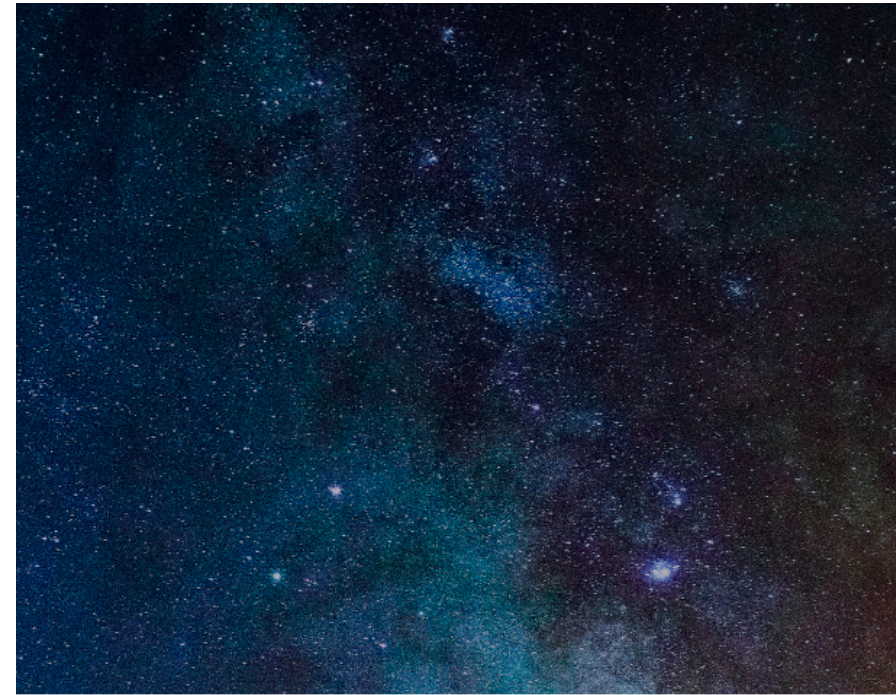


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Censo astrónomos/as 2023

Censo de astrónomos y astrónomas en instituciones chilenas durante 2023

📅 Ene 30, 2025

Resultados Comité Mixto ESO-Chile 2024

Los resultados para el llamado 2024 del Comité Mixto ESO-Chile ya están disponibles. Pueden ver el listado de ...

📅 Dic 18, 2024

Declaración Oficial SOCHIAS sobre el proyecto INNA / SOCHIAS Official Statement regarding the INNA project

📅 Ene 22, 2025

<https://sochias.cl/declaracion-oficial-sochias-sobre-el-proyecto-inna-sochias-official-statement-regarding-the-inna-project/>

WORKING GROUPS:

Light Pollution

Participación en modificación de normativas legales

Estas son algunas de nuestras intervenciones más importantes:

- Modificación a Ley 19.300 en 2019 ([modificación](#), [texto refundido](#)).
Gestiones de Eduardo Unda-Sanzana y Guillermo Blanc entre otros actores relevantes.
- Participación en [Mesa de Trabajo para la protección de los cielos](#)
Representante de SOCHIAS: Eduardo Unda-Sanzana.
- Participación en Comité Operativo Ampliado de Revisión de Norma de CL
Representante de SOCHIAS: Ricardo Bustos.
- Participación en Consejo Asesor sobre Áreas Astronómicas para Ministerio CTCI
Representante de SOCHIAS: Eduardo Unda-Sanzana

Inclusion & Gender

Education

Outreach

COMMITTEES: [Telescope Allocation Time \(CNTAC\)](#)

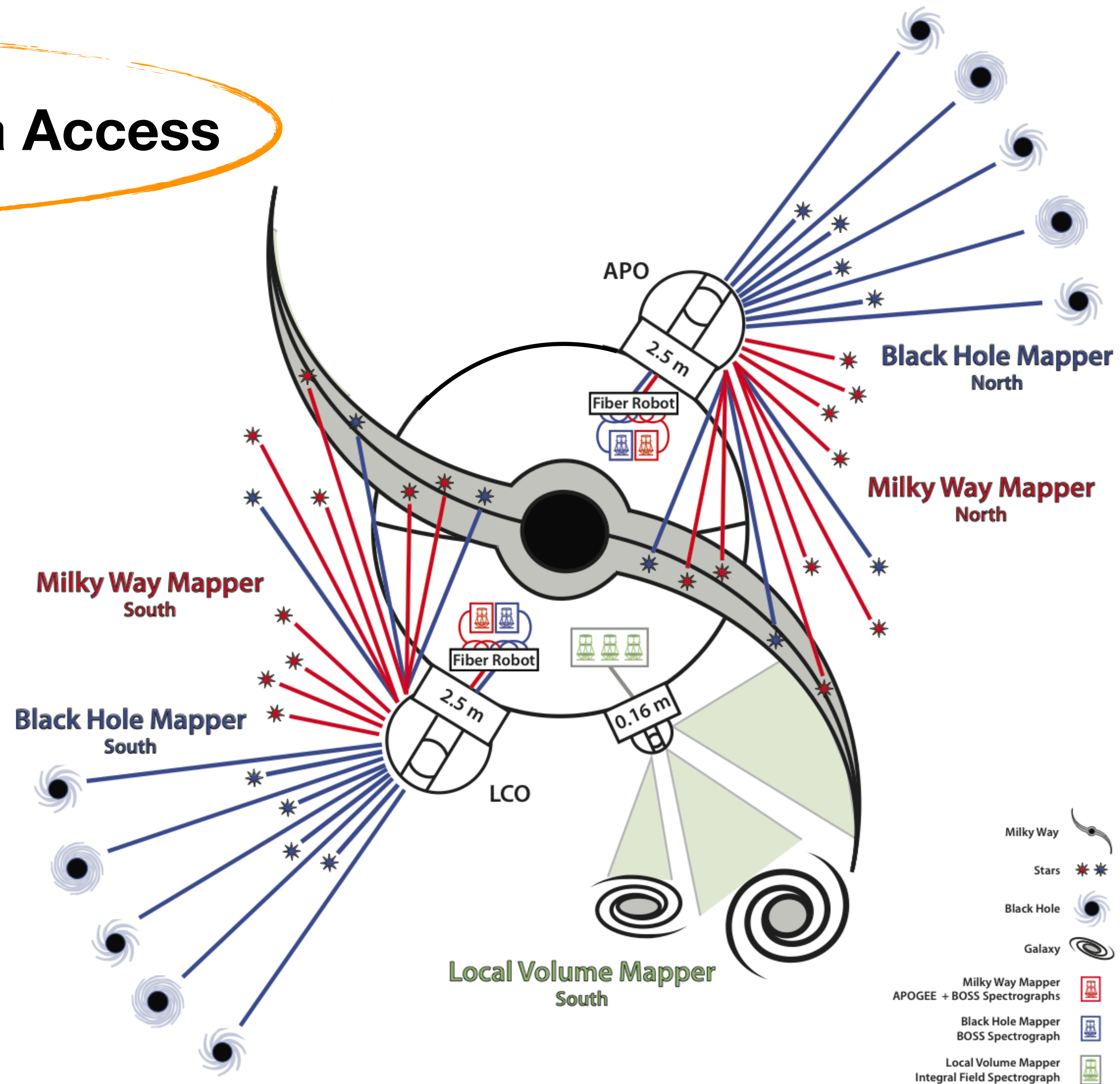
[Projects/Funds Allocation \(ESO-Chile, GEMINI-ANID, ALMA-ANID, CAS-ANID, QUIMAL\)](#)

[Ethics](#)

Chilean Telescopes and Data Access

SDSS-V

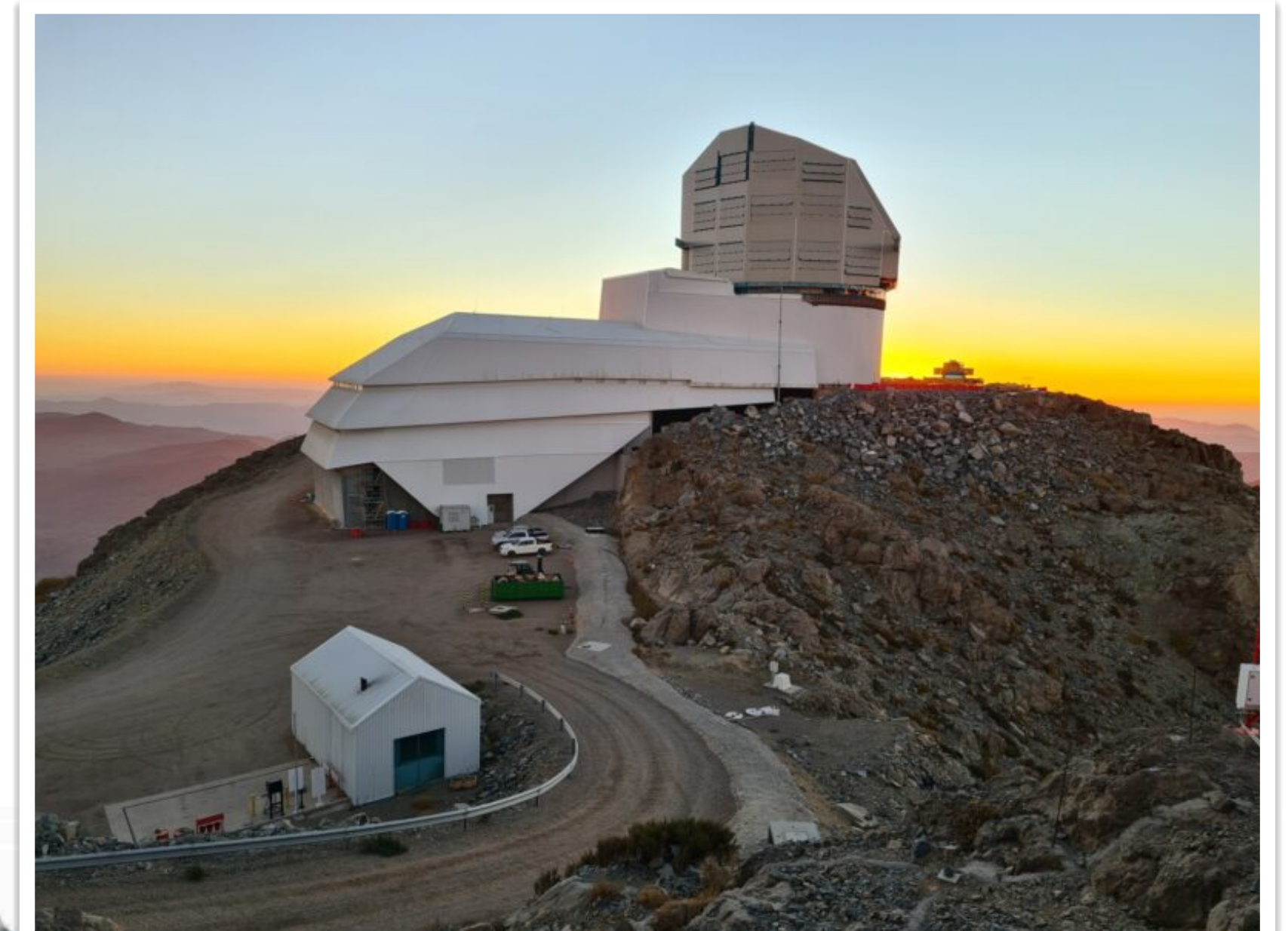
- 3 surveys being carried out
- Chile now hosts all three surveys at Las Campanas Observatory
- In return, the whole Chilean community are eligible to be members of SDSS-V



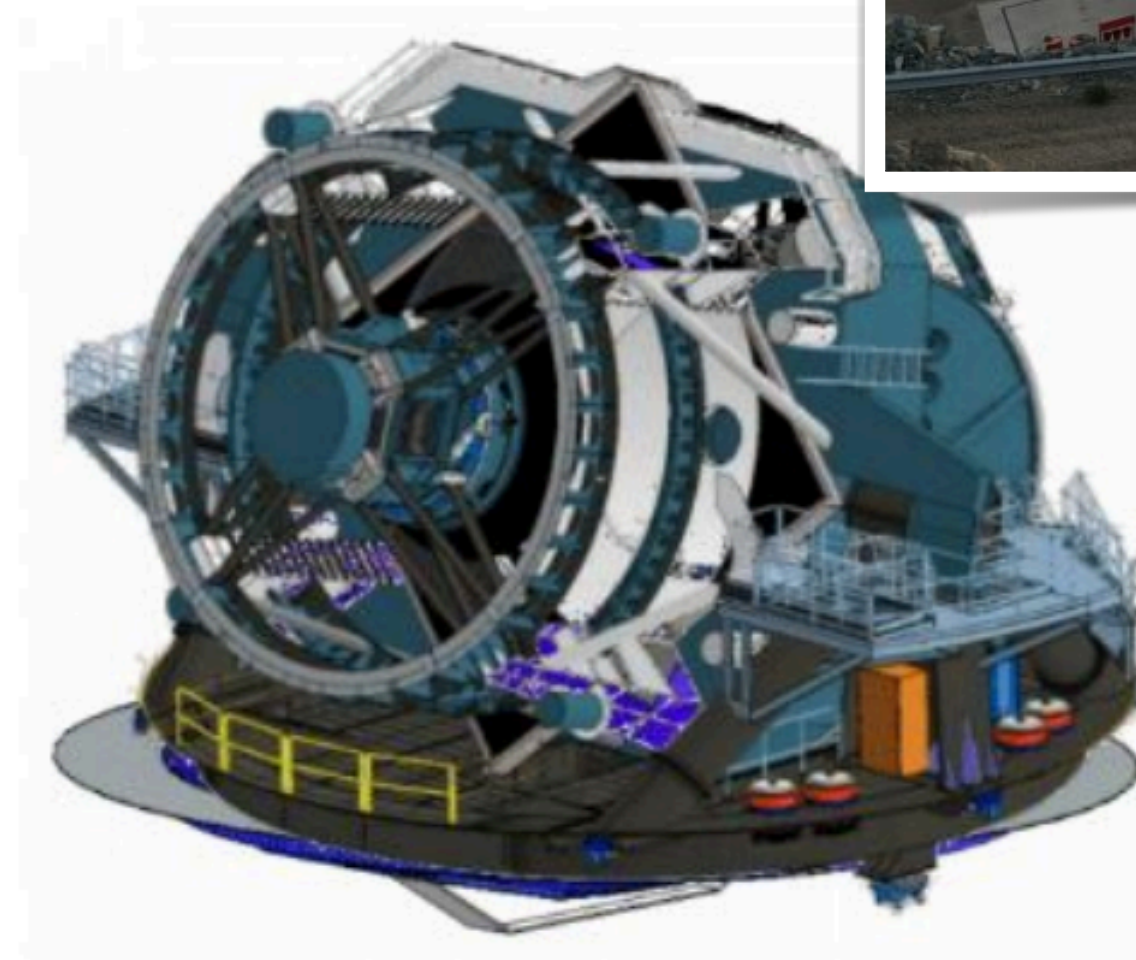
Chilean Telescopes and Data Access

Vera Rubin: LSST

- **Photometric Variability Survey (2025-2034)**
- 3200 megapixel camera and six different optical filters in a 8.4 m telescope on Cerro Pachón, with FoV = 9.6 deg²
- The telescope will image the entire visible sky every 3-4 nights



Jets, flares
Changing look/state AGN
Tidal Disruption Events (TDE) in AGN
SMBH binaries



Chilean Telescopes and Data Access

ChANGES: 4MOST Chilean AGN/Galaxy Evolution Survey PI: Franz Bauer, Paulina Lira

- **4MOST (ESO)**: a fibre-fed **spectroscopic survey** facility on the VISTA telescope (4m)

~ 2400 spectra simultaneously
FoV ~ 4.2 deg²

- ~ end of 2025: Science Verification / Commissioning

To complement Gaia, Euclid and eROSITA

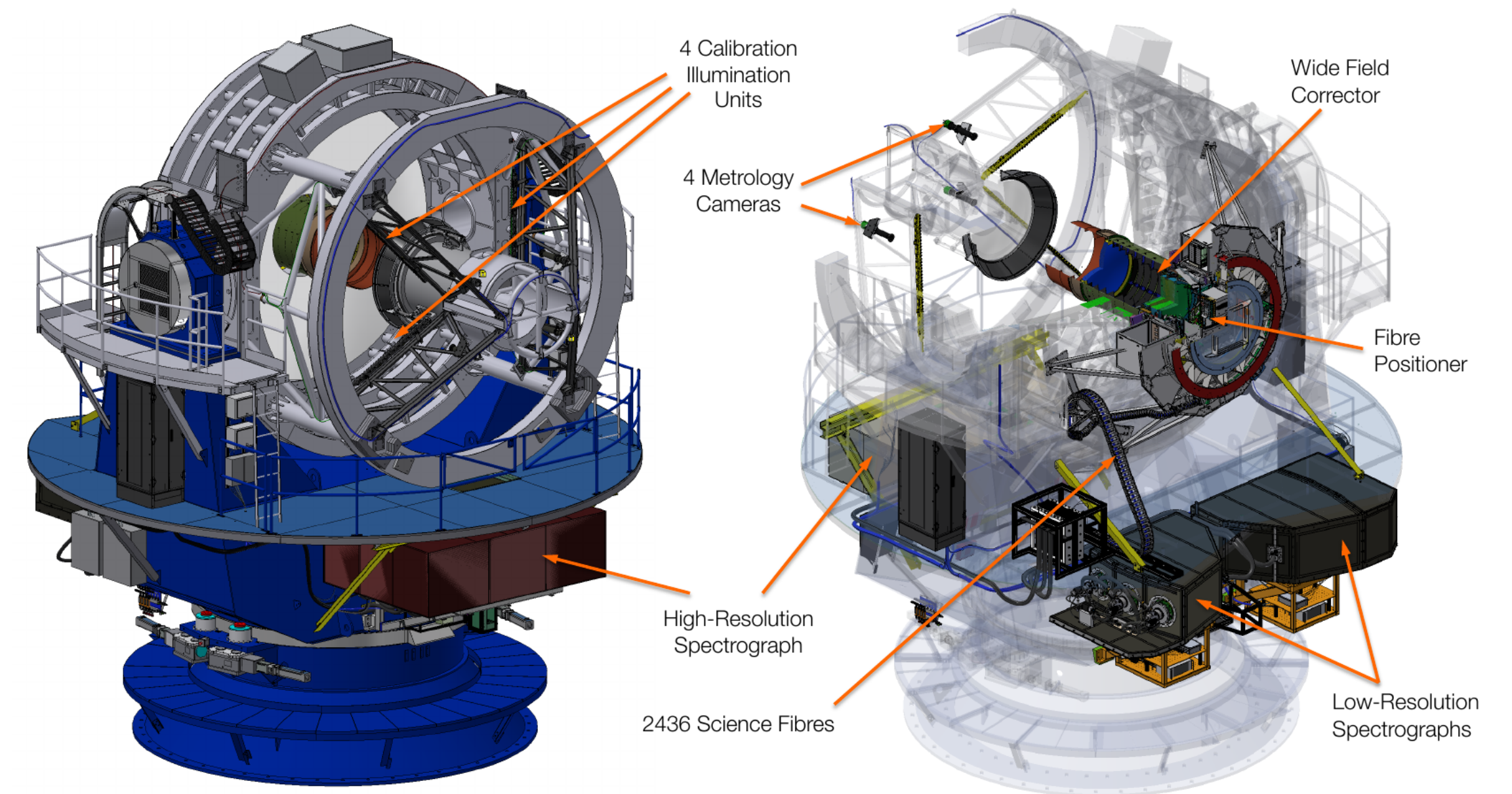
- **AGN selection of 4MOST/ChANGES:**

- **1.8 million fiber hrs**

- ▶ Variability

- ▶ Lead of the **SED Fitting Modelling group (W2SED, S1604)**, Catalogs based on DELVE+VHS/VIKING+WISE

- ▶ TDEs, Lensing



Job Opportunities in Astronomy in Chile

Thanks to the Observatories and the growth of the astronomy community in Chile, there are many opportunities for careers in astronomy... and not just in academia. (Astronomers in Chilean Institutions can publish in A&A for free).

Postdocs at Observatories

- ESO Fellowship (https://www.eso.org/sci/activities/fellowships-and-studentships/FeSt-overview/fellowship_programme.html)
 - 3 years in Chile then 1 year either in Chile (ESO or another Chilean university) or an ESO member state
 - Time spent 50-50 on research and observatory duties
 - Great opportunity to develop instrumentation and technical knowledge
- ALMA Fellowship (ESO, NRAO, NAOJ): www.almaobservatory.org
 - Similar to the ESO fellowship, but with just 3 years in Chile

Job Opportunities in Astronomy in Chile

Postdocs in universities

- FONDECYT Fellowships announced each year ~April (3 years):
<https://anid.cl/concursos/concurso-fondecyt-de-postdoctorado-2026/>
- Many other postdocs opportunities through other funding sources (2 years):
 - ESO-Chile Comité Mixto: <https://www.eso.org/> or <https://anid.cl/concursos/>
 - Gemini-ANID: <https://anid.cl/concursos/concurso-fondo-gemini-anid-2025/>
 - ALMA-ANID: <https://anid.cl/concursos/concurso-fondo-alma-anid-2025/>
 - CATA: <https://cata.cl/>
 - Nucleo Milenios: <https://anid.cl/concursos/>
 - MAS: <https://anid.cl/concursos/>
- Keep an eye on the job register (<https://jobregister.aas.org/>), or reach out to a collaborator or potential supervisor if you are interested in working with them

Job Opportunities in Astronomy in Chile

Outreach

- EPOD- ESO Public Outreach Department



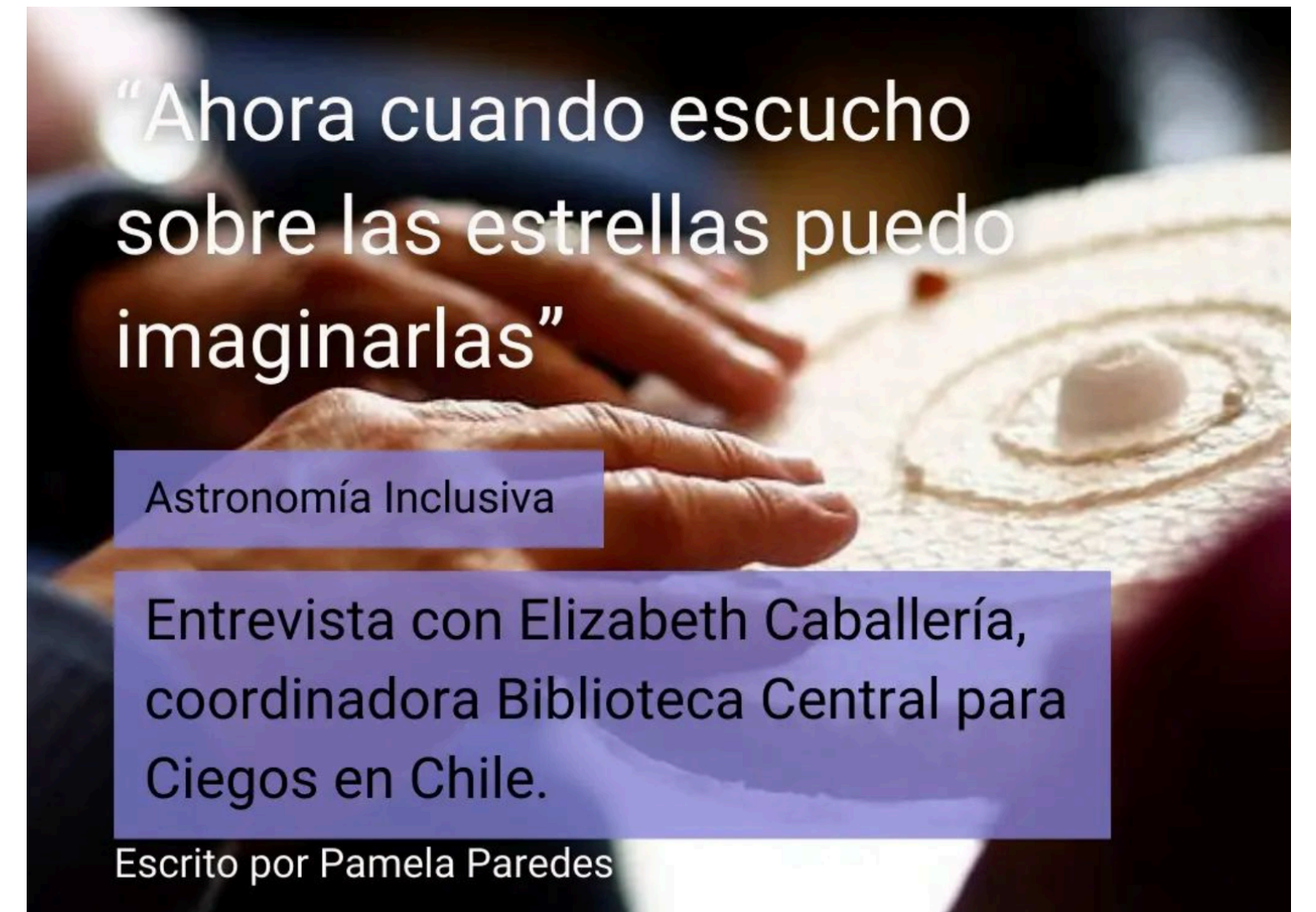
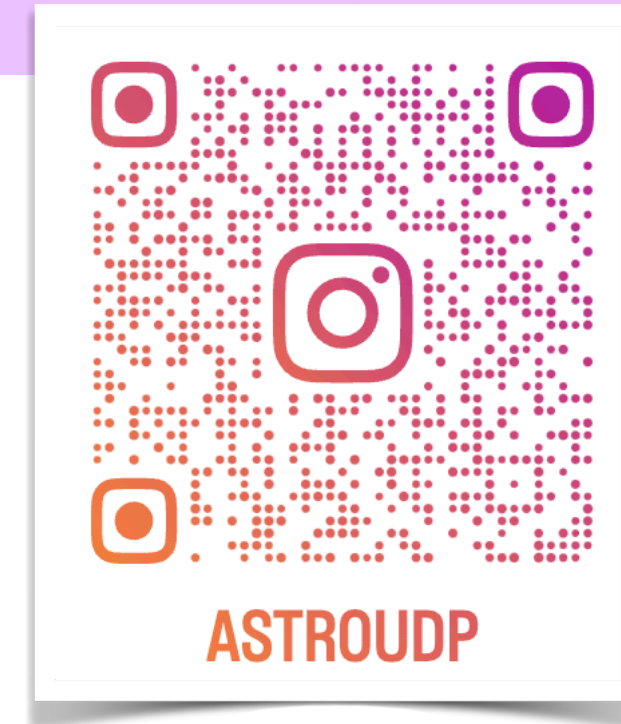
A screenshot of the ESO website's 'Press Releases' section. At the top, there is a language selection bar with various national flags and the text 'Select Language'. Below this is a navigation menu with links for 'ABOUT', 'IMAGES', 'VIDEOS', 'NEWS', 'ESOSHOP', 'TELESCOPES & INSTRUMENTS', and 'DISCOVERIES'. The 'NEWS' link is highlighted. The main content area features the ESO logo and the text 'European Southern Observatory'. Below this, there is a 'Press Releases' section with a subscribe button. Two press release thumbnails are visible: one for 'eso2401' titled 'Missing link found: supernovae give rise to black holes or neutron stars' dated '10 January 2024', and another for 'eso2320' titled 'New 1.5-billion-pixel ESO image shows Running Chicken Nebula in unprecedented detail' dated '21 December 2023'. The thumbnails show colorful astronomical images of supernovae and nebulae.



Job Opportunities in Astronomy in Chile

Outreach

- Outreach officers in many departments



Job Opportunities in Astronomy in Chile

Outreach

- Outreach officers in many departments



Job Opportunities in Astronomy in Chile

Outreach

- Many small observatories that run public tours all over the country



Job Opportunities in Astronomy in Chile

Observatory positions

- Observatories have various positions that astronomers can apply for
 - Support astronomer
 - With/without science time
 - Based at observatory HQ or a university when not on mountain
 - Telescope operator
 - Observing specialist (e.g. LSST)
 - Verification systems engineer (e.g. LSST)
 - Instrumentation
 - Science Archive Content Manager (e.g. ALMA)
 - Data Analyst
- And many more...

Job Opportunities in Astronomy in Chile

ESO studentship (PhD)

- Studentship to come to Chile and work with one of the staff astronomers or fellows
- 6 months - 2 years
- Two annual application deadlines: April 30th and October 30th

<https://www.eso.org/sci/activities/fellowships-and-studentships/FeSt-overview/ESOSTudentship.html>



Summary

- In the last 170 years Chile has become one of the most important countries in the world for astronomy
- Chile now has a large and very active astronomy community, and not just in research/academia
- We host some of the best telescopes in the world, and that has brought us many opportunities within astronomy that are difficult in other places

