

Observatories at the Extreme

Chilean Telescopes and Southern Sky Experience

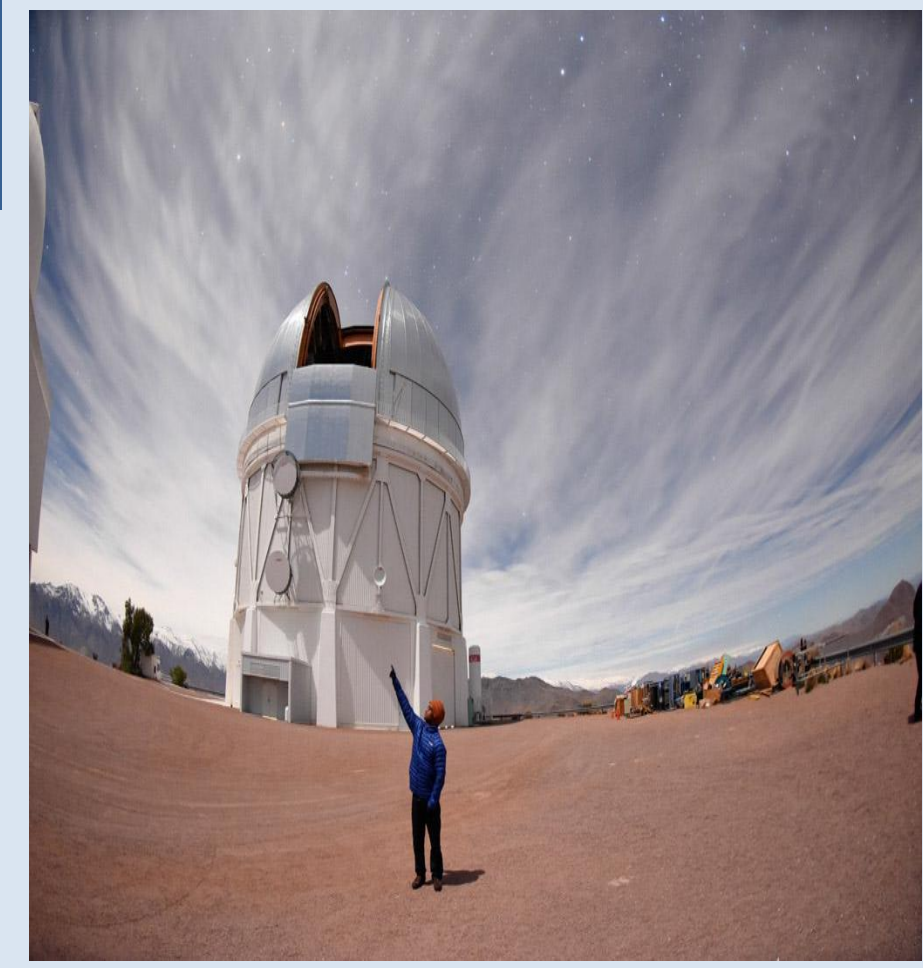
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Photo by John Blackwell

Astronomy in Chile Educator Ambassadors Program



The Astronomy in Chile Educator Ambassadors Program (ACEAP) is a program that brings amateur astronomers, planetarium personnel, and K-16 formal and informal astronomy educators to US astronomy facilities in Chile. The ambassadors visit Cerro Tololo Inter-American Observatory (CTIO), Gemini-South Observatory, and the Atacama Large Millimeter-submillimeter Array (ALMA) along with smaller tourist observatories. The ambassadors also participate in local school outreach. The program is funded by the National Science Foundation. In 2016, nine ambassadors were chosen from across the United States and Puerto Rico to travel to Chile and learn about the observatories, researchers, and science being conducted.



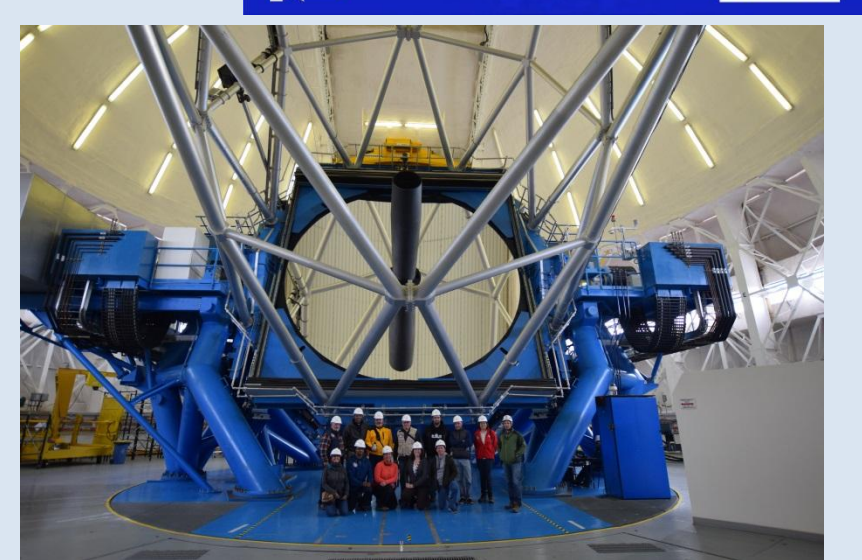
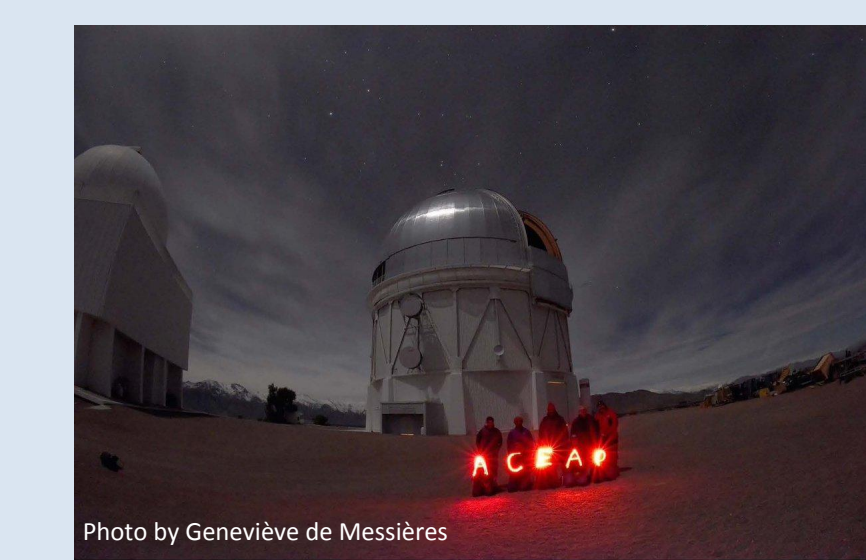
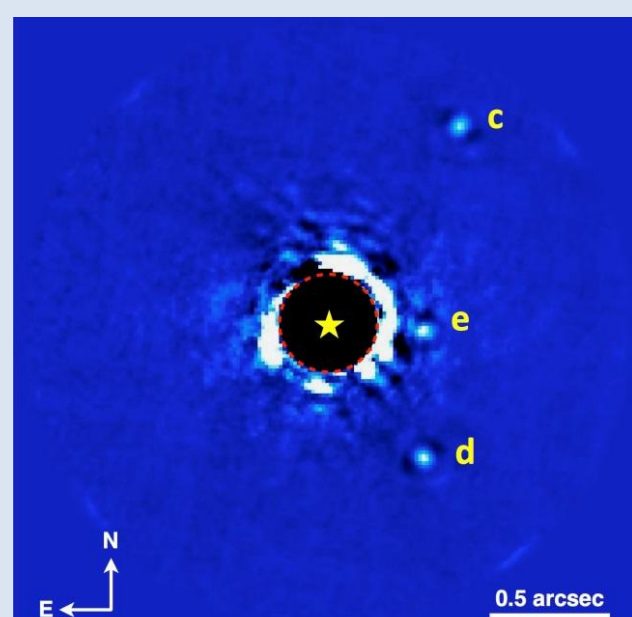
Gemini Observatory



The Gemini Observatory consists of twin 8.1 meter optical/infrared telescopes located in Hawai'i on top of Mauna Kea and in Chile on Cerro Pachón. The Gemini telescopes can collectively cover both hemispheres providing a complete view of the night sky.

Gemini is operated through an international agreement between the USA, Canada, Brazil, Argentina, and Chile. Astronomers from these partnering countries can apply for time on Gemini.

The Gemini Planet Imager (GPI) is a science instrument that provides spectroscopy or dual-beam polarimetry of any object in the field of view. It is used by astronomers to look for planets around stars. The GPI imaging to the right is of the planetary system HR 8799 in K band and you can see 3 of 4 planets.



ALMA

The Atacama Large Millimeter-submillimeter Array (ALMA) consists of sixty-six 12m (39 ft) and 7m (23 ft) radio telescopes located in the Atacama desert at an altitude of 5,059m (16,597 ft)



The antennas probe deep into our universe in search of the very first stars and galaxies to help us understand our cosmic origins.

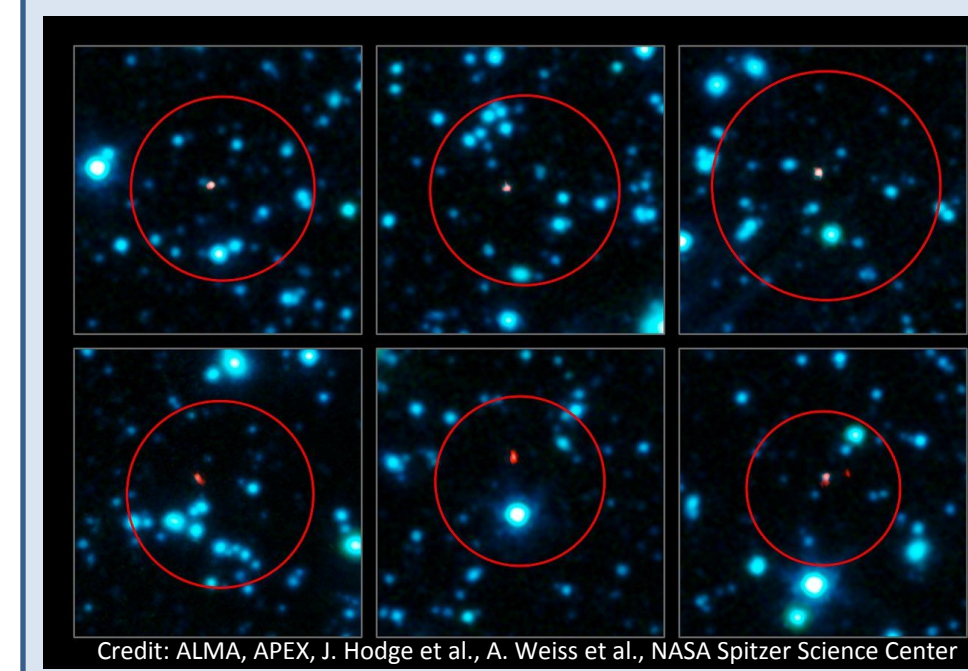
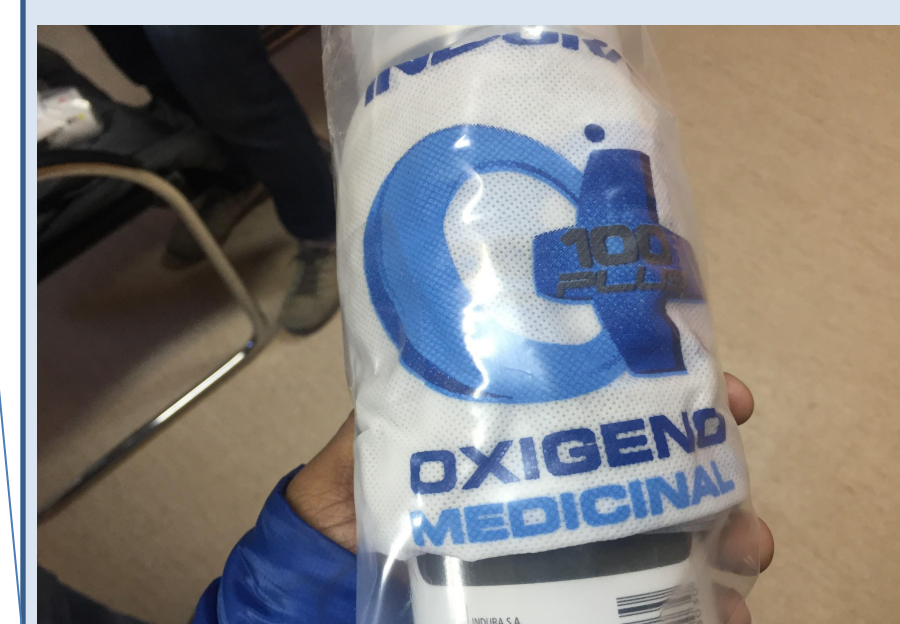


Image above: star-forming galaxies in the early universe.



The challenge of visiting ALMA is the altitude sickness which commonly occurs above 2,400m (8,000 ft). The low air pressure causes headaches and rapid pulse. We were required to pass a physical before ascending to 16,597 ft.

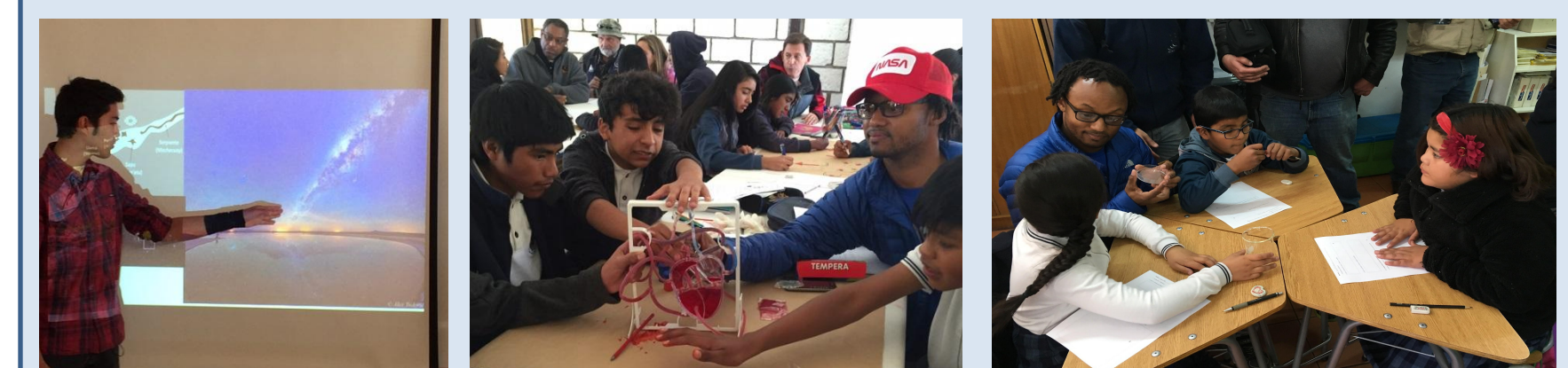
CTIO

The Cerro Tololo Inter-American Observatory (CTIO) is located in the Coquimbo Region of northern Chile. The 4m Víctor Blanco Telescope was completed in 1974 (image right). This telescope is similar to the 4m telescope located on Kitt Peak in my home state of Arizona. Cerro Tololo also includes the 1.5m, 1.3m, 1.0m, and 0.9m telescopes operated by SMARTS consortium.



Outreach

One of the best components of ACEAP is interacting with local schools. We visited two schools in the San Pedro region. This gave us an opportunity to listen to student presentations and to engage in small group discussion.



Summary of future work

The Astronomy in Chile Educator Ambassadors Program is one of the best professional development activities I have done. It was supported by my colleagues, STEM community, and professional learning networks. Participation in the program increased my understanding of Chilean observatories and current astronomical discoveries. The outreach also extends to the NASA Solar System Ambassadors Program. The goal is to gain a better understanding of celestial objects, and participate in unique astronomy events.



- My Top 10 Takeaways From ACEAP
- Becoming friends with the ambassadors
 - Learning about astronomical discoveries
 - Behind the scenes tours of observatories
 - Interacting with the local students
 - Ascending to 16,597 ft to see ALMA
 - Attending all the scientific presentations
 - Exploring Santiago and the Atacama desert
 - Learning more about astrophotography
 - Having amazing organizers and guides
 - Chilean food, culture, and music!

