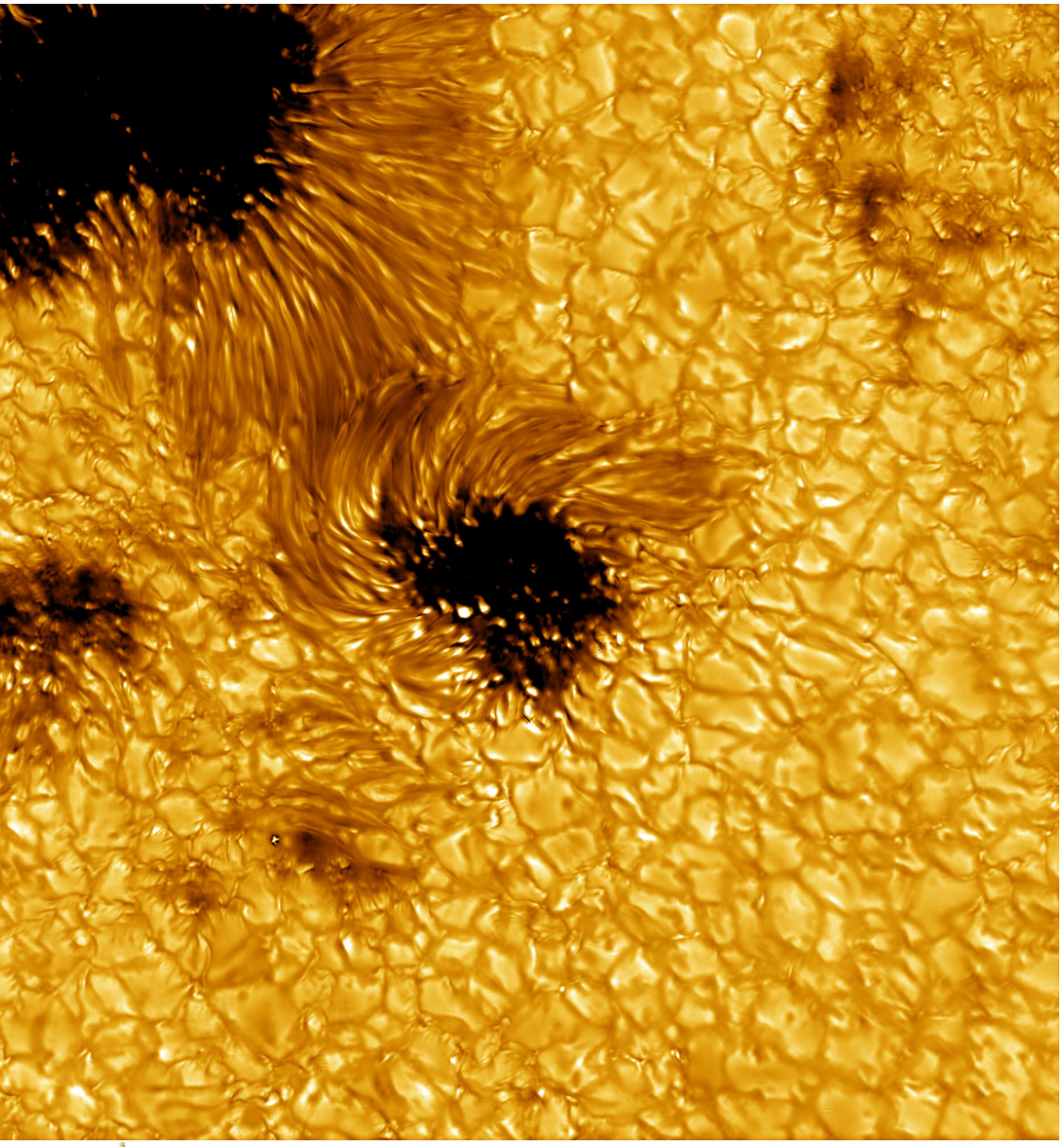
AAAC

Debra Fischer

NSF MPS/AST DD

Facility Updates



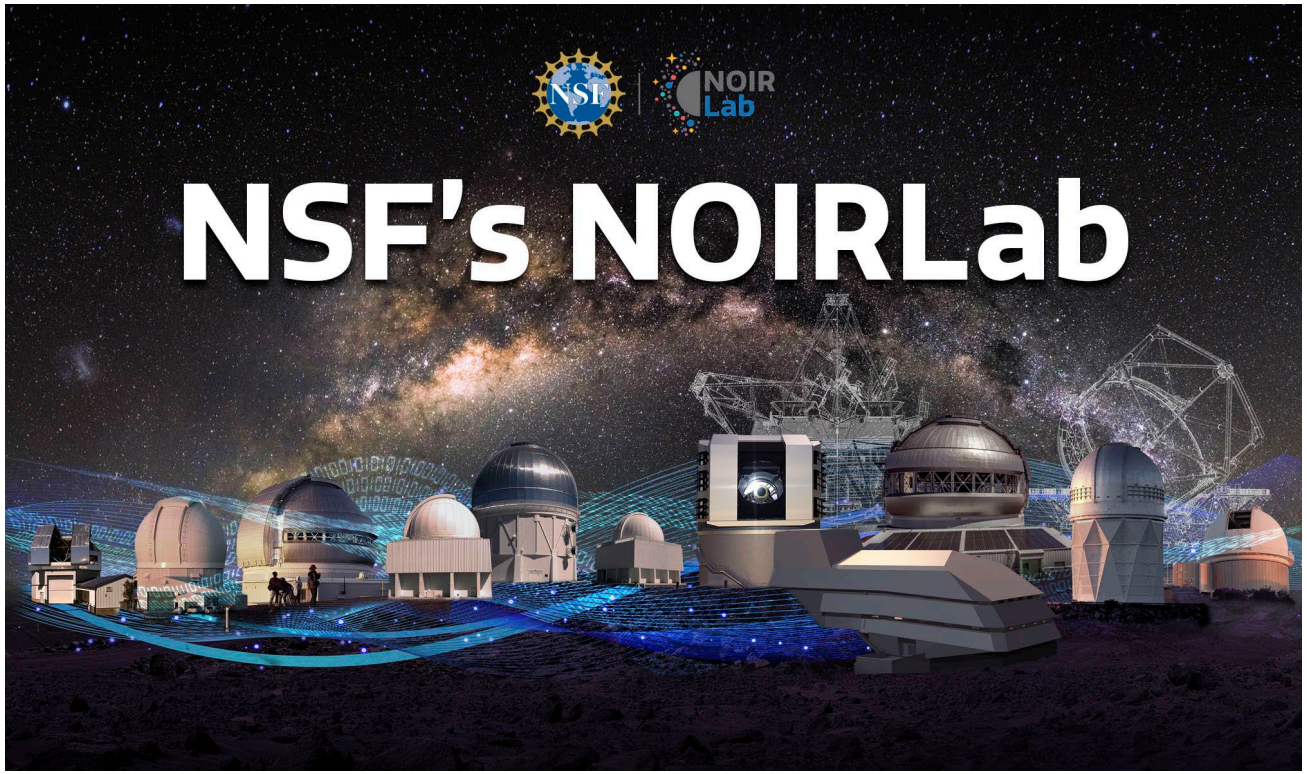
NSO
National Solar Observatory

On 23 Feb 2022, the Daniel K. Inouye Solar Telescope (DKIST) began

First Science Observations.

The worlds most powerful solar telescope obtains high resolution images of sunspots coupled with measurements of electric fields. These data will reveal how *magnetic reconnection* suddenly reconfigures the solar magnetic fields, producing jets of plasma that reach into the chromosphere.

NSF



Another major activity for NSF/AST:

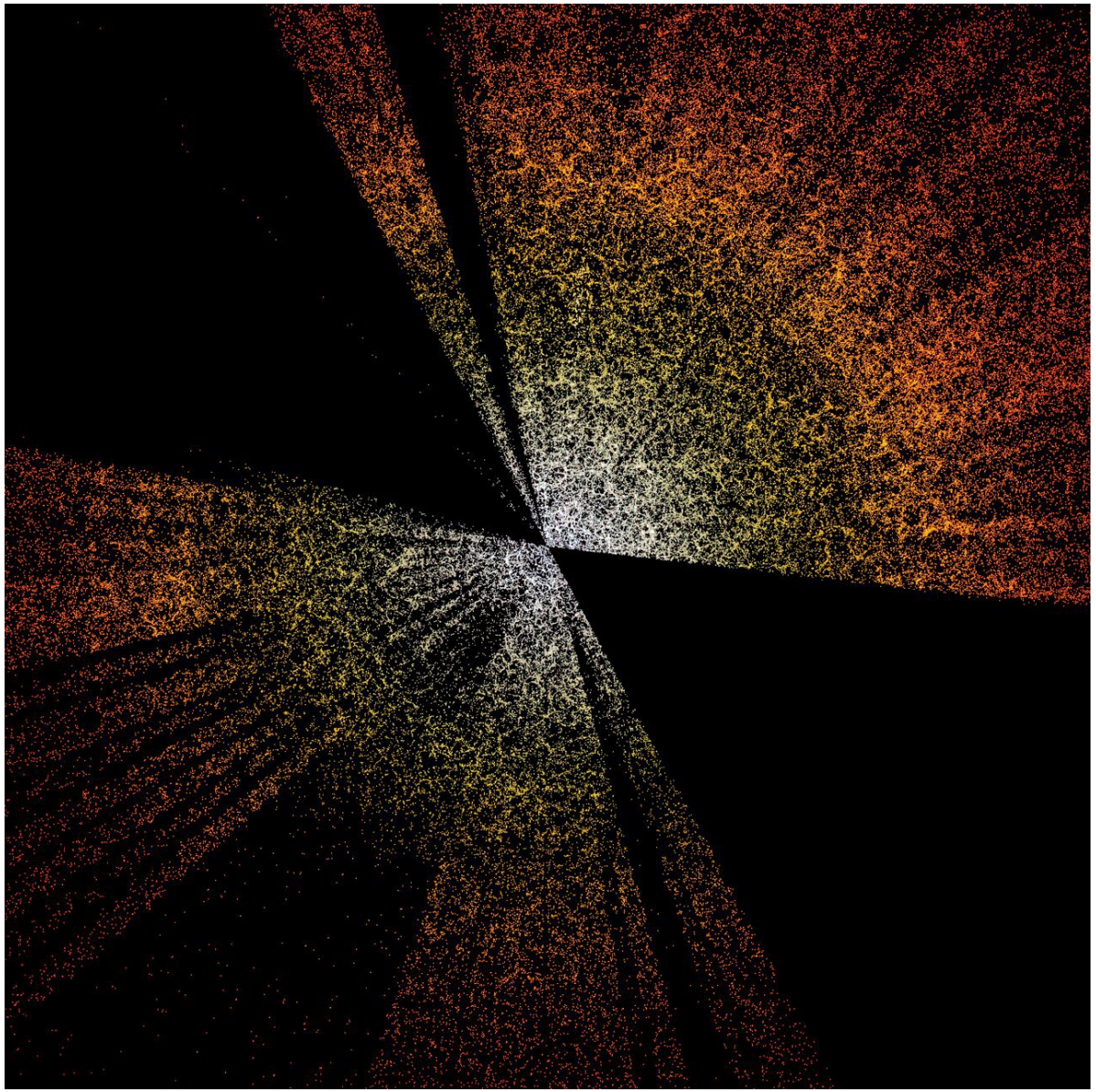
Panel review of 5-year NOIRLab proposal took place in February and their report back to NSF was just received.

Pretty Pictures!

The DOE-funded and fabricated DECam (CTIO / Blanco in Chile) was used to image NGC1566 “Spanish Dancer” galaxy.

Renovation of the McMath-Pierce Solar Observatory on Kitt Peak.

The first phase of conversion of this iconic facility to the *Windows on the Universe* outreach center, will be completed this May. Work now begins on design and installation of exhibits – including a Science of a Sphere Theater.

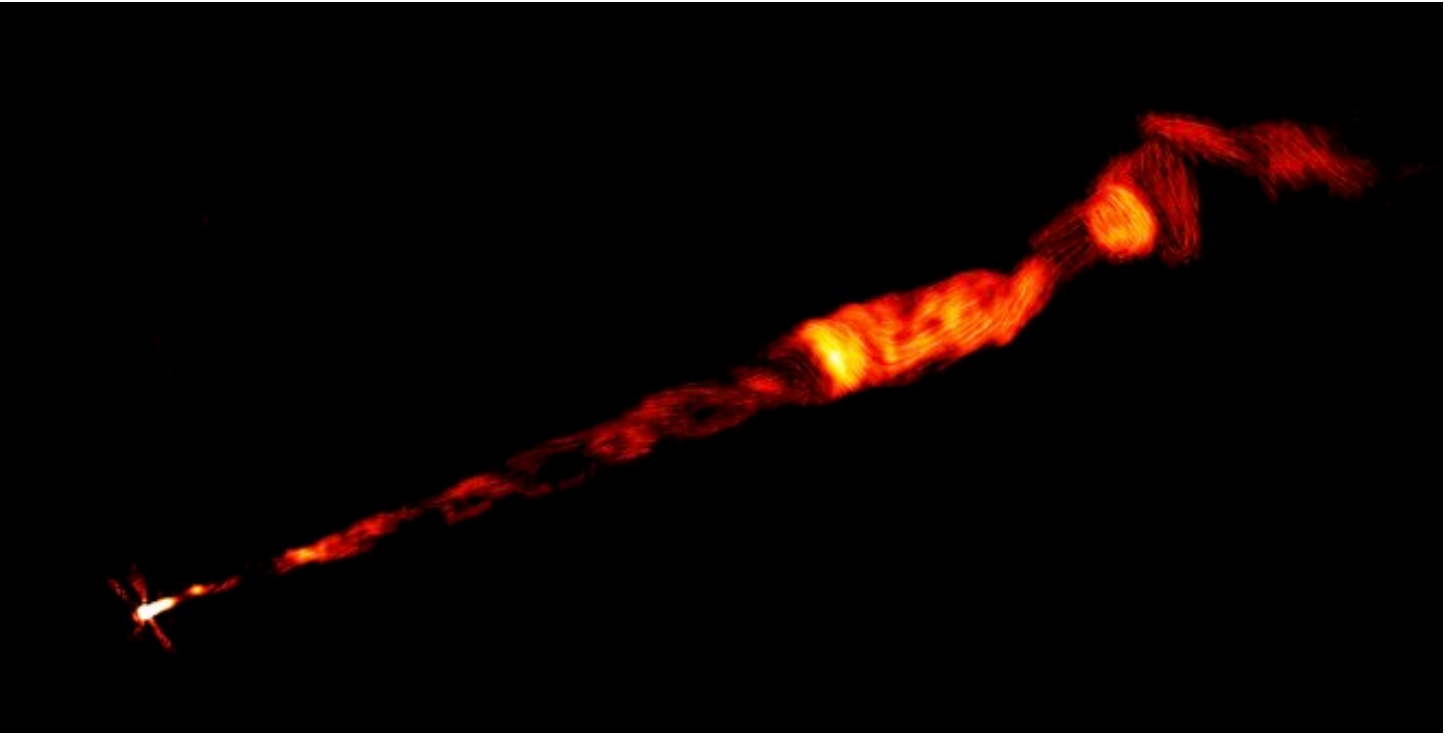


Redshifts!

The DOE DESI project at the Mayall telescope has already obtained more than 10 million redshift measurements since the start of science operations last summer. This is more galaxies than all previous 3D surveys combined.

Addressing the impact of satellite constellations:

1. New solicitation (ENG CISE MPS GEO): Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT) includes stream of funding R&D for astronomy and satellite constellations.
2. Support of U.S. statement on dark and Quiet Skies at U.N. COPUOS
3. Support of SpectrumX (spectrum innovation center, Notre Dame)
4. IAU SKAO / NOIRLab leadership: Center for Protection of Dark and Quiet Skies

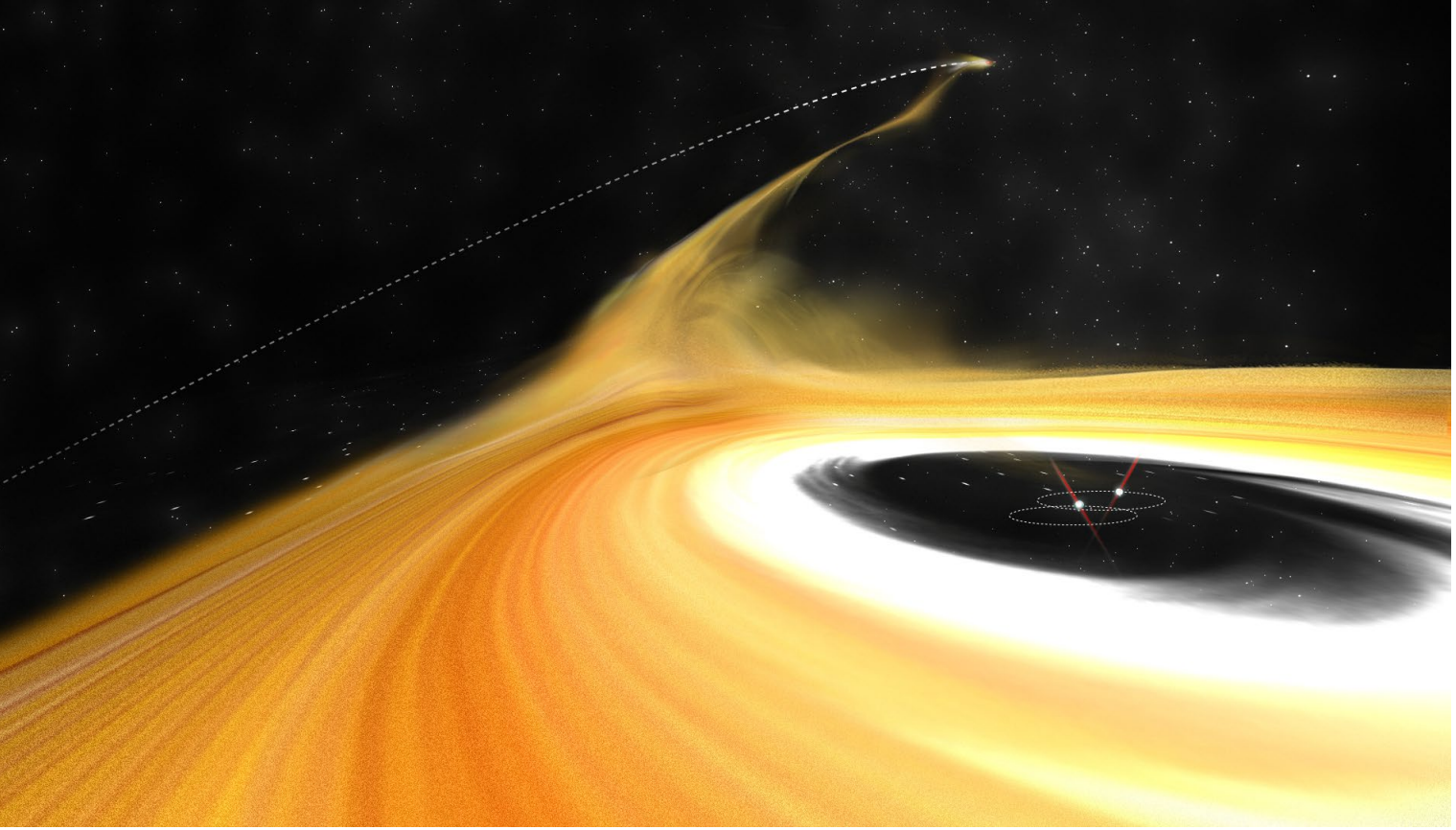


VLA image of the M87 radio jet

Credit: Pasetto et al., Sophia Dagnello, NRAO/AUI/NSF.

This is the first 3-D study of the M87 jet. A corkscrew-like helical structure seen in the inner part of the jet, which originates at the core of the galaxy where a supermassive black hole resides.

Polarization from the jet's magnetic field measured out to ~3,300 light years, the farthest ever. The magnetic field is expected to weaken with distance from the central black hole but does not (not only in M87 but in jets in general). This study indicates flow instabilities that may make the magnetic field more ordered and compressed, producing the helical structure.



An intruder object

caught disrupting protoplanetary disk of a binary protostar in Canis Majoris.

Observational data from the Subaru Telescope, Karl G. Jansky Very Large Array, and Atacama Large Millimeter/submillimeter Array suggest the intruder object was responsible for the creation of these gaseous streams, and its “visit” may have other impacts on the growth and development of planets in the star system.

Arecibo Observatory

Cleanup is complete; forensic investigation by UCF's contractor in final stages (expect report before next AAAC meeting)

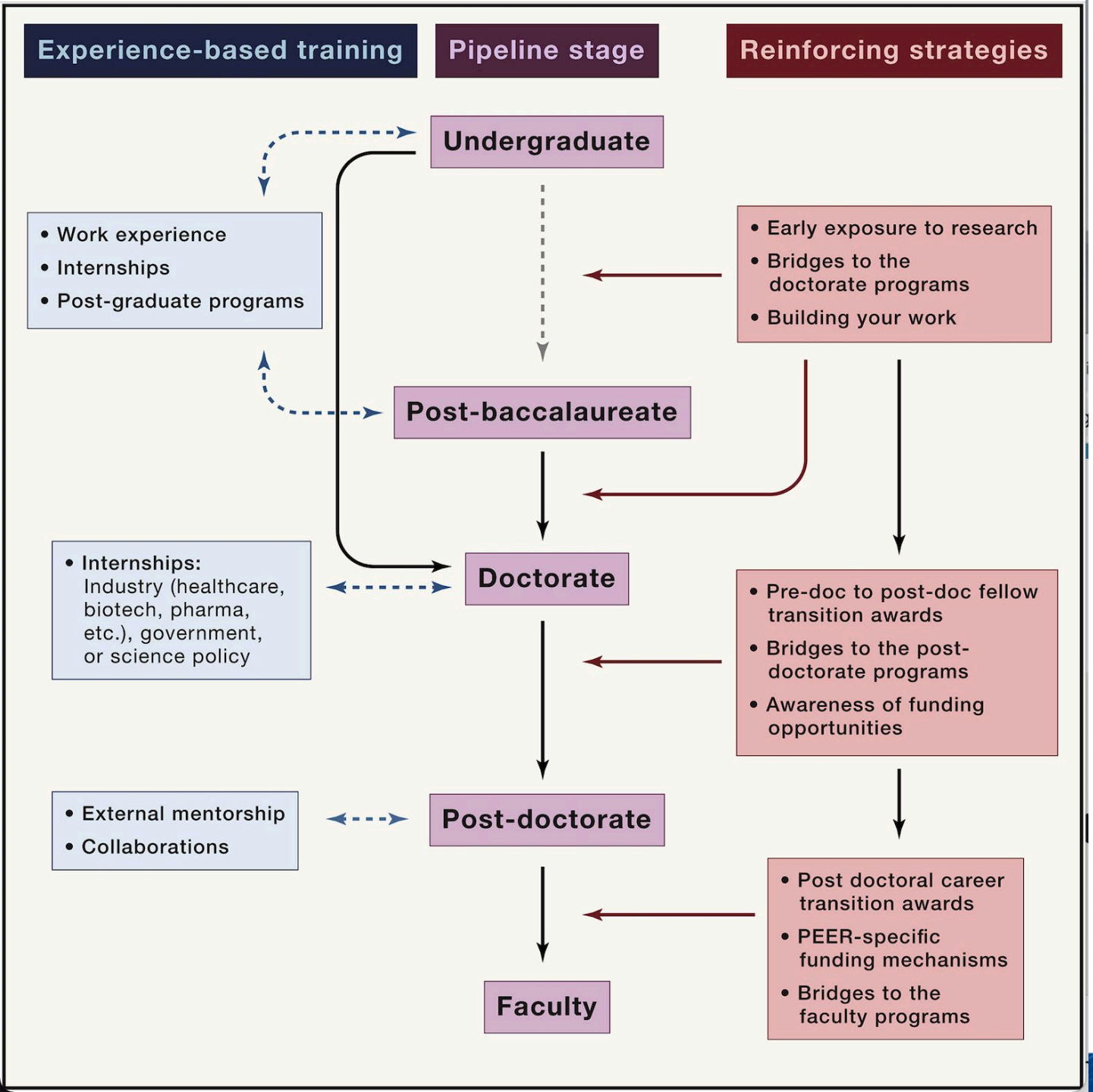
National Academies panel on Analysis of Causes of Failure and Collapse of Arecibo has begun. https://www.nationalacademies.org/event/01-24-2022/analysis-of-causes-of-failure-and-collapse-of-the-305-meter-telescope-at-the-arecibo-observatory-meeting-1

Center for Advanced Radio Sciences and Engineering

AST partnership with EPSCoR that also includes collaboration with industry to work on active RFI cancellation.

Launch of the Center at end of March 2022 at the University of Mayagüez in Puerto Rico.

Progress on Astro2020 “state of the profession”



Leaky STEM Pipelines for PEER

One of the most impactful things we can do to address the leaky pipeline for STEM is: "intentional and personalized direction, exposure, opportunities, and guidance to P.E.E.R. trainees throughout each stage"

Figure from Hinton et al. 2020 "Patching the Leaks: Revitalizing and Reimagining the STEM Pipeline"

NSF programs to address the leaky pipeline:

1. PAARE: Partnerships in Astronomy & Astrophysics Research and Education aims to establish authentic pathways into the research enterprise and broaden the participation of individuals from groups underrepresented in astronomy. *Strong proposal response!*
2. REU: projects involve students in meaningful ways in ongoing research programs. *Site awards being made!*
3. ASCEND: recognize postdoctoral fellows with significant potential who will broaden the participation by P.E.E.R. individuals. *Reviews ongoing!*
4. LEAPS: an emphasis to help launch the careers of pre-tenure faculty in MPS fields at institutions that do not traditionally receive significant amounts of NSF-MPS funding; aims to broaden participation to include members from P.E.E.R. *Reviews ongoing!*

Outreach

NOIRLab led the *Journey Through the Universe* outreach program for the eighteenth straight year this week – where observatory staff engage with local community school kids in Hawaii.

Mentorship program:

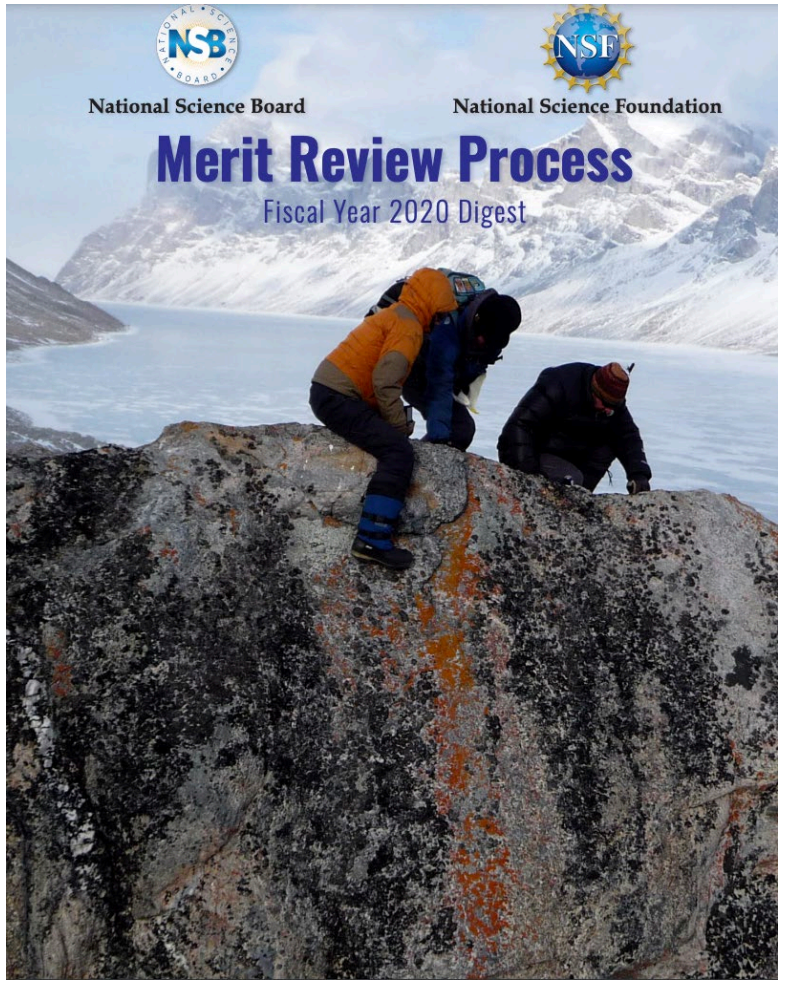
PROmoting VOCAtions (PROVOCA) to broaden participation of women in STEM careers in Chile. Long term commitment with female STEM professionals and students: Training (10 months), 350 hours of lectures, coaching, networking, roundtable discussions, final project presentations.

28 women have completed this mentorship training.
April 2022, AUI / NRAO applications for students who will receive mentorship

Demographics on Proposals

1. We are actively working to increase access to data about NSF's merit review process, including the demographics of individuals submitting proposals and receiving awards.

2. We collect and publish Directorate-level summary proposal data about gender, race, ethnicity, disability state, and career stage. (Note that there may be differences in definitions of categories between the 3 agencies.)

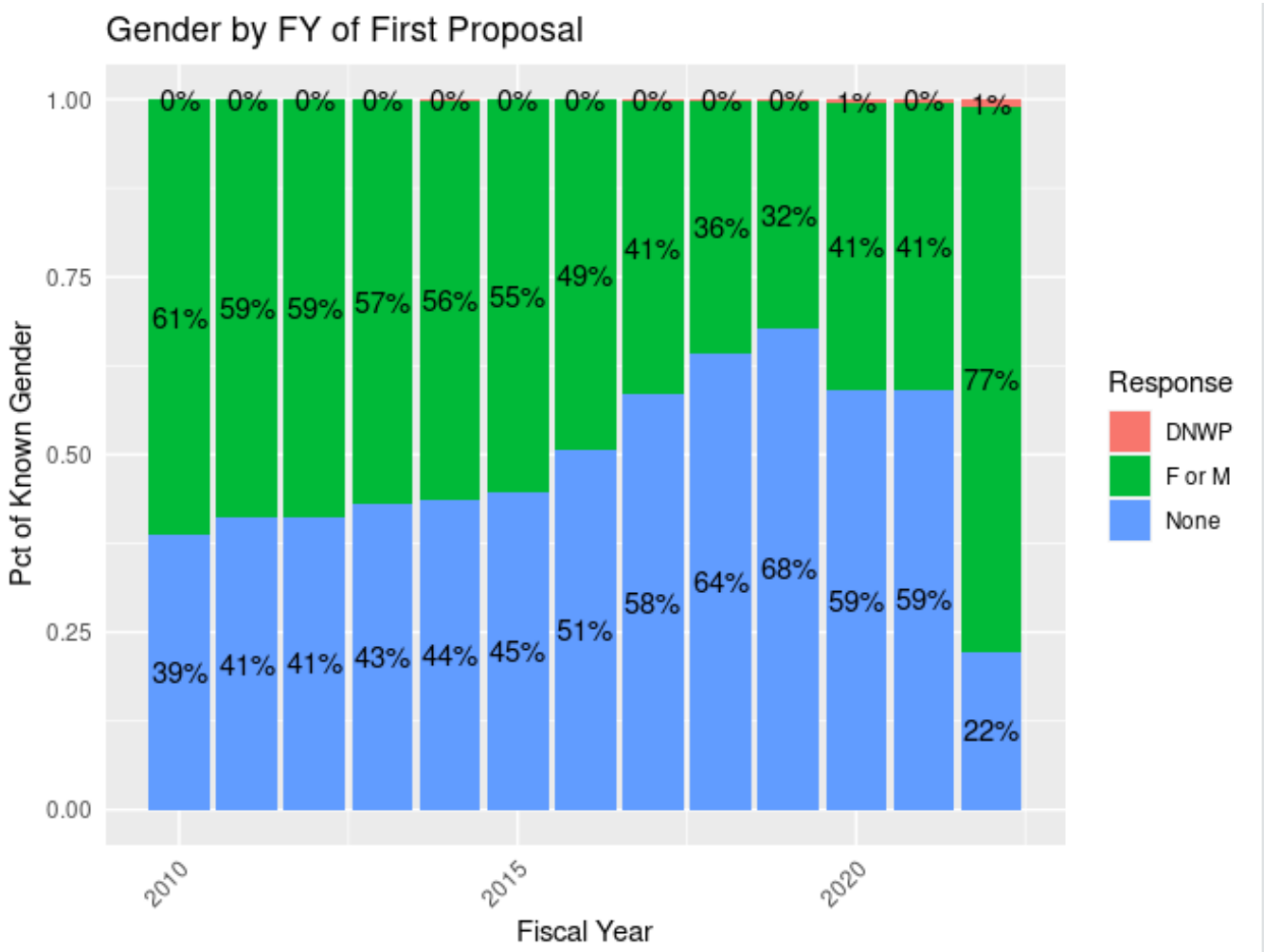


https://www.nsf.gov/nsb/publications/pubmeritreview.jsp

Demographics on Proposals

3. Not quite ready to share proposal demographic information (work in progress). This should be ready in the coming months – perhaps for the next AAAC meeting.

4. One Figure to share: a pilot program to address decreasing responses from new PIs regarding demographic information



A pilot was initiated in late FY 2021 requiring a response, while allowing a "Do Not Wish to Provide" opt out. Response improved dramatically.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