



AAAC meeting, June 1, 2023

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NSF MPS/AST DD



1. Updates on NSF Facilities
2. Progress responding to Astro2020



Brief recovery / status:

- Kitt Peak – ongoing work to provide optical fibers and public access to summit. NOIRLab will be repairing damaged dorms over the next 6-12 months, and UA will rebuild one of the two destroyed storage units. Operations stable for Mayall 4-m and WIYN 3.5-m
- ALMA – full recovery from cyberattack and ongoing work for security
- Gemini-N – primary mirror has been repaired and the mirror has been re-aluminized and reinstalled. Expect operations to resume first week of June
- Mauna Loa Observatory remains closed; UH established a temporary site for critical time-series measurements of atmospheric CO₂
- Green Bank Telescope – three azimuth wheels were replaced and operations resumed

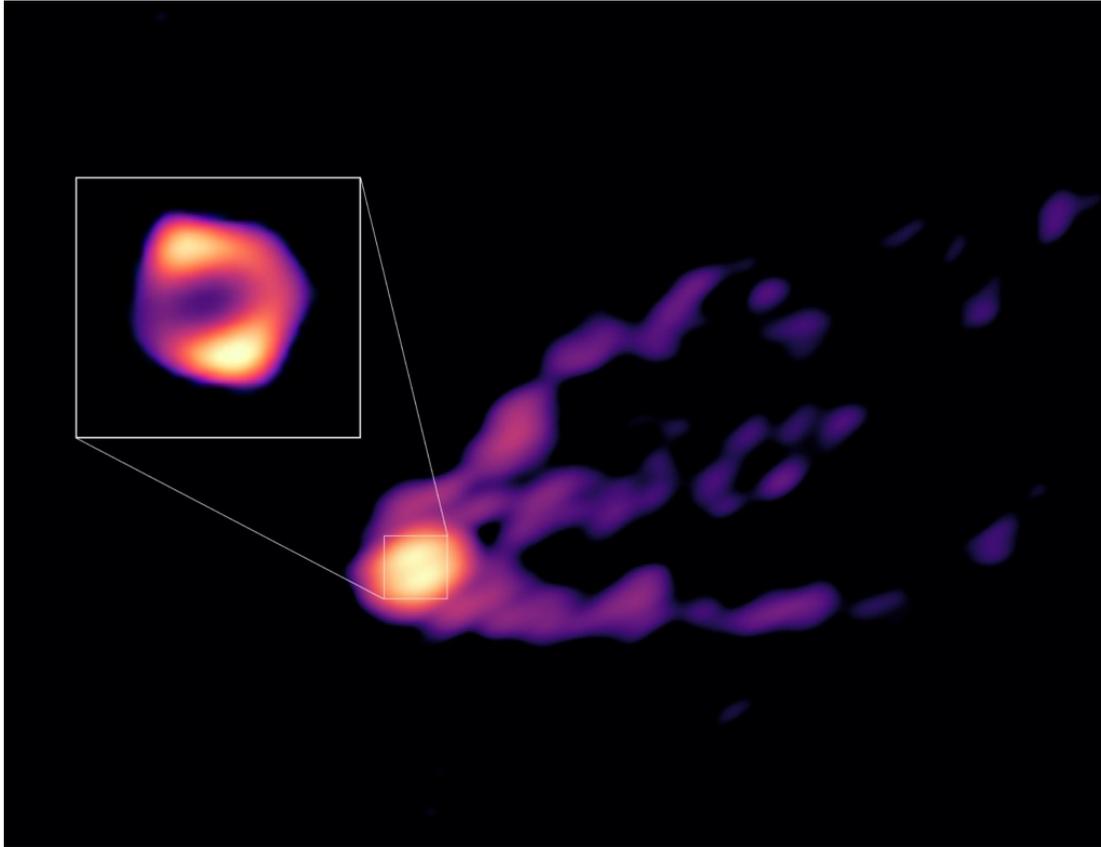


Formalized planning for deferred maintenance and critical upgrades at facilities

- Program Officers are compiling a list of prioritized needs for facilities to be supported as funding is available.
- This should improve planning for smooth operations



Science News from NRAO



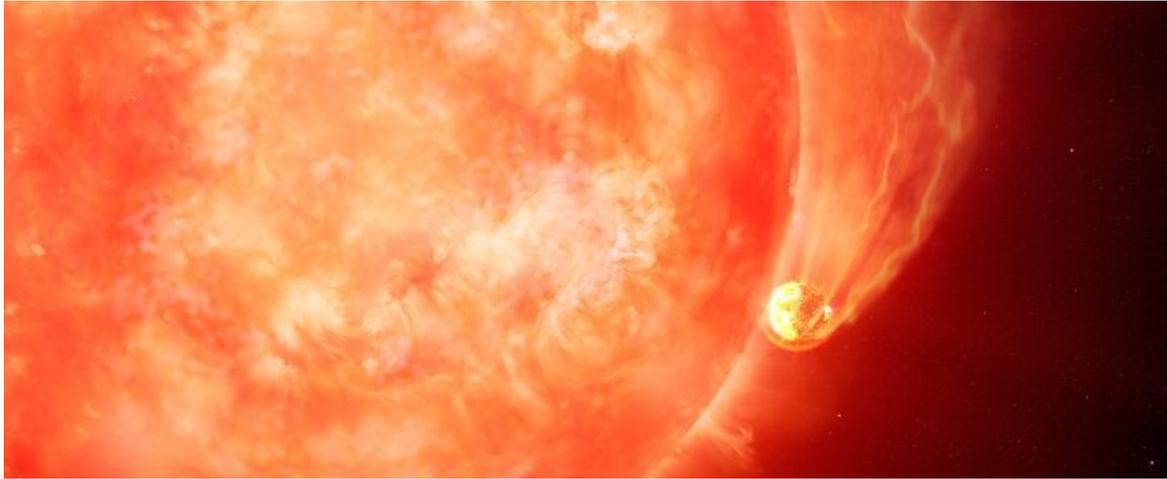
Scientists studying the supermassive black hole at the heart of the M87 galaxy have revealed the origins of the monster's powerful jet and imaged the jet and its source together for the first time. What's more, the observations have revealed that the black hole's ring is much larger than scientists previously believed.

Published Apr 26, 2023 in *Nature*.

Credit: R. Lu and E. Ros (GMVA), S. Dagnello (NRAO/AUI/NSF)



Science News from NOIRLabs

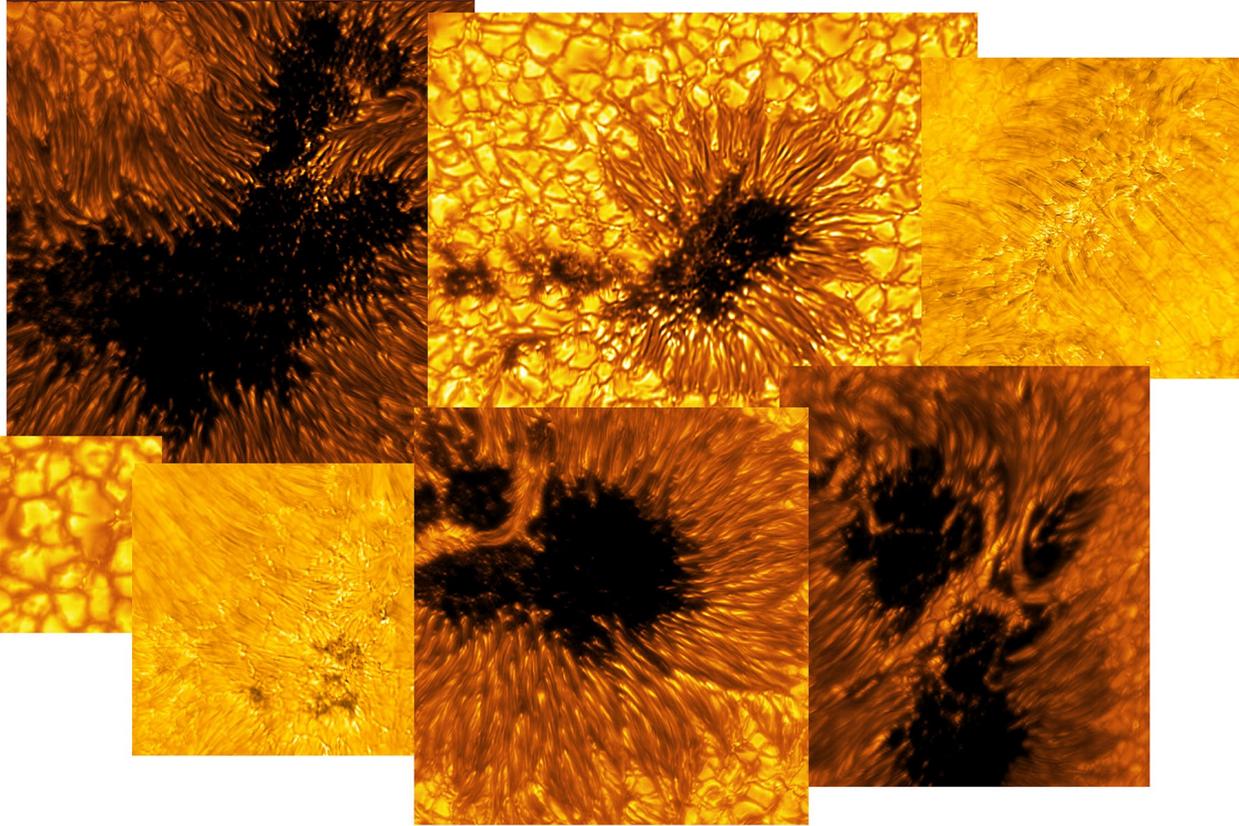


Credit:International Gemini
Observatory/NOIRLab/NSF/AURA/M. Garlick/M. Zamani

Astronomers using the Gemini South telescope in Chile, operated by NSF's NOIRLab, have observed the first evidence of a dying Sun-like star engulfing an exoplanet. The “smoking gun” of this event was seen in a long and low-energy outburst from the star — the telltale signature of a planet skimming along a star’s surface. This never-before-seen process may herald the ultimate fate of Earth when our own Sun nears the end of its life in about five billion years.



Science News from DKIST



The [National Science Foundation's \(NSF\) Daniel K. Inouye Solar Telescope](#) released eight new images of the Sun, previewing the exciting science underway at the world's most powerful ground-based solar telescope. The images feature a variety of sunspots and quiet regions of the Sun obtained by the [Visible-Broadband Imager \(VBI\)](#), one of the telescope's first-generation instruments.

Credit: NSF/AURA/NSO



News from Rubin (NSF / DOE)



Credit:Rubin Observatory/AURA/DOE/NSF

Vera C. Rubin Observatory has passed a major construction milestone: the telescope structure is ready to be outfitted with a full-size replica of its 8.4-meter mirror and stand-ins for its 3200-megapixel LSST Camera and other critical optical components. This major milestone means that Rubin Observatory is on track to help probe the mysteries of dark matter, study the fundamental nature of dark energy, document the dynamic Universe, and explore other grand challenges of cosmology.



Progress on Astro2020 recommendations



Develop Workforce:

- AAG Postdoctoral Fellows selected, NSF GSRFs, PAARE proposals under review, AAG proposals under review.
- Workshop: “Future of Data” held Feb at the Flatiron Inst; report release soon.
- Workshop: Time Domain Astronomy being planned (NSF and NASA) for Fall 2023
- Workshop: Centers of Excellence for Instrumentation / Technology – SOC is planning for a Fall 2023 meeting
- New solicitation expected this summer: up to 2 Astronomy AI institutes

Portfolio Reviews:

Continuing to develop plans for regular senior reviews to compare science productivity and cost across portfolio. Needed to give updates to MPS and the NSB and for long-term planning.



Increase support for Grants

- Effectively firewalled the Grants and Learning programs and increased funding by \$3M
- Significant additional grants support by co-funding across NSF (e.g., Windows on the Universe, EPSCoR)
- New Simonyi Scholars program (50:50 funding partnership with NSF) launched this year and first awards are being made.
- MSIP and Facilities are on the other side of this firewall.

Lab Astrophysics

- Presentation today



Protect the Skies

Spectrum/Astronomy and Satellite Constellations Update

- NSF-funded research has led to a joint paper with astronomers and industry with public software available providing brightness prediction of Starlink satellites from their ephemeris (<https://arxiv.org/abs/2305.11123>)
- NSF facilitated a signed Coordination Agreement with a second satellite company - OneWeb (May 2023). More details will be shared soon publicly.
- NSF's NOIRLab and the IAU CPS was highlighted by the US at the UN Committee on the Peaceful Uses of Outer Space (COPUOS) in statement which also expressed US support for an international agenda item on Dark and Quiet Skies and standing up an international Expert Group. There is general worldwide support. Will report back status at next AAAC meeting as COPUOS meeting is ongoing.
- We provide (and continue to update) quantitative data on the sensitivity limits imposed by the expected satellite constellations, based on lab measurements.



Protect the Skies

Spectrum/Astronomy and Satellite Constellations Update

- Proposals for SWIFT-SAT, a solicitation for coexistence of satellites and terrestrial systems, including radio and optical astronomy are due June 5th.
- NSF sponsored first annual Spectrum Week (April 24 - 28, 2023); great discussion about radio dynamic zones for added protection to radio telescopes
- NSF published a Request for Information (March 2023) for a technical and engineering study to modernize the National Radio Quiet Zone, improving emergency and telecommunication services while protecting the federal missions, including that of the Green Bank Observatory
(<https://sam.gov/opp/f36b99f739c74232a9ecc34db2770f99/view>)
- NSF is fully involved in preparations and activities with respect to the upcoming World Radiocommunication Conference (WRC-23) in Dubai in November. A number of satellite communication and coordination issues are under consideration that may impact astronomy.



Reduce GHG emissions:

- Funding provided for 100% renewable energy for Gemini-S: PV arrays and Mega-watt battery back-up
- Exploring / searching for funding to extend the G-S power, phasing in renewable energy for all of Cerro Pachón.
- Collecting information from FFRDCs on need for electric vehicles with possible support this year.



Major Facility Recommendations

Both ELT projects have completed PDR and reports received. Now planning for a Blue Ribbon Panel to recommend advancing projects to Final Design Phase. Not a decision for Construction Stage; supporting design would retire risks for a future decision.

Development for both ngVLA and CMB-S4 with plans to have projects advance to Conceptual Design Phase. Not a decision for Construction Stage; this support retires risk for future decisions.



Thank you!

We appreciate your service on the AAAC.

Your input is critical to the health of science and collaboration between NSF, DOE and NASA.



