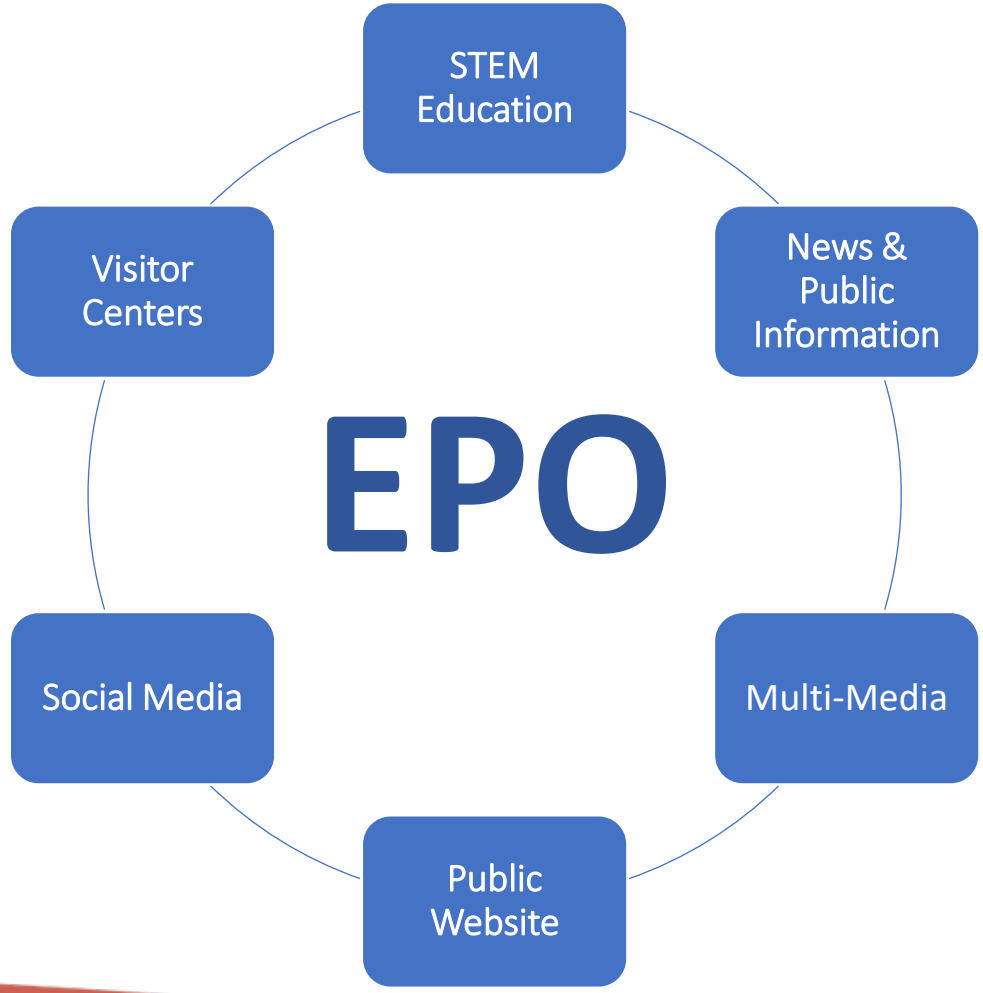
NRAO EPO
News & Public Information

National Radio Astronomy Observatory
GREEN BANK OBSERVATORY

Education & Public Outreach Division



News & Public Information

- Public communication
- Press releases
- Social media
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- Press/media relations
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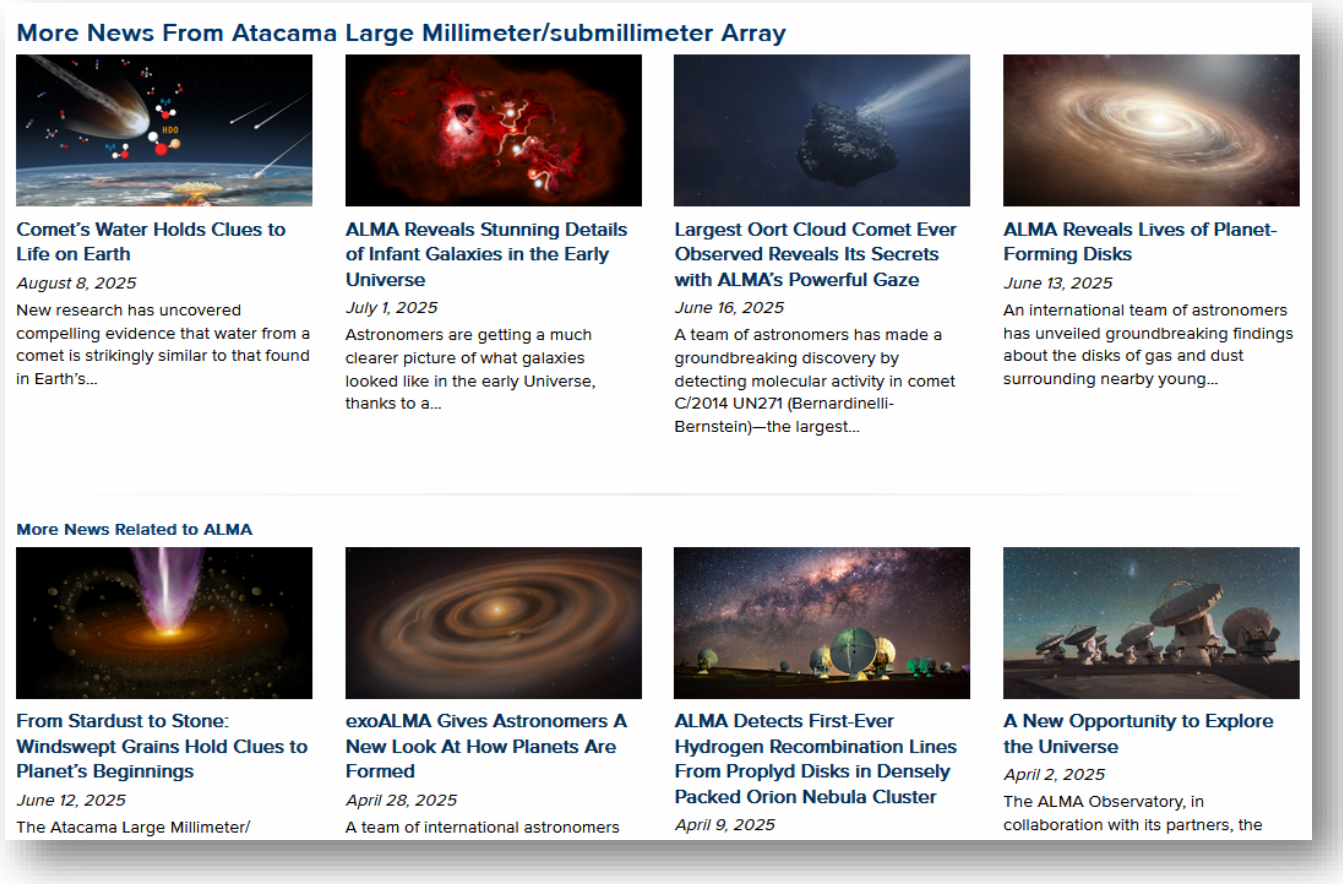
- Special projects & events



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ALMA Detects First-Ever Hydrogen Recombination Lines From Proplyd Disks in Densely Packed Orion Nebula Cluster
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The ALMA Observatory, in collaboration with its partners, the

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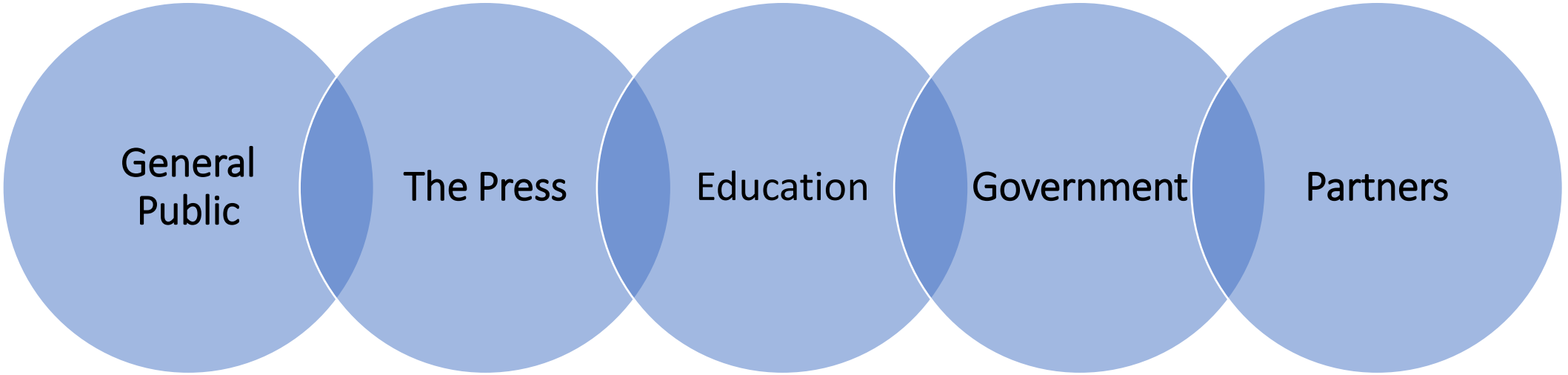

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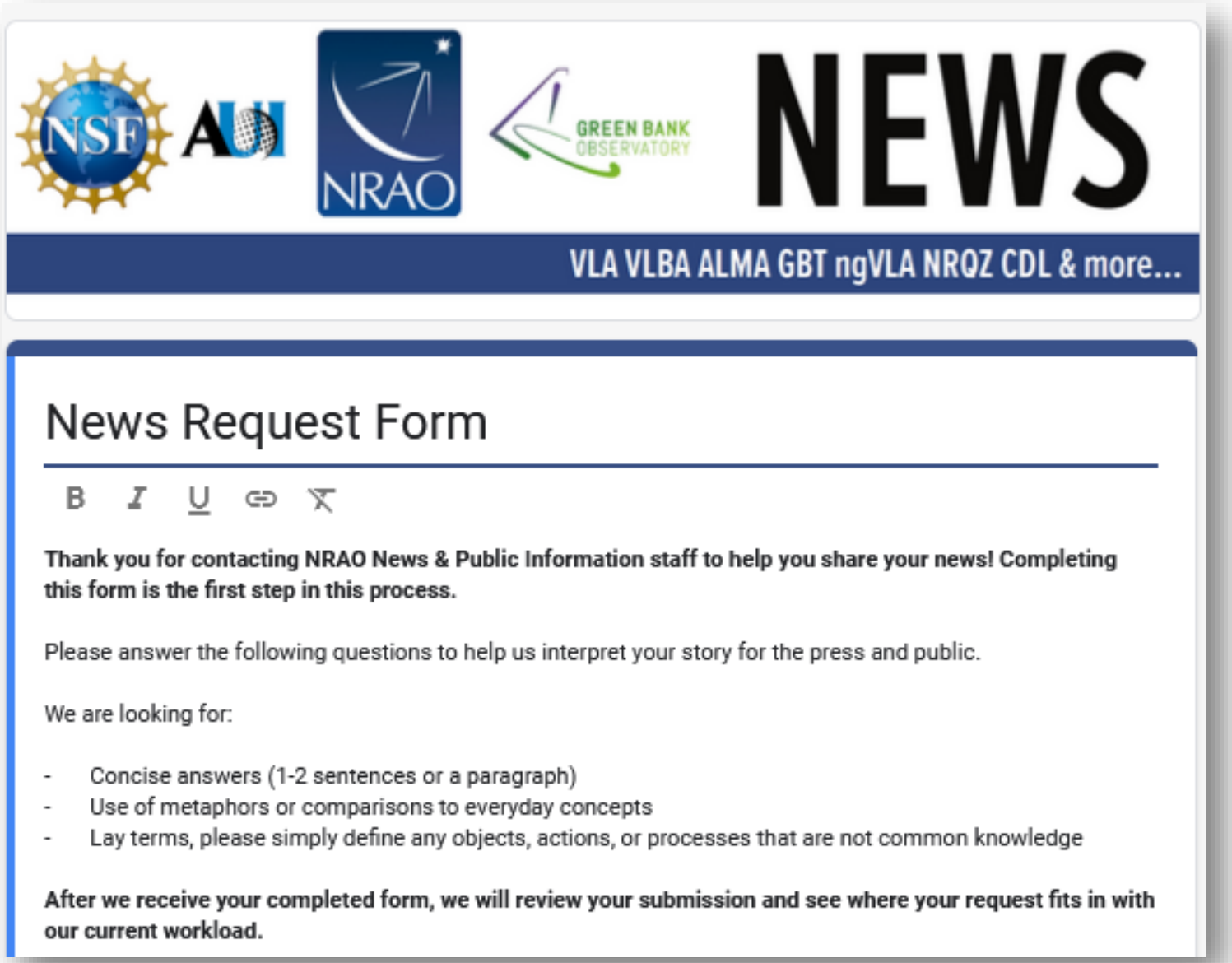
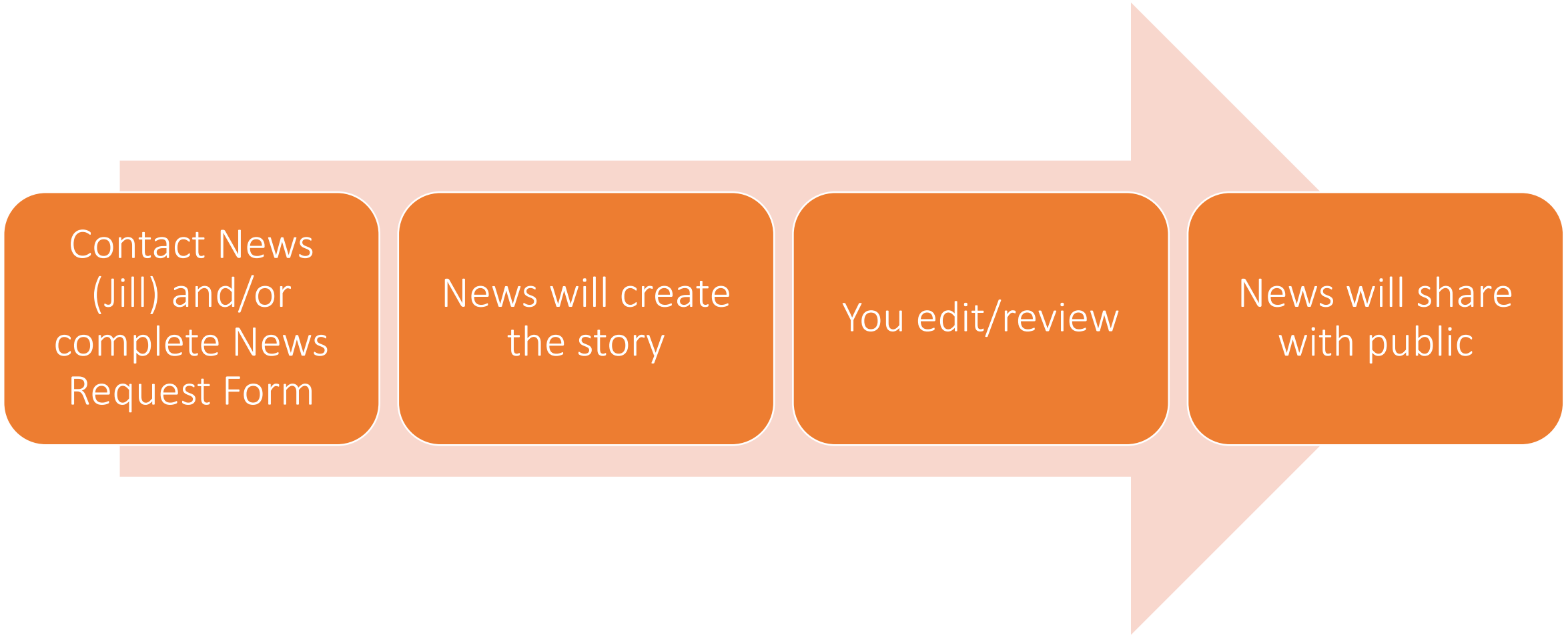


Press Release Workflow: Scientific Journal Article

Press Release Workflow: Project or Staff Story

How to Share Your News



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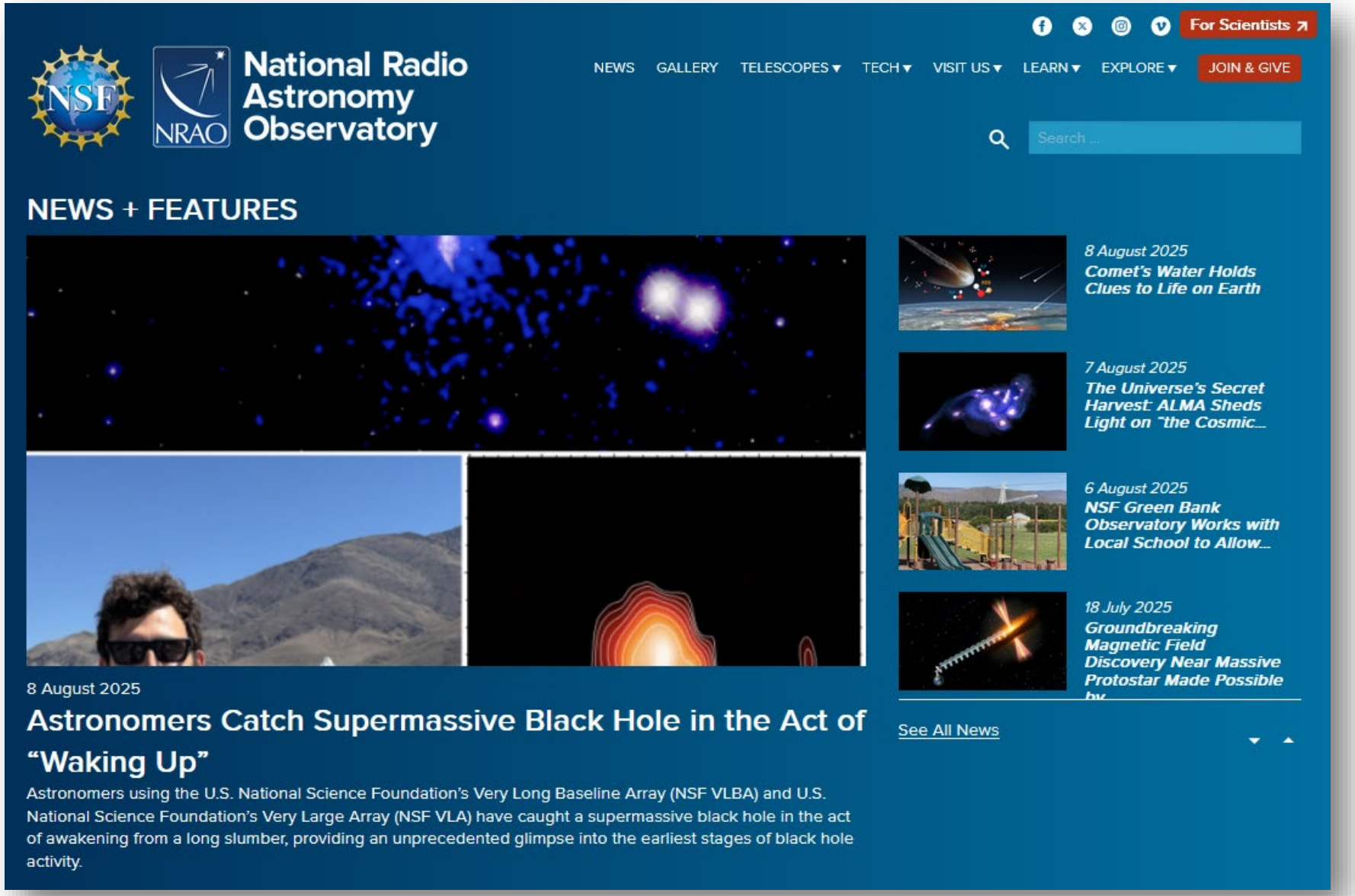

National Radio Astronomy Observatory

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Plasma Bubbles and the "Engine" of Fast Radio Bursts

Unveiled Origins of Persistent Emissions in Fast Radio Bursts

Credit: S. Dagnello, NSF/AUI/NRAO

Socorro, NM – The US National Science Foundation (NSF) National Radio Astronomy Observatory (NSF NRAO) and the Karl G. Jansky Very Large Array (NSF VLA) have played a pivotal role in uncovering the origins of persistent emissions observed in some fast radio bursts (FRBs). An international team of astronomers has demonstrated that this persistent radiation originates from a plasma bubble, shedding new light on the enigmatic sources powering these cosmic phenomena. The groundbreaking results are published today in the journal Nature.

Fast radio bursts, first discovered just over a decade ago, are one of the most powerful and mysterious events in the universe, releasing vast amounts of energy within milliseconds. Despite extensive research, the precise mechanisms driving these bursts remain unclear. However, in a few instances, the brief flash of an FRB is accompanied by a weaker, persistent radio emission.

A new study, led by researchers from the Italian National Institute for Astrophysics (INAF) and involving collaborators from institutions worldwide, focused on FRB20201124A. You can read their full press release HERE. This particular burst, located approximately 1.3 billion light-years from Earth, provided the team with unprecedented data, thanks to the NSF VLA, currently the most sensitive radio telescope in the world. Observations from the NSF VLA enabled the team to verify that a plasma bubble was responsible for the persistent emission observed in conjunction with FRBs. This supports the theoretical model predicting such an origin. The data suggest that the engine driving these FRBs could be a magnetar (a highly magnetized neutron star) or a high-accretion x-ray binary system, where intense winds from the magnetar or the binary system's accretion process create this plasma bubble. The persistent emission associated with FRB20201124A is the weakest ever detected for an FRB, expanding the known range of these emissions by two orders of magnitude.

Gabriele Bruni, INAF researcher and lead author of the paper, explains, "Our observations confirm that the persistent radio emissions from FRBs behave as expected from the nebular emission model, indicating a bubble of ionized gas surrounding the central engine. This allows us to better understand the physical relationship between the engine of FRBs and the surrounding nebula."

Luigi Pira, INAF researcher and co-author of the study, adds, "This research campaign, conducted at higher spatial resolution with the VLA, combined with observations in different bands from the NOEMA interferometer and the Gran Telescopio Canarias, has allowed us to reconstruct a comprehensive picture of the host galaxy and confirm the presence of a compact radio source— the FRB plasma bubble—within a star-forming region."

The NSF VLA's advanced capabilities were crucial in distinguishing the weak, compact emission from the surrounding diffuse emission, providing insights that previous studies could not achieve.

About NRAO

The National Radio Astronomy Observatory (NRAO) is a facility of the U.S. National Science Foundation, operated under cooperative agreement by Associated Universities, Inc.

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Artist's illustration of a magnetar, surrounded by the plasma bubble responsible for the persistent emission... Read More

Credit: S. Dagnello, NSF/AUI/NRAO

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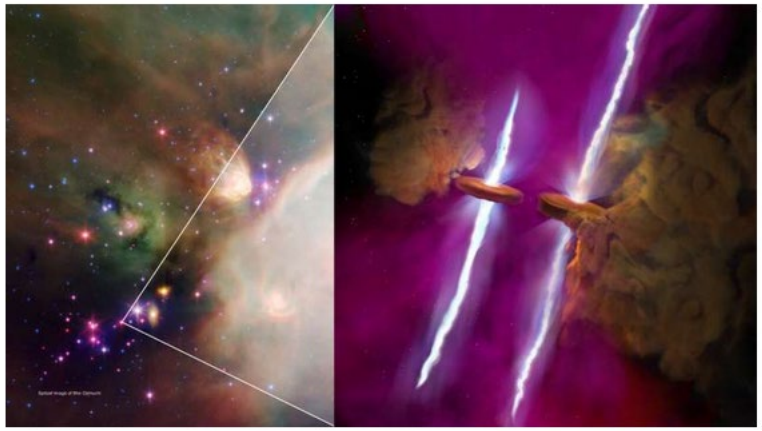
JUNE 12, 2024

Editors' notes

Astronomers discover parallel disks and jets erupting from a pair of young stars

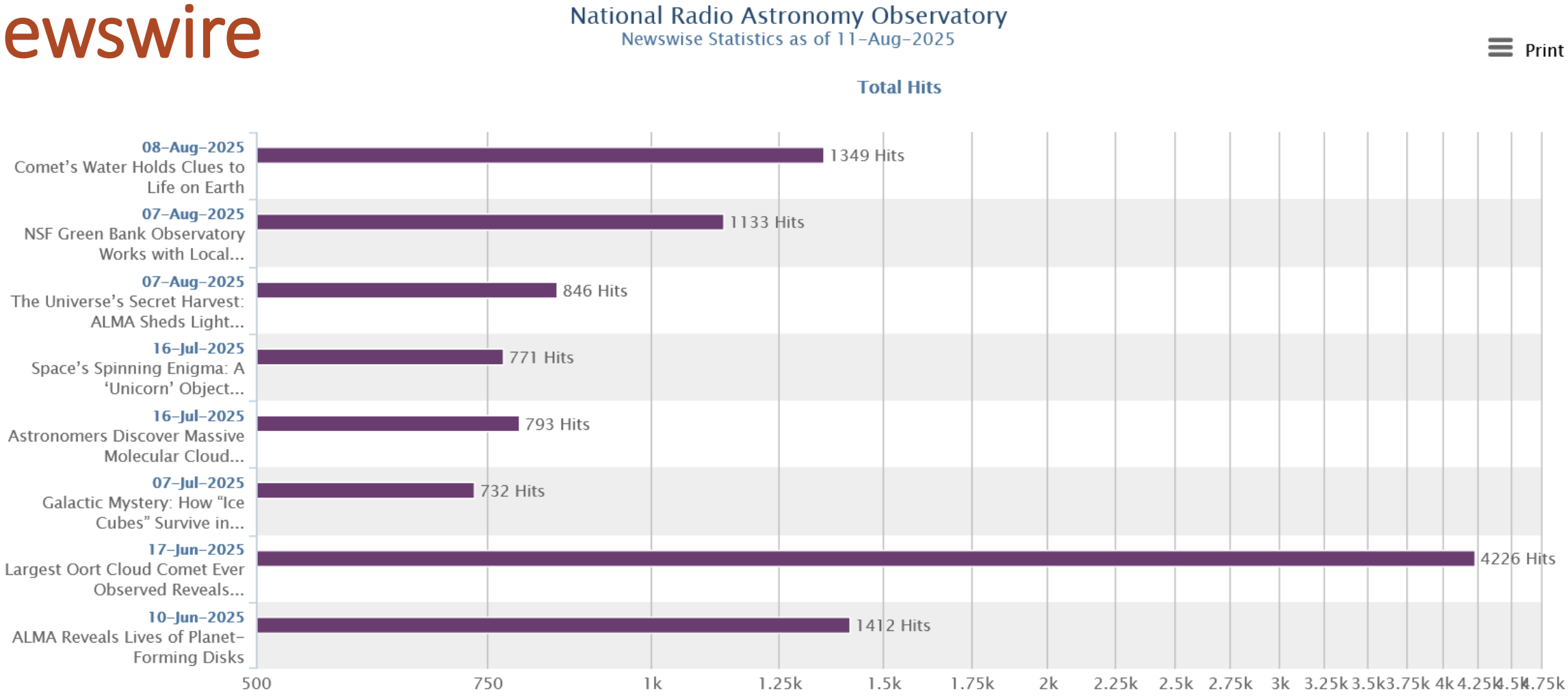
by National Radio Astronomy Observatory



At left, a mid-infrared image of the rho Ophiuchi molecular cloud complex by NASA's Spitzer Space Te…

Most of the universe is invisible to the human eye. The building blocks of stars are only revealed in wavelengths that are outside of the visible spectrum. Astronomers recently used two very different, and very powerful, telescopes to discover twin disks—and twin parallel jets—erupting from young stars in a multiple star system.

Newswire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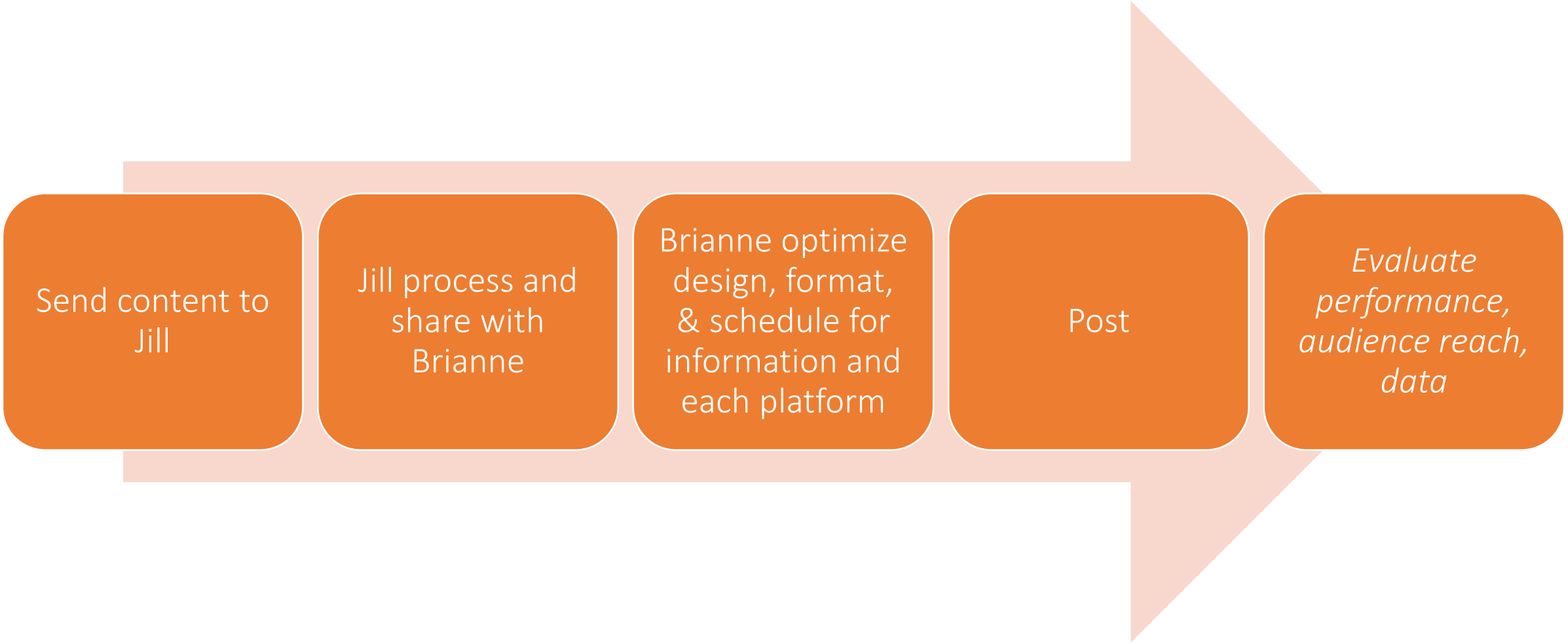

Press/Media Relations

- Broadcast news, documentaries, content creators
- Interviews, fact checking, image use
- Manage interviews, site visits/shoots
  - Identify staff members (training)
  - Security screening, scheduling
    - Operations, observing, safety
  - Escorting shoots
    - logistics, transportation

Communications Training

- As needed by project, or staff request
  - Interviews
  - Press Conferences
  - Presentations for

Resources

- NRAO & GBO brands
- Logo
- Templates
- Photos, illustrations, videos

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Media Resources

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THE GREEN BANK OBSERVATORY BRAND AND LOGO

Home » Media » Brand and Logo

The brand of the Green Bank Observatory what sets us apart in the world of radio astronomy – it is what is presented to scientists, advocates, partners, and radio astronomy enthusiasts around the world. It is more than just the logo used to represent the Observatory, it is a recognition of history, education, and excellence in scientific research and discovery. Whenever the Green Bank Observatory name appears in public, the brand is at work, therefore it is critical that the brand is protected.

Logo

A cornerstone of the Green Bank Observatory brand visual identity is our logo. The logo can be used by employees of the Observatory in documentation, marketing, and materials that support the mission and vision of the Observatory.

The logo can be used as a link to the Observatory website or acknowledge Observatory assistance or affiliation.

A logo is a flag for a brand

Paul Rand

How to use the logo

No explicit permission is necessary to use the Green Bank Observatory logo. A good use is to provide a link back to our website from an affiliate site. The Observatory logo cannot be used in a manner that falsely implies employment by or affiliation with Green Bank Observatory. The Observatory logo cannot be used to imply or endorse a product or service.

Logo Versions and Use

Standard Logo Versions

GREEN BANK OBSERVATORY
Black horizontal

GREEN BANK OBSERVATORY
White Horizontal

GREEN BANK OBSERVATORY
Horizontal logo

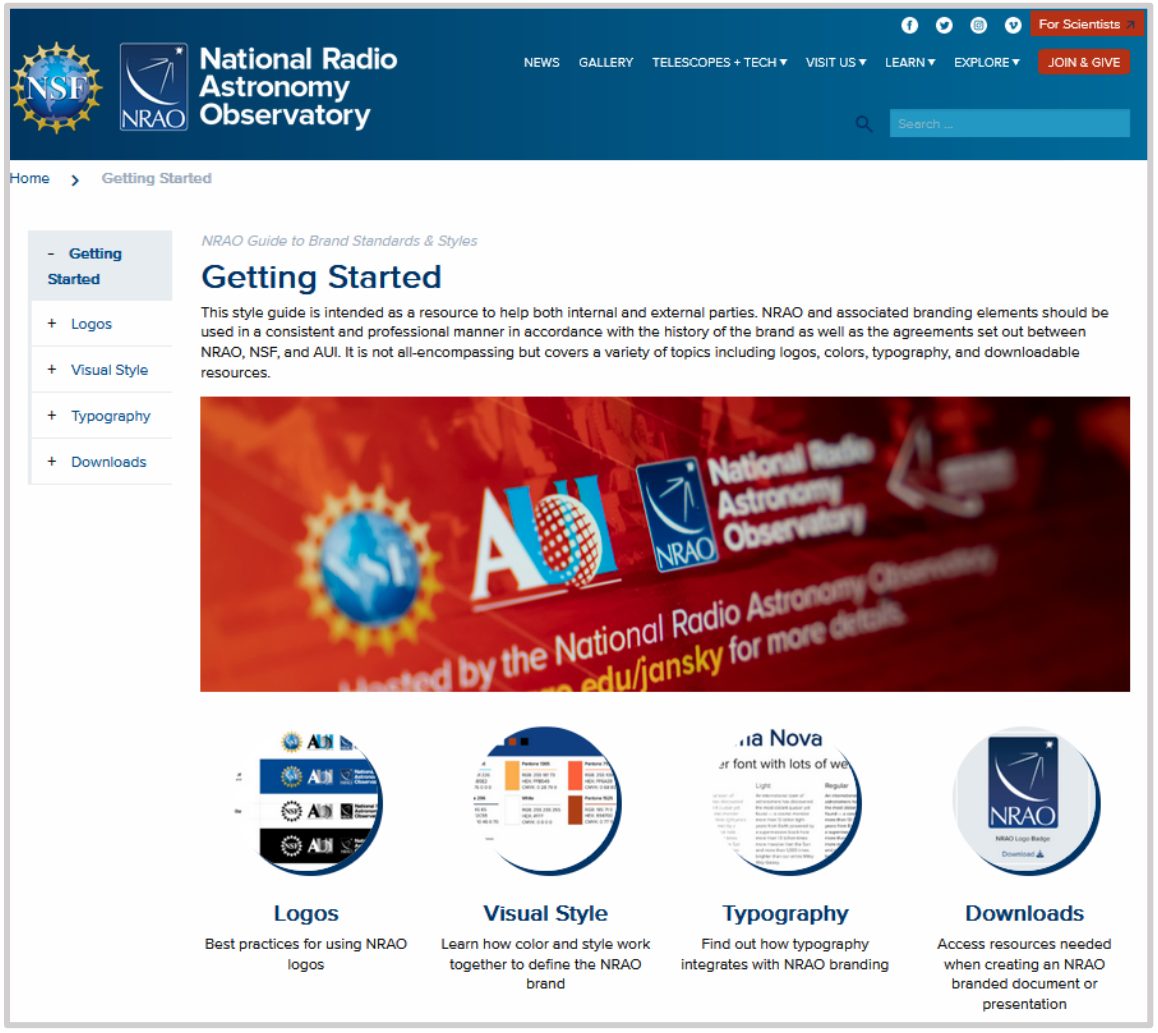
GREEN BANK OBSERVATORY
Vertical black logo

GREEN BANK OBSERVATORY
Vertical logo – reversed

GREEN BANK OBSERVATORY
Vertical gradient logo

Scalable Vector Graphics (SVG) is a text-based graphics language that describes images with vector shapes, text, and embedded raster graphics, this makes them ideal for print or for web use; Portable Network Graphic (PNG) or Joint Photographic Experts Group (JPEG) are for web or presentations. All SVG and PNG files have transparent backgrounds, unlike JPEG which have a solid white background. All Standard logos include the icon and logotype incorporated together. For all logos below, you may right-click to download and save the file formats.

Be sure to follow the Green Bank Observatory Brand Guidelines for all logos and logo use.



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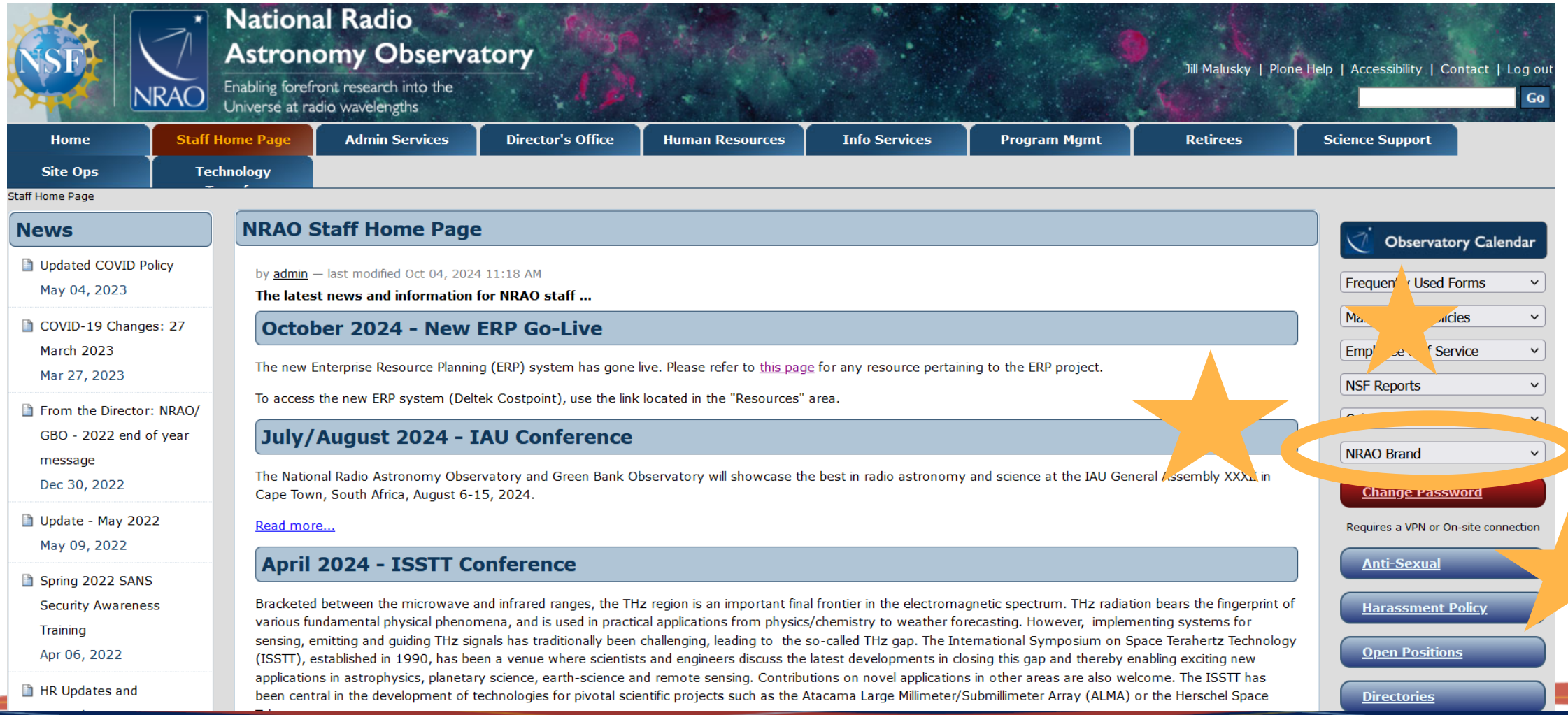
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October 2024 - New ERP Go-Live
The new Enterprise Resource Planning (ERP) system has gone live. Please refer to this page for any resource pertaining to the ERP project.
To access the new ERP system (Deltek Costpoint), use the link located in the "Resources" area.
July/August 2024 - IAU Conference
The National Radio Astronomy Observatory and Green Bank Observatory will showcase the best in radio astronomy and science at the IAU General Assembly XXXII in Cape Town, South Africa, August 6-15, 2024.
Read more...
April 2024 - ISSTT Conference
Bracketed between the microwave and infrared ranges, the THz region is an important final frontier in the electromagnetic spectrum. THz radiation bears the fingerprint of various fundamental physical phenomena, and is used in practical applications from physics/chemistry to weather forecasting. However, implementing systems for sensing, emitting and guiding THz signals has traditionally been challenging, leading to the so-called THz gap. The International Symposium on Space Terahertz Technology (ISSTT), established in 1990, has been a venue where scientists and engineers discuss the latest developments in closing this gap and thereby enabling exciting new applications in astrophysics, planetary science, earth-science and remote sensing. Contributions on novel applications in other areas are also welcome. The ISSTT has been central in the development of technologies for pivotal scientific projects such as the Atacama Large Millimeter/Submillimeter Array (ALMA) or the Herschel Space
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