

# FIG SAG Terms of Reference

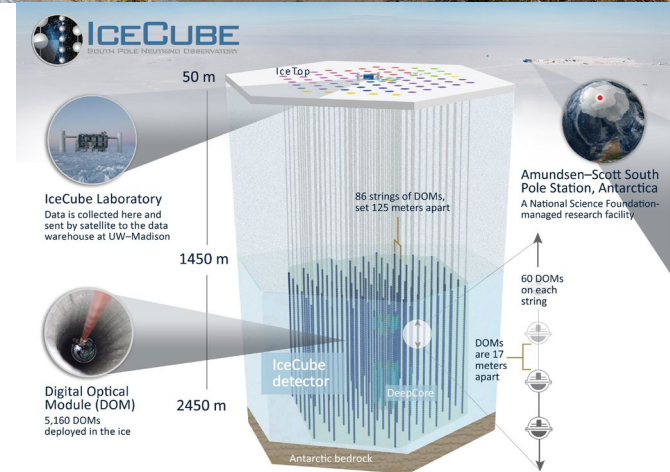
## Future Innovations in Gamma rays

- 1. Gamma-ray Science Priorities:** Identify opportunities uniquely afforded by gamma-ray observations.
- 2. Gamma-ray Mission Capabilities:** Which science objectives are only done or best done by space-based gamma-ray missions, considering the current missions in extended operation and funded missions in development.
- 3. Technology Investment:** What new technologies/methodologies exist and what is needed to achieve the science priorities.
- 4. Theory and Analysis Needs:** What advances do we need to make in theory and analysis to achieve the science priorities.
- 5. Synergies with Other Programs:** How do these goals tie to the broader astrophysics and physics community. What are the timelines to align with current priorities in multi-messenger astronomy.

# Synergies

Gamma-rays span a wide wavelength range and this means they span a wide range of physics. We want to think broadly to tie to a wide set of physics.

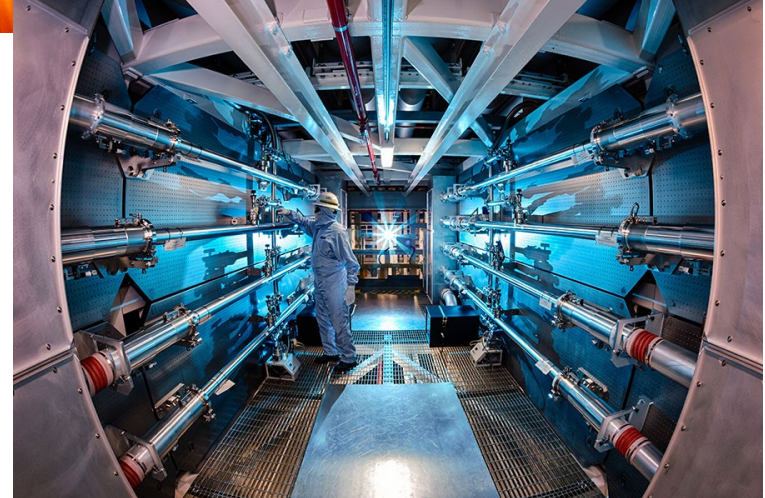
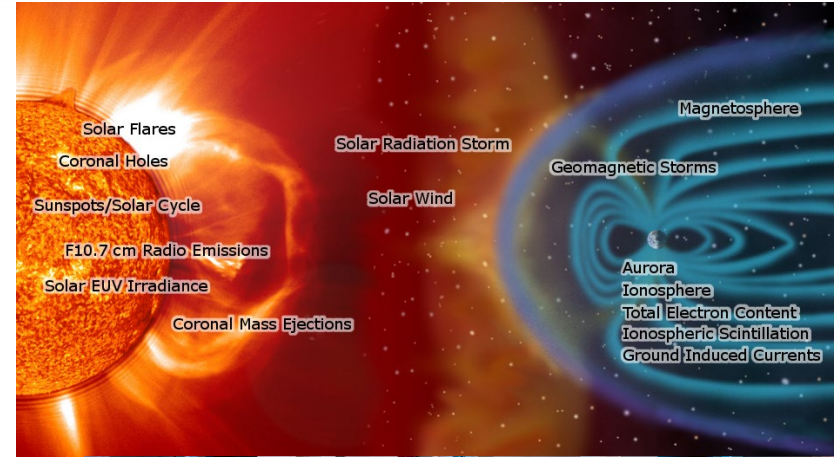
- **High Energy Physics (Snowmass report for P5, DOE OoS-HEP, NSF PHY-Particle P & PA):** Extremely high-energy gamma-rays are closely tied to cosmic ray and high energy neutrino detection (both in the production and destruction of these high energy particles).
- **Plasma Physics (MIPSE, DOE OoS-FES, DOE NNSA, NA-10, NSF PHY-Plasma P):** Although plasma physics is key in HEP, a broad set of plasma conditions are also important for MeV gamma-rays. This ties to heliophysics, space weather, fusion physics.
- **Nuclear Physics (NSAC-LRP, DOE NP, NSF NP):** Gamma-rays in the MeV range probe nucleosynthesis and provide the most direct ties to the engines of astrophysical transients and nuclear physics studies.



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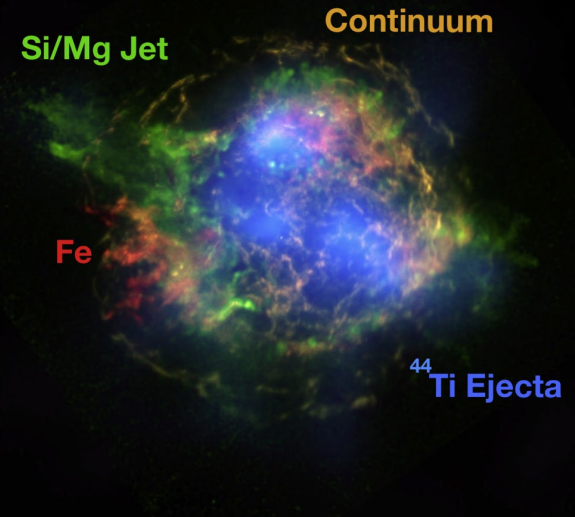
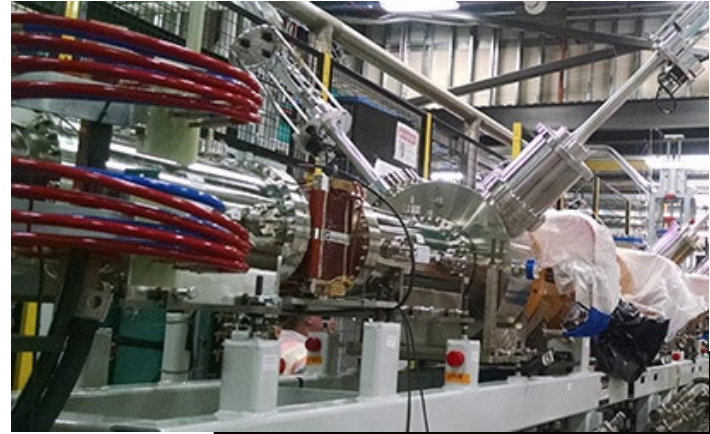
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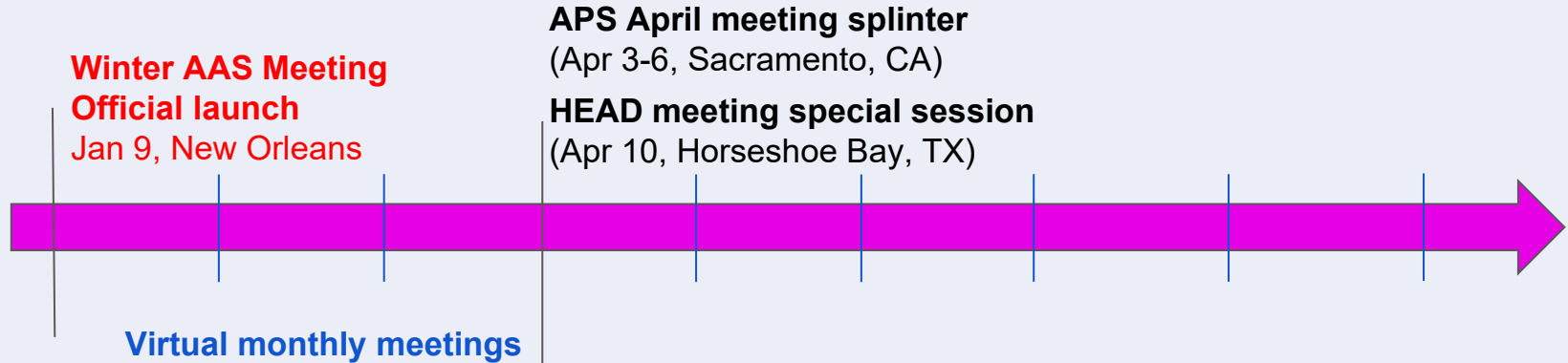
# FIG SAG Timeline

Future Innovations in Gamma rays



Chairs: Chris Fryer & Michelle Hui, Paolo Coppi, Milena Crnogorčević, Tiffany Lewis, Marcos Santander, and Zorawar Wadiasingh

Upcoming events in 2024:



Inputs wanted from gamma-ray, high-energy, and multimessenger communities.

Please fill out the [contact form](#) for future announcements and discussion forum.

Watch this space: <https://pcos.gsfc.nasa.gov/sags/figsag.php>