TDAMM SIG

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Astrophysics Advisory Committee (APAC)

- **APAC Members**
- Kelly Holley-Bockelmann; Chair – Vanderbilt University
- Daniela Calzetti – University of Massachusetts, Amherst
- Regina Caputo – Goddard Space Flight Center
- Hsiao-Wen Chen – University of Chicago
- Jessica Gaskin – Marshall Space Flight Center
- Erika Hamden – University of Arizona
- Ryan Hickox – Dartmouth College
- Shirley Ho – Flatiron Institute
- Shardha Jogee – University of Texas, Austin
- Alina Kiessling – Jet Propulsion Laboratory
- Mark Mozena – Planet Labs Inc.
- Ilaria Pascucci – University of Arizona
- Grant Tremblay – Harvard-Smithsonian Center for Astrophysics

Upcoming Meetings

•Spring Meeting: March 29, 10:00 a.m. – 5:00 p.m. EST, March 30, 9:00 a.m. – 4:00 p.m. EST (virtual)
•Summer Meeting: June 27 – 28, 2023

https://science.nasa.gov/researchers/nac/science-advisory-committees/apac

Program Analysis Groups (PAG)

- Cosmic Origins Program Analysis Group (COPAG)

  "How did we get here?" This program comprises projects that enable the study of how stars and galaxies came into being, how they evolve, and ultimately how they end their lives. The Hubble Space Telescope, Spitzer Space Telescope, and the Stratospheric Observatory For Infrared Astronomy (SOFIA) all address central questions of the Cosmic Origins Program. NASA's next flagship observatory, the James Webb Space Telescope (JWST) is the major new component of this program.*

- Exoplanets Program Analysis Group (ExoPAG)

  ExoPAG is responsible for soliciting and coordinating community input into the development and execution of NASA's Exoplanet Exploration Program (ExEP). The ExoPAG serves as a community-based, interdisciplinary forum for analysis in support of activity prioritization and for future exploration. It provides findings of analyses to NASA through the NASA advisory Council within which the ExoPAG Chair is a member of the Astrophysics Subcommittee.

- Physics of the Cosmos Program Analysis Group (PhysPAG)

  PhysPAG serves as a forum for soliciting and coordinating input and analysis from the scientific community in support of the Physics of the Cosmos program objectives. The PhysPAG enables direct and regular communication through public meetings that give the community opportunities to provide its scientific and programmatic input.

https://science.nasa.gov/researchers/nac/science-advisory-committees/apac/analysis-groups

PhysPAG – Science Interest Groups (SIGs)

- **Inflation Probe (IP SIG)** (Chair: Roger O'Brient): Coordinate community activities and preparations for a future cosmic microwave background polarization mission.
- **Gravitational Wave (GW SIG)** (Chairs: Chiara Mingarelli and Alessandra Corsi): Coordinate community activities and preparations for a future gravitational wave mission.
- **X-ray (XR SIG)** (Chairs: Grant Tremblay, David Pooley, Kristin Madsen, and Chien-Ting Chen): Coordinate community activities and preparations for a future X-ray astronomy mission.
- **Gamma Ray (GR SIG or GammaSIG)** (Chairs: Justin Finke, Eric Burns, and Manel Errando): Coordinate community activities and preparations for a future gamma ray astronomy mission.
- **Cosmic Ray (CR SIG)** (Chairs: Andrew Romero-Wolf and Athina Meli): Coordinate community activities and preparations for a future cosmic ray astronomy mission.
- **Cosmic Structure (CoS SIG)** (Chairs: Vera Gluscevic and Rebekah Hounsell): Coordinate community activities for future space activities concerning the nature of dark energy, dark matter, neutrinos, and tests of inflation, as well as astrophysical galaxy evolution.
- **TDAMM SIG* (Chairs: TBD; potentially cross-PAG)**

https://pcos.gsfc.nasa.gov/physpag/cphyspag-sigs.php

What's the point of a SIG?

- Organize a community with interests of relevance to NASA
- Foster communication between NASA and a given community
  - Input from community to NASA through APAC
  - Engaged and focused community group for NASA to communicate with
- Creation of Science Analysis Groups
- Input on technology gaps

PhysPAG – Science Analysis Groups (SAGs)

- **Astrophysics With Equity: Surmounting Obstacles to Membership (AWESOM)** (Cross-PAG). Contact: Ryan Hickox (ryan.c.hickox@dartmouth.edu).
- **New Great Observatories** (Cross-PAG) Contacts: the PhysPAG, COPAG, and ExoPAG Chairs (Grant Tremblay: grant.tremblay@cfa.harvard.edu; Janice Lee: janice.lee@noirlab.edu; Ilaria Pascucci: pascucci@arizona.edu, respectively).
- **Gamma-ray Transient Network (GTN)** Contacts: Eric Burns (Chair, erickayserburns@gmail.com) or Michael Coughlin (co-Chair, cough052@umn.edu).
- **TDAMM Communications SAG (Comms)** Contacts: Jamie Kennea (jak51@psu.edu), Judith Racusin (judith.racusin@nasa.gov)
  - To be proposed at next APAC meeting

https://pcos.gsfc.nasa.gov/physpag/physpag-sigs.php

GTN SAG

- Chaired by Eric Burns, Michael Coughlin
- Basically: “can we improve the way the active high energy monitors work together?”
  - Automation of associating triggers
  - Combined and automated localizations
  - Coherent sub-threshold triggers
  - Event-based archives
- What are the needs of the related communities?

https://pcos.gsfc.nasa.gov/sags/gtn-sag.php

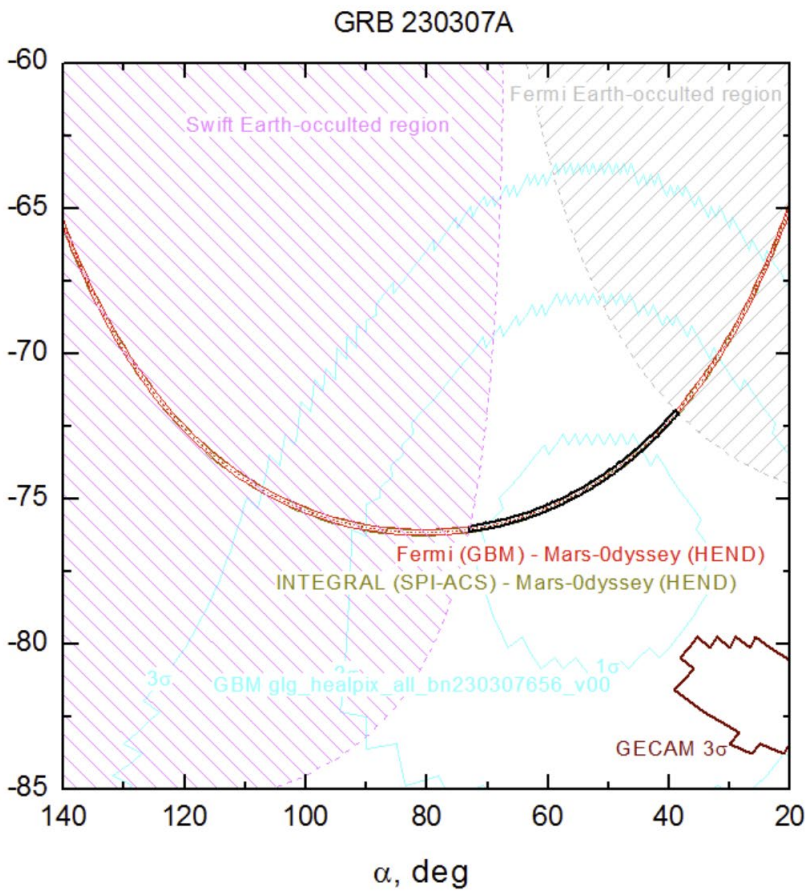
GTN SAG

Example of the need:

- GRB 230307A is the second brightest prompt gamma-ray burst in 50 years of observing
- Afterglow is quite faint
- Localized by the InterPlanetary Network, though reporting was delayed to due
  - Need for manual analysis
  - Timing issues in real-time Mars Odyssey data

The initial IPN triangulation map (GCN 33413)

IPN HEALPix triangulation map



Comms SAG

- Chaired by Jamie Kennea, Judith Racusin
- TDAMM is the only driver for several of NASA's future space-based communication needs (across all science divisions, not only Astro)
- The lack of a replacement plan for TDRSS is already causing problems for COSI and planning for future missions at all stages of development
- What are the actual needs for space-based communications, at various orbits? What are the science requirements that drive these needs?
  - Dowlink and uplink latency, downlink and uplink bandwidth, etc

NASA's Response to the Decadal TDAMM recommendations – my own view

Super short summary of Decadal comments to NASA on TDAMM

- $500-800M on a TDAMM ecosystem (top sustaining priority)
  - Replacement high energy monitor Fermi and Swift (for <1/3 the cost…)
- Standing Committee to advise NASA on how to best implement such a TDAMM program
- Investments in archives and software
- Increased investment in theory and simulation

NASA's Response to the Decadal TDAMM recommendations – my own view

- **Not great** – being 15% through the Decade
  - No standing committee means TDAMM missions are not judged in full context, no PAG, no theory increase or focus, 1/3rd of what Europe is spending on coordination, available funding allocated to Probe (which is explicitly a lower Decadal priority), no planned competed TDAMM call, minimal movement on archives, minimal allocation of suggested funding amount
  - Delay of COSI and suggestion to weaken comms requirements
    - **Now major gap of gamma-ray spectrometer with INTEGRAL shut down in 2024, COSI launch in 2027**
  - Only HQ representative at community-organized TDAMM session at AAS from NSF
  - No engagement with APS
  - And we are ceding a unique form of soft power to others, including non-aligned countries
- Response hampered by lack of organized engagement with TDAMM community(?)
- Ways to fix it (within the system)?
  - APAC, AAAC, CAA
  - **TDAMM SIG?**
  - **SAGs?**

Non-APAC Advisory Committees

AAAC
- Dr. Wenda Cao
- Dr. Kyle Dawson (Chair)
- Dr. Sarah Hörst
- Dr. Alexie Leauthaud
- Dr. Nikole Lewis
- Dr. Britt Lundgren
- Dr. Raffaella Margutti
- Dr. Michael McCarthy (Deputy Chair)
- Dr. Willie Rockward
- Dr. Abigail Vieregg
- Dr. Ann Zabludoff

CAA
- Christopher F. McKee (Chair)
- Alycia J. Weinberger (Co-Chair)
- William N. Brandt
- Ian J. Crossfield
- Gabriela Gonzalez
- Alyssa Goodman
- Shaul Hanany
- Elizabeth Hays
- Robert C. Kennicutt, Jr.
- Jeffrey R. Kuhn
- Elisa V. Quintana
- Scott M. Ransom
- Brant Robertson
- Kate Scholberg
- Joseph Silk
- Grant H. Stokes

Discussions today

- **Your thoughts**

- Early areas of emphasis for the TDAMM SIG
- Other ideas for focused SAGs
- Other problems of relevance to the TDAMM community
  - Lack of cohesion among NASA astrophysics press groups
  - No general software development call