



**Cosmic Origins Program Analysis Group (COPAG)
Report to Astrophysics Advisory Committee (APAC)
March 15, 16 & 17**

**Dr. Margaret Meixner
Chair, Cosmic Origins Program
Executive Committee**



Thank You for your COPAG EC service!

<i>Misty Bentz</i>	<i>2020</i>	<i>Georgia State University</i>
<i>Tom Megeath</i>	<i>2020</i>	<i>University of Toledo</i>
<i>Claudia Scarlata</i>	<i>2020</i>	<i>University of Minnesota</i>
<i>Jason Tumlinson</i>	<i>2020</i>	<i>STScI/JHU</i>
<i>Sarah Tuttle</i>	<i>2020</i>	<i>University of Washington</i>



COPAG Executive Committee

<i>Margaret Meixner (Chair)</i>	<i>2021</i>	<i>SOFIA Science Mission Operations/USRA</i>
<i>Janice Lee (Chair-elect)</i>	<i>2024</i>	<i>Gemini/AURA</i>
<i>Christine Chen</i>	<i>2024</i>	<i>Space Telescope Science Institute</i>
<i>Chris Depree</i>	<i>2024</i>	<i>Agnes Scott College</i>
<i>Steve Finkelstein</i>	<i>2021</i>	<i>University of Texas, Austin</i>
<i>Lisbeth Gavilan-Marin</i>	<i>2024</i>	<i>NASA/Ames</i>
<i>Christopher Hayward</i>	<i>2024</i>	<i>Flatiron Institute</i>
<i>Alina Kiessling</i>	<i>2023</i>	<i>Jet Propulsion Laboratory, Caltech</i>
<i>Stephan McCandliss</i>	<i>2021</i>	<i>Johns Hopkins University</i>
<i>Alexandra Pope</i>	<i>2021</i>	<i>University of Massachusetts</i>
<i>Sabrina Stierwalt</i>	<i>2024</i>	<i>Occidental College</i>

COPAG EC has a rolling application form. We are actively looking for new members so please apply or encourage your colleagues to apply.

[https://cor.gsfc.nasa.gov/news/Call for Nominations to COPAG EC.php](https://cor.gsfc.nasa.gov/news/Call_for_Nominations_to_COPAG_EC.php)



Join the Cosmic Origins (COR) Analysis Group (COPAG) Executive Committee (EC) or a lead a Science Interest Group !

WHY?

- The EC provides analysis of community input for the purposes of informing NASA of community feedback on its programs.
- These analyses can have an impact: e.g. ADAP offerings, the Great Observatories report.
- Coming soon: Decadal Survey results, analysis of those results will be interesting, impactful and fun to discuss.
- New Science Interest Groups (SIGs): Cosmology, Galaxies, ISM and planet formation, Stars and stellar populations, State of the Profession and Societal Impacts

WHAT?

- The EC is a diverse and inclusive body and the diversity of thought from their different backgrounds is critical to the discussions and analysis.
- EC members span the breadth of COR science and the astrophysics community.
- We aim for ~12-16 members at any given time
- The committee reports to NASA HQ Astrophysics Division

HOW?

- COPAG EC has a rolling deadline for nominations and self-nominations:
- https://cor.gsfc.nasa.gov/news/Call_for_Nominations_to_COPAG_EC.php

COPAG Activities at AAS

Growth of participation in American Astronomical Society (AAS) splinter sessions

Group	FY20	FY21	Δ€	Notes
Joint PAG	160	157	- 2%	Combined with PCOS & Exoplanet Exploration Program (ExEP); held outside AAS
Enhancing participation	-	84	NEW!	Combined with PCOS & ExEP; held outside AAS; new this year
COPAG	10	55	+450%	
UV SIG/TIG	30	36	+ 20%	
IR SIG	40	65	+ 63%	
Low frequency radio	-	39	NEW!	New this year



UV/Vis SIG/TIG Splinter Session at AAS237

https://cor.gsfc.nasa.gov/copag/AAS_Jan2021/AAS2021-agenda.php#uvvis

- Highlights
 - Introduction by Tumlinson emphasizing need to track technical readiness for mission critical technologies in post decadal era
 - Four talks on science missions:
 - Time Domain; Diffuse OVI; Exoplanet UV Environment; Spectroscopic Survey of Galaxies at “Cosmic High Noon”
 - Platforms ranged from CubeSats to Probes
 - Three talks on far-UV mirror coating developments broad and narrow band
 - Three talks on ultra-stable high contrast imaging technologies
 - Two talks on multiplex spectroscopic techniques
 - MCP detector talk by
 - AAS 2020 Weber Prize winner Dr. Oswald Siegmund -- UCB/SSL
- Consensus on regular (monthly) UV/VIS SIG/TIG talks; pitch for QUEST
 - Quorum for Ultraviolet Exploration of Science and Technology
 - Community forum for science updates /sharing “what works, what doesn’t”
 - Develop prioritization metrics for the UV/Vis components of Cosmic Origins Science guided by decadal debrief



Infrared Science Interest Group – Activity Highlights

Meredith MacGregor & Michael Zemcov (co-chairs)

- **Continuing to develop the new website and grow our mail list (> 450 subscribers)**
 - <https://cor.gsfc.nasa.gov/sigs/irsig.php>
 - Working with new COR Chief Scientist Peter Kurczynski.
 - Continuing to reach out to early career IR scientists.
- **New IRSIG newsletter published (Jan 2021)**
- **Continuing the webinar series**
 - Cadence of ~1 talk/month.
 - Typical attendance of 30 scientists from around the world.
- **Ran Splinter Session at 237th American Astronomical Society Meeting (~60 attendees)**
 - Made use of Zoom and gather.town to enable discussion between participants.
 - Compiled notes from discussion and plan to draft a summary paper to distribute.
- **Organizing virtual workshop “The Impacts of Astro2020 on IR Astrophysics” July 20-22, 2021**
 - Opportunity for the community to synthesize the priorities from the Astro2020 review.
 - Provide a forum for discussion of the future of the field in the next decade and beyond.

Long Wavelength Radio Astronomy

- Organized by Judd Bowman, Greg Taylor, Jack Burns, Gregg Hallinan, Jonathan Pober
- Attended by over ~40 members
- Missions/mission concepts discussed
 - DAPPER (Dark Ages Polarization Pathfinder) is a concept that will make spectral observations from the lunar farside of the Dark Ages & Cosmic Dawn using the highly redshifted 21-cm signal.
 - FAR SIDE (Farside Array for Radio Science Investigations of the Dark ages and Exoplanets)
 - Radiowave Observations at the Lunar Surface of the photoElectron Sheath (ROLSES, 2021) and Lunar Surface Electromagnetics Experiment (LuSEE, 2024) (2 radio frequency spectrometers going to the lunar surface)
 - Sun Radio Interferometer Space Experiment (**SunRISE**), designed for observing Solar Radio Bursts, can see the entire Low Frequency Sky over 12 month mission. Data Processing mirrors that of a larger array that could detect Extrasolar Planetary Emission or 21 cm signal (2023)



SAG11: Cosmic Dawn

This SAG11 was challenged by the COVID-19 pandemic.

Plan is to dissolve this SAG and roll the topic and work into the new Galaxies Science Interest Group (SIG) that will ingest the Decadal Survey.



COPAG – splinter: 2021 plans

Ingesting the Astro2020 Decadal survey

12 -12:15 pm: Ingesting the Decadal Survey Results: The role of the COPAG

- NASA HQ: Kartik Sheth
- COR Program Office/NASA Goddard: Peter Kurczynski
- COPAG Executive Committee: Margaret Meixner (USRA/SOFIA)

12:15-1 pm: New Science Interest Groups (SIGs) and Science Analysis Groups (SAGs) – chaired by Meixner

- Laura Lopez (OSU), ISM and planet formation
- Keith Hawkins (UT Austin), Stars, Sun and Stellar Populations
- Kartik Sheth (NASA HQ), State of the Profession & Societal Impacts
- Steven Finkelstein (UT Austin) Cosmic Dawn, Galaxies
- Jason Tumlinson (STScI/JHU) The Next Great Observatories
- DISCUSSION

1-1:30 pm: Panel Discussion: What have I done and liked about serving on the COPAG Executive Committee (EC)?

- Janice Lee, IPAC/CalTech
- Stephan McCandliss, Johns Hopkins University
- Alex Pope, University of Massachusetts, Amherst
- Tom Megeath, University of Toledo
- DISCUSSION

NASA HQ

Cosmic Origins Program

Management for NASA HQ the Strategic Astrophysics Technology (SAT) (Thai Pham + team)

Manages for NASA HQ the COPAG, SIGs, STIGs, S/TAGs + Community Engagement (Peter Kurczynski + team)

COPAG Executive Committee

Science Interest Groups (SIGs) **mirror** Decadal Panels

Science/Technology Interest Groups (STIGs) **mirror** HQ APRA bins

Cosmology

Galaxies

ISM & Planet formation

Stars, Sun and Stellar Pops

State of the Profession

Infrared / Radio

Ultraviolet / Optical

High Energy / Particles

Science/Technology Analysis Groups (S/TAGs) are **short term** groups that are spun off when a specific analysis and a coherent effort is needed.

The 5 SIGs **mirror** the 5 Decadal Prioritization Panels.
The 3 STIGs **mirror** the 3 APRA+SAT funding portfolios.

The SIGs that will analyze the Decadal & science panel reports to identify science gaps in achieving the Decadal recommendations.

They will closely work with the STIGs who will identify the technology gaps that **follow from** the science gaps in achieving the Decadal recommendations.

The Astrophysics Community

Kartik Sheth, Eric Tollestrup

Barb Grofic, Robin Krause

Thai Pham
Opher Ganel

Peter Kurczynski
Sangeeta Malhotra

Margaret Meixner, Janice Lee
Sabrina Stierwalt, Christine Chen, Chris Depree,
Chris Hayward, Stephen McCandliss, Alina Kiessling,
Steve Finkelstein, Alex Pope, Lisseth Gavilan-Marin

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mirror Decadal Panels

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Cosmology

Galaxies

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Stars, Sun and Stellar Pops

State of the Profession

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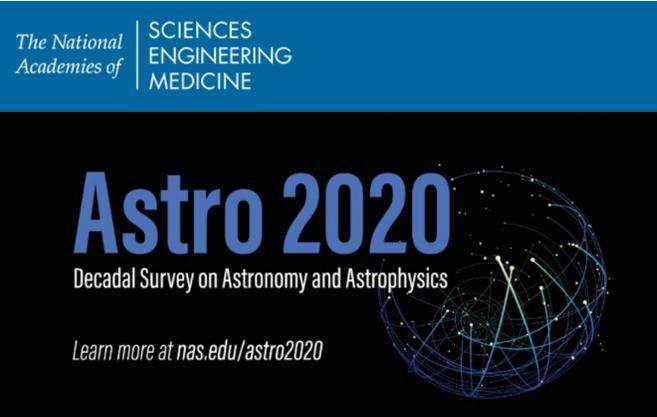
High Energy / Particles

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The Astrophysics Community

2021: Ingest of Astro 2020 Decadal Survey Results



Further analysis by COPAG may be important to the ingest

COPAG is creating 5 new Science Interest Groups that parallel the Decadal Panels:

- Cosmology
- Galaxies
- ISM and planet formation
- Stars, Sun and Stellar Populations
- State of the Profession and Societal Impacts (cross-cutting SIG)

Interested in leading or joining one of these SIGs or STIGs?

Fill out this form: <https://forms.gle/X1qUccRjk9Jy94iN6> or please contact any of us directly.