National Aeronautics and Space Administration

Cosmic Origins Program Analysis Group (COPAG) Report to Astrophysics Advisory Committee (APAC) March 20, 2024

Dr. Shouleh Nikzad
Chair, COPAG Executive Committee
COPAG UVSTIG Leadership Member
On behalf of COPAG EC

COPAG EC Overview
- Summary of Highlights

Charge and Organization
- Membership & Staffing; SIG/STIG Structure

Activities
- Community Engagement and Cross PAG activities ongoing and in planning:
  - AAS splinters, Cross PAGs, Join PAGs Chair meeting
  - Planning Town Hall with community
  - Science Gap and precursor Activities

SIG and STIG Activities
- UV Working Group Objective and Activities Update
- UV Workshop Planning
- Update on Strategic Plan development for the next two years and beyond

Updates on COPAG EC and SIGs/STIGs makeup

Two members rotated off, two new members joined and initiated
Leadership Councils formed for SIGs and STIGs

AAS

COPAG splinter well attended by engaged participants
Three SIGs (Galaxies, Stars, and DGCE) held an excellent joint splinter during the COPAG splinter
Joint PAG splinter reformatted by working across PAGs. Excellent feedback received from community.
IRSTIG and UVSTIG (joined forces with “Mind the Gap” splinter) held very successful splinters
Cross PAG SIGs TDAMM, AWESOME, well underway. TDAMM co chairs from each PAG provide reports to their PAG-EC
Astronomy on Tap (Rachael Beaton); Hyperwall talks (Sabrina Stierwalt, Rachael Beaton)

UV WG Report

White paper on last stages of editing
- will be shared with HQ
- will be put on the arXive astroph

UV Workshop

May 7-9, JPL’s von Karman Auditorium
SOC formed and have been meeting to finalize the structure of the workshop, invite speakers
Advertisement through COR News, UVSTIG email blast, HWO-START email blast….

SIGs and STIGs Activities

SIGs and STIGs leads have been meeting with COR CS, DCS and are at various stages of plans for the year

Cosmic Pathfinder is Active

COPAG Strategic Plan Implementation

Progress being made on objectives including work with program office, better engagement with the community, SIGs plannir

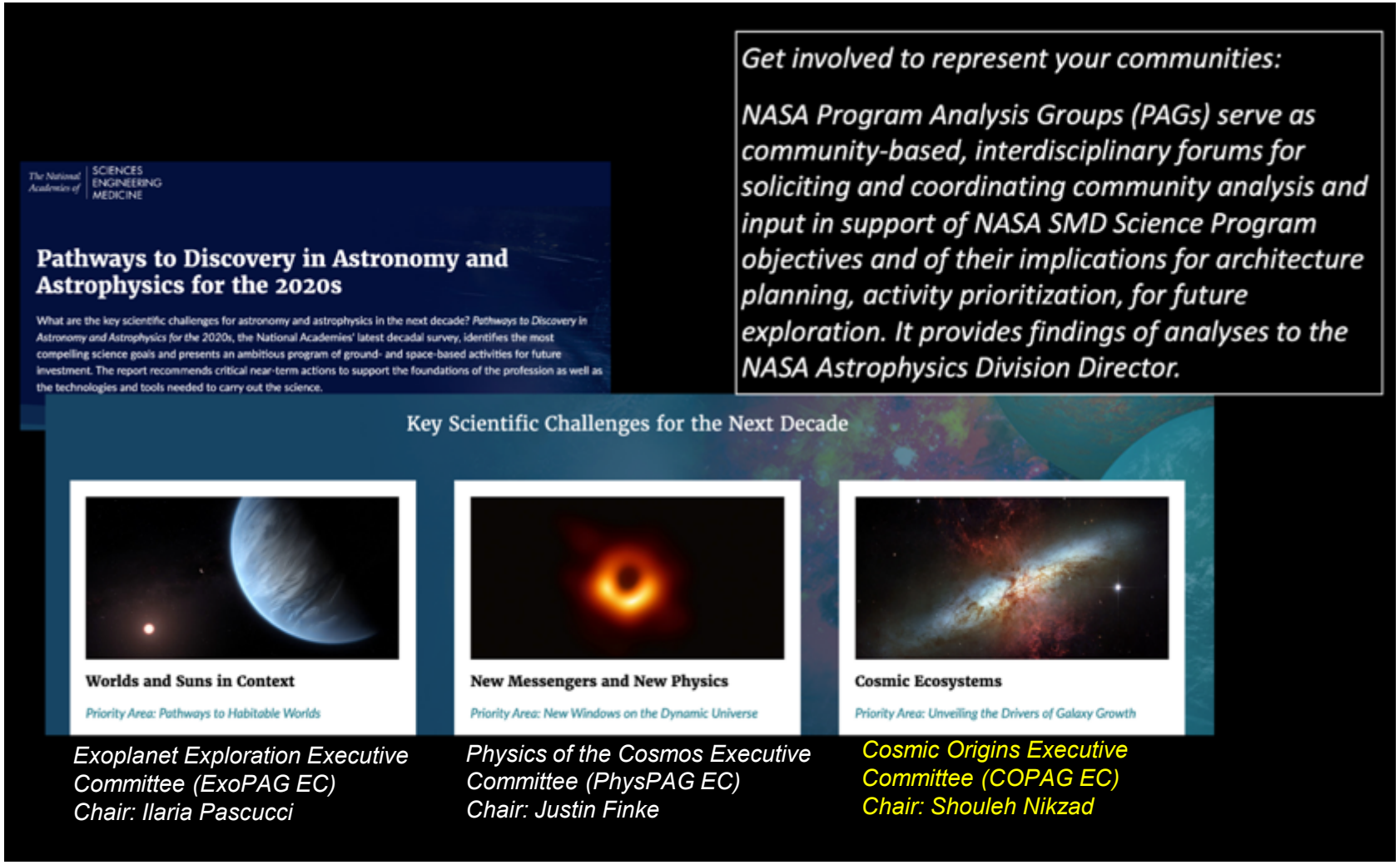
COSMIC ORIGINS EXECUTIVE COMMITTEE: Review of charge and organization

COPAG EC lead analysis and coordinate PAG activities; members should span breadth of COR science, technology

Program Support Manager: Stephanie Clark

COR Chief Scientist: Peter Kurczynski
COR Deputy CS: Swara Ravindranath

Program Scientist: Patricia Knezek



COPAG EXECUTIVE COMMITTEE: Gratitude to Members who Rotated off

Member	Term	Institution
Shouleh Nikzad, Chair	April 2022-October 2024	Jet Propulsion Laboratory
Stephan McCandliss	November 2018-October 2024	Johns Hopkins University
Christine Chen	November 2020-January 2024	Space Telescope Science Institute
Chris Hayward	November 2020-January 2024	Flatiron Institute
Sabrina Stierwalt, Vice Chair	November 2020-January 2024	Occidental College
Hsiao-Wen Chen	April 2022-October 2024	University of Chicago
Enrique Lopez Rodiguez	April 2022-October 2024	Stanford University
Rachael Beaton	January 2023-October 2025	Space Telescope Science Institute
Sanchayeeta Borthakur	January 2023-October 2025	Arizona State University

Christine

Chris

Nov' 20 - Jan '24

Shouleh, Chair

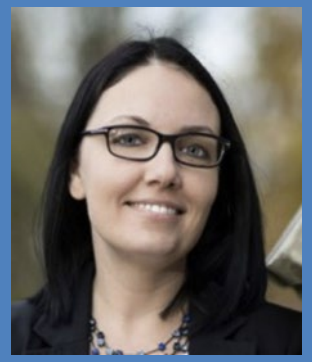
Steve

Hsiao-Wen

Enrique

Apr' 22 - Oct '24

Sabrina, Vice Chair



Nov '20 - Oct '25

Rachael

Sanch

Jan' 23 - Oct '25

COPAG EXECUTIVE COMMITTEE: Welcomed New Members

Member	Term	Institution
Shouleh Nikzad (Chair)	April 2022–October 2024	Jet Propulsion Laboratory
Stephan McCandliss	November 2018–October 2024	Johns Hopkins University
Hsiao-Wen Chen	April 2022–October 2024	University of Chicago
Enrique Lopez Rodriguez	April 2022–October 2024	Stanford University
Sabrina Stierwalt, Vice Chair	November 2020–October 2025	Occidental College
Rachael Beaton	January 2023–October 2025	Space Telescope Science Institute
Sanchayeeta Borthakur	January 2023–October 2025	Arizona State University
Rana Ezzeddine	February 2024–January 2027	University of Florida
Varsha Kulkarni	February 2024–January 2027	University of South Carolina

Rana

Varsha

Feb' 24 - Jan '27

Shouleh, Chair

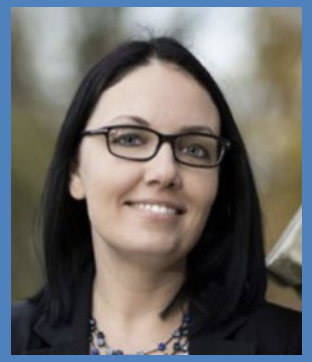
Steve

Hsiao-Wen

Enrique

Apr' 22 - Oct '24

Sabrina, Vice Chair



Rachael

Sanch

Nov '20 - Oct '25

Jan' 23 - Oct '25

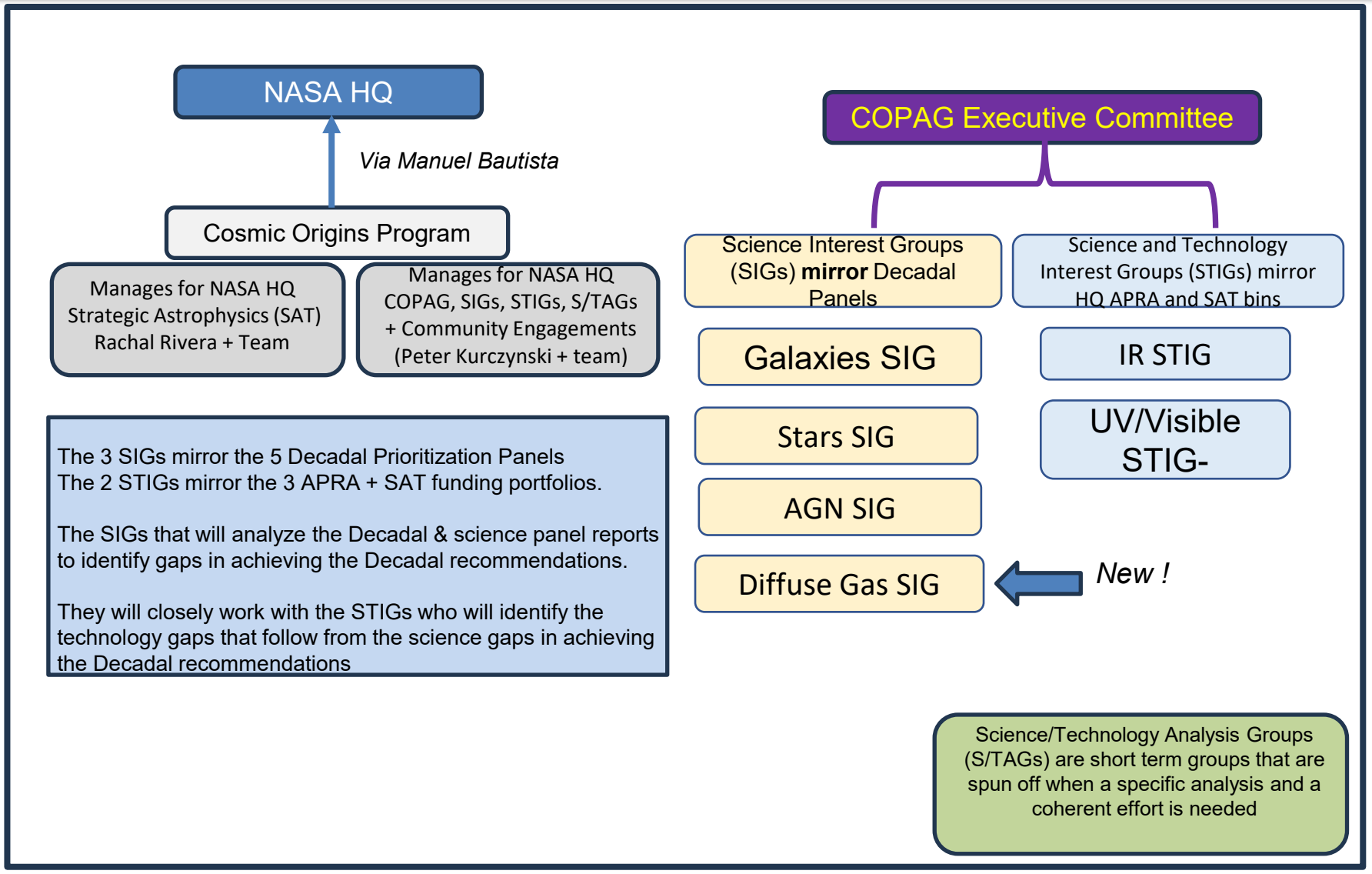
IR and UV STIGS: active since 2000s; established networks and participation

SIGs formed to prepare for analysis of Astro2020

- Stars SIG, active
- Galaxies, active
- AGN, active

New SIG proposed and formed

- Diffuse Gas in Cosmic Ecosystems, active



Galaxies SIG

AGN SIG

Stars SIG

Diffuse Gas in Cosmic Ecosystem SIG

Hsiao-Wen

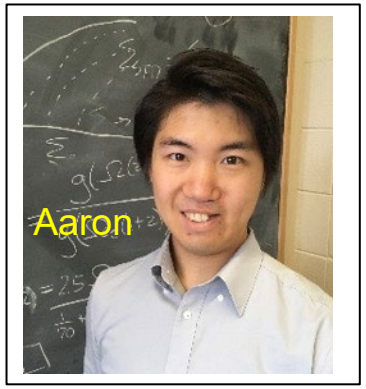
Erika

IR STIG

UV/Visible STIG

COSMIC ORIGINS EXECUTIVE COMMITTEE
Welcomed new SIG and STIG leadership

Galaxies SIG



AGN SIG

Stars SIG

Cosmic Ecosystem SIG

- New leadership in Galexies SIG and IRSTIG
- Leadership Councils fromed in all SIGs & STIGs
- COR CS and DCS met with all SIGs & STIGs leads to discuss the plans for the year—this is in part a result of COPAG's Strategic Plan

New !

IR STIG

UV/Visible STIG

Community Engagement Activities in various stages of planning

2024 Winter AAS, New Orleans, LA

- Splinter sessions for SIGs and STIGs
- Joint PAG Splinter (new format)—Proposed a new format to/with other PAG Chairs to potentially to have more community engagement
  - Cross PAG SIGs short presentations
  - Precursor Science Panel
  - Panel with APD Director and PAG EC Chairs,
  - Open Q&A
- Worked on making booths even more engaging for the community-Planning on interactive demonstration (monitor with skymap) at the AAS to increase engagement with attendees.
- Two Hyperwall talks by Rachael Beaton and Sabrina Stierwalt
- Astronomy on Tap by Rachael Beaton and Ron Gamble

Community Townhall

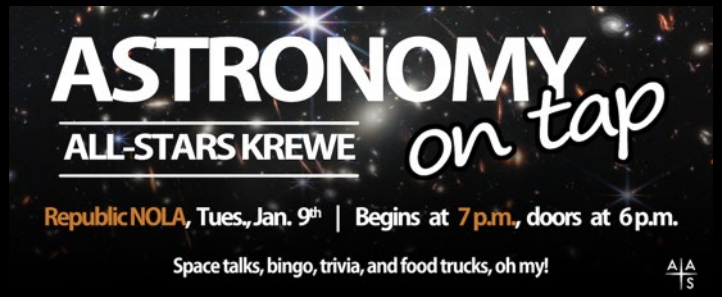
- Sabrina and Shouleh are planning the Town Hall along with EC members—especially timely to engage the community in light of the budget announcements

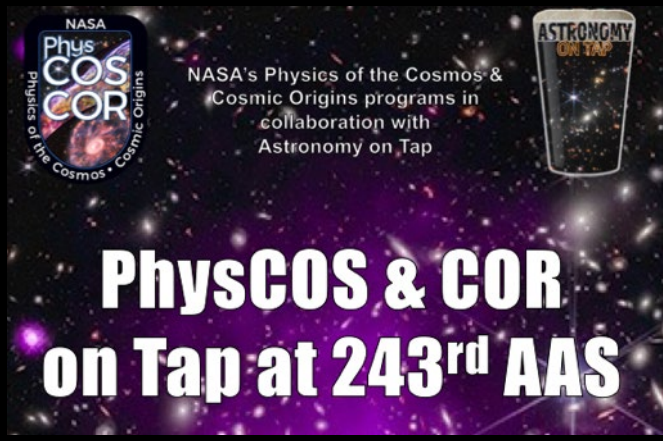
Workshops

Working on a series of Cross PAG Workshops toward working with astrophysics community toward HWO

UV Science and Instrumentation: May 7-9, 2024

Astronomy on Tap at Winter 2024 AAS





IRSTIG - March 2024 Update

- **Continuing the webinars series**
  - Continuing cadence ~1 talk/month - 4 talks since October 2023
  - ~ 20 /30 people in attendance each time
  - Half of the speakers were early-career scientists
- **Splinter Session at Winter AAS 243, New Orleans, LA**
  - Title:``Guest Observer Science with a FIR Probe''
  - 10 talks, 3 from FIR Probes PIs, 7 from early-career scientists
  - ~40 people in attendance
- **Revisiting the Group Newsletter**
  - Planning on creating a dedicated blog collecting science and technology highlights contributed by members of the community

IRSTIG - March 2024 Update, cont.

- **Providing a Voice for the FIR Community**
  - Following SOFIA's closure, the FIR is without a permanent observatory accessible to the general astrophysics community
  - The community is searching for new opportunities to recruit and maintain talent to enable a future Origins Space Telescope-like mission in the vision of Astro2020
  - We want to voice the concerns of the community and its longevity to NASA administration
- **Planning For an IR Workshop Spring 2025**
  - In the wake of the APEX decision, we would like to reconvene the IR community (following onto our Mar 2022 workshop) to discuss its future given the opportunities presented to it

UVSTIG - Update

- **Winter AAS 243 09 January 2024 t:**
  - Mind the Gap & Ultraviolet/Visual Science Interest Group Joint Splinter Session AAS 243 09 January 2024
    - Morning and Afternoon Sessions (~100 inperson + virtuial)
    - 19 Presentations – https://cor.gsfc.nasa.gov/copag/meetings/AAS_Jan2024/AAS2024-Agenda-MineTheGap-AM.php

- **UVSTIG QUEST* Virtual Seminar Planning Activities Winter/Spring 2024:**
  - Suggested topics: **UV Coronagraph**; **FarUV Mirror and Filter Variants**; **Multiobject and Integral Field Spectroscopy**; **Contamination Control**; **Photocounting Detectors – Photoemissive, Photoconductive, Photothermal**; **Diffraction Gratings**
  - **April – Kevin France will speak on his for STAMP-1 (Smallsat Technology Acceleration Maturation Platform-1)**
    - ***Quorum for Ultraviolet/visible Exploration of Science and Technology**
    - QUEST* seminars are archived at https://www.youtube.com/playlist?list=PL_dmnk6FeUeASWgZwzBIUR--Ut8axxSut

Mind the Gap & Ultraviolet/Visual Science Interest Group Joint Splinter Session – Raison d'etre

There will be a 10-20 year gap between the end of the Hubble Space Telescope (HST) mission and the beginning of a new flagship mission with ultraviolet spectroscopic capabilities. In the interim, what science should potential small- and modest-sized missions focus on as precursor efforts that advance conceptual and technical readiness and foster core-excellence in early career scientists who will go on to be mainstream uses of future flagship missions.

The sessions are organized around 3 topics:

1) Science goals that define UV spectroscopy and/or spectropolarimetry at various resolving powers and spatial resolution, that might be achievable in the next 10-15 years in preparation for HWO.

2) Current status of UV optical components, detectors and future technology developments

3) Description of missions under implementation that seek to leverage technology states of the art to address high priority science

This meeting is an opportunity for the astronomers interested in UV observations and researchers focused in improving UV observational tools (including detectors, mirror coatings and other new technologies) to gather and discuss science goals, current technical readiness and potential future technology capabilities needed to meet theses science goals.

Virtual Attendance will be available (no AAS registration necessary).

NASA COPAG AAS243 activities can be found at https://cor.gsfc.nasa.gov/news/2023/COPAG_Session_at_AAS_Winter.php

Mind the Gap & Ultraviolet/Visual Science Interest Group Joint Splinter Session Organizers

Mind the Gap Organizing Committee:

Joy Nichols - Harvard & Smithsonian CfA
Carol Grady - Eureka Scientific
Ted Gull - NASA/GSFC (Emeritus) & STScI
Erika Hamden - University of Arizona
Keri Hoadley - University of Iowa
Al Holm - Retired; STSci Operations
Geraldine Peters - USC
Paul Scowen - GSFC/NASA
Chris Shrader - GSFC NASA
Sarah Tuttle - University of Washington

Raison d'etre

UVSTIG Leadership Committee:

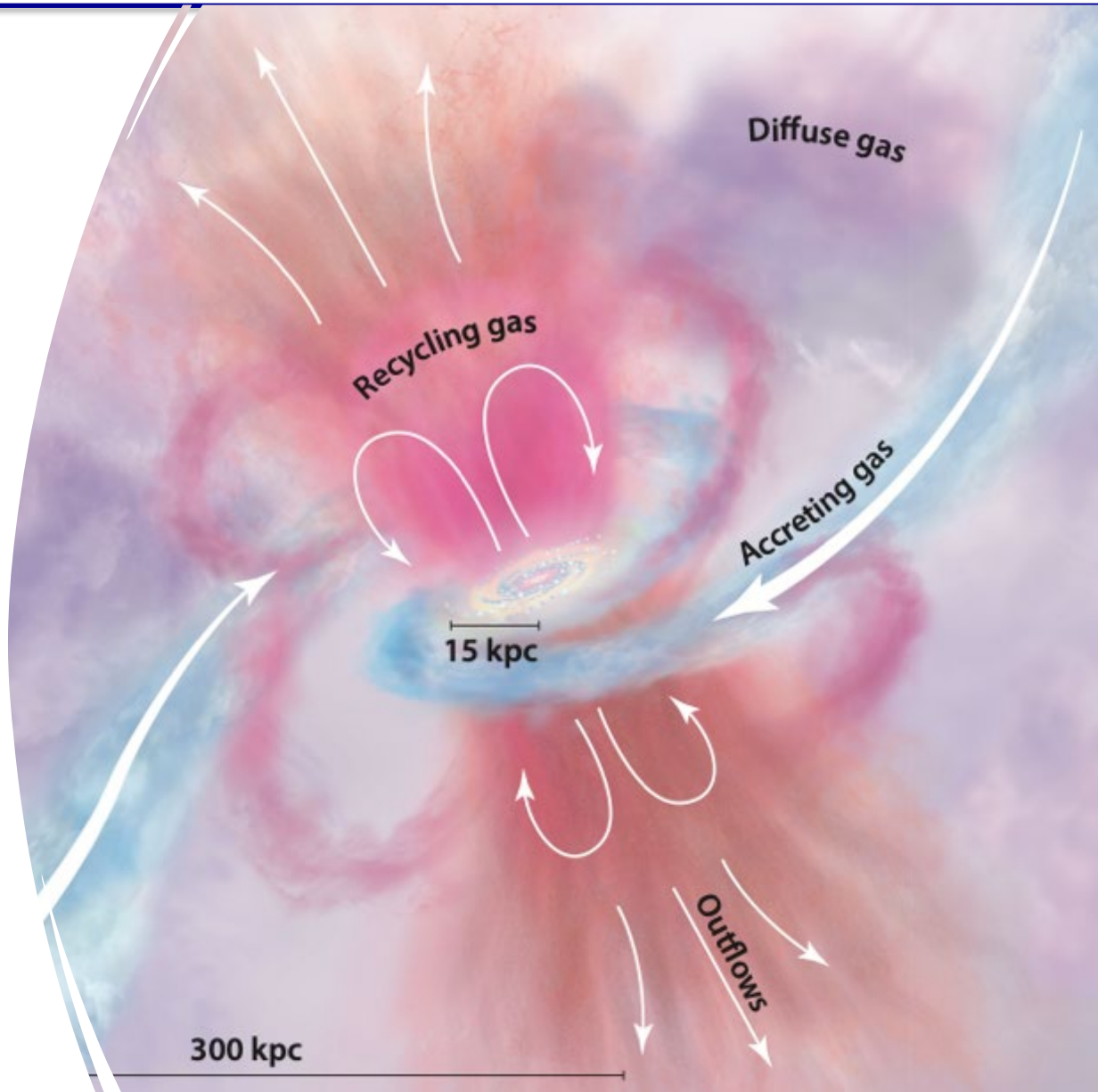
Stephan McCandliss - Johns Hopkins University
Jason Tumlinson - STScI
Sarah Tuttle - University of Washington
Camden Ertley - SWRI
Derek Buzasi - Florida Gulf Coast University
Kevin France - University of Colorado, Boulder
Allison Youngblood - GSFC
John Hennessy - JPL
Erika Hamden - University of Arizona
Emily Witt - University of Colorado, Boulder
Keri Hoadley - University of Iowa, Iowa City
Shouleh Nikzad - JPL

DGCE SIG March 2024 Update

Diffuse Gas in Cosmic Ecosystems (DGCE) Science Interest Group

New Science Interest Group: Highlights (Hamden et al.)

- DGCE SIG Talks continue each month and are well attended. In addition, the recordings are regularly viewed.
- Talks scheduled through August 2024, with between 30-50 viewers per session
- Talks are recorded on zoom and posted to YouTube
- Organized joint SIG splinter session at AAS which was well received and generated a great deal of discussion



Contacts:
Erika Hamden hamden@arizona.edu and
Hsiao-Wen Chen hchen@astro.uchicago.edu

Image: Tumlinson, Peeples, Werk, 2017, ARAA 55:389

Stars SIG - Summer 2023 Update

Co-Chairs: Yuan-Sen Ting (ANU) & Rachael Beaton (STScI)

Aided in planning the UV Cosmic Origins Science Splinter at AAS243

- Hope to write a short report on the science themes that were explored and engage speakers to get their highest priority science.
- From this, the idea of a SAG on an "**Age Ladder**" that connects age measurements across space and time.
  - Currently coordinating how to organize the SAG around the other high priority topics.
- Hope to reboot speaker series around these topics as part of the SAG preparation work.

Galaxies SIG - March 2024 Update

Also participated in planning joint splinter along with Stars and DGCE for Winter AAS 2024

Galaxies Science Interest Group

- The SIG was represented at the COPAG strategy retreat in Pasadena, May 2023, and discussed key science questions from the decadal survey, as well as appendix N on State of the Profession, and identified decadal survey science questions most relevant to Habitable Worlds Observatory.
- We are a relatively new group that was formed just over a year ago, and we are planning to ramp up group activities in the Fall semester, including a seminar series and discussions on identifying science gaps in the Astro2020 Decadal Report.
- Chair: Benne Holwerda
  Deputy Chair: L. Y. Aaron Yung

TDAMM SIG March 2024 Update

- Cross PAG SIG—Co Chairs: Brad Cenko (COPAG), Rebekah Hounsell (PhysPAG), Eric Burns (PhysPAG, Ian Crossfield (ExoPAG)
- First in person meeting at the Winter AAS meeting
- First virtual meeting (Mar. 1)
  - Opening talk by Fiona Harrison on the Decadal and TDAMM
  - Broad discussion between Fiona and members
    - Identified the key need for NASA to build the Decadal-recommended standing committee to provide TDAMM priority recommendations this decade
    - Emphasis on the Decadal priorities, with TDAMM as the top sustaining activity (noting the separate recommendation pipe for GOMAP and (what is now) HWO)
- Talks are recorded on zoom and posted to YouTube
- Working through next steps, and plans for future meetings.

Cosmic Pathfinders Program

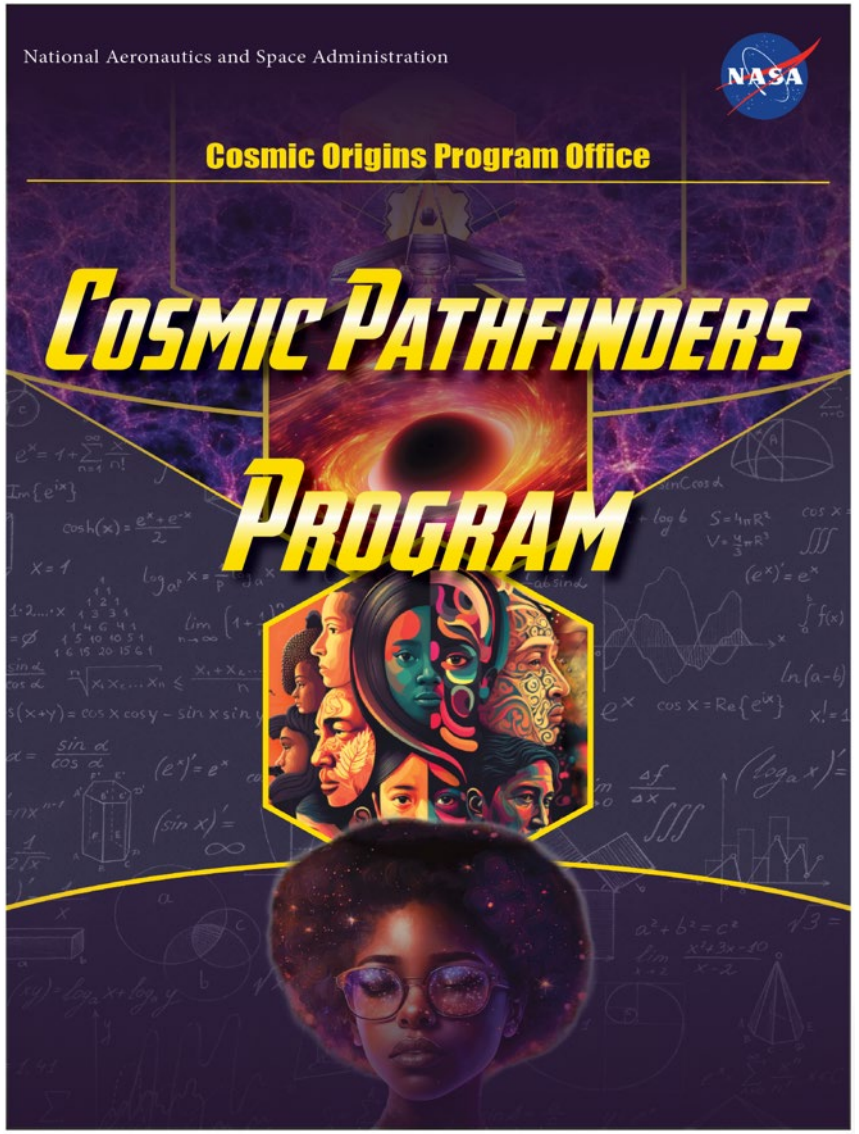
Directed by Ronald Gamble, NASA/GSFC/UMCP

Current student membership across the Cosmic Pathfinders footprint has eclipsed ~500 students & Early-Careers

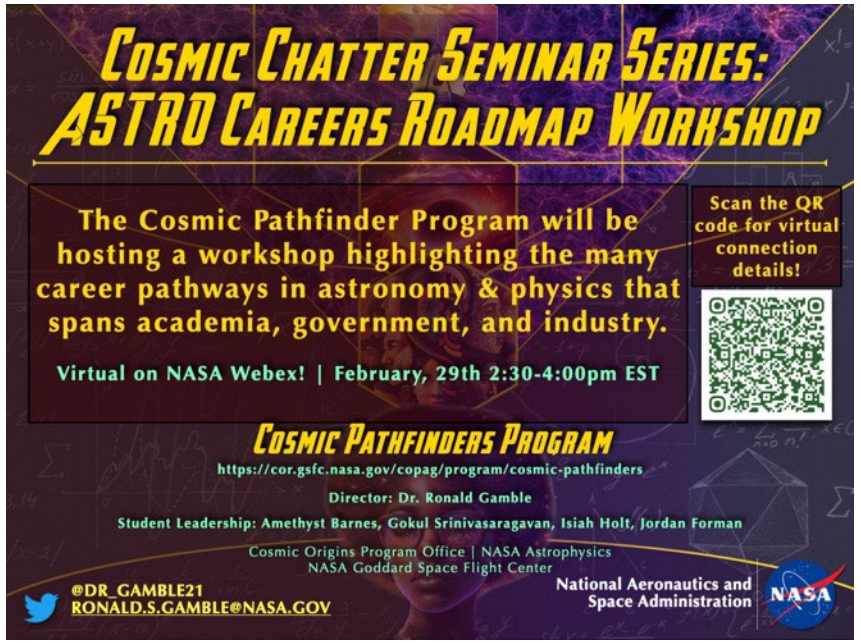
Current student leadership includes:

- **Amethyst Barnes (NASA GSFC/CRESST-II Post-Bac, Roman/STScI)**
- **Jordan Forman (NASA GSFC/CRESST-II Post-Bac, FERMI)**
- **Gokul Srinivasaragavan (Doctoral Candidate, UMCP Department of Astronomy)**
- **Isiah Holt (NASA Pathways Intern & Doctoral Candidate, UMCP Department of Astronomy)**

- **Cosmic Chatter**
  - **Career Roadmap Discussion — Career pathways for Missions**
  - **Science Communication Panel — Communication**
  - **(~12) Student Presentations [March - June] — Engagement**
- **Hack-a-thons**
  - **JWST, XRISM, COSI…Roman (?), HWO (?), LISA (?) , along with the potential to extend to many others.**
- **Professional Societies/ Conference Participation & Sessions**
  - **AAS, APS, NSBP, SACNAS, NSBE, SPIE, Great Minds in STEM**
- **University Chapters**



Cosmic Pathfinders Program



February | Attendance ~40 (virtual)

The Cosmic Pathfinder Program hosted a workshop highlighting the many career pathways in astronomy & physics that spans academia, government, and industry. This interactive and engaging workshop to explored a roadmap of how to matriculate within the fields of astronomy & physics and what a potential career could look like. Making the nontraditional career path mainstream.

The program kicked off in January at the 243rd AAS winter meeting in New Orleans, LA with a splinter session on how to "Hack Your Career". Attendance ~40 (in-person)

UV Working Group: Technology White Paper

Co-Chairs: Sarah Tuttle (UW, Seattle) & Mark Matsamura (GSFC)

Goal: Create a foundational document to capture UV driving science, current status of UV technology crucial to HWO development, and specifiy areas needed to focus development to reach notional requirements. Capture key technical advancements in one location to encourage broad engagement in pathfinding missions

- Working Group initiated in late spring/early summer 2023
  - 33 members (including co-chairs, as well as Swara & Peter)
  - 11 universities represented, as well as JPL & GSFC, and Industry participants
  - Broad career stages (grads, postdocs, and researcher levels)
  - Weekly telecons
  - Draft white paper under review for circulation
- Meeting Participation
  - Participated in Mini UV-Exo Workshop at Caltech Keck Think Tank, May 2023
  - July Science w/HWO Meeting at STSci – multiple presentations & Tech Day Participation
  - Presentation at CGM meeting in September
- Upcoming
  - White paper is out for final round of comments by co authors
  - White paper will be shared throughout NASA leadership
  - White paper will post to arXiv/Astro-ph
  - Multiple presentations at AAS including supporting Mind the Gap/UVSTIG splinter session to share broadly with the community – across technology/science interests, and engaging early career researchers.

UV Science and Instrumentation Workshop

- UV Science and Instrumentation Workshop was conceived as part of conversations across PAGs and following the AAS Winter 2023 and Mini Workshop (UVCOR-Exo) at Caltech Keck Center, May 2023, and the work of the UV Working Group led by Sarah Tuttle.
- Workshop was announced at the AAS and was met with great interest by the community.
- SOC has been formed and has met three times. One or two more members might be joining the SOC.
- Format is shaping up to be a true workshop format to allow for interactions and discussions amongst the participants.
- A report or series of papers are expected to be submitted to JATIS, potentially as a special issue which would include the UVWG output as well.

Questions?

Backup Slides

COPAG Strategic Plan

Introduction

The Cosmic Origins Program Analysis Group (COPAG) undertook a thorough strategic planning process during Spring 2023. The process was kicked off with a 2-day meeting on May 11 and 12 at the Keck Center Think Tank.

This report is the culmination of this extensive process. This strategic plan will guide COPAG over the next five years and beyond as we transform into a more focused, responsive, and collaborative organization.

Our commitment to community and our desire to serve that community with the highest level of engagement and inclusion will be strengthened by the implementation of this far-reaching plan.

Our executive committee will use this strategic plan as a road map into the future, guiding our analysis, processes, and interactions with the community and NASA. The COPAG-EC will measure progress towards the established goals of this plan periodically in order to ensure our vision is kept on target.

The COPAG-EC and leaders of the COPAG-affiliated Science Interest Groups have a great deal of enthusiasm for this strategic plan. Its implementation will only ensure the successful future and effectiveness of COPAG to serve the astrophysics community and help NASA uncover mysteries of the Universe and discover our cosmic origins.

Shouleh Nikzad, Ph.D.
EC Chair

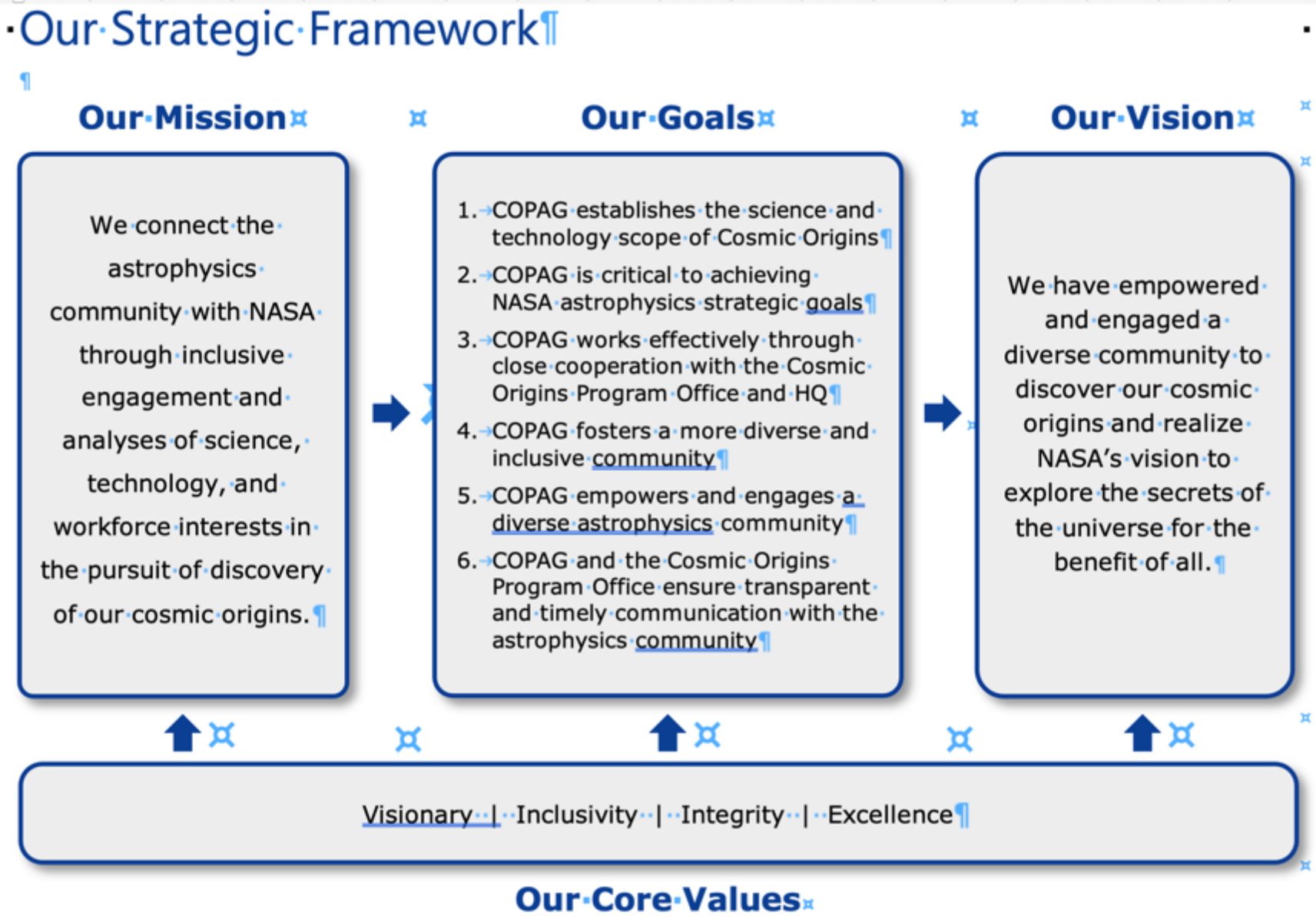
Manuel Bautista, Ph.D.
NASA HQ Program Scientist

Peter Kurczynski, Ph.D.
Chief Scientist, COR

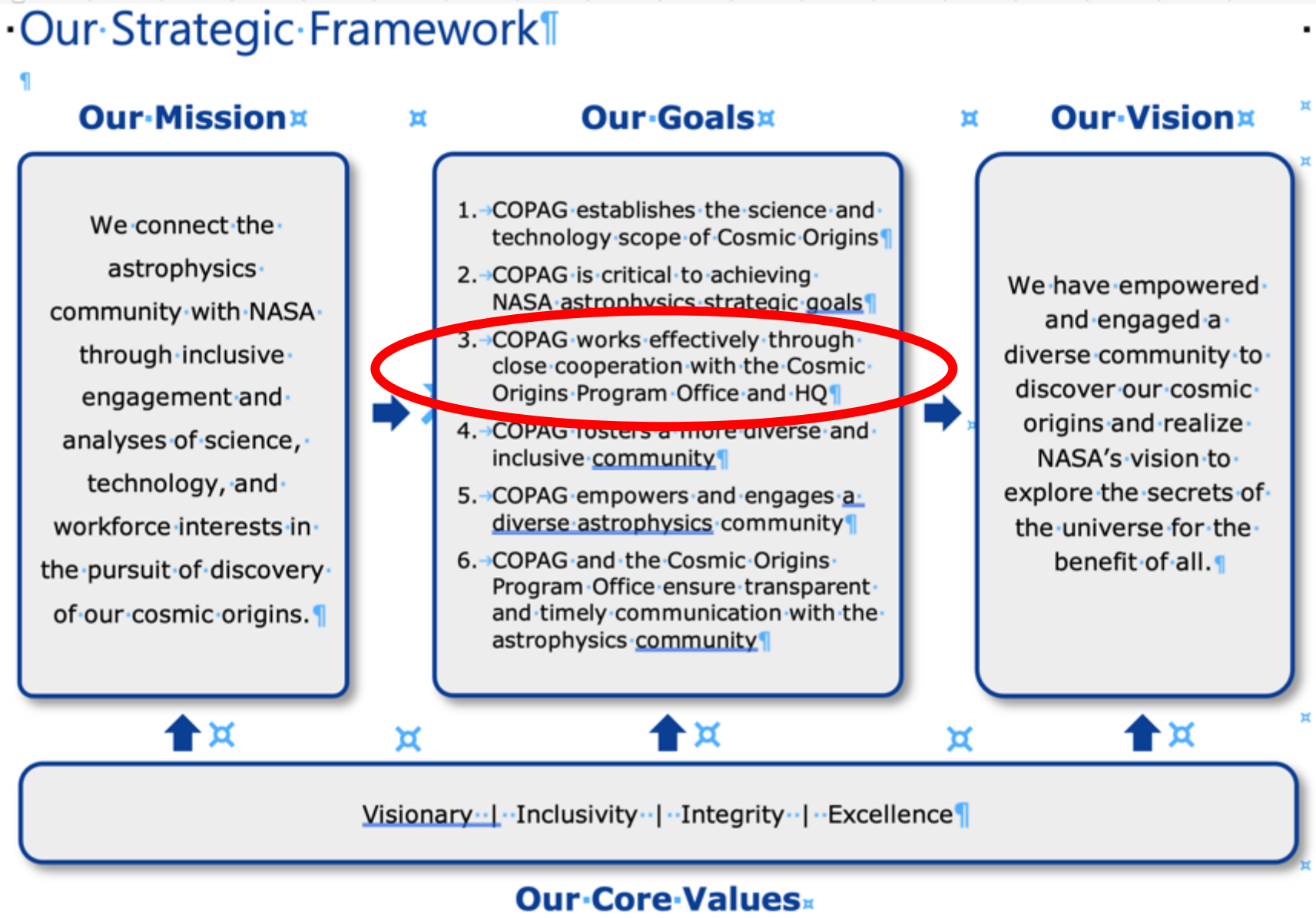
Sabrina Stierwalt, Ph.D.
Vice-chair, COPAG EC

Swara Ravindranath, Ph.D.
Deputy Chief Scientist, COR

Framework


Our Strategic Framework
Our Mission
We connect the astrophysics community with NASA through inclusive engagement and analyses of science, technology, and workforce interests in the pursuit of discovery of our cosmic origins.
Our Goals
1. COPAG establishes the science and technology scope of Cosmic Origins
2. COPAG is critical to achieving NASA astrophysics strategic goals
3. COPAG works effectively through close cooperation with the Cosmic Origins Program Office and HQ
4. COPAG fosters a more diverse and inclusive community
5. COPAG empowers and engages a diverse astrophysics community
6. COPAG and the Cosmic Origins Program Office ensure transparent and timely communication with the astrophysics community
Our Vision
We have empowered and engaged a diverse community to discover our cosmic origins and realize NASA's vision to explore the secrets of the universe for the benefit of all.
Visionary | Inclusivity | Integrity | Excellence
Our Core Values

Sample Strategic Objectives and Assignments



Sample Strategic Objectives and Assignments

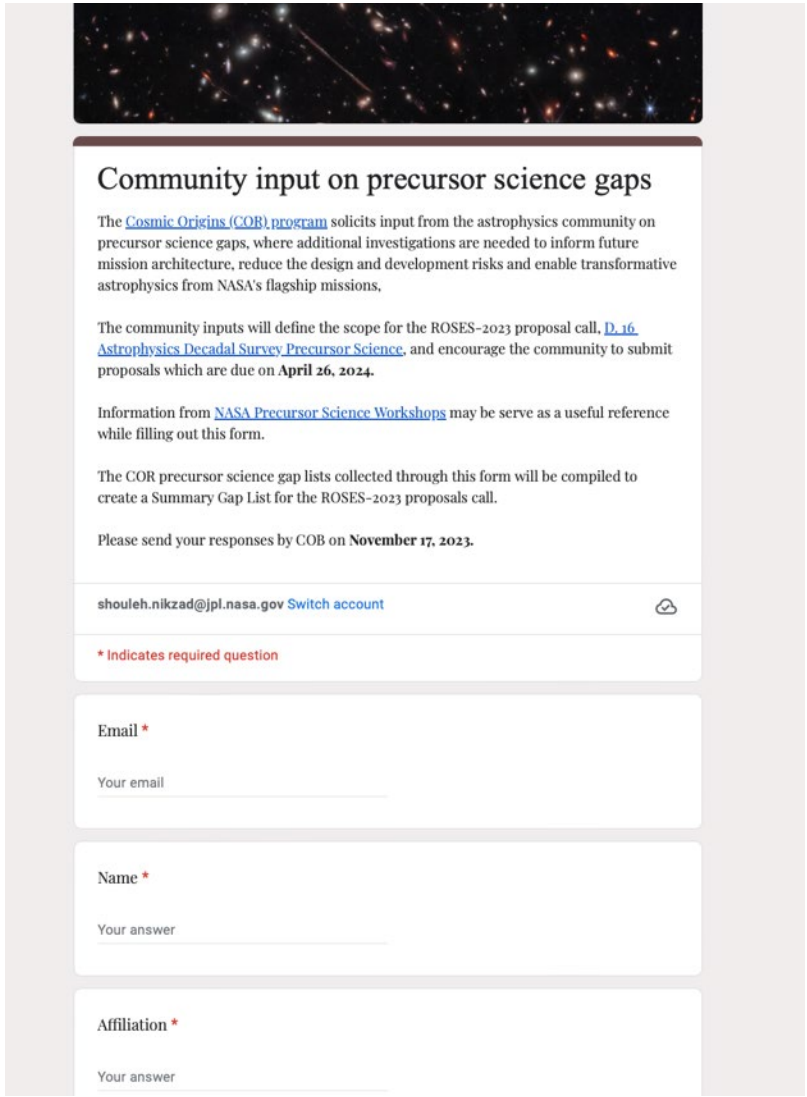
Goal 3: COPAG works effectively through close cooperation with the Cosmic Origins Program Office and HQ		
Business Results: Collaboration; clearly defined relationships		
Strategic Objectives	**Target Date**	**Owner**
1. → A clear streamlined **communication structure** between the COPAG, the Program Office, and HQ	Aug 2023	Peter
2. → **Management plan** defining the relationships between COPAG – Program Office – NASA HQ	Aug 2023	Peter
3. → Every COPAG EC members has an **assigned objective** (e.g., strategic plan)	Aug 2023	Sabrina and Shouleh
a. → Onboarding process for new EC members		
b. → Assign new COPAG EC members with individual objectives		
4. → **Engagement plan** for in-person and virtual events with EC and with HQ	Sep 2023	Shouleh
5. → **Operations manual** for COPAG events and presentations and SIG activities (e.g., booths at conferences)	Mar 2024	Peter & Stephanie
a. → Best practices for engaging APAC and HQ		

Precursor Science: Soliciting Community Input

- Began COR Science Gap activities in Stars and Galaxies SIGs splinters at the AAS January 2023
- Activities continued within COPAG EC and SIG leads at the Pasadena May mini Workshop
- Program office created form for community input on precursor science gaps

https://tinyurl.com/COR-science-gaps

- COR CS (Peter) and DSC (Swara) attending SIG meetings to solicit input
- AAS joint splinter for Galaxies, Stars, and DGCE organized and chaired by Hsia-Wen Chen and the panel moderated by Rachael Beaton generated a number of great ideas toward precursor science. Rachael Beaton is working toward collating the ideas.



Community input on precursor science gaps

The Cosmic Origins (COR) program solicits input from the astrophysics community on precursor science gaps, where additional investigations are needed to inform future mission architecture, reduce the design and development risks and enable transformative astrophysics from NASA's flagship missions.

The community inputs will define the scope for the ROSES-2023 proposal call, D. 16 Astrophysics Decadal Survey Precursor Science, and encourage the community to submit proposals which are due on **April 26, 2024.**

Information from NASA Precursor Science Workshops may be serve as a useful reference while filling out this form.

The COR precursor science gap lists collected through this form will be compiled to create a Summary Gap List for the ROSES-2023 proposals call.

Please send your responses by COB on **November 17, 2023.**

shouleh.nikzad@jpl.nasa.gov Switch account

* Indicates required question

Email *

Your email

Name *

Your answer

Affiliation *

Your answer