



Cosmic Structure Science Interest Group

Co-Chairs Vera Gluscevic (USC) &
Rebekah Hounsell (UMBC/NASA GSFC)

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Current Co-Chairs



Vera Gluscevic: USC



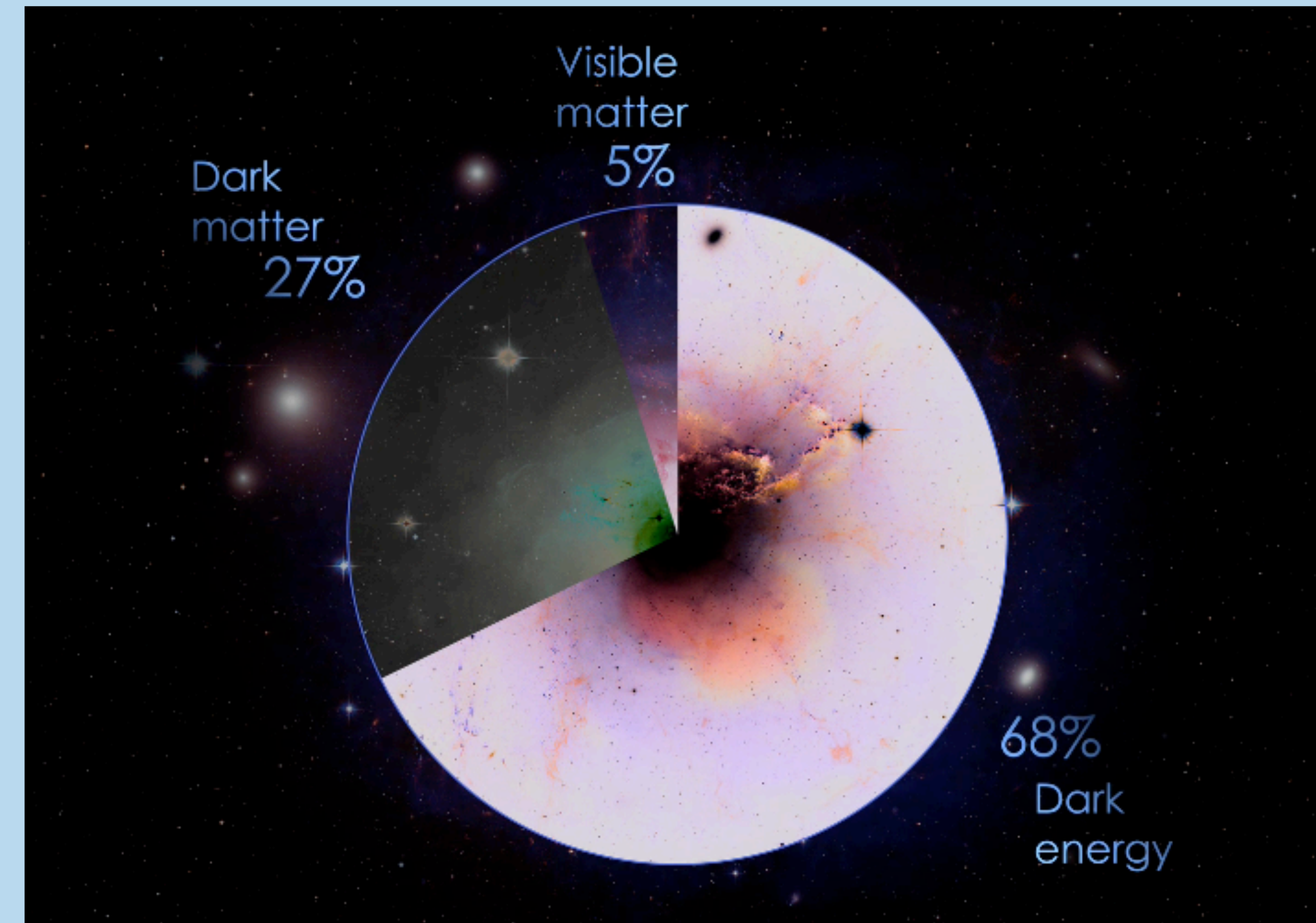
Rebekah Hounsell: UMBC/NASA GSFC

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Goals

The goal of the *Cosmic Structure Science Interest Group (CoS SIG)* is to serve communities interested in utilizing measures of cosmic structure based on 3-dimensional spectroscopic and photometric surveys of galaxies, galaxy clusters, supernovae, and gravitational lensing. Science drivers for the SIG include understanding the nature of dark energy, dark matter, neutrinos, and tests of inflation, as well as astrophysical galaxy evolution, amongst others.

The CoS SIG will provide a way to collect, discuss and communicate to NASA community inputs on future missions including quantitative metrics and assessments and new issues.



We have a Website

Physics of the Cosmos

About PhysCOS | PhysPAG | Mission Studies | Resources | Documents

Cosmic Structure Science Interest Group

Introduction

The goal of the Cosmic Structure Science Interest Group (CoS SIG) is to serve communities interested in utilizing measures of cosmic structure based on 3-dimensional spectroscopic and photometric surveys of galaxies, galaxy clusters, supernovae, and gravitational lensing. Science drivers for the SIG include understanding the nature of dark energy, dark matter, neutrinos, and tests of inflation, as well as astrophysical galaxy evolution, amongst others.

The CoS SIG will provide a way to collect, discuss and communicate to NASA community inputs on future missions including quantitative metrics and assessments and new issues as we move up to the 2020 Decadal. This includes:

- Review and update mission science goals following current developments in the field,
- Review and update information about and requirements on potential foreground contaminants and their removal,
- Review and update requirements on and developments in control of systematic errors, and
- Assess necessary technology developments and prioritize areas for increased technical emphasis.

CoS SIG also provides a way to discuss and coordinate areas of overlapping interest with the other SIGs, e.g. the Inflation Probe SIG (**IP SIG**), in understanding the theoretical origins of inflation, complementary gravitational tests to those of interest in the Gravitational Wave SIG (**GW SIG**), and complementary cluster science with X-ray SIG (**XR SIG**).

The CoS SIG is open to all members of the community.

If you are interested in contributing to the work of the CoS SIG, please subscribe using the link below.

For other inquiries, e-mail co-Chairs Vera Gluscevic (Univ. of Southern California) at vera.gluscevic@usc.edu and Rebekah Hounsell (UMBC/GSFC) at rebekah.a.hounsell@nasa.gov.

CoS SIG Mailing List

Subscribe to the [CoS SIG mailing list](#).

NASA Missions Study What May Be a 1-In-10,000-Year Gamma-ray Burst

On Sunday, Oct. 9, 2022, a pulse of intense radiation swept through the solar system so close to Earth that it was detected by the Fermi Gamma-ray Burst Monitor as a gamma-ray burst (GRB), the most powerful class of explosions in the universe. [Read more.](#)

PhysCOS News

See our new [Events Calendar](#)

Program News and Announcements

- [Sign up for PhysCOS News and Announcements](#)

16 May
NSF Astronomy and Astrophysics Advisory Committee Meeting 1 June 2023 » [Details.](#)

16 May
Science with the Habitable Worlds Observatory

16 May

<https://pcos.gsfc.nasa.gov/sigs/cossig.php>

What we do

Events are listed

Join our mailing list

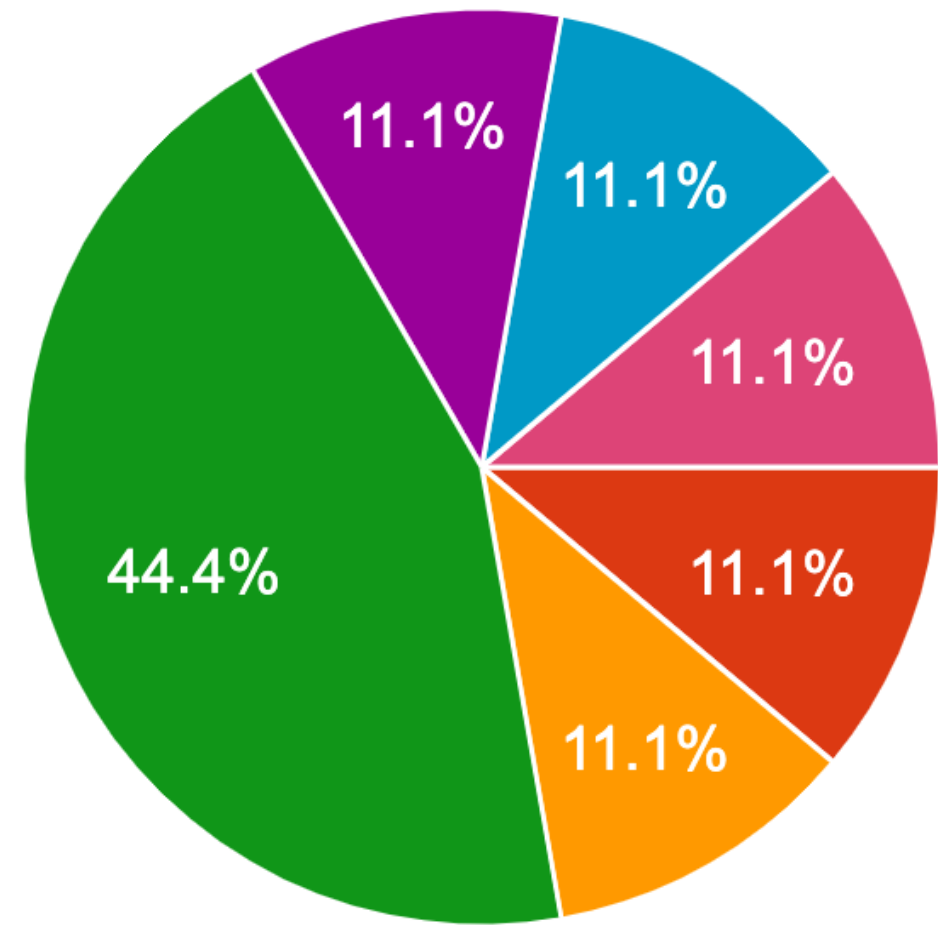


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What does a SIG Do?

- Organize meetings at AAS/APS
- Holds online seminars/discussions
- Organizes white papers in response to questions/studies i.e as done for Astro 2020
- Starts Science Analysis Groups (SAGs) to address a scientific question/topic and to produced a report (~1 year long)
- Workshops
- Etc.....

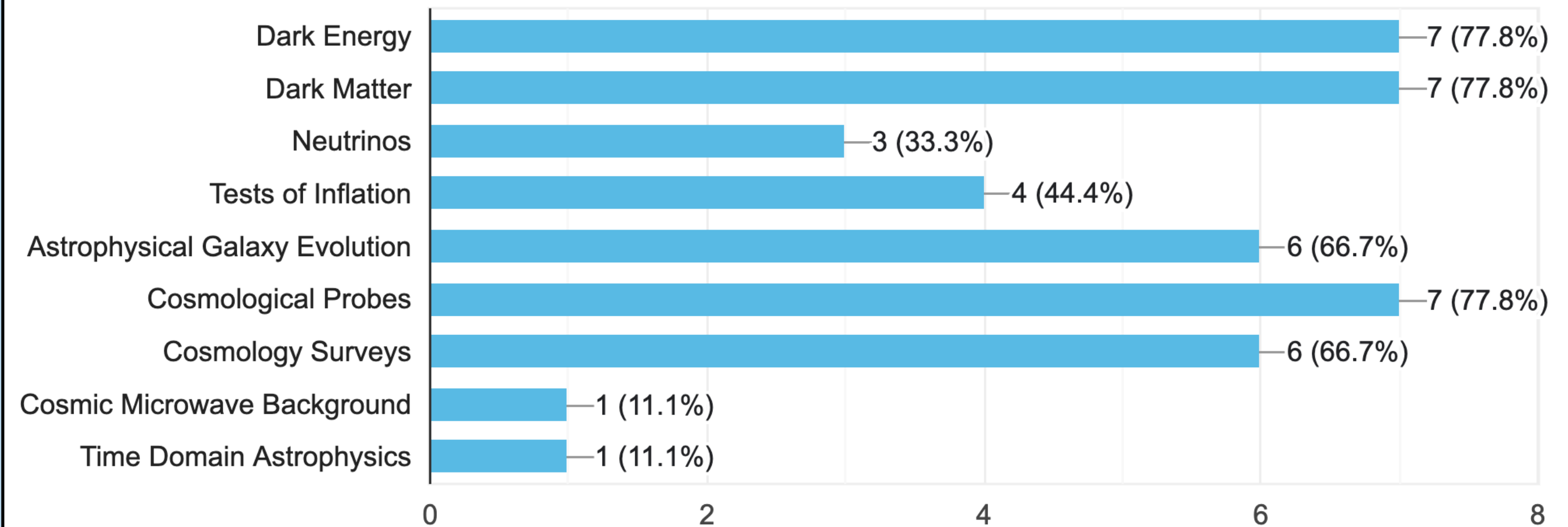
Meet & Greet Event!



- Undergraduate Student
- Graduate Student
- Postdoc
- Research Staff
- University Faculty
- Chief Scientist
- JPL Principal Scientist and Manager

Career Stage

Science Interest



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We address Technology Gaps

LATEST REPORT



2022 Astrophysics Biennial Technology Report (ABTR)

This is the second ABTR, presenting joint technology reporting from the three Astrophysics science-theme-focused Program Offices -- Physics of the Cosmos (PhysCOS), Cosmic Origins (COR), and Exoplanet Exploration Program (ExEP).

ADDRESSING THE FUNDAMENTAL QUESTIONS:

"How does the universe work?"

"How did we get here?"

"Are we alone?"

<https://apd440.gsfc.nasa.gov/technology.html>

Next report Spring 2024

We need your input!



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We address Science Gaps

SCIENCE GAP: A RESEARCH AREA WHERE ADDITIONAL WORK IS NEEDED

- Enhances the science return of a mission already flying - usually. through **Follow Up Science**.
- Enhances the science return and helps plan operations for an upcoming mission that is already designed - usually as **Preparatory Science**
- Provides information needed to quantify a future mission's ability to meet its science goals, and to assess mission design options - this is **Precursor Science**.

Roman White Paper Call

Call for Community Input into the Definition of the Roman Space Telescope's Core Community Surveys

https://roman.gsfc.nasa.gov/science/ccs_community_input.html

Overview

The Nancy Grace Roman Space Telescope, NASA's next flagship observatory, is planned for launch in late 2026. The Roman Mission requests the astronomical community's input for the purpose of initiating the community-led definition of the Roman Space Telescope's **Core Community Surveys**. Combined, these surveys are anticipated to use the majority of the observing time during Roman's first five years. The cosmology and exoplanet science requirements for these surveys leave significant parameter space available to define the observational strategies (filters, depth, cadence, etc.) in a way that will enable a broad range of astrophysical investigations.

To maximize participation, this call for input consists of two independent avenues for members of the community to provide information on science drivers and the requirements they place on the design of the Core Community Surveys. The second avenue, technically focused white papers describing what observing strategies are needed for a given science investigation, **is now open**. White papers are due by **June 16, 2023**. The first avenue, submission of a **short, one to two paragraph 'science pitch' (including a questionnaire)** was due February 17, 2023, and resulted in more than 100 submissions. Submission of a science pitch is not required for submission of a white paper.

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Habitable Worlds Observatory

- Considered as an exoplanet observatory but will have a General Astrophysics Program
 - Imaging + Spectroscopy (not fixed!)
 - UV (0.115-0.4 μm) ??
 - Vis (0.4 - 0.95 μm) ??
 - NIR (0.95 - 1.8 μm) ??
 - Coronagraph
- What are the CoS SIG science questions that HWO can address in the General Astrophysics Program?
 - Compile topics
 - Write mini white papers
 - And beyond...



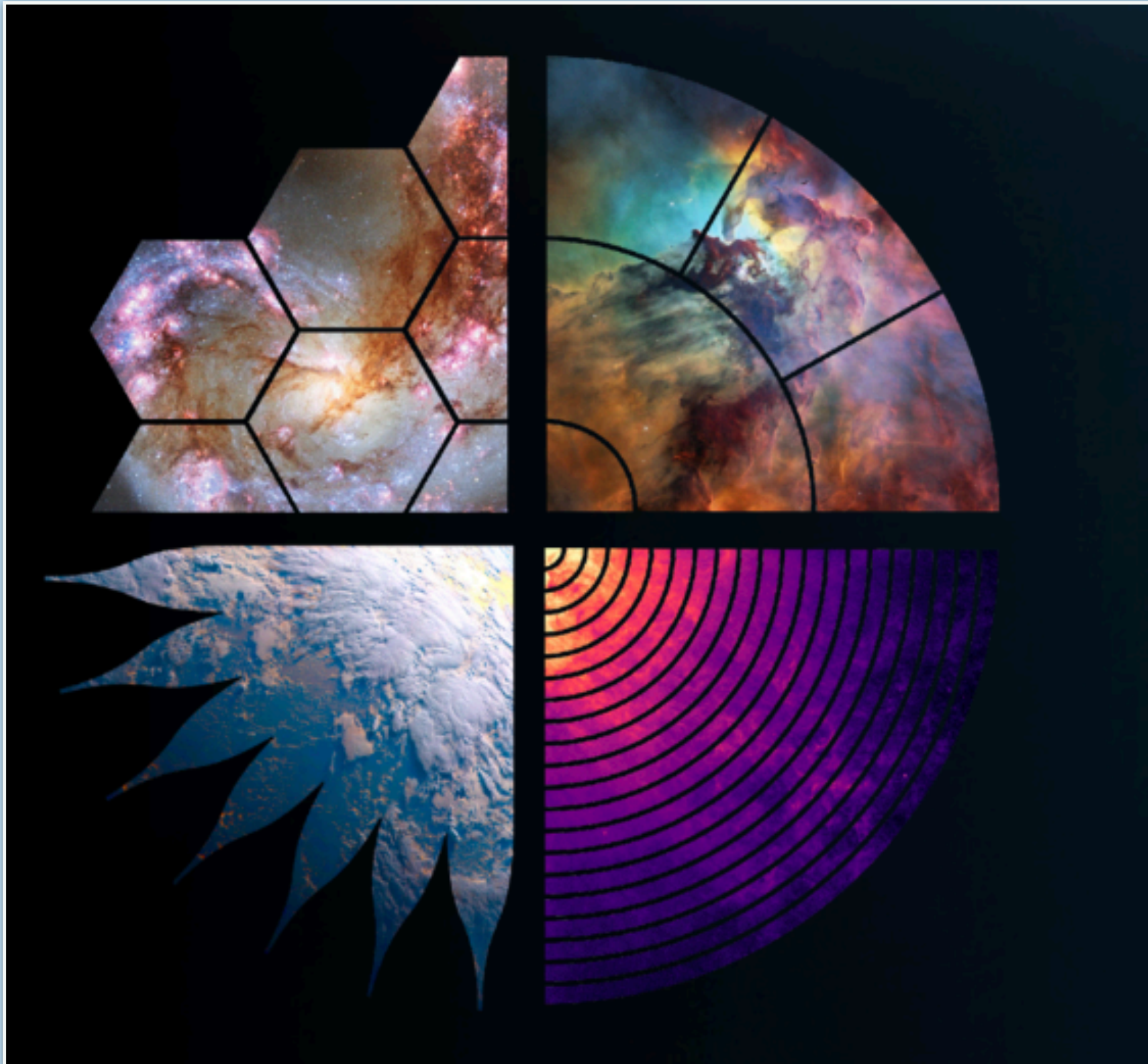
Great Observatory Maturation Program

GOMAP Background

The 2020 Astrophysics Decadal Survey, "[Pathways to Discovery in Astronomy and Astrophysics for the 2020s](#)" (Astro2020) lays out an ambitious vision for a new fleet of three multi-wavelength Future Great Observatories (FGOs) in space – the first entrant an infrared/optical/ultraviolet observatory, designed to search for life outside the Solar System and perform transformative astrophysics. Astro2020 also recommended NASA establish a "Great Observatories Mission and Technology Maturation Program" before approving a new flagship telescope for formulation.

In response, NASA is implementing Astro2020's recommendation under the name Great Observatory Maturation Program (GOMAP). GOMAP evolves NASA's project management strategies by applying past lessons learned to reduce technical/cost/schedule risk and develop large, complex astrophysics space observatories with predictable costs and schedules. Consistent with Astro2020, the first entrant into GOMAP will be the infrared-optical-ultraviolet observatory, designated the Habitable Worlds Observatory (HWO).

<https://science.nasa.gov/astrophysics/programs/gomap>



Science, Technology, Architecture Review Team (START!)

GOMAP Activities

GOMAP will focus on several key early activities to ensure flagships, starting with HWO, are developed on a predictable cost and schedule while minimizing risks of overruns. GOMAP's coordinated activities will ensure the scope of HWO is clearly defined, will advance the technologies that will enable HWO's ability to deliver on that scope, and will begin to plan additional long-lead activities. A few sets of groups are currently being formed to help guide these activities including: a Science, Technology, Architecture Review Team (START) and a series of Technology Development Roadmap Working Groups. We are currently soliciting self-nominations for the START, and will accept nominations until June 5, 2023. Details on the START and the self-nomination process are contained in a Dear Colleague Letter and a Terms of Reference for the START, which can be found below.

- [Dear Colleague Letter to Solicit Nominations for Participation in the HWO START](#)
- [Terms of Reference for the NASA Astrophysics HWO START](#)
- [GOMAP START Virtual Town Hall slides](#)

How can we facilitate?

PROGRAM OFFICE CAN PROVIDE

- Dedicated mailing lists
- Webex for virtual meetings
- Web page maintenance, including event announcements, slides, recordings, documents
- Assistance publicizing activities via PhysCOS News mailing list and at conferences
- Dedicated workshop support

Lets Talk: Future Plans!

- Monthly meetings?
 - Science talks: Focus on one key concept at a time
 - AoT style talks?
 - Focus on appropriate deadlines: White papers, proposals etc
 - Roman
 - HWO
 - Discussion of expansion into other areas Etc....

WHAT DO YOU WANT THESE MEETINGS TO BE?