



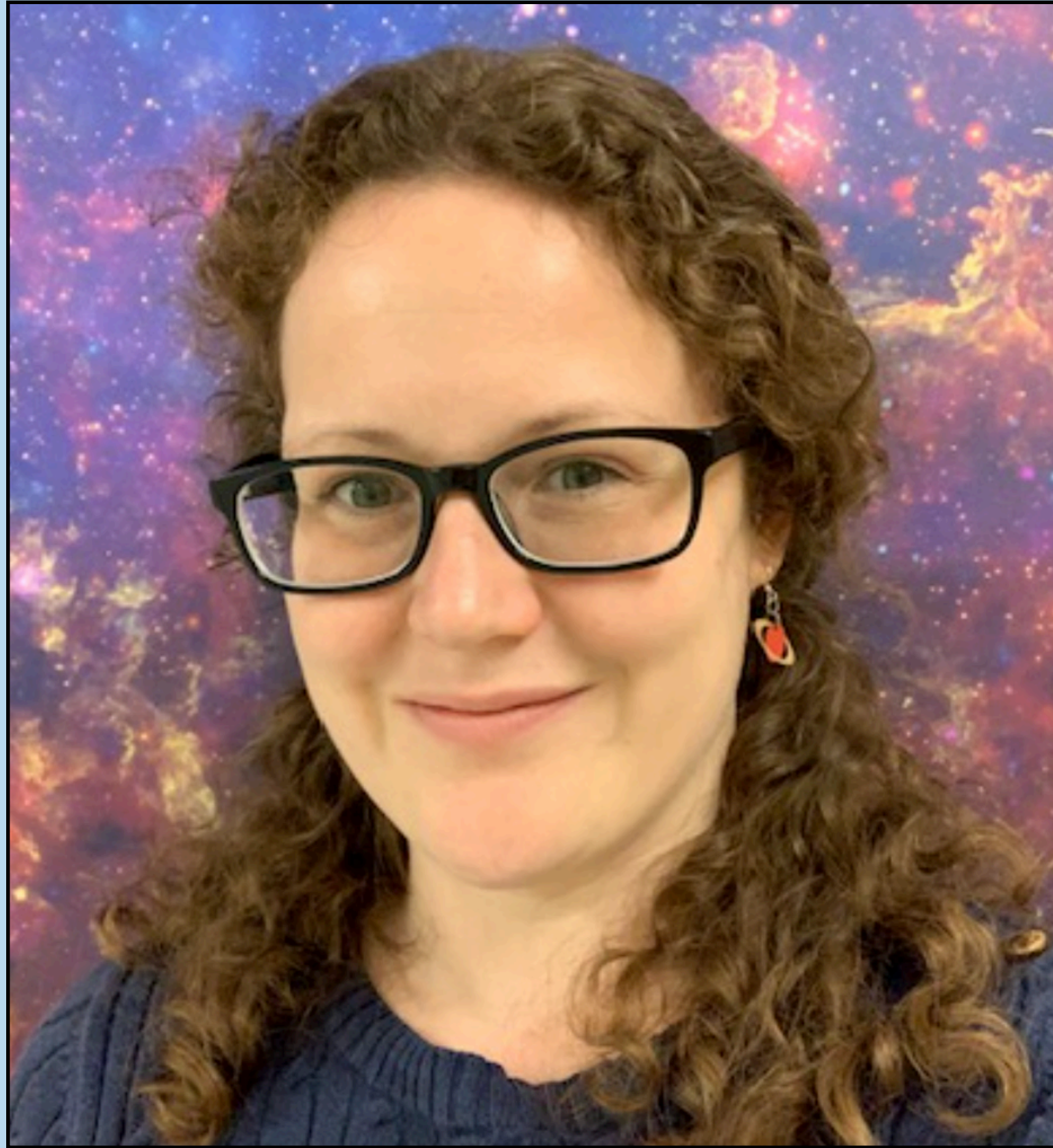
# Cosmic Structure

# Science Interest Group

## AAS 243

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# Current Co-Chairs



**Rebekah Hounsell: UMBC/NASA GSFC**



**Vivian Miranda: Stony Brook University**

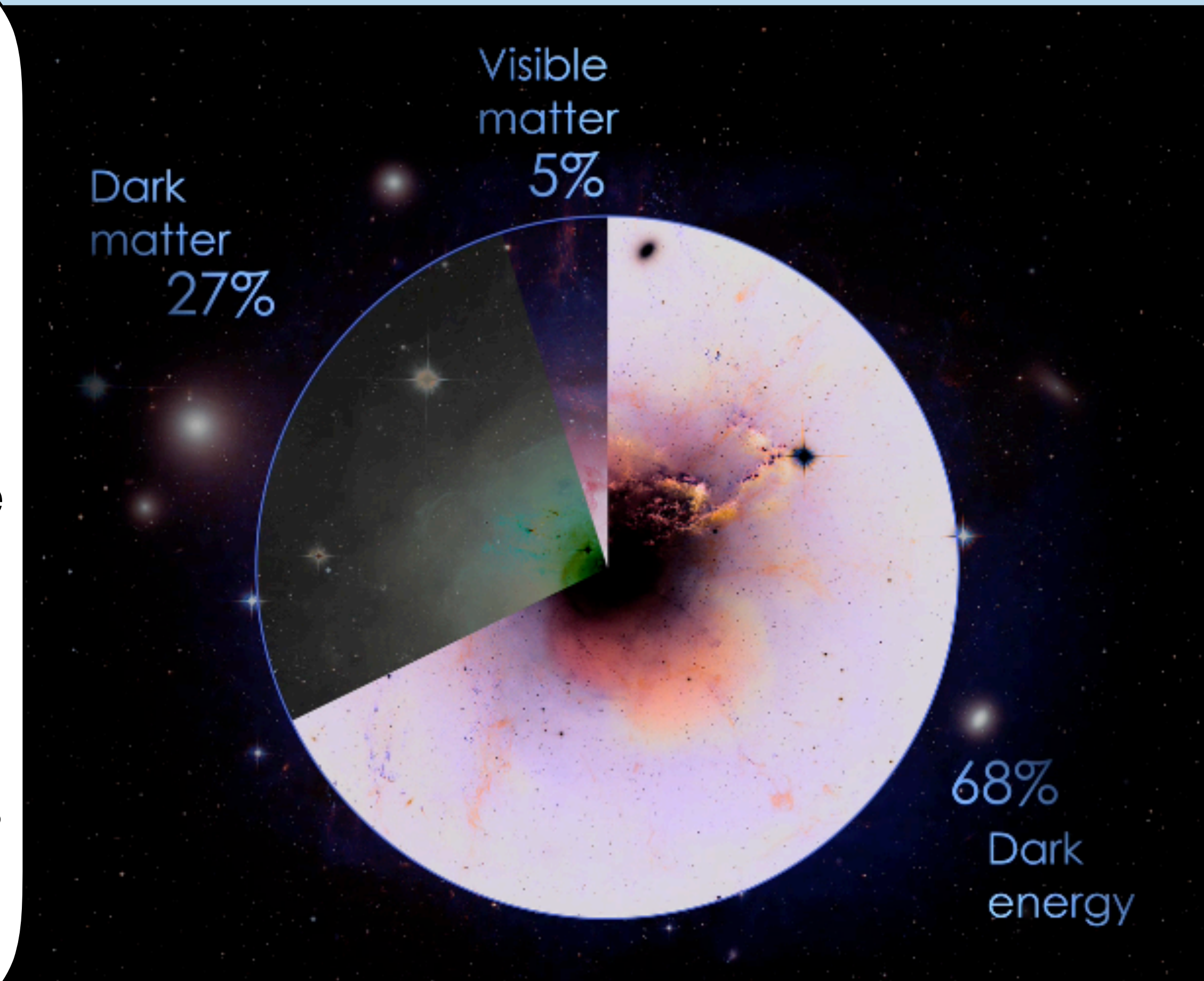
# Goals of the CoS SIG

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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

The screenshot shows the website's layout. At the top is a navigation bar with links: Home, PhysPAG, Science Interest Groups, Science Analysis Groups, Mission Studies, and Resources. Below this is a banner for "Physics of the Cosmos" with the tagline "Exploring fundamental questions regarding the physical forces of the universe". A secondary navigation bar contains "SIG Events" and "SIG Leadership". The main content area features an article titled "Cosmic Structure Science Interest Group (CoS SIG)" with an "Introduction" section. To the right is a "News" sidebar with several recent announcements. At the bottom, there is a subscription form for the "Cosmic Structure SIG News and Announcements Email List".

Events

News Items

What we do

Join our mailing list

# We answer Science Gaps

## Typology:

- Follow-up science: Enhances the science return of a *mission already flying*
- Preparatory science: Enhances the science return & helps plan operations for an *upcoming mission* that is already designed
- Precursor science: Provides information needed to quantify a *future mission's ability* to meet its science goals and to assess mission design options
- Non-strategic: Open science questions not connected to a currently planned/future mission

# Checkout the Science Gap Website

**Physics of the Cosmos**  
Exploring fundamental questions regarding the physical forces of the universe

**Physics of the Cosmos Program Analysis Group (PhysPAG)**

**Science Gaps List**

The Physics of the Cosmos (PhysCOS) program is asking the PhysCOS community to think about science gaps, research areas where additional work is needed, that are relevant to future great observatories as well as general science gaps that are not considered strategic at this time.

Science Gaps can be divided into several categories:

- **Follow-up science:** Enhances the science return of a mission already flying.
- **Preparatory science:** Enhances the science return & helps plan operations for an upcoming mission that is already designed.
- **Precursor science:** Provides information needed to quantify a future mission's ability to meet its science goals and to assess mission design options.
- **Non-strategic:** Open science questions not connected to a currently planned/future mission.

This is the first effort for the PhysCOS community to put together this list that will be eventually published, maintained, and updated on this website in the years to come.

We are soliciting contributions from the Physics of the Cosmos community for science gaps in any of the above categories. Gaps can be submitted via this [Google Form](#).

You are welcome to submit more than one gap, but please submit one gap per form. It is not necessary to complete every field in the form.

Note that this effort is separate from the request for technology gaps as inputs to the ABTR, which will be issued separately.

The [PhysCOS Program Analysis Group \(PhysPAG\) Executive Committee](#) will collect and edit the submitted gaps, posting a draft document to the community for feedback. We anticipate repeating this process every one to two years.

Precursor science gaps were discussed during the NASA's [Precursor Science Workshops in 2022](#) and precursor science gap lists were started by the community. Some of the Science Gaps were highlighted in the [2022 ROSES Proposal Call for Precursor Science Studies](#). Additional input or refinement for those precursor science gaps that were not included in the 2022 Call (and those that were!) is very welcome.

NASA's [Exoplanet Exploration \(ExEp\) Program](#) has been mainly focused on the science gaps that are most relevant to their science and it can be found [here on their website](#). This was the way it was built during the years was presented by the ExEp Chief Scientists at the above workshop [\[PDF\]](#).

**News**

**20 December 2023**  
PhysCOS Announces New PhysPAG Executive Committee Members  
» [Details](#)

TDAMM SIG Kickoff Session at AAS Winter Meeting  
» [Details](#)

Chandra Cycle 26 Call for Proposals Released  
» [Details](#)

ROSES-23 D.18 XRISM General Observer (GO) Cycle 1: Due Date April 4, 2024  
» [Details](#)

ROSES-23 F.21 Artemis Deployed Instruments Program — Second Crewed Landing deferred to ROSES-24  
» [Details](#)

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- We are asking the PhysCOS community to think about the science gaps - where is more research needed, is that work relevant to future observatories, what gaps are not considered strategic right now.
- Input will eventually be published
- Input can also be used to guide future missions

Google Form

Previous Precursor Science Gaps

Examples





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# Get Involved!

**GOAL: To produce a detailed science gap list for CoS SIG related science  
Not just strategic gaps!**

## **CoS SIG has a very broad scope!**

- We need to include discussion of science gaps relevant to the entire field:
  - Dark Energy
  - Dark Matter
  - Neutrinos
  - Tests of inflation
  - Galaxy evolution
  - And more...

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# Our Speakers



**Jordan Mirocha: Astrophysics and cosmology with SPHEREx**



**Remy Gerras: Updates on Simons Observatory**



**Dan Scolnic: Cosmological Measurements with Roman from Type Ia Supernovae**