

Summer 2025

PRIMA

Community Newsletter

Key Dates:

- **September** Publication of PRIMA GO Book Volume 2
- **Oct 6** Abstract submission date for Winter AAS PRIMA special session!
- **Oct 6-8** Infrared Spectroscopy from Space: New Frontiers from Exoplanets to the Early Universe (Pasadena, CA)
- **Nov 10-14** Dusty Universe 2025: The Fifth Pan Dust Conference (Tucson, AZ)
- **Dec 18** Concept Study Report Due Date

News and Updates:

- PRIMA continues to make excellent progress toward the submission of the Concept Study Report. The entire team remains hard at work, and has been successfully shepherding PRIMA through internal reviews! The team remains dedicated to submitting a final Concept Study Report in compliance with updated guidelines from NASA Headquarters.
- **PRIMA JATIS special issue is in progress.** The first group of papers was published in July 2025, with more continuing to follow as they are accepted. Details are shared below.
- The PRIMA **GO Book Volume 2** has received 120 community submissions, with more than 430 authors from 34 countries contributing to these white papers. A team of editors, led by Arielle Moullet, is in contact with authors and is preparing submitted science cases for publication in early September.
- **We thank the entire PRIMA community for their enthusiastic support and advocacy that continues to push PRIMA onward!**

JATIS Special Issue Released

Publication of the JATIS Special Section on the PRIMA Probe-Class Mission Concept is underway, with articles appearing in JATIS Vol. 11 No. 3 as soon as they have undergone the refereeing process. Editors Naseem Rangwala and Matt Griffin have assembled a fantastic group of papers that showcase the technological breakthroughs and scientific opportunities that are motivating PRIMA. You can find the papers on [arXiv](https://arxiv.org/)!

Science Spotlight: New hope for obscured AGN: the PRIMA-NewAthena alliance

(Barchiesi et al., <https://doi.org/10.1117/1.JATIS.11.3.031609>)

Abstract: Understanding the AGN-galaxy co-evolution, feedback processes, and the evolution of Black Hole Accretion rate Density (BHAD) requires accurately estimating the contribution of obscured Active Galactic Nuclei (AGN). However, detecting these sources is challenging due to significant extinction at the wavelengths typically used to trace their emission. We evaluate the capabilities of the proposed far-infrared observatory PRIMA and its synergies with the X-ray observatory NewAthena in detecting AGN and in measuring the BHAD. Starting from X-ray background synthesis models, we simulate the performance of NewAthena and of PRIMA in Deep and Wide surveys. Our results show that the combination of these facilities is a powerful tool for selecting and characterizing all types of AGN. Although NewAthena is particularly effective at detecting the most luminous, the unobscured, and the moderately obscured AGN, PRIMA excels at identifying heavily obscured sources, including Compton-thick AGN. We find that PRIMA will detect ~60 times more sources than Herschel over the same area and will allow us to accurately measure the BHAD evolution up to $z \sim 8$, better than any current IR or X-ray survey, finally revealing the true contribution of Compton-thick AGN to the BHAD evolution.

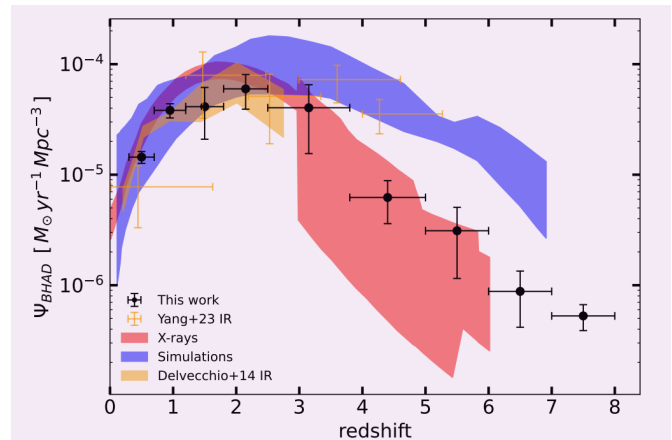


Fig. 6. Prediction of PRIMA-derived measurements of the BHAD. The black points represent the predictions of the BHAD obtainable with a PRIMA Deep survey with PPI1 (98 μ m). For comparison, we report the BHAD measured from X-ray surveys (red area Ueda et al. 2014; Vito et al. 2014; Aird et al. 2015; Vito et al. 2018; Pouliaxis et al. 2024), and IR surveys (orange area and points Delvecchio et al. 2014; Yang et al. 2023). In blue, BHAD predictions from simulations (Volonteri et al. 2016; Sijacki et al. 2015; Shankar et al. 2013) are shown. Our points follow the BHAD measured from the X-rays as our simulations started from X-ray background modelling.

(Barchiesi et al. 2025)

PRIMA at Conferences

PRIMA has been an active presence at conferences all over the world this summer!

Kicking things off at the **STScI Spring Symposium** in Baltimore, Maryland from May 12-16, co-I *Cara Battersby* gave an invited talk on PRIMA science and led a GO science case workshop. At the same time, science affiliate *Irene Shiva* co-chaired **CRISOL 25** in Toledo, Spain, where co-I *Rachel Sommerville* gave an invited talk on PRIMA. Things were in full swing by May 19-21, when **PRIMA and the Future of Far-Infrared Science**, chaired by co-Is *Brandon Hensley* and *Elisabeth Mills*, hosted 355 participants in-person and virtually in Pasadena, CA. The working meeting featured full 3 days of talks from more than 40 members of the community on topics ranging from time-domain astronomy to debris disks and AGN. At the summer **American Astronomical Society Meeting** June 8-12, co-I *Ted Bergin* led a session on anticipating lab astrophysics needs for PRIMA. Meanwhile, at the **Far IR Fine Structure Lines workshop** in Winona, Minnesota from June 10-13, PRIMA featured prominently in talks by co-Is *Matt Bradford* and *Alex Pope* and science affiliate *Jed McKinney*. At the **European Astronomical Society** meeting in Cork, Ireland June 23-27, Deputy PI *Margaret Meixner* and co-I *Carlotta Gruppioni* gave talks to a standing room only crowd at a PRIMA special session chaired by co-I *Laure Ciesla*. Finally, the Japanese community hosted a **PRIMA Science Workshop** in Tokyo, Japan July 7-8, led by *Yao-Lun Yang*. Thanks to everyone who joined us at these events!



Far IR Fine Structure Lines Workshop (Winona, MN)



PRIMA and the Future of Far-Infrared Science (Pasadena, CA)



CRISOL 25 (Toledo, Spain)



PRIMA Science Workshop
(Tokyo, Japan)



EAS (Cork, Ireland)



STScI Spring Symposium
(Baltimore, MD)

PRIMA Community Synergies

Thanks to new missions and observatories the landscape of astronomy is shifting faster than ever. We are asking astronomers to share how they would use PRIMA in combination with other facilities to tackle the latest scientific questions and opportunities.



Andrew Saydjari is a NASA Hubble Fellow at Princeton.

Roman, PRIMA, and precision cosmology

PRIMA will be revolutionary for our understanding of dust in the Milky Way! PRIMAGER's FIR coverage perfectly straddles the family of black body peaks relevant for interstellar dust, which provides robust constraints on dust temperature and is ideal for converting FIR emission to dust extinction. Further, PRIMA's fast mapping speed means it can achieve an all-sky, polarized, 4-band, 3-epoch survey with simultaneous all-sky hyperspectral imaging in just a fraction of the General Observer time. PRIMA's unique capabilities can thus enable the creation of a next-generation dust map with 34x higher angular resolution than the high-impact and still-state-of-the-art SFD98 dust map from COBE/IRAS.

By combining a PRIMA survey with optical/NIR extinctions from Roman/Rubin, we can probe variations in the properties of dust and its local environment across the Galaxy. Precise extinction measurements enabled by PRIMA are key for surveys measuring ultra-large-scale galaxy clustering (e.g. DESI, SPHEREx, and Rubin), where controlling dust extinction systematics is crucial for precision cosmology experiments (e.g., f_{NL}). These sensitive, high-resolution measurements of dust polarization, extinction, and temperature from PRIMA will facilitate a broad range of science cases including studies of feedback, star formation, the interstellar radiation field, and Galactic scale magnetic fields all while producing multi-epoch, legacy data products with lasting community impact for decades to come.



Yun-Ting Cheng is a Research scientist at Caltech.

SPHEREx, PRIMA, and the origins of dust

Polycyclic aromatic hydrocarbon (PAH) emission in the infrared carries rich information about the interstellar medium of galaxies. Tracing PAHs in high-redshift galaxies is one of the key science goals of PRIMA. While PAH features from bright galaxies can be detected individually with PRIMA, the bulk of the PAH emission in the Universe is expected to arise from faint, unresolved galaxies. Intensity mapping offers a powerful complement to individual detections by capturing the aggregate emission from all sources in wide-field imaging data. **We forecast the feasibility of conducting PAH intensity mapping with PRIMA** and find that it can achieve high-sensitivity detections of multiple PAH features out to $z \sim 5$. This capability from PRIMA provides a complementary probe to SPHEREx observations at $z < 0.5$ to help build a more complete picture of galaxy formation and evolution in the early universe.

P-CAST Talks

Our monthly online talk series typically takes place on the 4th Monday of the month at 12:00 PM Eastern

September 8 : Klaus Pontoppidan

September 22 : Edgar Vidal

Information on how to join is on our [P-CAST page](#)!

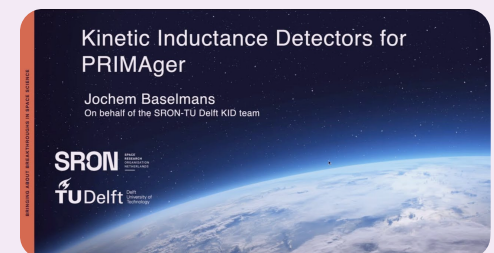
Recordings of past P-CAST talks can be found on our [YouTube channel](#)!



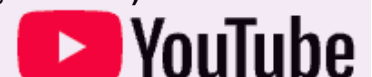
August 25: Yao-Lun Yang (RIKEN)



June 30: Kishalay De (Columbia, Flatiron Institute)



April 27: Jochem Baselmans (SRON, TU Delft)



PRIMA spotlight Highlighting the people who make PRIMA happen!



Marco Cheng (JPL/UC Irvine)

PRIMA summer intern assisting with the preparation of the Concept Study Report

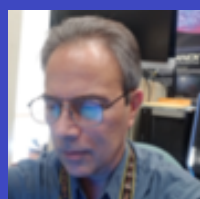
I am a rising senior at UC Irvine majoring in Applied Physics, with a focus on astrophysics and aerospace engineering. At UC Irvine, I work on a variety of projects such as SPHEREx data analysis, aerospace structures, and CubeSat development. This summer, I'm contributing to the PRIMA Step 2 CSR, where I am developing sensitivity calculations and supporting survey statistics with the science team. I intend to pursue graduate studies in observational astronomy/instrumentation, and develop space telescopes as a career. Outside of lab, I am a big Pokémon fan and polo shirt collector.



Kirstin (Kris) Ryan (JPL/ University of Kansas)

PRIMA summer intern working on mission implementation planning

I am a rising junior at the University of Kansas. I am majoring in Engineering Physics pursuing minors in Math and Astronomy. This summer at JPL I am one of the interns assisting the PRIMA proposal team! I have been working in mission implementation, creating figures to understand instrument scanning modes and constraints, as well as a long-term observation schedule. My "dream job" is to work in space mission design, creating probes that enable scientists to make new discoveries about our universe. This internship aligns very closely with my career goals, and I have been so honored to help the proposal come together. Go PRIMA!



John Arballo (JPL)

Technical/scientific graphics and science support for PRIMA

I have been at JPL for over 30 years. During that time I have been involved in software development, data analysis, and science data visualization for ground-based and space missions including ISEE-3, Ulysses, Polar, GAVRT/SETI, Planck, M2020, Europa Clipper and Juno.



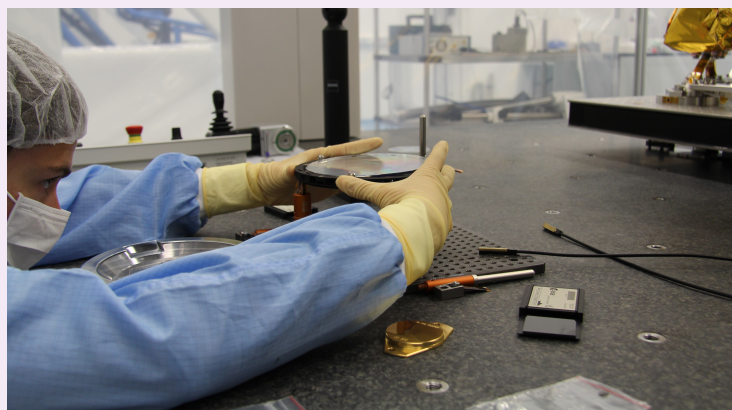
Rendering of the PRIMA spacecraft



Anne Costille (LAM, CNRS)

Lead system engineer for PRIMAgger instrument

As lead system engineer, my responsibility is to define with JPL and the European team the specifications and interfaces between PRIMAgger and the payload. I am managing the architects team that is working on the PRIMAgger design, and in strong interaction with the instrument scientist team to evaluate the performance of the instrument and making sure the proposed design will reach the expected performance. My expertise is mainly in optics and system engineering thanks to my former contribution to the EUCLID mission.



Anne Costille in the lab testing a grism for EUCLID