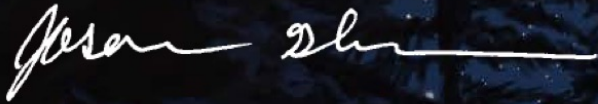


# PRIMA



UNVEILING OUR COSMIC ORIGINS IN THE FAR INFRARED



Dr. Jason Glenn, Principal Investigator  
Goddard Space Flight Center  
and Jet Propulsion Laboratory

Jan 11, 2024

Jason Glenn (NASA GSFC)

Presented by Margaret Meixner

(Jet Propulsion Laboratory, California Institute of Technology)

on behalf the PRIMA team.

PI science overview  
Instrumentation  
Detectors  
GO science

At AAS



PI: Jason Glenn  
DPI: Margaret Meixner

PS: Matt Bradford  
DPS: Klaus Pontoppidan

Science Lead: Alexandra Pope  
Dep. Sci. lead: Tiffany Kataria

IDEA Lead: Cara Battersby

Many astronomers providing use cases – kudos !

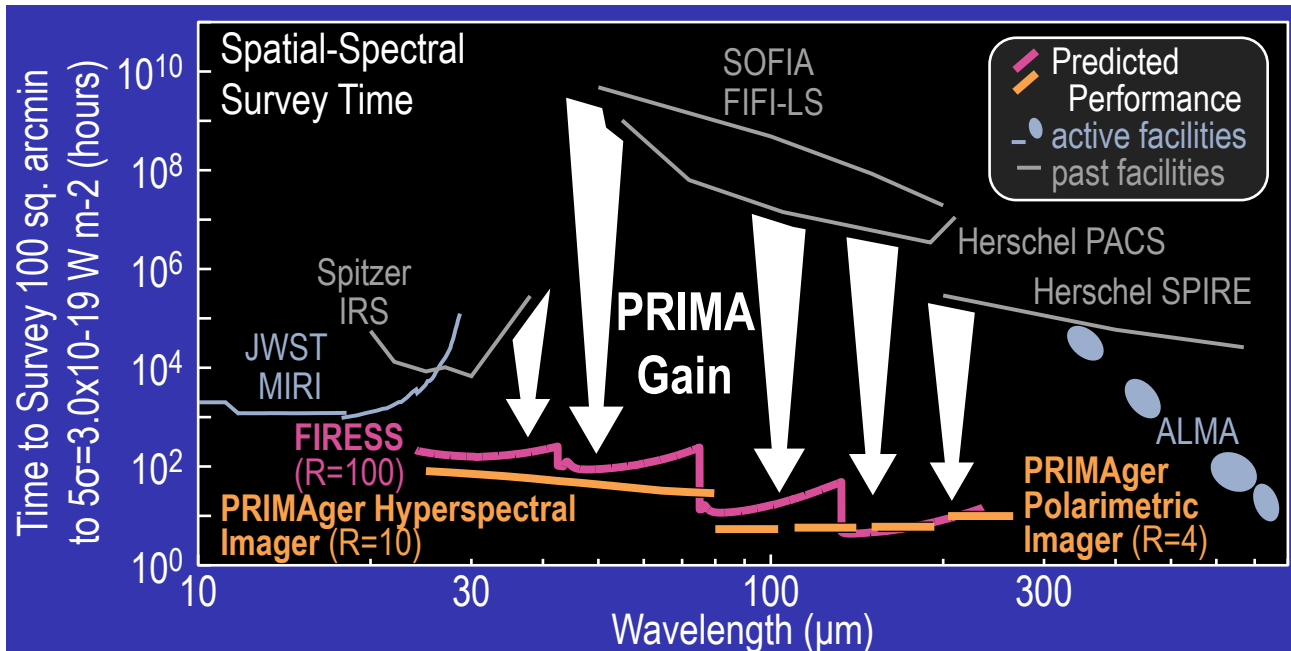
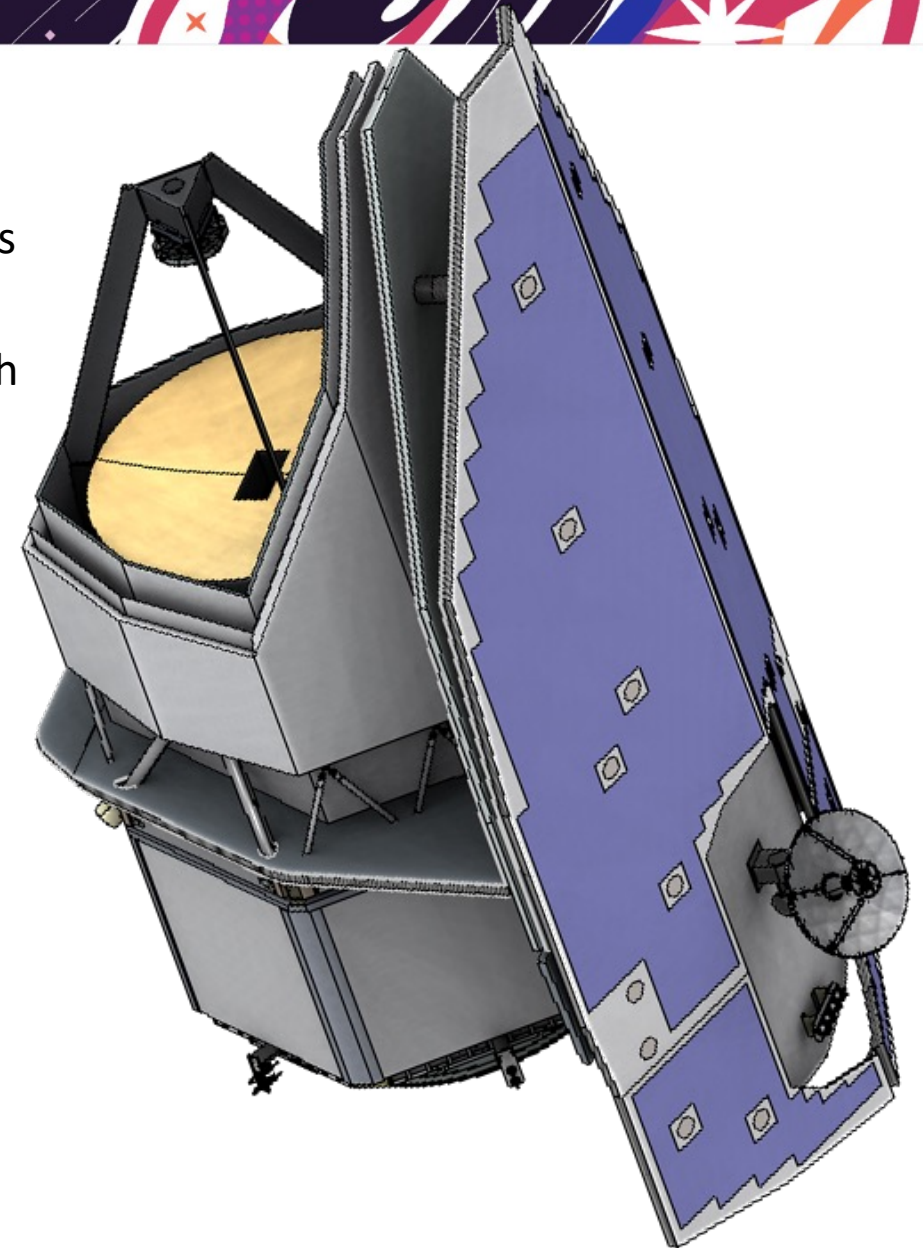
Excellent engineering / technology teams at JPL, GSFC

Strong JPL formulation team: Jenn Rocca, Liz Luthman, Steve Unwin, w/ D. Richardson @ GSFC

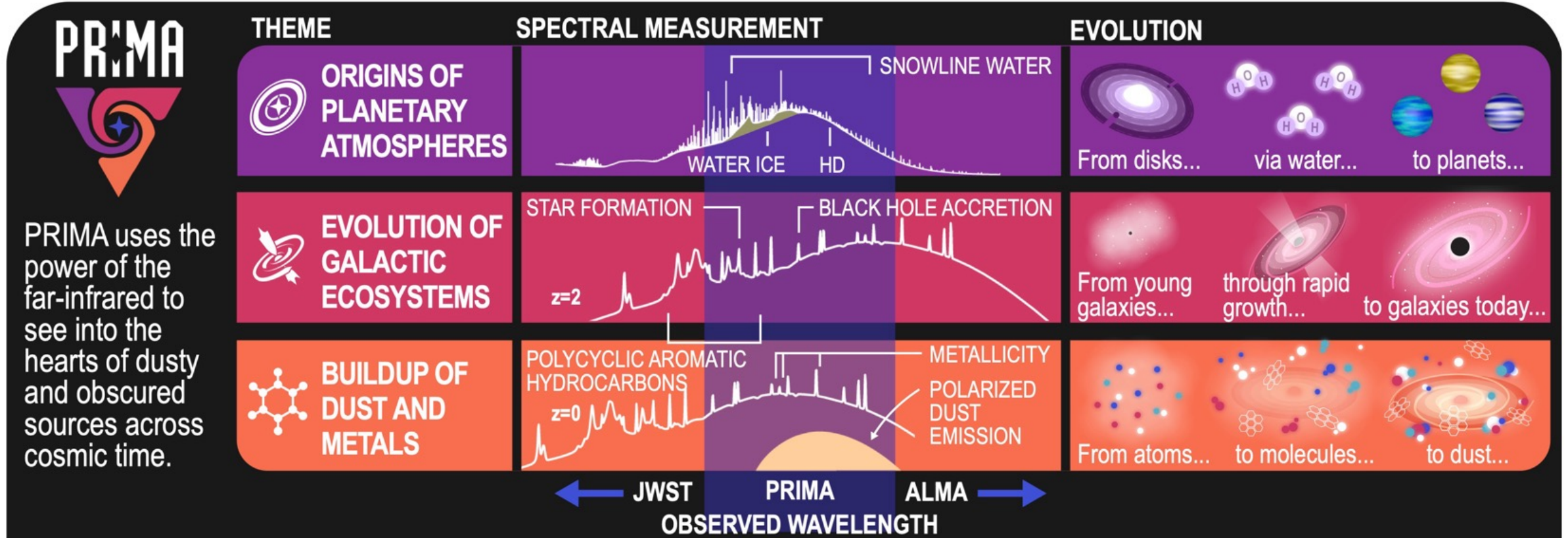


## PRIMA at a Glance

- 1.8-m, all-aluminum telescope cooled to 4.5 K.
- PRIMAgger imager and polarimeter (France / Netherlands): 25-80 microns R=10 hyperspectral imaging, 91-232  $\mu\text{m}$  imaging polarimetry.
- FIRESS Spectrometer (JPL w/ GSFC) : 24-235  $\mu\text{m}$  in 4 grating modules with  $R>85$ . High-res mode gives R of thousands across full band.
- 100 mK focal planes with kinetic inductance detectors, provided by joint JPL/ GSFC and SRON team.
- JPL lead with GSFC, Ball spacecraft, IPAC data handling, many others.



## PRIMA PI Science Programs: Exercises the observatory, and provides legacy datasets

**Planetary Atmospheres**

106.18, Unwin et al.

High-res spectroscopy across the full 24-235  $\mu\text{m}$  band.  $R = 4,400$  at 112  $\mu\text{m}$ **Galactic Ecosystems**

306.07, Mills et al.

Hyperspectral blind imaging surveys, follow-up full band spectroscopy for fine-structure lines, PAHs at  $z=1$  to 2.3

Full-band medium res spectroscopy for outflows

**Dust and Metals**

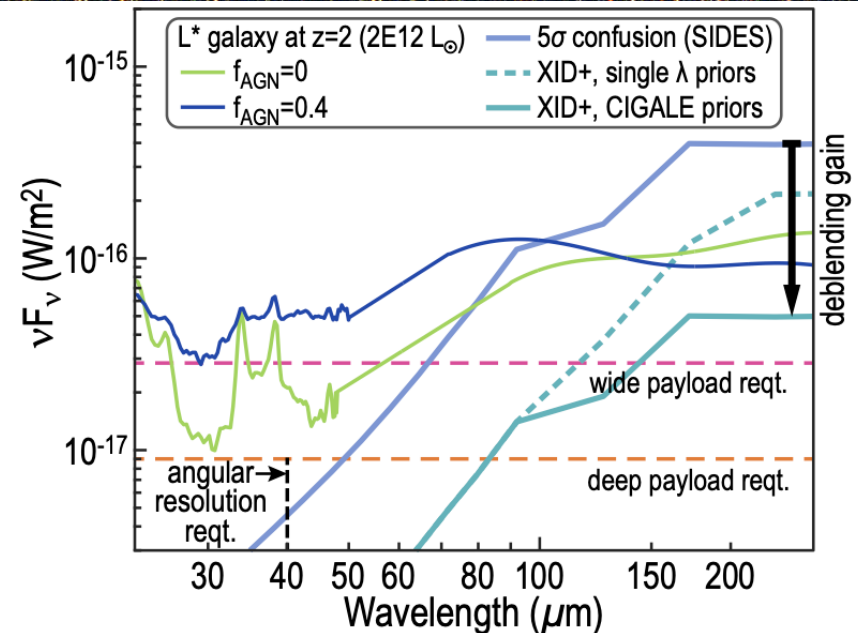
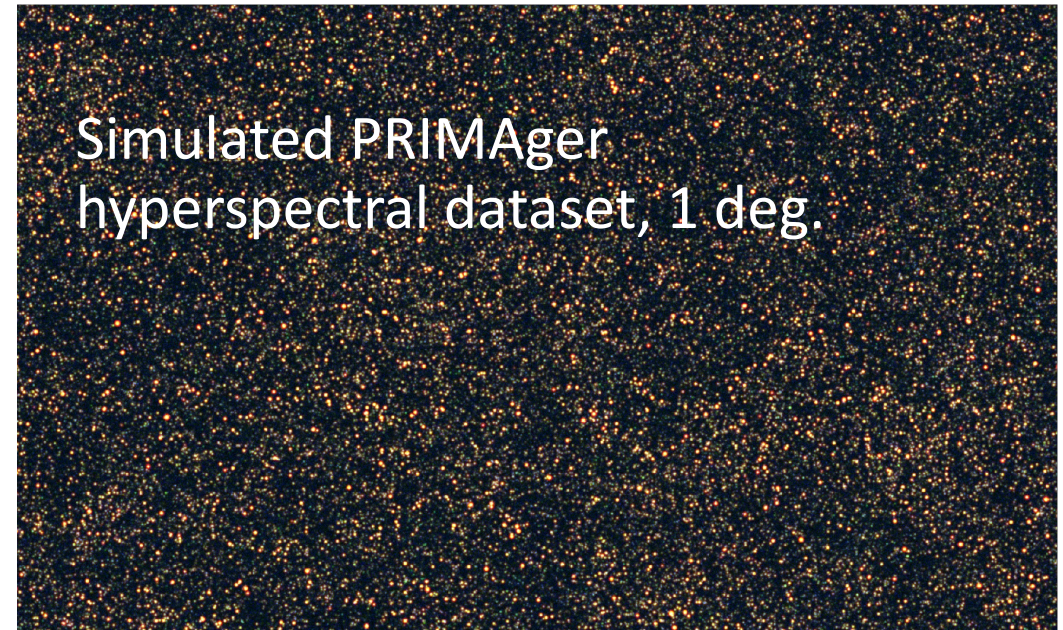
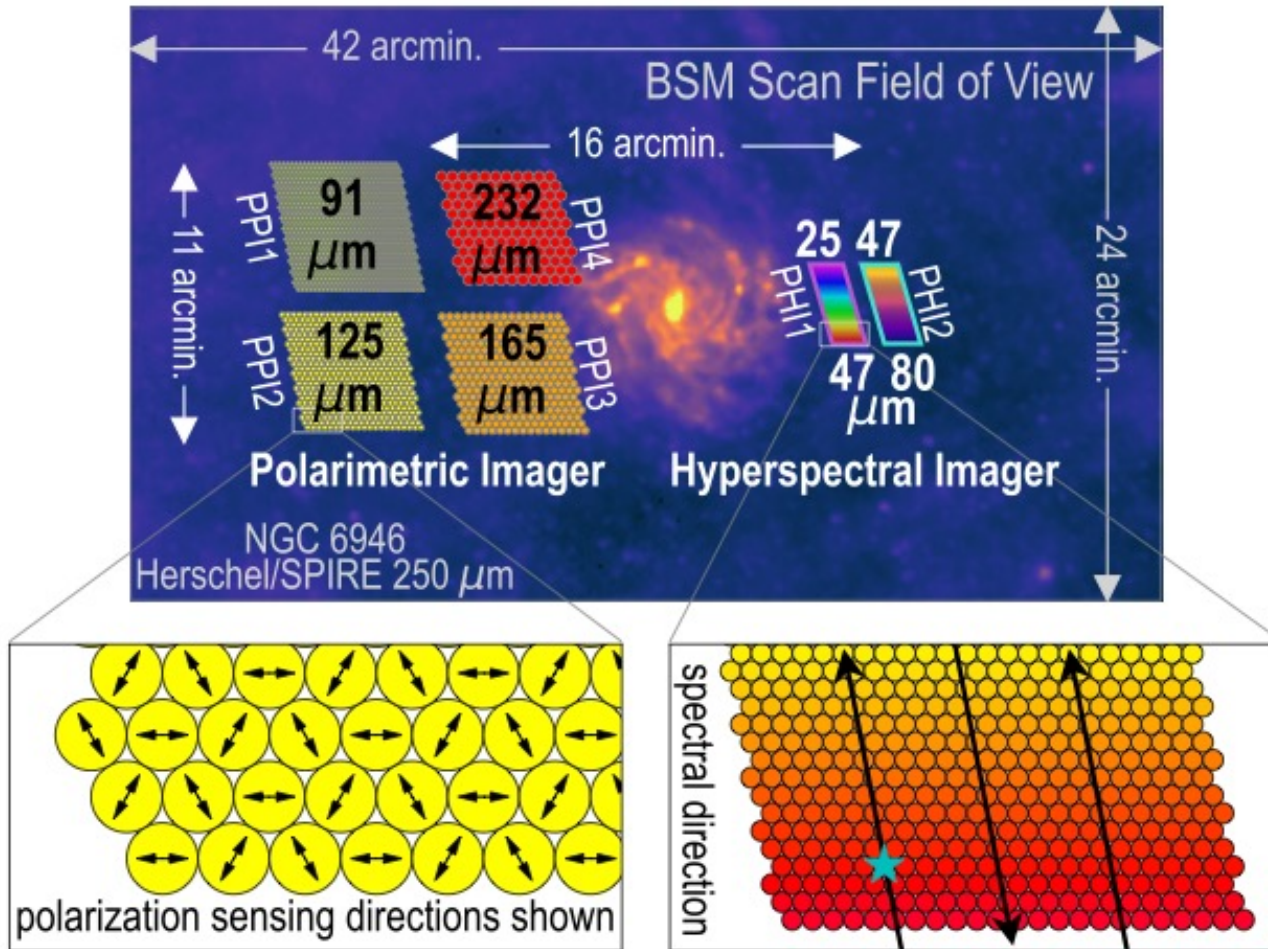
457.02, Staguhn et al.

Polarimetry at 90-235  $\mu\text{m}$



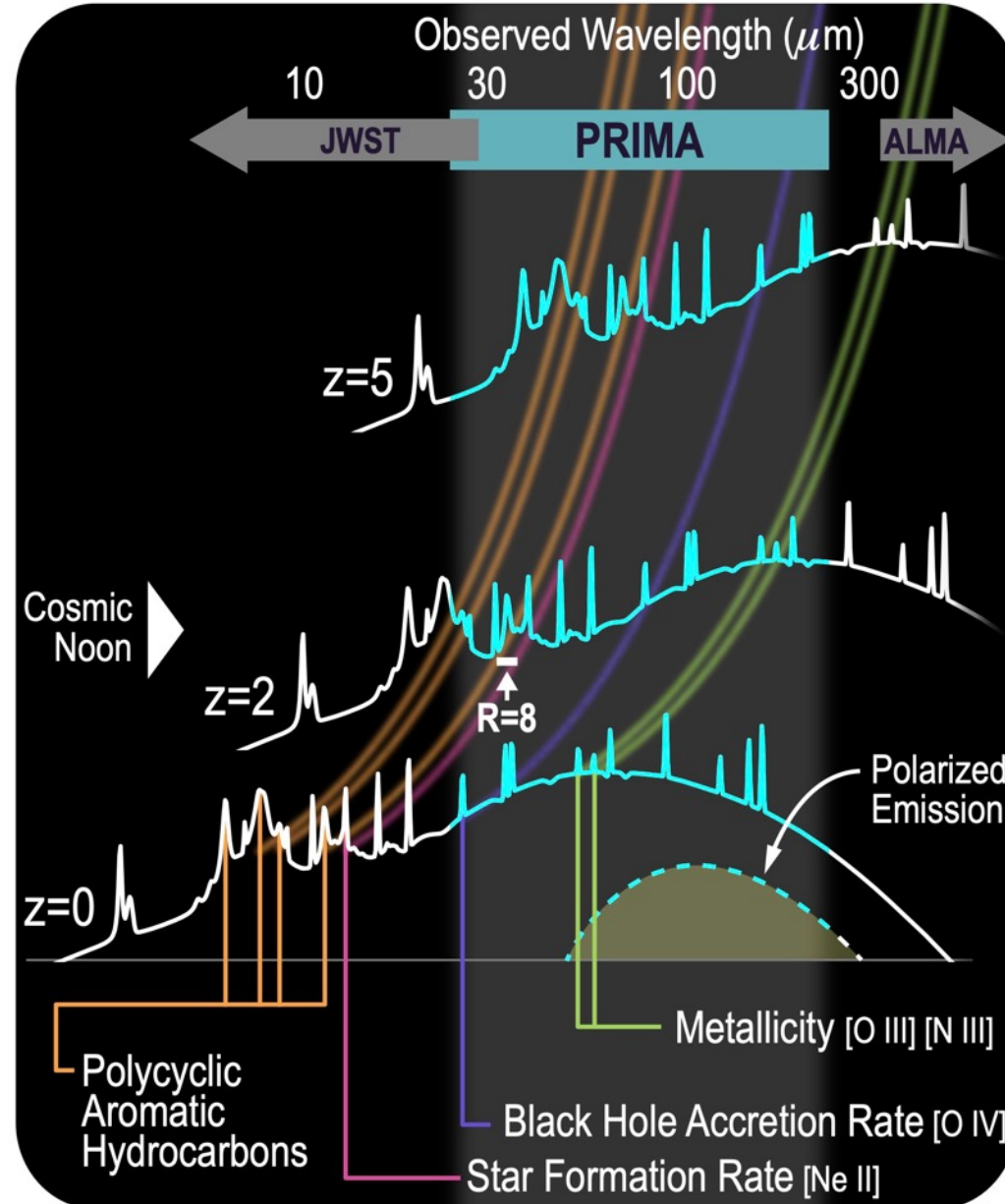
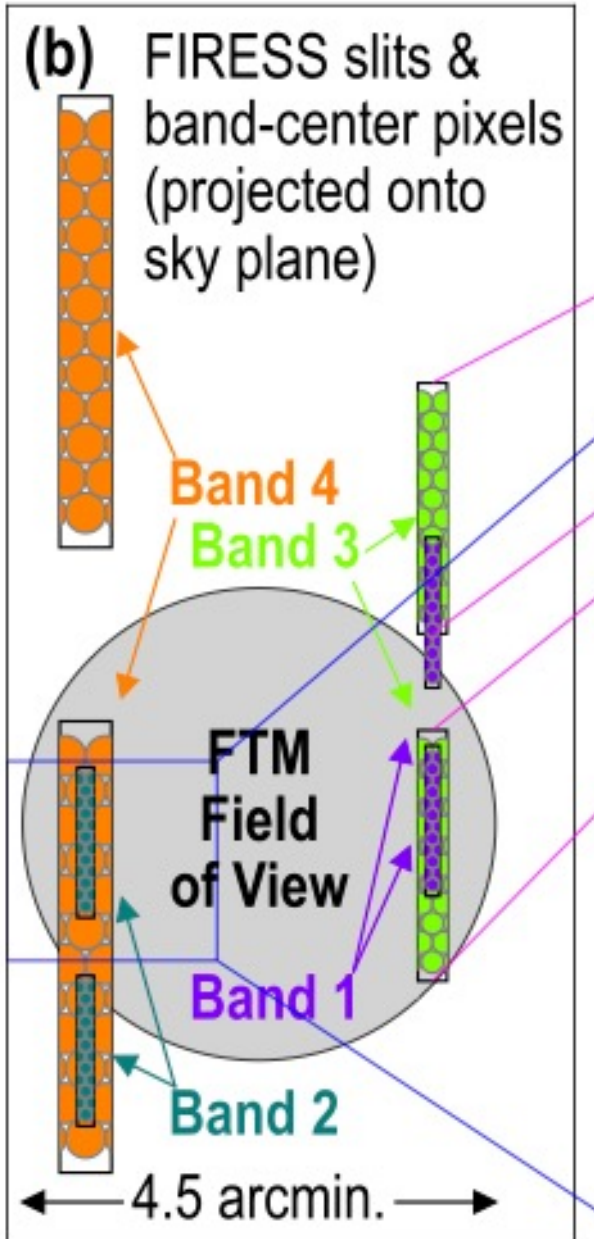
# PRIMAger Instrument (Leads Denis Burgarella, Laure Ciesla, Marc Sauvage) iposter 457.13, Meixner et al.

PRIMAger On sky





## FIRESS Instrument, iposter 457.11, Bradford et al

24-235  $\mu\text{m}$ 4 grating modules with  $R > 85$ .High-res mode gives  $R$  of thousands across full band.

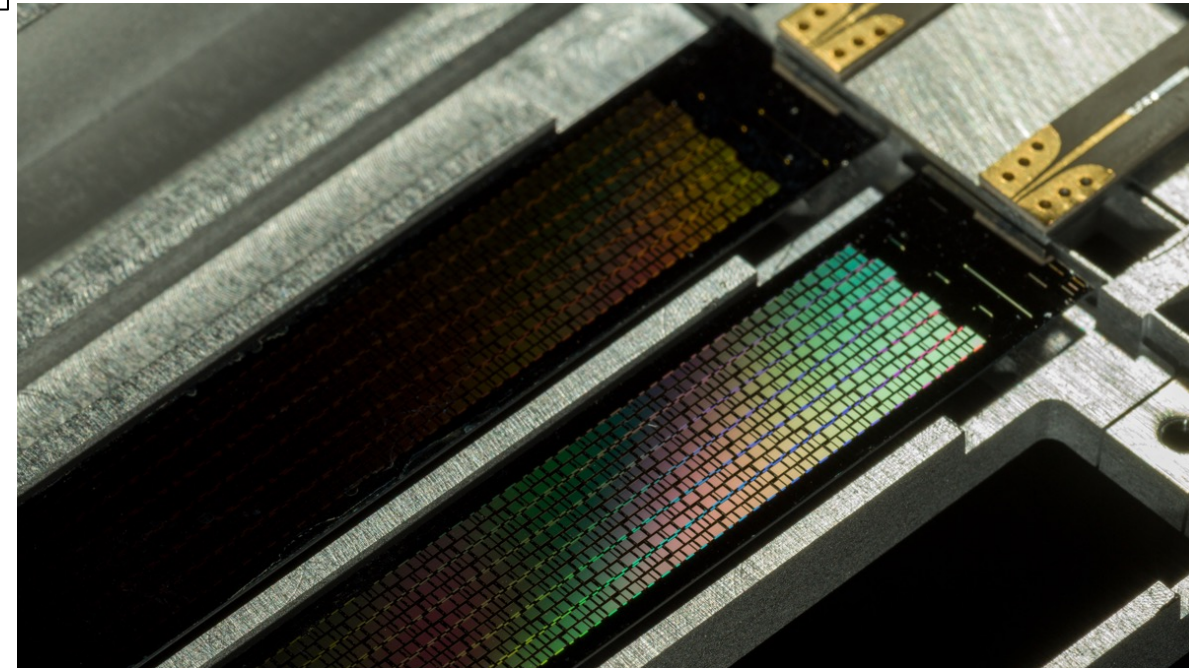
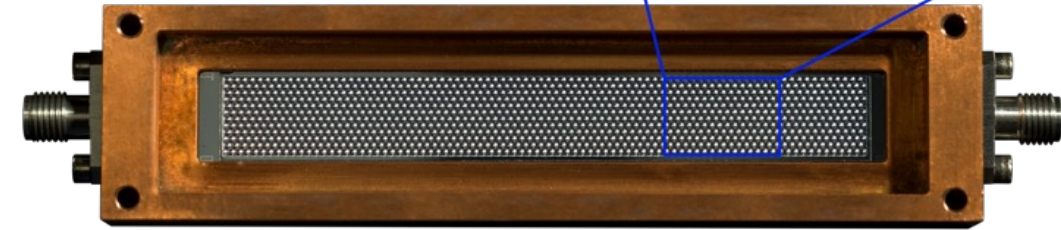


## KID Detectors: a JPL / GSFC / SRON Collaboration for PRIMA

- ***Sensitivity exceeds performance requirements over full wavelength range.***
- Demonstrated detector/lenslet hybridized arrays with full FIRESS format (84x12, 900- $\mu\text{m}$  pixel pitch). PRIMAGER prototypes in place from SRON.
- Key remaining challenge is yield with lenses bonded and full-band readout.

SRON PRIMAGER  
polarimetric array  
prototype: 96%  
resonator yield

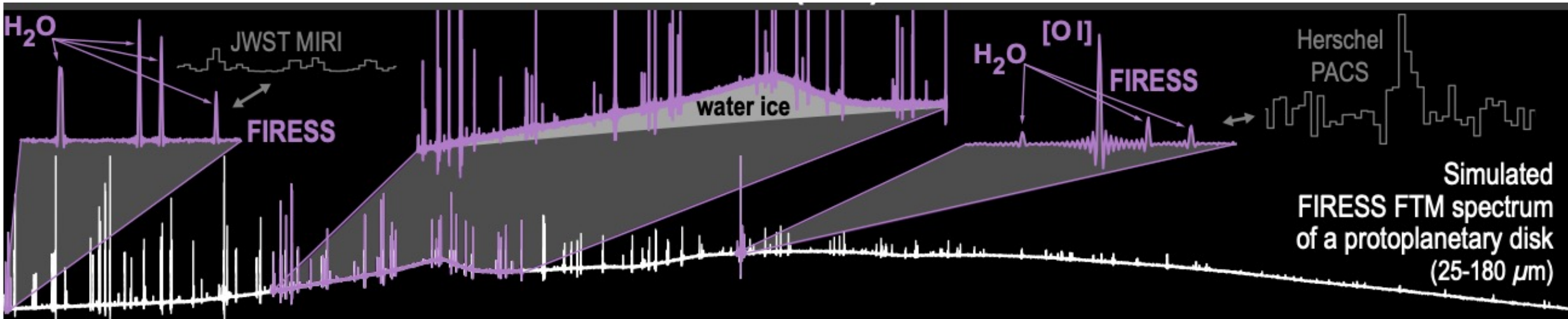
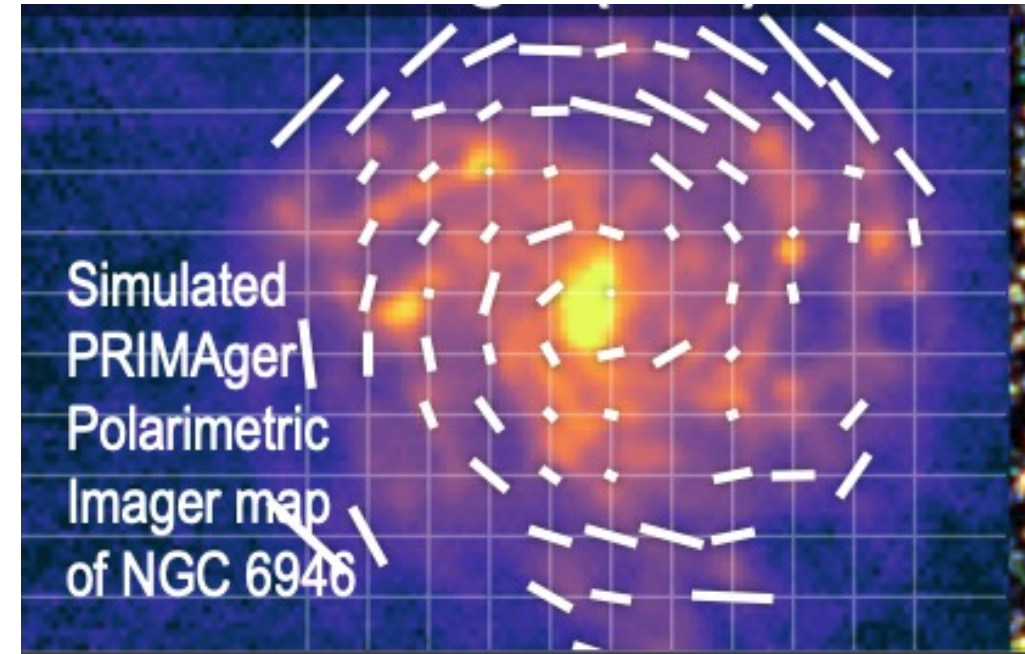
JPL FIRESS arrays  
12 x 84 pixel tiles, 2  
per focal plane: >90%  
resonator yield





## PRIMA GO Opportunities: 75% of time is for GO programs, iposter 360.03, Moullet et al.

- GO book a set of example fiducial cases – 76 cases in total. Thanks very much to those of you that contributed.
- Demand for a far-infrared observatory is high, ~21,000 hrs with PRIMAgger 35%, FIRESS 32%, both together 33%
- **Time domain cases were prominent:** young stellar object accretion, transient follow-up, high energy compact object mergers. PRIMA will provide a substantial time line and agile observatory to expand this important window on the universe.



Thank you! Visit our website!

[prima.ipac.caltech.edu](http://prima.ipac.caltech.edu)

