THE ROMAN CORONAGRAPH

SCIENCE CASES

Roman School
Europe

March 9
2026

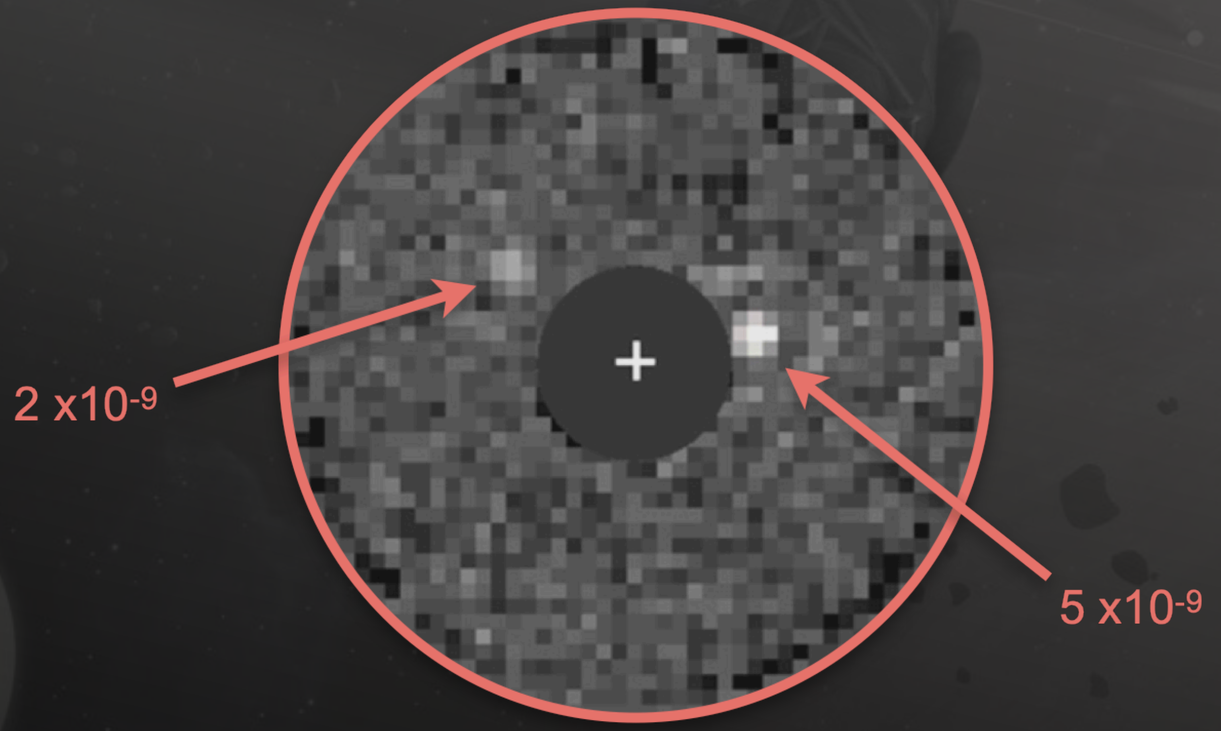
Julien Girard

Space Telescope Science Institute (SOC)

Community Participation Program (CPP)

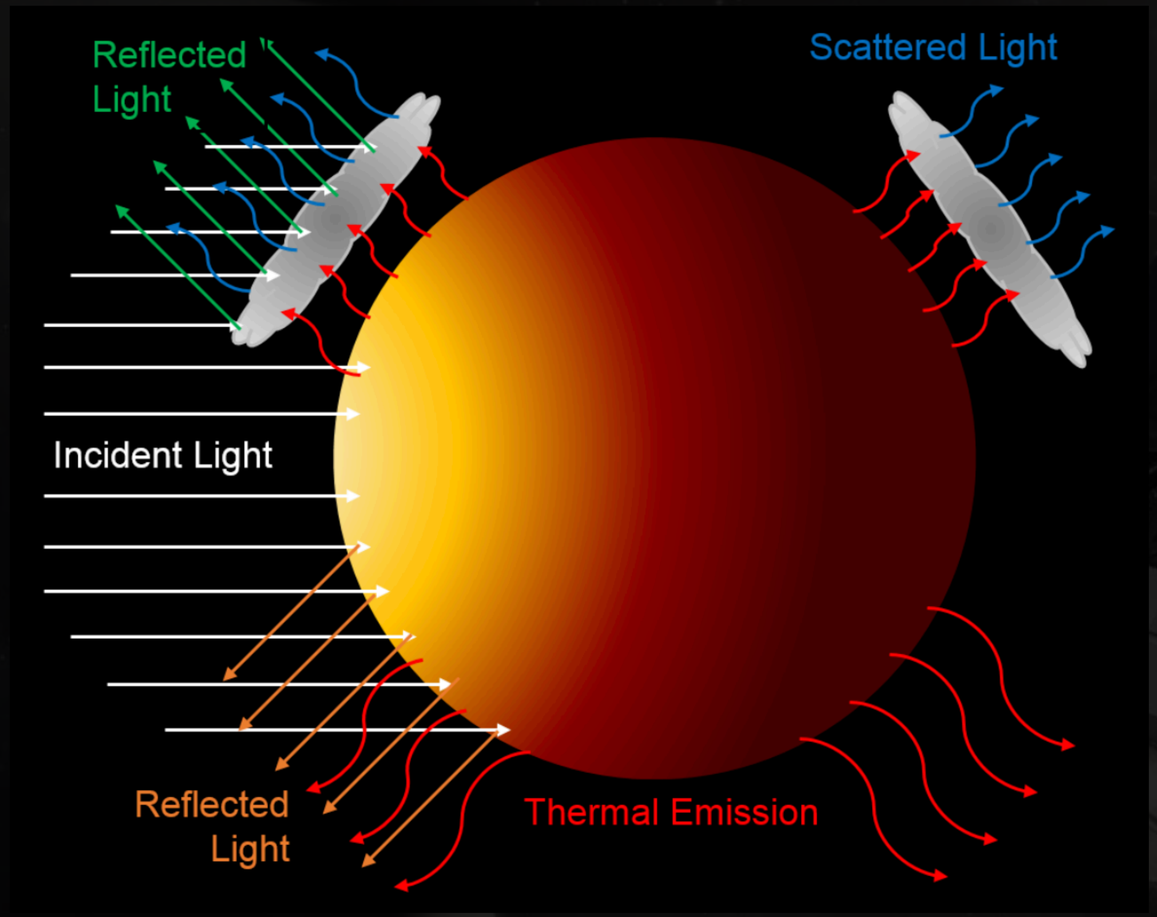
GIANT PLANETS IN REFLECTED LIGHT

Visible light contrast > 10^8



OS11 Simulation (Krist et al. 2023)

GIANT PLANETS IN REFLECTED LIGHT



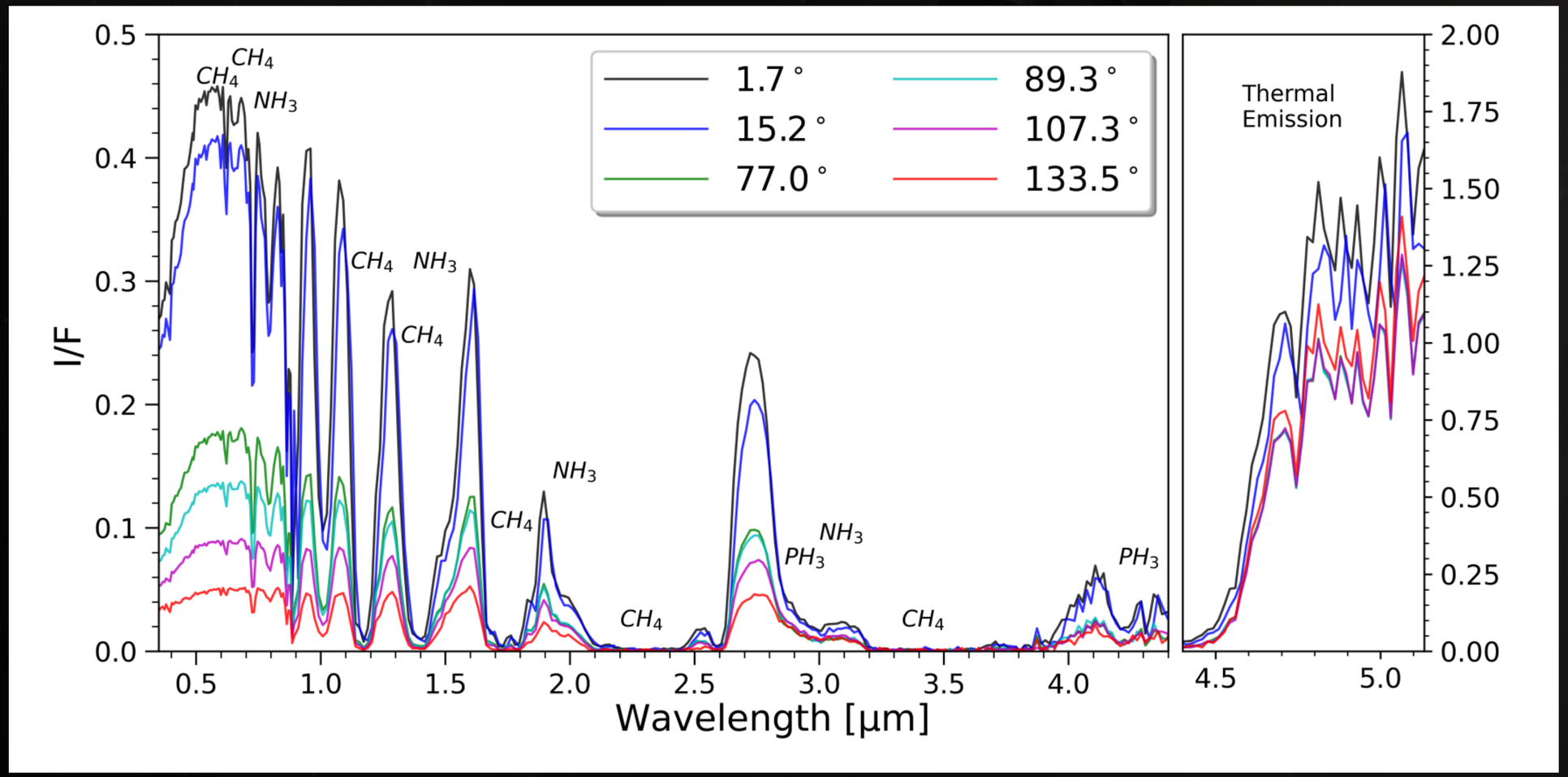
LIKE JUPITER IN THE NIGHT SKY

JUPITER'S SPECTRUM

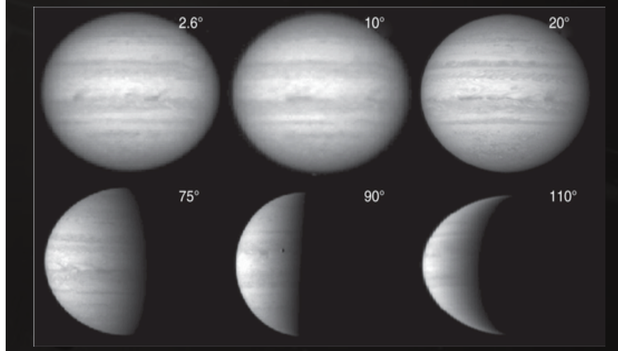
Coulter et al. 2022

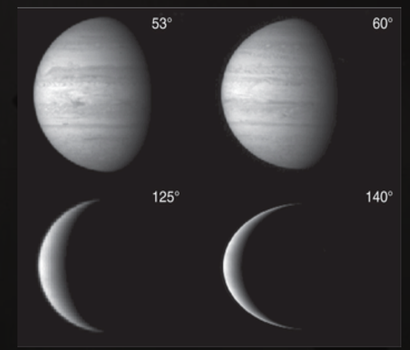
REFLECTED LIGHT

THERMAL LIGHT

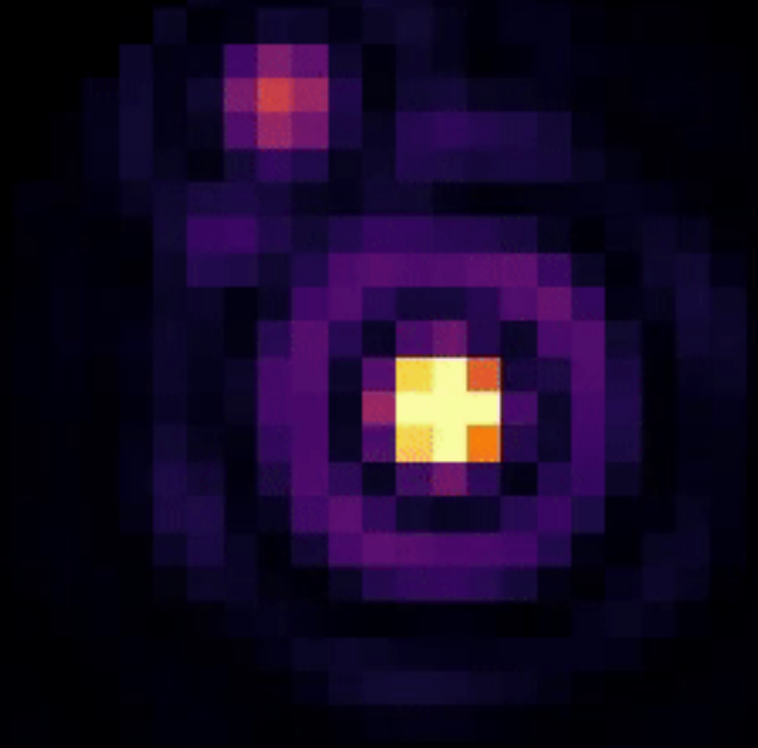


PHASES





GIANT PLANETS IN REFLECTED LIGHT



NOISELESS SIMULATION

Noiseless simulation made
for the Roman Exoplanet Imaging Data Challenge
(2019, Neil Zimmerman, OS 6

$\Delta T = 0.01$ yr

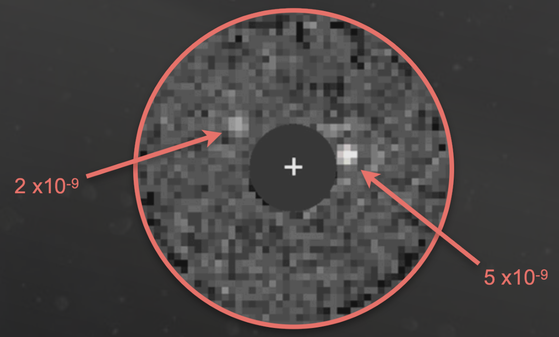
The star (47 UMa)
has been subtracted out.

3 fictitious planets orbit
in the system and their
flux is attenuated by the
HLC coronagraph
throughput and the
effect of the phase in
reflected light

GIANT PLANETS IN REFLECTED LIGHT

VISIBLE REFLECTED LIGHT SPECTROSCOPY!

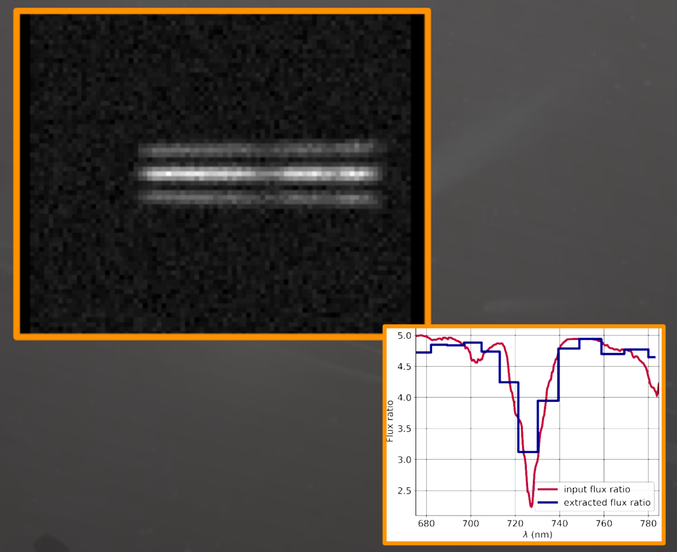
Visible light contrast > 10^8



OS11 Simulation (Krist et al. 2023)

680-780 nm
Band 3

CH4 absorption, albedo

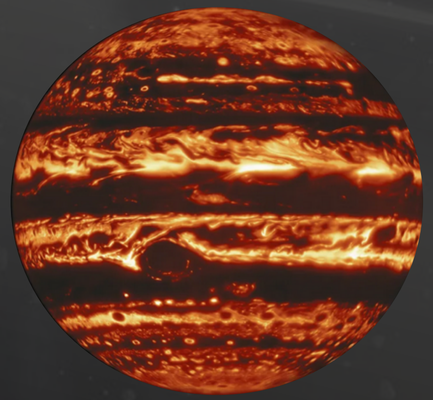


Methane absorption

Briana Lacy will talk more about that

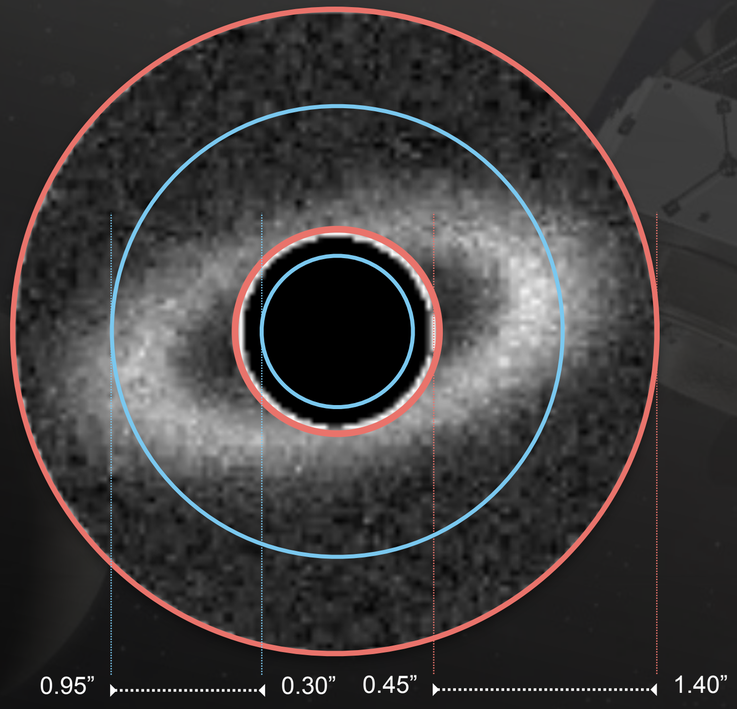
SELF LUMINOUS GIANT PLANETS

B1, B3, B4 light contrast > $10^{6 \text{ to } 9}$

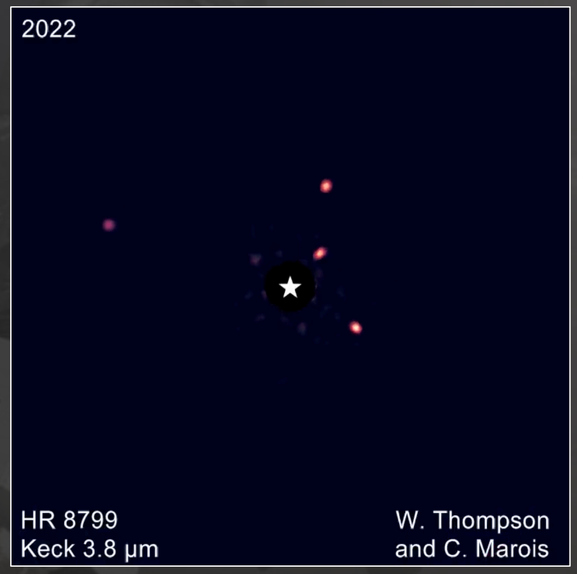


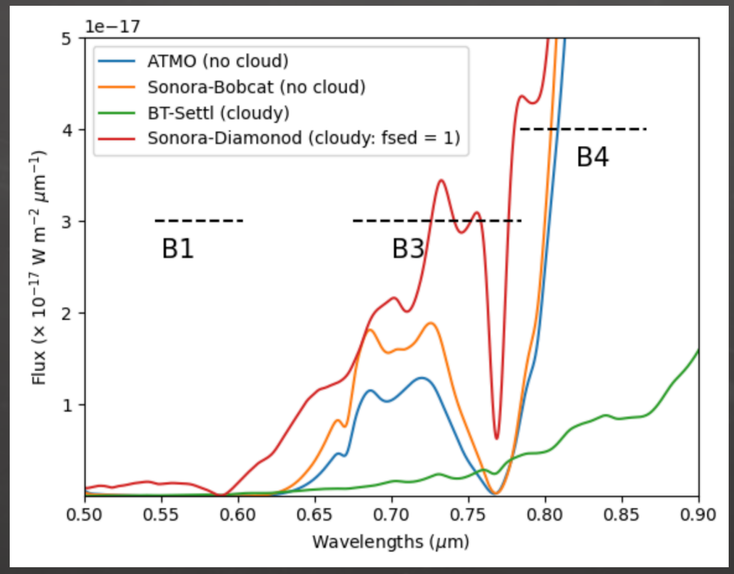
Wide Field Imaging - SPC

(goal)



Atmospheric properties
of known, previously imaged giants planets

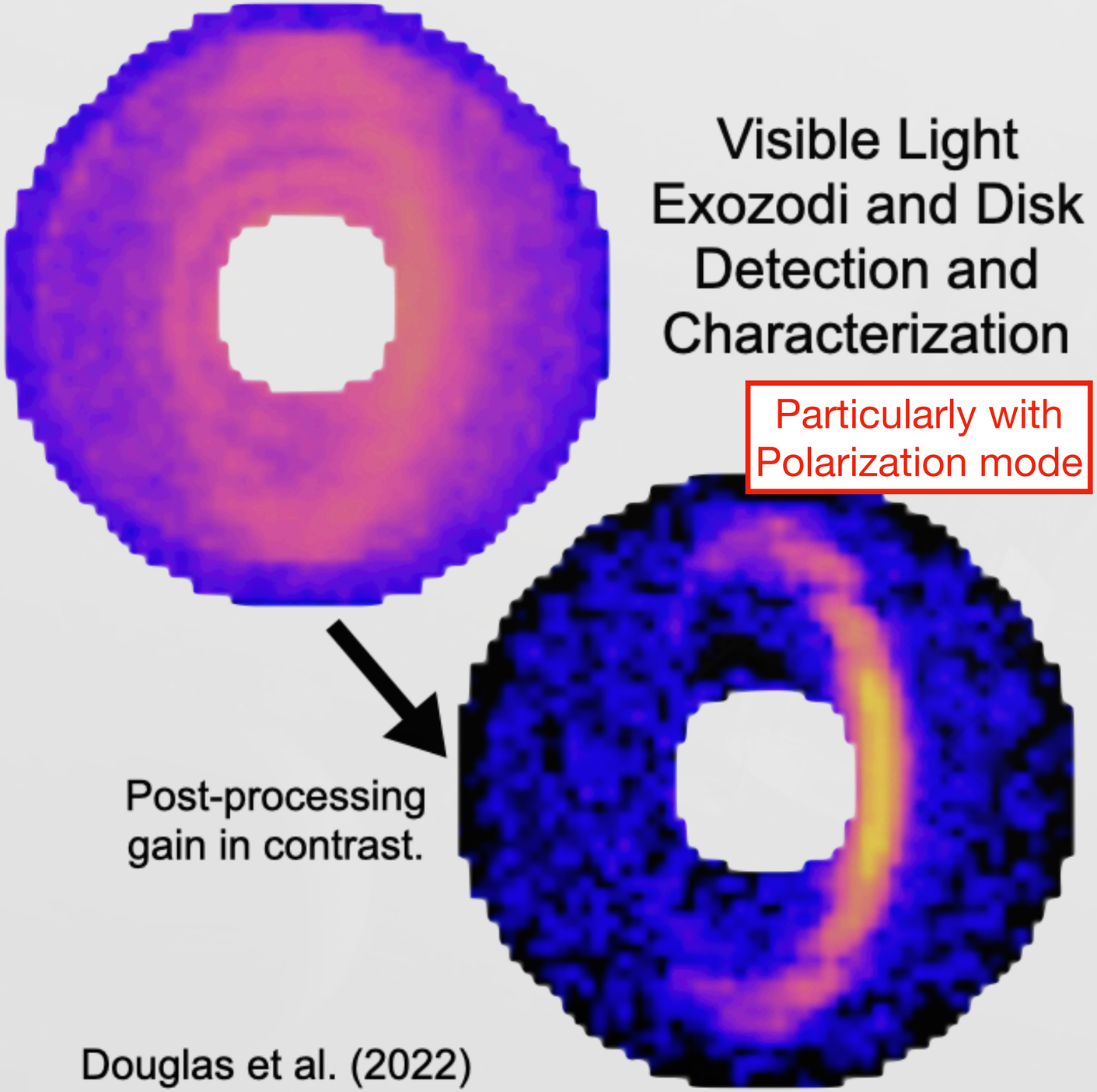




M. Kuzuhara

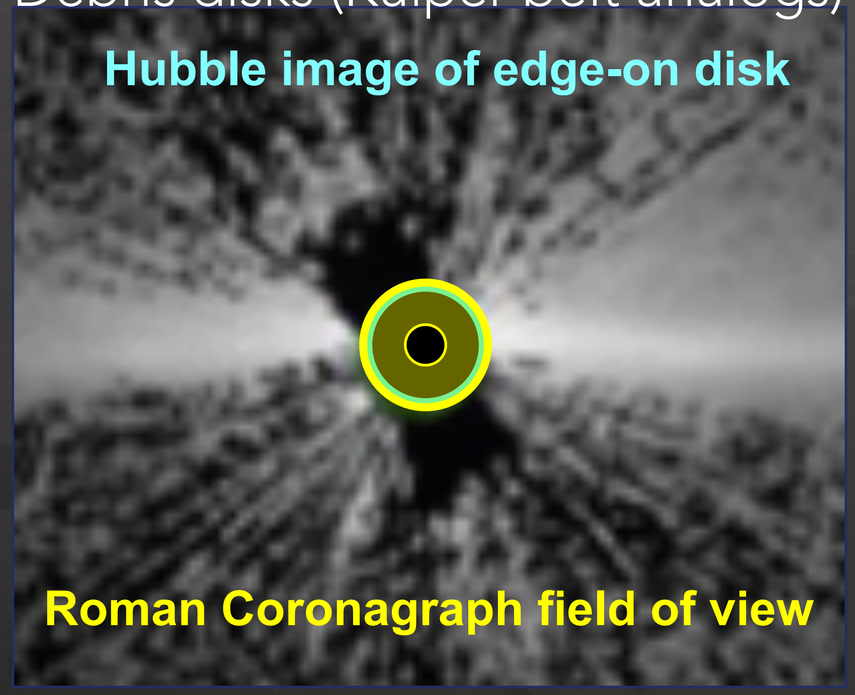
It’s not trivial to estimate B1, B3, B4 fluxes
(contrast regimes)

Zarah Brown & Sagnick Mukherjee
will talk more about that



OPPORTUNITY FOR DISK SCIENCE

Debris disks (Kuiper belt analogs)



Isa Rebollido & Ramya Anche
will talk more about that