

Some Closing Thoughts Know Thy Star, Know Thy Planet 2

#knowthystar2



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Caltech

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What do we need for HWO Targets?

Know Thy Star, Know Thy Planet 2 Conference

February 3 - 7, 2025 • Ramo Hall on the Caltech Campus

#KnowThyStar2

Community
Input Request

Stellar/System Characterization Needs for HWO

This week's Know Thy Star, Know Thy Planet meeting brings together many experts in stellar and exoplanet characterization. We'd like to leverage this gathering and collect the community's inputs on what types of stellar and exoplanet system knowledge are most crucial to obtain in advance of the Habitable Worlds Observatory (HWO).

This form is intentionally open ended, and we invite you to submit your thoughts in whatever format is best / easiest for you. All questions are optional, responses that address only some of the questions are welcome!



https://bit.ly/KTS2_HWO_Characterization

#knowthystar2

Posting the Talks

- We would like to post the talks
- All speakers will be contacted for permission and have the opportunity to say no or remove things they don't want shared
- Recordings of talks will also be posted.

235 (200 in-person) attendees



A Big Giant Thank You to You All

Some General Observations

2017 was all about discovery ... 2025 has been all about characterization

“Know thy star, know thy planet, know thy system, know thy formation, know thy demographics”

• - *Dan Huber*

Some General Observations

2017: presentations dominated by Kepler and 1 m/s RV

- Before Kepler and After Kepler

2025: presentations dominated by Kepler, TESS, sub-1 m/s RV, Gaia, JWST

- Before JWST and After JWST
- Before Gaia and After Gaia

“Pre-Gaia times were rough!” – *Zafar Rustamkulov*

Some General Observations

2017: sun/stars are not constant and have inhomogeneities

- And are a pain for planet discovery

2025: sun/stars are still not constant and still have inhomogeneities, but we have even more detailed models both empirically and physically of the structures on the stellar/solar surfaces

- And are a pain for planet characterization

Some General Observations

But one thing always remains true ...

One person's noise is another person's signal

“We are definitely signal to noise limited - we could correct this with more signal and less noise.”

- Nathanael Burns-Watson

Some General Observations

2017: Gearing up for TESS

2025: And wow – TESS has been incredible

Some General Observations

2017: Gearing up for JWST

2025: And wow – JWST has been incredible

Some General Observations

2017: Gearing up for Gaia

2025: And wow – Gaia has been (and will be) incredible

Some General Observations

2017: Gearing up for Improved Modeling

2025: And wow – Improved Modeling has been incredible

The Future is amazing ...

JWST, Gaia, Pandora, SPHEREx, Roman, Plato, Ariel, HWO

Continuing and improving techniques, instruments and models

“But beware we may have a 6σ detection that the Moon is made of cheese.” - *Luis Welbanks*

Some General Observations

- 2017: No Coffee (*#wheresmycoffee*)
- 2025: Coffee !!
 - And Food !
 - Wine/Beer !



A big giant thank you ...

Frank Aragon

Sean Kindt

Catherine Clark

Pina

Wendy Burt

Mari Castillo

Eric Oh

The IPAC Staff

The Caltech Staff



KTSKTP → KTSKTP2 → KTSKTP3

“Know Thy Star 1 was the very first conference I ever attended as an undergrad.” – *Sam Yee*

(And he came back!)

I hope that is true for many of you for this meeting as well !

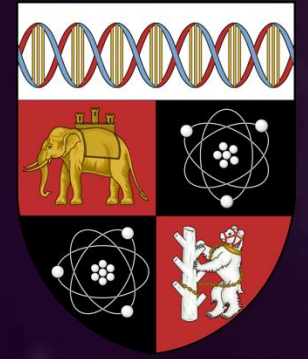
Know Thy Star, Know Thy Star 3

2017 → 2025 → 2033

But asteroid 2024 YR4 is
supposed to impact the
earth in 2032



Know Thy Star, Know Thy Star 3



2017 → 2025 → 2028

University of Warwick (Talk to Heather Cegla)



“Never underestimate the ability of nature to screw with you.”

- Calibration, calibration, calibration!
- Those who already know astereoseismology can check their email or go to sleep
- Probably a miracle I got this far without talking about interferometry.
- Corpuscular
- A whole slew of mathematical jiu jitsu
- I am not responsible for any of the acronyms
- We ignore the binaries
- I do love the binaries
- I have never heard limb darkening spoken about with such malice in all of my years going to star meetings as I have in the 2 days of this conference.
- Pay no attention to the vampire costume.
- Just look at that transit with JWST!
- Stars are scary!
- Know Thy Star AND Know Thy Instrument
- Know Thy Sun, Know Thy Earth
- Know Thy Haze
- Know Thy Star, Know Thy Protoplanetary Disk
- Know Thy Rockstar (Karaoke)