2026 Sagan Summer Workshop

Monday, July 20

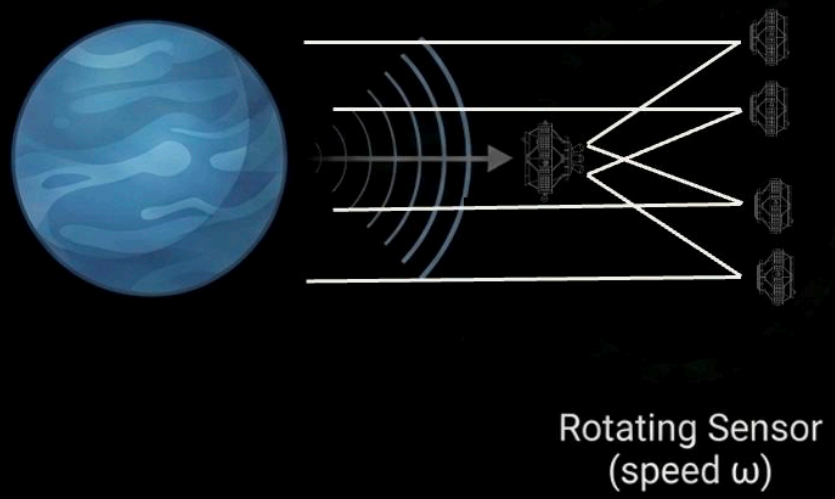
Poster Pops 1

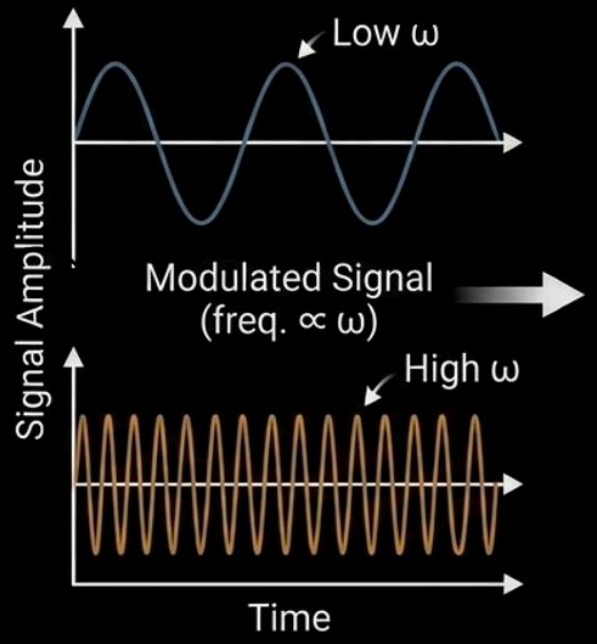
SAGAN SUMMER WORKSHOP

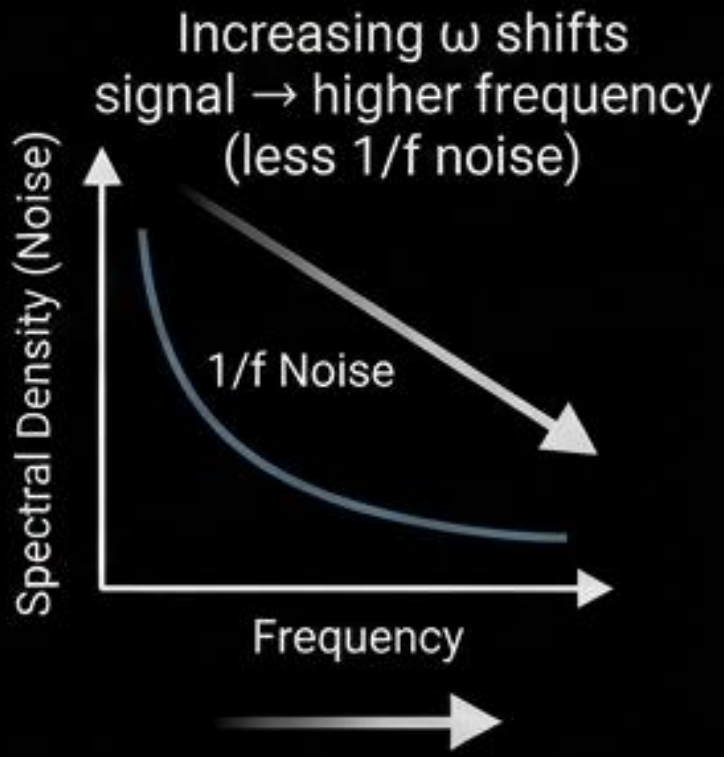
nexsci.caltech.edu/workshop/2026

NExScI

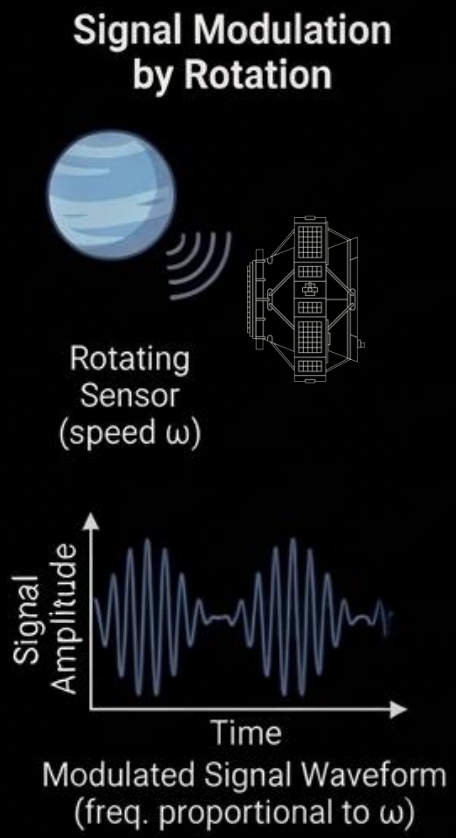
Rotation-Speed Optimization for Planet Detection in a LIFE-like Nulling Interferometer

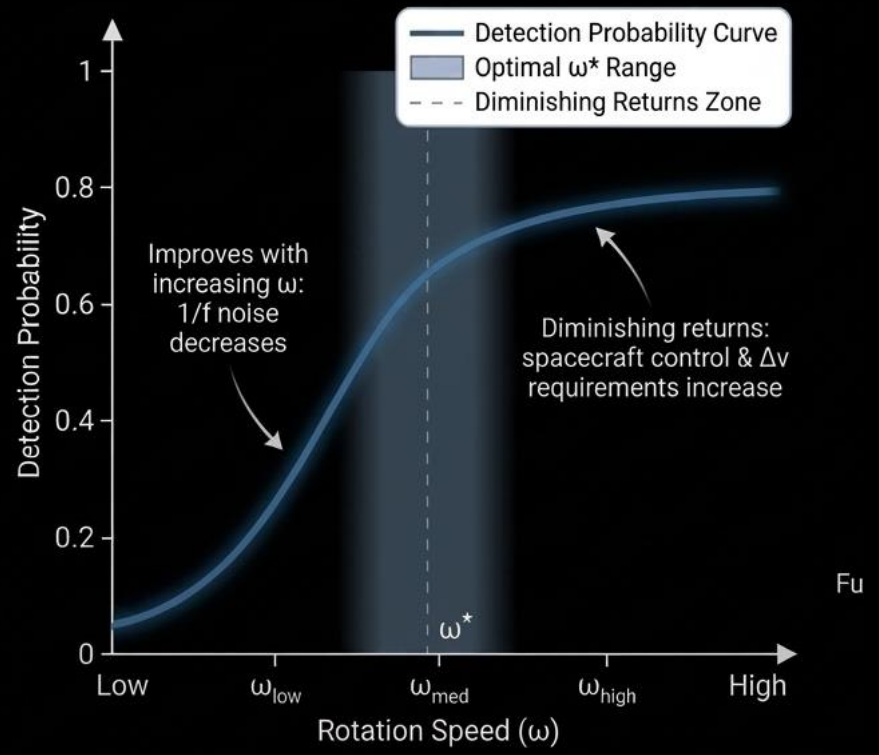


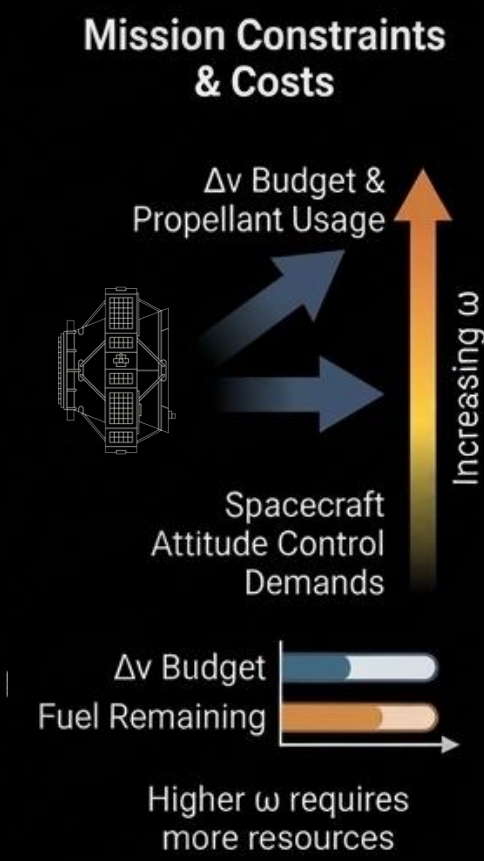




What rotation speed ω* provides the best detection performance under realistic mission constraint?

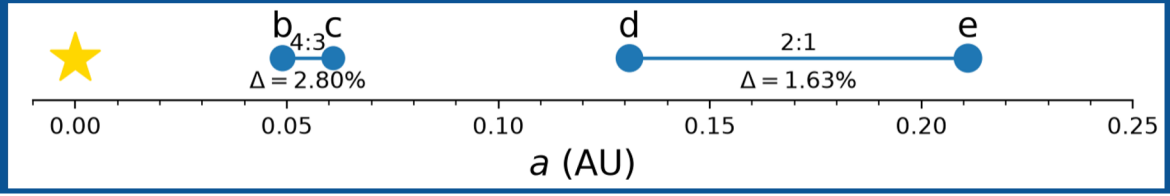


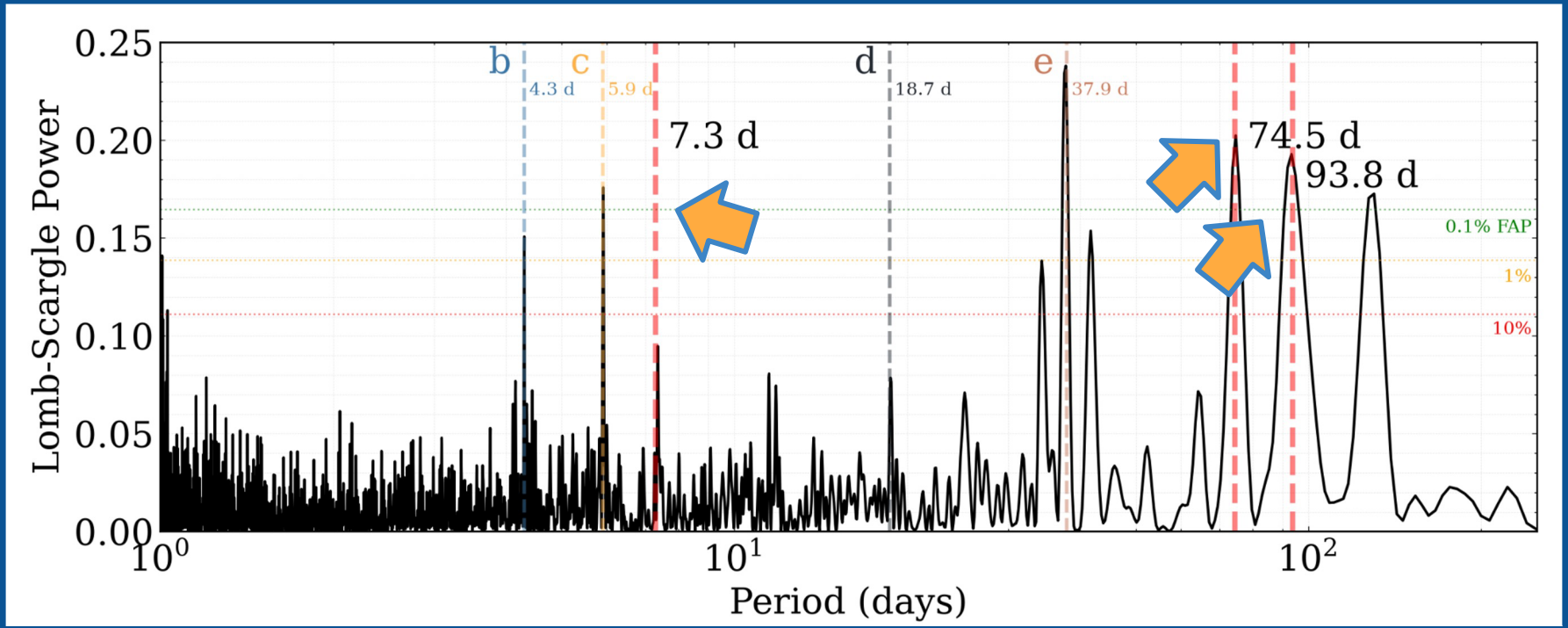


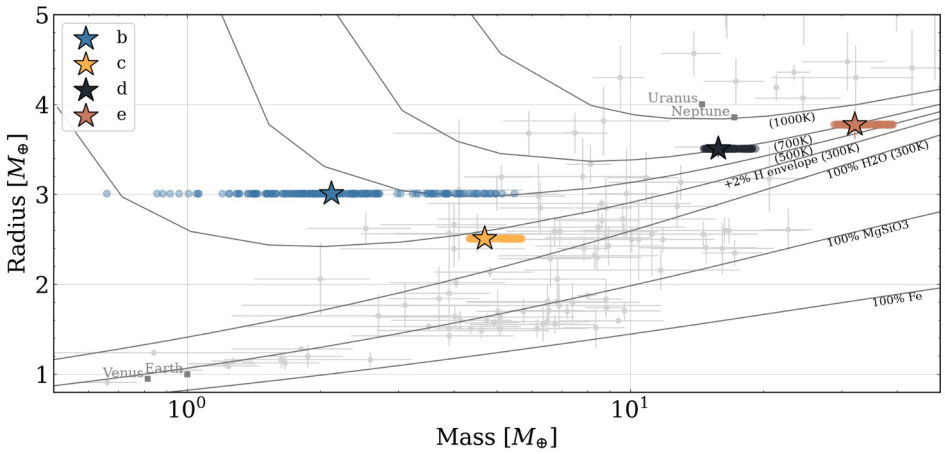


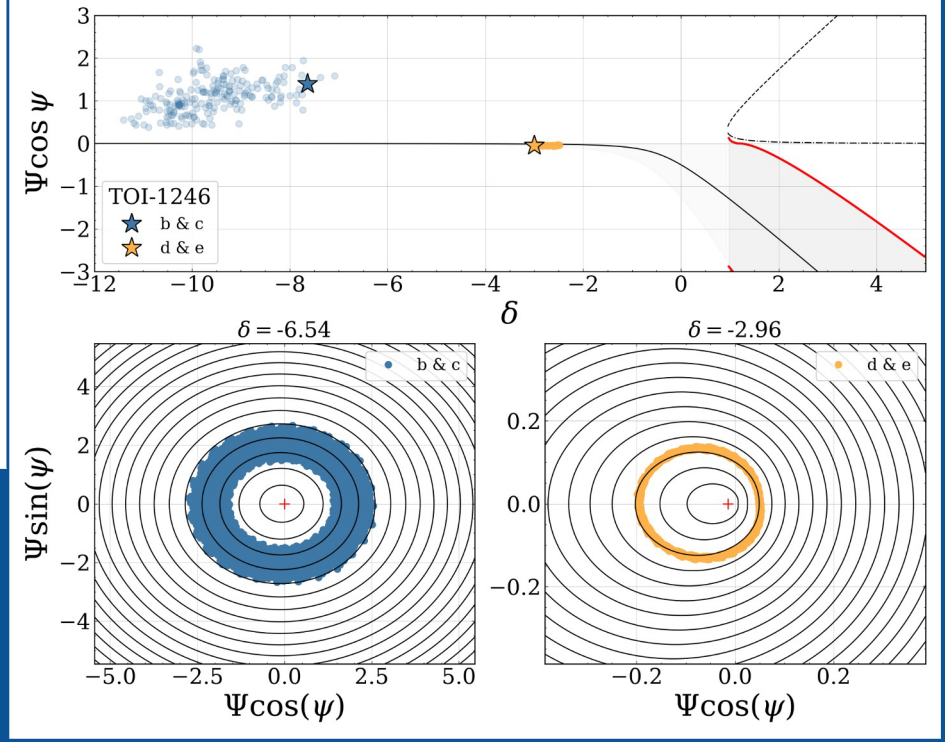
key mission design parameter

RATTLED BUT NOT BROKEN: The Partially Broken Resonant Chain TOI-1246 and Its Non-Transiting Companions









- Employ forward modeling to explore system architectures.
- Back out planet mass and radii from joint TTV + RV fit.

Conclusion: TOI-1246 is a partially broken chain slightly wide of resonance

Evan Carrasco
University of Hawaii at Manoa, Institute for Astronomy

Happy to chat!
evancarr@hawaii.edu

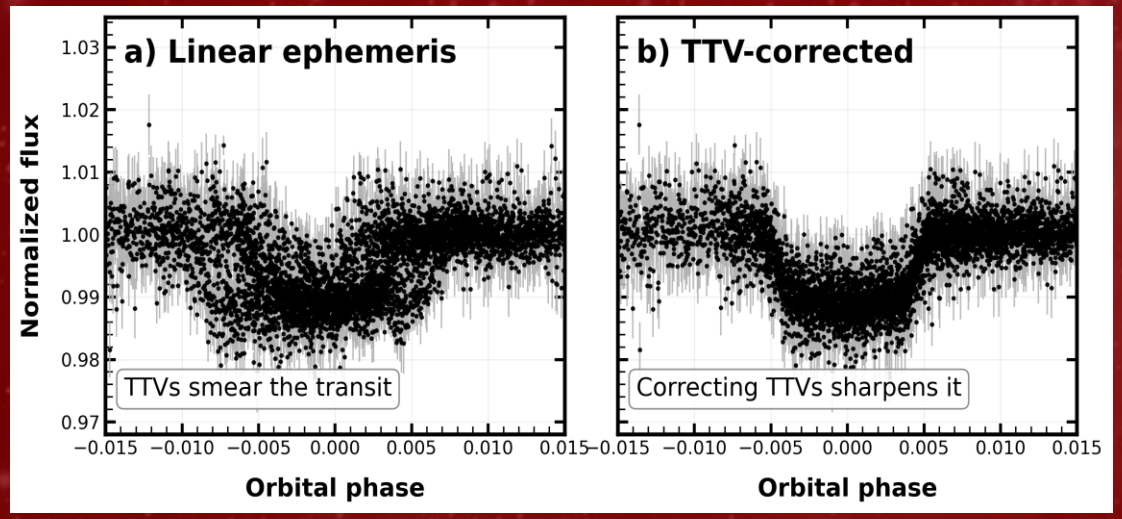
A Compact Pair of Giant Planets near the 2:1 Mean Motion Resonance around TOI-3850

Sean Collins[1,2], Michelle Kunimoto[1], *et al.*

1 Department of Physics and Astronomy - University of British Columbia, 2 Department of Astronomy - University of Michigan

Question: What is causing the strong transit timing variations (TTVs) observed in this young, faint TESS system?

A Multi-Planet Warm Jupiter System Revealed by TTVs



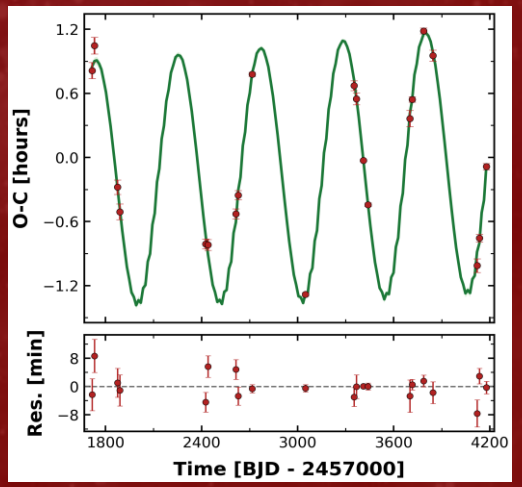
Characterization from a Joint RV+TTV Fit

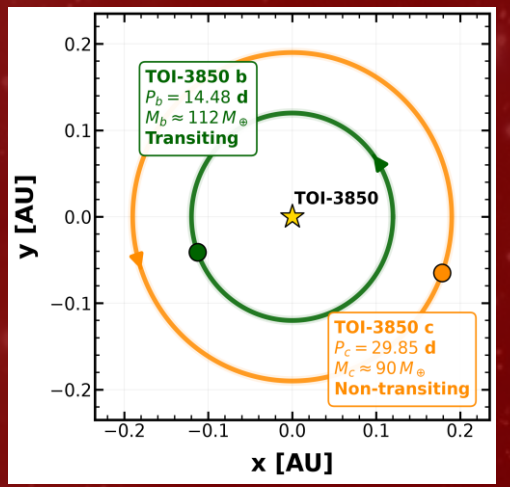
TOI-3850 b – a transiting warm Jupiter:

$P_b = 14.48$ d, $R_b = 12.1\ R_\oplus$, $M_b = 112 \pm 20 M_\oplus$

TOI-3850 c – a non-transiting companion:

$P_c = 29.85 \pm 0.01$ d, $M_c = 90 \pm 15 M_\oplus$





A dynamically cold, multi-giant system

SETTING UP A STRATEGY FOR TRIPLE-LENS MODELING

UNISA - Salerno University
INFN - Salerno sections
INAF

Antonio Consiglio
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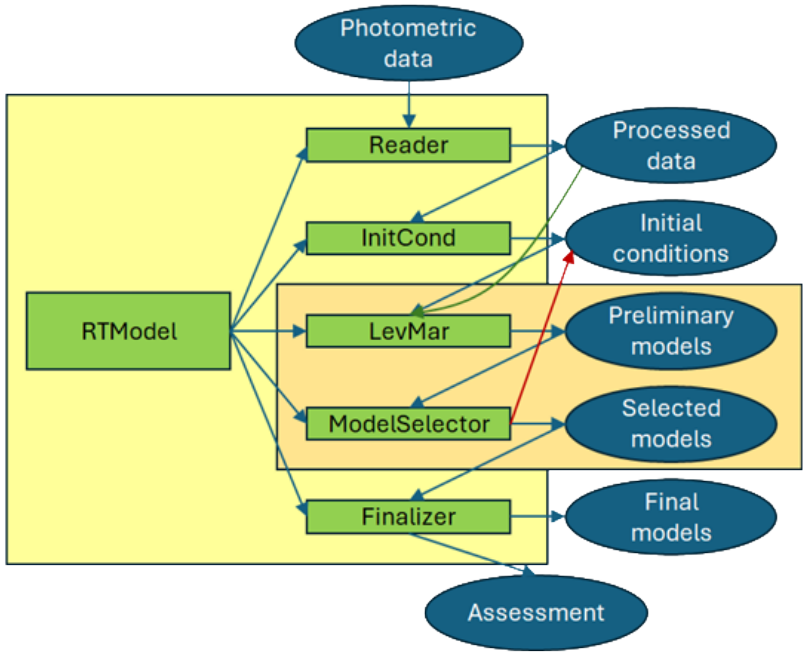
Supervisor:

Valerio Bozza

What is RTModel?

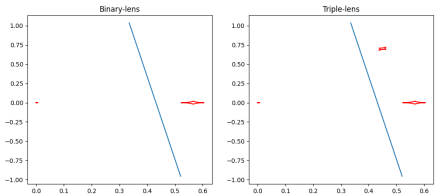
RTModel is a well-established platform, used for the real-time analysis and interpretation of microlensing events. It's an open-source Python library that interfaces with C++ subprograms, each of which performs a specific task with the ultimate goal of providing the best model that represents the observed microlensing event.



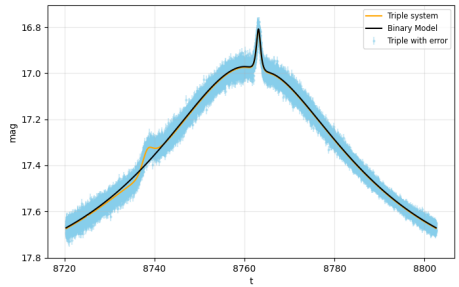
Caption: RTModel subprograms

Triple lens model for RTModel

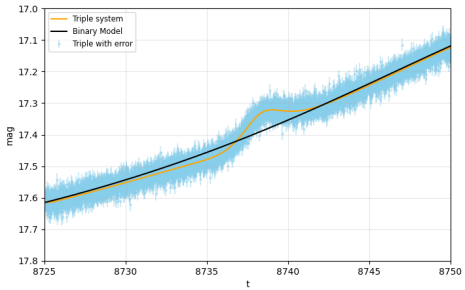
We are developing a strategy to provide accurate initial conditions for fitting triple-lens systems. My contribution focuses on the introducing of an anomaly detector. Starting from a binary lens model and applying analytical formulas, we can add a planet so that its caustic creates a perturbation at the time of the anomaly.



(a) caustics of the binary and triple systems



(b) binary model pertubated

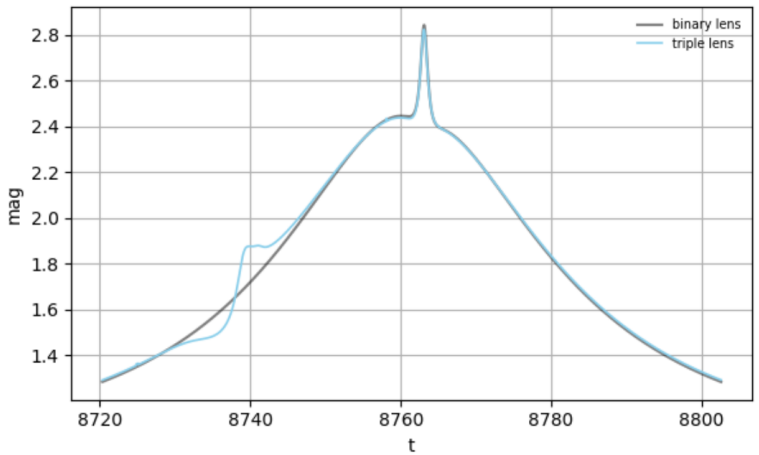


(c) zoom on anomaly

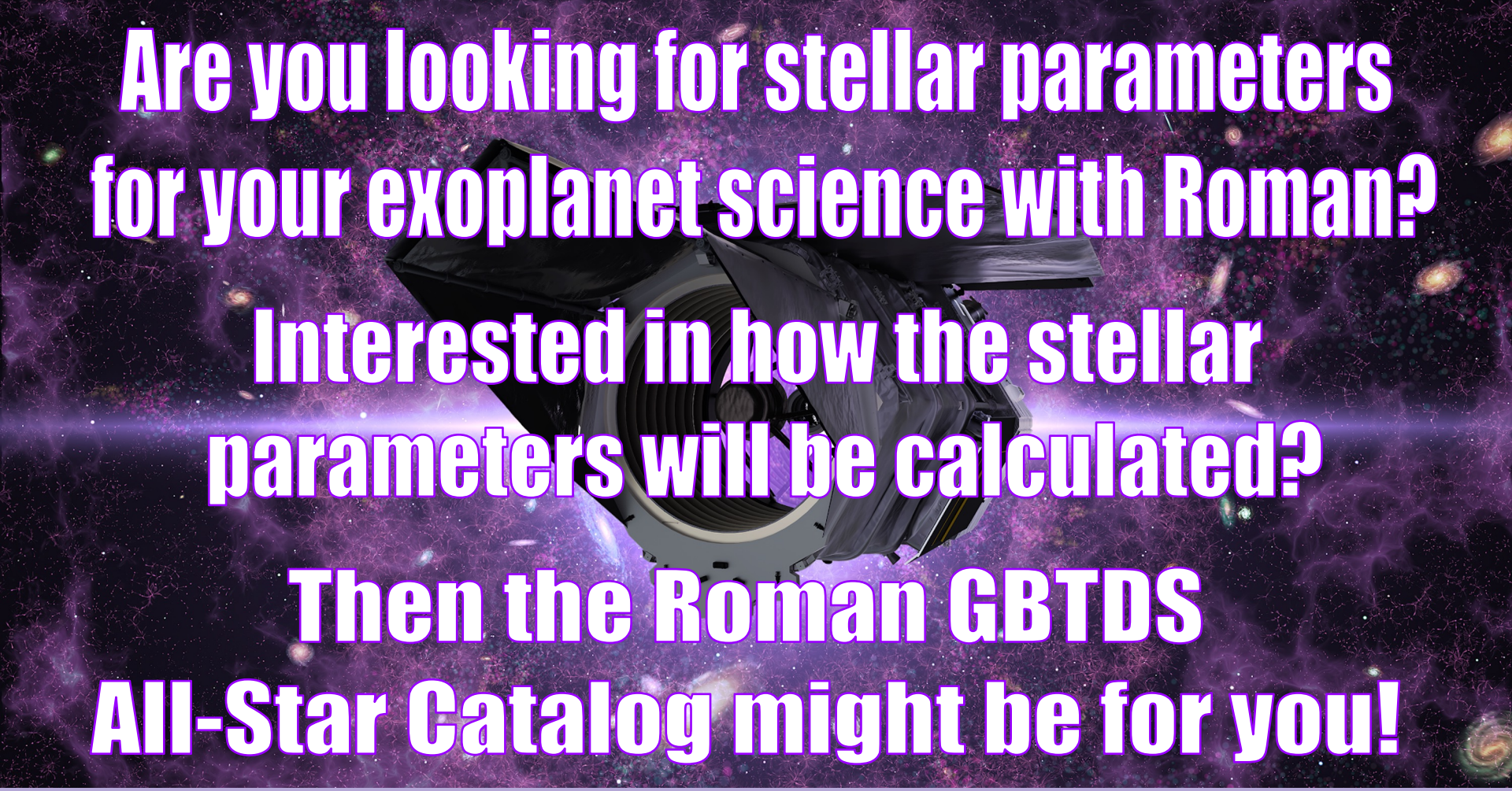
The initial condition for Triple lens system

The new generated model provides an initial condition for fitting a triple-lens model.
Taking the initial conditions obtained from the fit, we obtain the following triple-lens model.

s	1.1913693743
q	0.0005128017
u0	0.4768875822
alpha	1.6610890273
rho	0.00001013
tE	38.544326156
t0	8761.41
s2	0.7104341633
q2	0.001
beta	4.2048962775



Caption: triple lens model



Ashley Elliott

LSU
Department of Physics & Astronomy

The Roman GBTDS All-Star Catalog

Sneak peak at what we plan to provide!

To find out more come check out my poster!

The Galactic Bulge Time Domain Survey

★Will use the Wide instrument to per continuous broad fields towards the

★Will operate over over the 5-year R

★Additional lower c snapshots will be medium-band filt

SCIENCE GOALS

★ We will provide the first comprehensive catalog of stellar properties for the ~100 million GBTDS stars.

★ For stars with $F146_{mag} < 22$, catalog will provide:

- ★ MSOS Object Identifier
- ★ Photometry (Roman,Rubin,Euclid, Gaia,and Hubble - Fig. 1)
- ★ Radius
- ★ Mass
- ★ Effective Temperature
- ★ Luminosity
- ★ Metallicity
- ★ Age
- ★ Surface Gravity
- ★ Proper Motion
- ★ Distance
- ★ Extinction Prior
- ★ Binarity Indicator Flag

Motivation

terize exoplanets is l by our ability to : stars.

over ~100,000 and ~1,000 ets by searching the Galactic Bulge. e parameters will be science with the nabling all exoplanet demographics studies.

Ashley Elliott

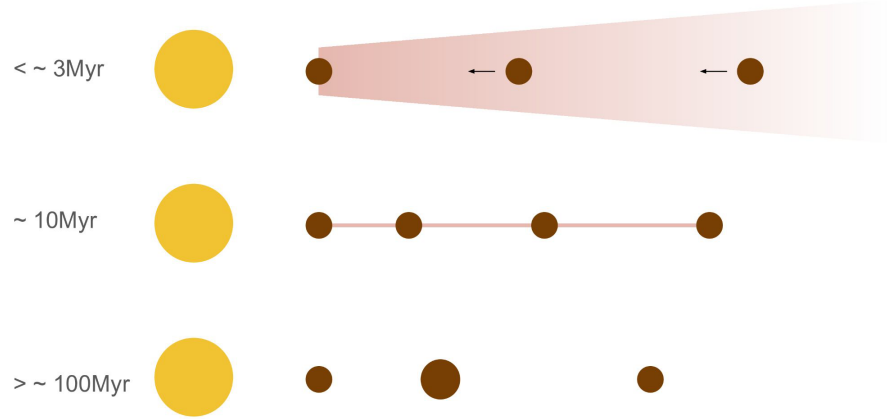
LSU Department of Physics & Astronomy

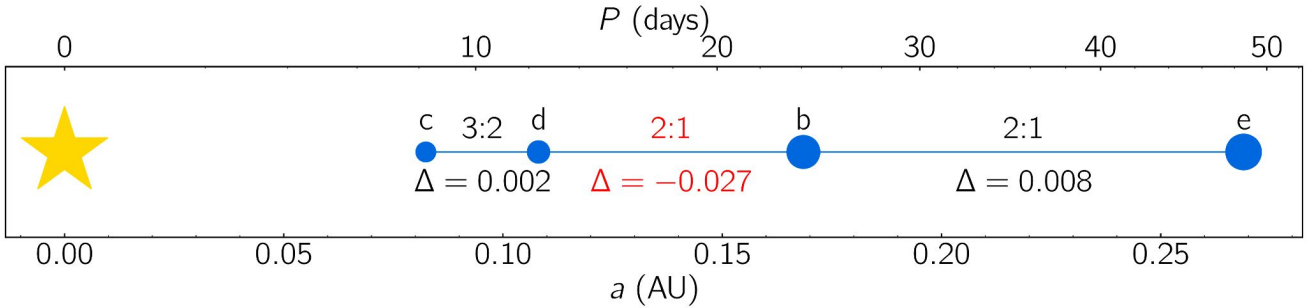
The Missing Link: Explaining V1298 Tau's Broken Resonance Chain

Joseph Hand, Fei Dai
Institute for Astronomy, University of Hawai`i

Why do resonance chains seem to fall apart as systems evolve?

V1298 Tau can help us explain this…





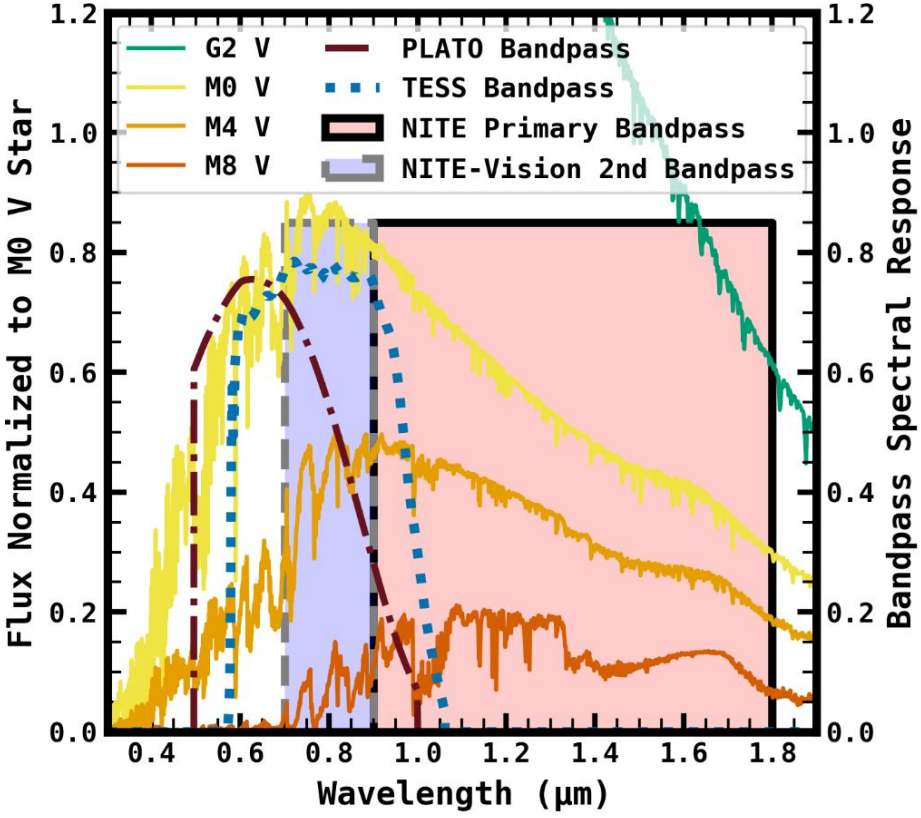
The Near-Infrared Transit Explorer (NITE)

A survey mission concept designed to detect >100 habitable zone Earth-sized planets orbiting nearby M dwarfs.

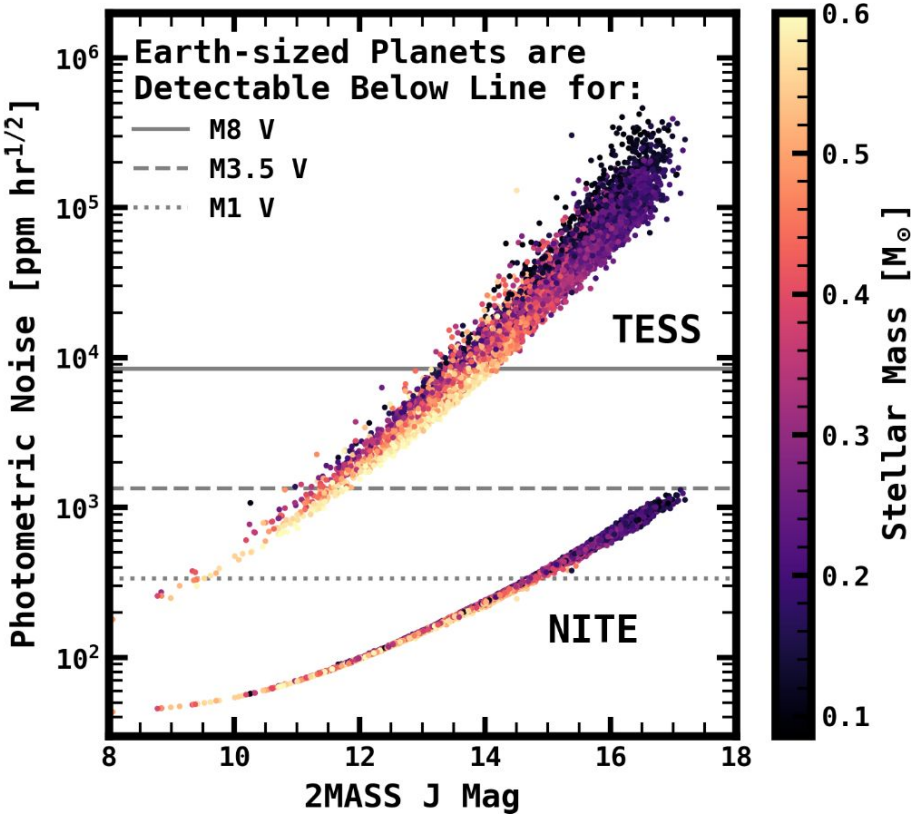
Kevin Hardegree-Ullman[1] (kevinkhu@caltech.edu), Robert Wilson[2,3], Galen Bergsten[4], Sakhee Bhure[5], Jessie Christiansen[1], David Ciardi[1], Jamie Dietrich[6], Alison Duck[7], Rachel Fernandes[8], Steven Giacalone[9], Emily Gilbert[1], Thomas Greene[1], Christina Hedges[3], Michelle Kunimoto[10], Christopher Lam[1], Dana Louie[11,3], Stanimir Metchev[12], Brandon Radzom[8], Jason Rowe[13], Sabina Sagynbayeva[14], Allison Youngblood[3], Robert Zellem[3]

[1]Caltech/IPAC, [2]University of Maryland, [3]NASA GSFC, [4]STScI, [5]University of Southern Queensland, [6]Arizona State University, [7]NASA JPL, [8]Pennsylvania State University, [9]Caltech, [10]University of British Columbia, [11]Catholic University of America, [12]Western University, [13]Bishop's University, [14]Stony Brook University

The NITE infrared bandpass(es) are optimized for M dwarfs.



NITE will have exquisite sensitivity to Earth-sized planets orbiting nearby M dwarfs.



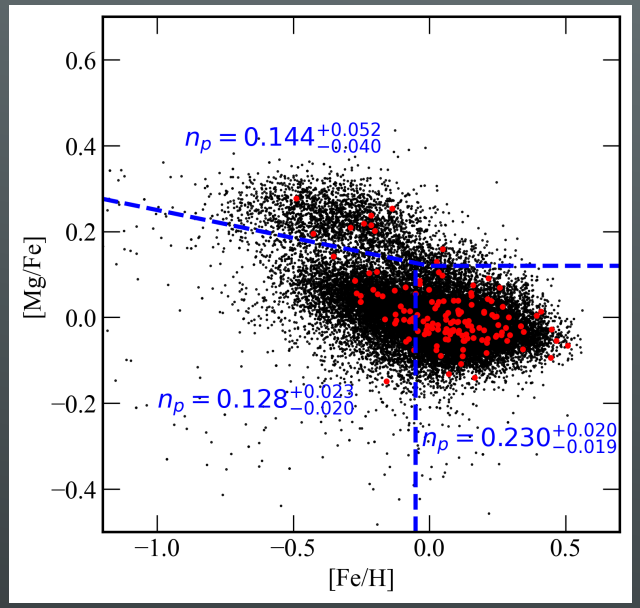
Galactic substructures provide a powerful laboratory to study how stellar properties influence planet formation

Matthew Lastovka

Ph.D. Candidate

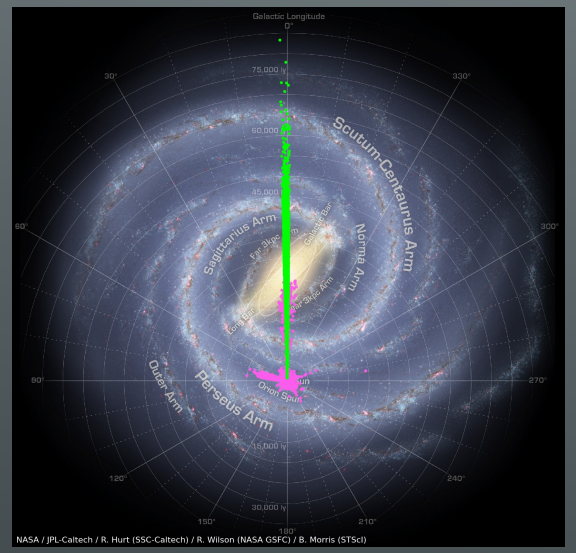
University of Maryland – College Park

Using K2/APOGEE to measure thin vs. thick disk exoplanet occurrence rates

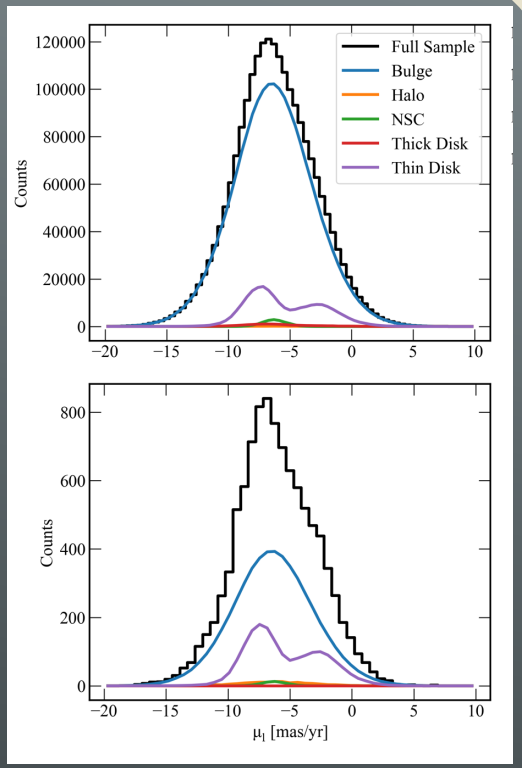


The decreased occurrence rate in the thick disk can be explained by metallicity

Roman will provide unprecedented access to planets in other galactic populations



Framework using galactic models to calculate occurrence rates across populations



Inferring Planet Occurrence Rates in Different Galactic Populations: Connecting K2 and Roman