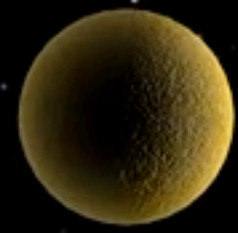


Strategies for Confirmation and Characterization of Long Period Planets in TESS



credit:NASA SVS

Steven Villanueva Jr. (MIT, Pappalardo Fellow)
Diana Dragomir (Co-chair), Daniel Baylis, Juliette
Becker, Jennifer Burt, Paul Dalba, Nora Eisner,
Chelsea Huang, Belinda Nicholson, Hugh Osborn,
Andrew Vanderburg, Xinyu Yao, and Carl Ziegler



 @skyientist

Science Goals



Improve statistics for the mass-radius relation of small planets as a function of distance from host stars

Eccentricity distribution of warm/cold Neptunes

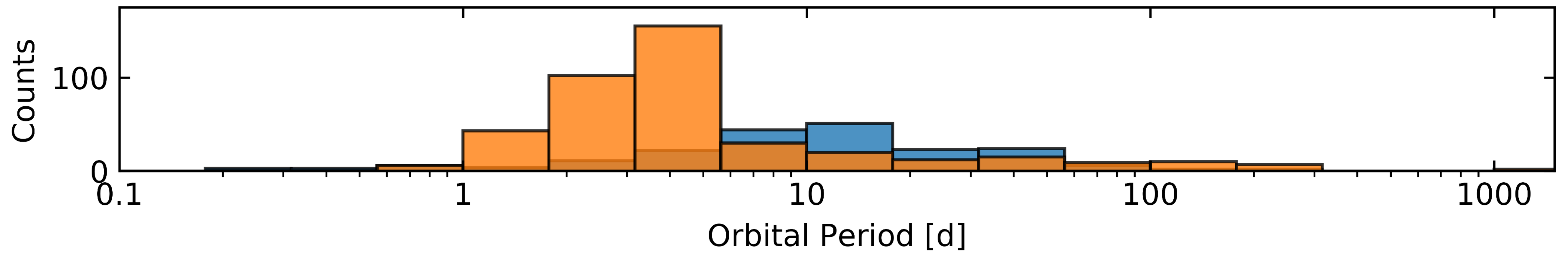
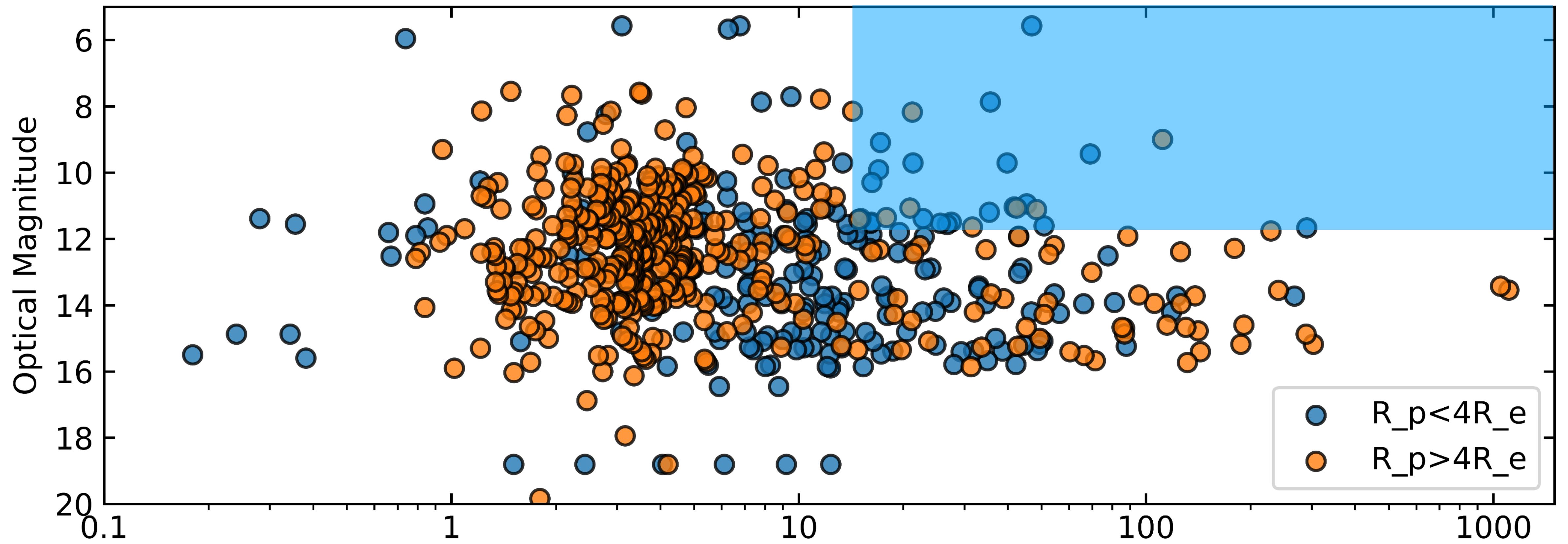
Obtain a closer-to-complete picture of the architecture of multi-planet systems

Temperate planets among which to select the best for atmospheric characterization with the JWST/ELTs

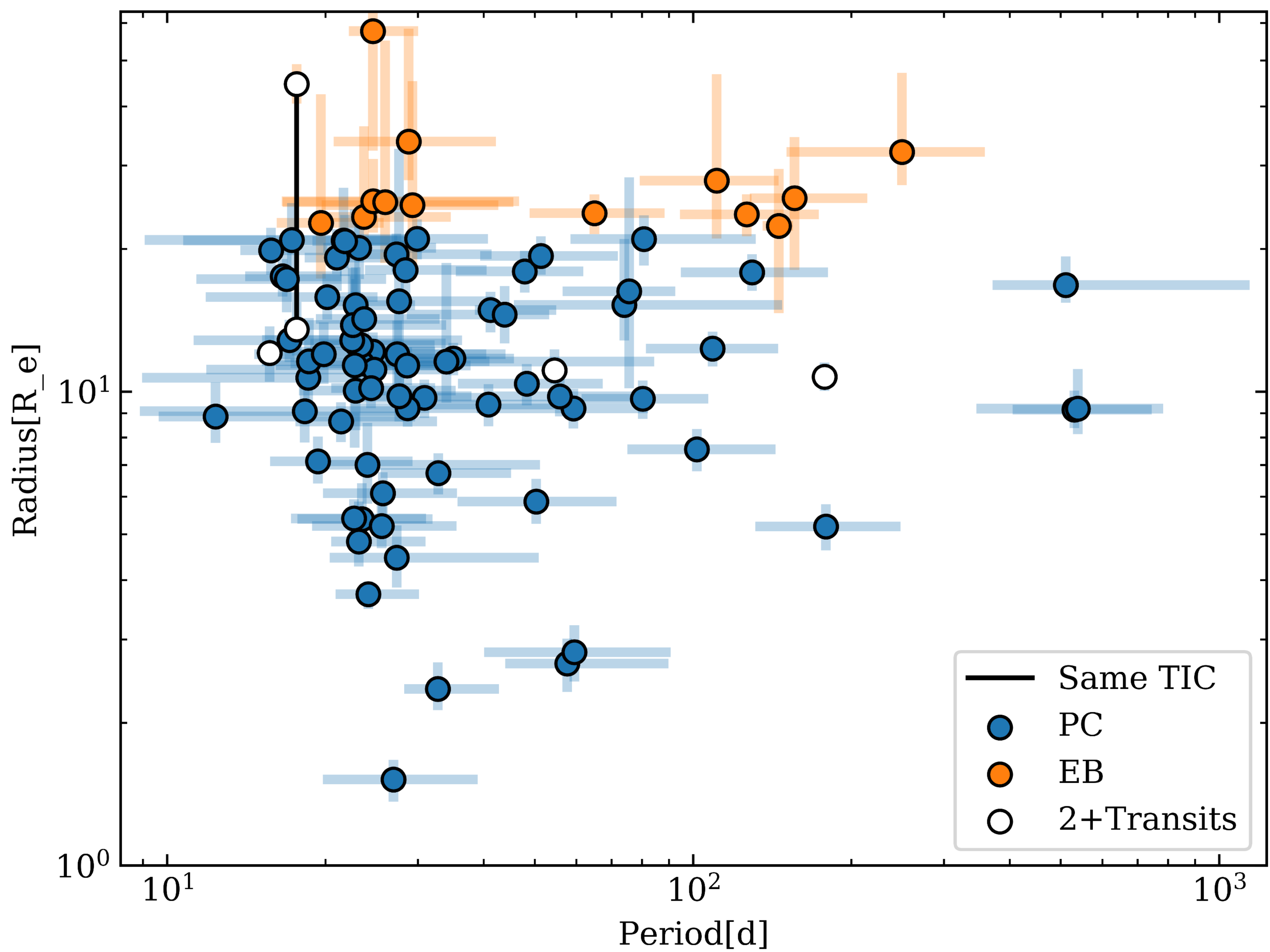
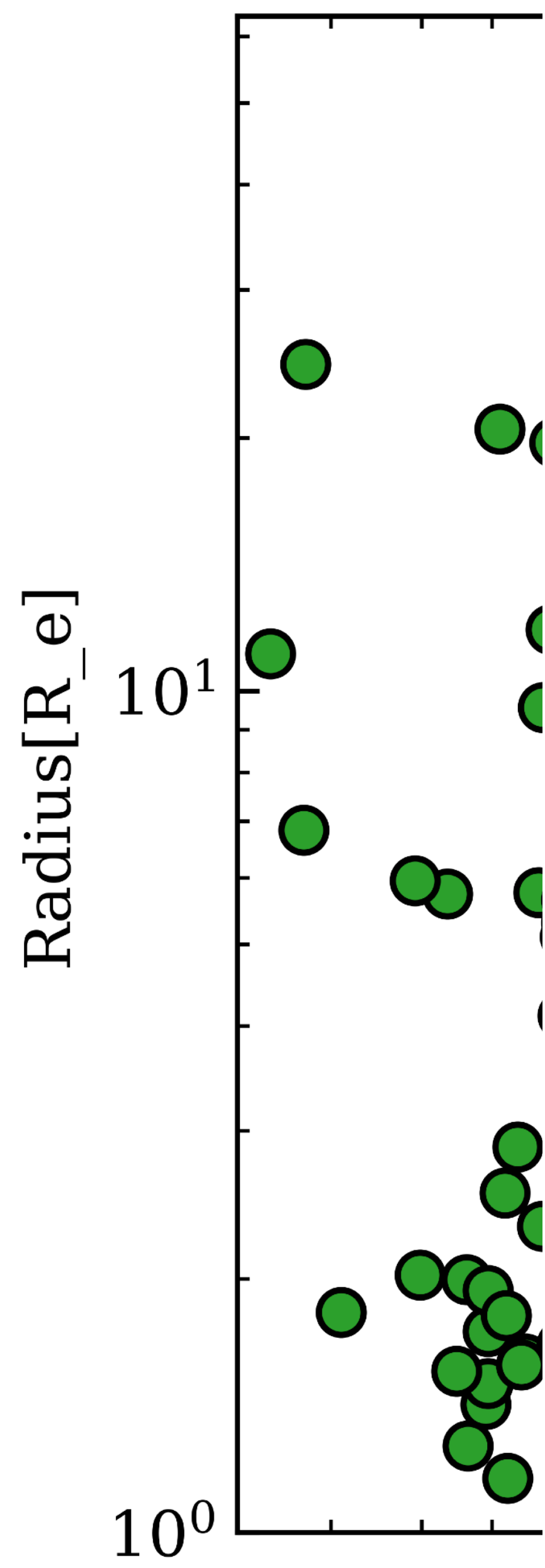
Increase the sample of circum-binary planets

A few candidates for future direct imaging observations (with measured radius!)

Larger sample of warm/cold Jupiters for formation studies (obliquity + eccentricity distributions) and their relationship to hot Jupiters



Data from Exoplanet Archive 2 July 2019



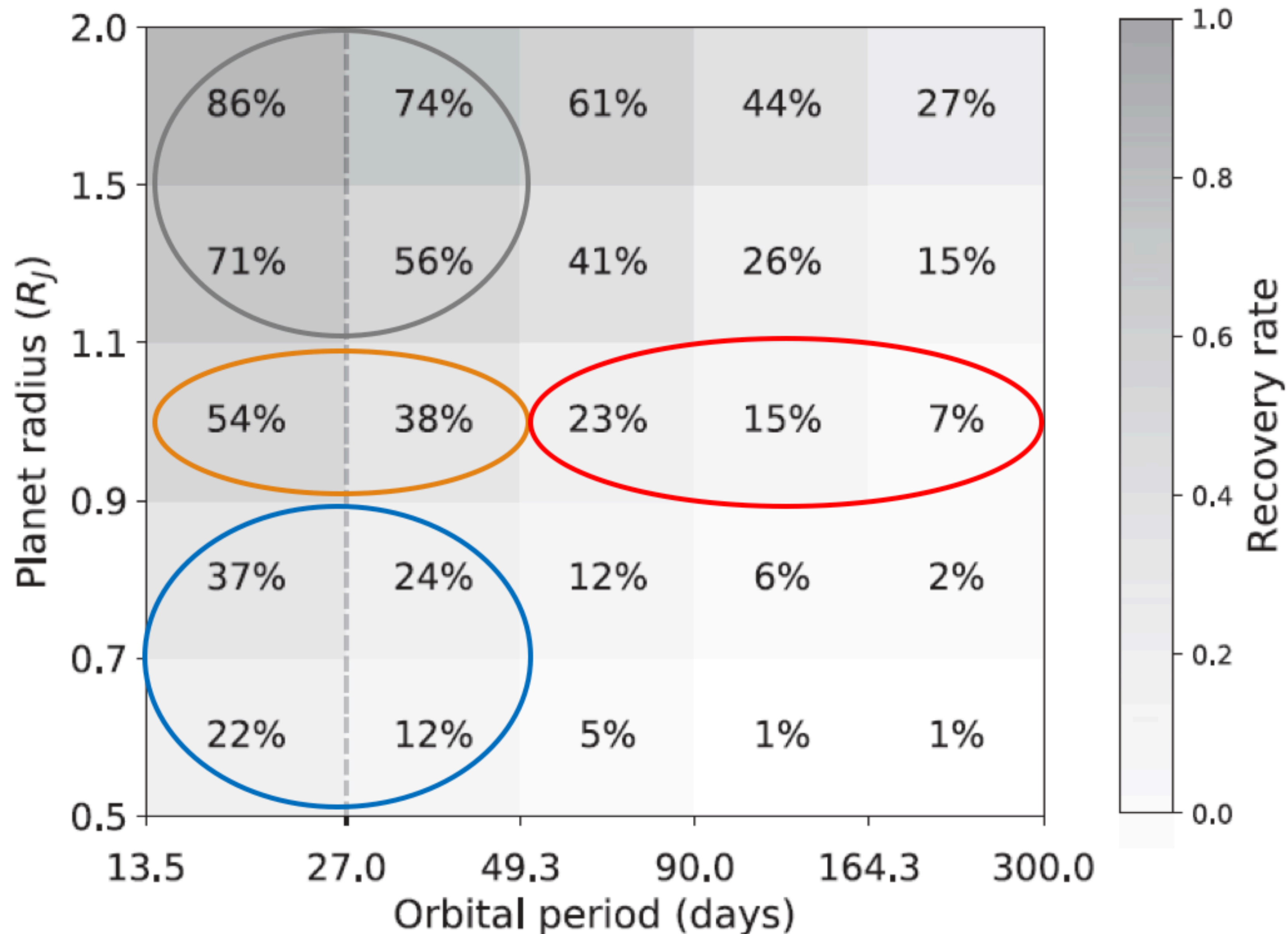
Recovery rate for planet radius vs. period

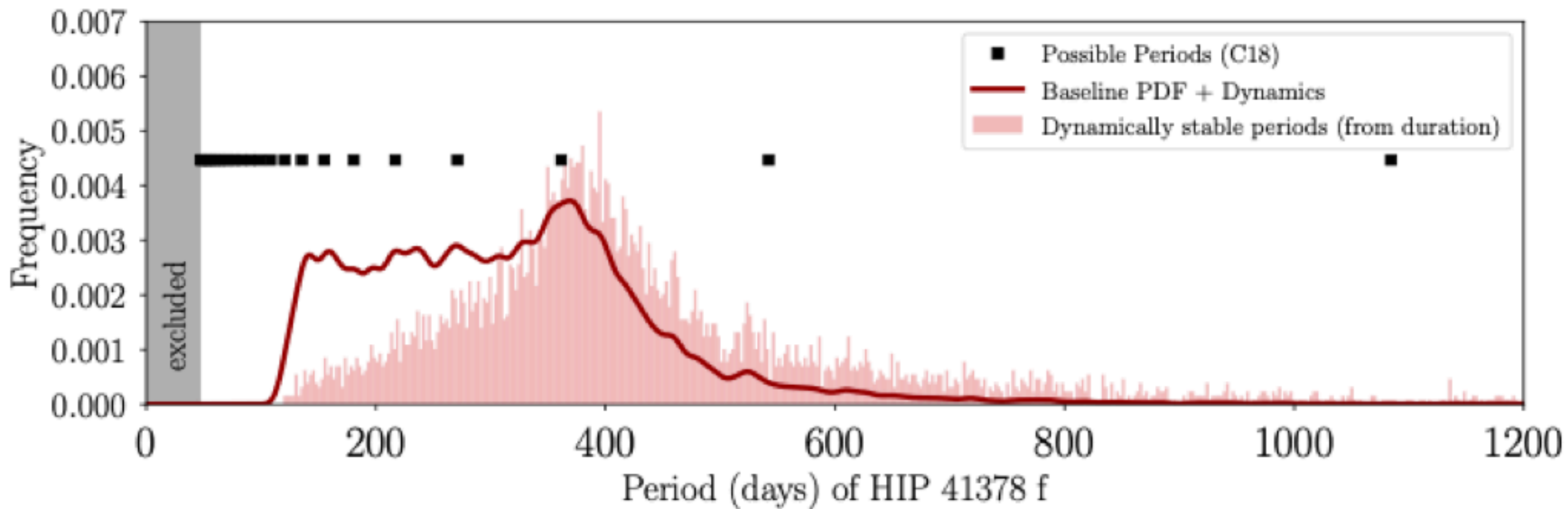
Warm inflated
Jupiter

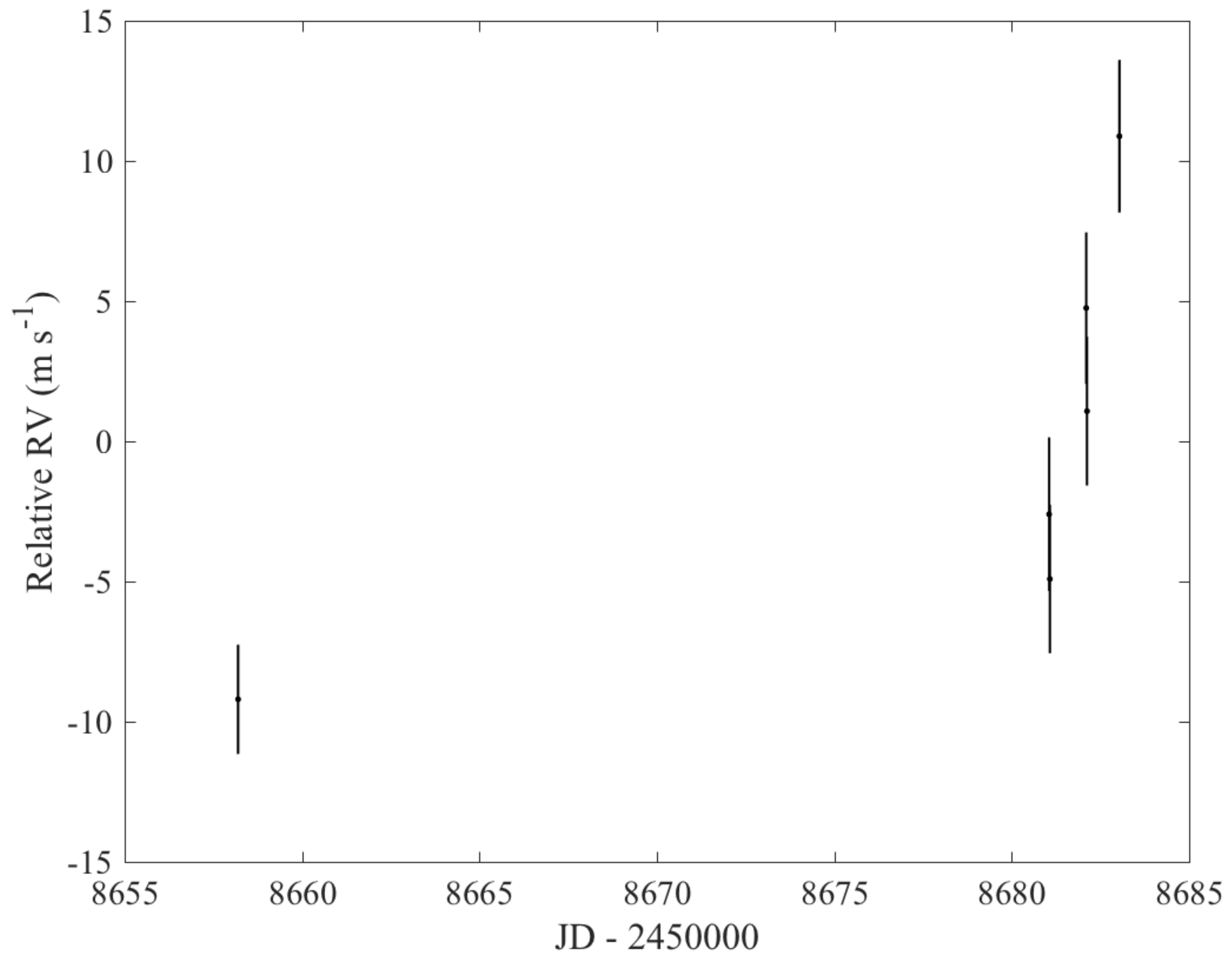
Warm Jupiter

Temperate
Jupiter

Warm Saturn







396

One Hit Wonders

PI: Carl Ziegler

0.5-m aperture telescope

Diffuser assisted photometry

Fully autonomous operation

On-the-fly pipeline, rapid triggers

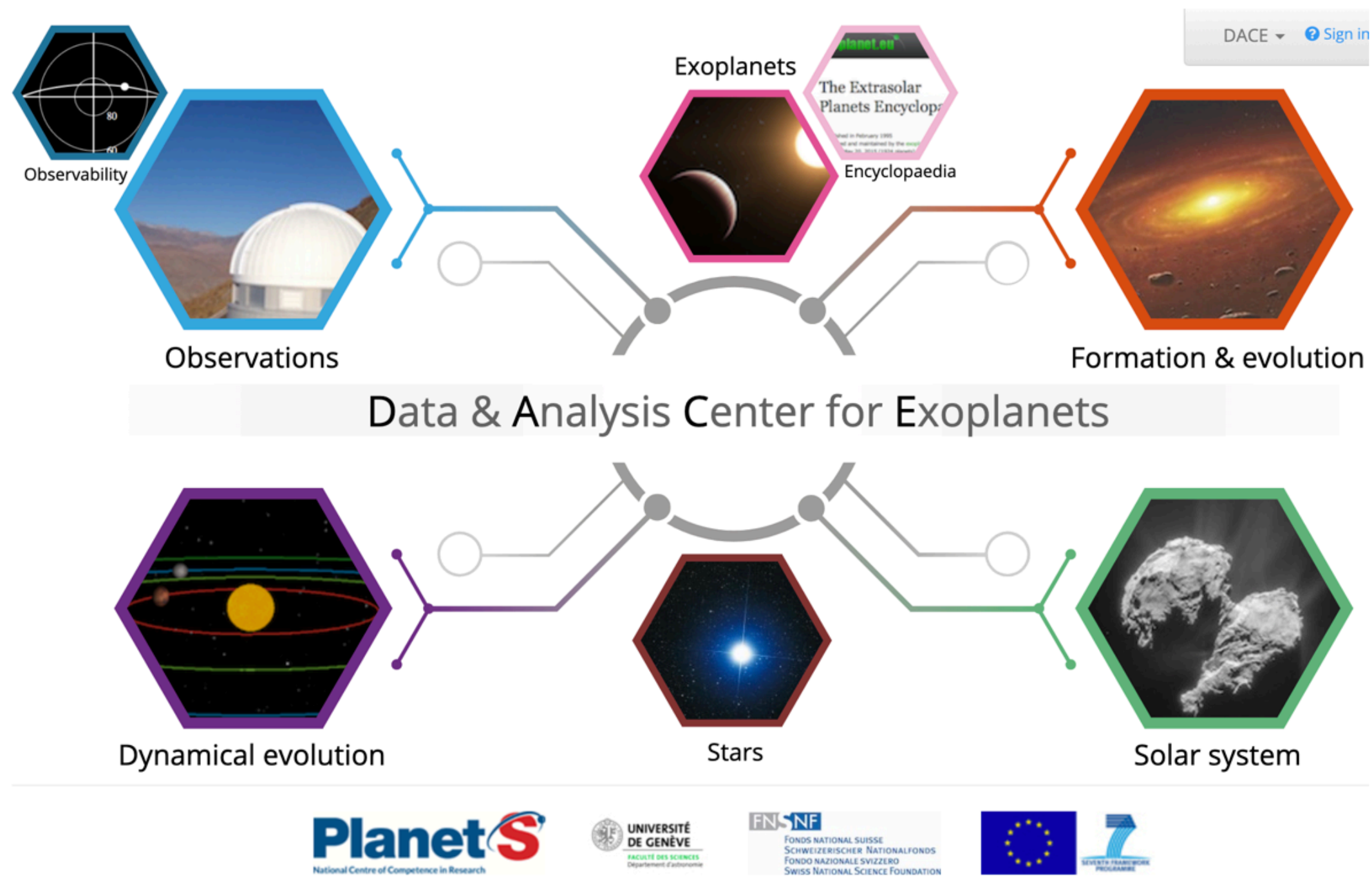
Deploying to New Mexico later this month

Recover ~20 Northern TESS single transits in next year



Places to look for archival RVs

(But make sure you check that they were reduced in a systematic way!)



<https://dace.unige.ch/dashboard/>



GENERIC **SPECTRAL** **IMAGING** **VISTA**

PHASE3 ARCHIVE INTERFACES

HELP DATA TYPES FAQ DATA RELEASES DATA STREAMS

http://archive.eso.org/wdb/wdb/adp/phase3_main/form

CARNEGIE SCIENCE | DTM Home News About History Telescopes

THE EARTHBOUND PLANET SEARCH

PROBING NEARBY PLANETS

<https://ebps.carnegiescience.edu/data>

Take-aways:

Long-period planets, including singles, are interesting, if not difficult

Single transits are becoming abundant in TESS

1/2 to 3/4 of singles transits will be recovered by the extended mission

Constrain the periods when possible

Use archival data when possible

Prioritization scheme is needed: ease of follow-up vs scientific interest vs unique

People want to collaborate!



**Stop
Collaborate
and Listen**

Thanks Carl!

Ask these people questions!



Jennifer Burt Steven Villanueva Dan Baylis Paul Dalba Carl Ziegler Hugh Osborn Andrew Vanderburg

Nora Eisner Belinda Nicholson Diana Dragomir Chelsea Huang Juliette Becker Xinyu Yao