PlanetS

Domain 2

Planetary systems architecture, their formation and evolution

FNSNF
SWISS NATIONAL SCIENCE FOUNDATION

PlanetS AG, 28 April 2022

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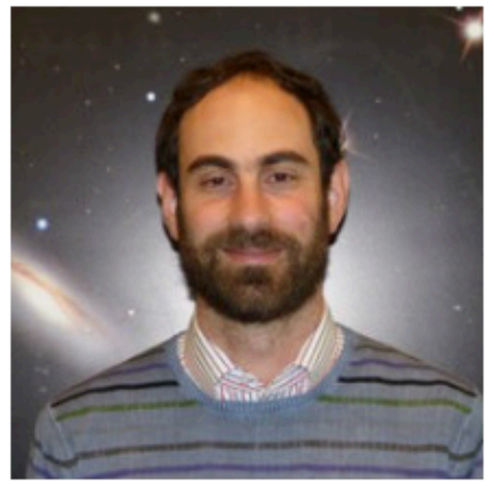
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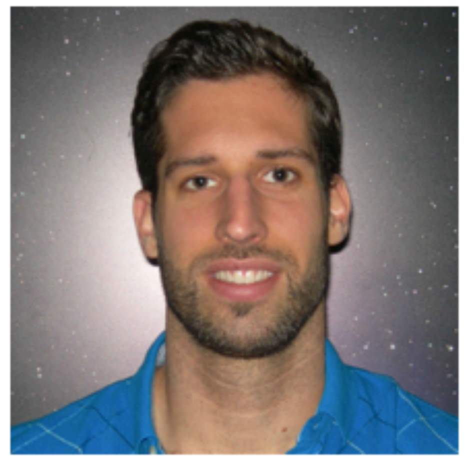
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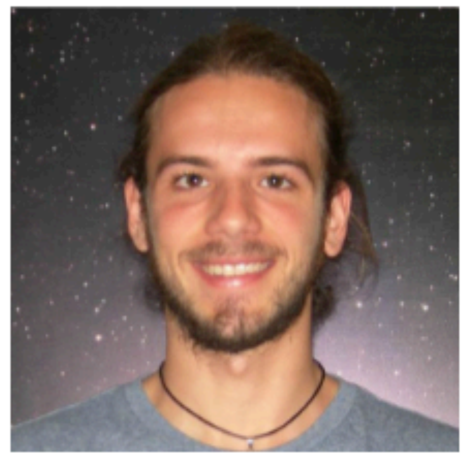
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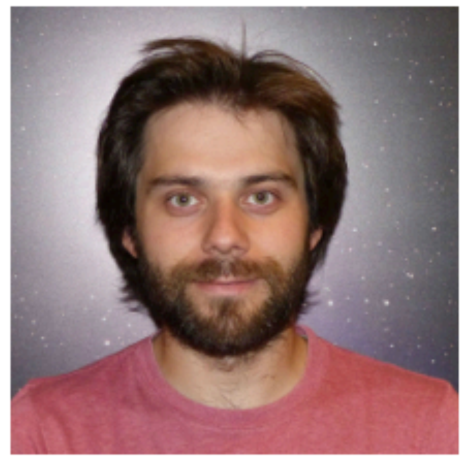
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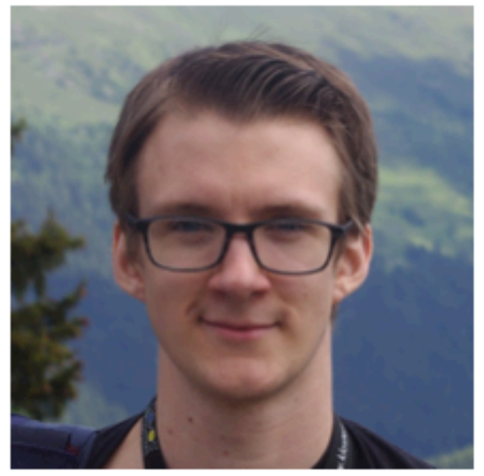
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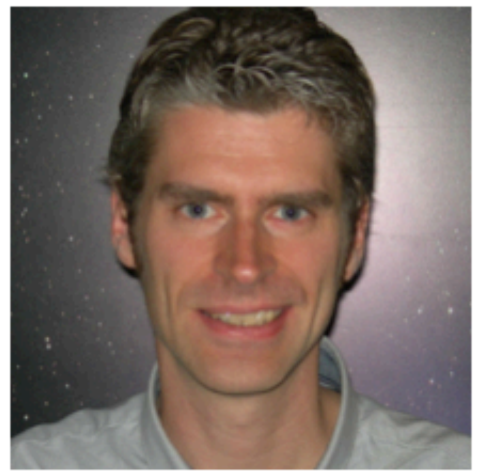
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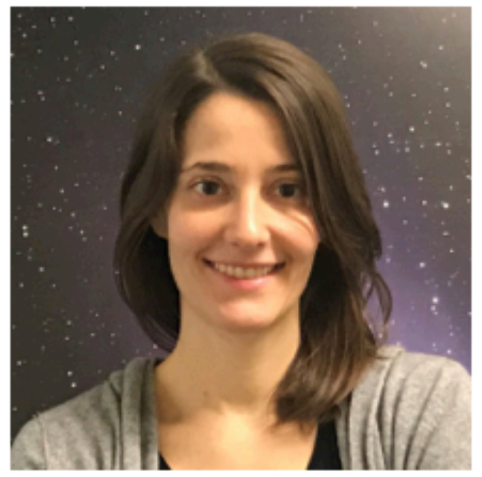
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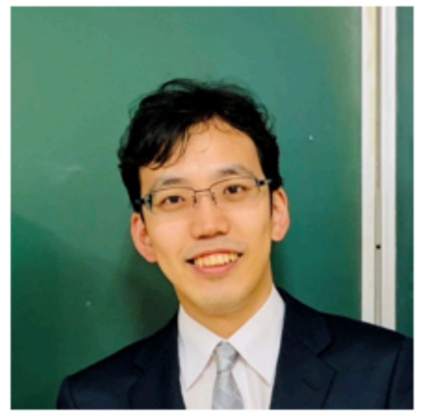
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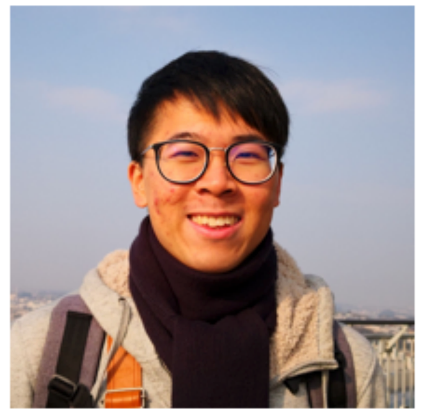
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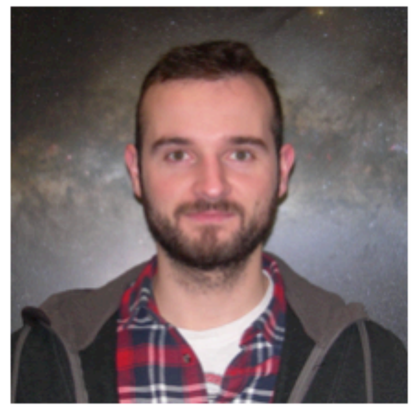
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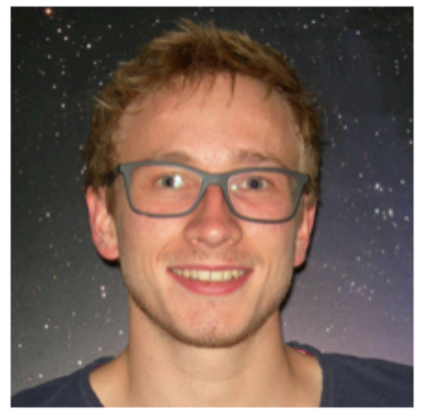
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PlanetS

Domain 2

Coordinator: X. Dumusque

2.8 — Signal correction to reveal other Earths
X. Dumusque (UGE)
ERC funded

2.1 — Understanding planetary system architectures
S. Udry (UGE)

2.2 — The density of exoplanets
F. Bouchy (UGE)

2.7 — Monitoring solar system formation and evolution with noble gases
H. Busemann (ETHZ)

2.3 — Direct imaging of forming and mature planetary systems
S. Quanz (ETHZ)

2.6 — Collisional growth and orbital evolution of planets
J. Stadel (UZH)

2.4 — Planet evolution: connection with stellar properties, processes, and formation
R. Helled (UZH)

2.5 — Formation & composition of core dominated planets
Y. Alibert (UBE)

Domain 2 projects

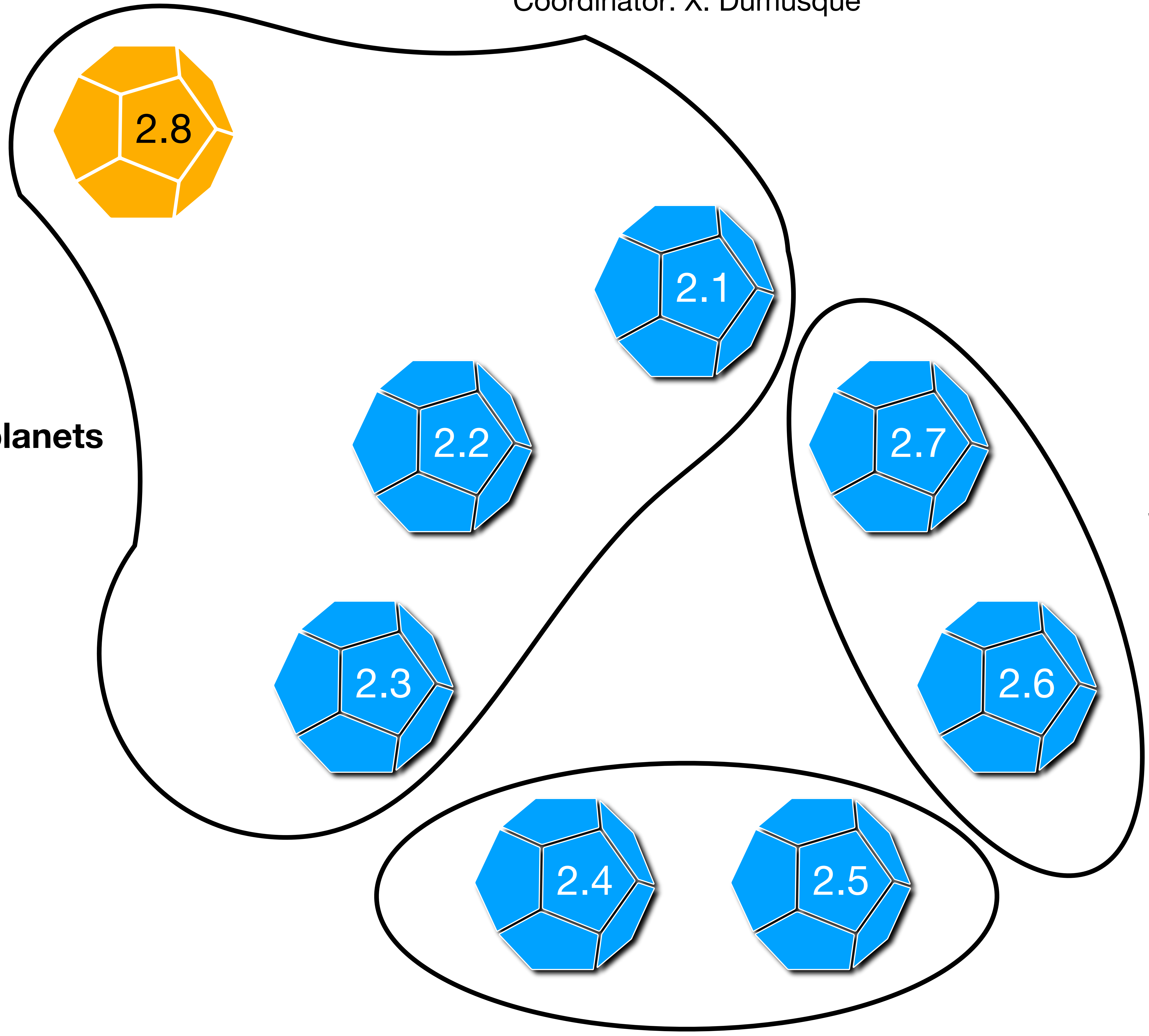
Externally funded

PlanetS

Domain 2

Coordinator: X. Dumusque

Observation of exoplanets



Study of the solar system

Linking theory of planetary formation and observations

Domain 2 projects

Externally funded

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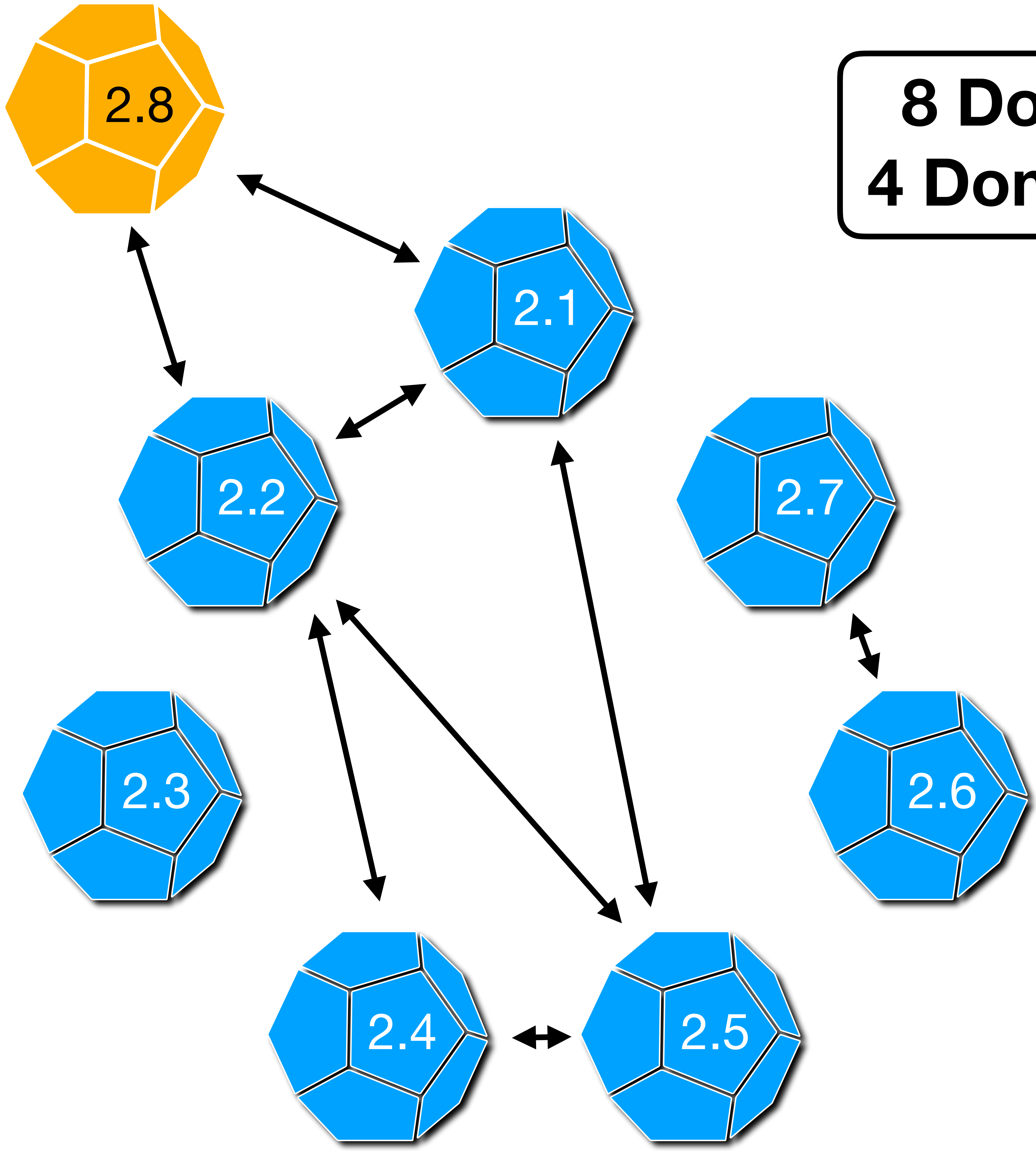
Swiss National Science Foundation



8 Domain 2 generic meetings
4 Domain 2 specific workshops

Domain 2 projects

Externally funded

FNSNF
Swiss National Science Foundation

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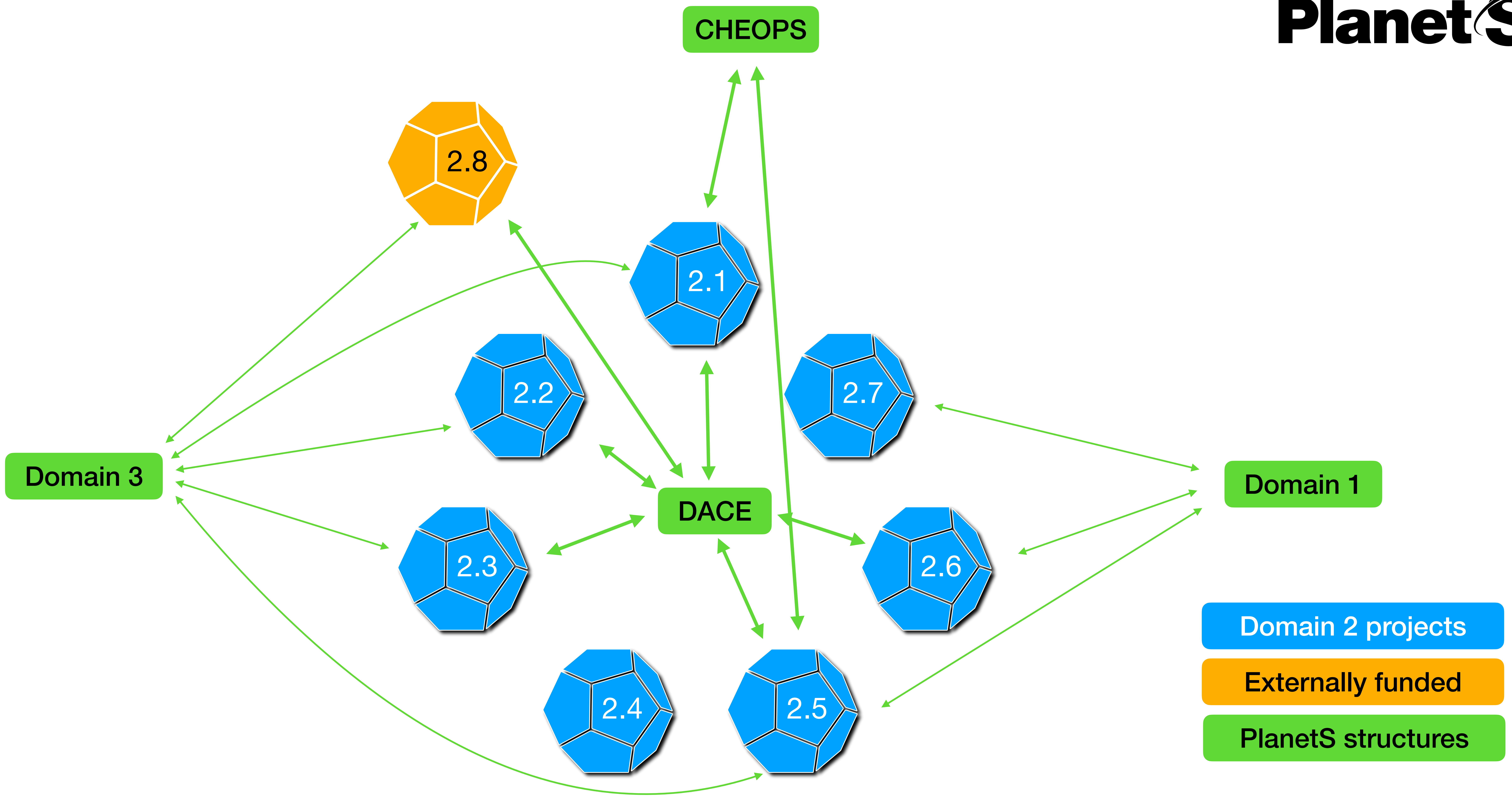

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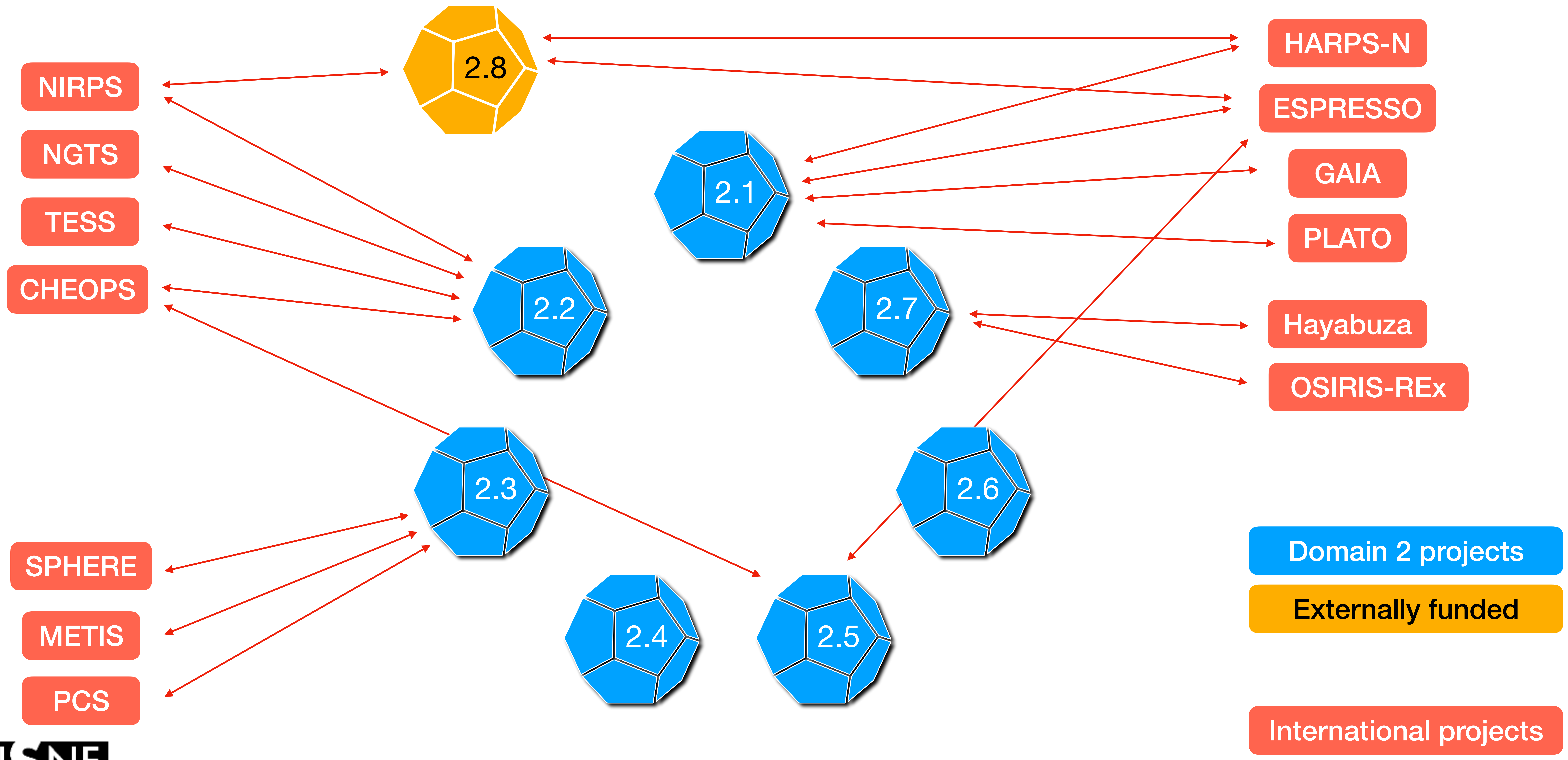

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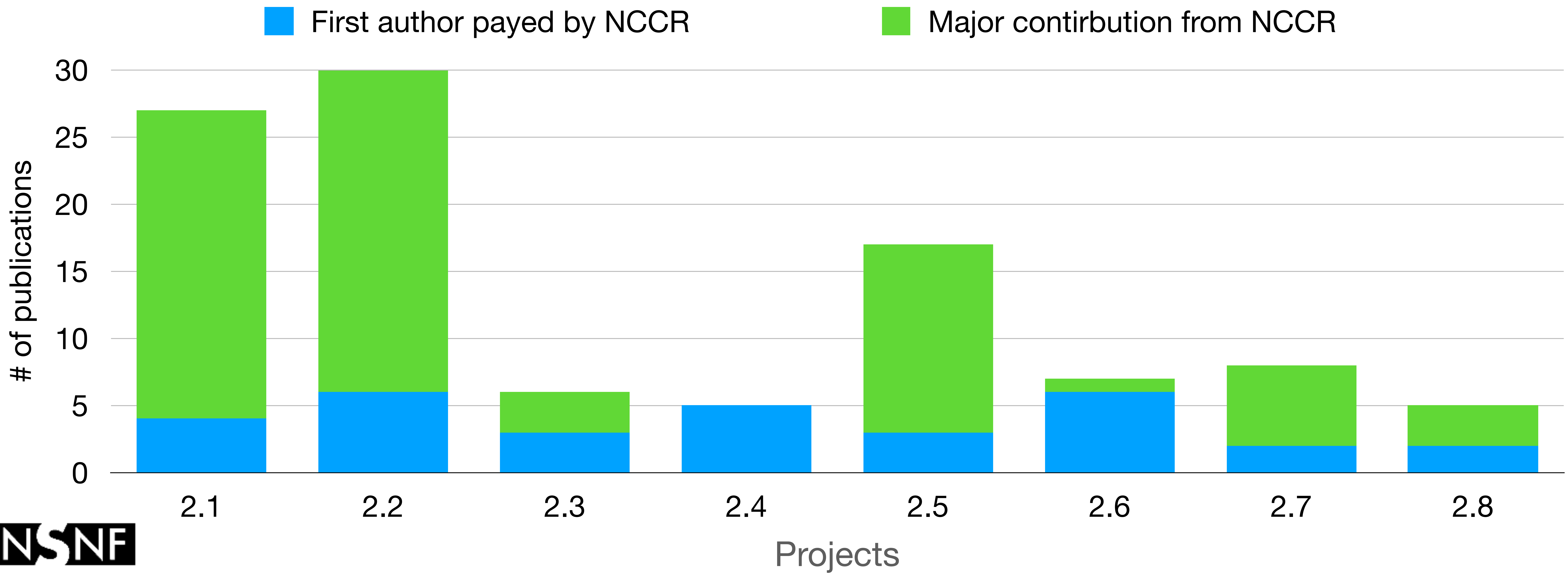
	P 2.1	P 2.2	P 2.3	P 2.4	P 2.5	P 2.6	P 2.7	P 2.8
WP1	In progress	Nearly Completed	Completed	In progress	In progress	In progress	In progress	In progress
WP2	In progress	Nearly Completed	In progress	In progress	In progress	In progress	In progress	In progress
WP3	In progress	In progress		In progress	In progress	In progress	Completed	In progress
WP4	Refocused	In progress			Completed	In progress	In progress	In progress
WP5	Not started				In progress			Soon starting

Publications

31 papers with first author payed by NCCR (~1 paper/year/project)

81 papers with major contribution from NCCR (~2.5 papers/year/project)



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Highlights since last site visit

Understanding planetary system architectures

P2.1

PI: Stéphane Udry

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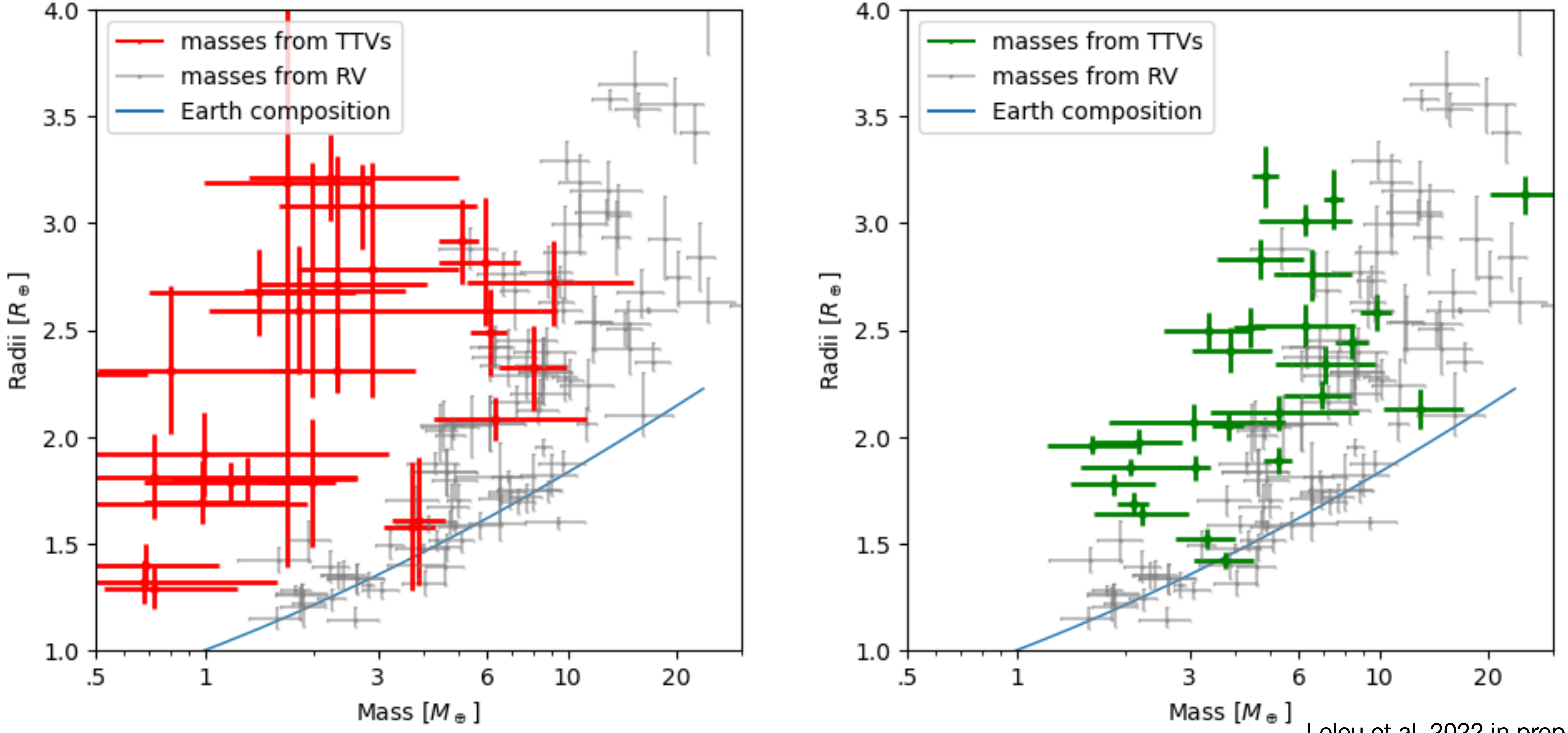
Understanding planetary system architectures

Before optimising TTV detection

After

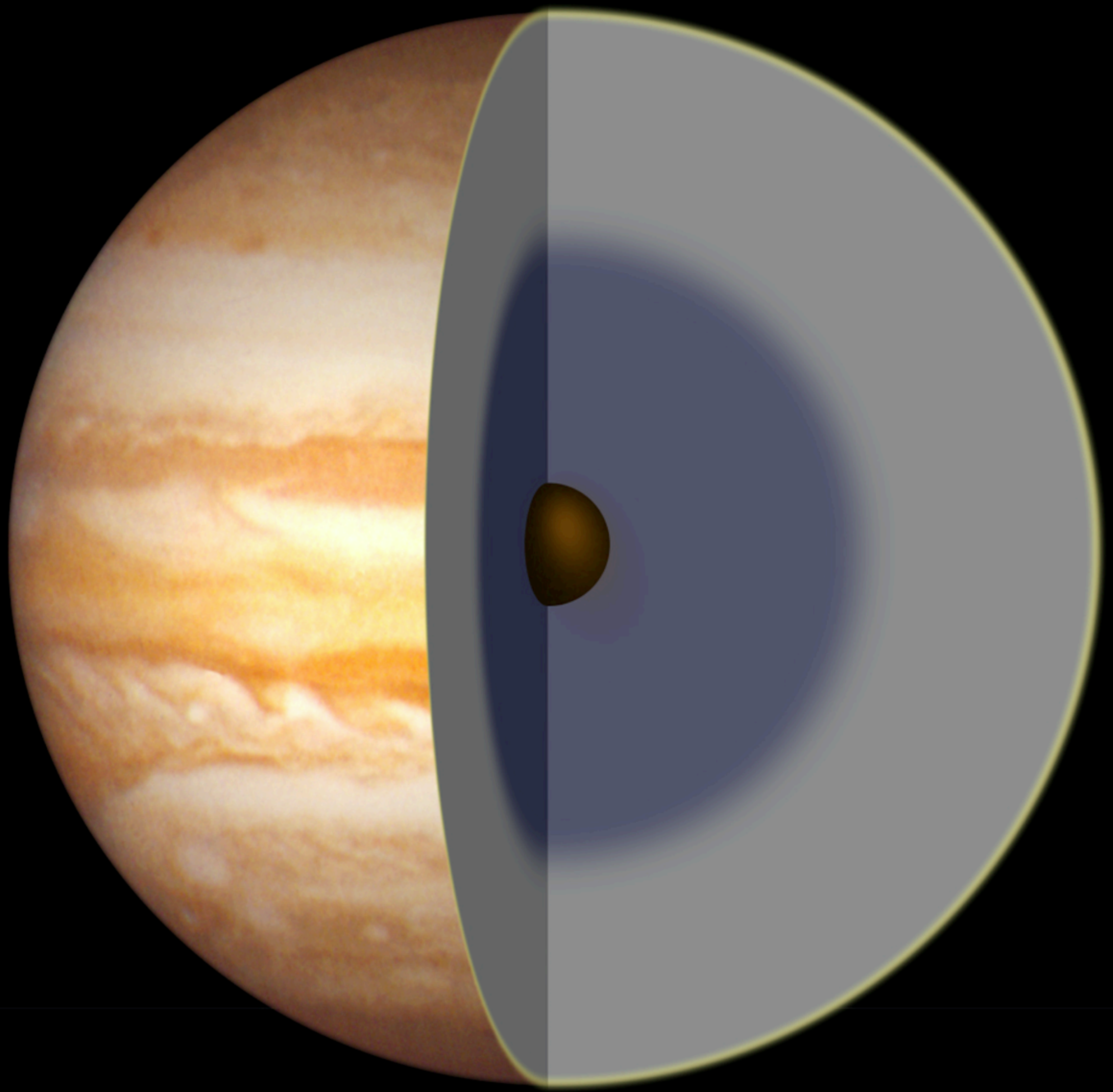


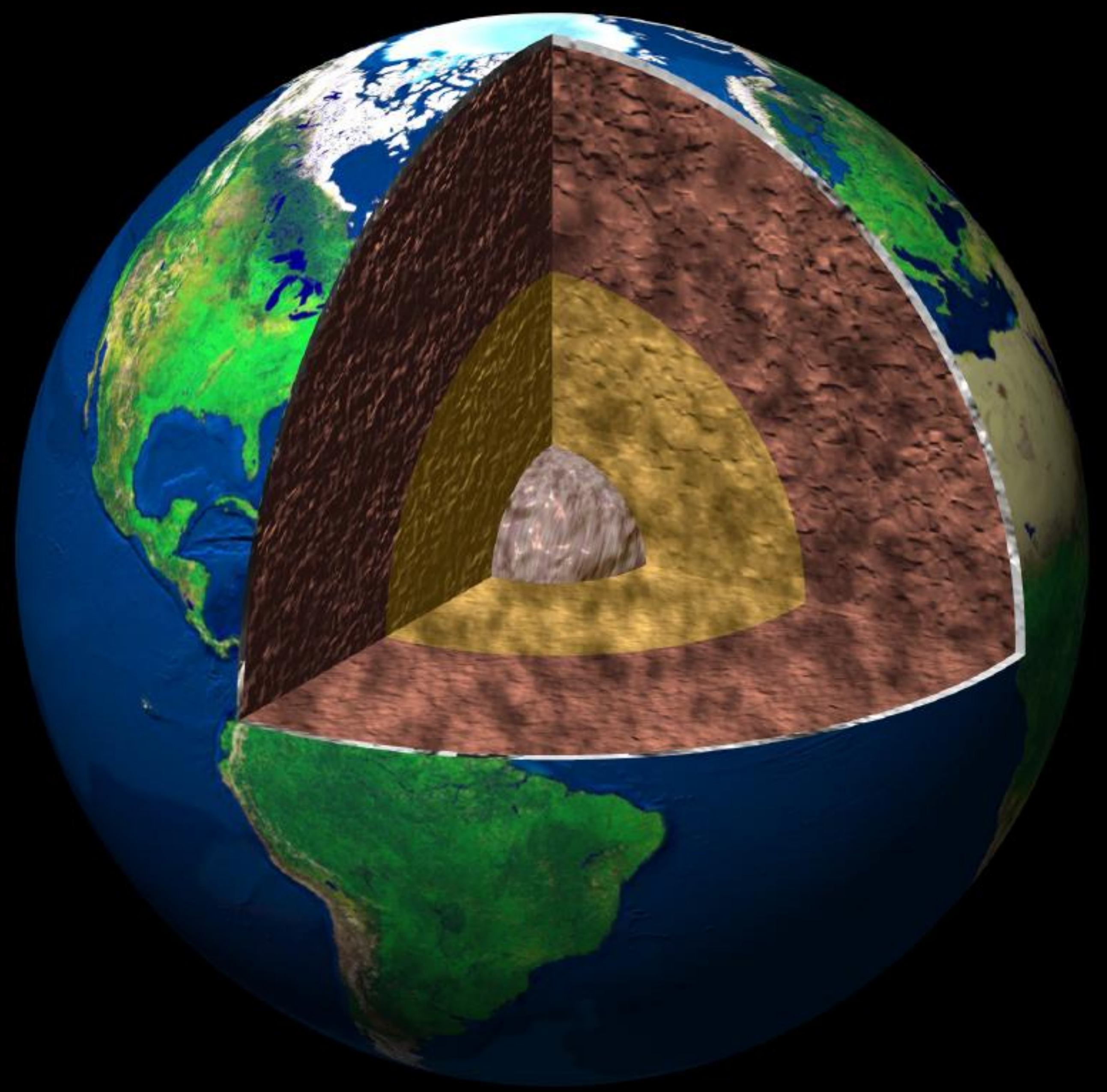
Leleu et al. 2022 in prep.

The density of exoplanets

P2.2

PI: François Bouchy





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P2 2

ouchy

NIRPS integrated in Chile

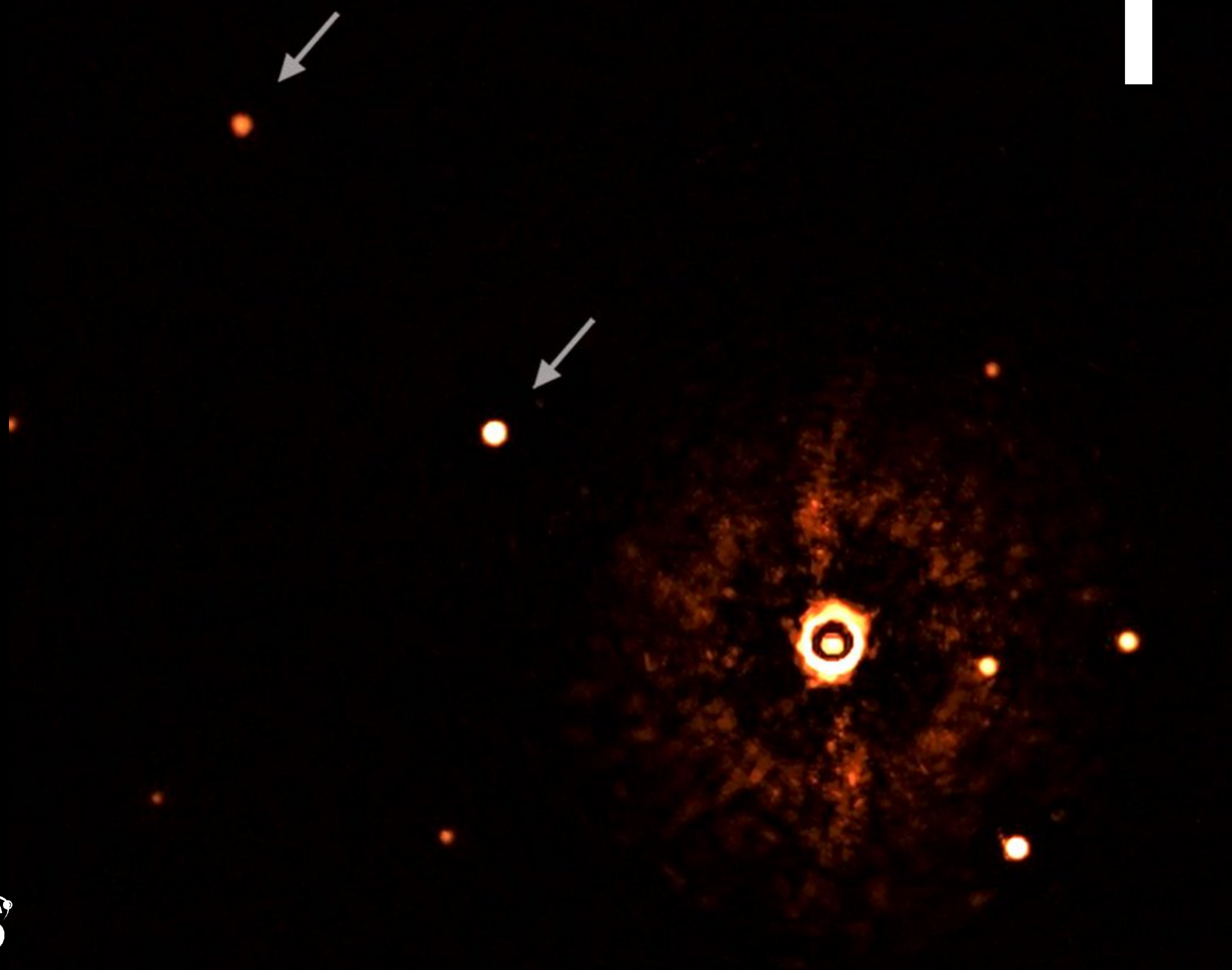
Commissioning starts June 7th

Data flow, Data reduction, configuration for simultaneous observations with HARPS completed

Direct imaging of forming and mature planetary systems

P2.3

PI: Sascha Quanz



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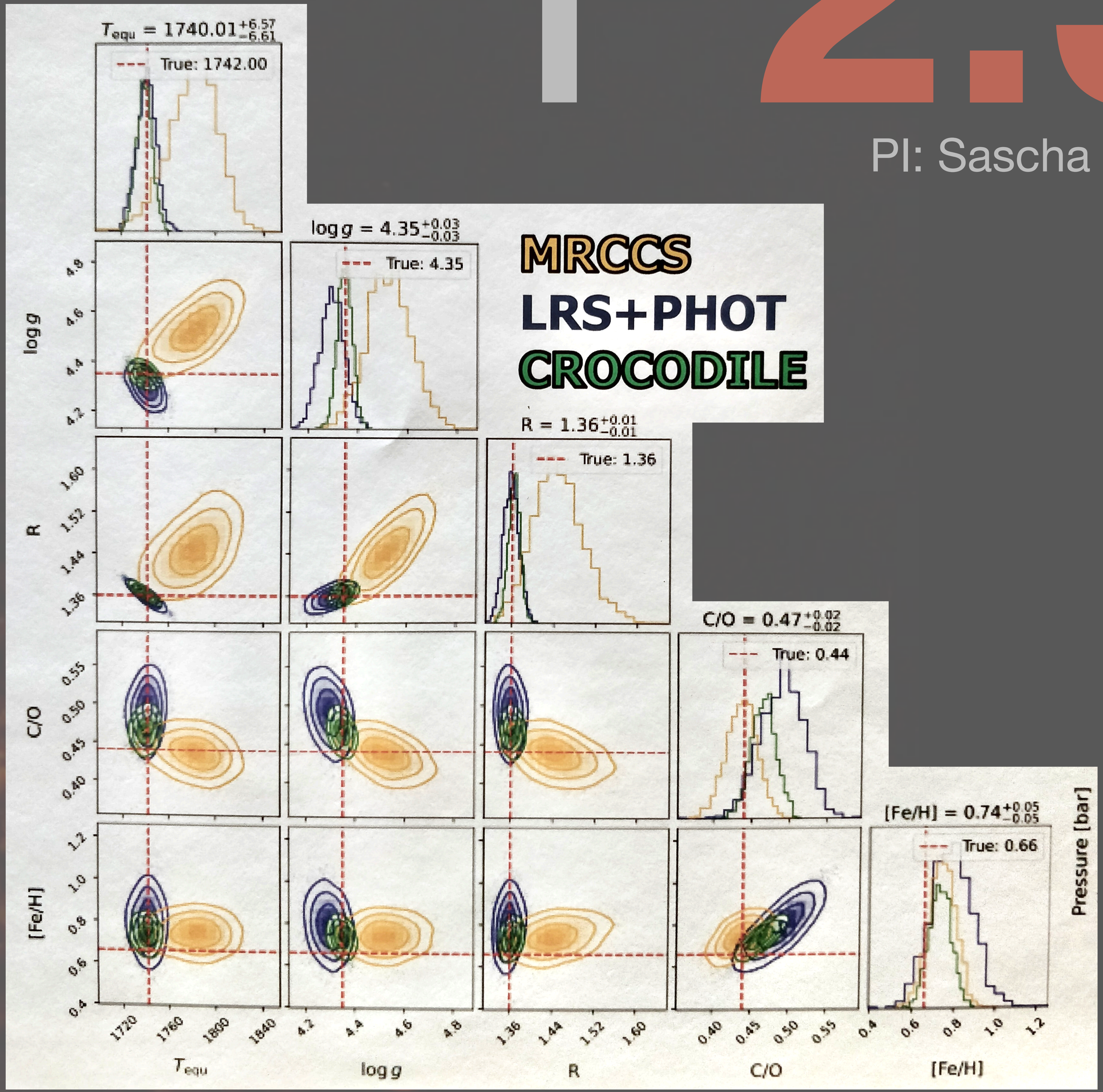
Direct imaging of forming and mature planetary systems

P2.3

PI: Sascha Quanz

Atmospheric retrieval code that use cross-correlation and combines photometry, low and medium resolution spectroscopy observation of directly imaged exoplanets



CRODODILE

Hayoz et al. 2022, in prep.

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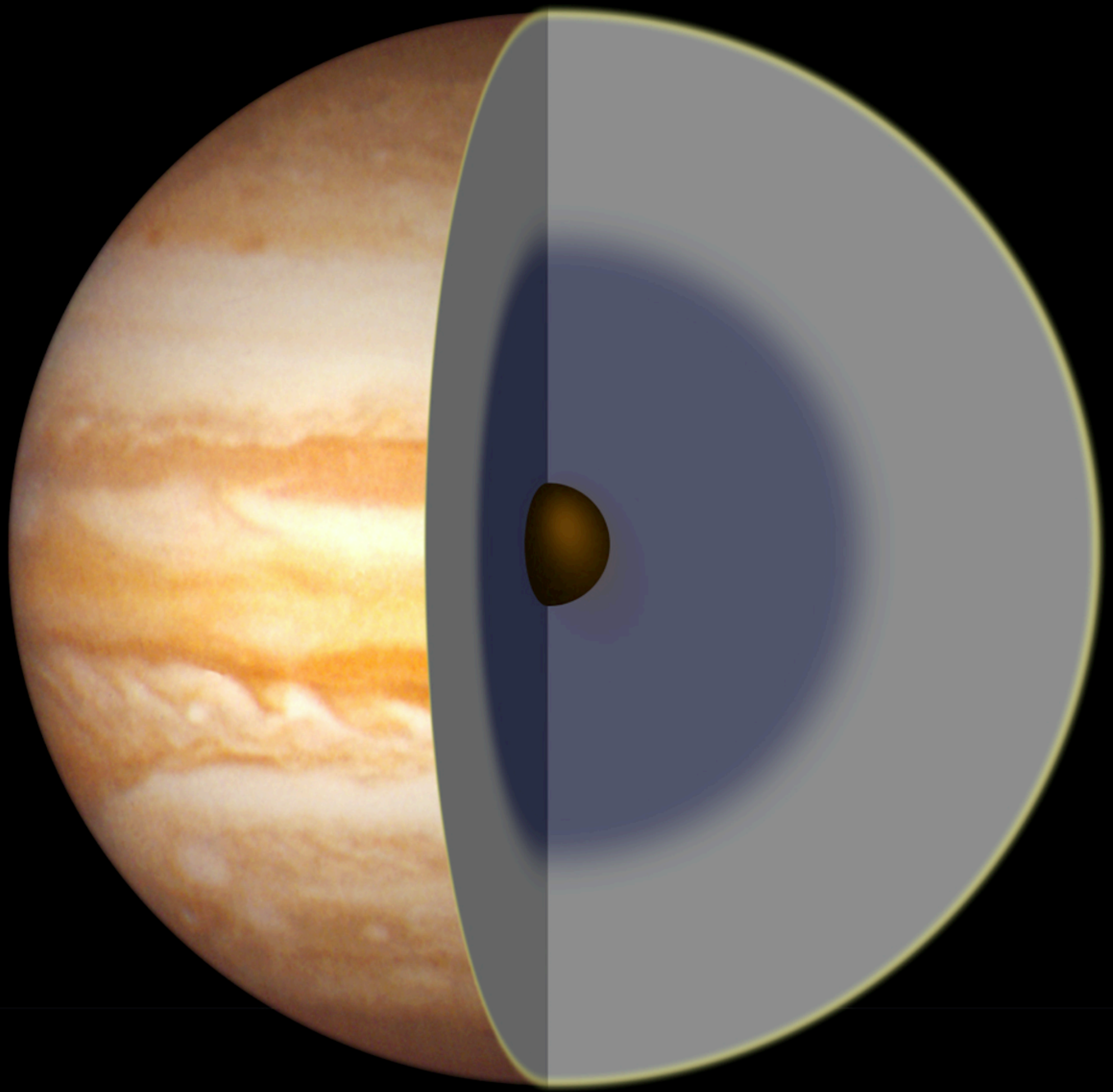
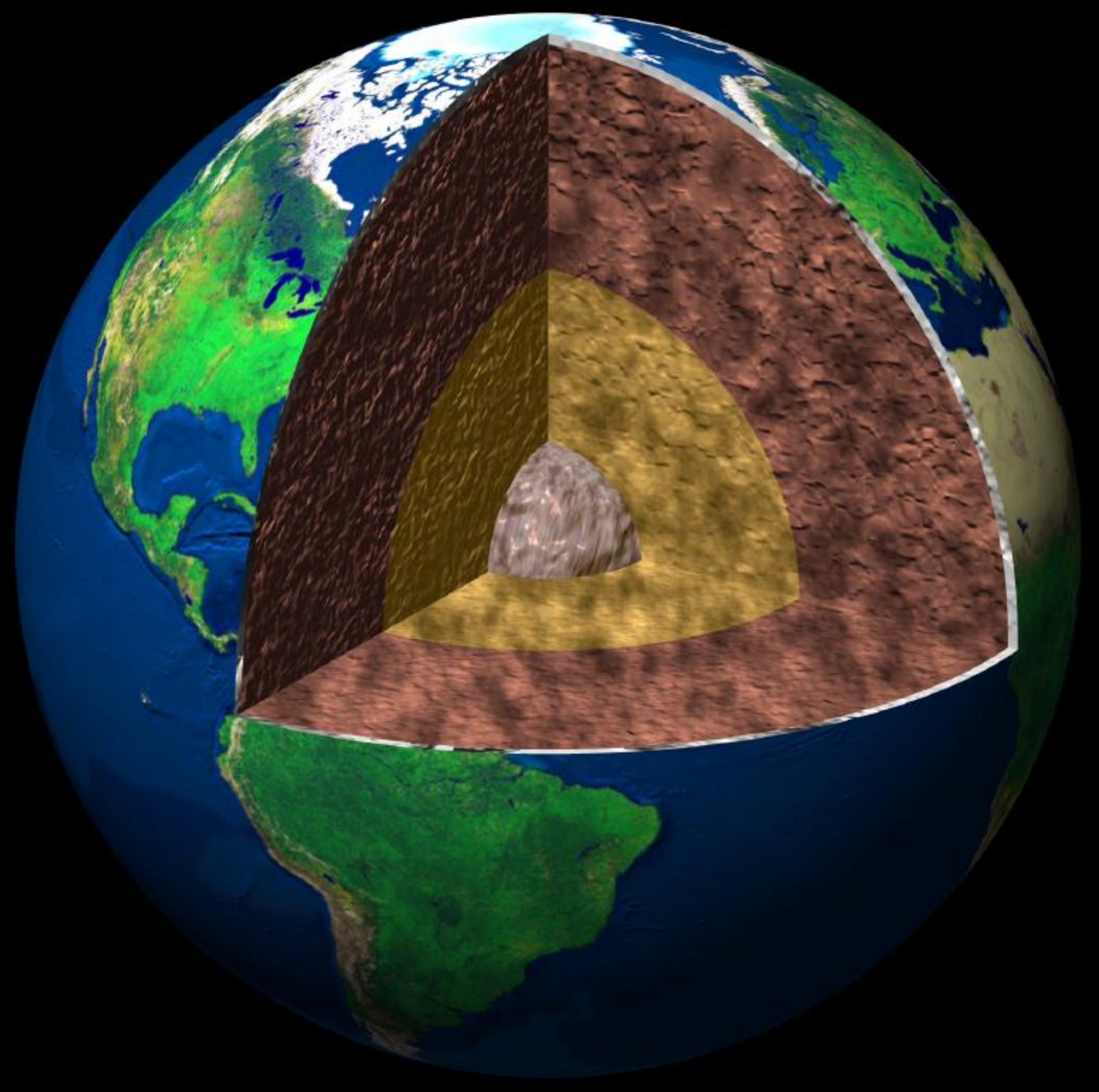
The density of exoplanets

P2.4

PI: Ravit Helled





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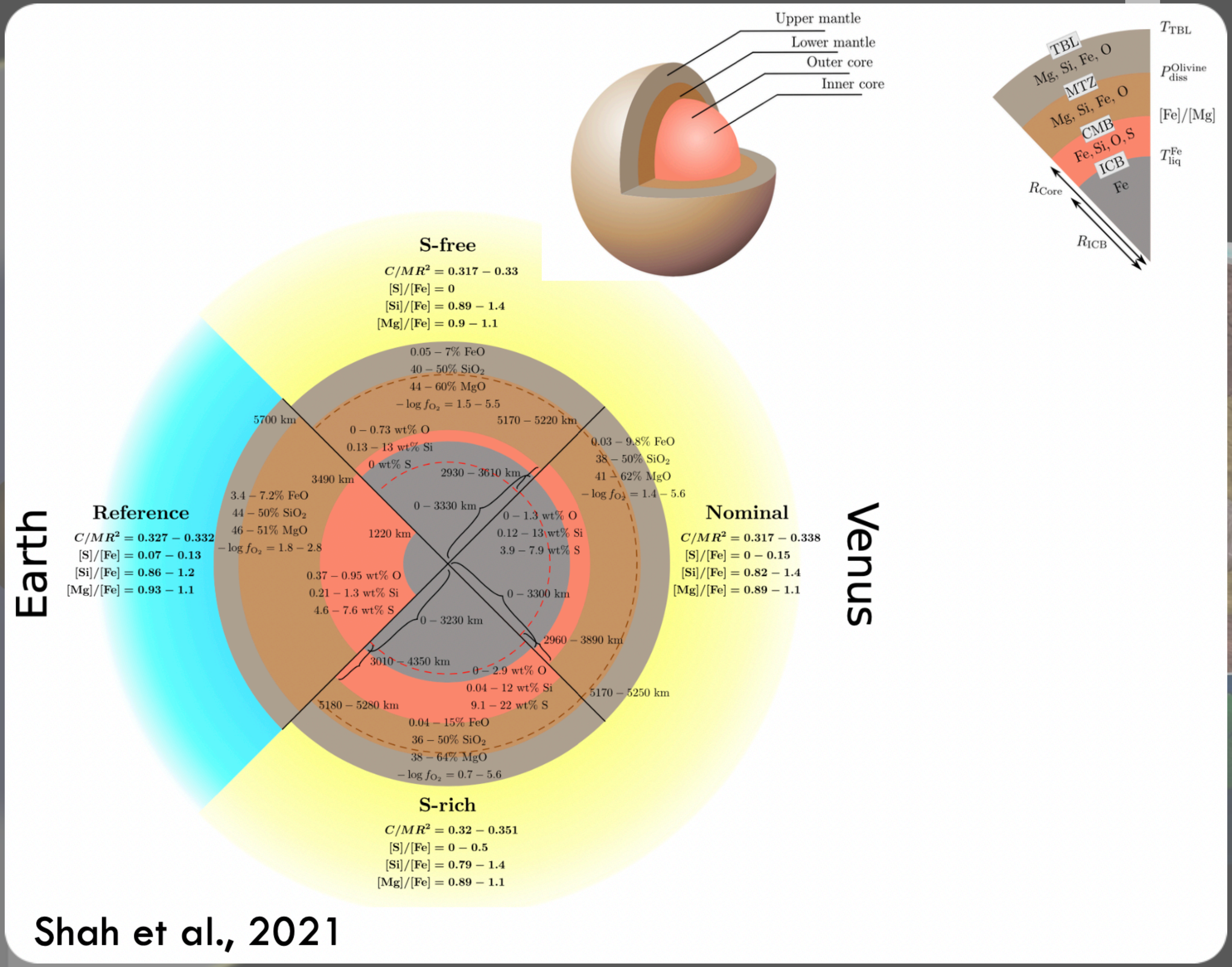
P2.4

PI: Ravit Helled

Venus internal structure



Core size of Venus between 2930 and 4350 km for all assumed composition

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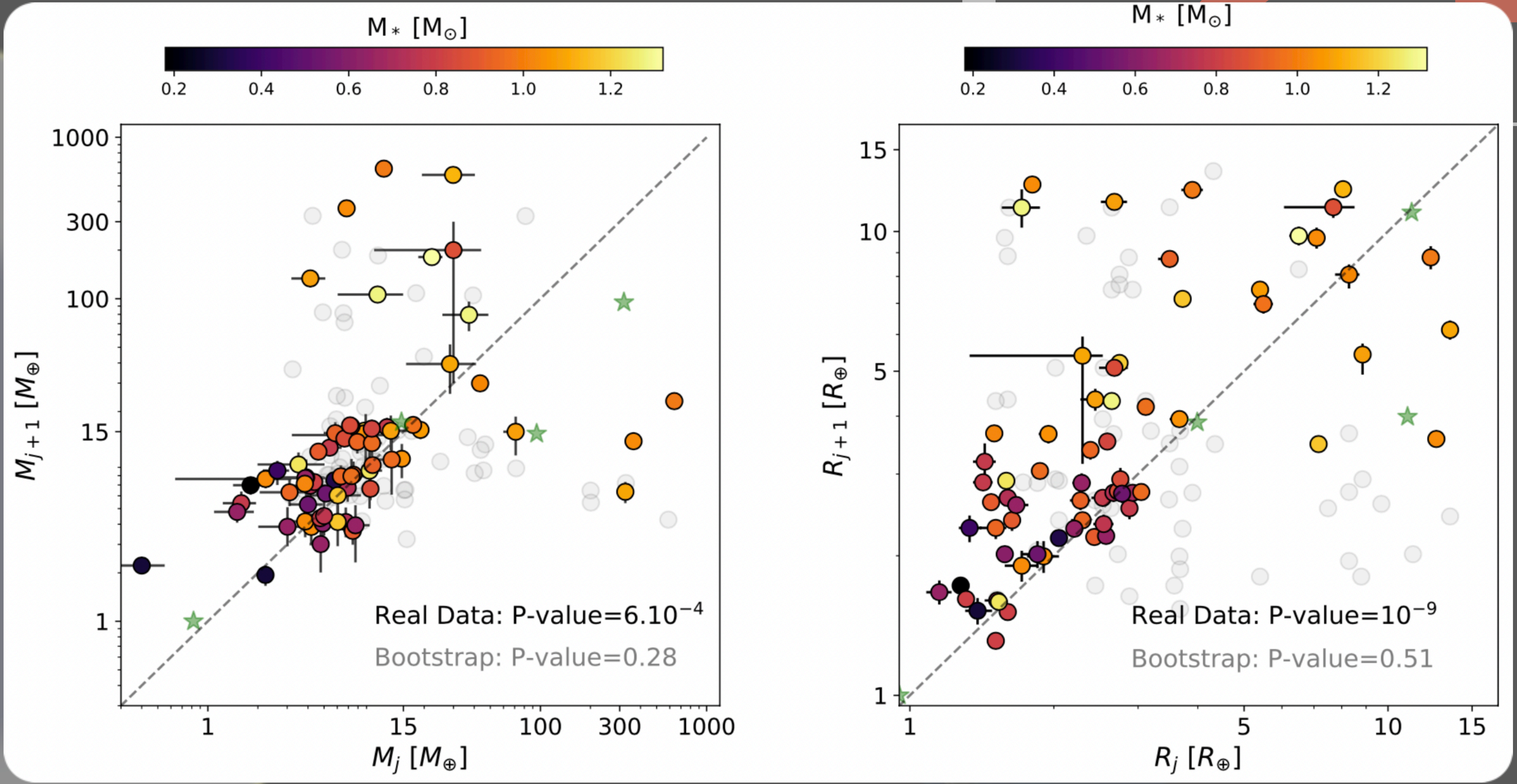
The density of exoplanets

P24

Helled

Similarity of multi-planet systems

Otegi et al. 21



Planets in systems that are similar in radius could be different in mass and vice-versa

More similarities in radius than in mass

A transition in the "peas in the pod" pattern for planets with $M > \sim 100\ M_\oplus$ and $R > \sim 10\ R_\oplus$.

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Formation & composition of core dominated planets

P2.5

PI: Yann Alibert

PlanetS

Formation & composition of core dominated planets

P2.5

PI: Yann Alibert

P2.5

First populations based on hybrid (pebbles/planetesimal) formation model

PI: Yann Alibert

Formation & composition of core dominated planets

P2.5

PI: Yann Alibert

First populations based on hybrid (pebbles/planetesimal) formation model

First models with planetesimal fragmentation and drift computed

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Formation & composition of core dominated planets

P2.5

PI: Yann Alibert

First populations based on hybrid (pebbles/planetesimal) formation model

First models with planetesimal fragmentation and drift computed

Bayesian internal structure models applied to numerous CHEOPS and ESPRESSO planets

Formation & composition of core dominated planets

P2.5

PI: Yann Alibert

First populations based on hybrid (pebbles/planetesimal) formation model

First models with planetesimal fragmentation and drift computed

Bayesian internal structure models applied to numerous CHEOPS and ESPRESSO planets

Model of circumstellar disk (Yuhito Shibaike's presentation)

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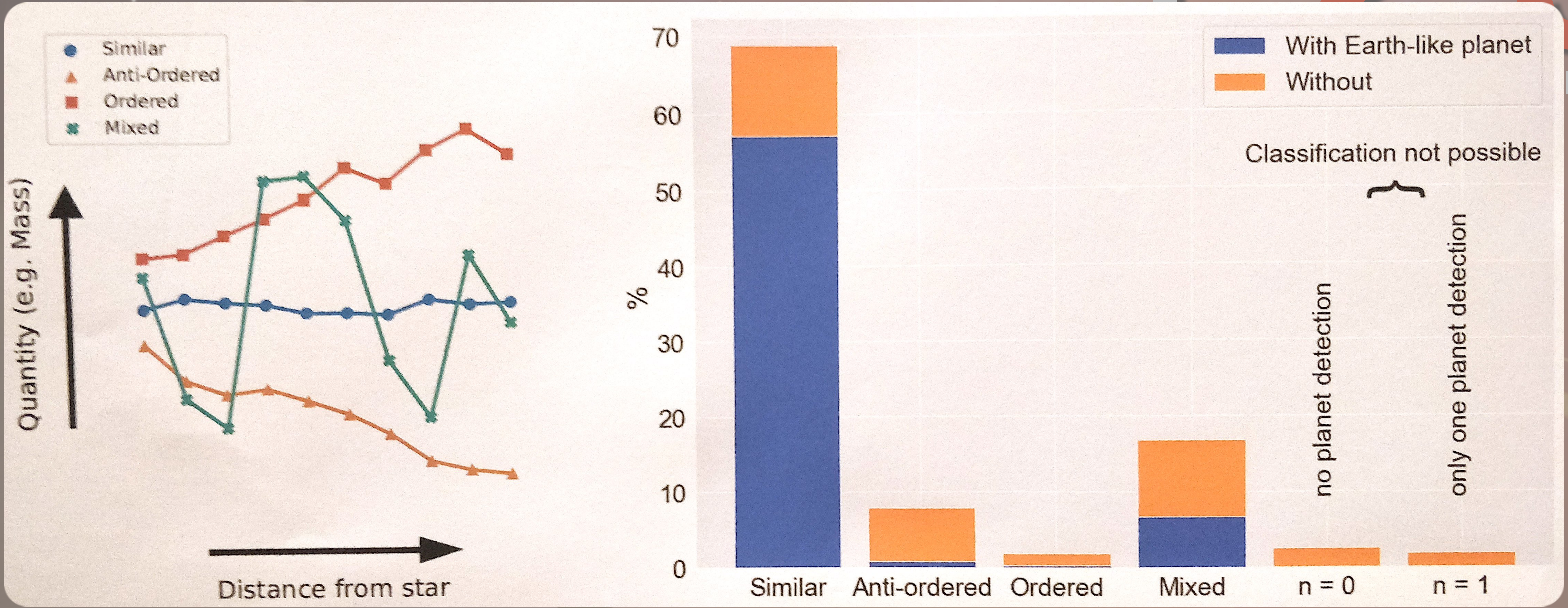
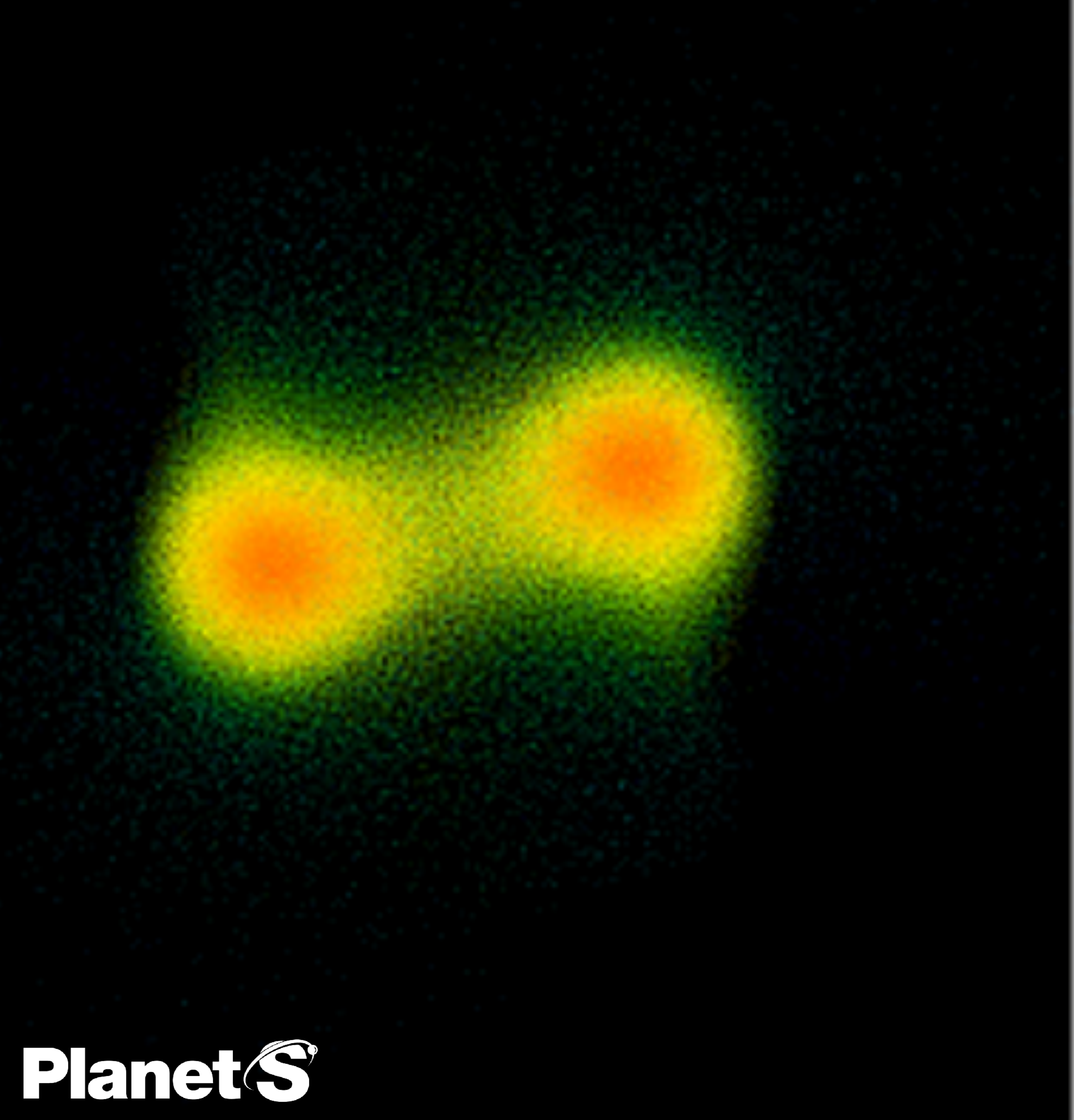
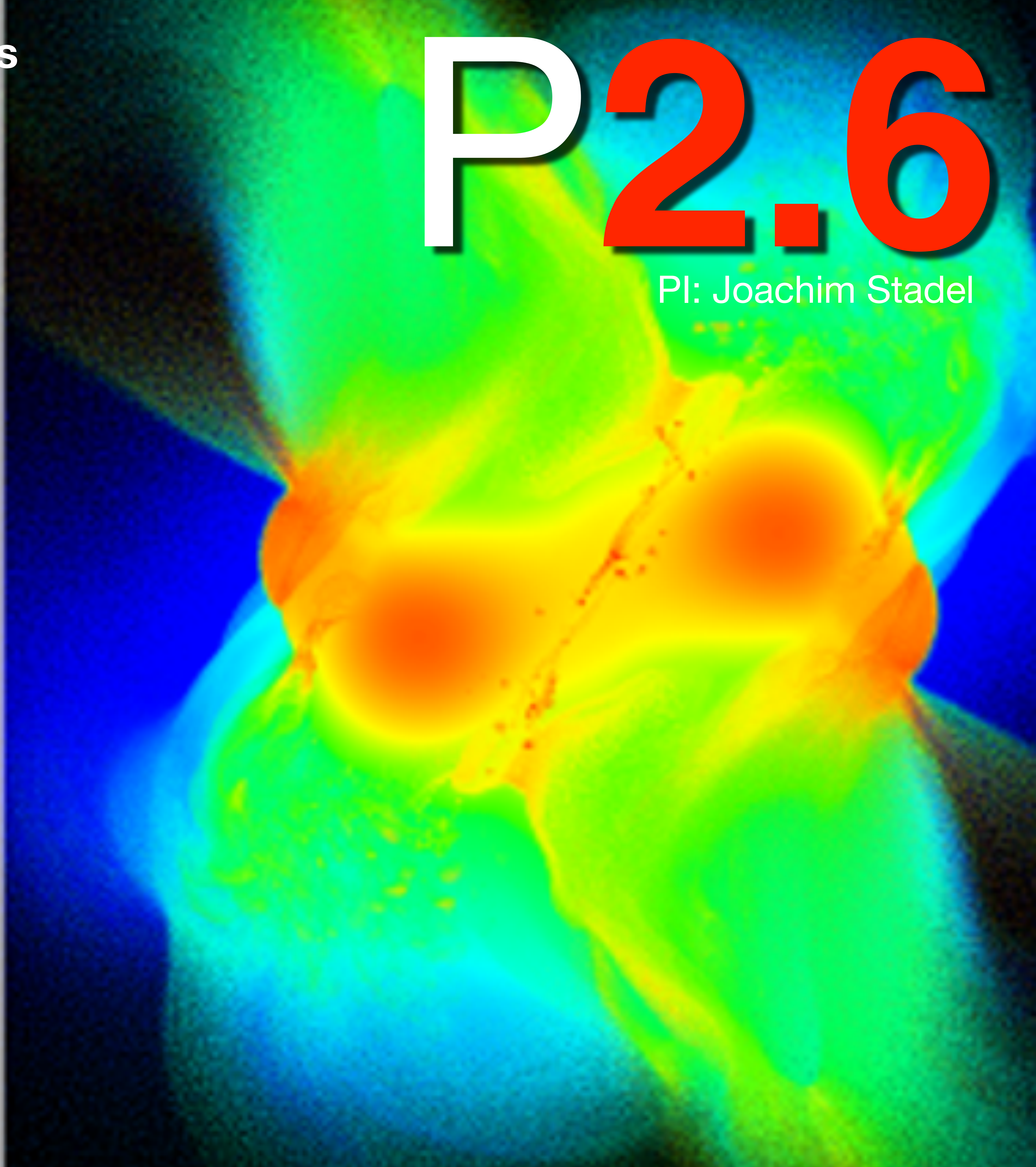
Formation & composition of core dominated planets



Intra-system correlations used to identify Earth-harboring systems
Work by Jean Davoult (based on results from Mishra et al. 22, sub.)

Collisional growth and orbital evolution of planets





P2.6

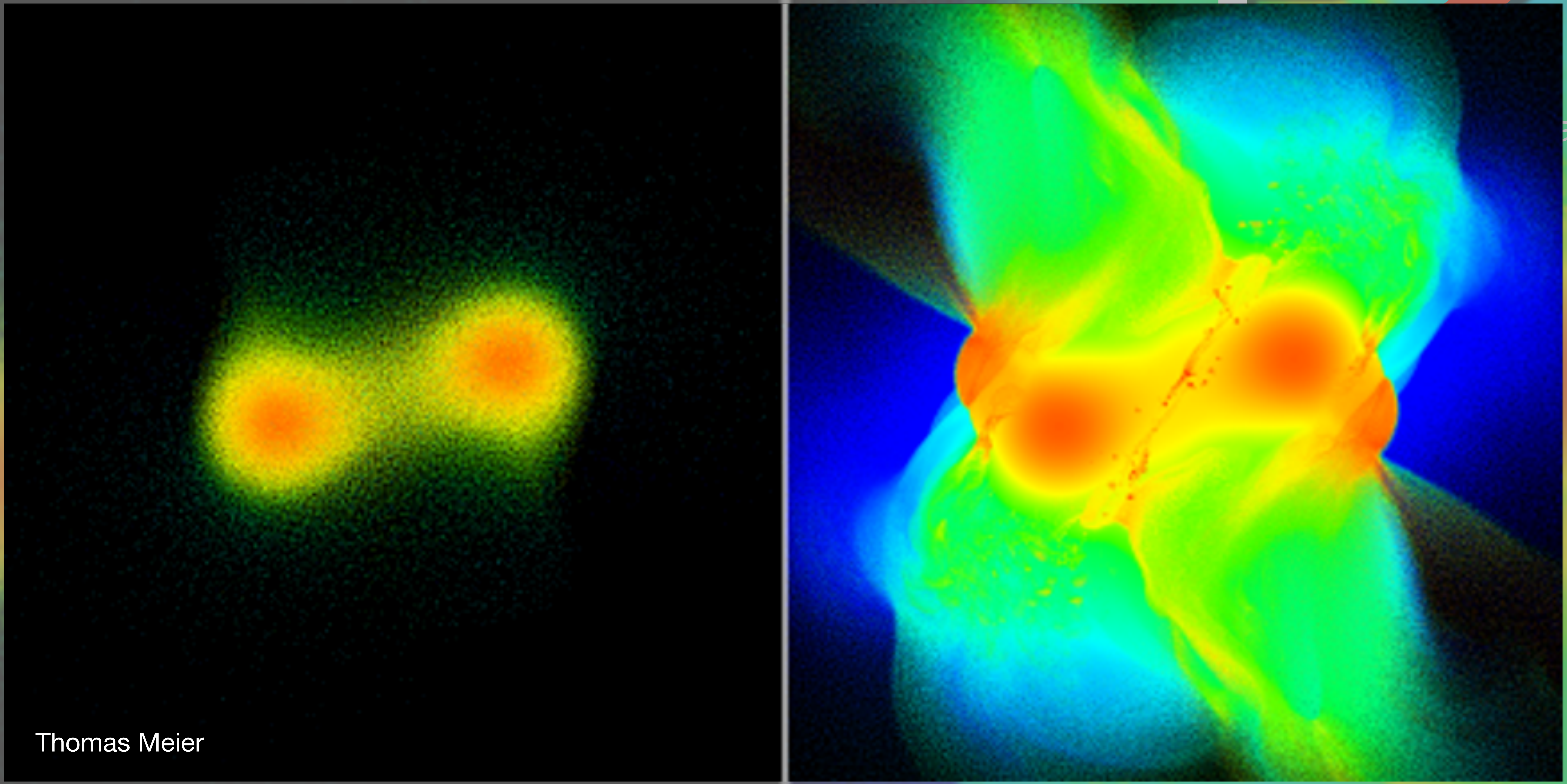
PI: Joachim Stadel


Collisional growth and orbital evolution of planets
P2.6
PI: Joachim Stadel
New GENGA 2.0 code released (Grimm et al. 22, subm.)
Thomas Meier
PlanetS

Collisional growth and orbital evolution of planets

P2.6

achim Stadel



Smooth particle hydrodynamics added to state-of-the-art PKDGRAV3 code

Many applications, like high-resolution model to study the formation of the Moon

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Monitoring solar system formation and evolution with noble gases

P2.7

PI: Henner Busemann

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Monitoring solar system formation and evolution with noble gases

P2.7

Back to the lab

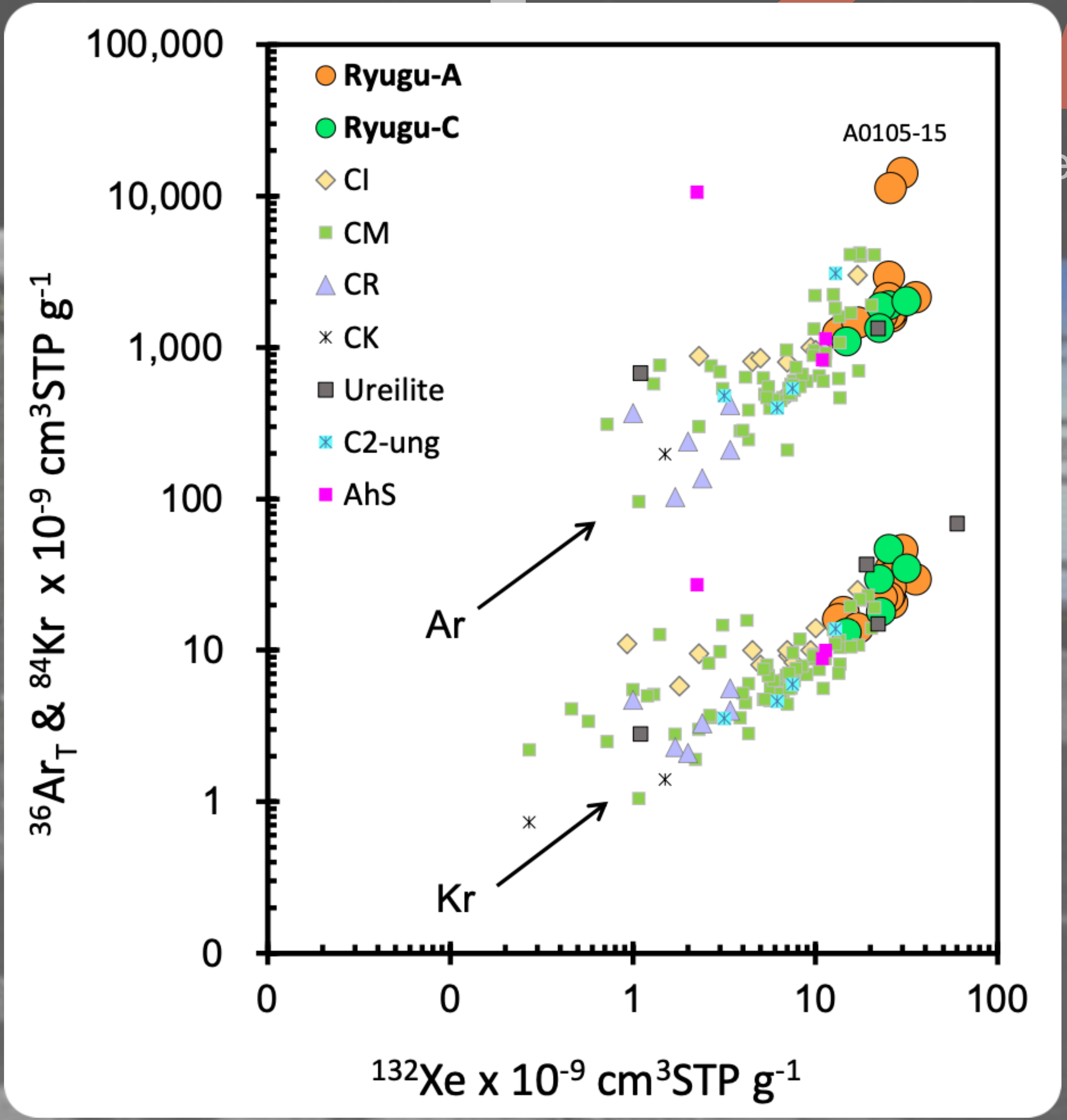
PI: Henner Busemann

P2 7

emann

Back to the lab

Measurements of Ryugu dust samples returned with JAXA's Hayabusa 2 spacecraft (Science, in review)



Monitoring solar system formation and evolution with noble gases

P2.7

PI: Henner Busemann

Back to the lab

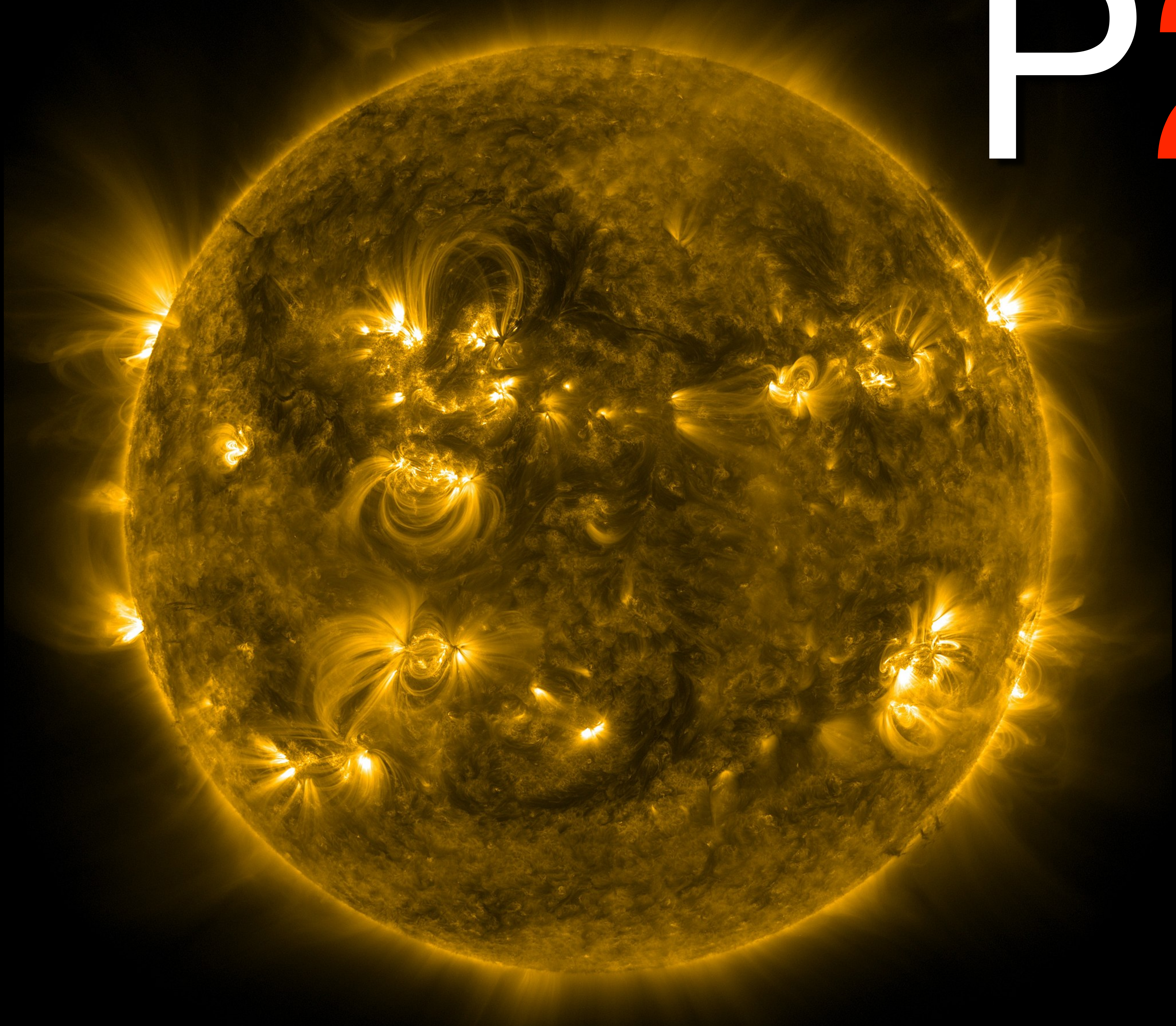
Measurements of Ryugu dust samples returned with JAXA's Hayabusa 2 spacecraft (Science, in review)

Measurements of gas from the Hayabusa 2 spacecraft, outgassed from recovered samples (Science Adv. , in review)

Stellar Correction to Reaveal other Earths

P2.8

PI: Xavier Dumusque



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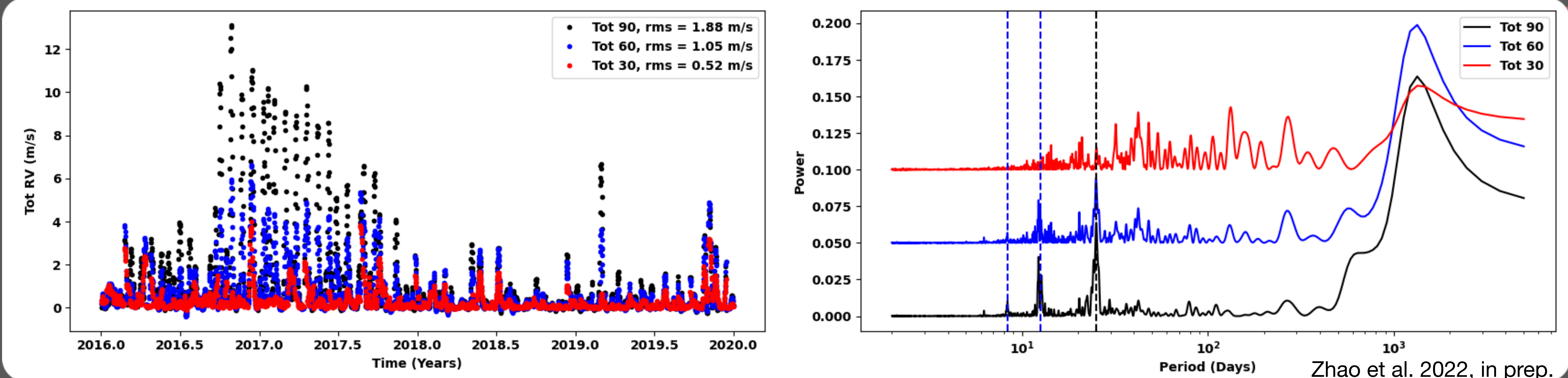
Stellar Correction to Reaveal other Earths



Zhao et al. 2022, in prep.

Modelisation of stellar activity in high-resolution spectra

Allows to investigate stellar activity correction techniques at the spectral level


End