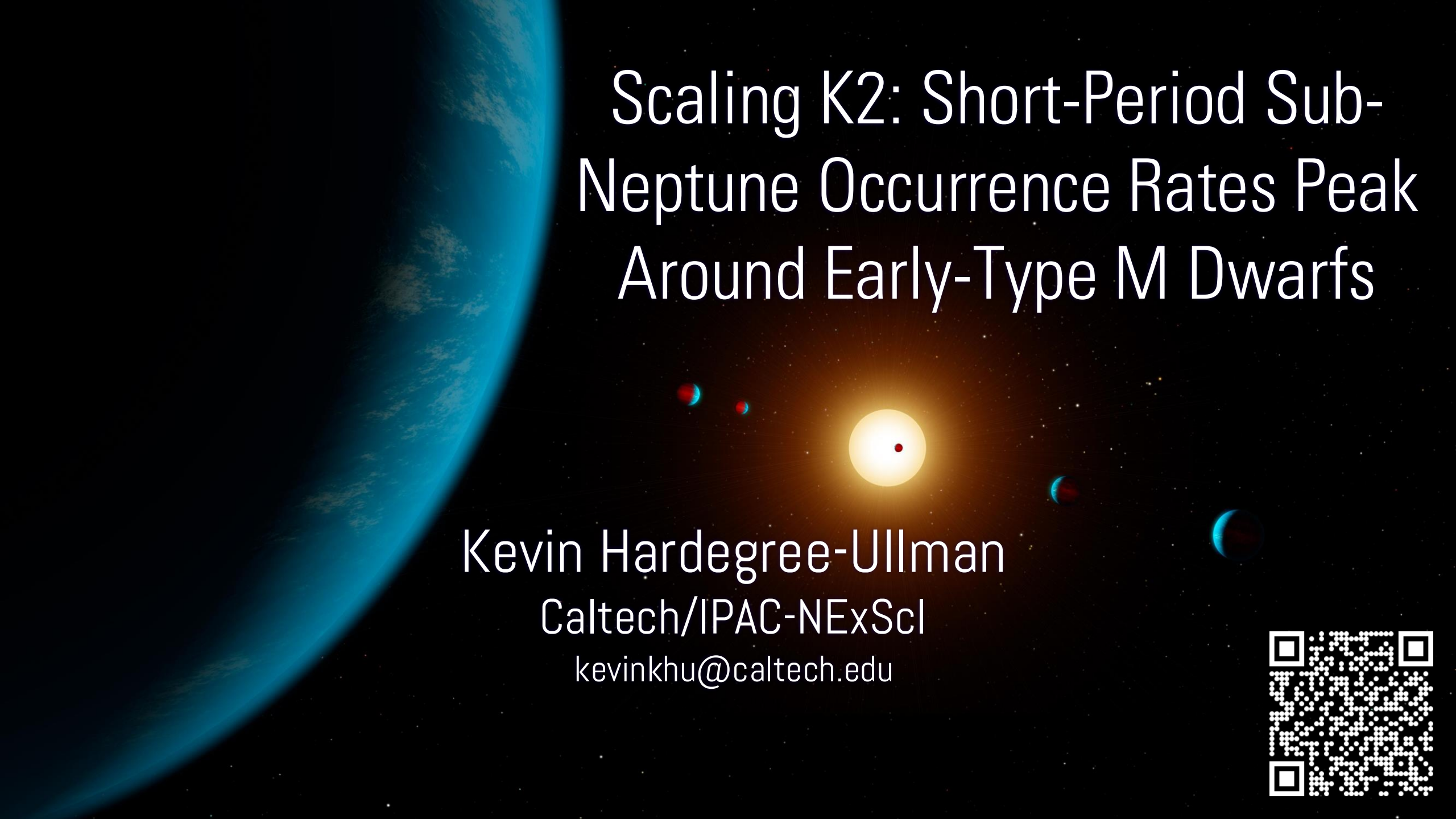
# Scaling K2: Short-Period Sub-Neptune Occurrence Rates Peak Around Early-Type M Dwarfs



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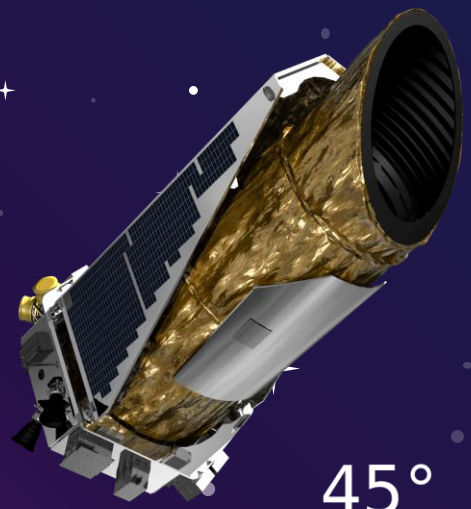
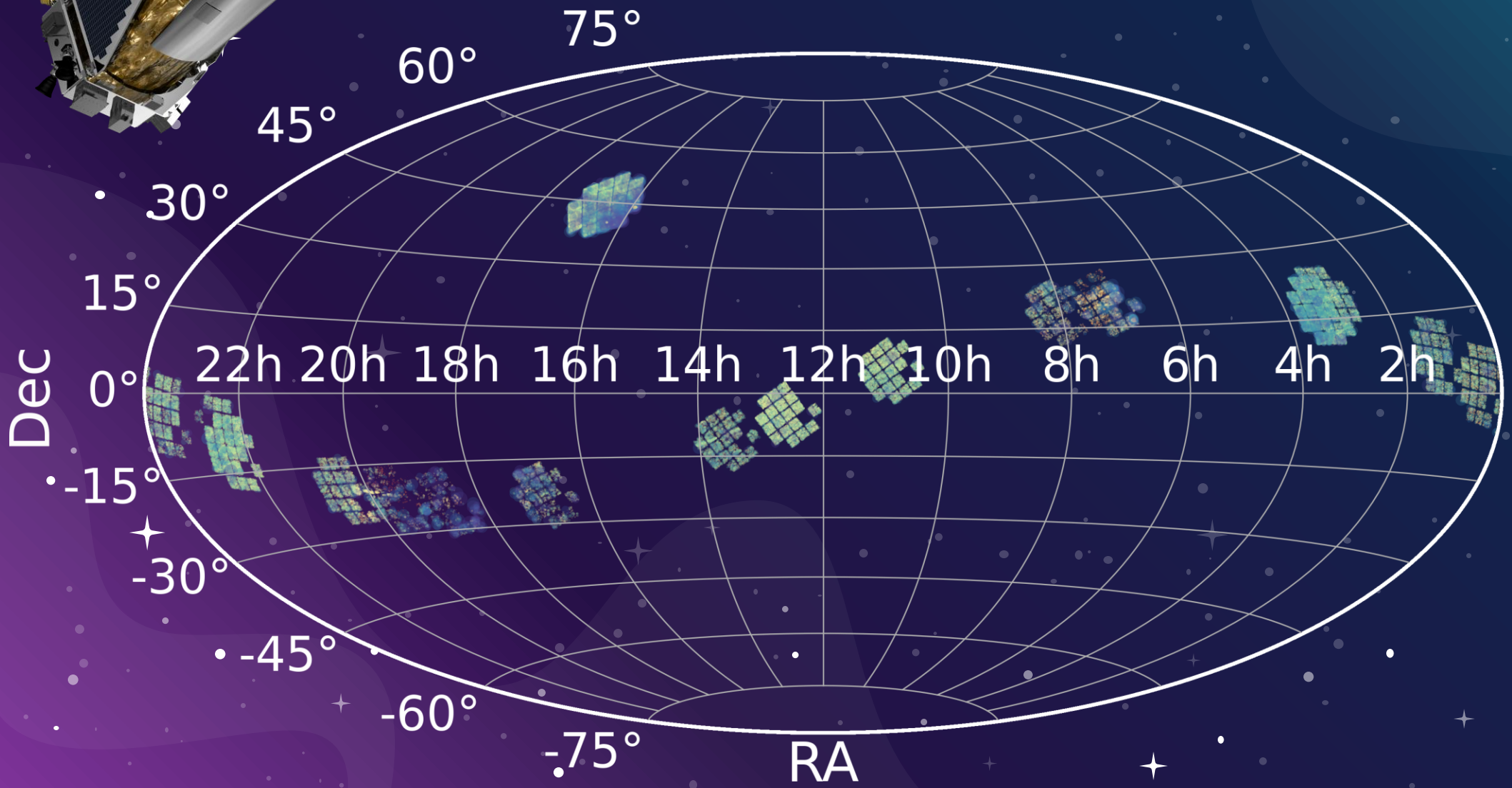
# Scaling K2 Project: Demographics Beyond Kepler






**BlackSun** @blacksun.bsky.social · 3mo

Scaling K2 sounds like the closest thing to traveling to another planet you can do without leaving Earth, fascinating, yet terrifying and deadly. Clearly, only the most exceptionally insane humans attempt this.

**K2: The Killing Peak by Matthew Power**

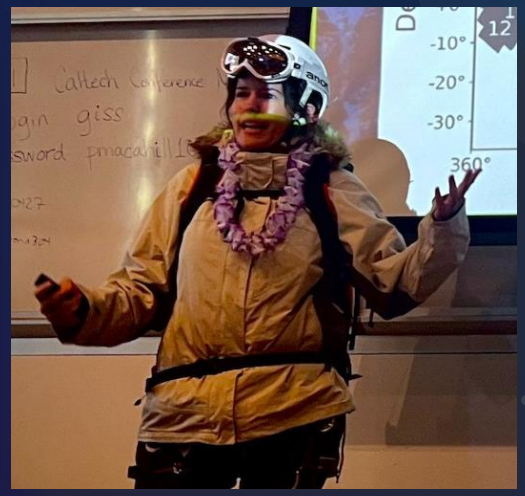
K2, the world's second-highest summit, is the true climber's mountain, more challenging and dangerous than Everest – as the world learned this August, ...

www.mensjournal.com

# The most exceptionally insane humans

Kevin Hardegree-Ullman

Galen Bergsten



Jessie Christiansen

Jon Zink

Sakhee Bhure

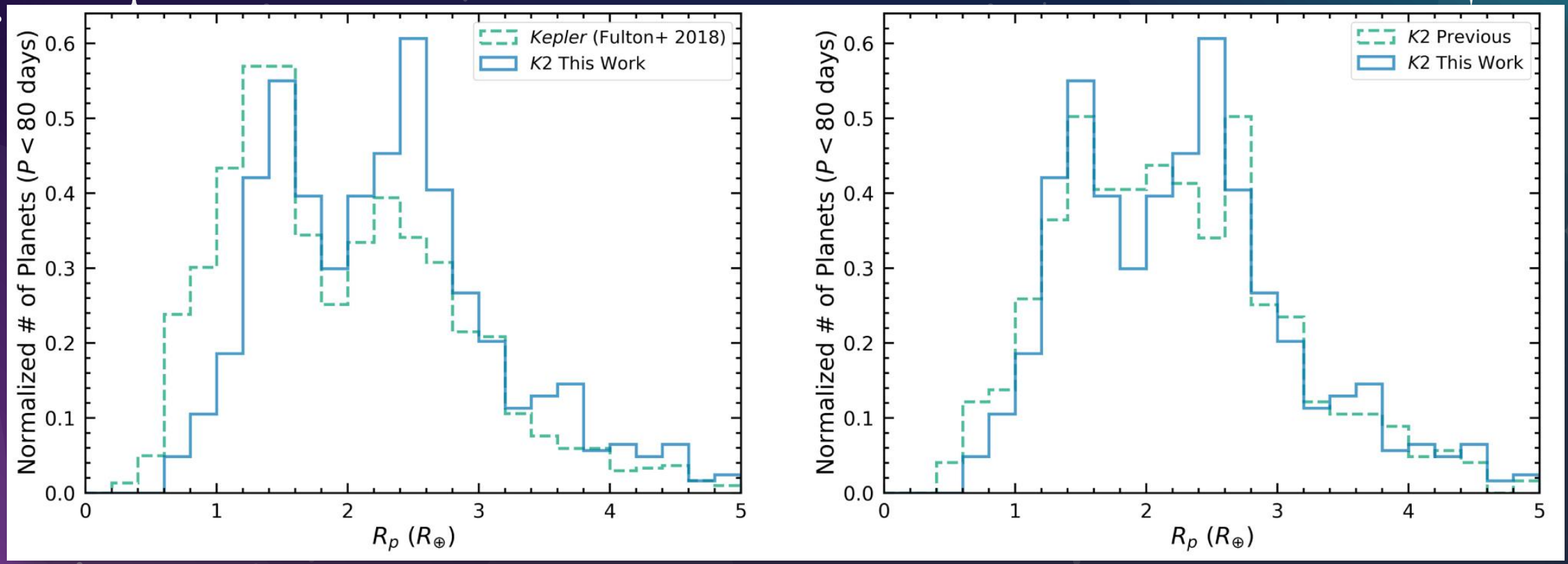
Kiersten Boley

Rachel Fernandes

Steven Giacalone

Preethi Karpoor

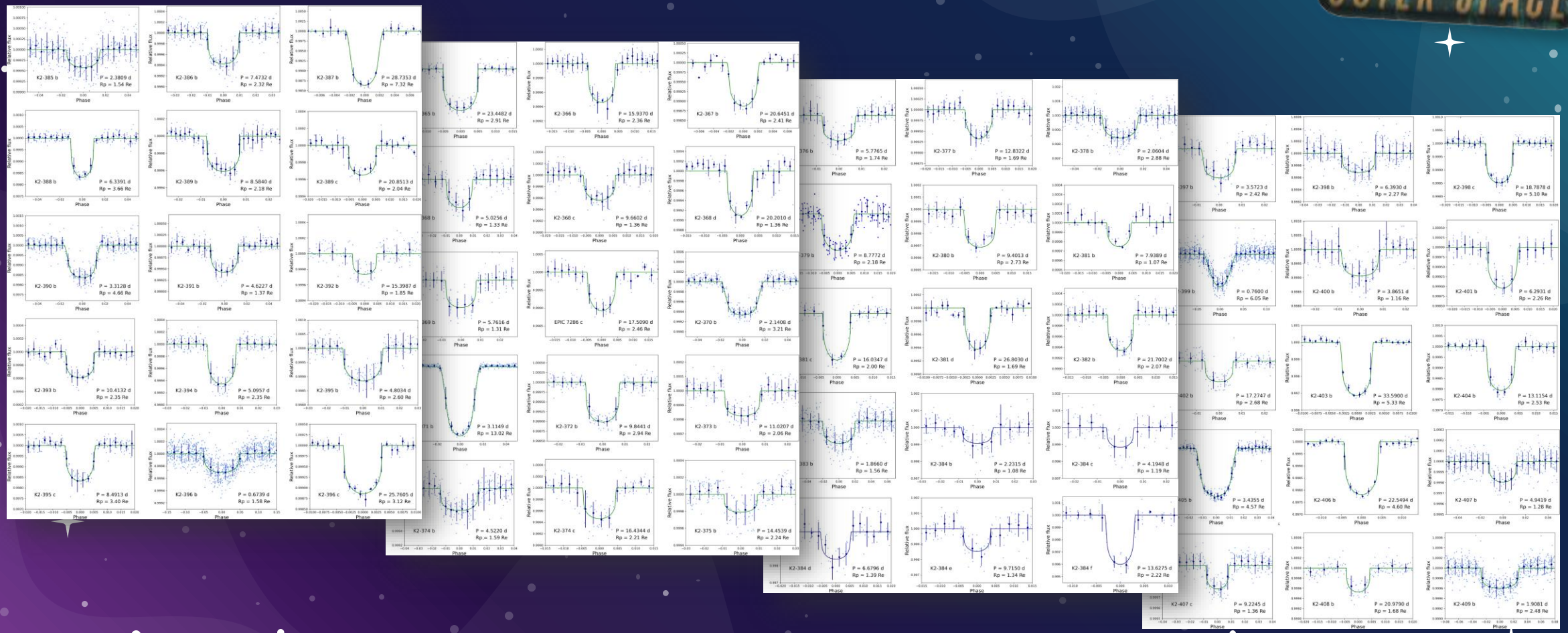
# Scaling K2: Greatest Hits




K2 planet radius valley – planet formation similar across galaxy!

Hardegree-Ullman+ (2020)

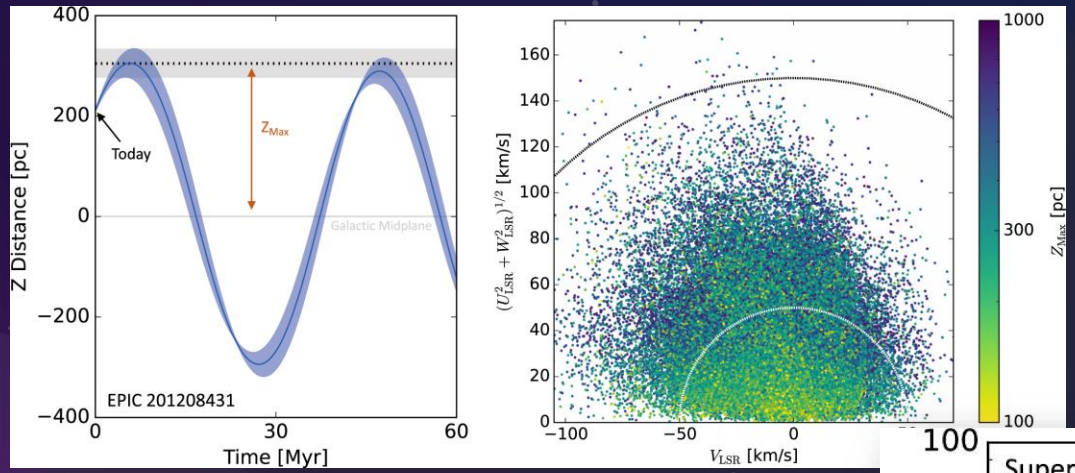
# Scaling K2: Greatest Hits

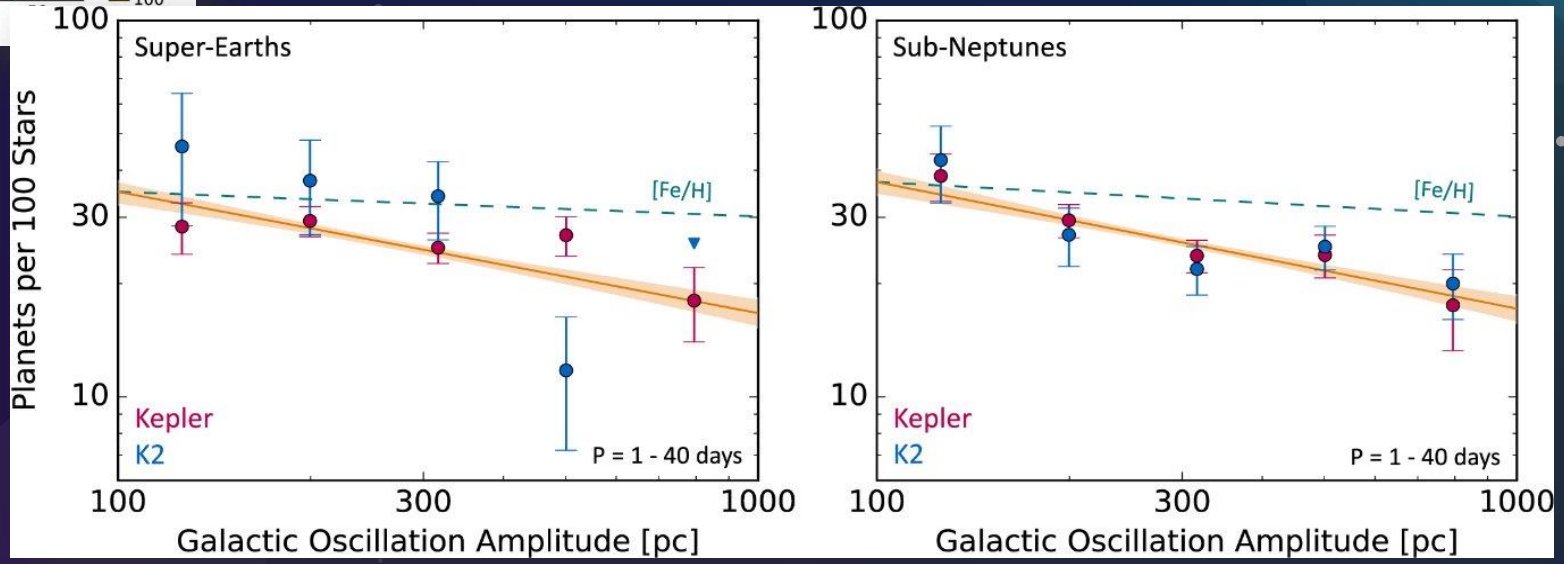


60 statistically validated exoplanets!

Christiansen+ (2022)

# Scaling K2: Greatest Hits

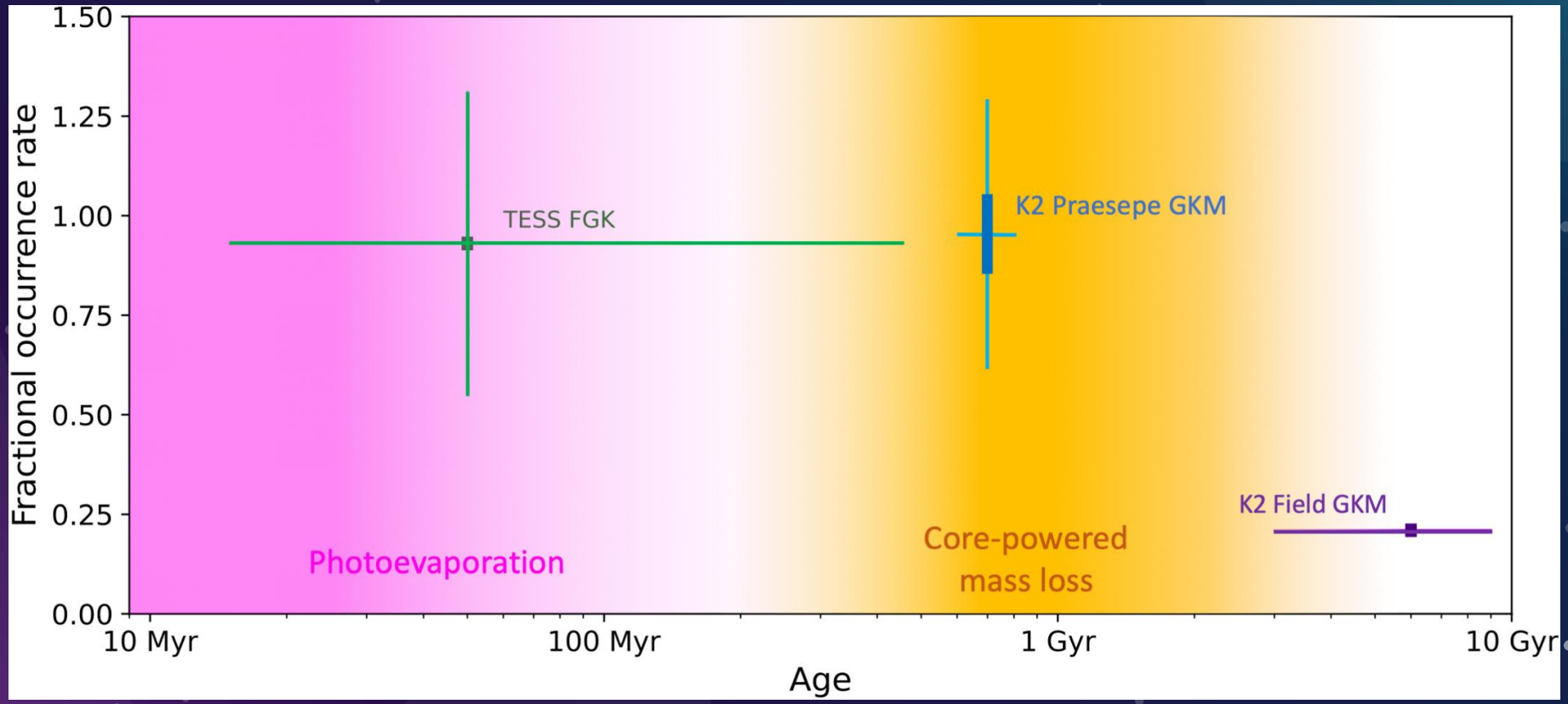



Higher galactic amplitude stars have fewer small planets

Zink+ (2023)

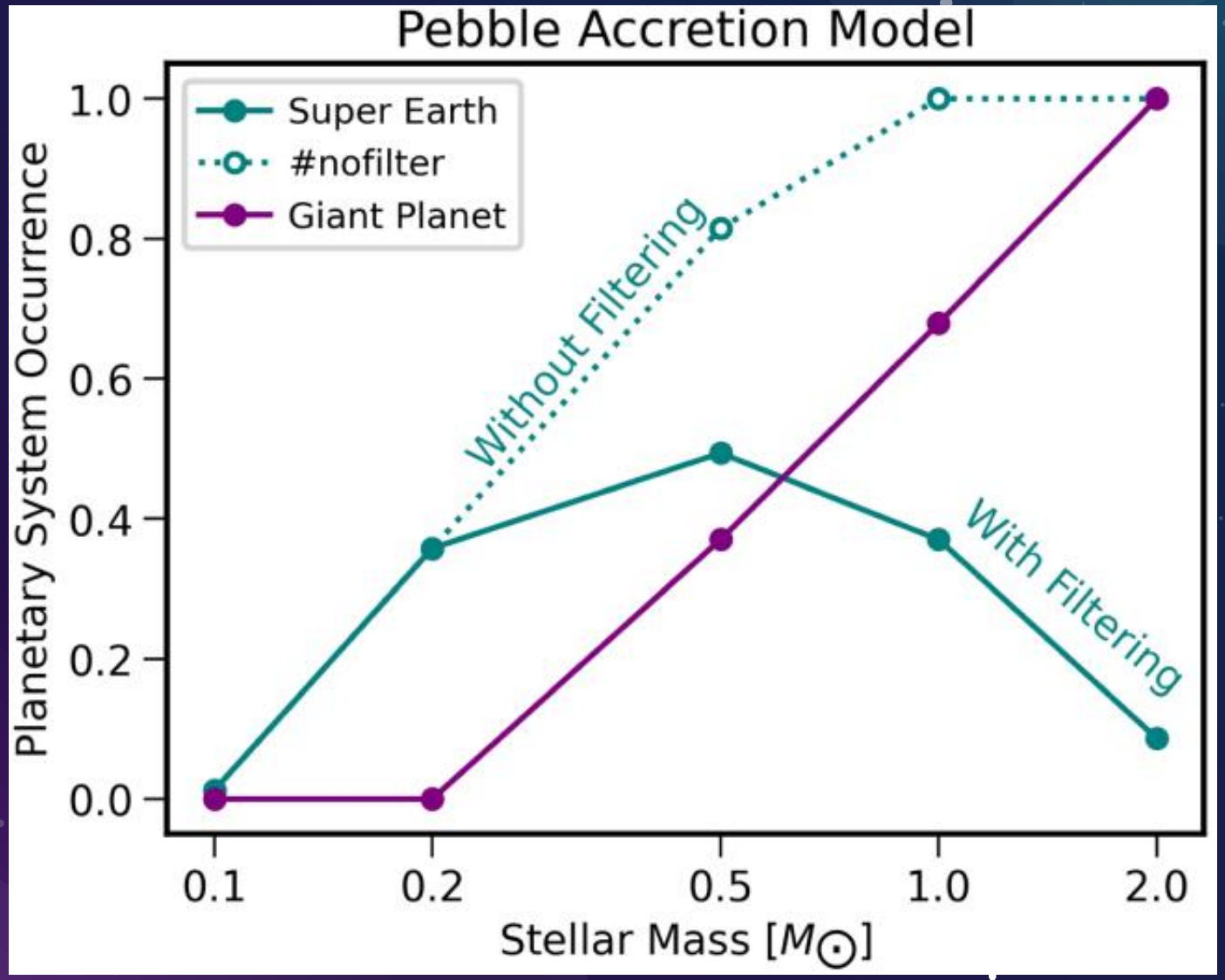
# Scaling K2: Greatest Hits



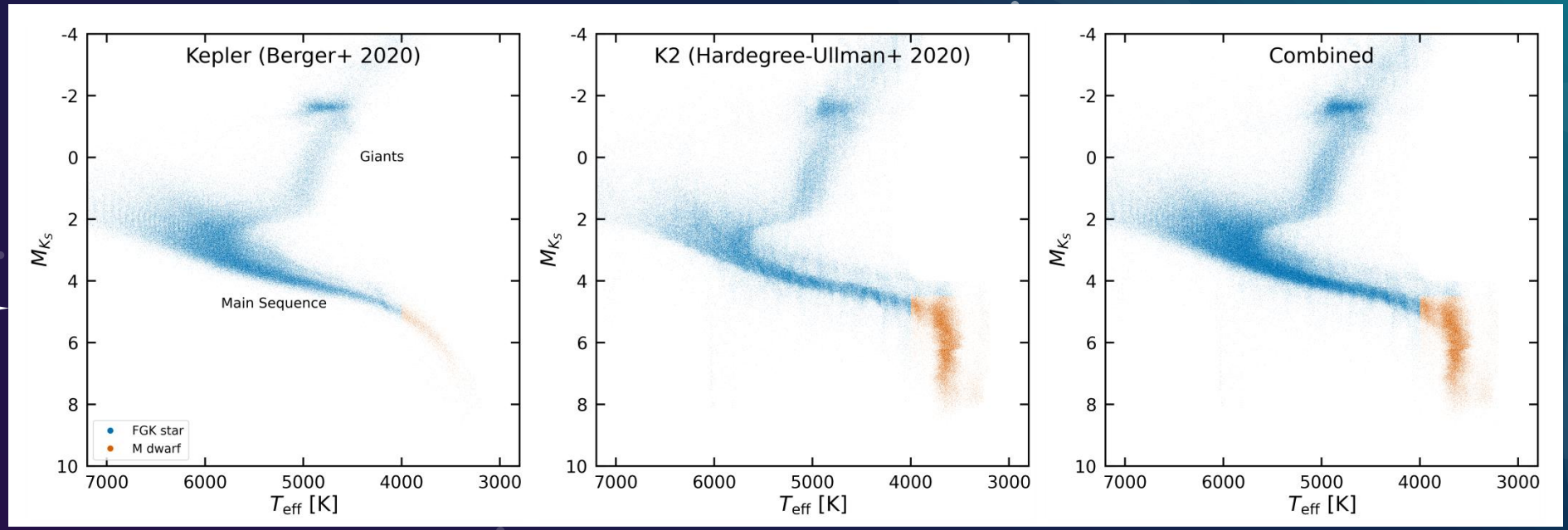

## Intermediate age hot sub-Neptunes are common

Christiansen+ (2023)

# Formation models predict a "small planet" peak

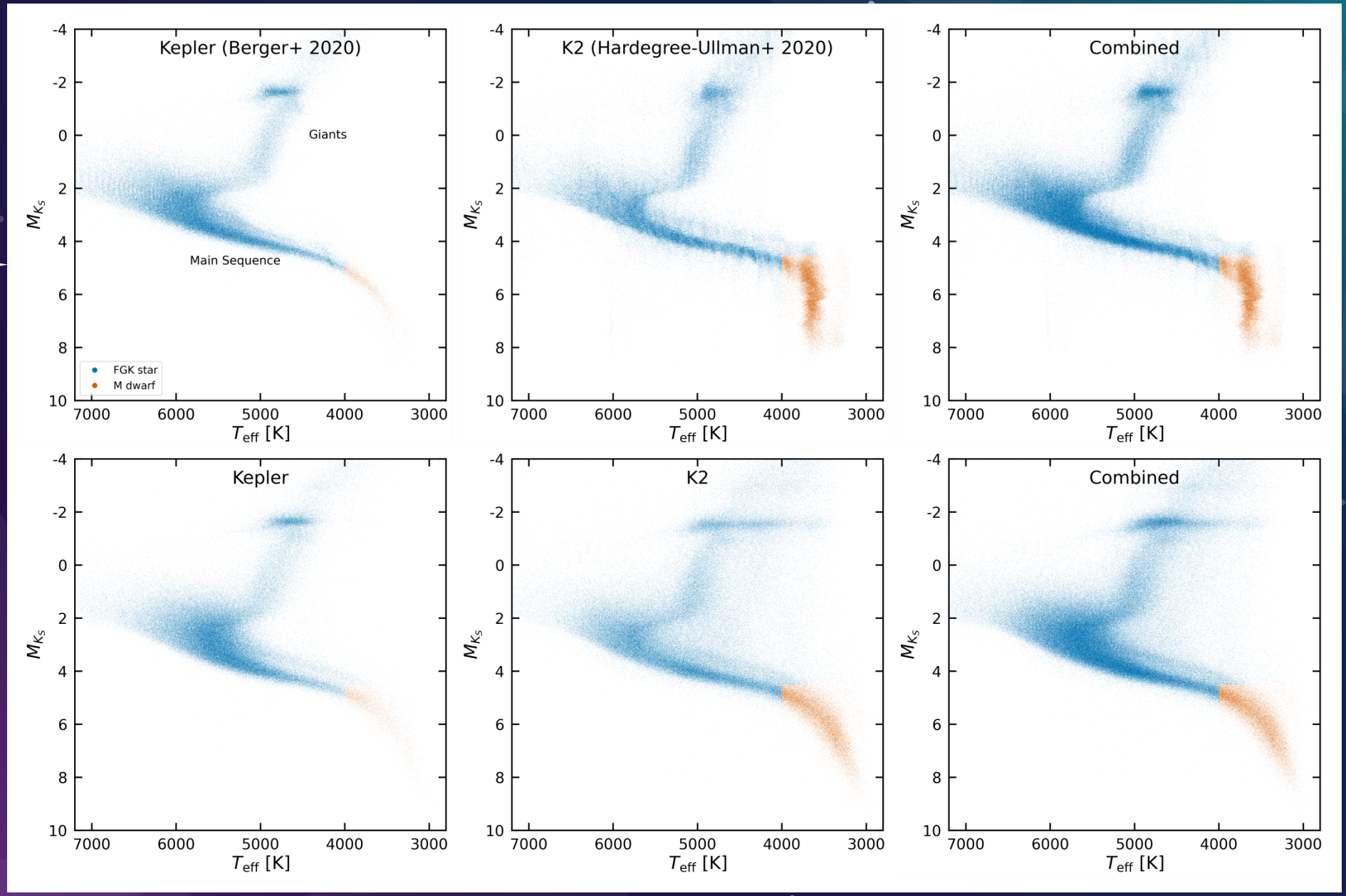



Mulders+ (2021)




# Combining surveys requires homogeneous analysis

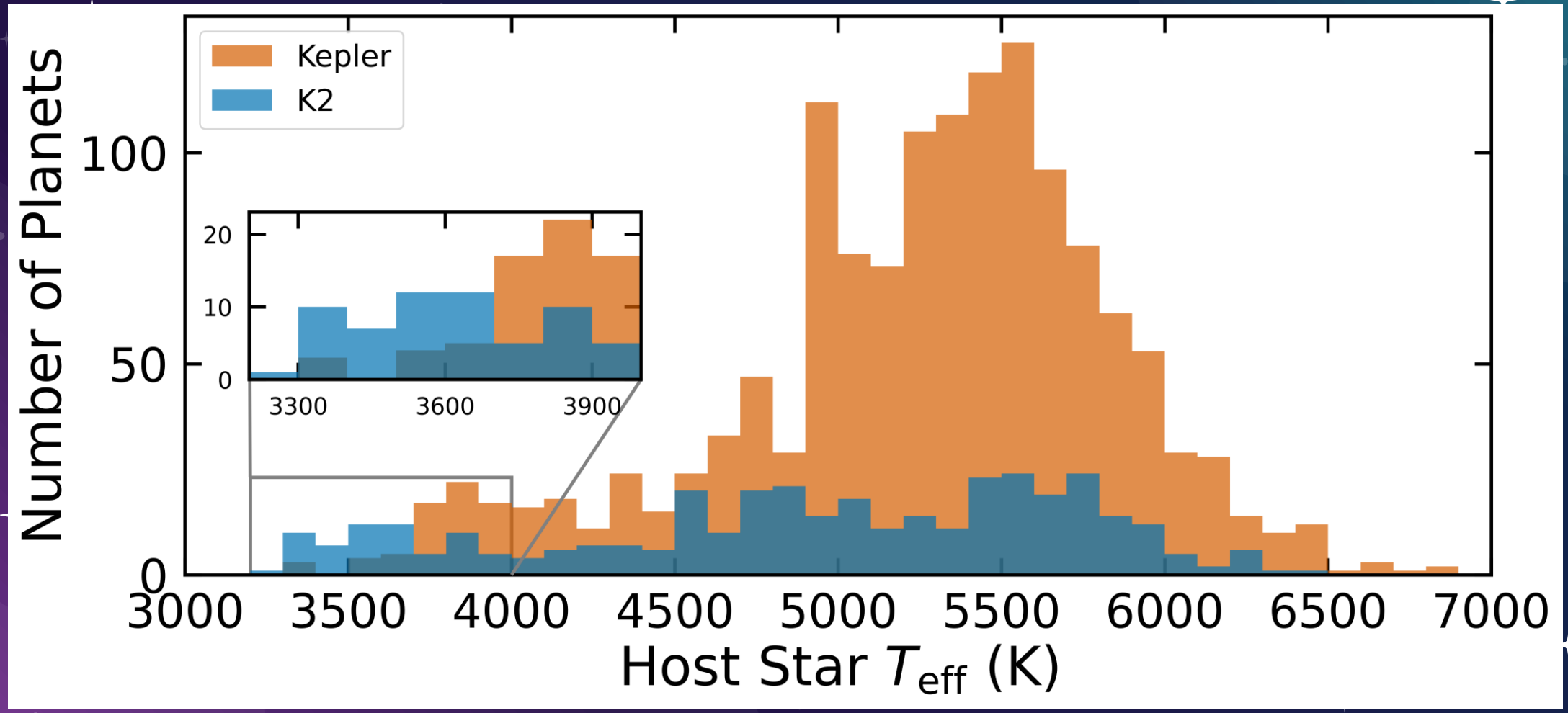
Hardegree-Ullman+ (2025)



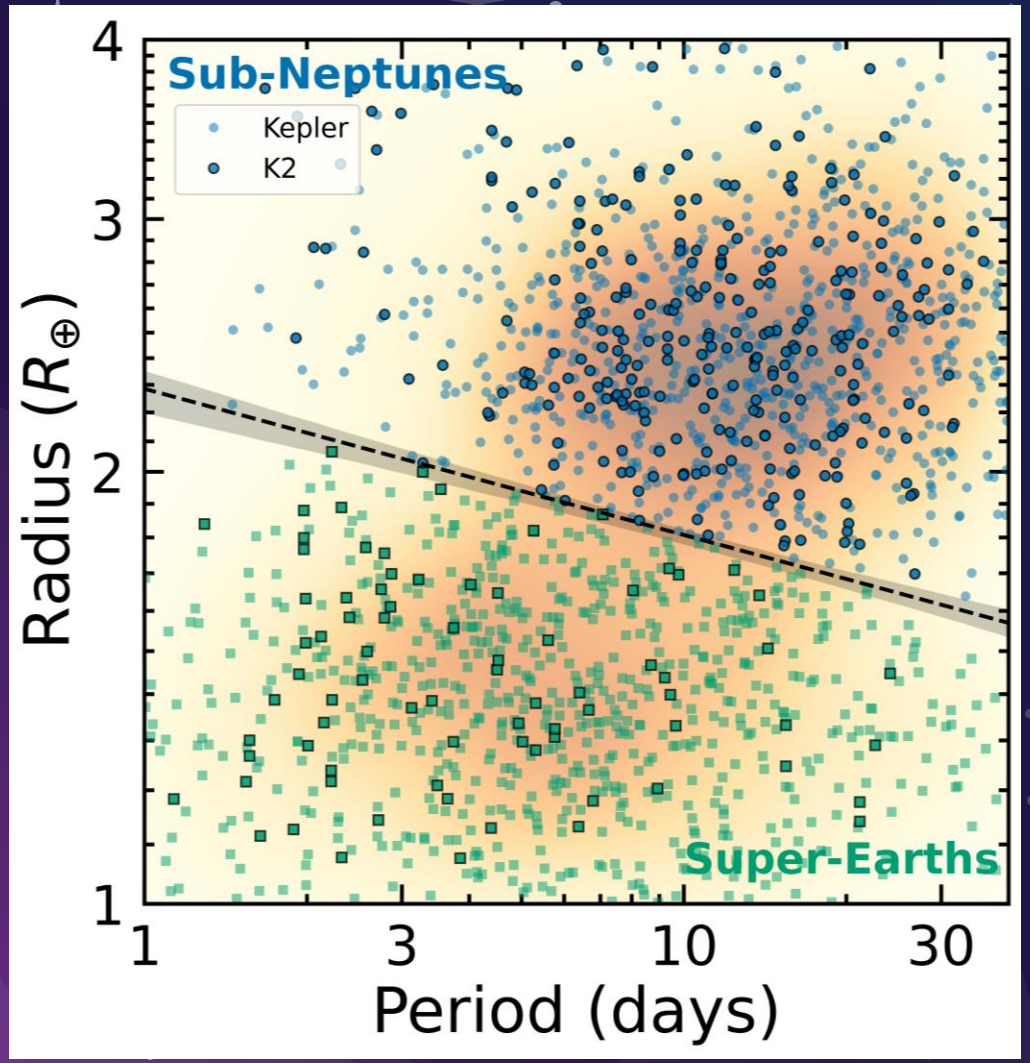

# K2 observed ~10x more M dwarfs than Kepler

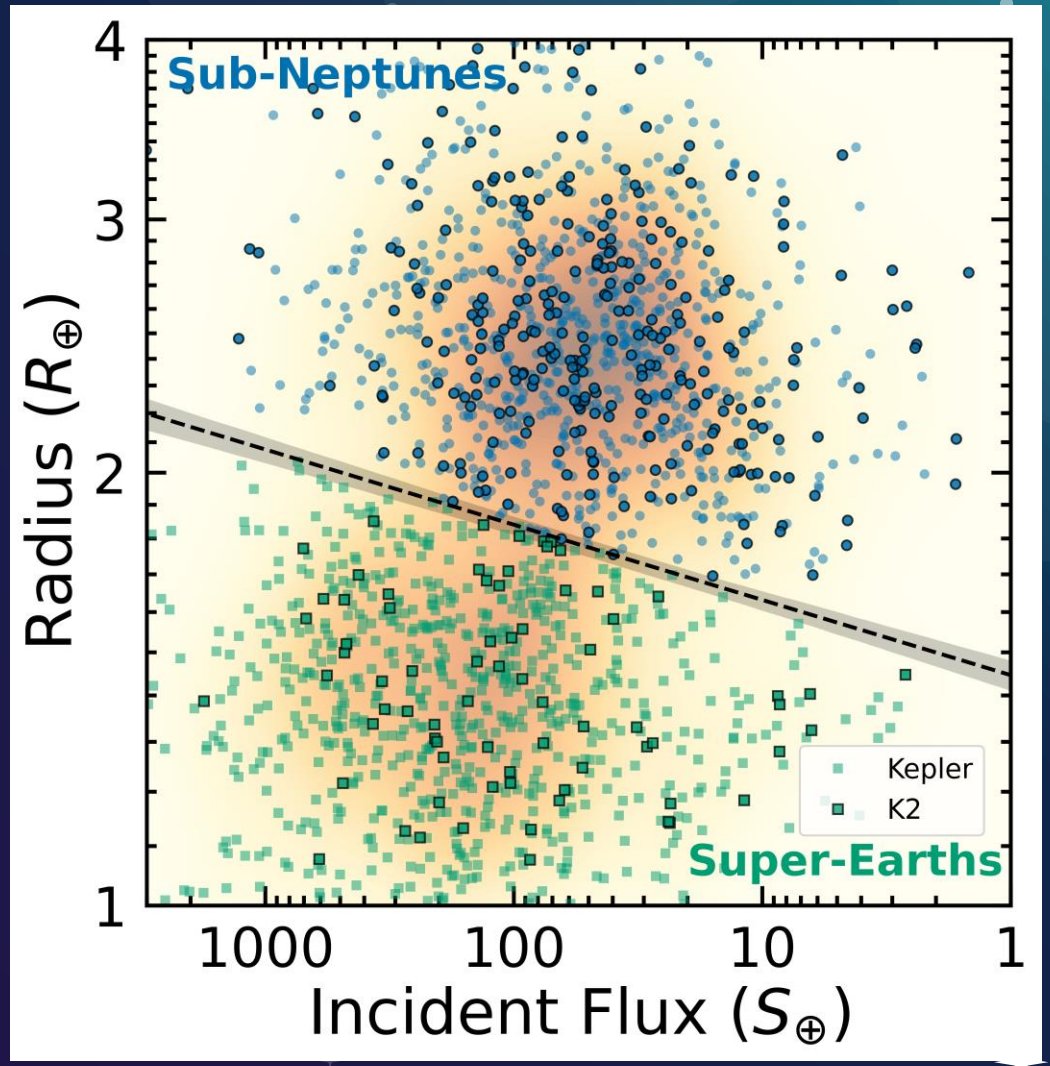
Hardegree-Ullman+ (2025)

# Below 3700 K, **3.5x more** K2 Super-Earths & Sub-Neptunes than Kepler




Hardegree-Ullman+ (2025)

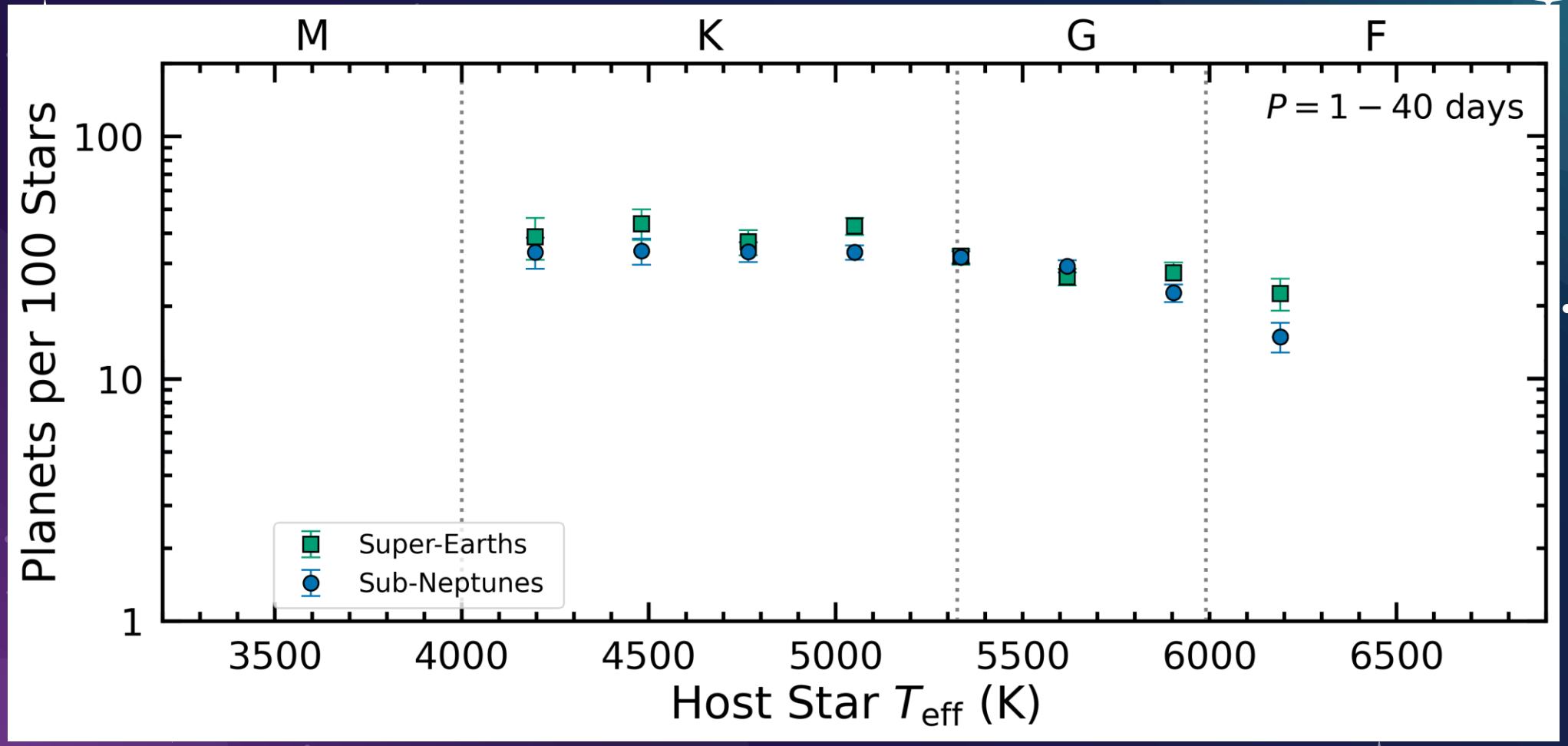



# Two distinct planet populations

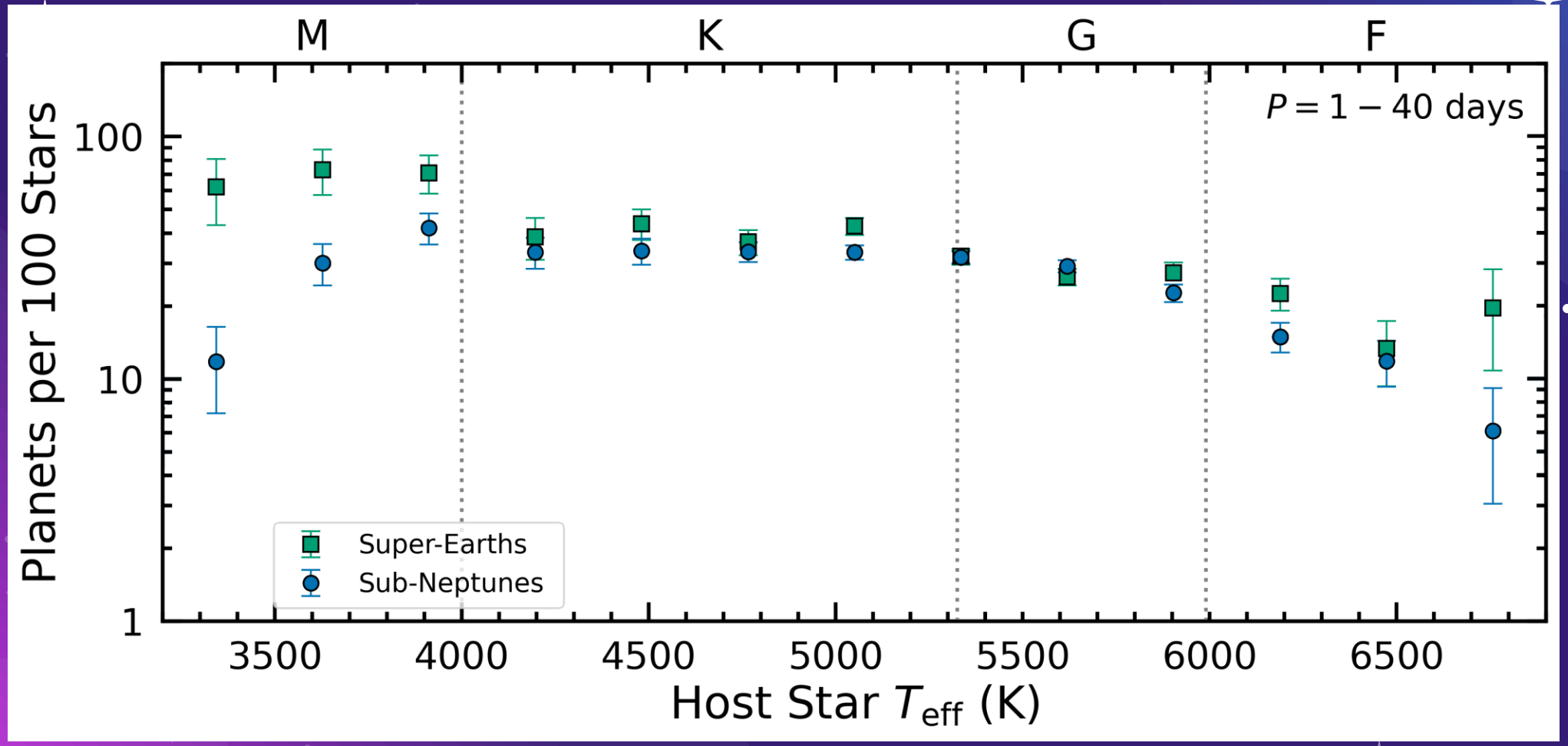
Hardegree-Ullman+ (2025)

# Previous analyses suggest comparable Super-Earths & Sub-Neptunes across ~FGK range



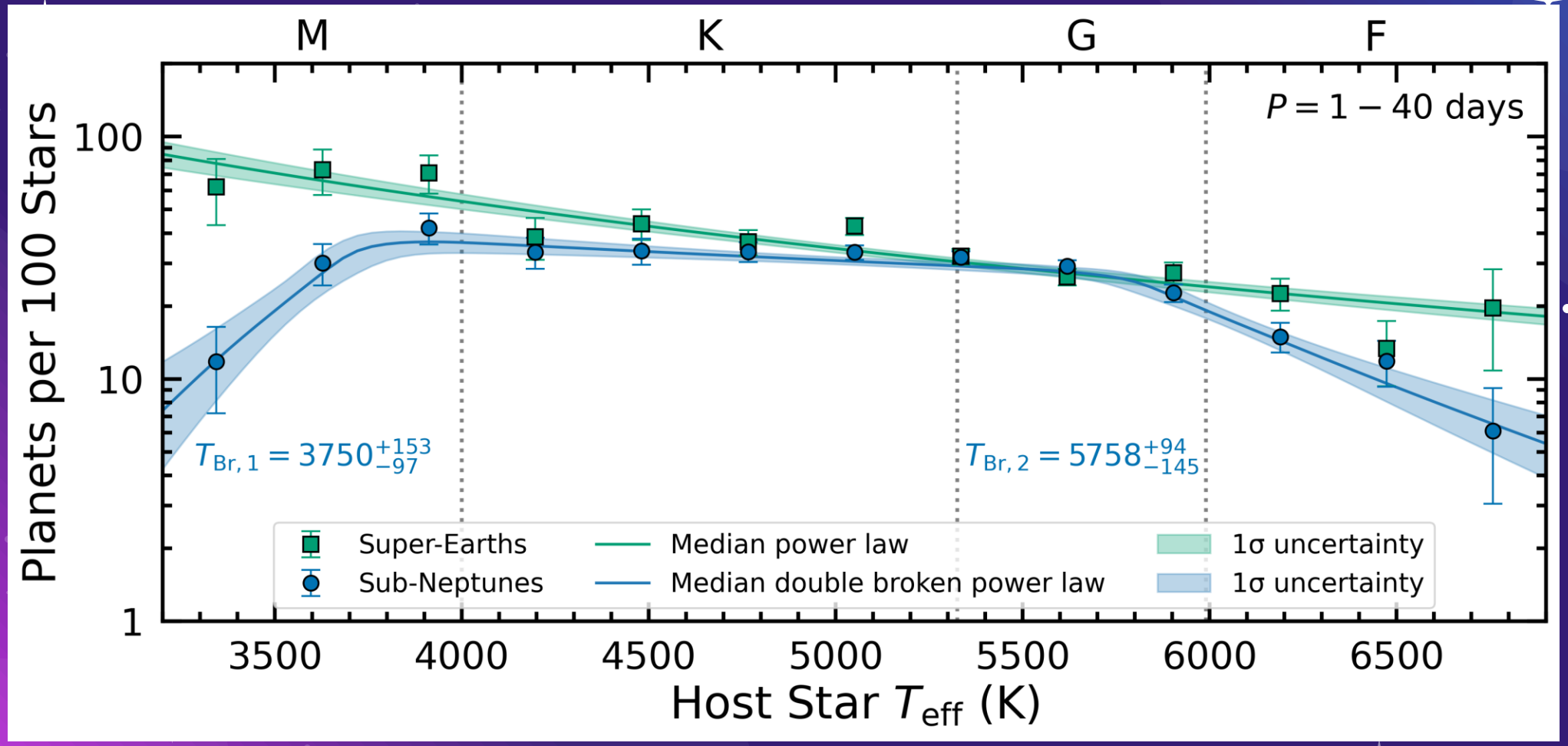

Hardegree-Ullman+ (2025)

# Sub-Neptune Occurrence Rates Peak Around Early-Type M Dwarfs!



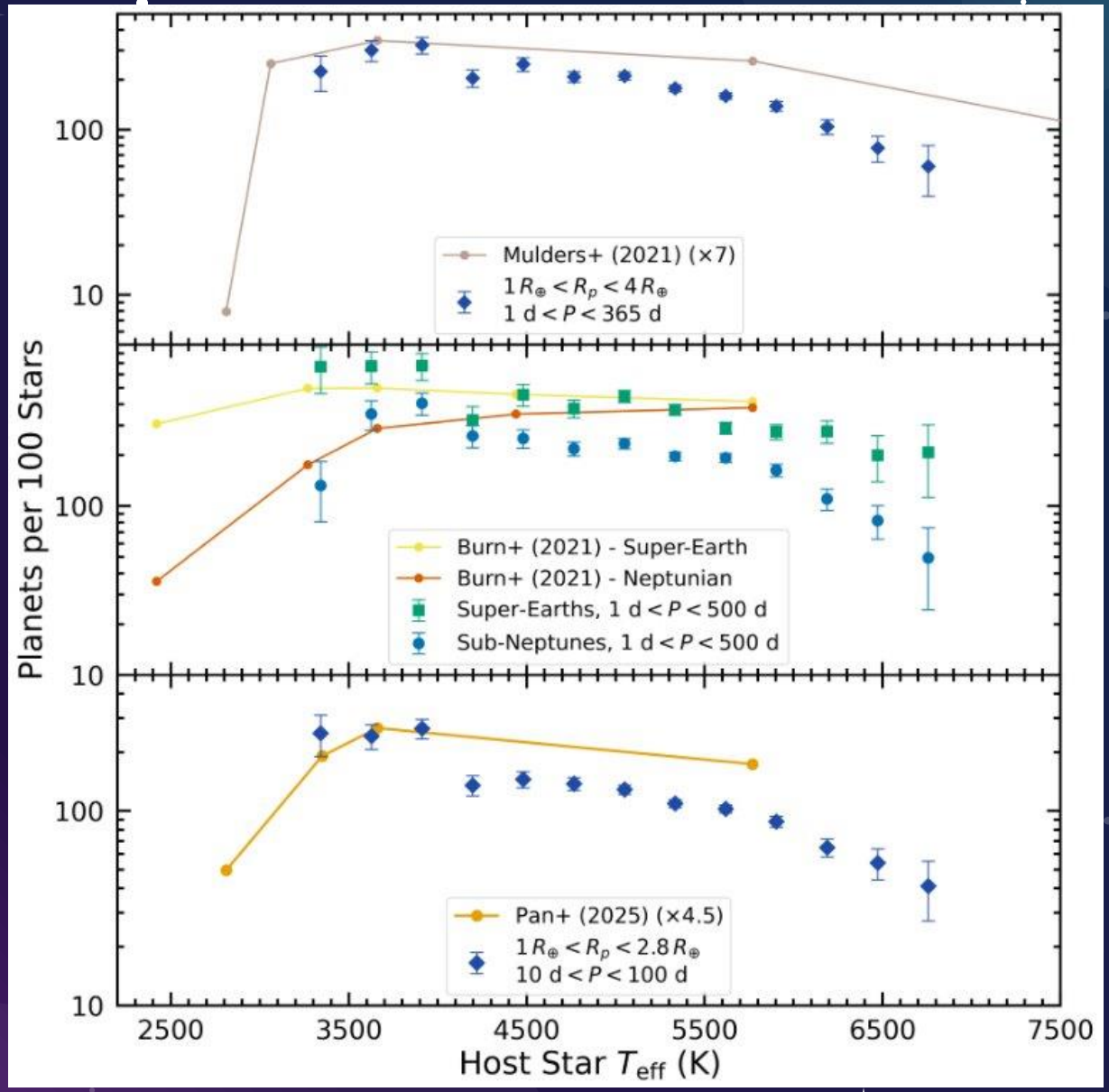

Hardegree-Ullman+ (2025)

# Are there two sub-Neptune drops?




Hardegree-Ullman+ (2025)

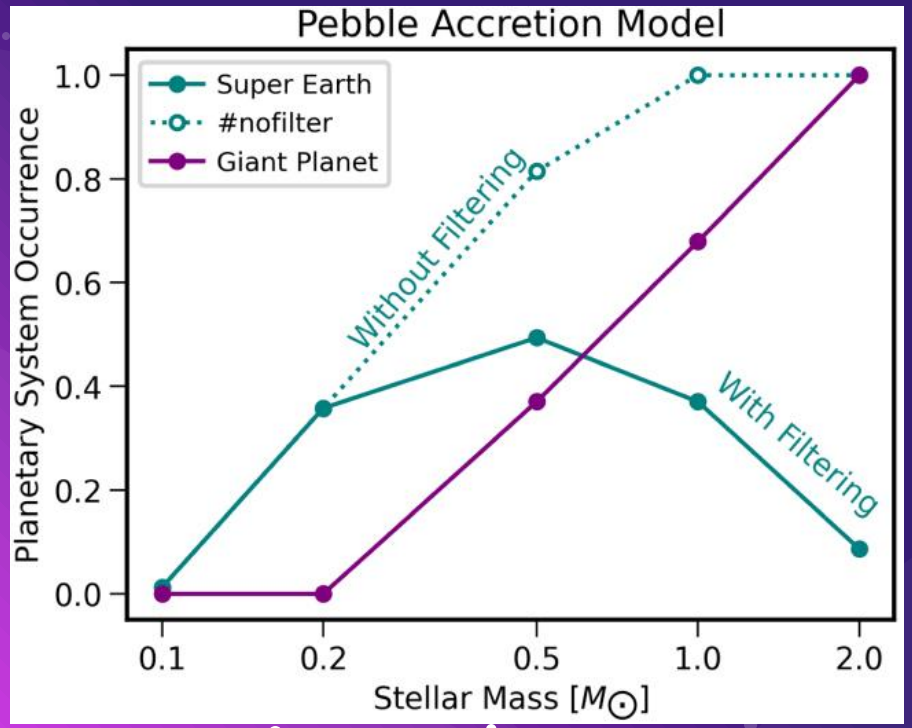
# Planet formation models need refinement!



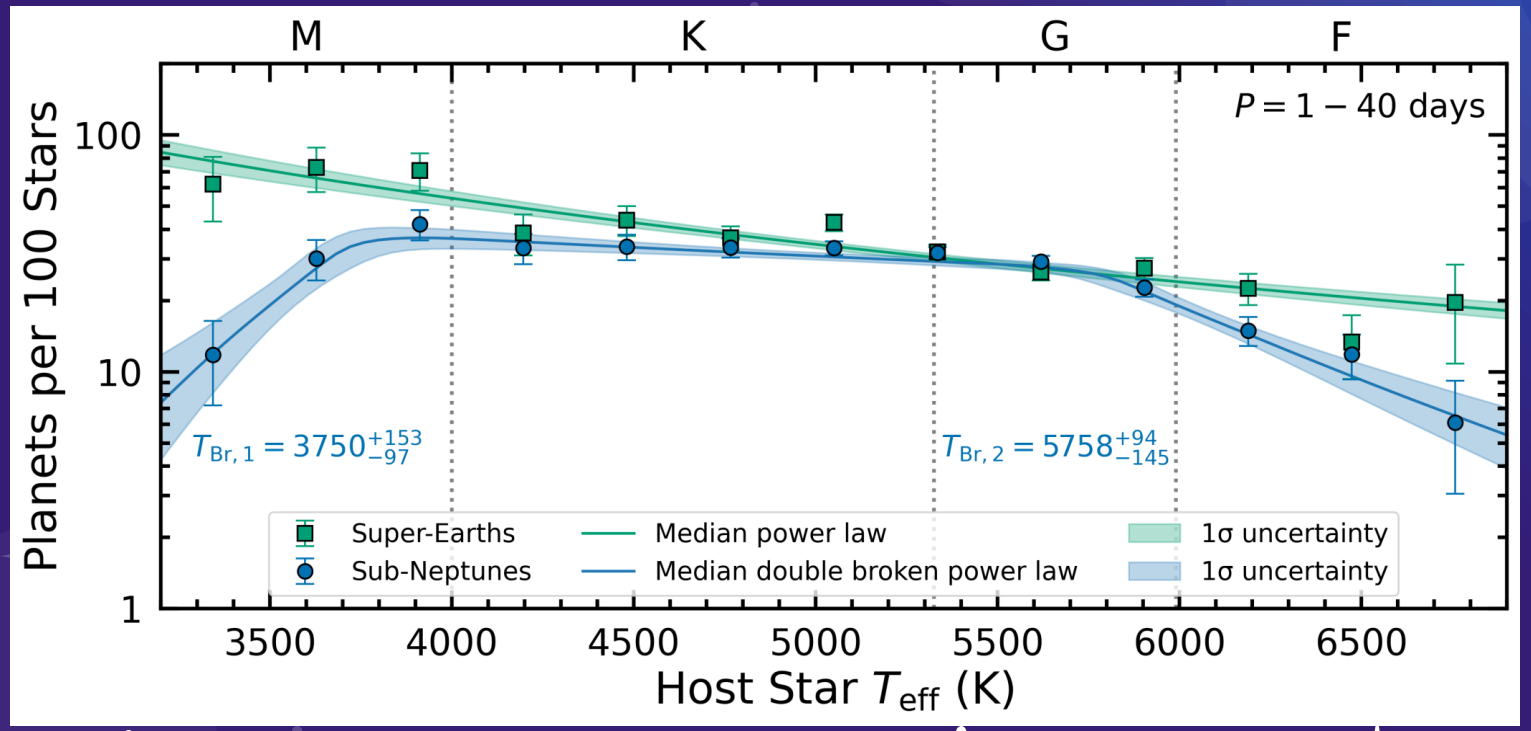

Hardegree-Ullman+ (2025)

# Short-Period Sub-Neptune Occurrence Rates Peak Around Early-Type M Dwarfs

## Prediction




## Observation/Confirmation!

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