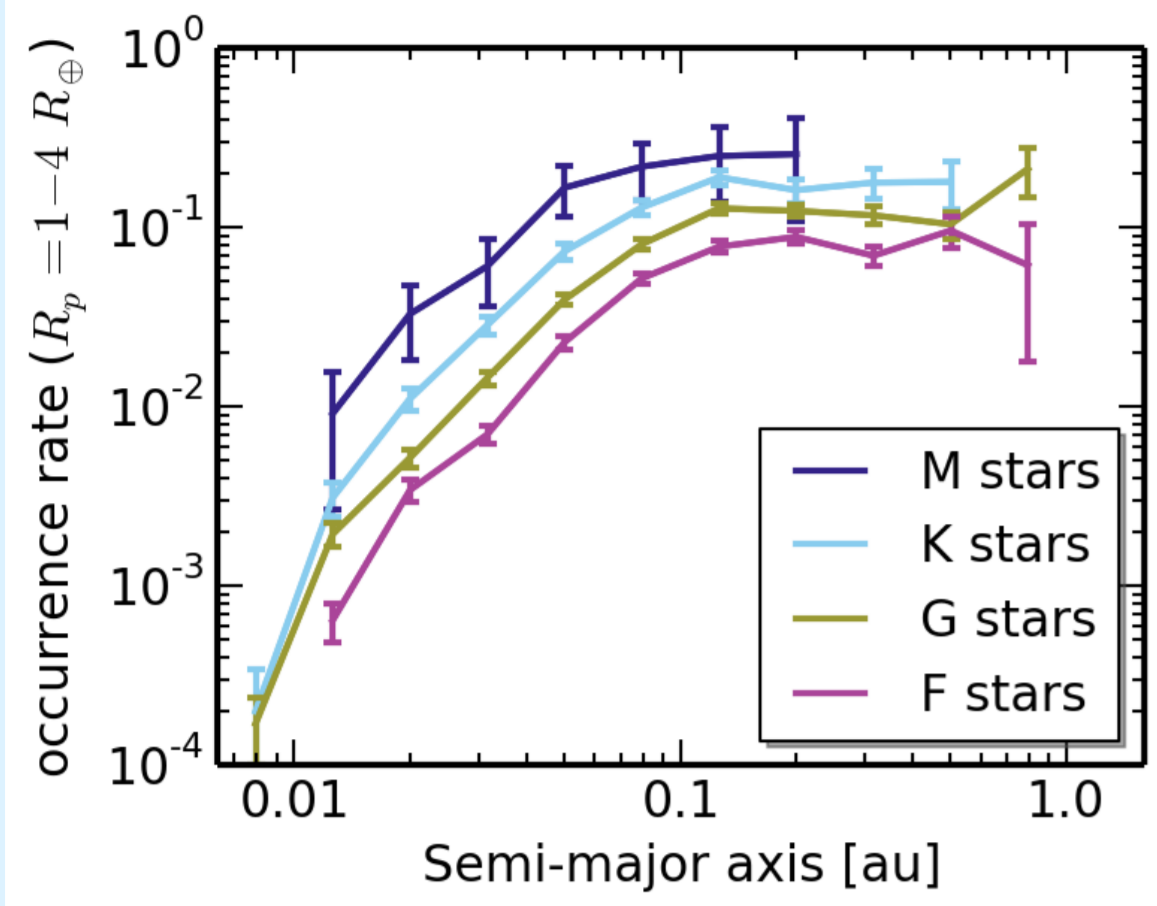


Why do M dwarfs have more transiting exoplanets than sun-like stars?

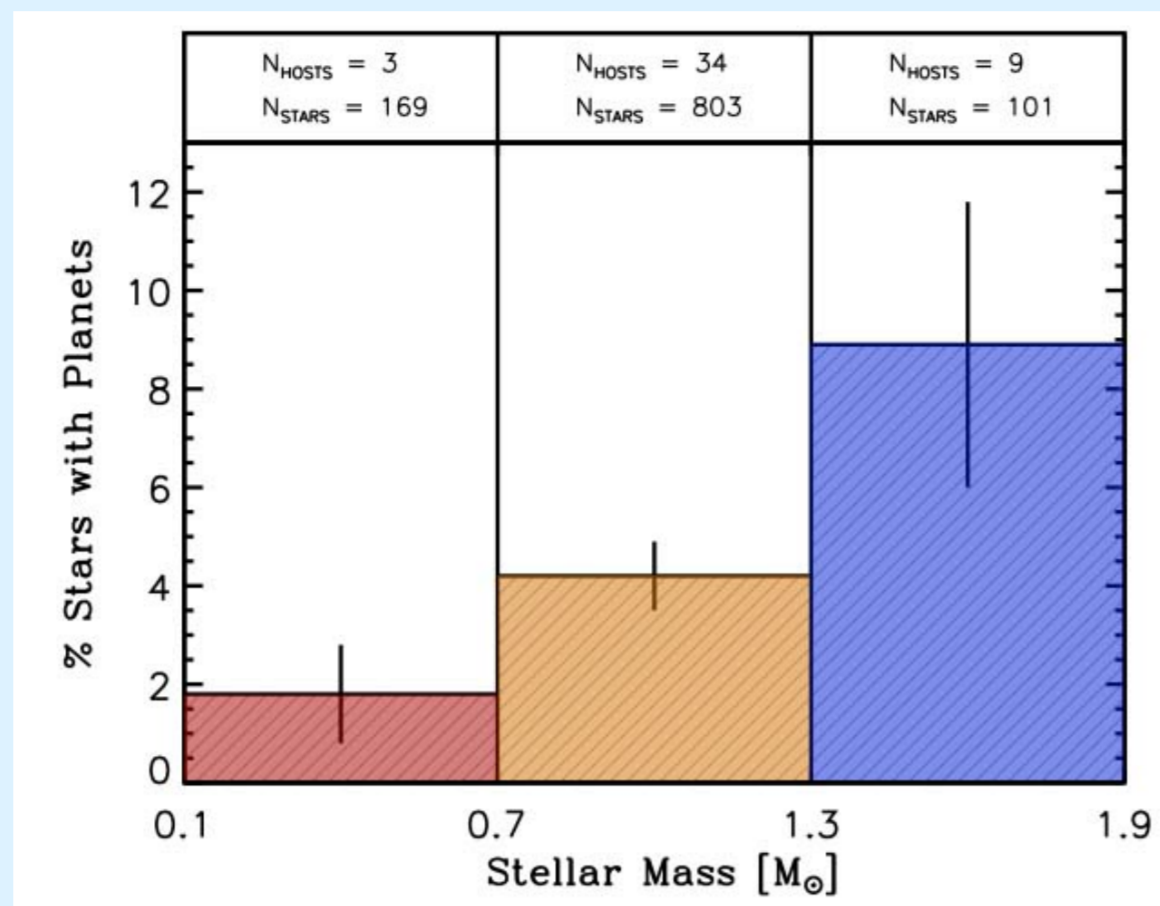
Mulders, Drazkowska, Van der Marel, Ciesla & Pascucci 2021; ApJL 920:1

Context



Occurrence rates of transiting planets are **higher** around M dwarfs than around sun-like stars

Mulders et al. 2015

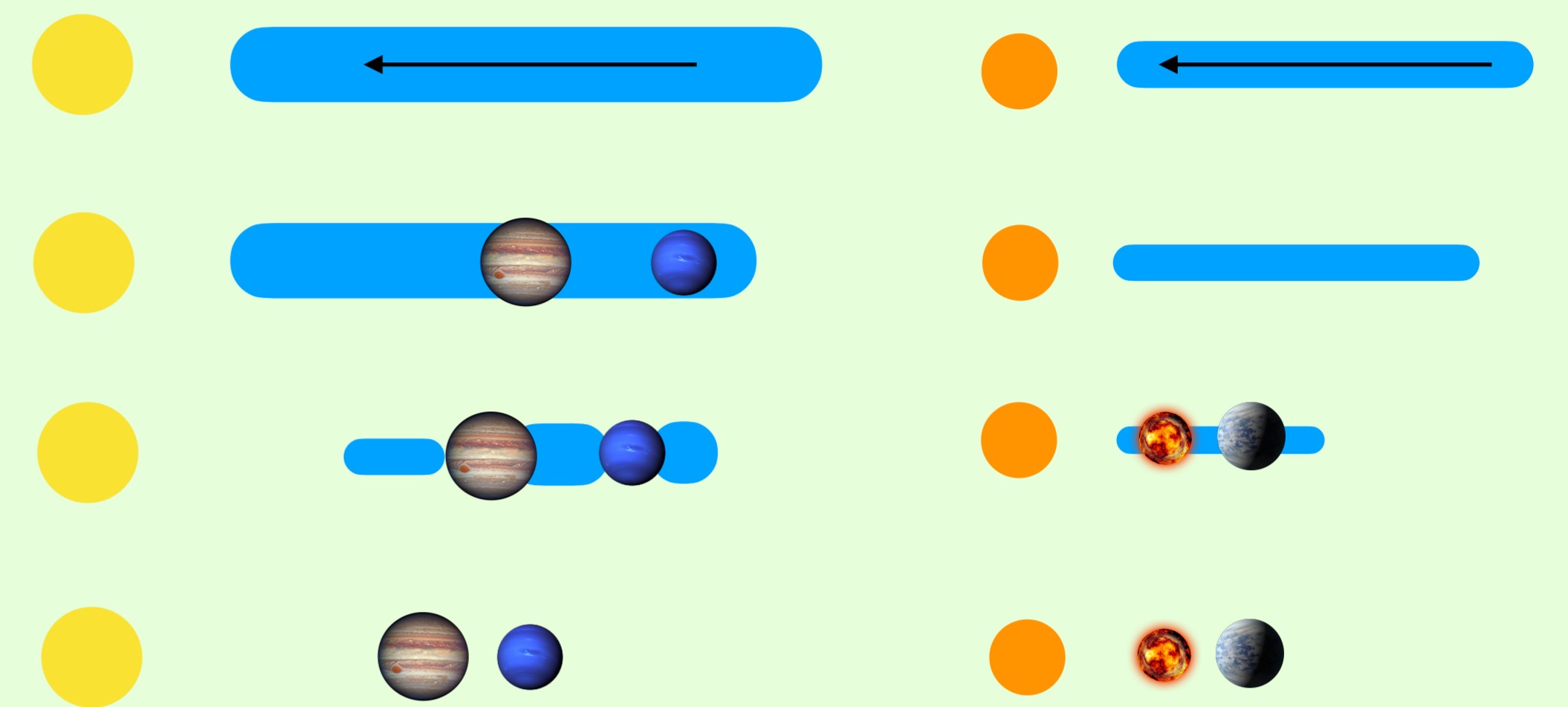


Occurrence rates of radial velocity giant planets are **lower** around M dwarfs than around sun-like stars

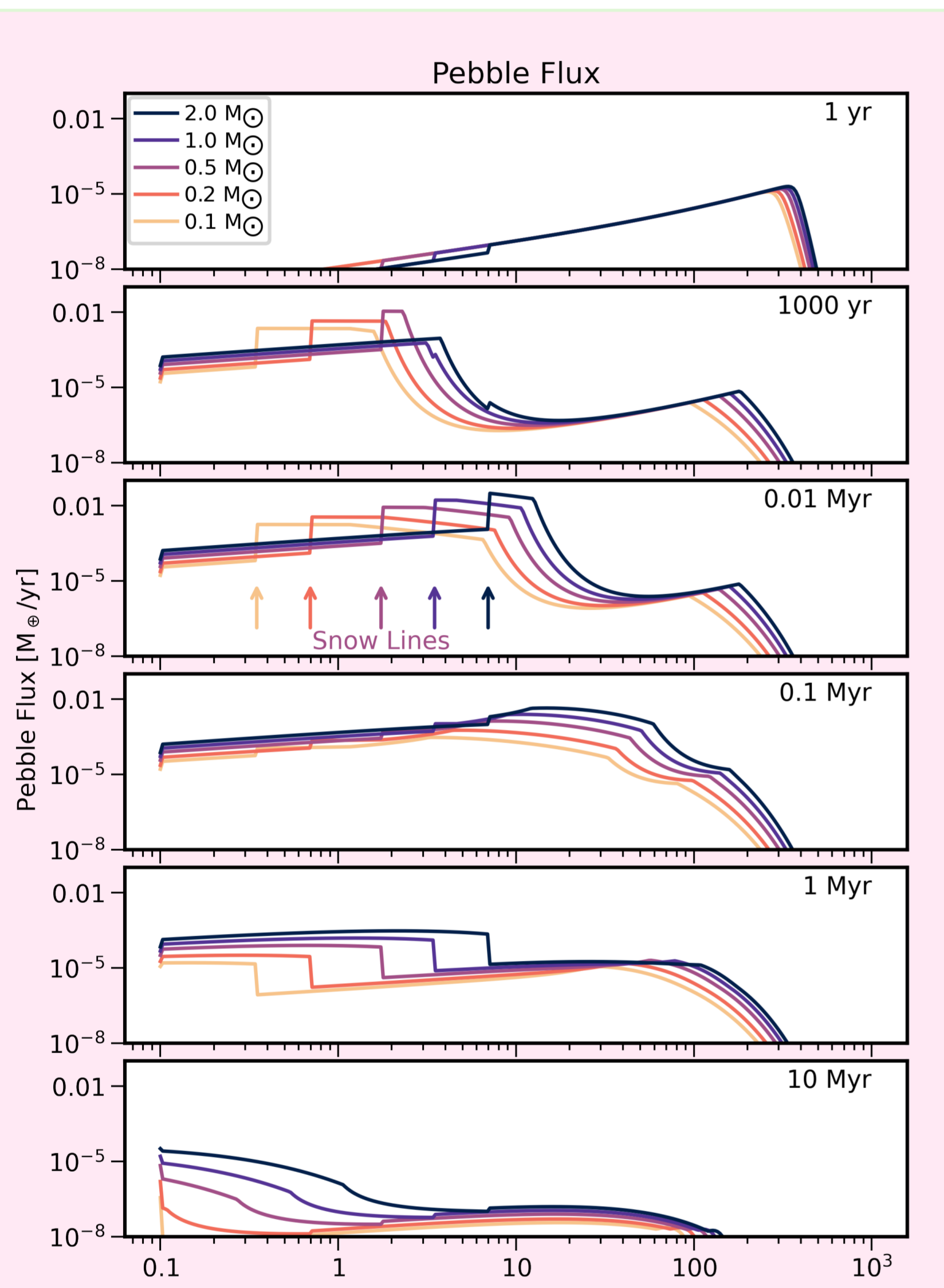
Johnson et al. 2010

Hypothesis

Giant planets **block the flow of pebbles** to the inner disk, suppressing super-earth formation around sun-like stars

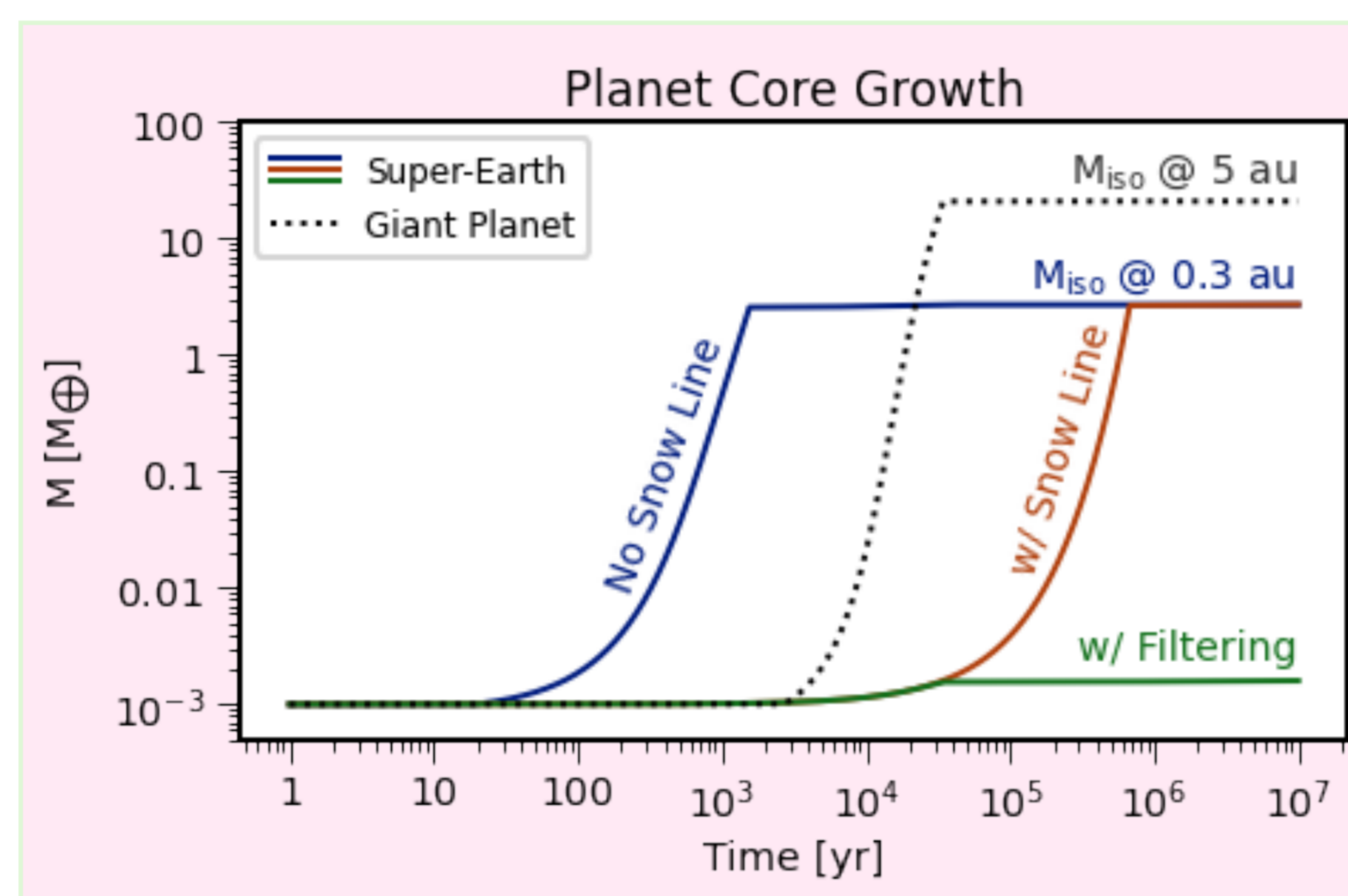


Method



Model the flux of pebbles in stars of different masses using **PebblePredictor**

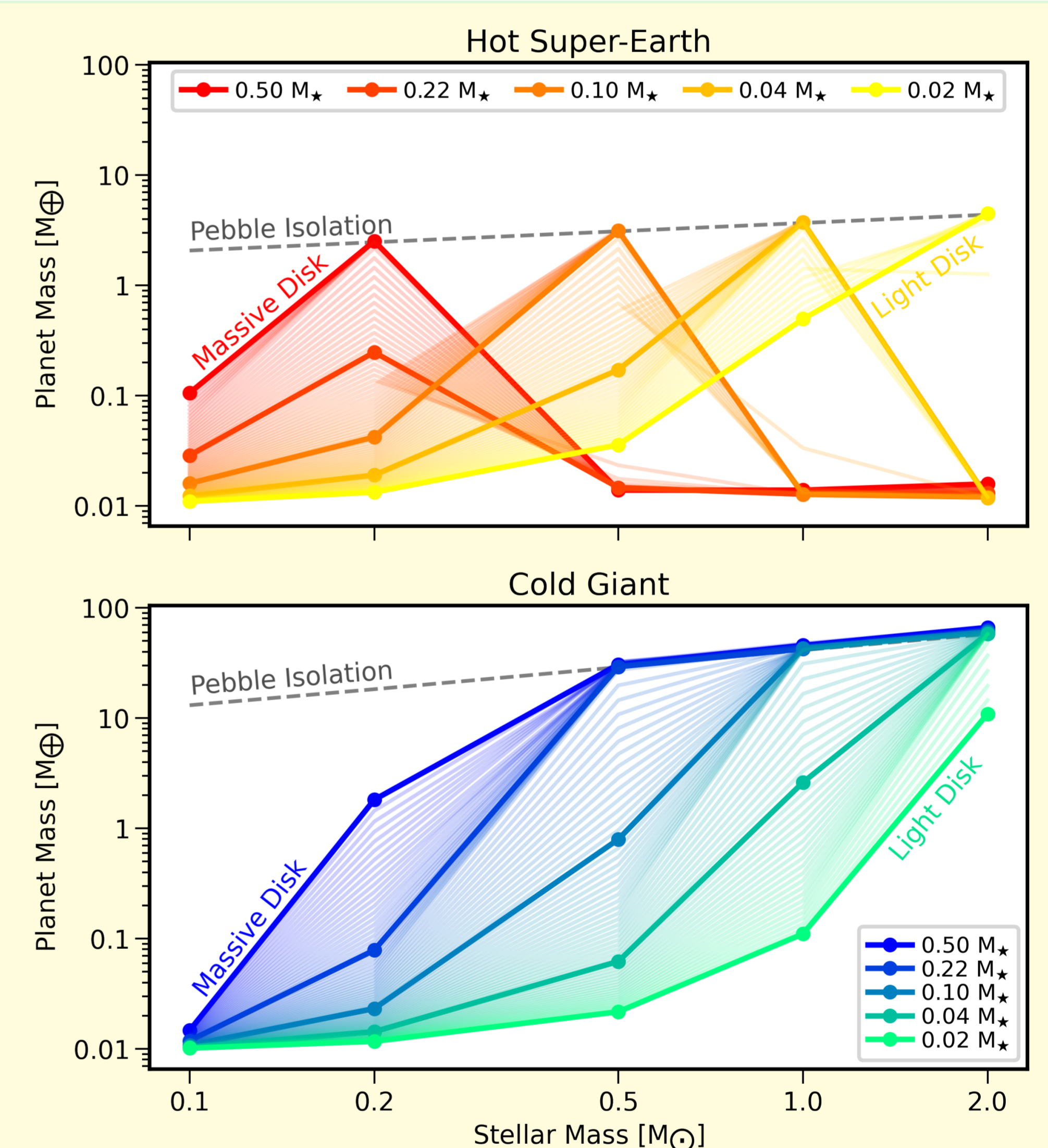
Drazkowska et al. 2021



Calculate the growth of planets inside and outside the **snow line** using analytical prescriptions

Ormel & Liu 2018; Liu & Ormel 2018

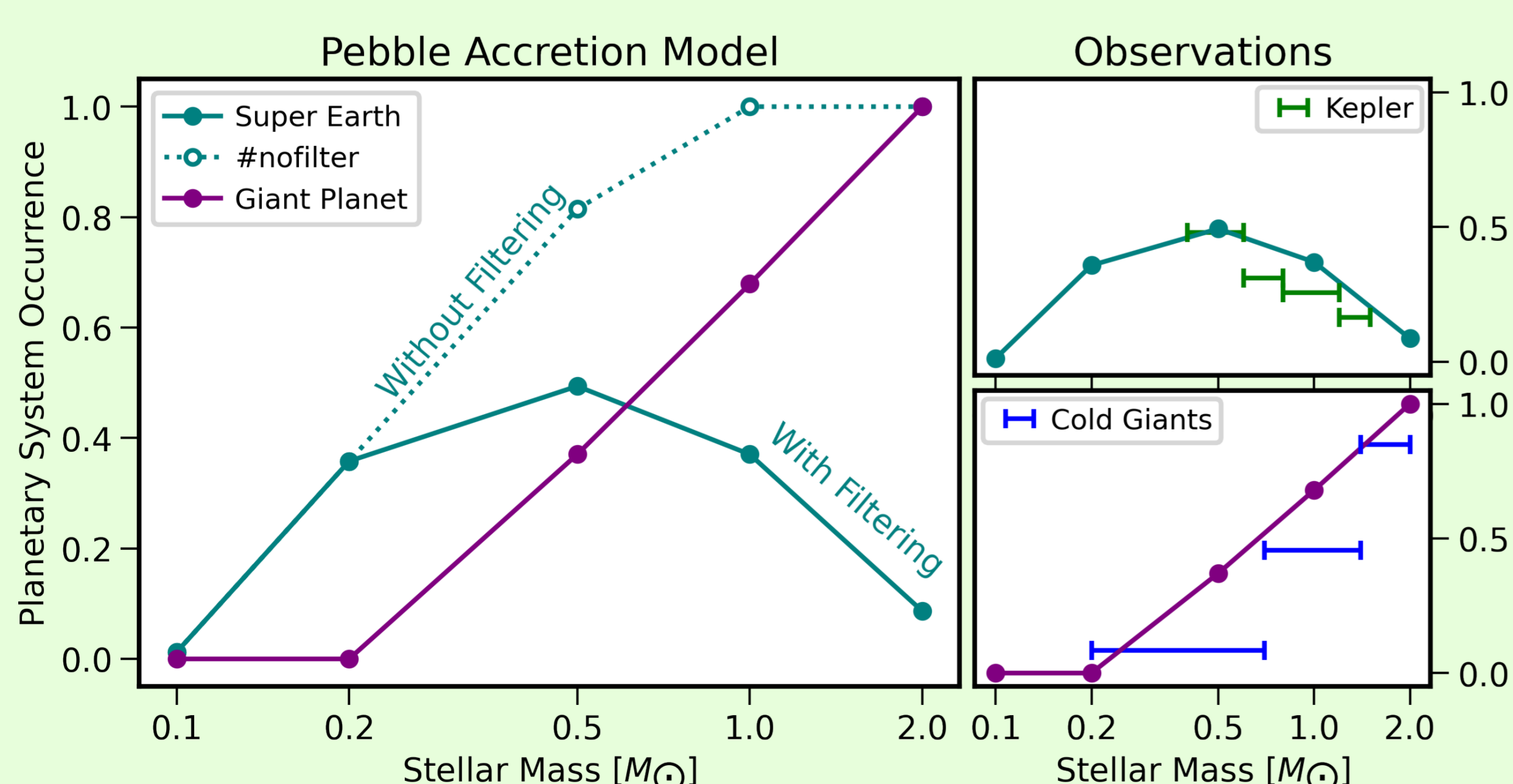
Application



Run a parameter study varying the initial disk mass

Mulders et al. 2021

Results



The filtering of pebbles by giant planets leads to a **decrease** in transiting planet occurrence rates with stellar mass as observed with Kepler

Mulders et al. 2021

Further steps

- Check for consistency with the observed correlations between super-earths and giant planets.
- Measure the anti-correlation between the masses of super-earths and giant planet in the same system.
- Look for the predicted decrease in planet occurrence rates for the lowest mass M dwarfs

About the Author



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