Synthesizing Accretion and Circumplanetary Disk Properties of a Wide Orbit Planet with HST and JWST

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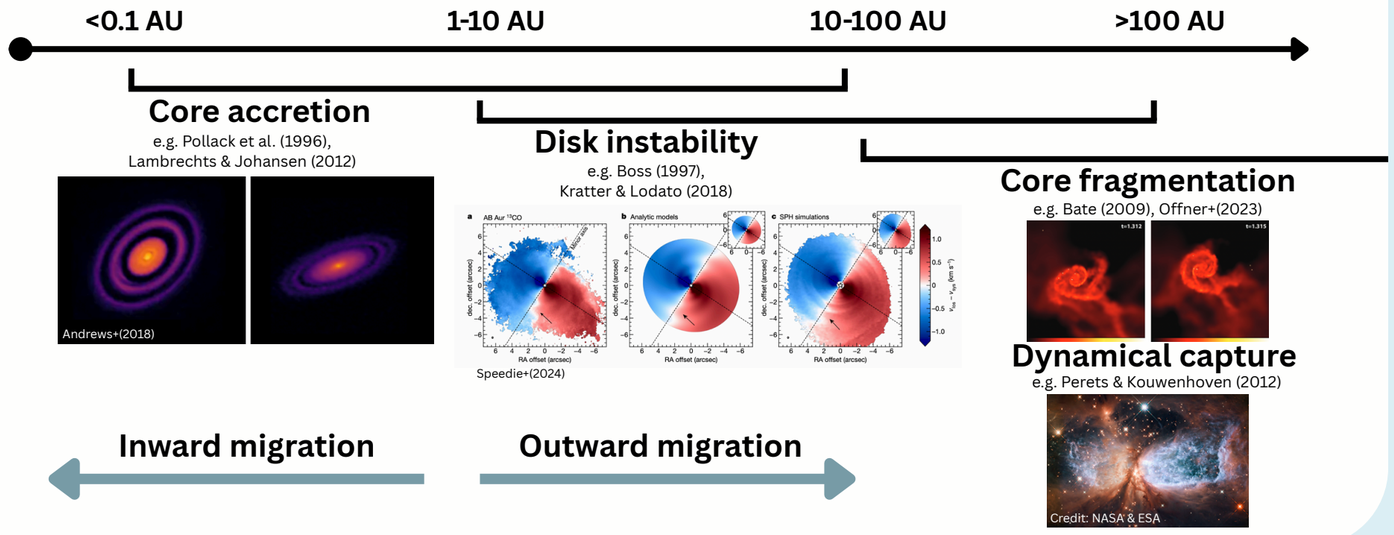
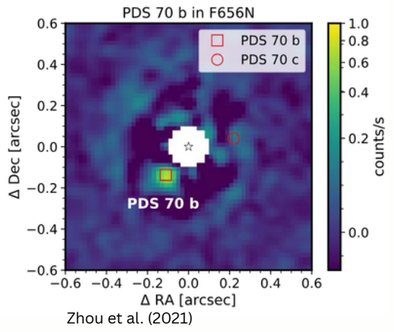
How do giant planets form?

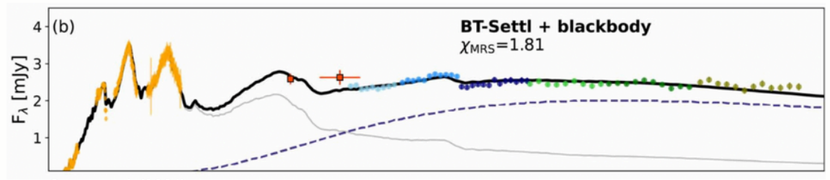


Accretion from a circumplanetary disk



Zhou et al. (2021)

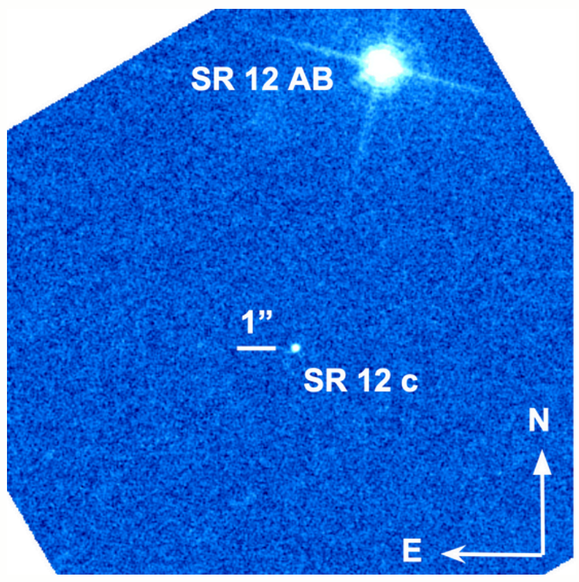
Planets gain mass by accreting gas from a circumplanetary disk. These can be studied with observations in the UV (accretion) and mid-infrared (disk emission).



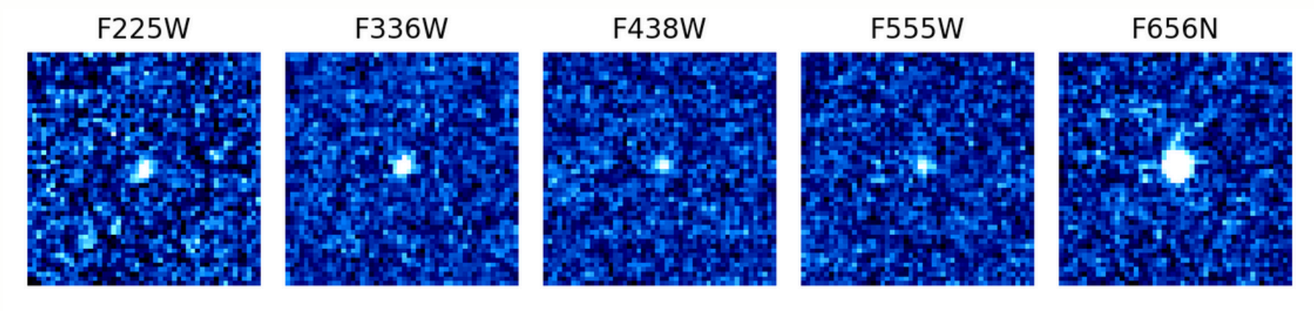
Cugno et al. (2024)

SR 12 c: a young (2 Myr), accreting giant planet (11 M_{Jup}) on a wide orbit

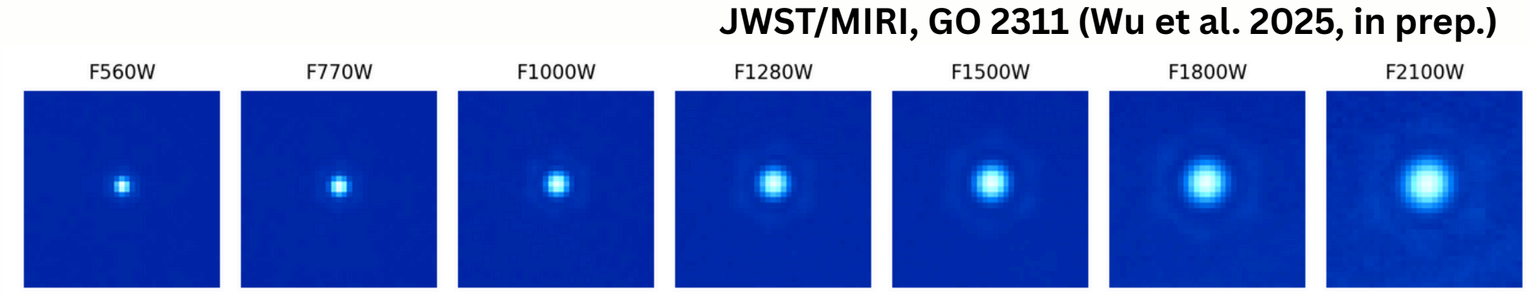
We present new HST and JWST imaging of accreting giant planet SR 12 c



HST/WFC3-UVIS, GO 16302 (Finley et al. 2025, in prep.)

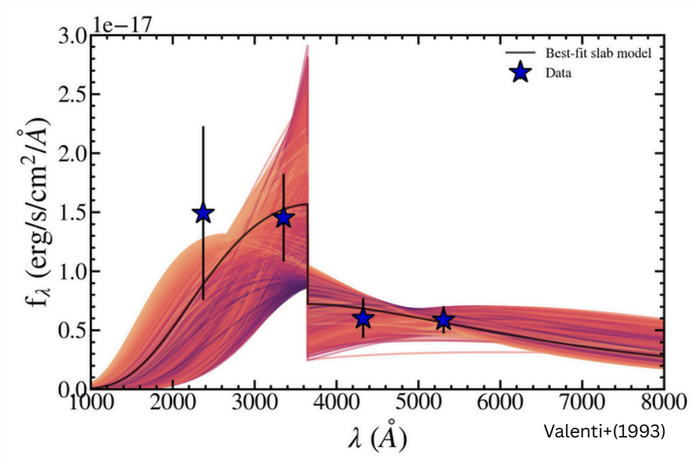


JWST/MIRI, GO 2311 (Wu et al. 2025, in prep.)



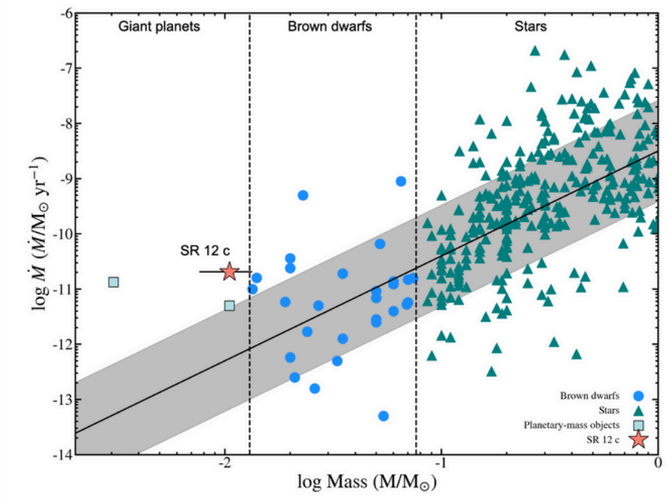
Accretion slab modeling results

We fit accretion slab models using a Bayesian framework to determine the accretion luminosity and mass accretion rate



Valenti+(1993)

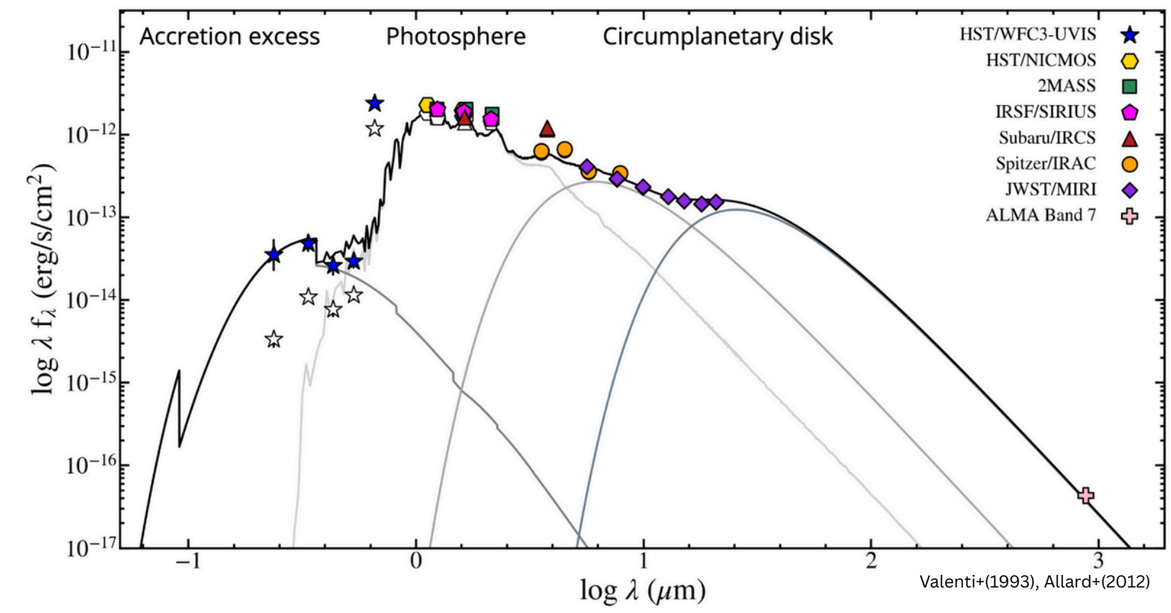
SR 12 c joins the small sample of giant planets with accretion continuum measurements, highlighting the importance of expanding the sample



See CASPAR database (Betti+2023)

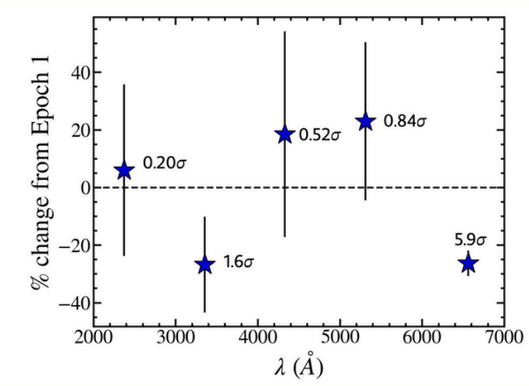
Modeling the full SED of SR 12 c

The 0.2-21 micron SED of SR 12 c allows us to jointly constrain accretion and disk properties



Valenti+(1993), Allard+(2012)

HST imaging shows variability in Hα over a baseline of 4 weeks



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