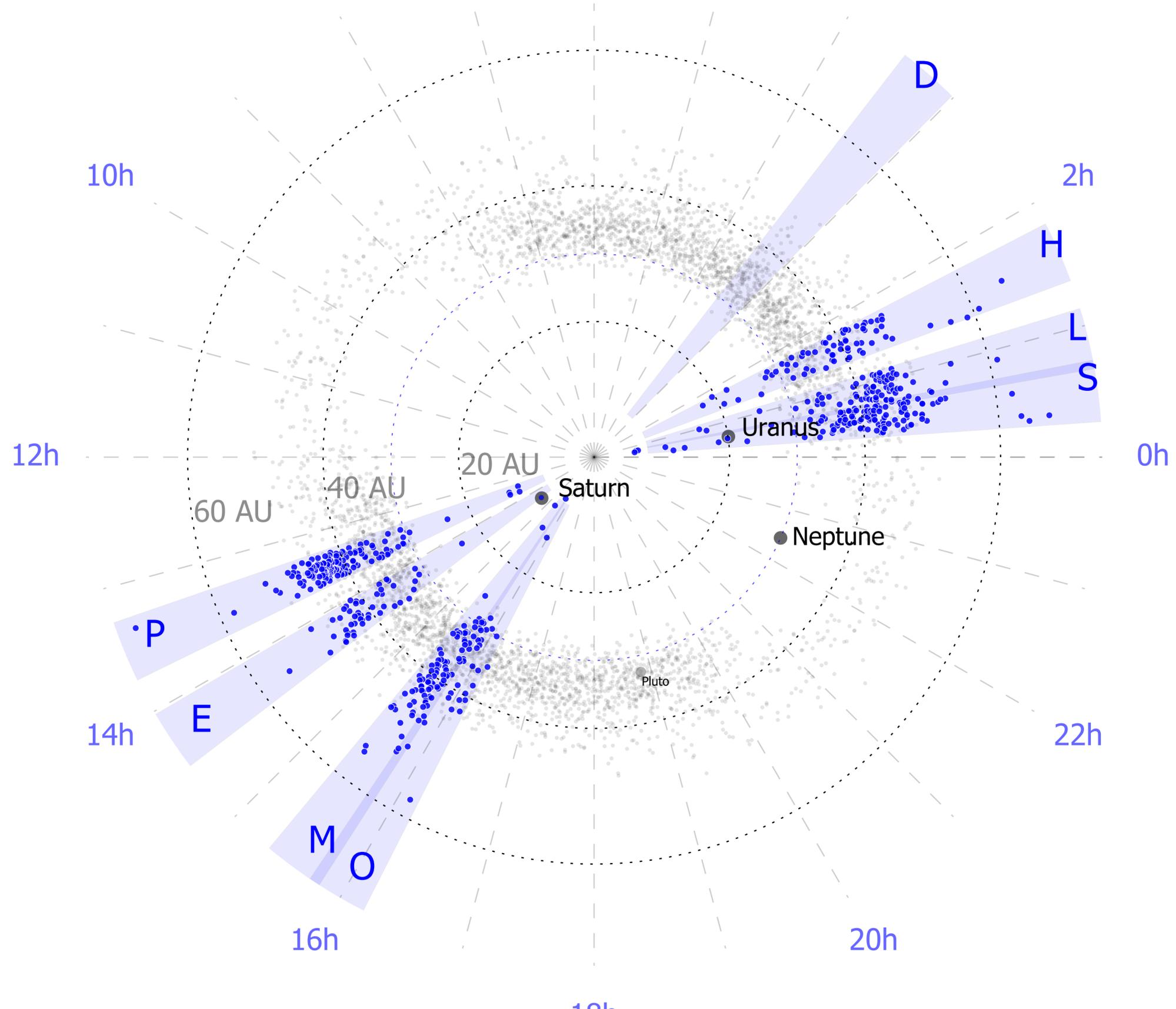


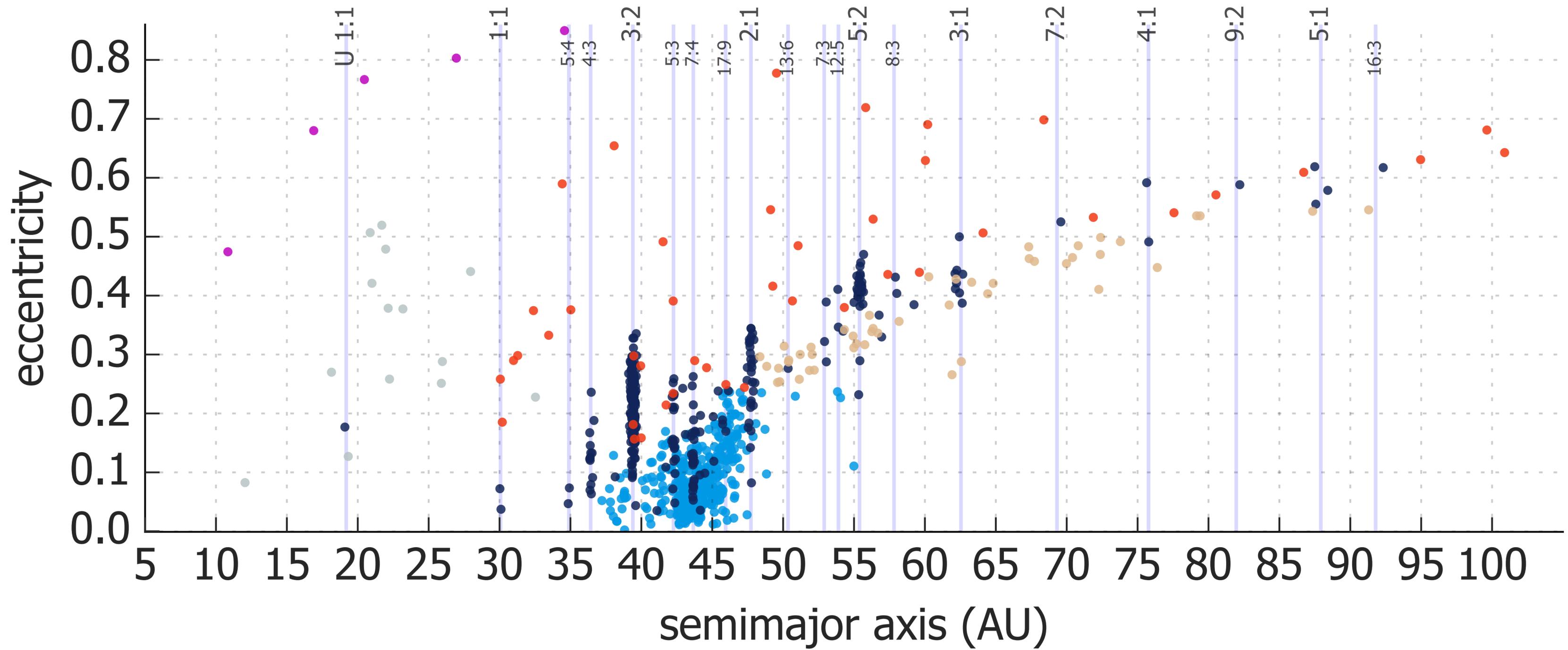
TNOs with JWST

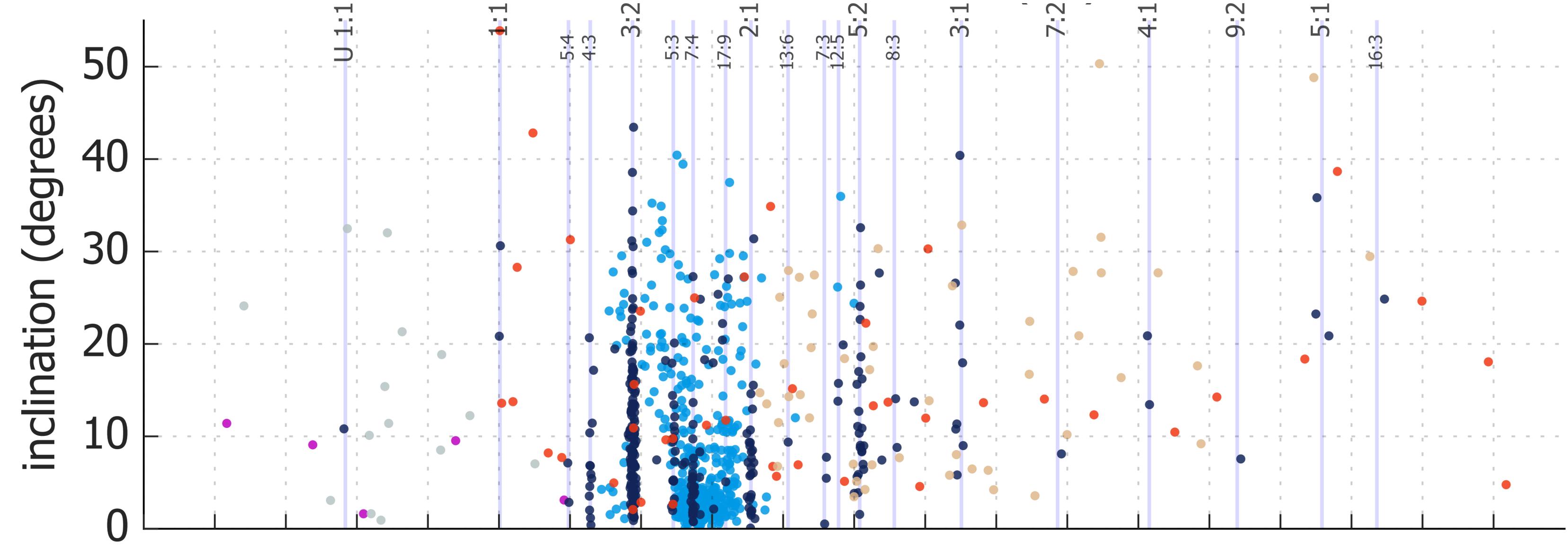
JJ Kavelaars

+ OSSOS, CoLOSSOS and New Horizons datasets

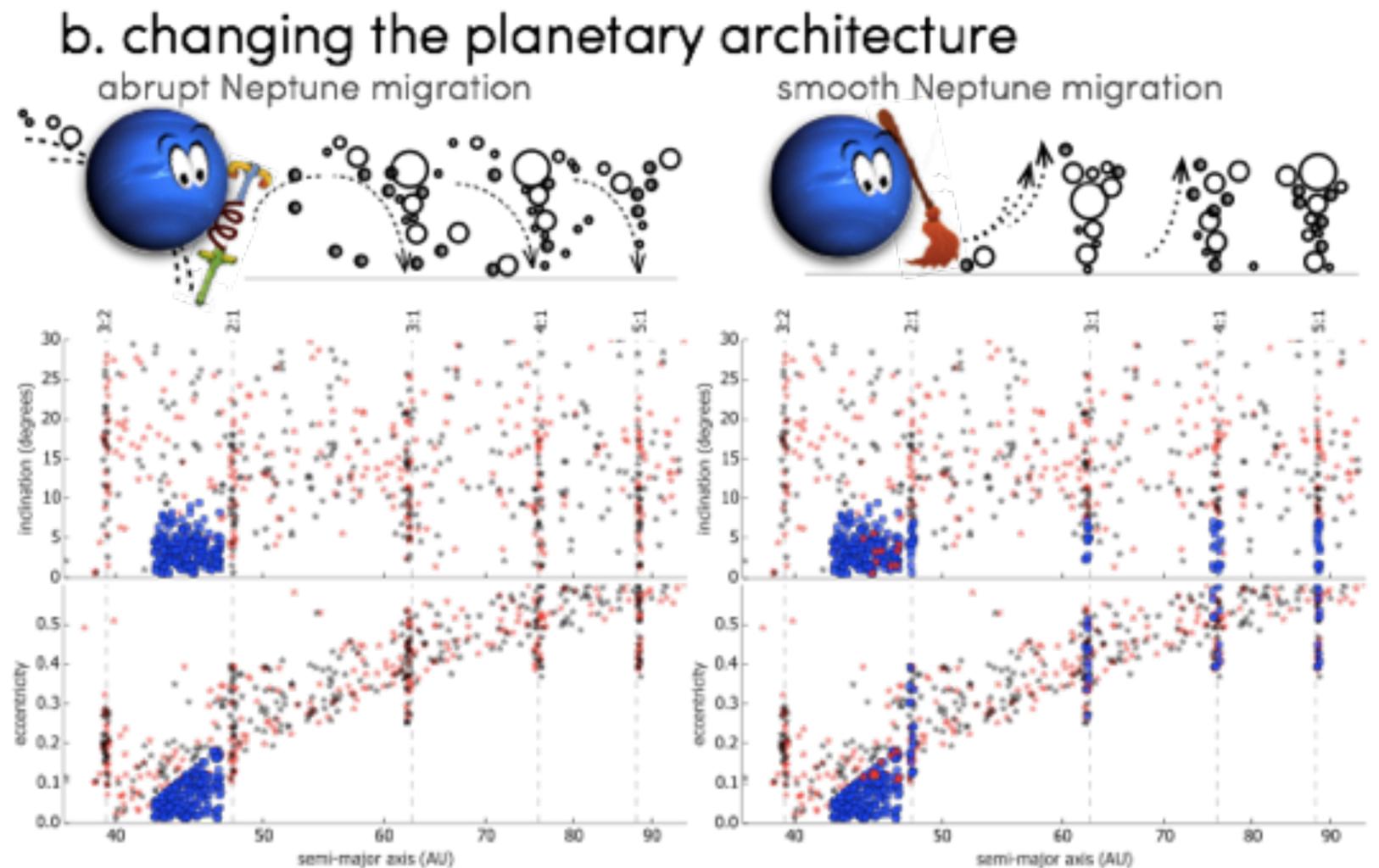
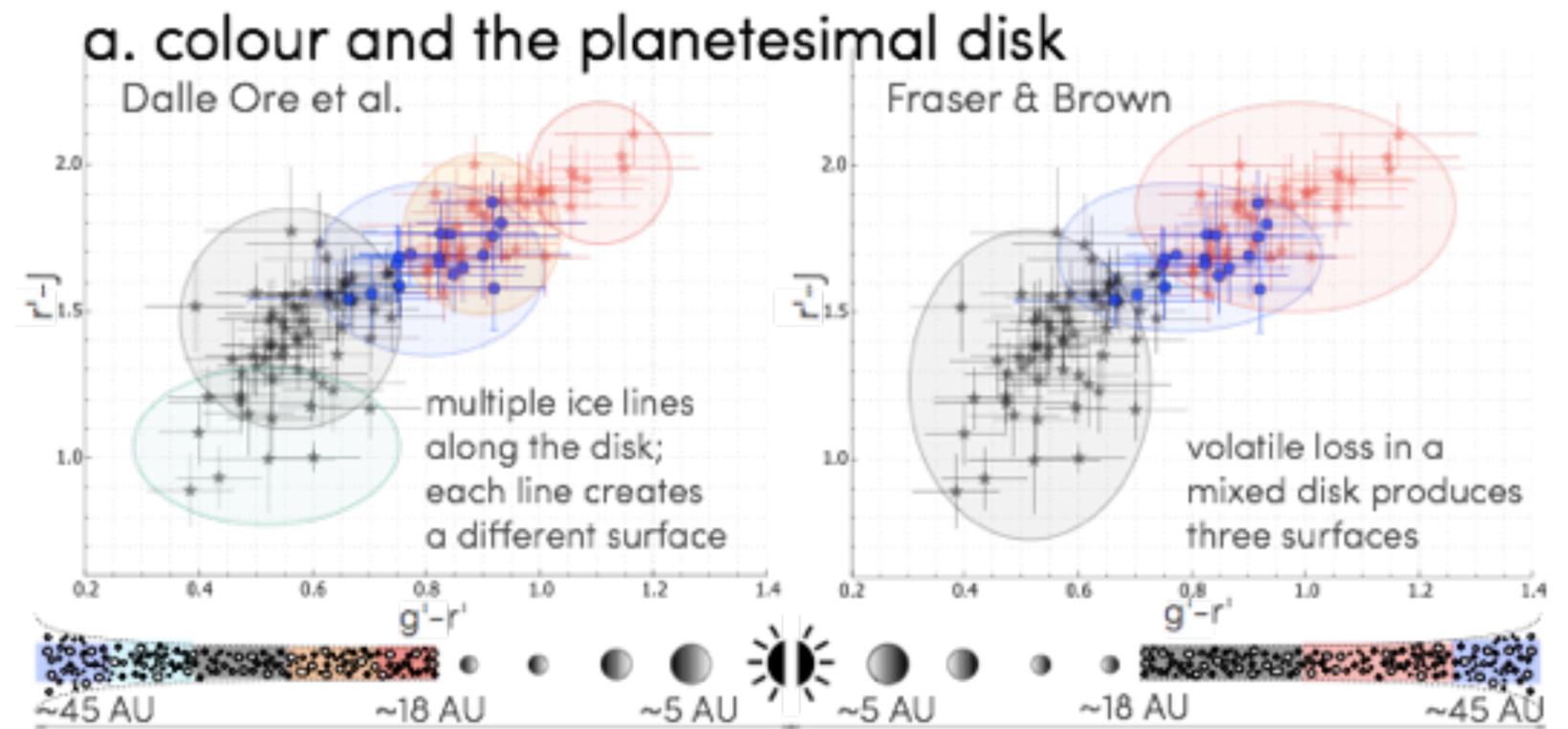
OSSOS Observing Bias



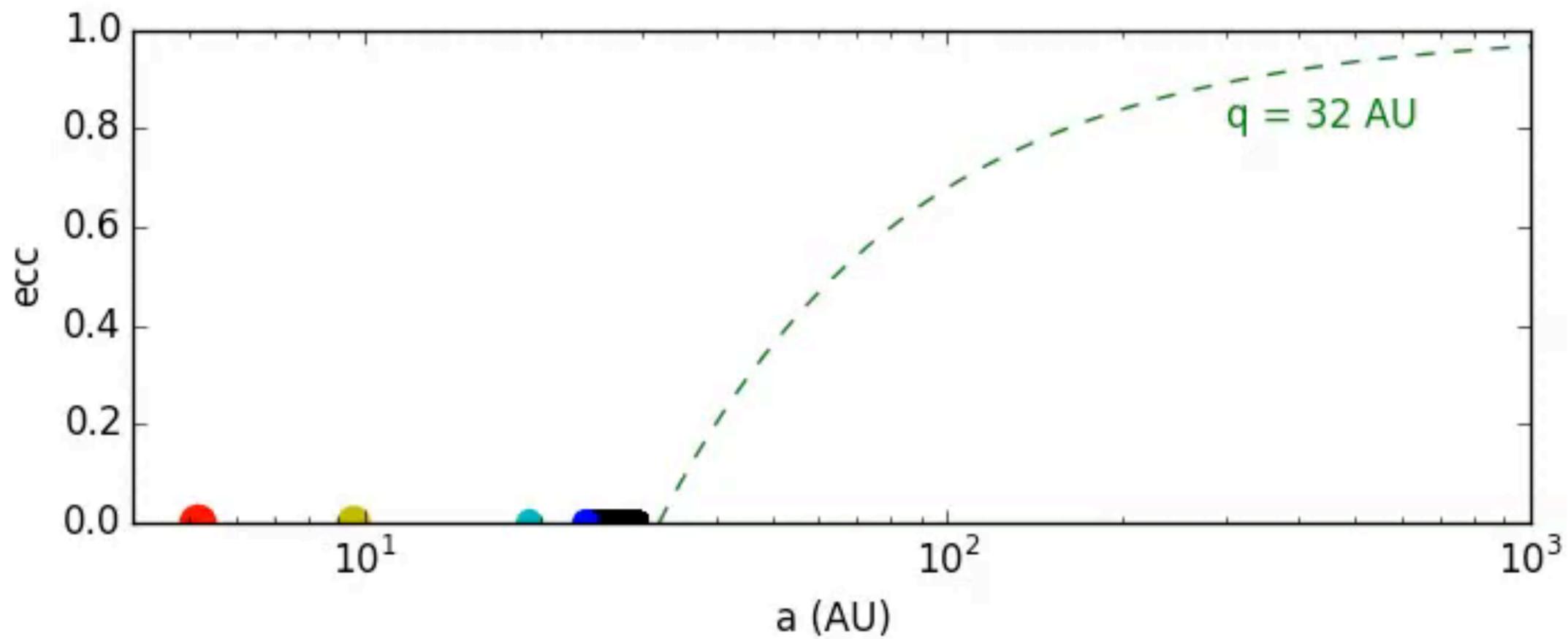
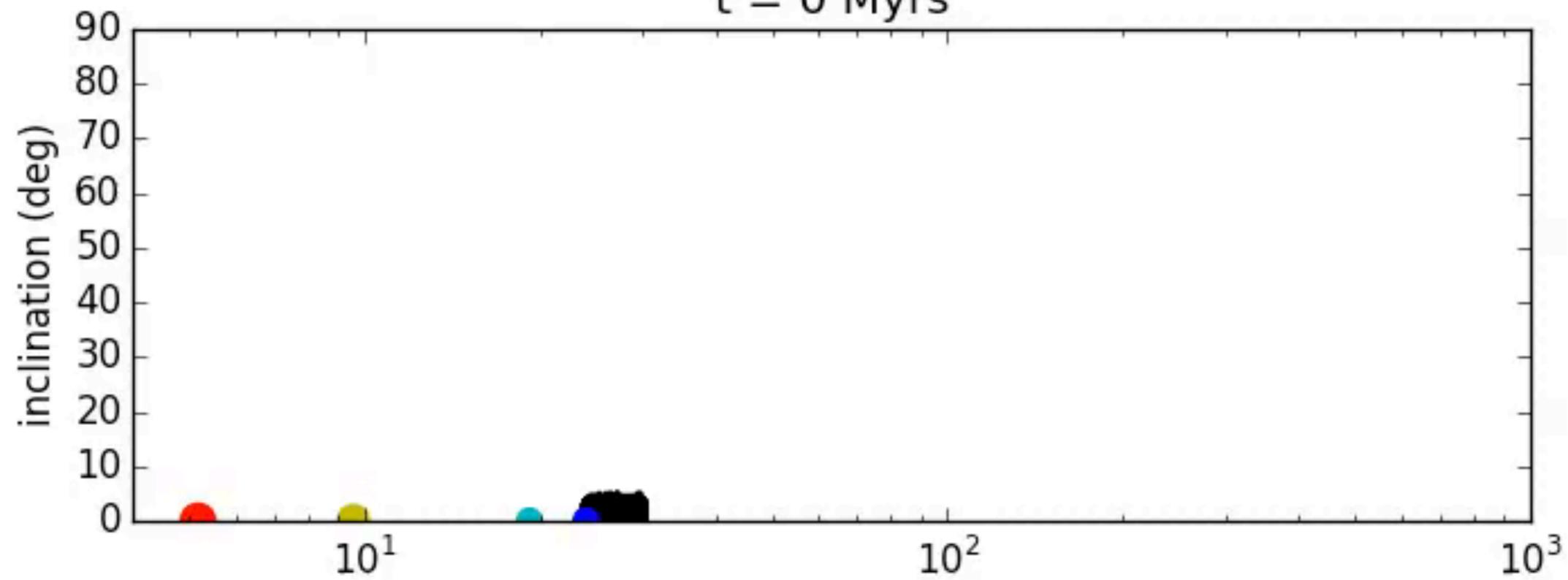




Radial structure in the disk chemistry can be implanted into the orbital distribution

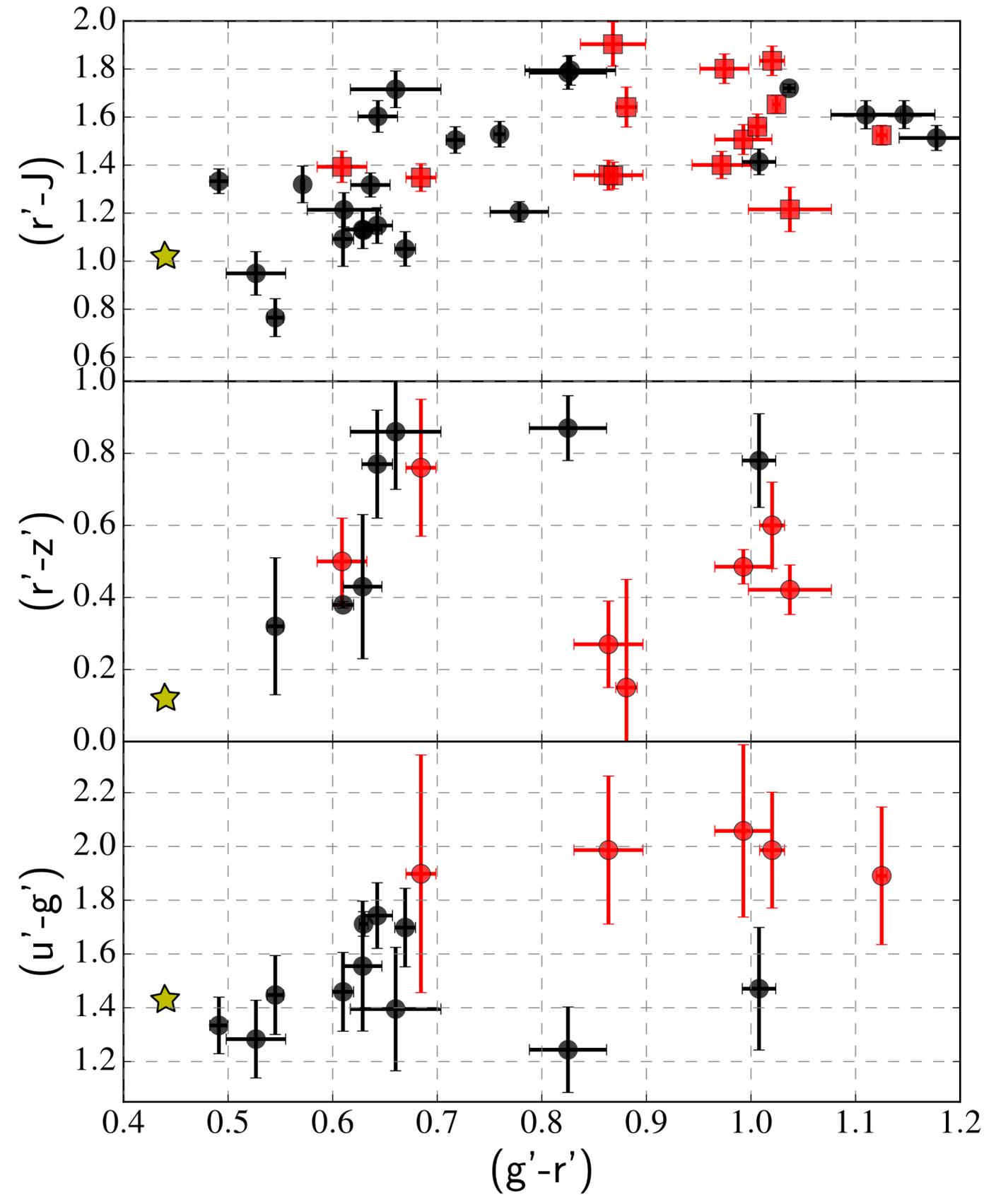


t = 0 Myrs

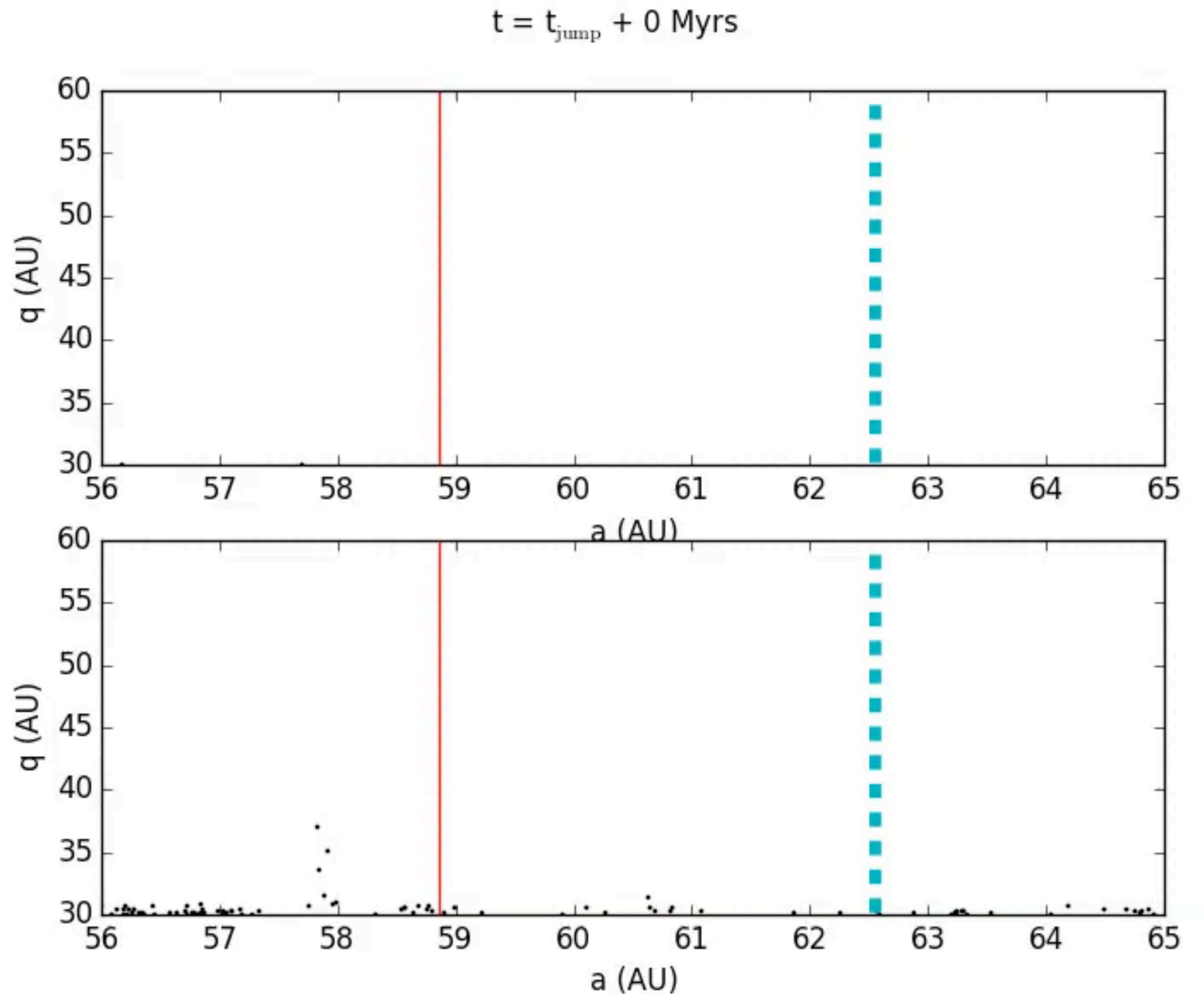


Colour diversity but also structure

Red symbols for low inclinations
Black symbols for high inclinations



Slow versus fast
migration:
resonance
sweeps material
farther along and
drops over larger
range when
migration is slow.

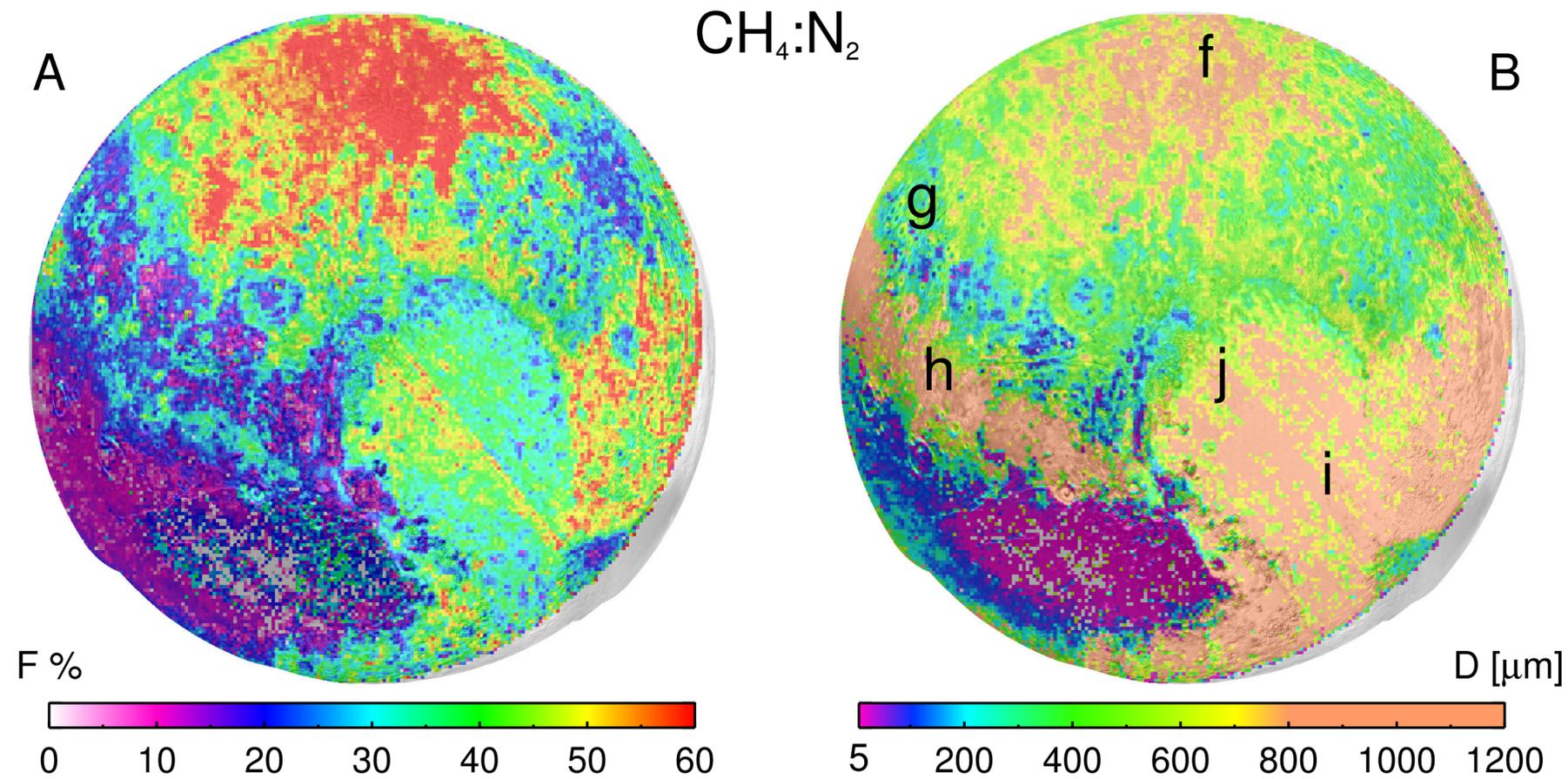


Kaib et al. (2016)

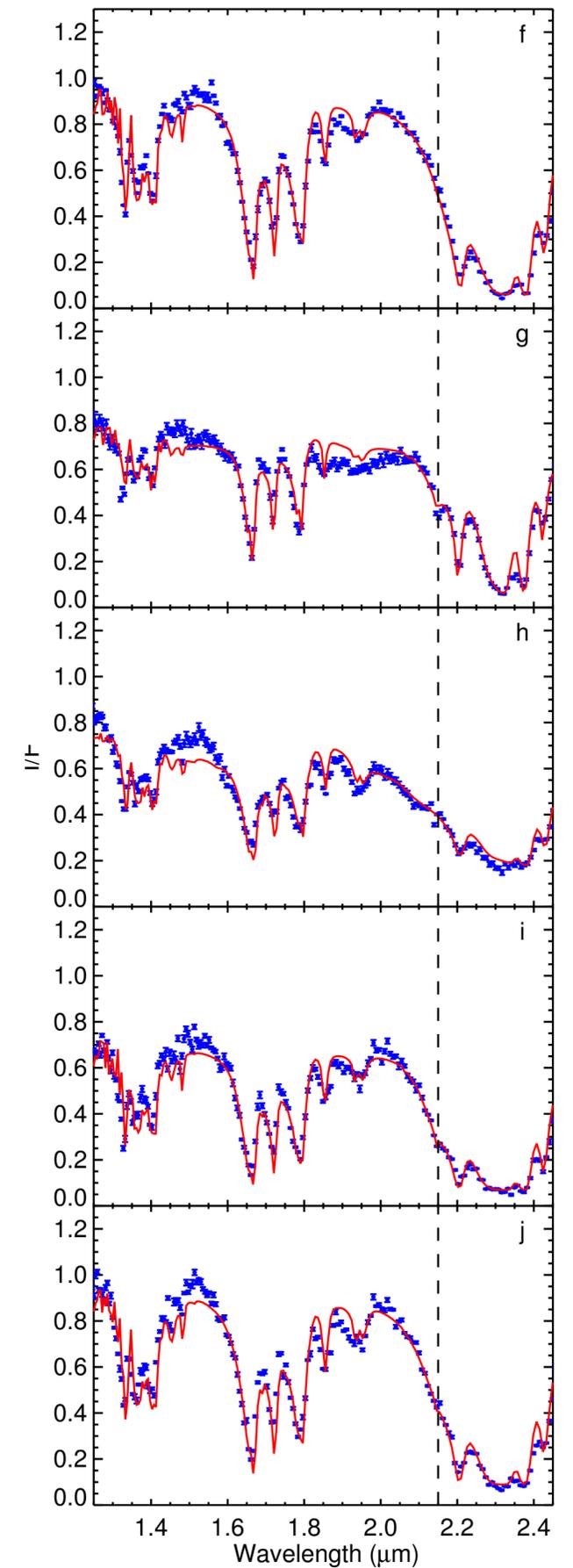
New Horizons
Pluto and Charon



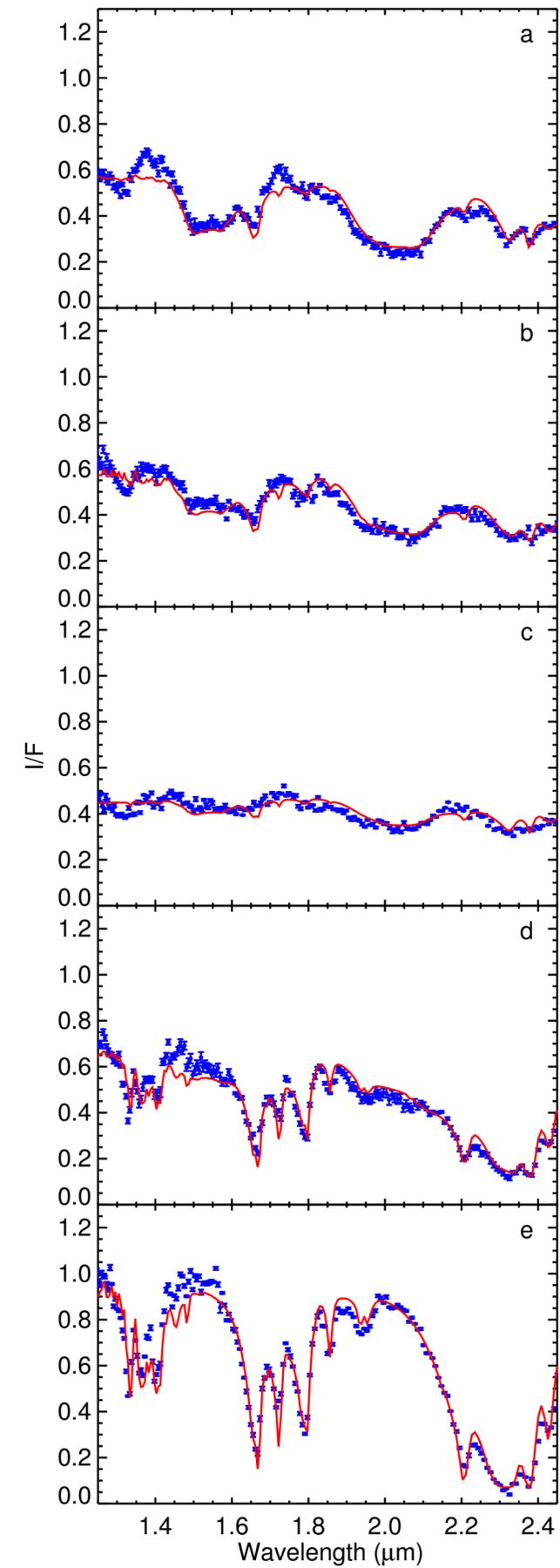
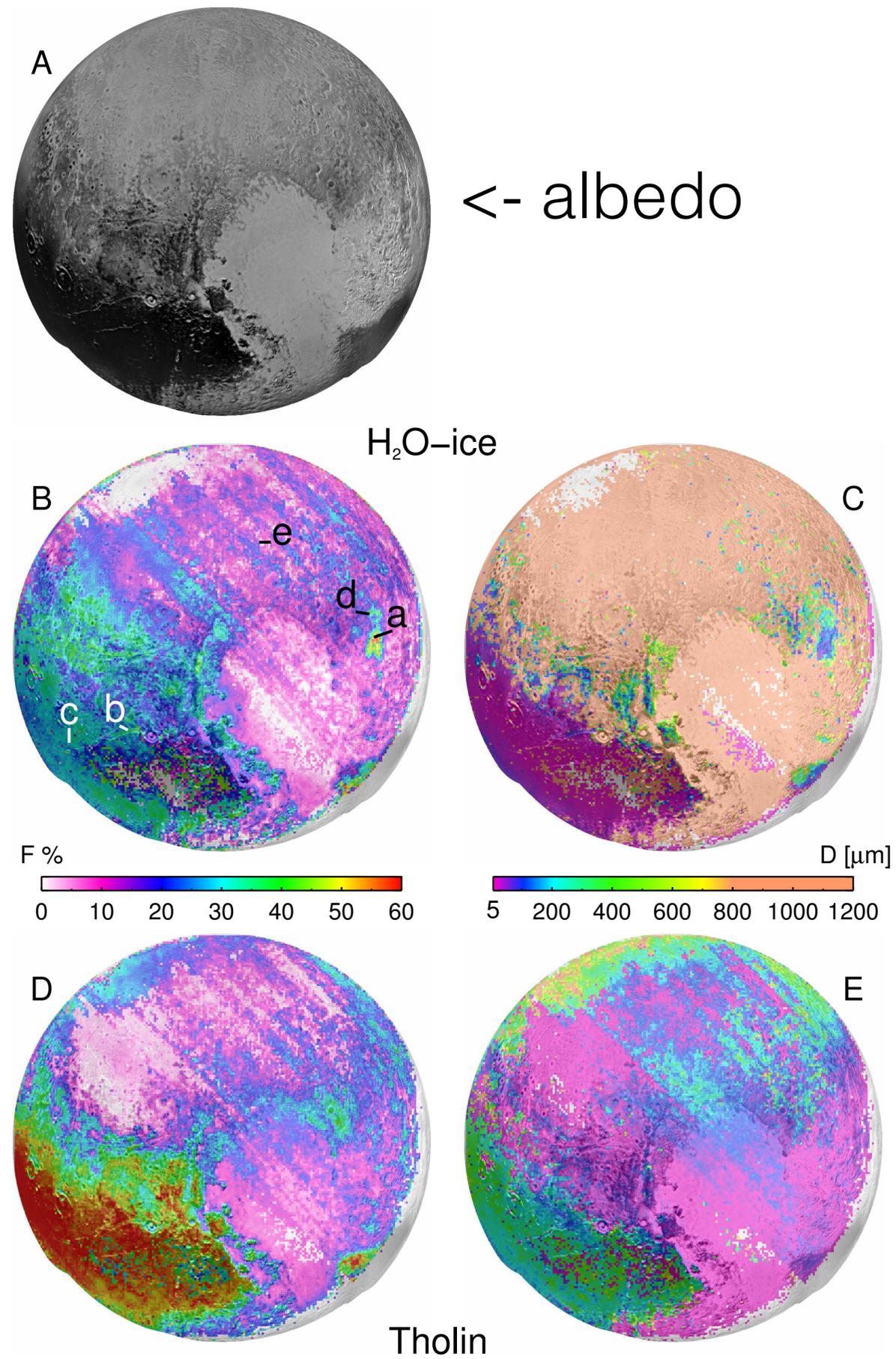
Pluto's global surface composition through pixel-by-pixel Hapke modeling of New Horizons Ralph/LEISA data

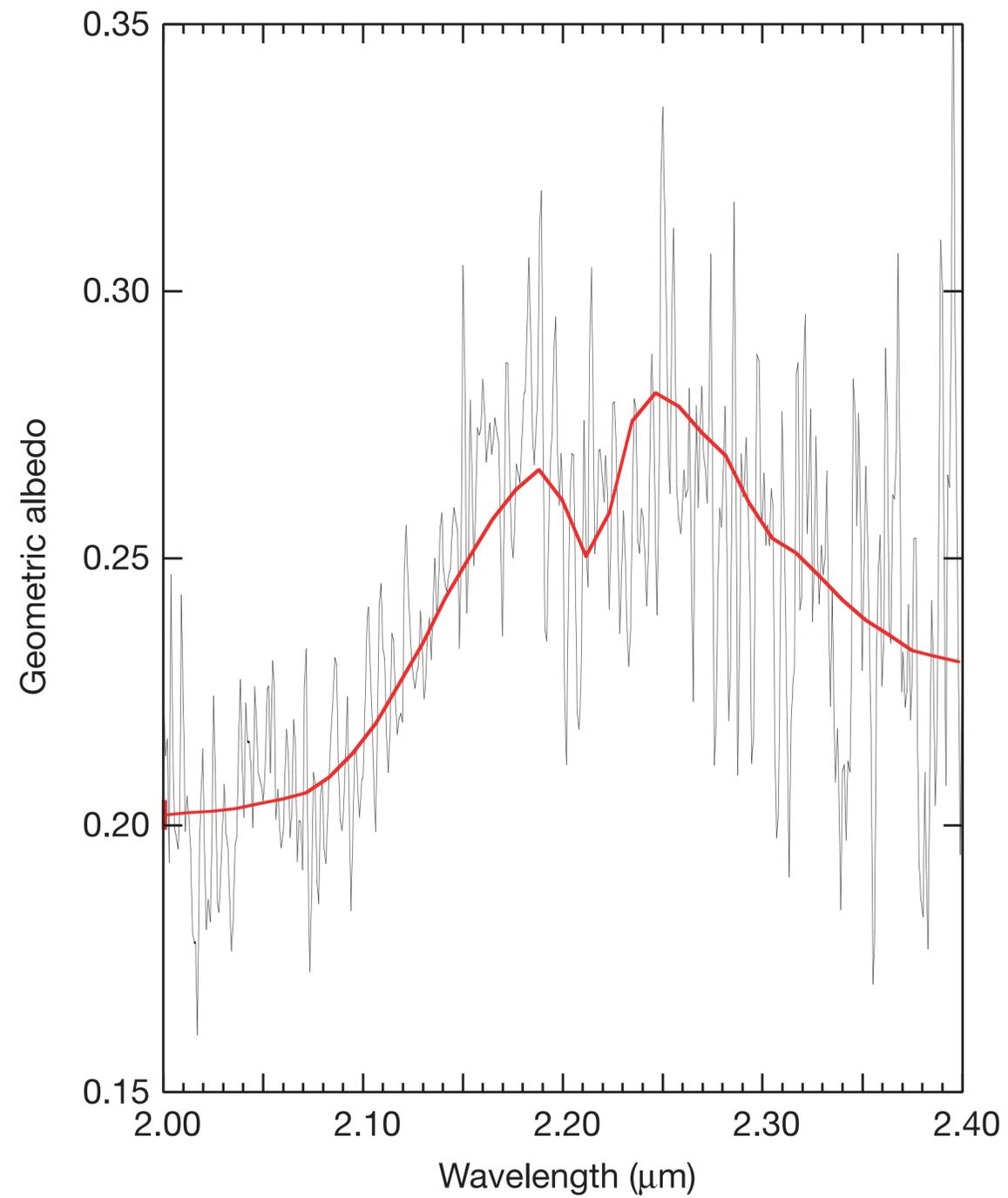


Protopapas et al. (2016)

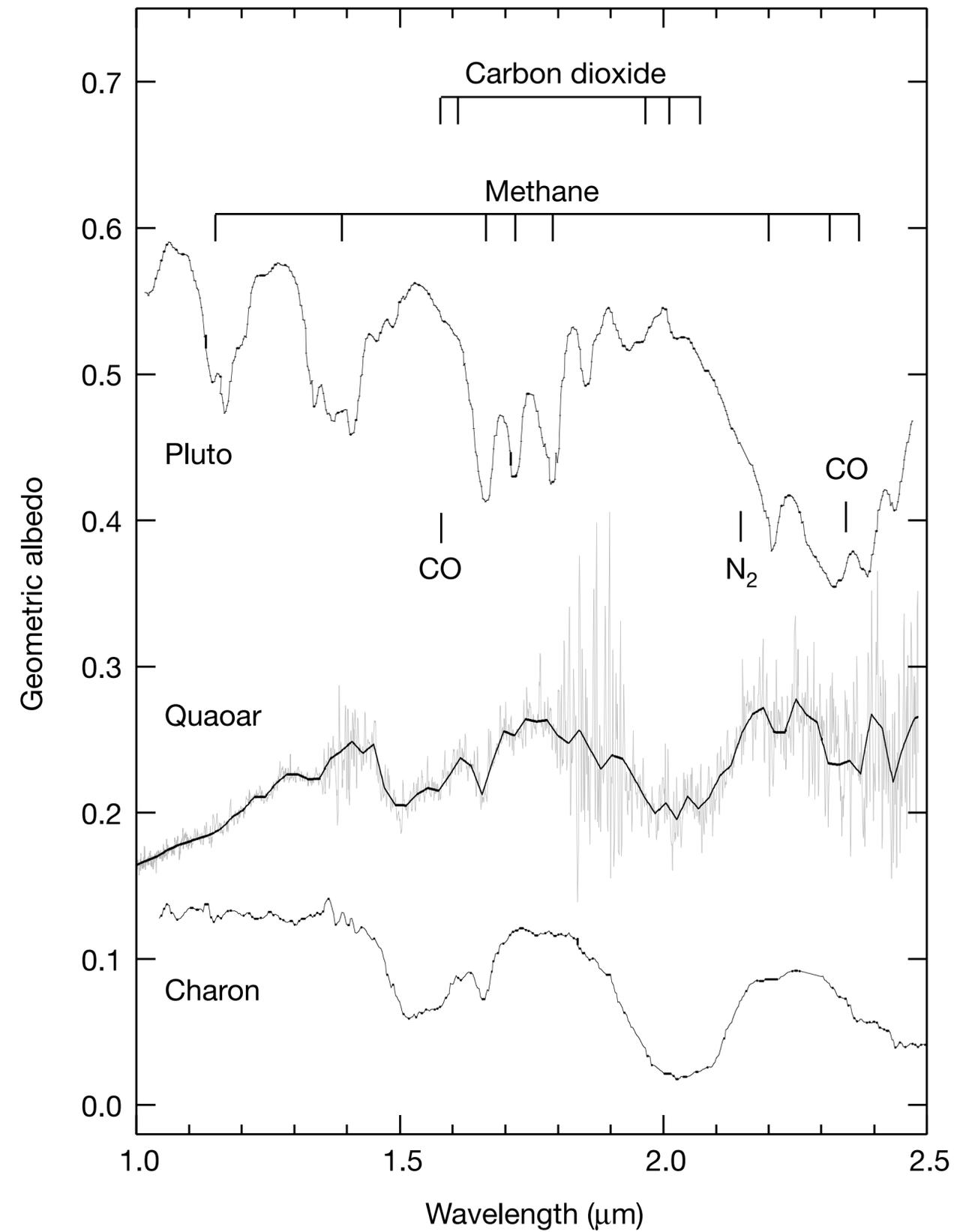


Protopapas et al. (2016)





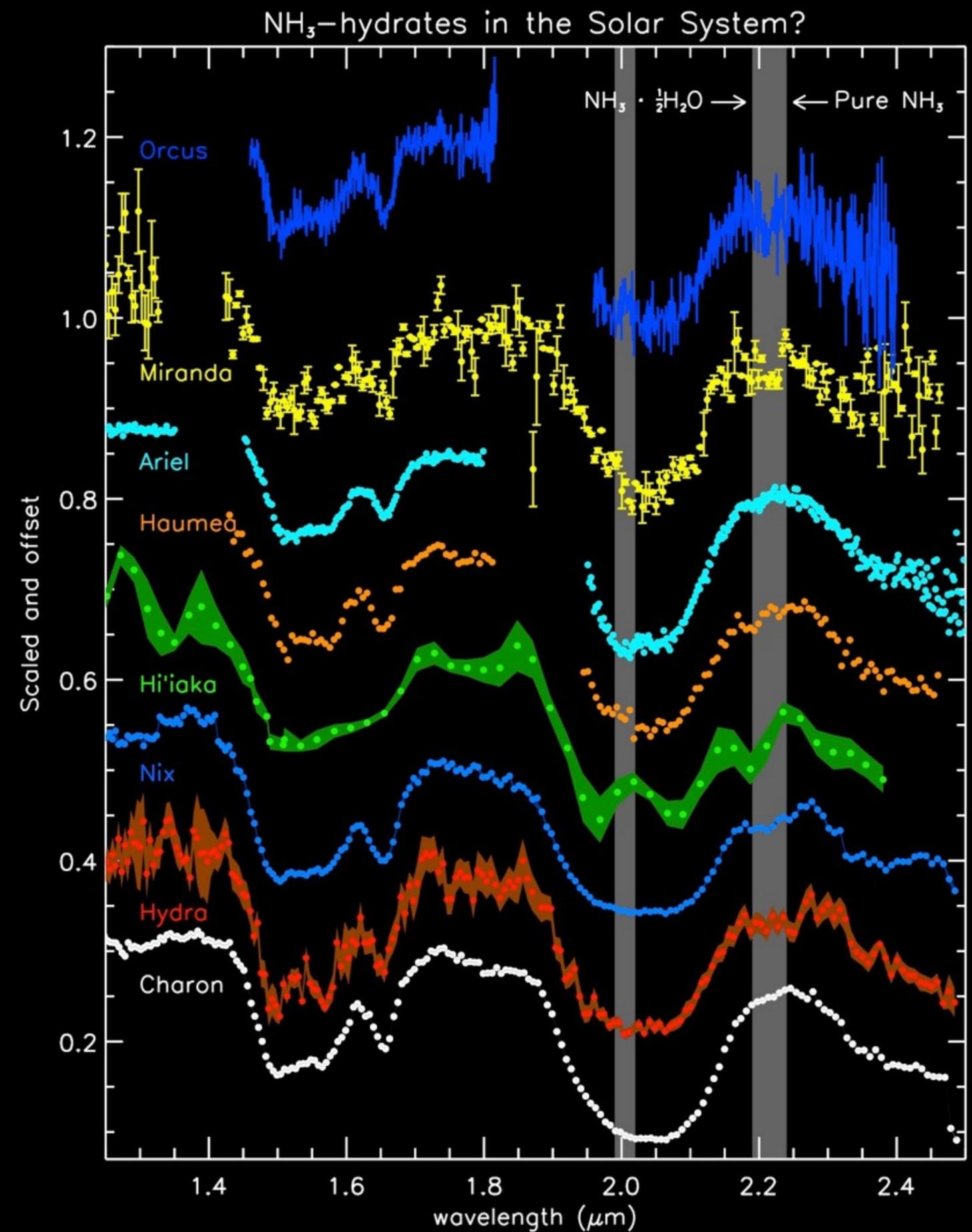
ammonium hydrate on Quaoar
(Jewitt and Luu, 2004)

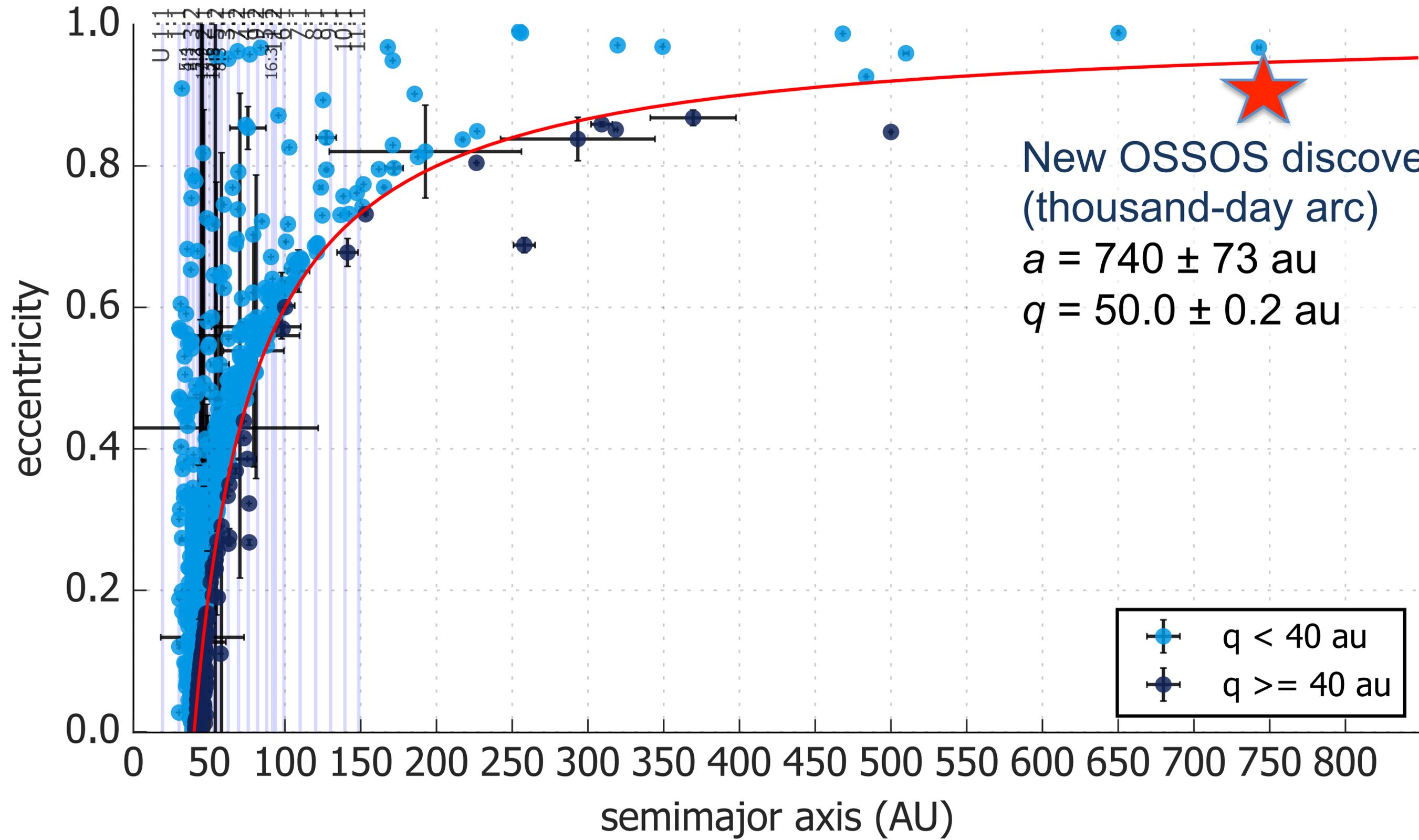


Quaoar spectrum from 2 nights on Subaru

But not simple history:
Many objects
exhibiting hydrates

Jason Cook and
New Horizons
Science Team.





What can go out, could have come down

