A planet population dichotomy from isotopic enrichment?

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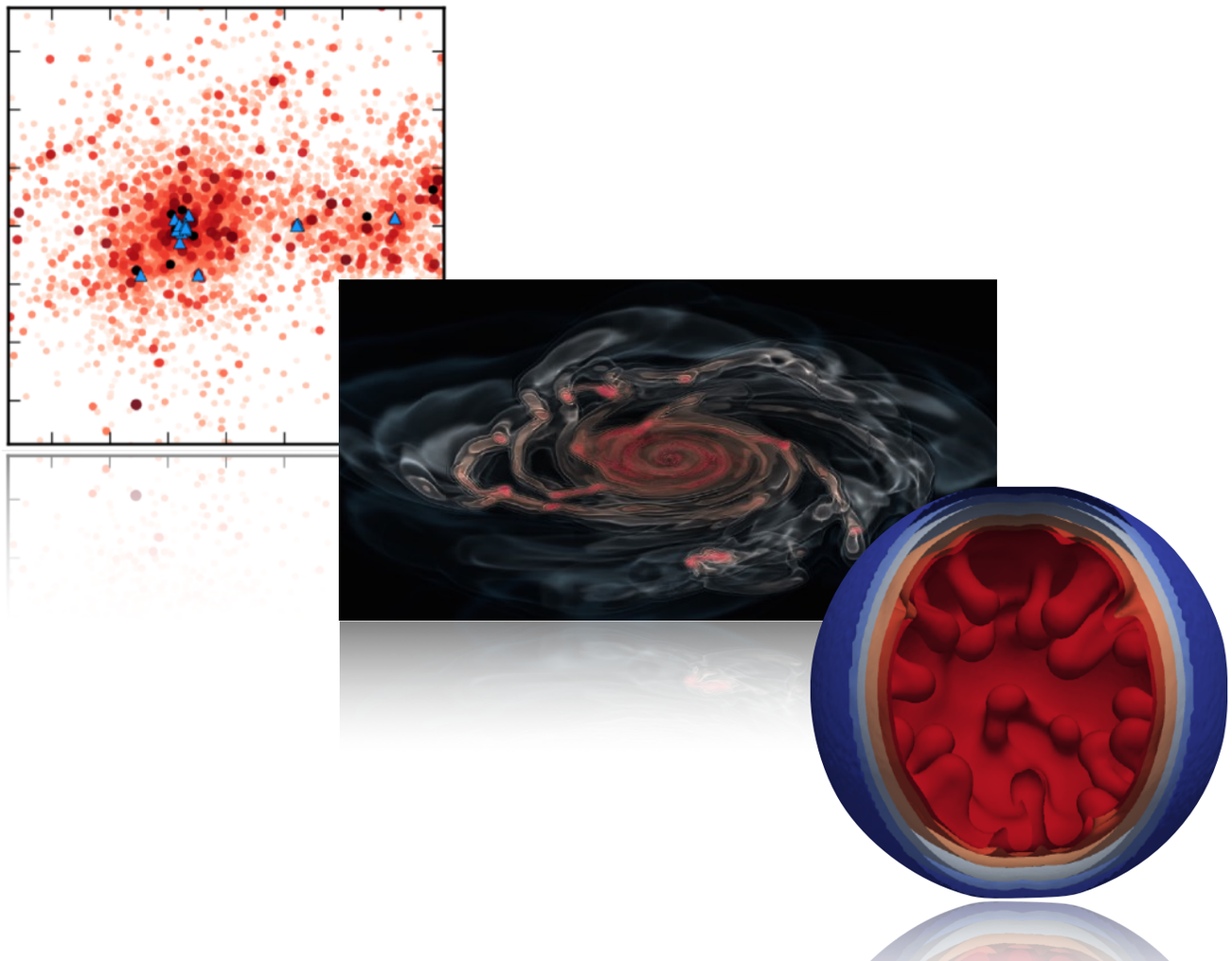
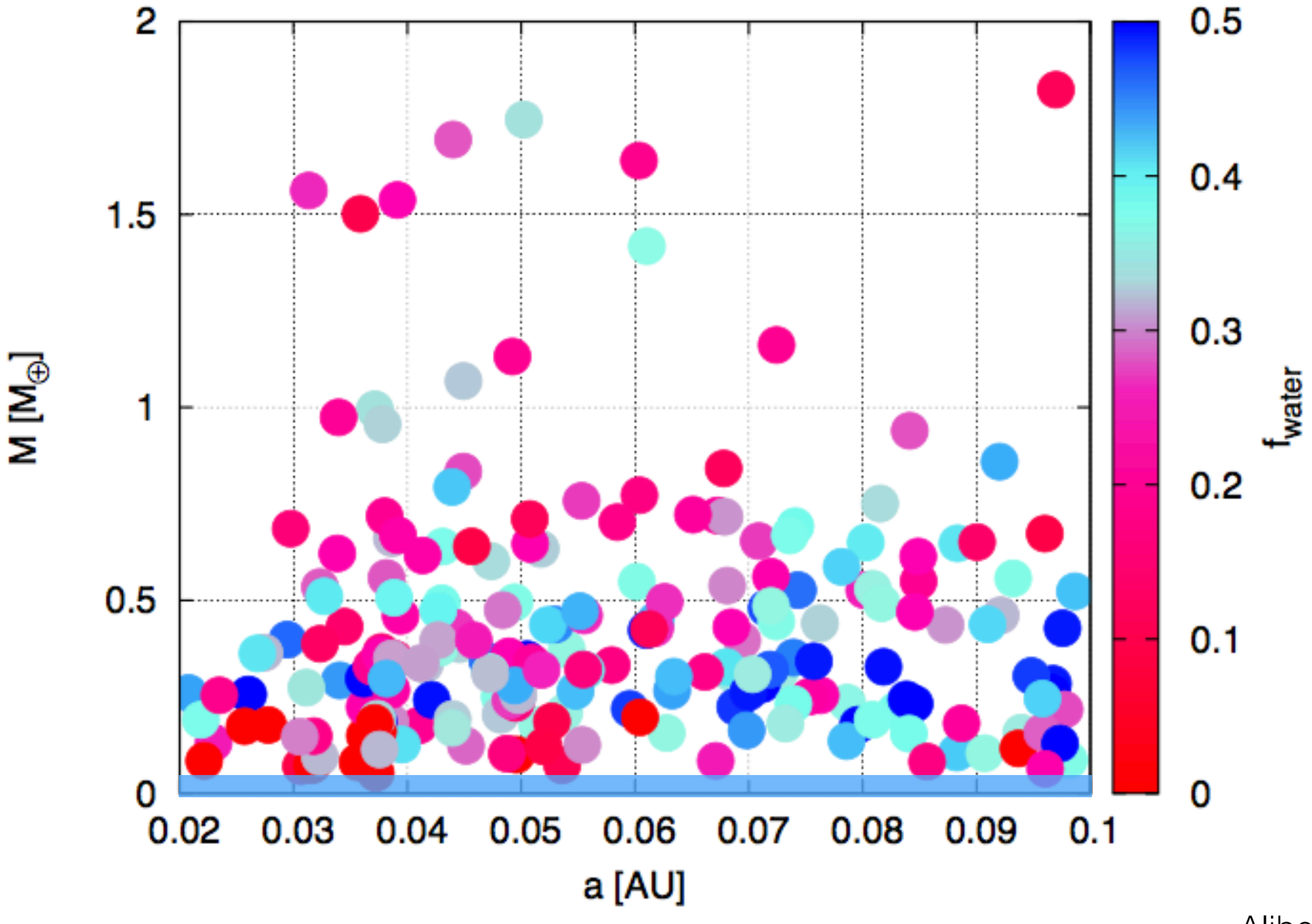
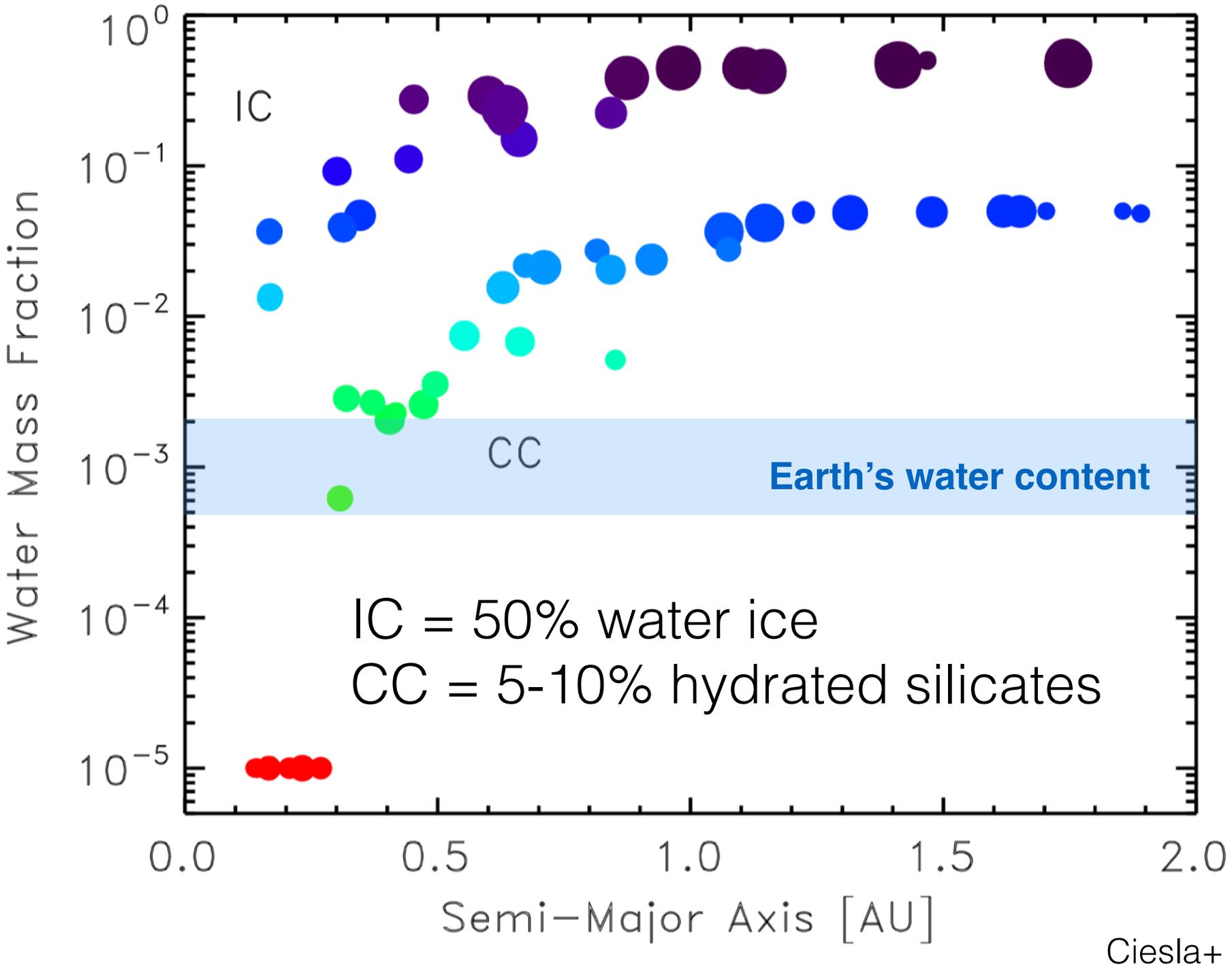


Lots of water worlds?



Alibert & Benz 17

Deplete the building blocks



Ciesla+ 15, Mulders+ 15

^{26}Al — the Solar system link to its birth environment

1. Aluminum-26 fused in massive star

↓

2. Transport to nascent Solar System

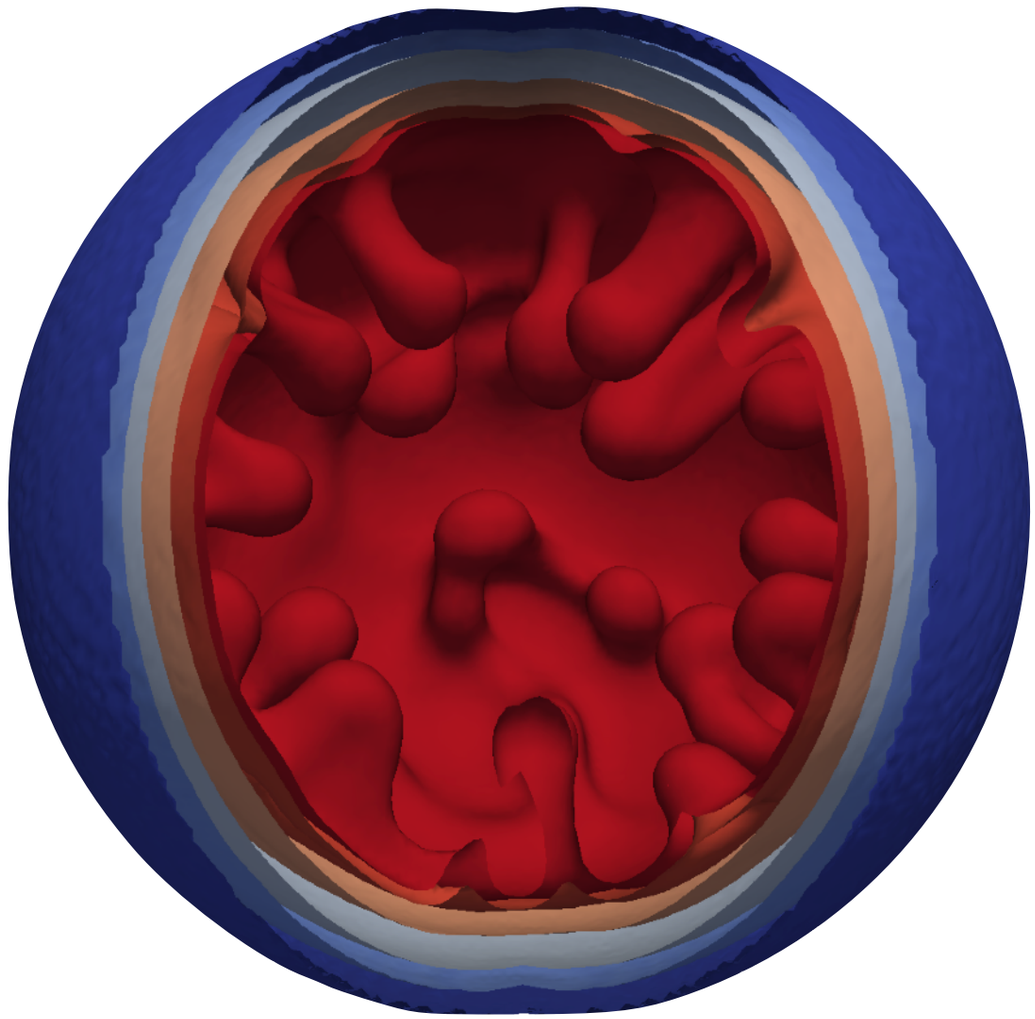
↓

3. Mixing into dust/solid material

↓

4. Heating of early planetesimals by radioactive decay

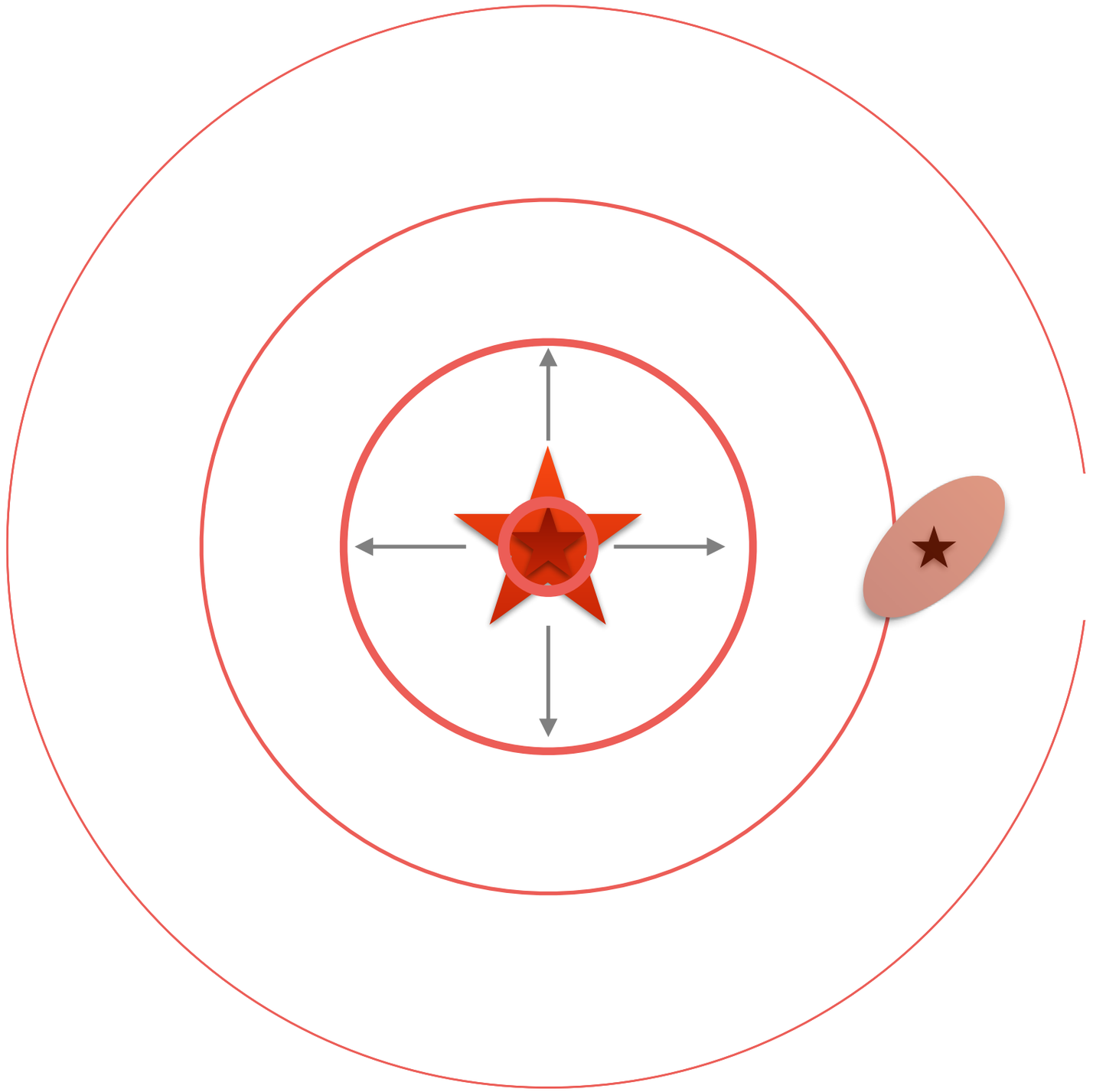
➡ Differentiation, serpentinization, volatile degassing, …



Lichtenberg, Golabek, Gerya, Meyer (2016)

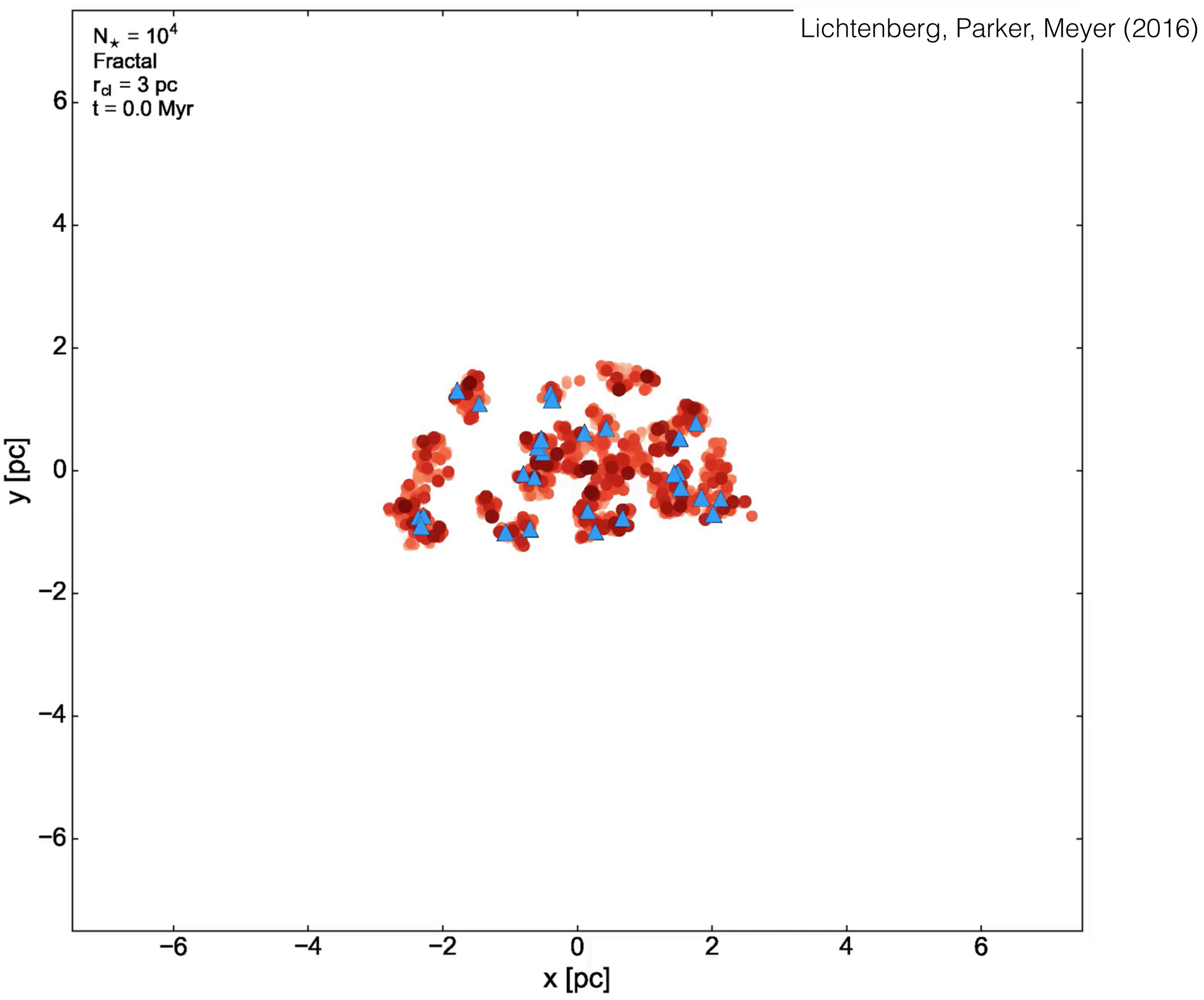
Lichtenberg, Parker, Meyer (2016)

Late ^{26}Al injection from supernova pollution



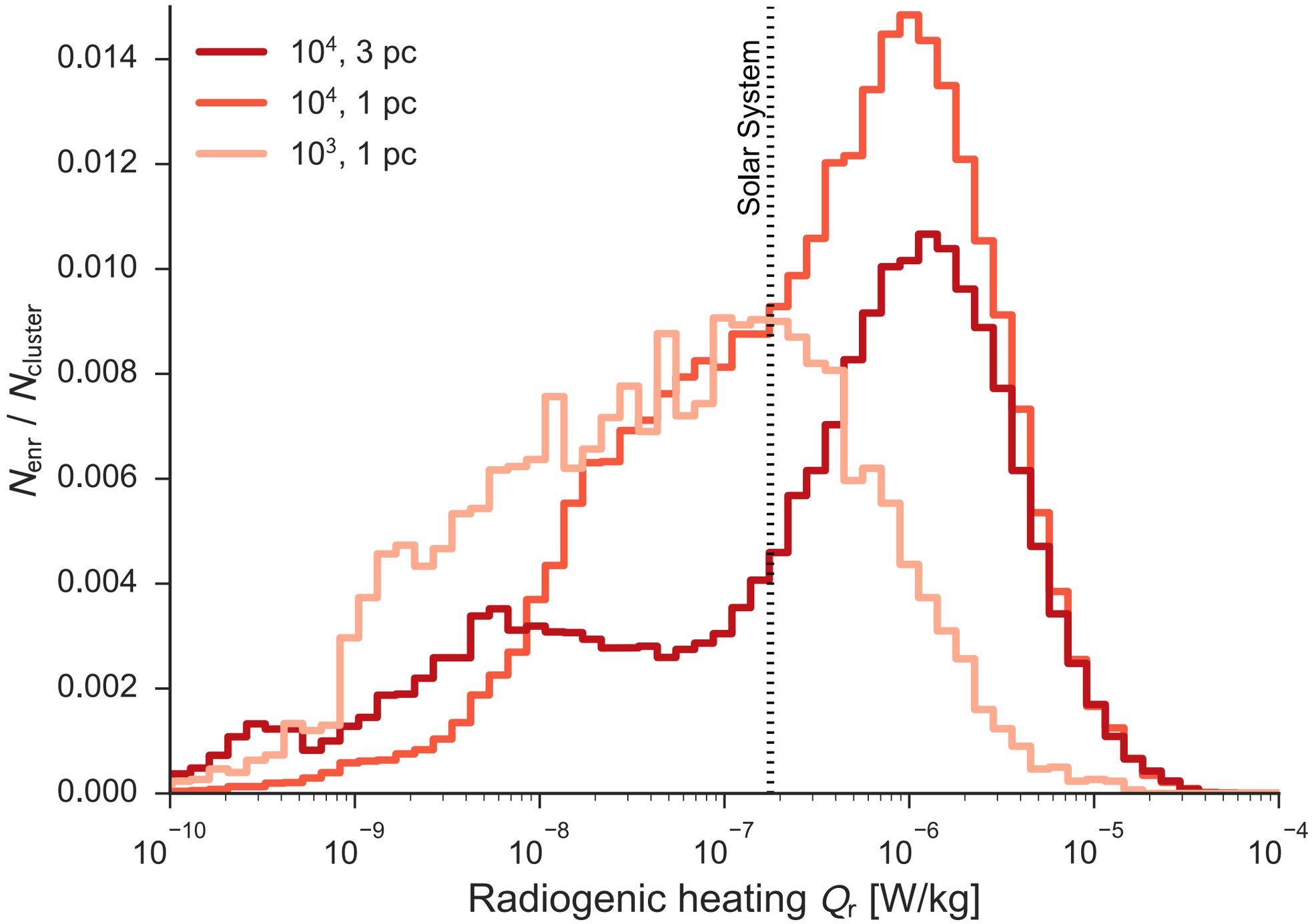
Clayton 77, Chevalier 00

Lichtenberg, Parker, Meyer (2016)

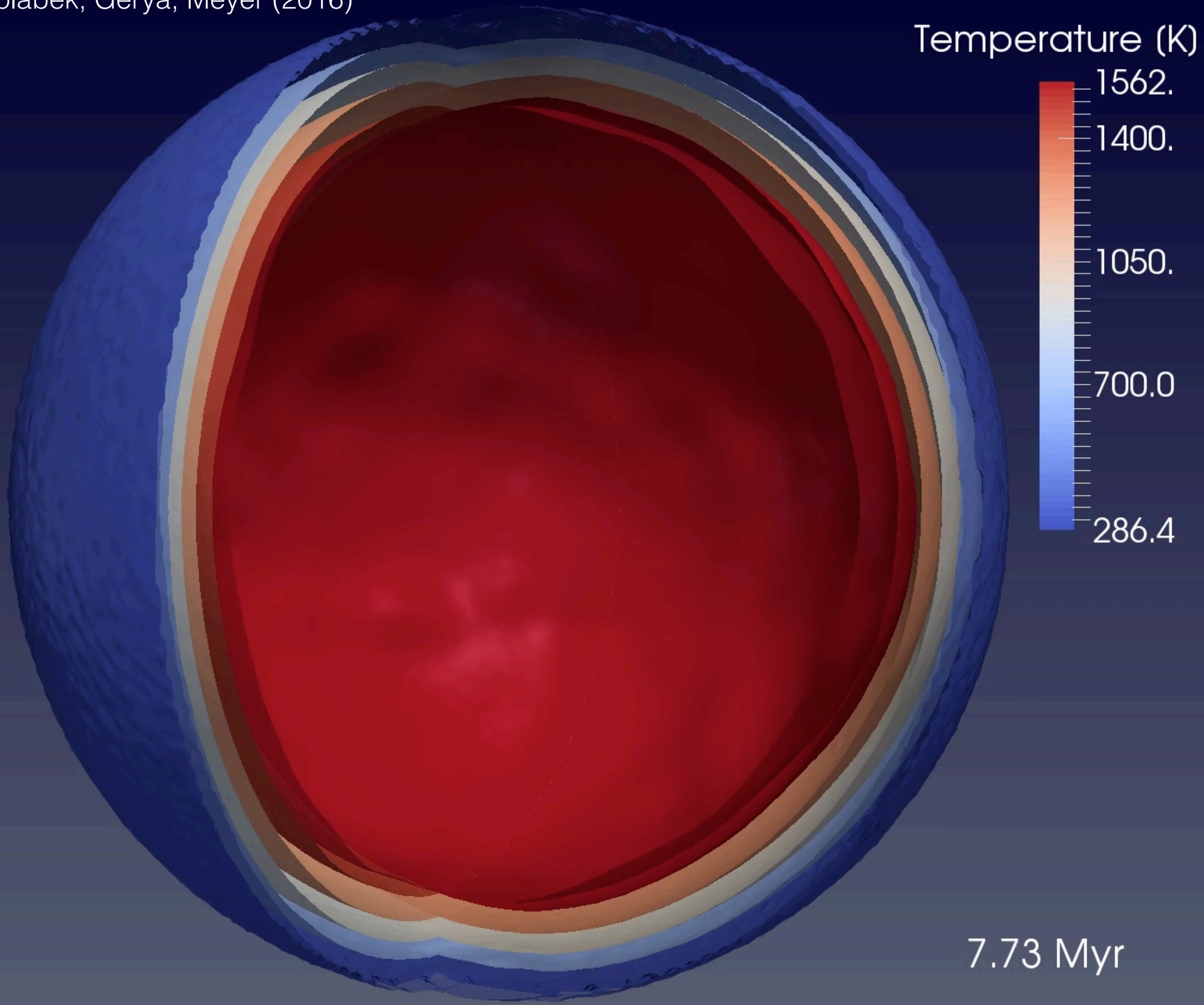


Lichtenberg, Parker, Meyer (2016)

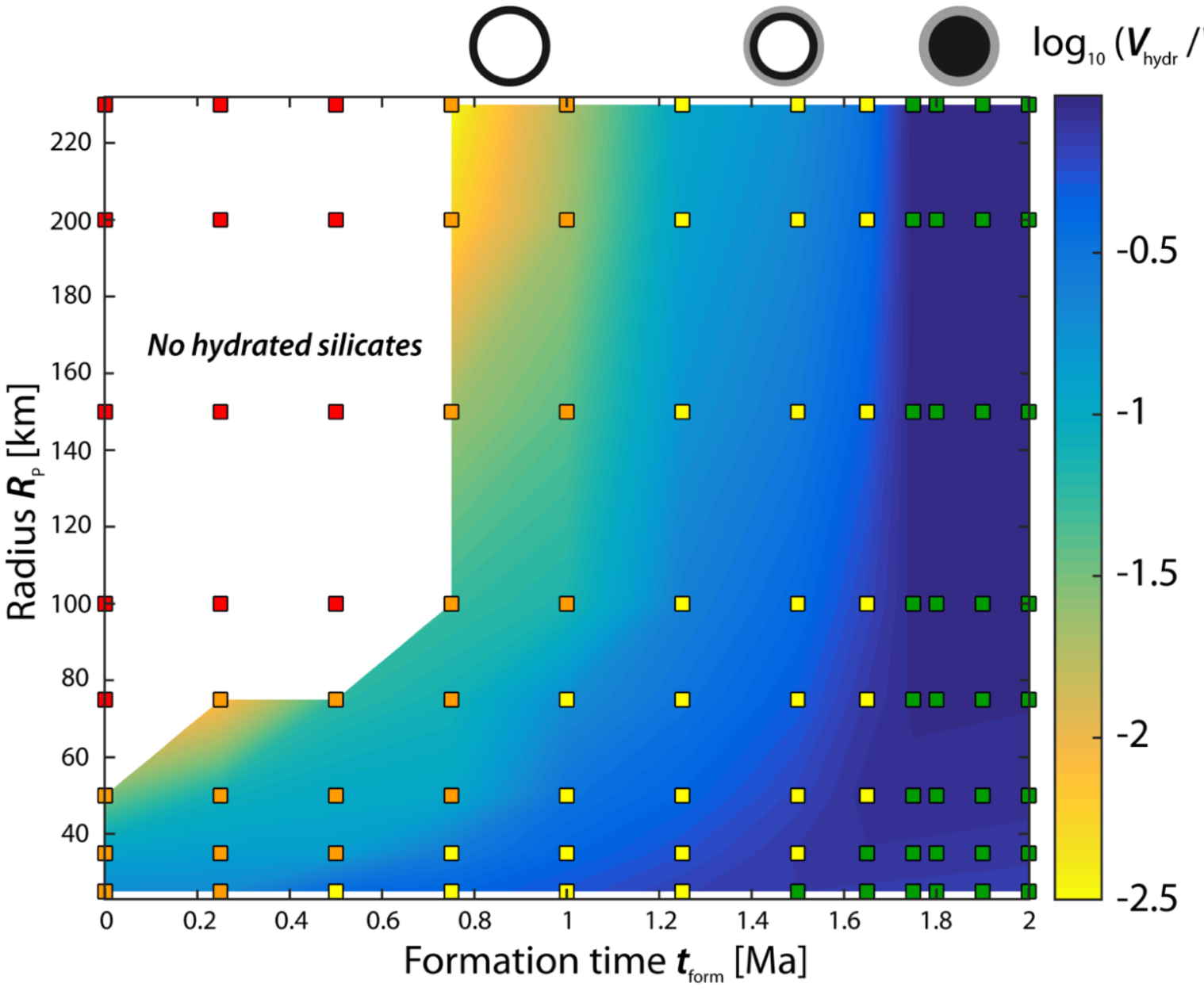
Planetesimal heat budget



Lichtenberg, Golabek, Gerya, Meyer (2016)



Radiogenic heating ⟷ Volatile budget



- In some bodies W/R > 1-10
  (Hewins+14, Molotov 14)
- Ceres outer mantle currently ~20-30%
- Aqueous alteration omnipresent
  (Doyle+15)

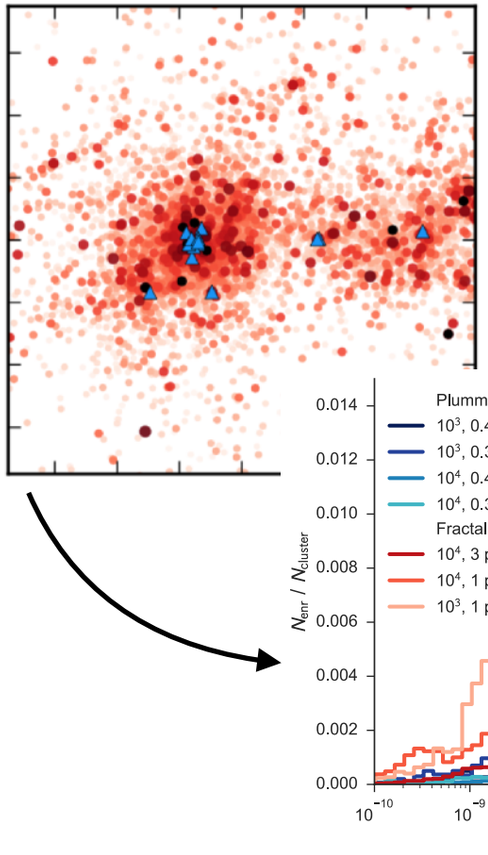
Courtesy: Gregor Golabek

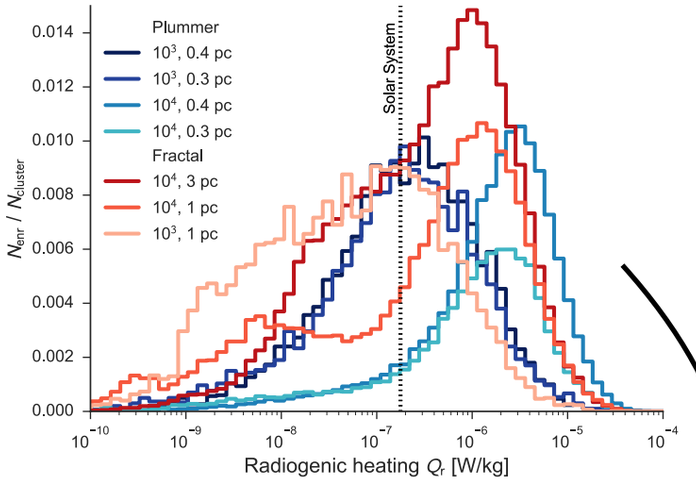
Take away

1. ^{26}Al distribution dichotomy among planetary system (from late injection?)

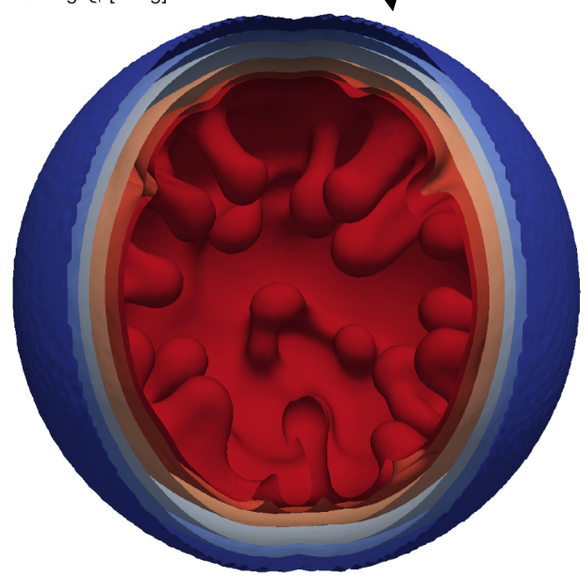
2. ^{26}Al-driven planetesimal interior evolution in enriched systems

➡ Planet population synthesis?





Lichtenberg, Parker, Meyer (2016), MNRAS



Lichtenberg, Golabek, Gerya, Meyer (2016), Icarus