Isotopic Enrichment of Forming Planetary Systems via Supernova Pollution

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ETH zürich

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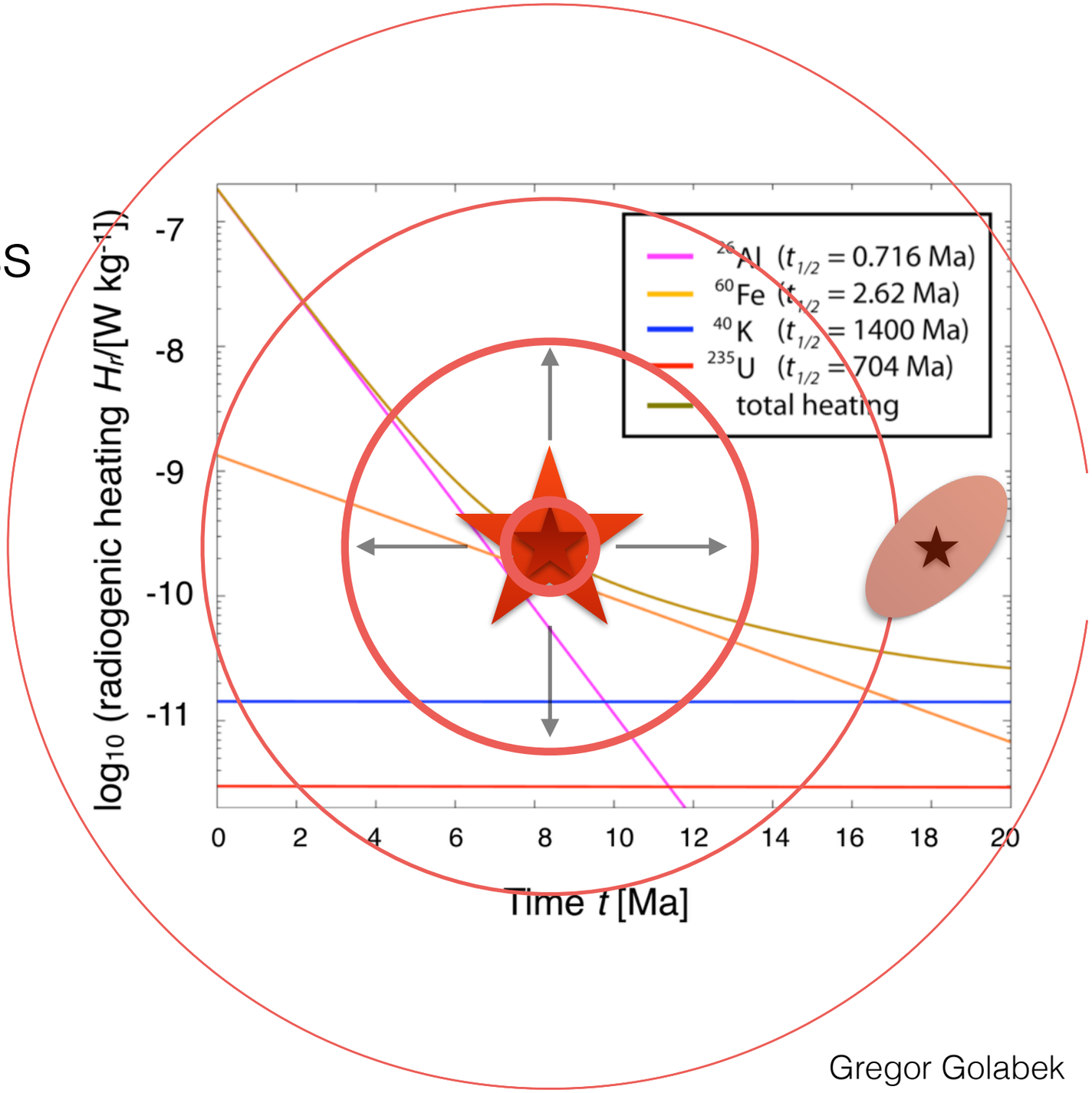
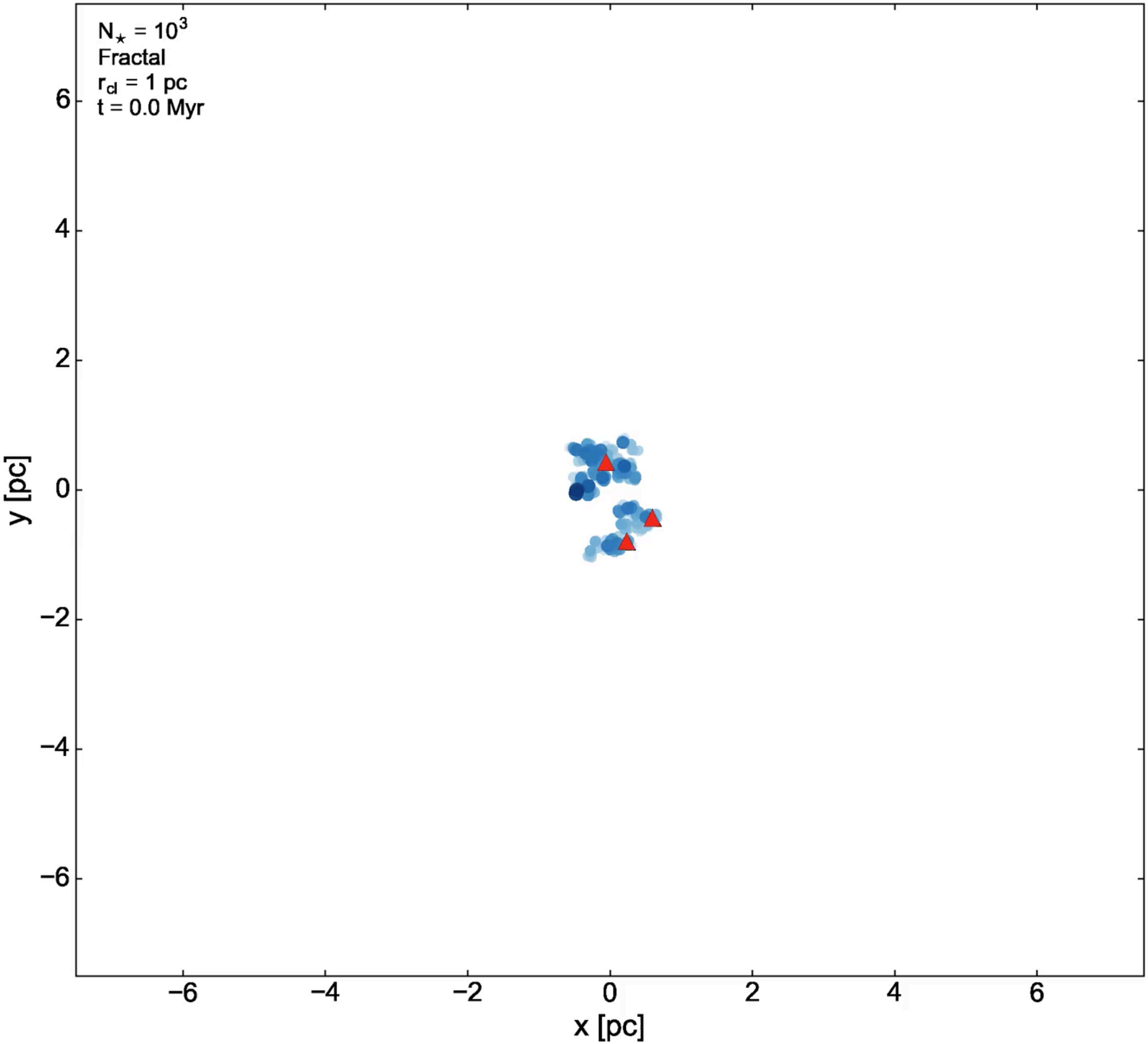
SLRs as Link to Star Formation Environment

- SLRs in SS dominate heat budget and thus volatile loss
- Early planetary evolution coupled to star formation environment
- Enrichment distribution via disk pollution from supernovae



Pfalzner+ 15, Gounelle+ 15, Davies+ 14, Makide+ 11, Ouellette+ 10, etc.

Gregor Golabek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Fractal
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y [pc]
x [pc]
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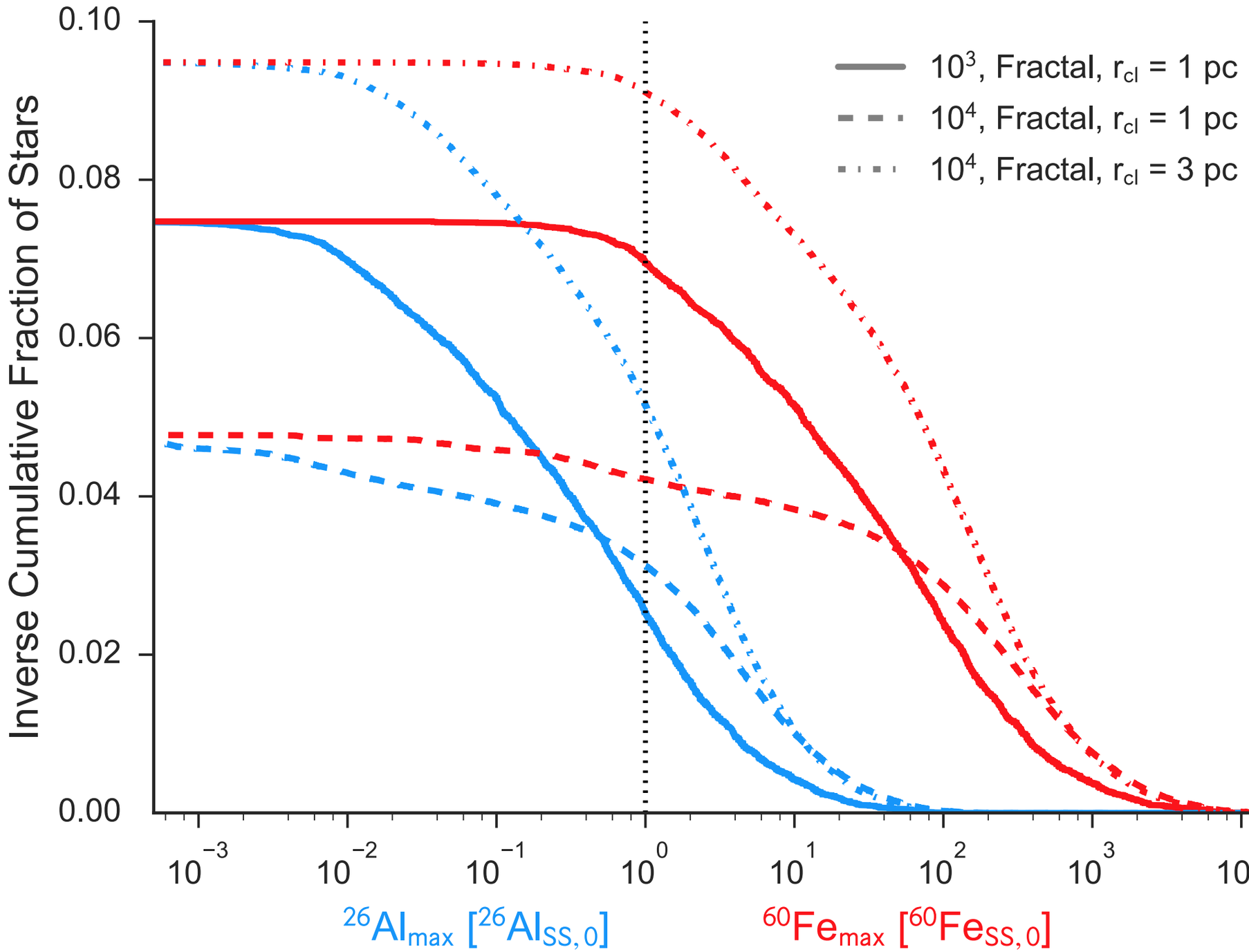
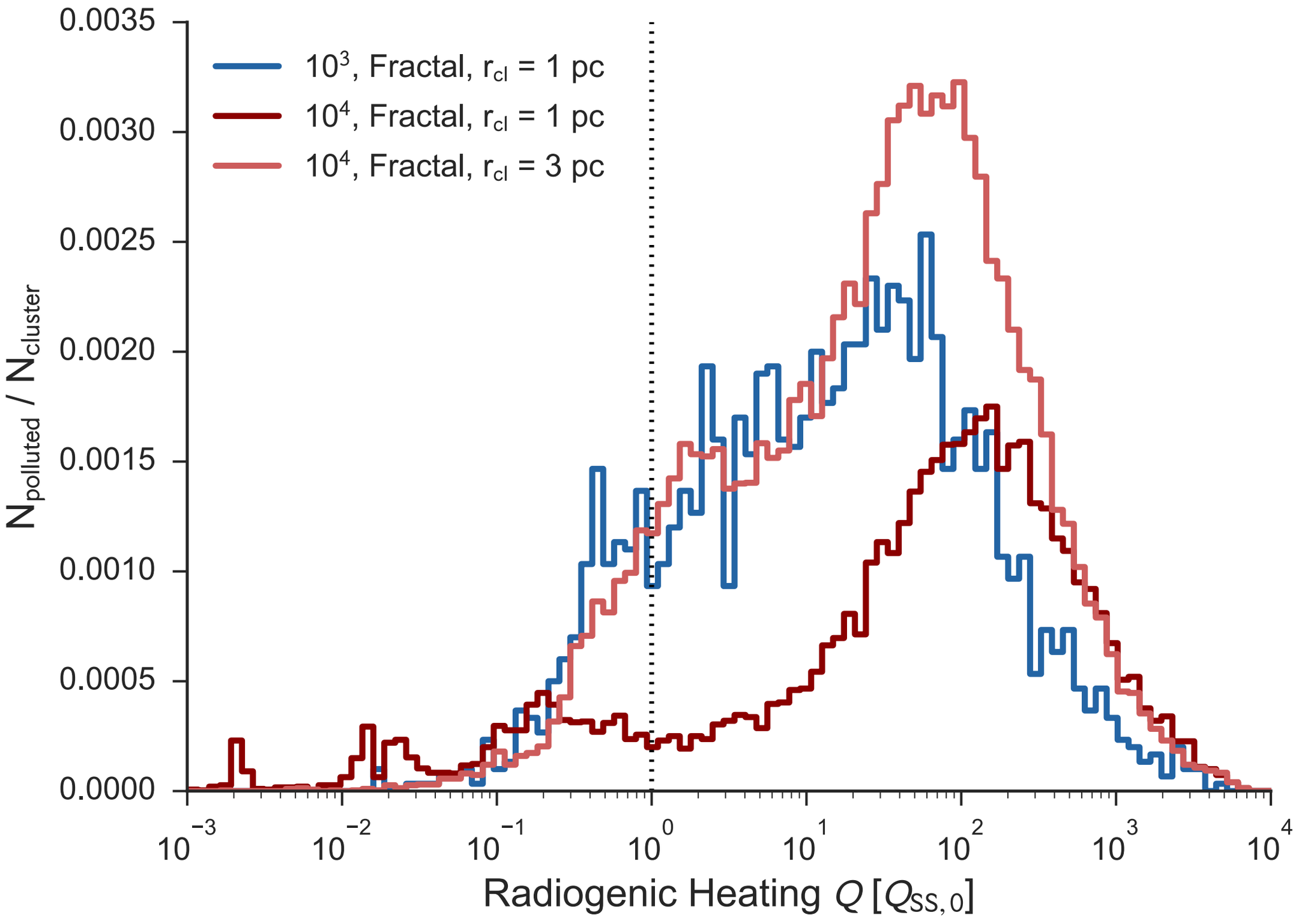
4
2
0
−2
−4
−6
−6
−4
−2
0
2
4
6

Enrichment Distribution



Heat Budget for Planet Formation

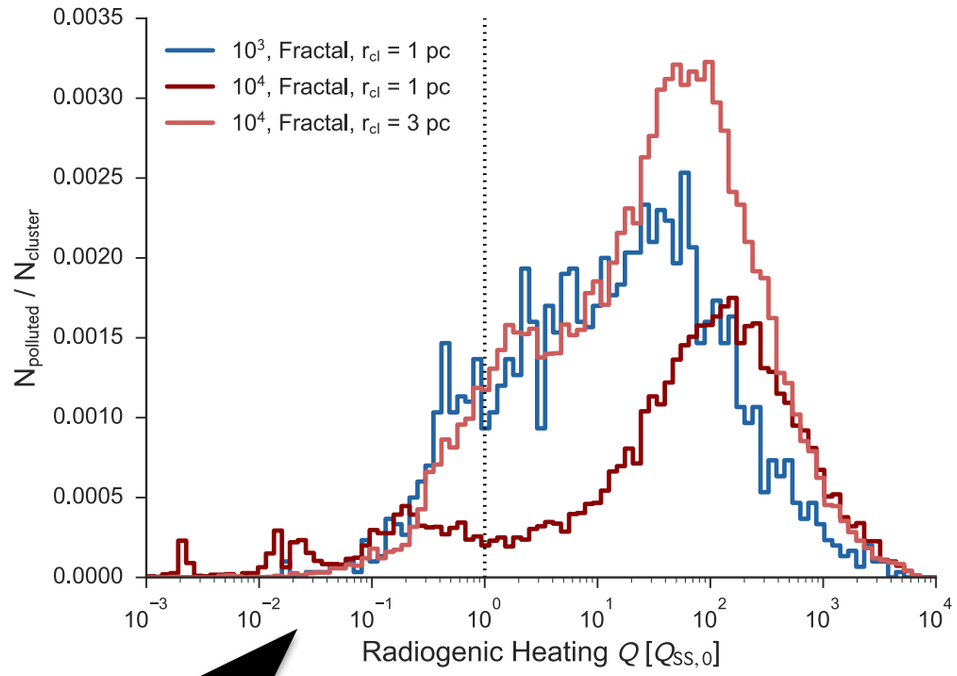


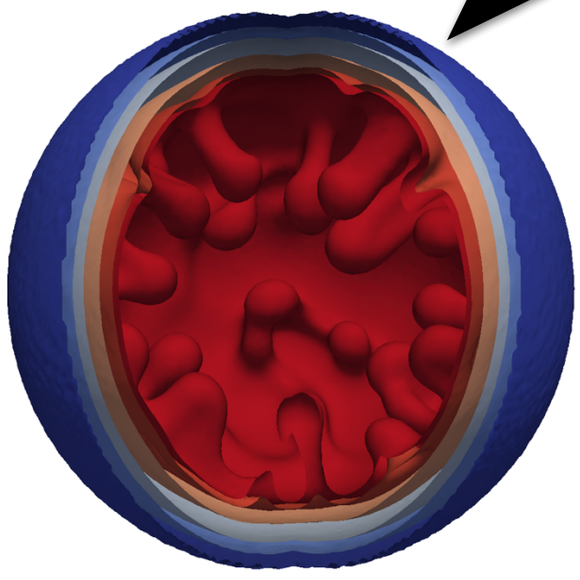
Summary & Conclusions

- Internal heat budget varies *dramatically* between planetary systems

- Consequences for planetary population: water planets vs. desert planets?

- Future study: investigate volatile loss due to SLR heating via multi phase fluid simulations





Lichtenberg+
The impact of short-lived radionuclides and porosity on the early thermo-mechanical evolution of planetesimals, submitted

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Isotopic Enrichment of Forming Planetary Systems via Supernova Pollution, in progress