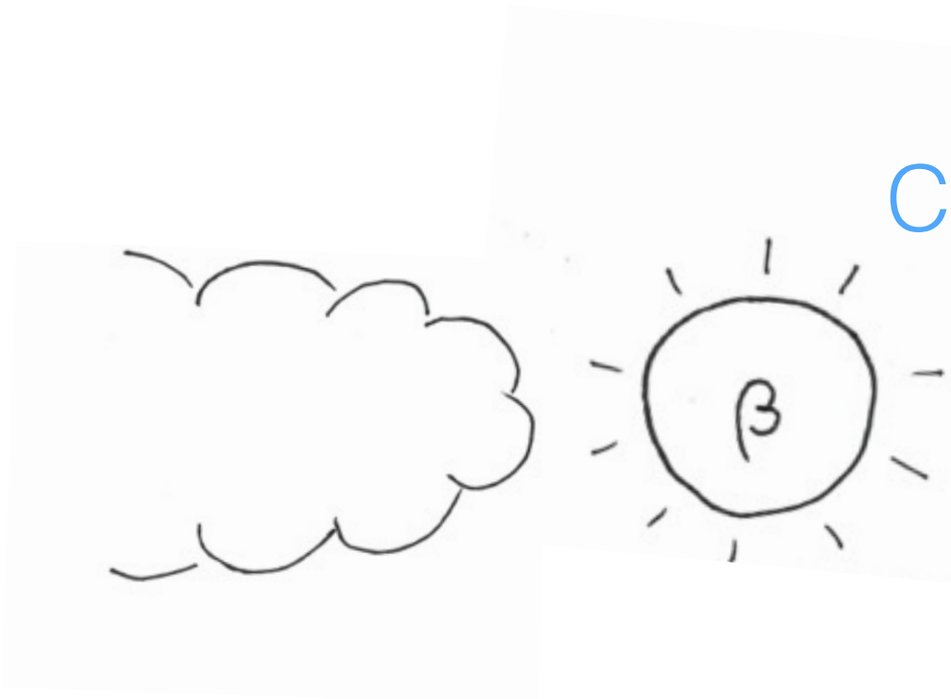
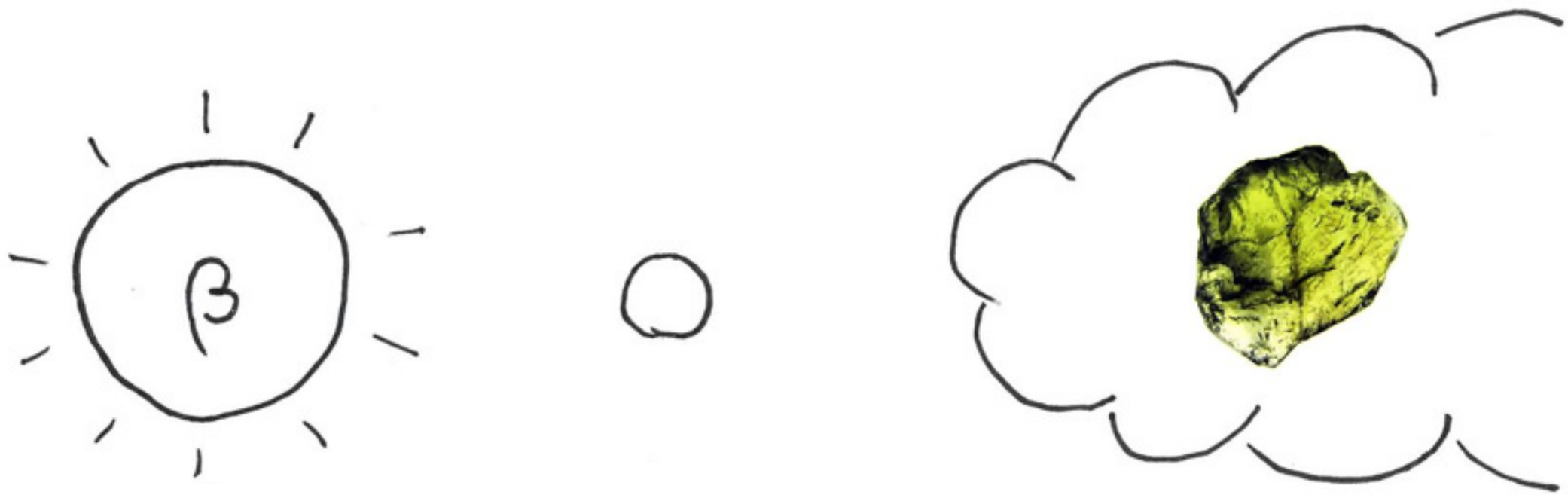


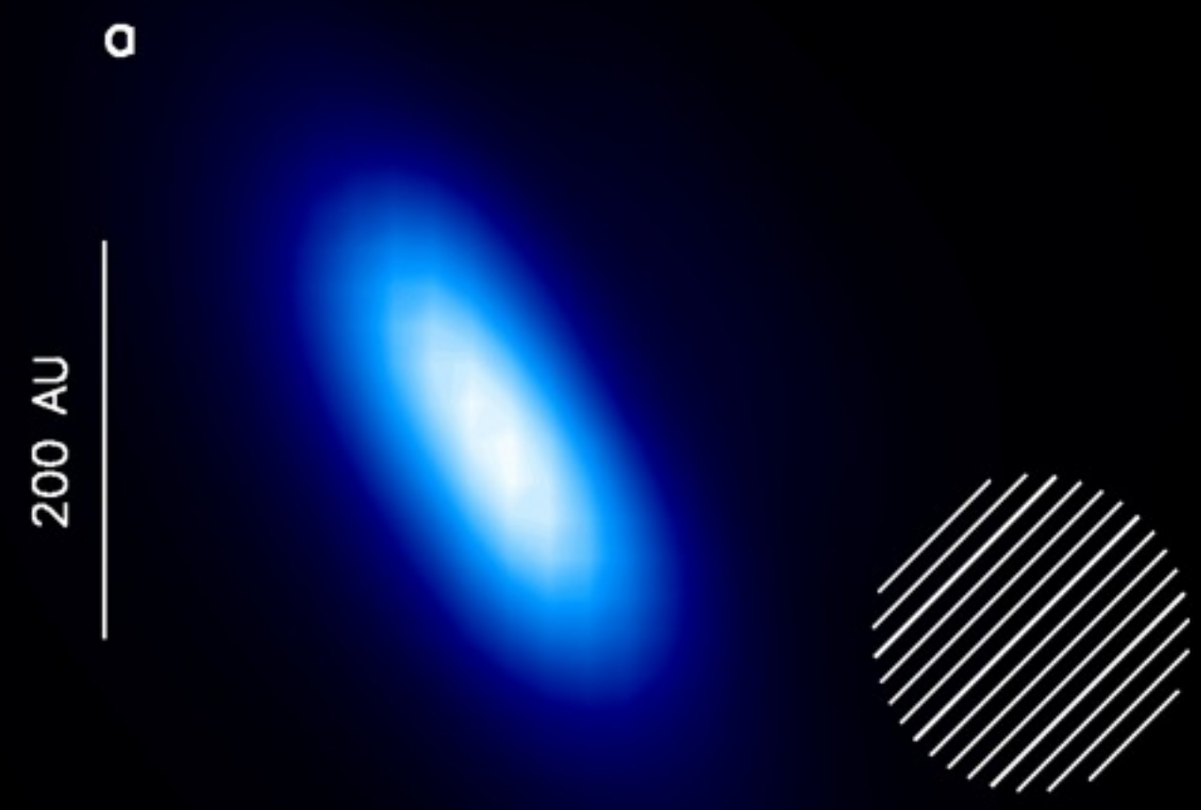
Comet-like mineralogy of olivine crystals in an extrasolar proto-Kuiper belt

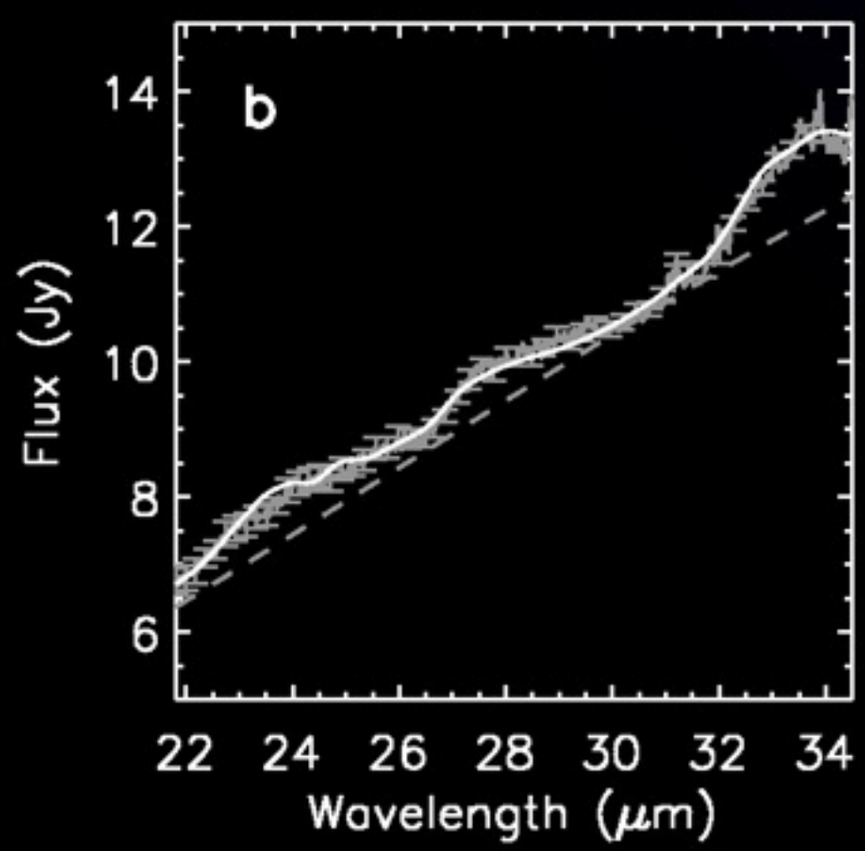
AlbaNova University Centre, Stockholm University
Stockholm University Astrobiology Centre
Instituut voor Sterrenkunde, K.U. Leuven

B.L. de Vries
Acke
Blommaert
Waters
++
PI: G. Olofsson, et al.

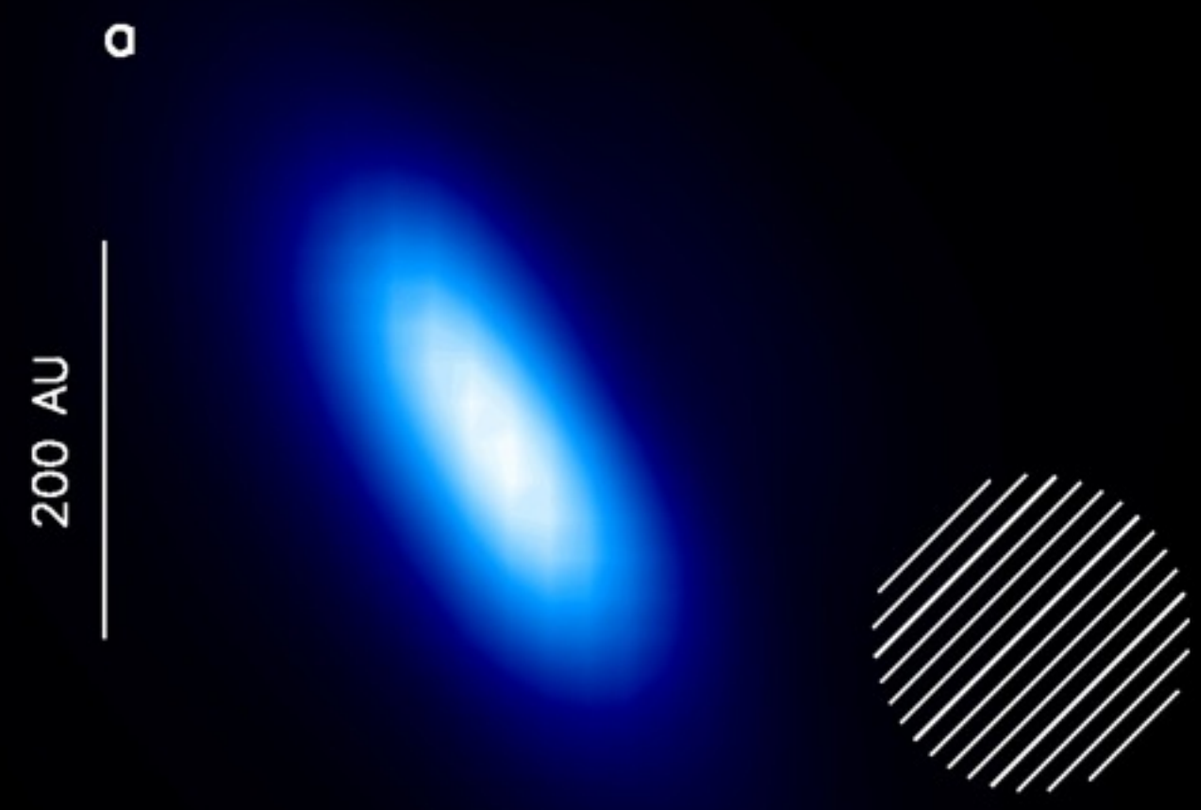

β

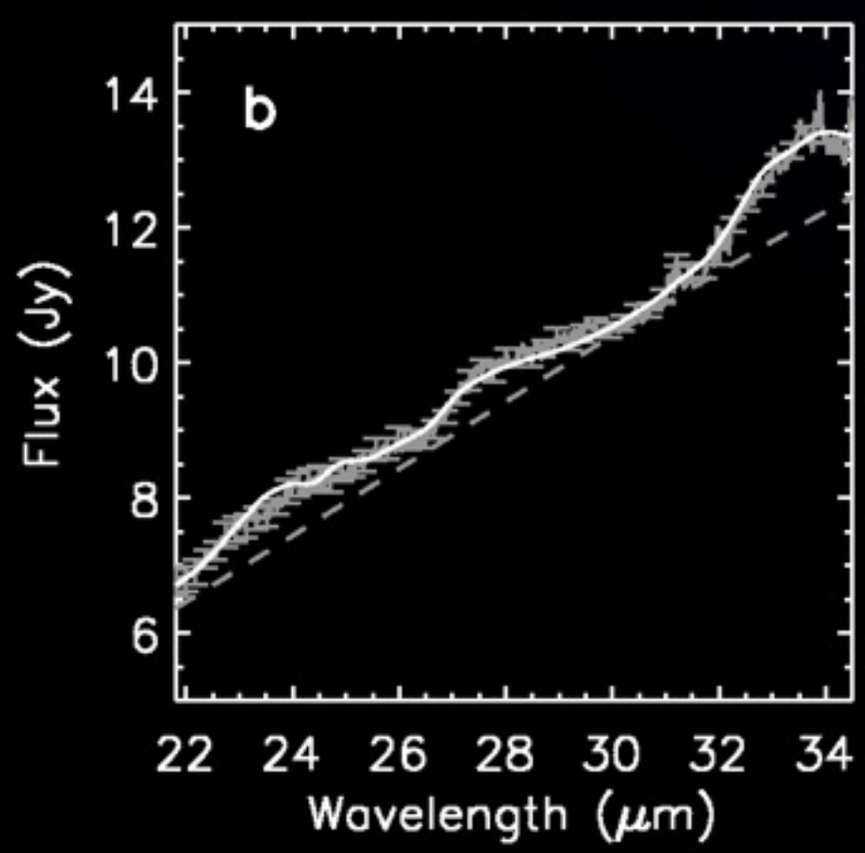

200 AU

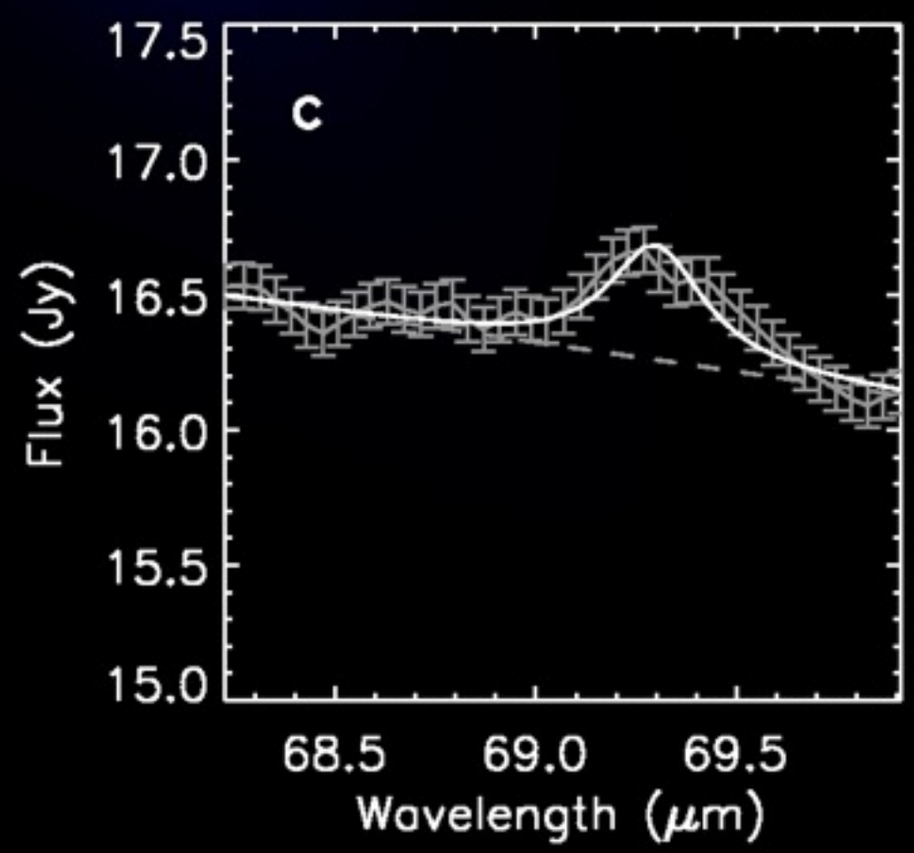




Vandenbussche et al. 2010, Chen et al. 2007,

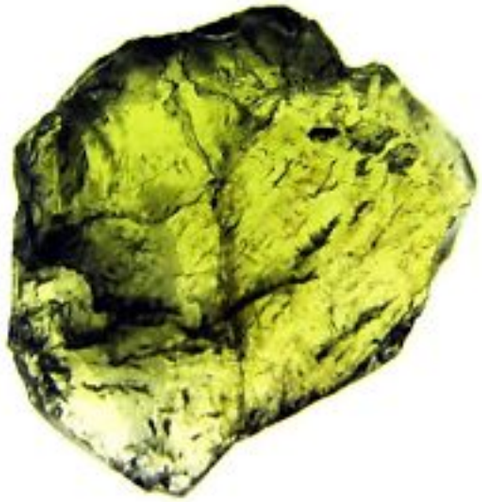




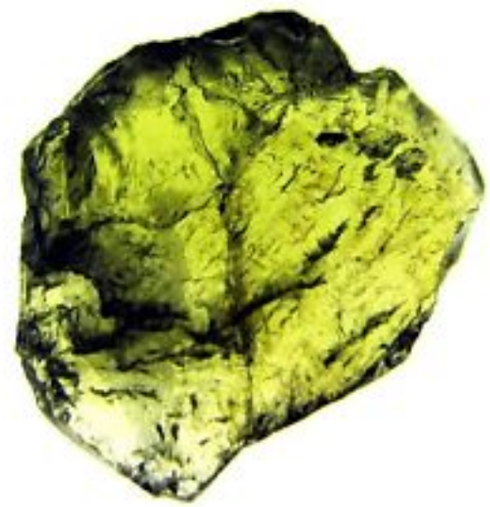


Vandenbussche et al. 2010, Chen et al. 2007,

de Vries et al. 2012, Consortium G. Olofsson



$(Mg,Fe)_2SiO_4$

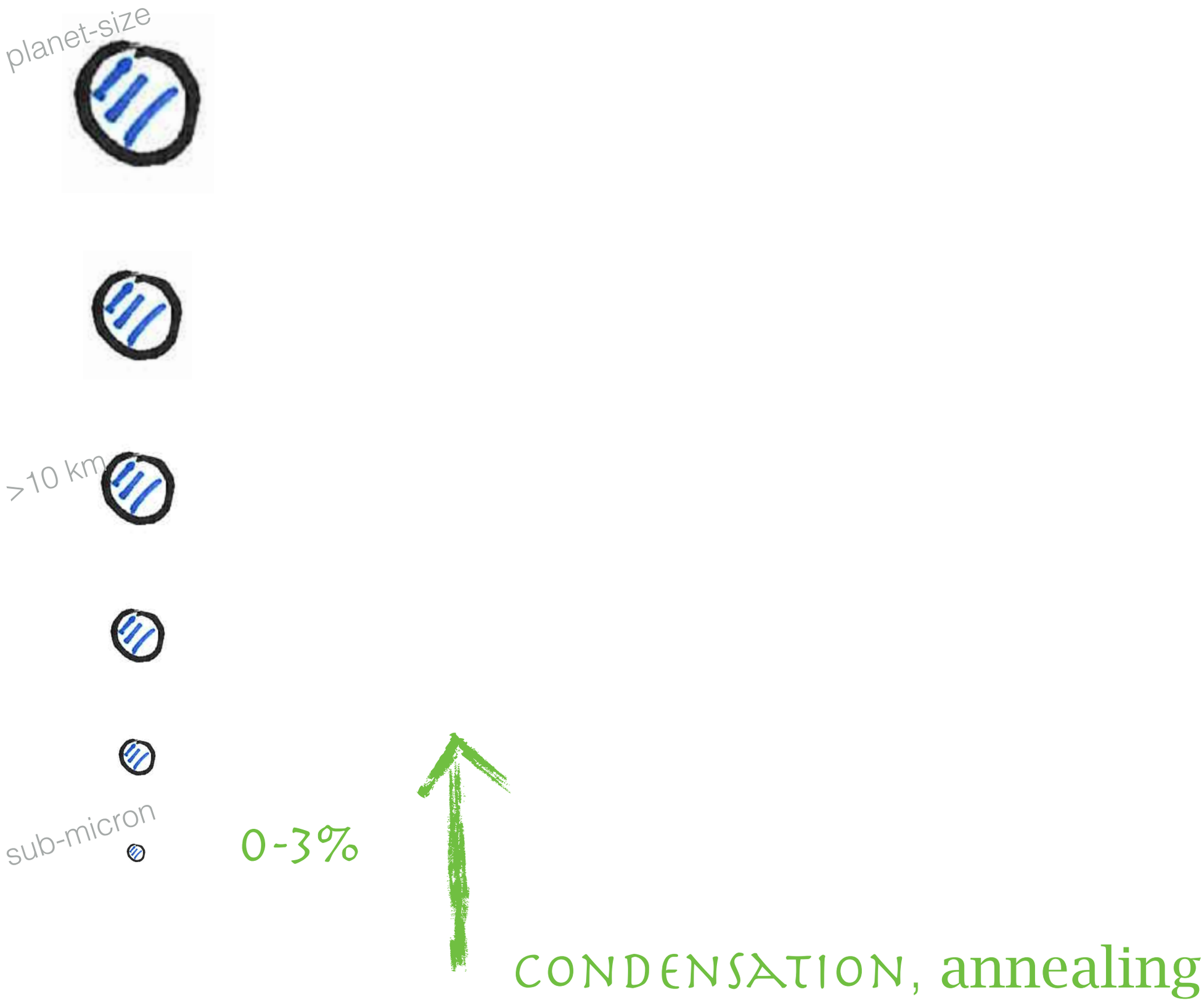


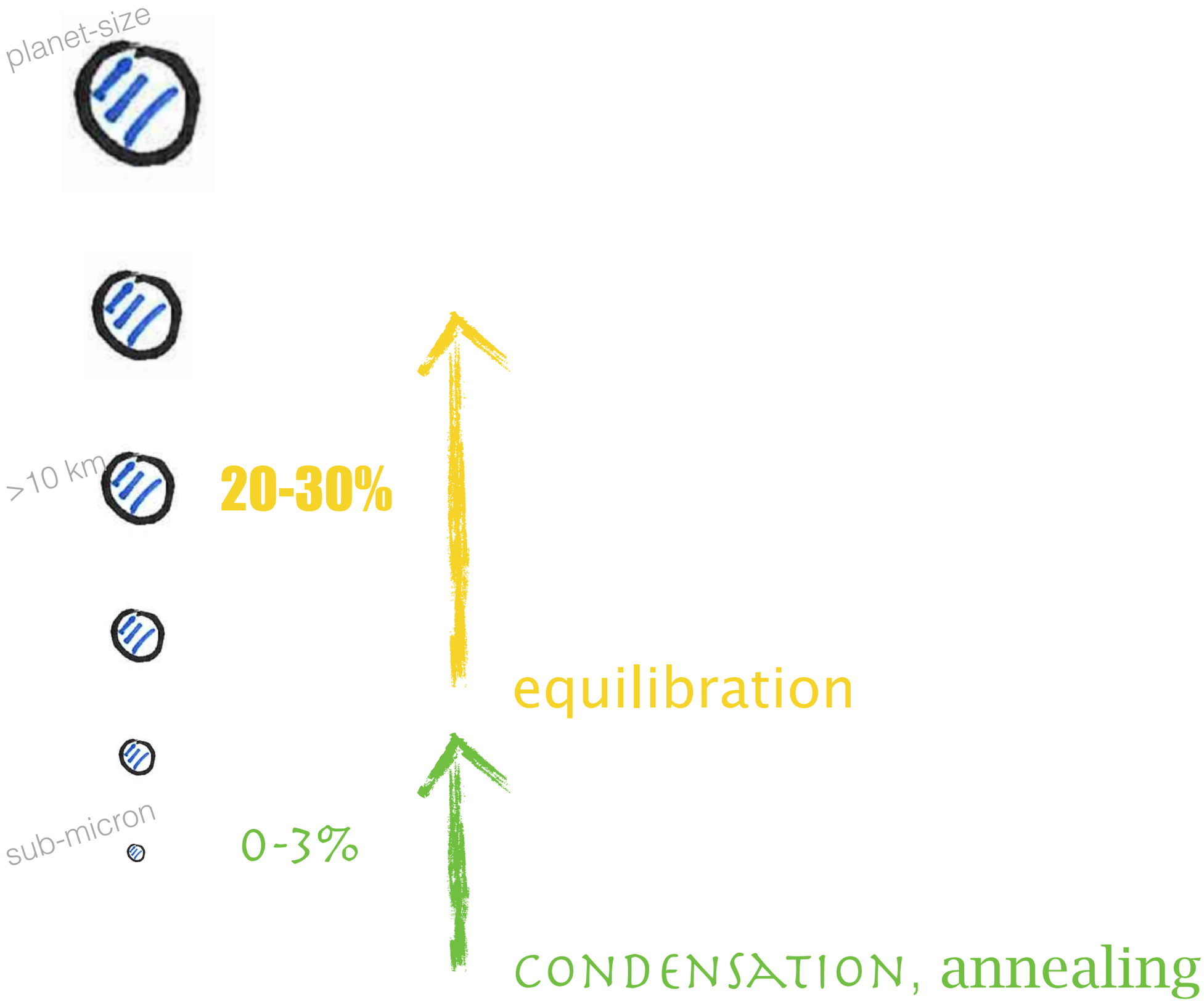
$(Mg,Fe)_2SiO_4$

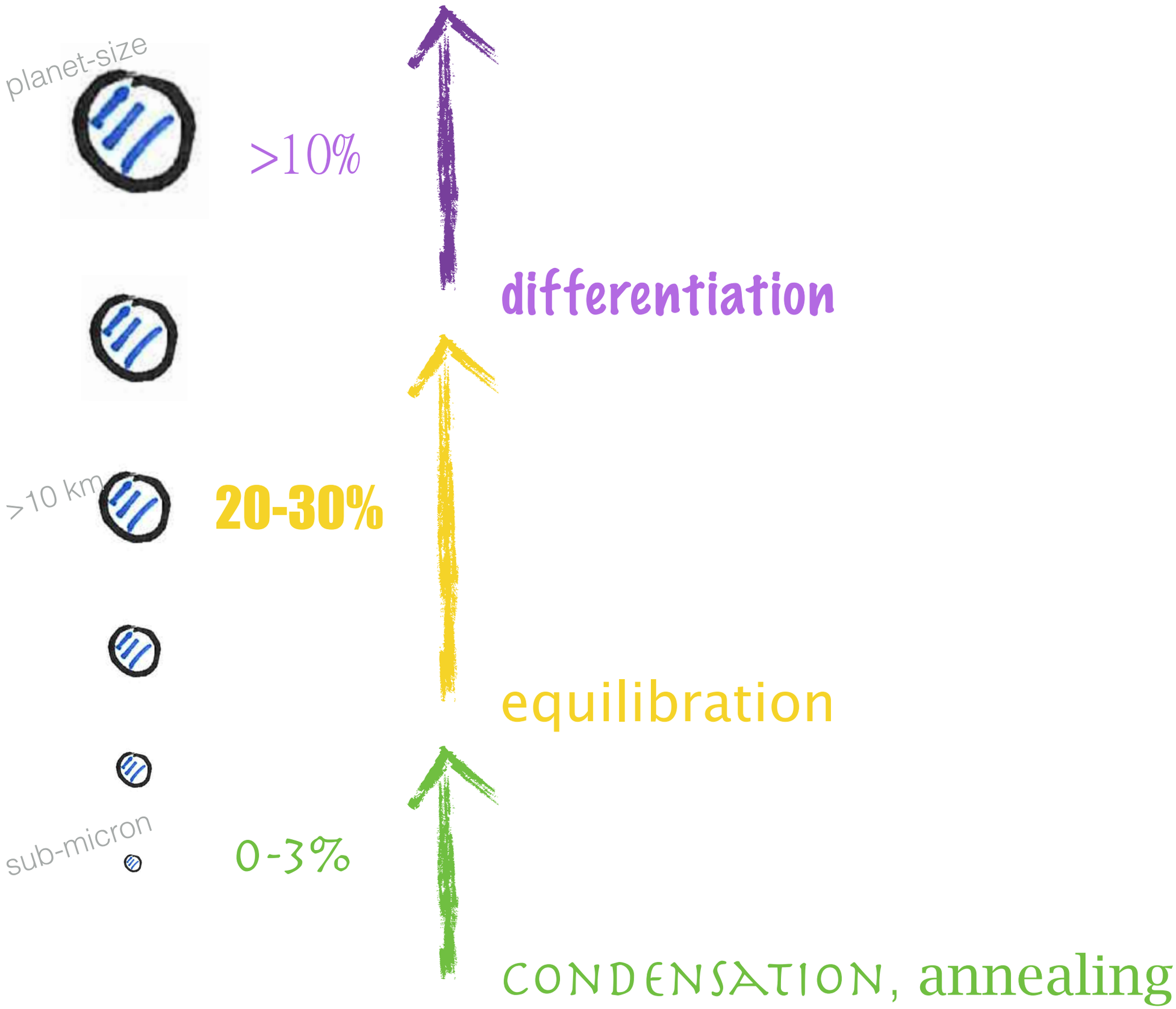
Forsterite

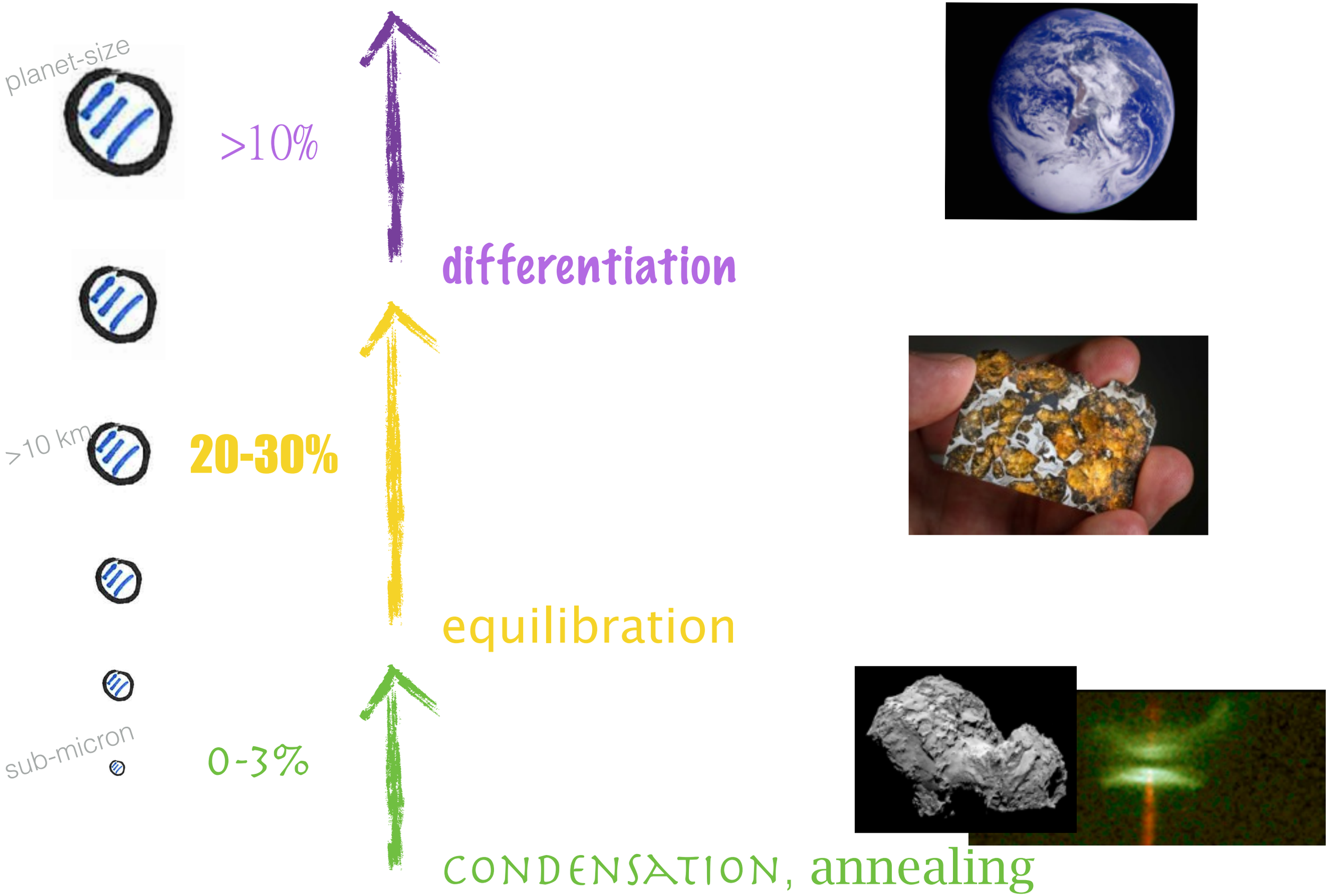
Mg_2SiO_4 → Fayalite Fe_2SiO_4


planet-size
>10 km
sub-micron


planet-size
>10 km
sub-micron
0-3%
CONDENSATION, annealing


planet-size
>10 km
20-30%
equilibration
sub-micron
0-3%
CONDENSATION, annealing


planet-size
>10%
differentiation
>10 km
20-30%
equilibration
sub-micron
0-3%
CONDENSATION, annealing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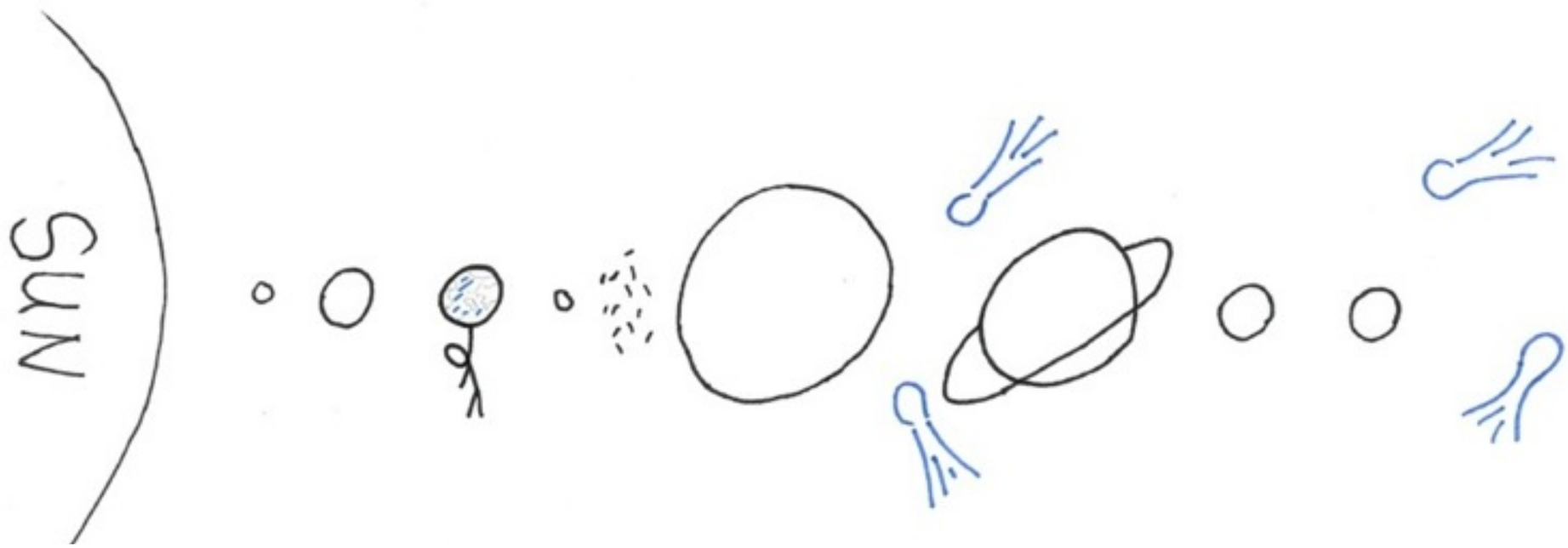
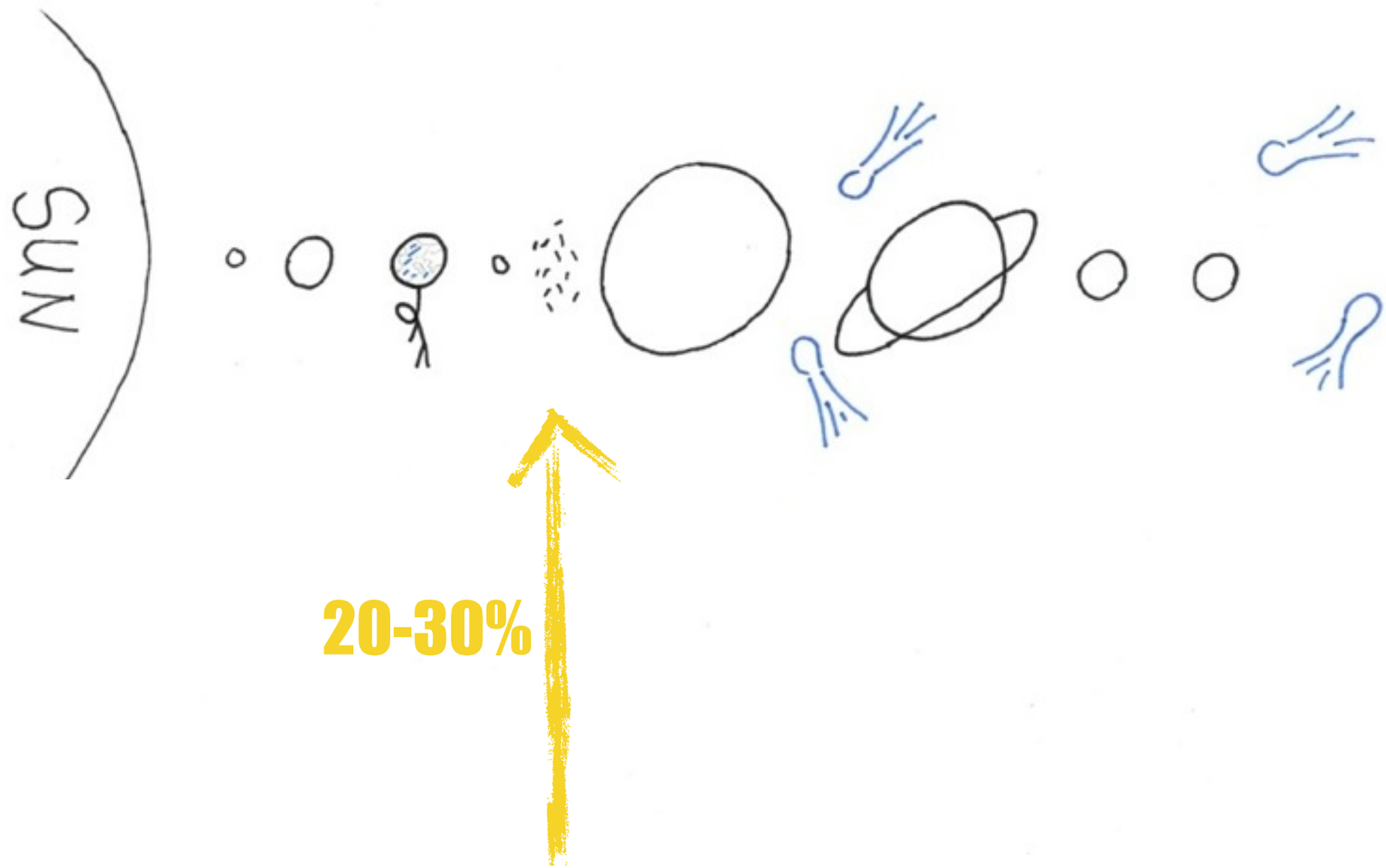
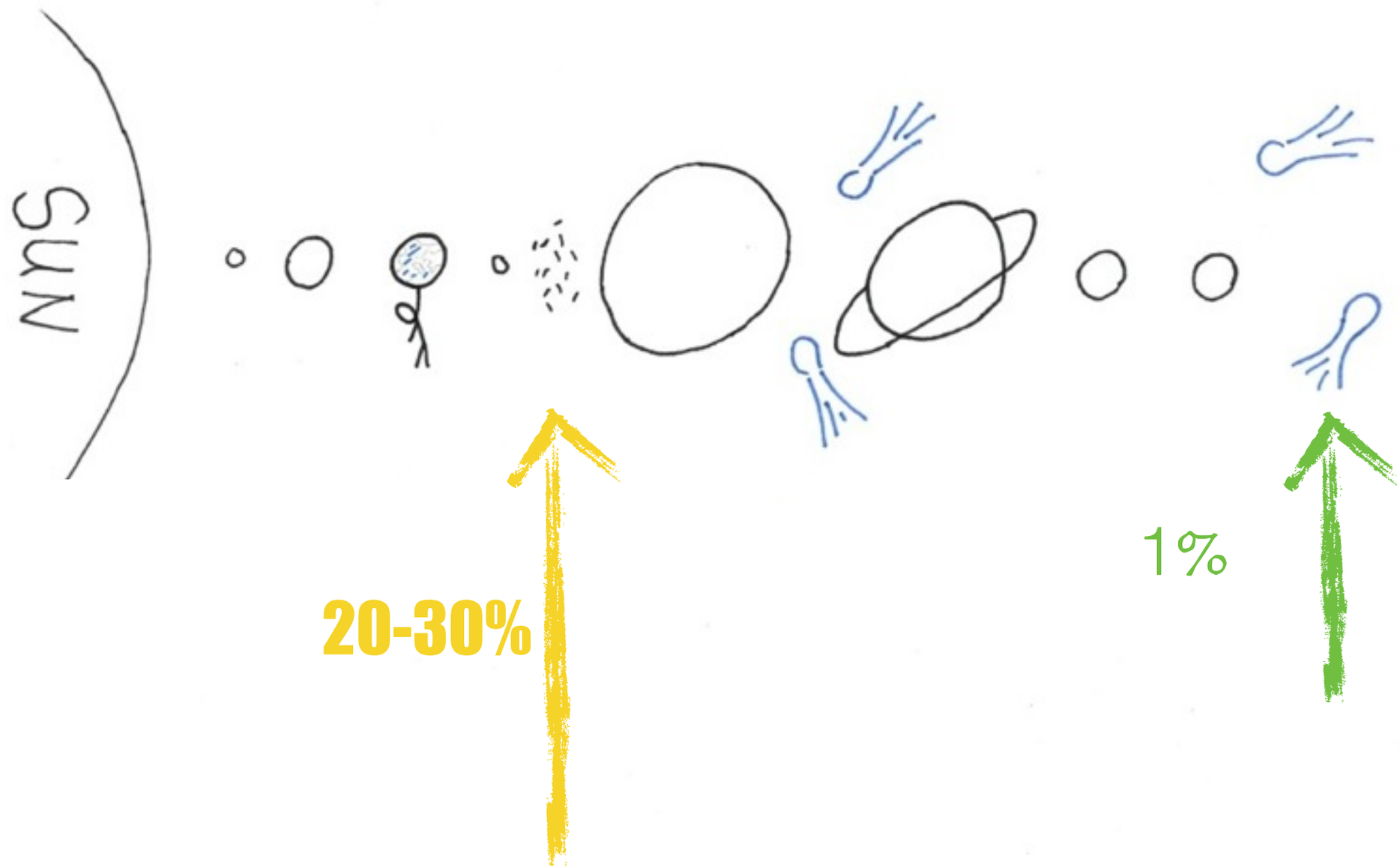


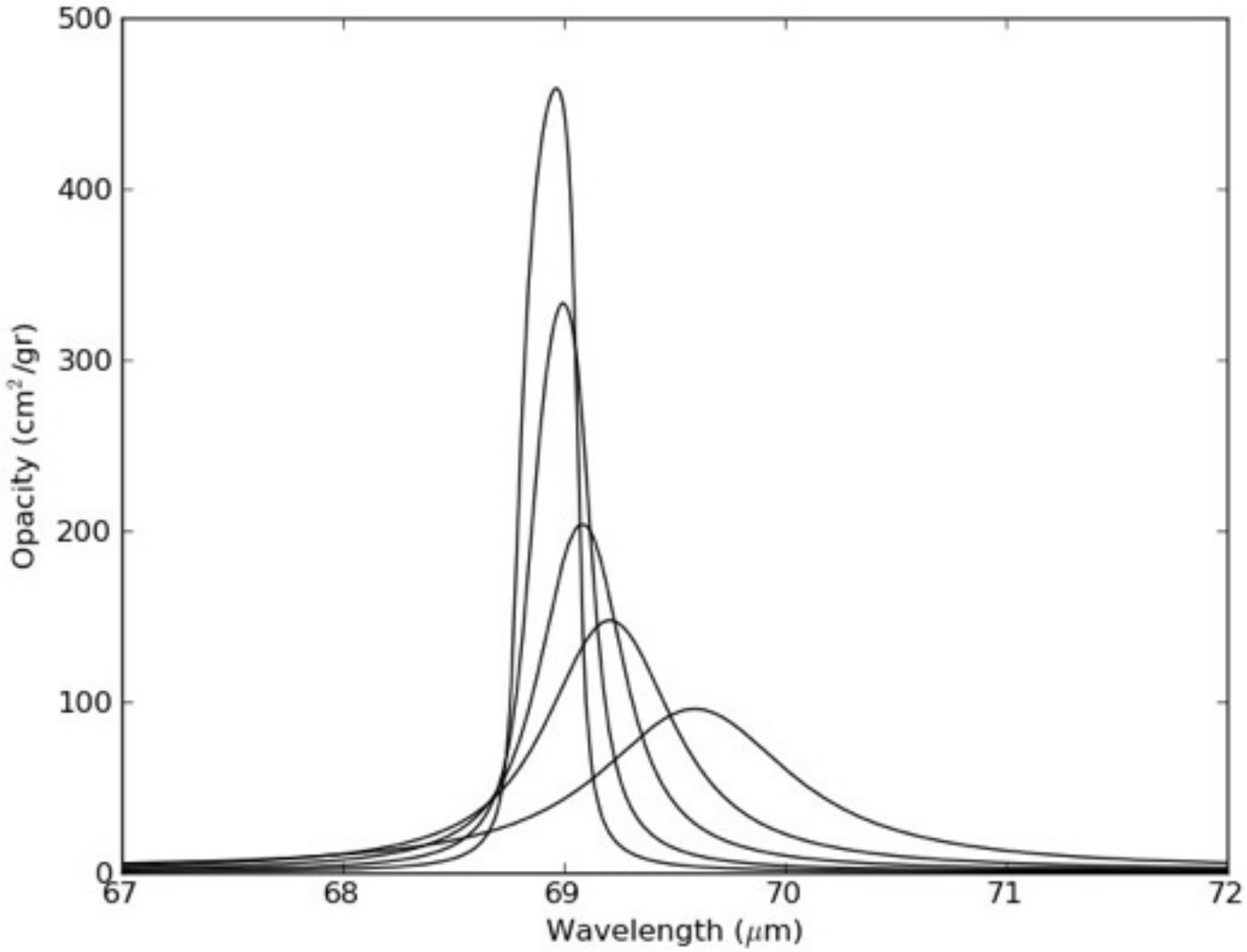
Nakamura+11, Olofsson+12, Zolensky+06,08, ++



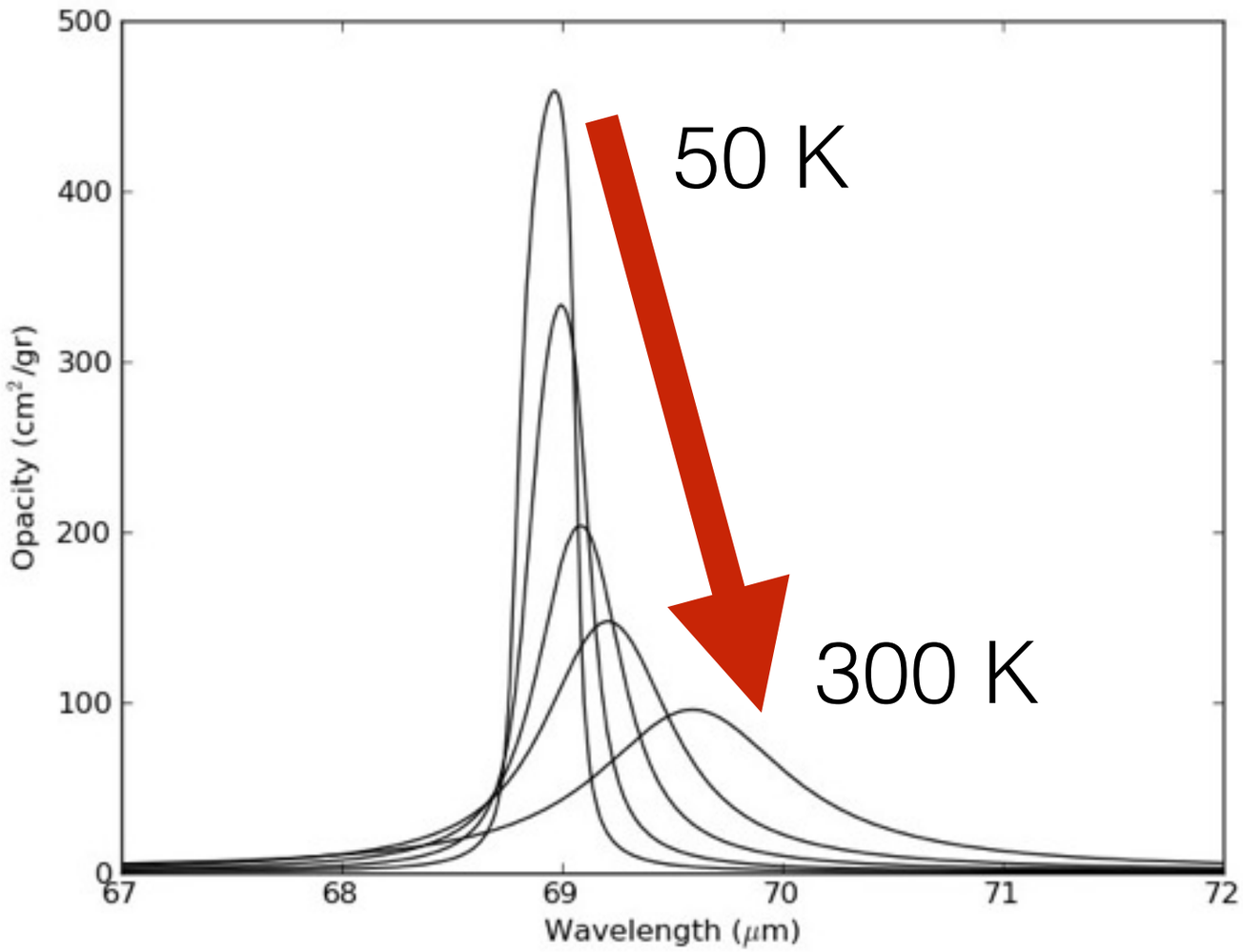
Nakamura+11, Olofsson+12, Zolensky+06,08, ++



Nakamura+11, Olofsson+12, Zolensky+06,08, ++



Koike et al 2003, Suto et al 2006, de Vries et al 2012



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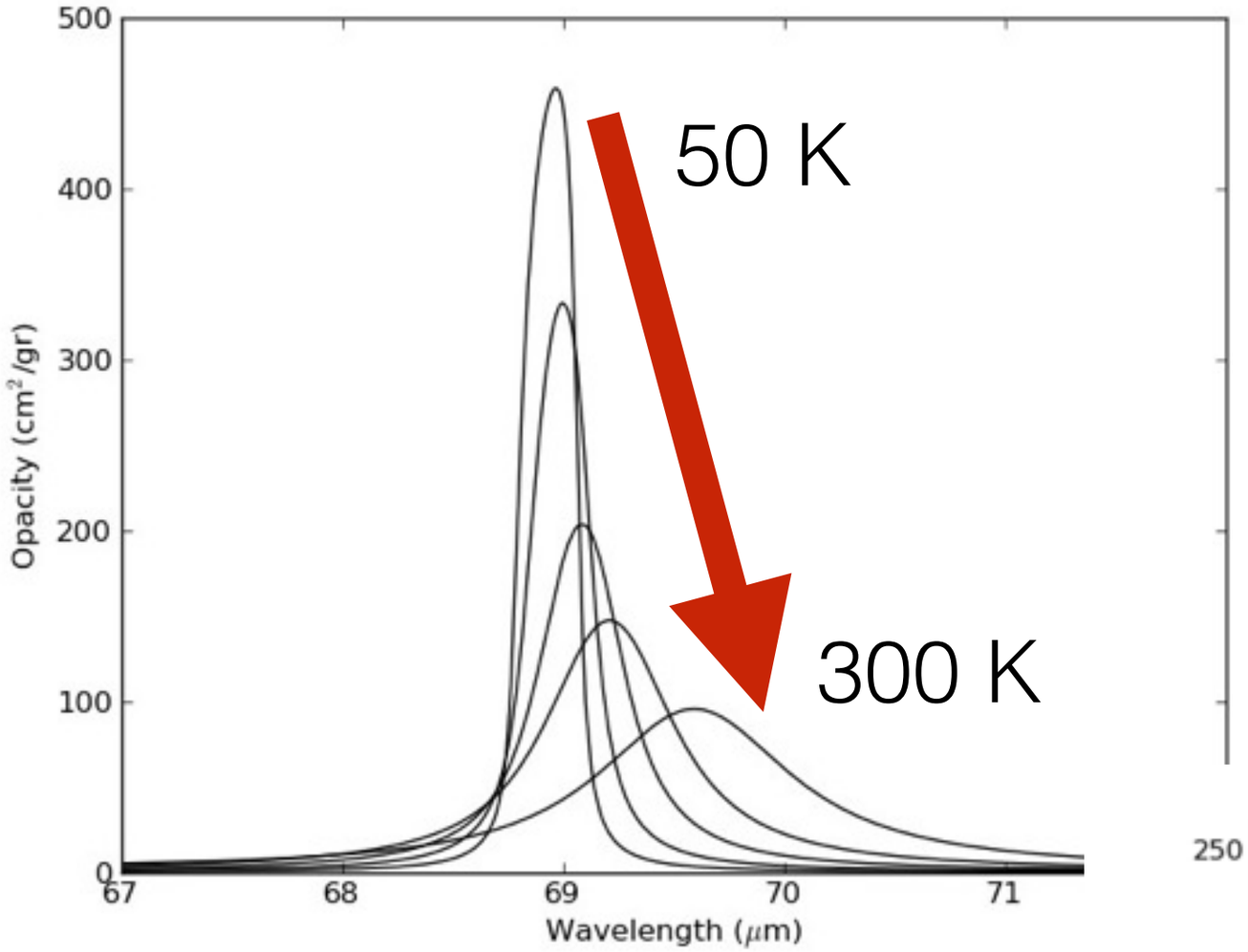

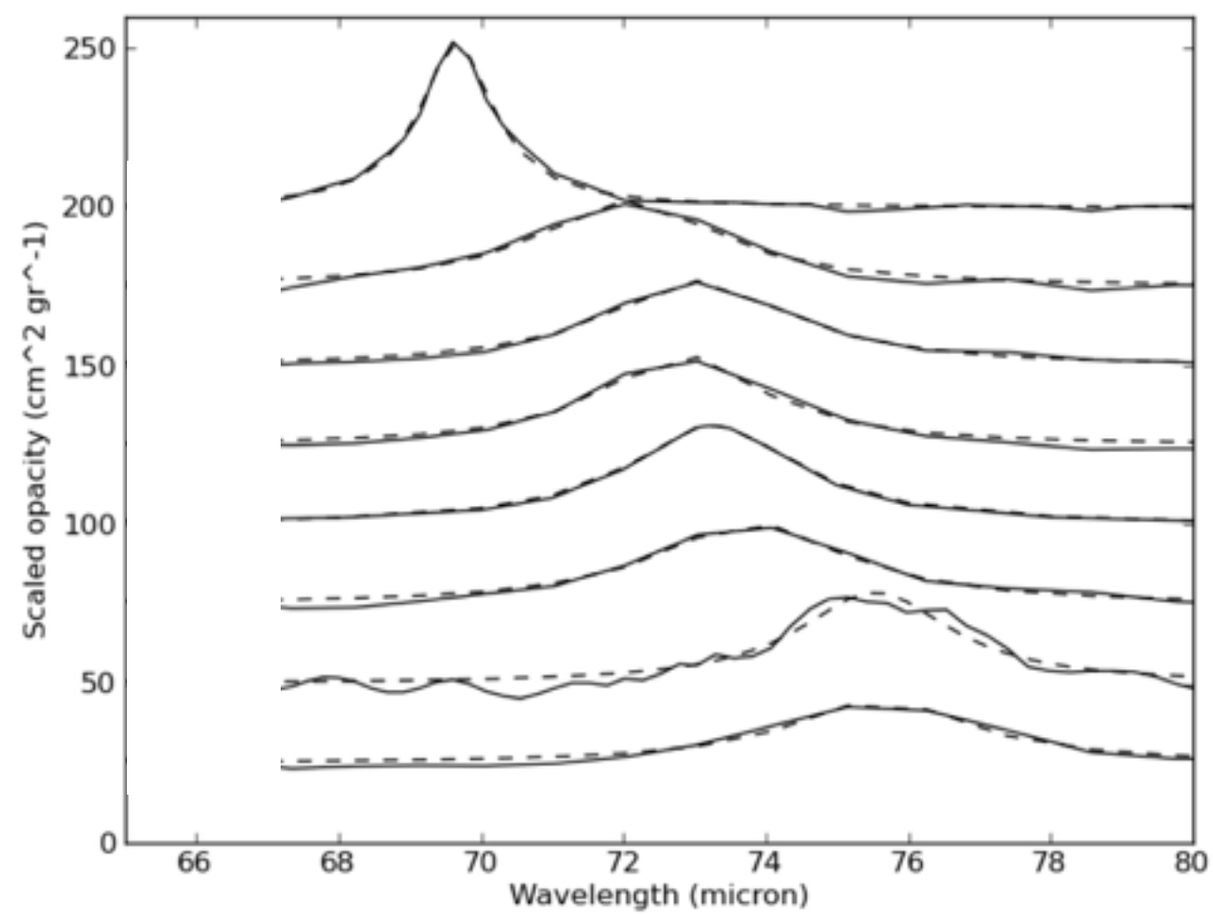

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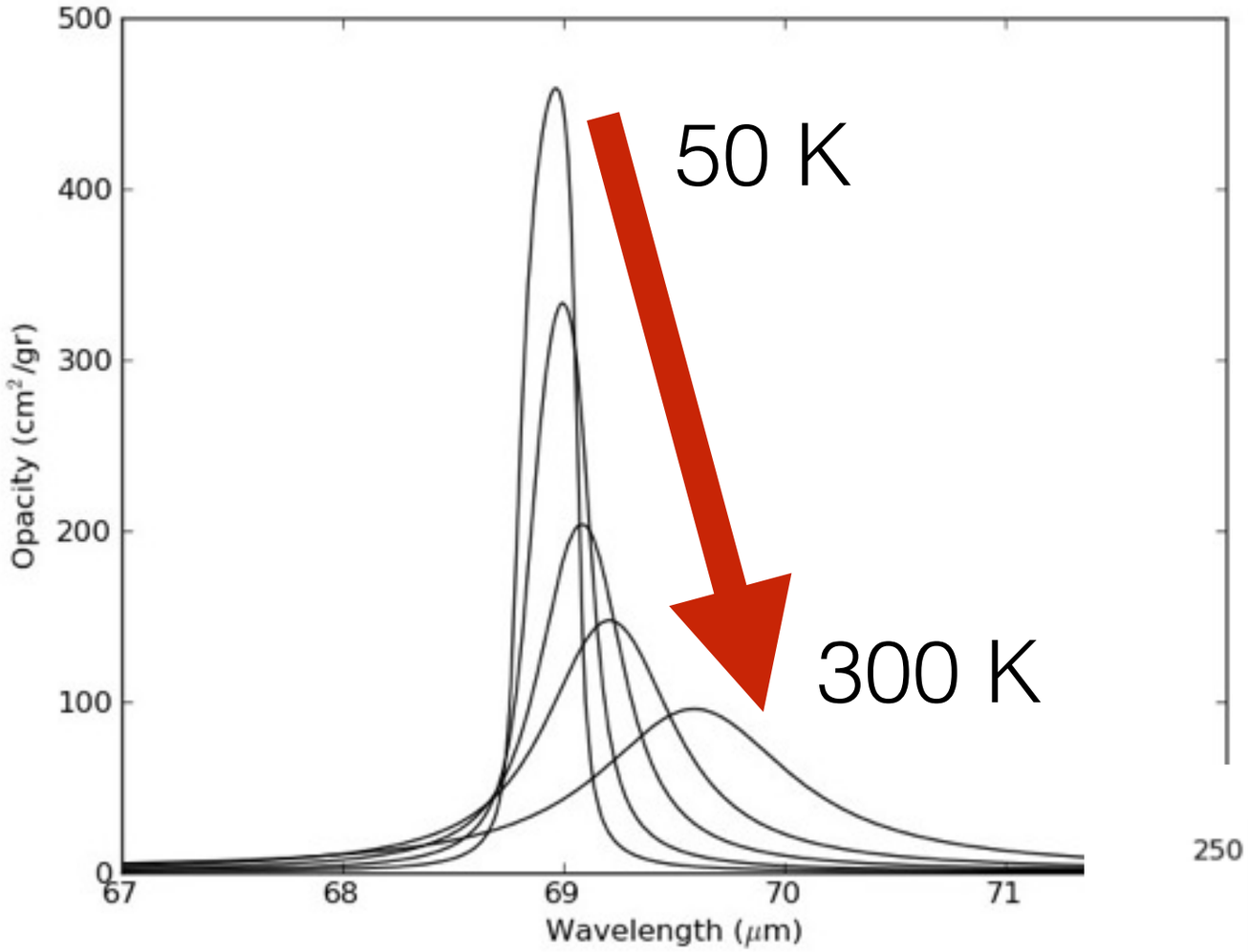

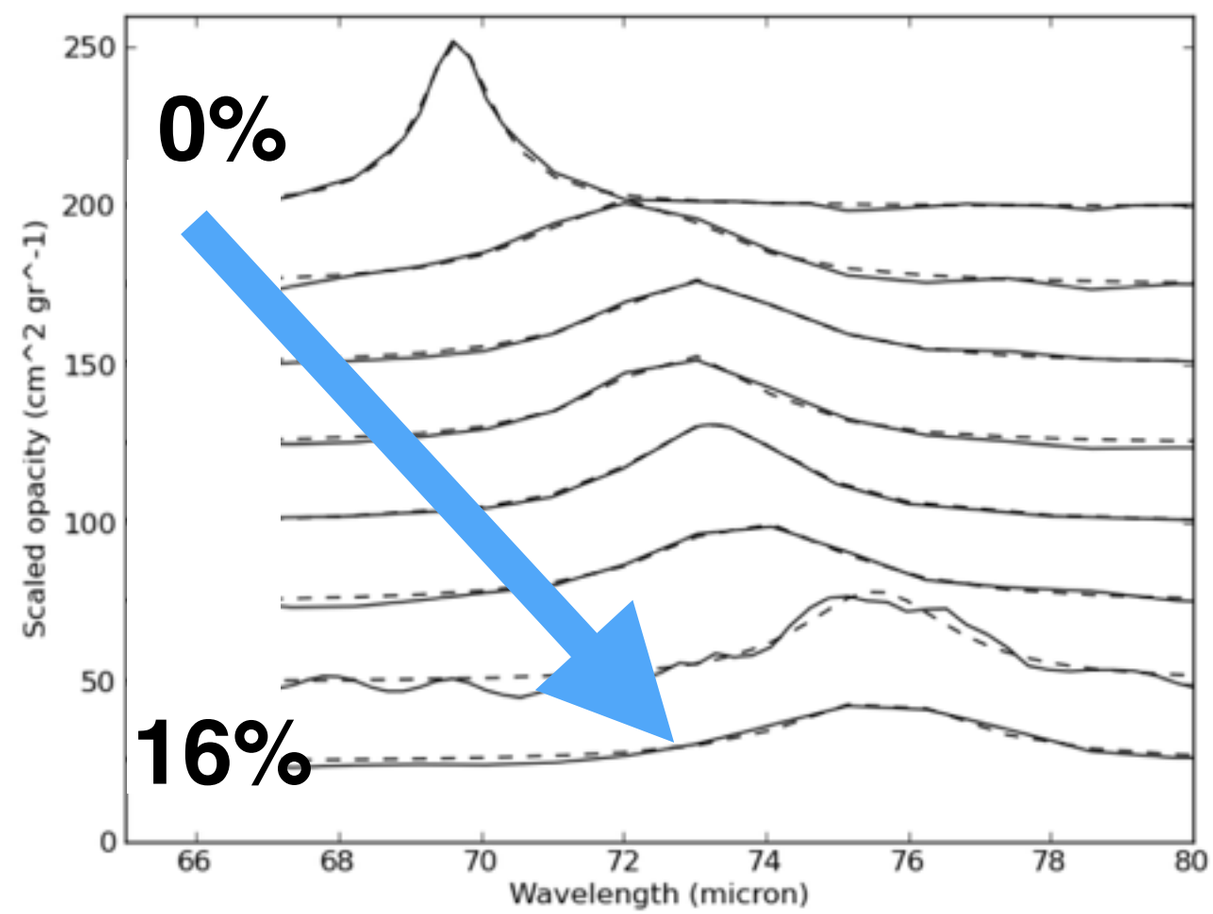

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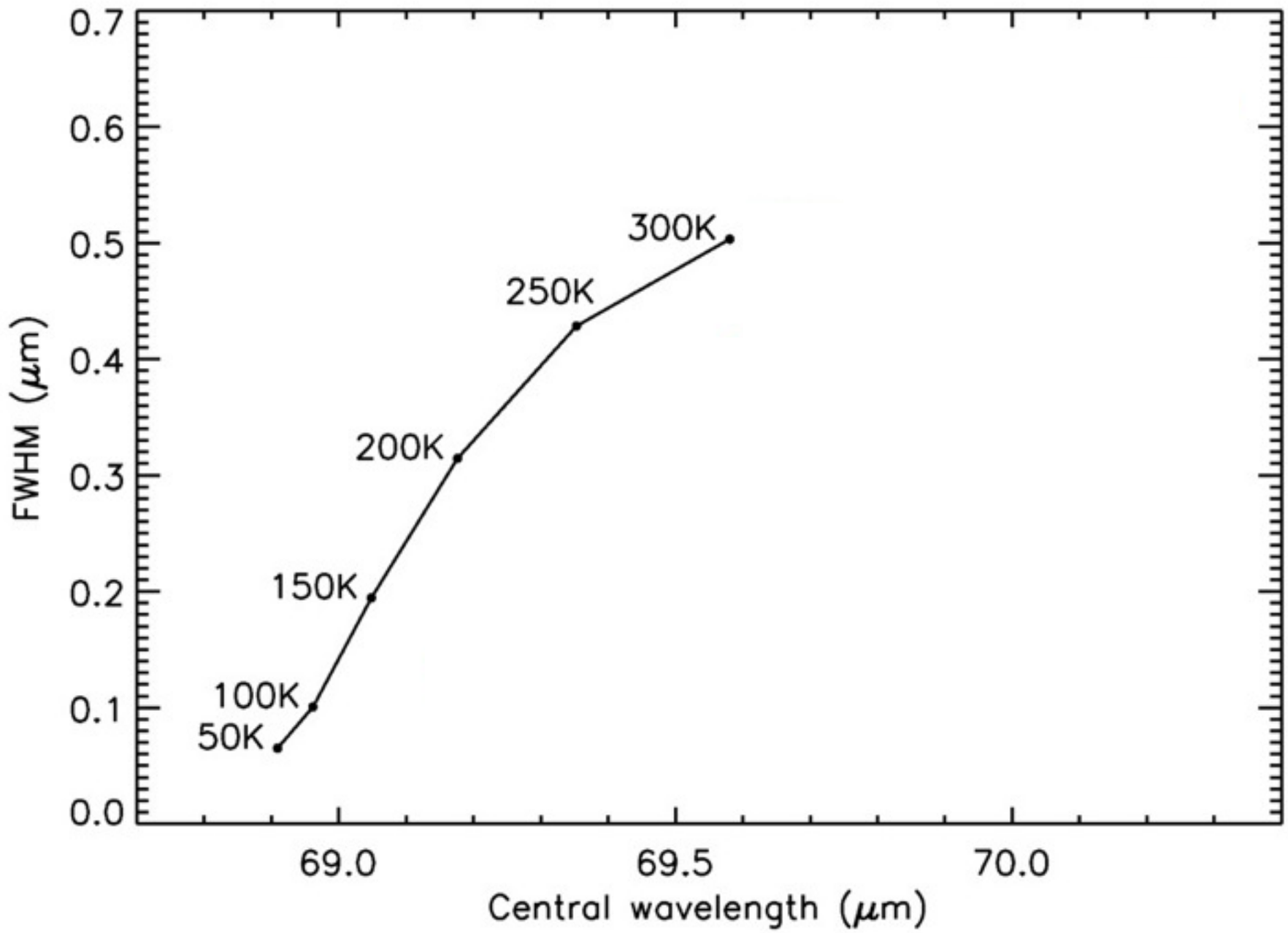

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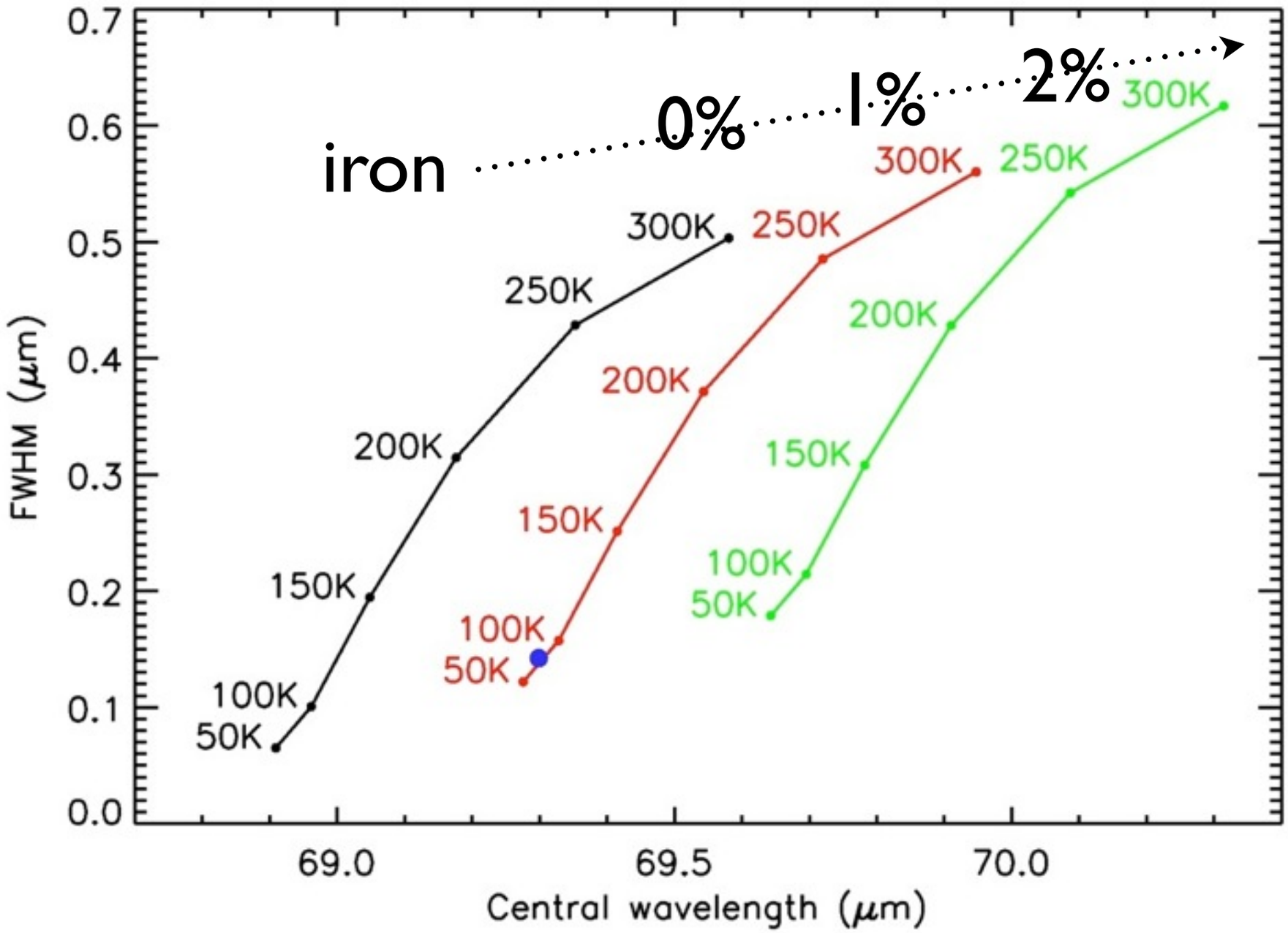

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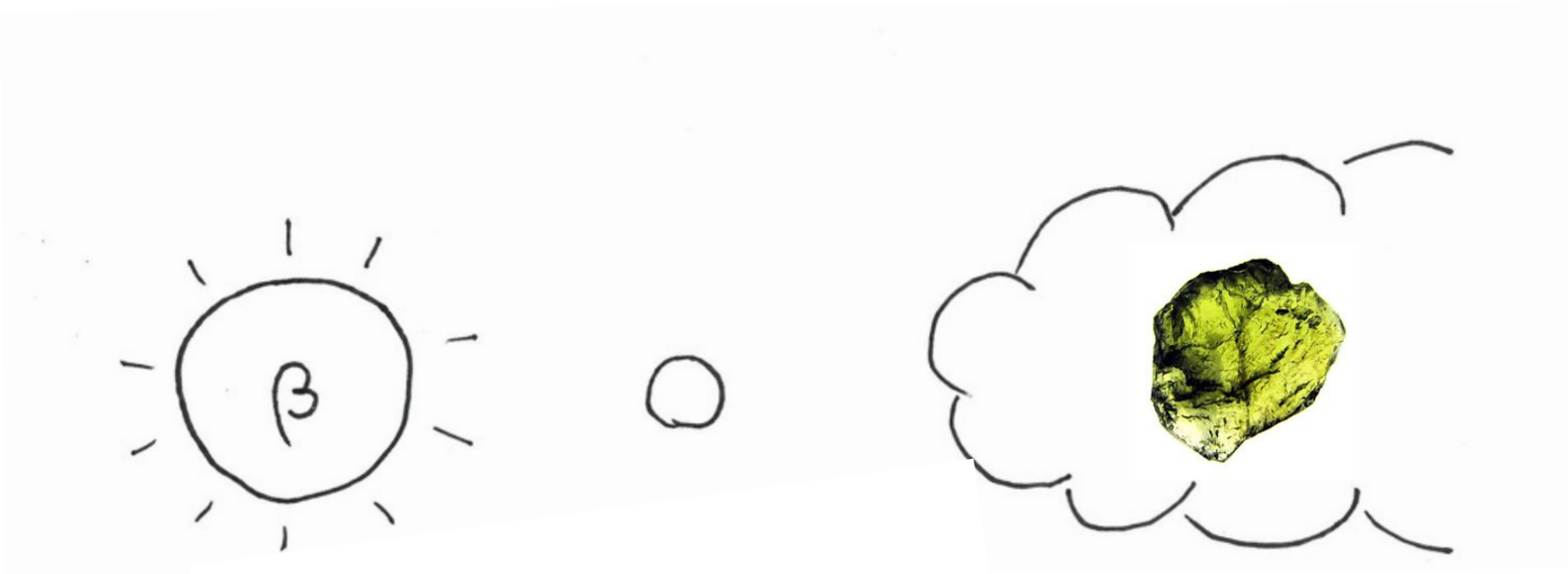
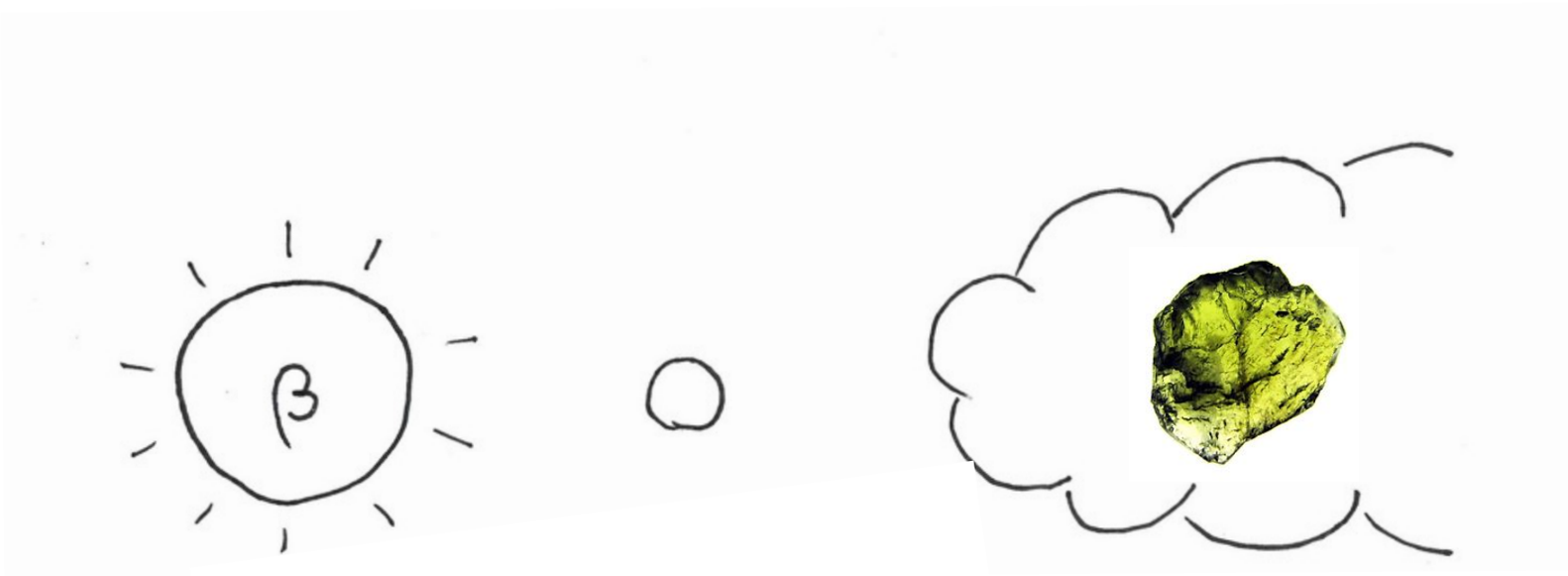

β



Crystalline olivine:

iron composition	1.0 ±0.1 %
abundance	3.6 ± 1.0 %
Temperature	85 ± 6 K
planetesimals	<10-km

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All diagrams and the error analysis are in the paper!

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Thank you

Questions?

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