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All Planetesimals are born equal - Why the size distribution of Asteroids and Kuiper Belt objects is so similar.

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The Idea is that by assuming the paradigm of Planetesimal formation via gravitational fragmentation of locally concentrated dust, in either zonal flows or vortices - for which we have a parameterized model - we seek answers to the following questions: 1. Can we trace back the origin of Asteroid Material, i.e. the place in the disk it has formed, before drifting in and getting transformed to Planetesimals? Can we relate this to its composition (Ice, Water, Volatiles, Refractory, etc.)? 2. What is the Planetesimal to Pebble ratio in the young Asteroid belt? I.e., how much of the local dust population is not yet in planetesimals? 3. Can we determine the parameter range for our Planetesimal Formation model, based on the Asteroid belt? I.e. can we exclude certain parameters for disk and dust evolution in the Solar Nebula? In this talk I will present our latest understanding of the initial mass function of planetesimals based on numerical experiments as well as analytic derivations. I will also present our new planetesimal synthesis model that combines a novel parameterization of planetesimal formation to our disk and dust evolution code.

[1] Raettig, N., Klahr, H., Lyra, W. (2015) ApJ 804, 35.
[2] Dittrich, K., Klahr, H., Johansen, A. (2013) ApJ 763, 117.

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