



Contribution ID: 66

Type: Talk

## Weak singularities in large-scale structure: identification and workaround

*Monday, 2 September 2019 15:50 (20 minutes)*

The large-scale structure of the universe is mostly the consequence of the gravitational clustering of cold dark matter (CDM). Eventually the CDM trajectories begin to intersect ("shell-crossing"), which marks the starting point of elaborate computations in the phase-space. I show that, due to the collisionless nature of CDM, phase-space trajectories exhibit weakly singular behaviour such as local non-differentiability of the particle acceleration. Conventional N-body simulations should be able to handle these intrinsic features of perfectly cold CDM. Alternatively, singular features may be regulated by adding a finite temperature, or by employing semiclassical descriptions for the large-scale structure which I will briefly discuss.

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**Session Classification:** Parallel Sessions: Large Scale Structure (C.A.R.L., H09)

**Track Classification:** Large Scale Structure