

## P131a Understanding the properties of filaments observed in the interstellar medium

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The highly filamentary structure of the interstellar medium (ISM) is impressively revealed by the unprecedented quality and sky coverage of *Herschel* and *Planck* images tracing the Galactic dust emission in both total and polarized intensities. These observations provide unprecedented data allowing us to describe in detail the properties of the filamentary structures observed in both quiescent clouds and in star forming regions, where the densest filaments appear to be the main sites of star formation.

The omnipresence of filaments in observations as well as in numerical simulations suggests that the formation of filamentary structures is a natural product of the interplay between ISM turbulence, gravity, and magnetic fields. The detailed description of their observed properties is important to improve our understanding of their formation and evolution process, providing required quantities to compare with theoretical models, putting strong constraints on the physics at play in the magnetized turbulent interstellar medium, as well as the initial conditions of star formation.

I will present the properties of the filamentary structures derived from *Herschel*, *Planck*, and molecular line observations, and I will discuss the observational constraints on the formation and evolution of interstellar filaments.