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Our chemical origins: from prestellar cores to planets

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Since the discovery of the first exoplanet more than 5000 exoplanets have been detected. This indicates that planet formation is a robust mechanism and nearly every star in our Galaxy hosts a system of planets. However, little is known about the chemical processes which were at work during the star and planet formation process, and which concurred to determine the chemical composition of the Solar System and of an habitable planet.

The Solar System is born from a dense core in a molecular cloud which underwent gravitational collapse giving rise to the Sun, and a disk of gas and dust, the protosolar nebula, where planets formed due to dust grains growth and assemble. The chemical composition of planets depends on the processes occurring along the star and planet formation process, from the prestellar core stage, when complex organic molecules form on the icy mantles of dust grains, to the formation of planets in the disk and the delivery of organic material from comets and meteorites. Investigating the physical and chemical processes occurring along the star and planet formation process is a fascinating journey to reconstruct our chemical origins.

I will review the observational efforts carried out to chemically characterise young Solar-System analogs, from the prestellar stage to planet-forming disks. I will show the efforts to understand the formation routes of molecules through the synergy with experts of theoretical and laboratory chemistry. I will stress the importance of future radio observations to investigate the chemistry in the planet formation region.

sessioni congresso

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