



Baylor University and CASPER present:

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Independent Educational Contractor, Pearson

Magnetohydrodynamic Processes in the Formation of the Solar System

Abstract: Magnetic fields play a central role in the dynamics of accretion disks. Our understanding of a particular type of such structures, protoplanetary disks, has revealed a complex set of magnetohydrodynamic processes that are involved in the formation of planet precursors. One of these processes is turbulence, which can be generated and sustained by a combination of differential rotation of the disk flow and coupling of a weak magnetic field to the disk gas. One can describe how solid bodies of different sizes move in this environment, based on results from numerical simulations and semi-analytical calculations. In particular, one can discuss measurements of solid particle relative velocities, spatial concentrations and diffusivities. One specific application of this problem concerns the formation of dusty envelopes around the meteoritic components known as chondrules. Lastly, one can outline future improvements of these models that take into account disk chemistry and dust grain charging.

Dr. Carballido obtained his PhD in astronomy from the University of Cambridge, in the UK (2006). Afterwards, he carried out postdoctoral work at the Jet Propulsion Laboratory in Pasadena, CA (JPL; 2006-2009) and at the National Autonomous University of Mexico in Mexico City (UNAM; 2009-2011).

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Baylor Sciences Building (BSB) Room C. 206

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