Séminaire organisé par

AIM &Le service d'Astrophysique
CEA/DSM/Irfu

THE INTERNAL ROTATION PATTERN OF THE SUN

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Helioseismology has become precision tool that has allowed the inner rotation pattern of the Sun to be elucidated. While the radiative zone is well modeled by solid body rotation, the turbulent convective zone shows a regular pattern of differential rotation. Surfaces of constant angular velocity are, roughly speaking, poleward-opening cones, coaxial with the rotation axis. In this talk, I will show how a few simple physical ideas and mathematical techniques are able to reproduce these observations with striking fidelity. The narrow boundary between the convective zone and the radiative zone is a region of rapidly changing rotation in which the conical pattern breaks down, the so-called ``tachocline''. I will argue that the tachocline also fits naturally within the general framework, while presenting interesting puzzles that have yet to be understood. If correct, the principles of the theory should be applicable to a wide class of stars, including those with fully convective envelopes, and possibly to the internal rotational dynamics of convective planets.

29 Septembre 2011

11h00 Salle Galilée bât 713 C - Orme des Merisiers

Un café sera servi 15 mn avant le séminaire

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