



ARNOLD SOMMERFELD  
CENTER FOR THEORETICAL PHYSICS



## Sommerfeld Theory Colloquium

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### Imaging Astrophysical Turbulent Convection and Dynamo Action in the Sun

The Sun is a most remarkable object: it is filled with vibrantly evolving magnetic fields, well-mixed hierarchically-arranged turbulent convective cells, and also poorly-mixed sunspots that persist with impunity. Solar variability has direct consequences for the earth and space weather, an important reason to develop an appreciation for the physics of the solar cycle (dynamo).

Direct observation of the solar subsurface is impossible due to the high degree of optical scattering by the partially ionized plasma that inhabits the near-surface layers of the Sun. The deepest part of the Sun visible to us, known as the photosphere (also the solar surface), appears as a roiling, turbulent, radiative, magnetized, convecting plasma. At first glance, it would seem therefore that subtle questions relating to the subsurface constitution of the Sun seem completely unanswerable and the interior properties unknowable. However, analogous to geoseismology, a great deal can be gleaned about the internal structure and dynamics of the Sun by carefully observing and analyzing the surface wavefield. This has been made possible over the last few decades through the development and application of techniques of helioseismology.

In this talk I will outline some of the major results in this area over the last two decades and discuss some recent developments pertaining to the properties of turbulence in the deep-convection zone of the Sun.

Wednesday, 12 January 2011, 10:30h, Room 348 / 349, Theresienstr. 37 / III

Prof. V. Mukhanov