

Physics Colloquium

Monday March 6th, 2005 4:15 PM
428 Pupin Hall
Professor G.V. Shlyapnikov
of the Van der Waals Zeeman Institute,
University of Amsterdam

“Strongly interacting Fermi gases in the molecular and unitarity regimes”

I will give an overview of recent studies of strongly interacting (two-component) Fermi gases and first focus on the regime of weakly bound dimers formed at a positive scattering length for the interspecies interaction. They represent novel composite bosons which exhibit the features of Fermi statistics at short interdimer distances. In particular, the Pauli exclusion principle for identical fermions provides a strong suppression of relaxation of these dimers to deep bound states and makes them remarkably stable, which paves a way to their Bose-Einstein condensation (BEC). I then analyze mixtures of heavy and light fermionic atoms and address the problem of superfluidity in these systems. In the unitarity limit, where the amplitude of interaction between heavy and light fermions is tending to infinity, I will show how one can map this system onto the system of long-range interacting heavy bosons and treat a superfluid transition as BEC of such bosons.



Host: Prof. Altshuler