

Novel physics with ultracold fermions

Georgy Shlyapnikov

Ultra cold Fermi gases are new interesting systems where one can discuss the formation of Cooper pairs, known from the Bardeen-Cooper-Schrieffer theory of superconductivity. The composite bosons will be weakly bound molecules of fermions. One can go to the regime of strong interaction where a Bose-Einstein condensation of these bosons occurs. At short distances they "remember" that they consist of fermions and manifest fermion statistics. This provides them with a remarkable collisional stability. After introducing these concepts, I will forecast what one can expect in mixtures of different Fermi gases.

Georgy V. Shlyapnikov

Georgy Shlyapnikov is one of the leading theoreticians in the field of quantum matter at ultra low temperatures. His main contributions are in the modern theory of quantum gases, a domain of physics that has expanded dramatically over the past decade in the wake of the observation of Bose-Einstein condensation in ultracold gases. He is presently director of the Laboratoire de Physique Theorique et Modelles Statistique in Orsay and professor of Physics at the University of Amsterdam. In 1999 he obtained a Humboldt fellowship and in 2000 he was co-receiver of the Kurchatov prize.