



## Quantum Optics Seminar

**Title:** Squeezing and entanglement in the ground state spin subsystems of macroscopic atomic ensembles

**Speaker:** Dr. D. V. Kupriyanov, State Polytechnical University, St. Petersburg, Russia

**Time:** Friday, May 2, 2003 at 13:00

**Place:** 520-732

**Abstract:**

The cooperative Raman-type scattering of correlated photon pairs on the spin-oriented atoms can be a mechanism to create the macroscopic quantum states in the ground state spin subsystems of atomic ensembles. It seems accessible for existing experimental setups based on magneto-optic traps confining the alkali atoms. Such an "optical pumping" method can be applied for macroscopic but not optically dense medium with the number of atoms up to  $10^9$ . The observation of the quasi-spin squeezing or entanglement can be done with Mach-Zehnder type interferometer. As far as the optical interaction is weak and has a short duration, there will be no light induced acceleration effects in the proposed schemes of squeezing and entanglement.

Eugene Polzik