**Atomic and Laser Physics Seminar**

**Monday, 29 October**

**11.30**

**Audrey Wood Seminar Room**

# Dr Dimitrii Kozlov

General Physics Institute,

Russian Academy of Science

# *Molecular spectroscopy and gas probing using laser-induced gratings*

Laser induced gratings provide a sensitive means of detecting gas phase molecules and studying their relaxation dynamics. The principles and experimental implementation of the technique will be explained.  The purpose of this high-sensitivity spectroscopic investigation was to derive characteristics of extremely weak single-photon absorption transitions. Experimental studies of highly-excited vibrational states of methane molecules, and of collisional deactivation of laser-excited singlet oxygen molecules in heated hydrogen-oxygen mixtures will be described. Heated hydrogen-oxygen mixtures were probed using the technique with the aim of measuring the singlet oxygen deactivation rate by hydrogen vs gas temperature. Additionally, the concentration of water molecules, being formed while the temperature is increasing could also be measured. These experiments illustrate the kind of quantitative information that can be obtained by such studies.