

## PhD position in experimental quantum optics with trapped ions

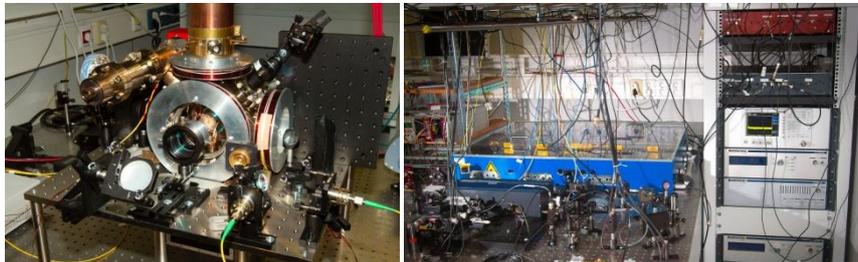


Palacký University, Olomouc  
in collaboration with  
Institute of Scientific Instruments, Brno  
Czech Republic

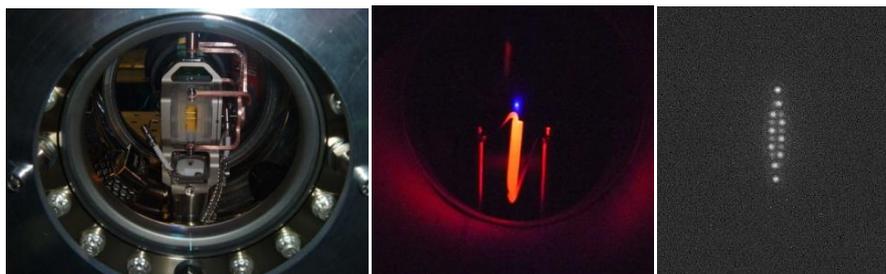


A **4 year PhD position** is available in the **Trapped ions group in the Department of Optics and Optoelectronics at the Palacký University in Olomouc** in collaboration with Institute for Scientific Instruments in Brno. The position is part of the **Centre of excellence for classical and quantum interactions in nano-world (GACR)**.

Studies of single atoms and photons together with their mutual interactions represent essential ingredients for better understanding of the fuzzy borderline between applicability of classical and quantum descriptions of physical reality. Controlled observations of atom-light interactions at single atom-photon level constantly raise number of intriguing fundamental questions and in turn, their peculiar properties stimulate broad range of emerging application including scalable quantum computing and communication, quantum metrology and sensing, or ever increasingly important field of simulation of complex quantum systems.



Research in our group focuses on **optomechanical interactions with most elementary quantum oscillators**, single trapped and laser-cooled atoms, both in linear and nonlinear regime and on related dynamics. This research is strongly connected with realization and studies of **generation and measurement of nonclassical states and processes** on single and few-particle level, **precise frequency metrology and quantum information processing**. The PhD candidate will gain substantial theoretical background in all these research directions and develop experimental skills related to complex field of trapping, cooling and precise manipulation of charged atoms, which include techniques necessary for producing ultra-high-vacuum, laser frequency stabilization, computer control of the whole experimental apparatus and number of additional optics and electronics skills.



The PhD candidate is expected to show a strong motivation and commitment to research, in particular by substantial contribution to **realization of experiments with already existing ion-trapping apparatus**, and by contribution to **realization of the new vacuum chamber utilizing segmented Paul trap**, which will enable studies of nonlinear quantum dynamics of one or two atoms in cubic and quartic potentials. The candidate will also help with development of theoretical description of observed quantum effects. The offered position will naturally motivate and include development of excellent writing and oral scientific communication skills by participation in several international scientific conferences and by publishing achieved results in scientific journals. In addition, the 4 years position will include a few months of research stay at one of excellent partner research institutions abroad. The research position will be financially supported by Centre of excellence for classical and quantum interactions (GACR) and the salary will be comparable to equivalent positions in commercial sphere.

For more information please email Dr. Lukas Slodicka ([slodicka@optics.upol.cz](mailto:slodicka@optics.upol.cz)),  
or Prof. Radim Filip ([filip@optics.upol.cz](mailto:filip@optics.upol.cz)).