日時：10 月 13 日（木）14:00－15:00
場所：大阪大学豊中キャンパス
　　基礎工学部　Ｄ棟共用セミナー室（Ｄ棟４階Ｄ４０４－４０８号室）
　　http://www.es.osaka-u.ac.jp/access/index.html
講師：Dr. Chin-wen Chou
　　National Institute of Standards and Technology (NIST)

Dr. Chou は現在 NIST の Wineland のグループで、量子情報の手法を精密計測に適用した量子論理分光法によるアルミニウムイオン原子時計の研究をしておられます。中でも超高精度な原子時計によって、実験室内で相対論的効果が観測できるという報告で、広く注目されています。興味のある方はご参加ください。

Title: Al+ Optical Clocks for Fundamental Physics and Geodesy

Abstract:
Laser-cooled trapped atoms have long been recognized as potentially very accurate frequency standards for clocks. Ultimate accuracies of 10^-18 to 10^-19 appear possible, limited by the time-dilation of trapped ions that move at laser-cooled velocities. The Al+ ion is an attractive candidate for high accuracy, owing to its narrow electronic transition in the optical regime and low sensitivity to ambient field perturbations. Precision spectroscopy on Al+ is enabled by quantum information techniques. With Al+ “quantum-logic” clocks, the current accuracy of 8.6×10^-18 has enabled a geo-potential-difference measurement that detected a height change of 37±17cm due to the gravitational red-shift. We have also observed quantum coherence between two Al+ ions with a record Q-factor of 3.4×10^16, and compared the Al+ resonance frequency to that of a single Hg+ ion to place limits on the temporal variation of the fine-structure constant. This work is done in collaboration with D.B. Hume, M.J. Thorpe, D.J. Wineland, and T. Rosenband.

主催：科研費・新学術領域研究「原子が切り拓く極限量子の世界」
共催：科研費・新学術領域研究「量子サイバネティクス」

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