

## 原子・分子・光（AMO）関係および物性関係の研究者の皆様

パキスタンを代表する Quaid-i-Azam 大学より Farhan Saif 教授が1カ月半の予定で本学に滞在中です。先生は1999年から度々本学を訪れておりますが、今回は専門テーマである原子と光の相互作用の話題から「ナノ・オプト・メカニクス」に関する先生の最近の研究についてお話ししていただくことになりました。

研究室の学生さんもお誘い合わせの上、奮ってご参加ください。

日時：8月6日（月）16:30～18:00 東 6-803

題名： Quantum Coherence and Control in Nano Opto-Mechanics

講演者： Professor Farhan Saif

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概要： Quantum mechanics is profoundly successful theory at smallest scale, making the world-around comprehensible with exquisite precision. However, taking this to macroscopic scale is a long-sought target that brings experimental challenges. Optomechanics provides a playground to study quantum mechanics in macroscopic systems keeping precision in control, thus enabling us to develop technology to newer scale that was unthinkable a few years ago. In opto-mechanics we combine mechanical and optical degrees of freedom via radiation pressure force. In the seminar I explain quantum characteristics of mechanical mode and optical mode in the opto-mechanical systems. We show that these systems possess entanglement, that leads to the engineering of single Fock state of mechanical mode by photon subtraction. As another intriguing perspective, a new generation of optical lattice experiments is in focus where quantum mechanical moving end-mirror either interacts with ultra-cold atoms through confining optical lattice or couples with another mirror through Coulomb coupling, leading to hybrid opto-mechanical systems. We show that these systems display mechanical and vibrational bistability. In addition, we explain optomechanical induced transparency, subluminal and superluminal effects in these systems.

主催：レーザー新世代研究センター

共催：理工学談話会、量子科学研究センター

問い合わせ先

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