



IBS Center for Molecular Spectroscopy and Dynamics

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## COLLOQUIUM

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- **SPEAKER**

Prof. Eunmi Chae (The University of Tokyo)

- **TITLE**

Towards ultracold molecules – cooling molecules by photon scattering

- **ABSTRACT**

Due to their complex internal structures and strong long-range interactions, diatomic molecules are promising platforms for precision measurements, quantum simulations of strongly correlated systems, qubits in quantum information, and studies of quantum chemistry. Most of these experiments require ultracold temperatures, and to fully exploit the diversity of molecular structures requires a general method of cooling. A crucial step towards achieving lower temperatures is trapping, which in itself allows for further cooling methods to be applied. One promising option is a magneto-optical trap (MOT), the workhorse tool of optical cooling and confinement for atoms. However, the additional internal structure present in molecules has made it difficult to produce a molecular MOT, mostly due to the lack of closed cycling transitions. In this talk, I will describe the challenges of MOTs for diatomic molecules and recent successes to laser-cool and apply magneto-optical force on CaF molecules.

If time allows, I also would like to briefly introduce my current experiment on an ultrastable Ti:Sapphire frequency comb locked to an optical atomic clock and future experiments with it.

- **DATE AND VENUE**

May 01, 2017 (Monday, 3:00–4:00 p.m.)  
Seminar Room 116, KU R&D Center

- **LANGUAGE**

English