



515th ASRC Seminar



Date: 13:30 ~15:00, 4 June

Location: Meeting room 103, ASRC Building

Speaker: Mr. Ran Cheng

(The University of Texas at Austin)

Title: Dynamics of antiferromagnets driven
by spin current

When a spin-polarized current flows through a ferromagnetic (FM) metal, angular momentum is transferred to the magnetization via spin transfer torques. In antiferromagnetic (AFM) materials, however, the corresponding problem is unsolved. We derive microscopically the dynamics of an AFM system driven by spin-polarized current, and find that a spin current can drive local staggered order directly without the need of inducing FM moments on top of the AFM background. Rather than producing a torque, the spin current exerts a driving force determining second order dynamics of the local staggered order. Two examples are studied: (i) A domain wall is accelerated to a terminal velocity by purely adiabatic effect and no Walker's break-down exists.

(ii) Injection of spin imbalance splits the AFM resonance frequencies and a sufficiently large spin current triggers spin-wave instability.



<Contact>

Michiyasu Mori (81-3508)

Advanced Science Research Center

