536th ASRC Seminar

Date: 13:30 ～15:00, 8 November

Location: Meeting room 302, ASRC Building

Speaker: Prof. Stewart E. Barnes
(University of Miami)

Title: Does the Nambu-Goldstone theorem imply the absence of a GMR in magnetic tunnel junctions (MTJ)?

The Nambu-Goldstone theorem assures the rotational invariance of the broken symmetry magnetisation of a ferromagnet. In practice magnets form domains to reduce the long range dipole energy and this theorem is violated.
In the absence of the magnetic broken symmetry, the Hamiltonian (or Lagrangian) predicts an isotropic conductivity. For tunnel junctions the resistance is determined by the tunnelling matrix elements without needing to explicitly specify how the dissipation occurs.
It will be suggested that, in this usual situation, the GMR is due to ``spin-motive'' forces (SMF) and not dissipative resistance.
In experiment an SMF of about to 0.2 - 0.3 V can occur and is not at all negligible to MRAM applications and the usual thinking about such devices.
The latest results for ``chiral'' STT and SMF effects, i.e., the Rashba effect in the spintronics will also be discussed.

＜Contact＞
Michiyasu Mori (81-3508)
Advanced Science Research Center