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Skyrmions in Multiferroics SHINICHIRO SEKI, Department of Applied Physics, University of Tokyo, XIUZHEN YU, RIKEN CMRG/CERG, SHINTARO ISHIWATA, YOSHINORI TOKURA, Department of Applied Physics, University of Tokyo — Magnetic skyrmion is a topologically stable particle-like object, which appears as nanometer-scale vortex-like spin texture in a chiral-lattice magnet. In metallic materials, electrons moving through skyrmion spin texture gain a non-trivial quantum Berry phase, which provides topological force to the underlying spin texture and enables the current-induced manipulation of magnetic skyrmion. Such electric controllability, in addition to the particle-like nature, is a promising advantage for potential spintronic device applications. In this talk, we report the experimental discovery of magnetoelectric skyrmion in an insulating chiral-lattice magnet Cu_2OSeO_3. We find that the skyrmion can magnetically induce electric polarization through the relativistic spin-orbit interaction, which implies possible manipulation of the skyrmion by external electric field without loss of joule heating. The present finding of multiferroic skyrmion may pave a new route toward the engineering of novel magnetoelectric devices with high energy efficiency.

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