Magnetoelectric coupling across the spin flop transition in Ni_3TeO_6

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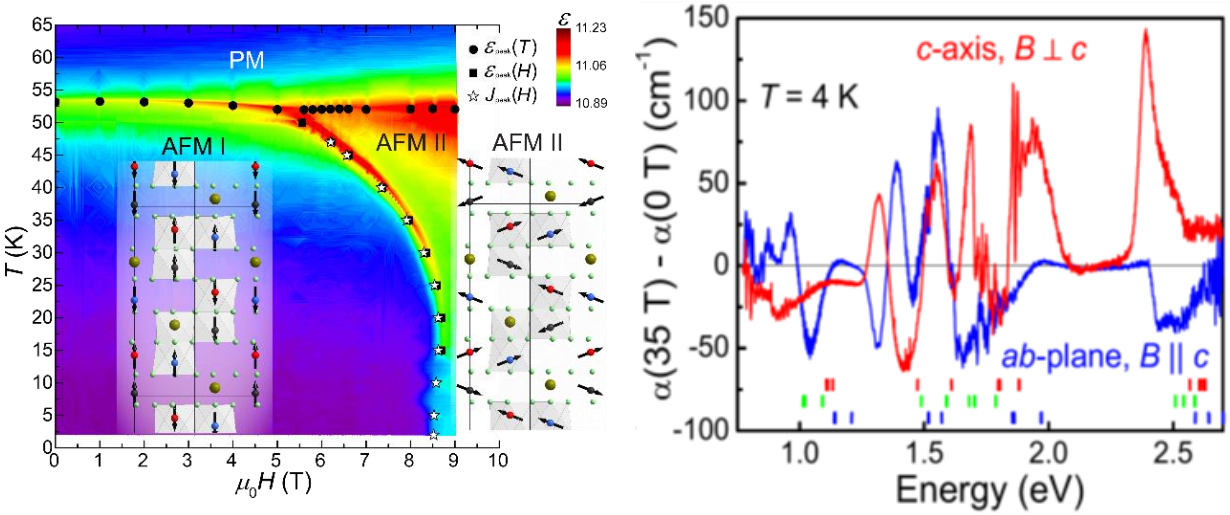
We combined high field optical spectroscopy and first principles calculations to analyze the electronic structure of Ni_3TeO_6 across the 53 K and 9 T magnetic transitions, both of which are accompanied by large changes in electric polarization. The color properties are sensitive to magnetic order due to field-induced changes in the crystal field environment, with those around Ni1 and Ni2 most affected. These findings advance the understanding of magnetoelectric coupling in materials in which magnetic 3*d* centers coexist with heavier spin-orbit-coupled non-magnetic ions.



[*] M. O. Yokosuk, A. al-Wahish, S. Artyukhin, K. R. O'Neal, D. Mazumdar, P. Chen, J. Yang, Y. S. Oh, S. A. McGill, K. Haule, S. –W. Cheong, D. Vanderbilt, and J. L. Musfeldt, Phys. Rev. Lett. **117**, 147402 (2016).