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Abstract for an Invited Paper  
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**Terahertz spectroscopic studies of noncentrosymmetric magnets.<sup>1</sup>**

DIYAR TALBAYEV, Tulane Univ

Magnetism is a rich and fascinating subject in condensed matter physics. We will present spectroscopic studies of magnetic insulators using terahertz (THz) frequency light. This frequency range is important in magnetism because it often hosts the spin resonances and spin waves found in many classes of magnetically ordered crystals. Combined with the ability to collect spectroscopic information at low temperatures and high magnetic fields, THz spectroscopy can serve as a tool for the determination of microscopic magnetic interactions that govern a material's magnetic properties. We will also introduce polarimetry of light and nonlinear optics as a way to interrogate the symmetries inherent in magnetic crystals. When magnetism occurs in noncentrosymmetric crystals, new kinds of optical phenomena often emerge, such as nonreciprocity. In nonreciprocal propagation, a crystal can be transparent to a light wave traveling in one direction and be completely opaque to the same wave traveling in the exact opposite direction. We will consider the necessary symmetry conditions and microscopic origins of the nonreciprocity.

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