

Physics Colloquium

Michigan Technological University

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Room 138, Fisher Hall

11:00 am



MOLECULAR NANOMAGNETS

Myriam P. Sarachik

Distinguished Professor of Physics

City College of New York

New York City, NY

ABSTRACT

Molecular magnets, sometimes referred to as single molecule magnets, are organic crystals containing a very large (Avogadro's) number of magnetic molecules that are nominally identical, providing ideal laboratories for the study of nanoscale magnetic phenomena. With molecular clusters of large total spin (10 and higher), their behavior straddles the border between classical and quantum magnetism. Interest in these materials has grown dramatically in the last several years, owing to their potential use for high-density information storage, as well as the possibility that they could provide the qubits needed for quantum computation. Typical behavior of the class will be examined by considering Mn₁₂-acetate, a particularly simple prototype. The talk will end with a brief description of our discovery of magnetic deflagration, a phenomenon closely analogous to the propagation of a flame front through a flammable chemical substance.

BIOGRAPHY

Dr. Myriam Sarachik is Distinguished Professor of Physics at the City College of the City University of New York. She is a member of the National Academy of Sciences and served as President of the American Physical Society in 2003. An experimental condensed matter physicist, Sarachik has published extensively in professional journals on her work in superconductivity, disordered metallic alloys, metal-insulator transitions in doped semiconductors, hopping transport in solids, properties of strongly interacting electrons in two dimensions, and spin dynamics in molecular magnets.

Professor Sarachik received the 1995 New York City Mayor's Award for Excellence in Science and Technology, a 2004 Sloan Public Service Award from the Fund for the City of New York, the 2005 Oliver E. Buckley Prize in Condensed Matter Physics, and was chosen for the 2005 L'Oreal/UNESCO Award "For Women in Science" for North America. She was awarded an honorary Doctor of Science degree by Amherst College in 2006. Professor Sarachik is currently serving on the Governing Council of the National Academy of Sciences (NAS) and the Council of the American Association for the Advancement of Science (AAAS). Professor Sarachik has been active in defending the human rights of scientists as a National Board member of the Committee of Concerned Scientists, a long-time member of the Human Rights of Scientists Committee of the New York Academy of Sciences, and as a member and chair of the Committee on the International Freedom of Scientists of the American Physical Society.