

FYRE First Year Research Experience

Dr. Michael Pechan in Physics is seeking First Year students to become part of his research projects through the new FYRE program.

To apply, e-mail Martha Weber at weberme@muohio.edu

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PROFESSOR, PHYSICS



513-529-4518 Culler Hall Room 17

Interested in FYRE- STEM or Research Shadowing Opportunities in Physics?

Visit Dr. Pechan's website for more information about his research interests.

<http://www.muphysics.org/research/condensed->

Research Areas: Condensed matter, nanoscale magnetism

My research is on magnetic materials. In one recent study, my group examines the state (magnetostatics) and motion (magnetodynamics) of nano-scale magnetic elements. We are currently studying vortex states in 300 nanometer (nm) diameter ferromagnetic dots coupled by ferromagnetic bridges of width ranging from 0 to 60 nm. We are also investigating spatial variations (anisotropy) in the magnetic states of these coupled nano-dots.

In this same system we are examining the magnetic excitations in the dots. Excitations on uncoupled dots resemble vibrations found on drum heads (described by Bessel functions). The coupling between cylindrical dots modifies these Bessel modes in very interesting and novel ways.

The techniques employed in my lab include ferromagnetic resonance, torque magnetometry, vibrating sample magnetometry and the magneto-optic Kerr effect. I have successfully mentored several first year students in my research, such that by the time they graduate, they have co-authored several refereed journal articles and made presentations at national and international meetings.

What is the FYRE Program Student Application Process?

To apply, simply e-mail Martha Weber Undergraduate Research Coordinator in the Office for the Advancement of Research and Scholarship, 102 Roudebush at Weberme@muohio.edu.