

**University of Rochester
Department of Electrical and Computer Engineering
Special Seminar**

**Motion of Magnetic Flux Quanta in Artificial Channels for Easy Vortex Flow in YBa₂Cu₃O_{7-x}
Superconducting Thin Films**

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**Tuesday, May 1st
11:00 AM – 12:00 PM
Computer Studies Building (CSB) 209**

High-temperature superconductors (HTSs), even more than 25 years after their discovery, are still subject of very intense, both fundamental and applied research. The physics of the pairing mechanism responsible for the superconductivity at the 100-K level is still unknown, while practical applications of HTSs in areas ranging from lossless electrical energy transport over very large distances to ultrafast superconducting optoelectronics are very promising. We present our experimental research on dynamics of magnetic vortices coupled into artificial channels for easy vortex motion in YBa₂Cu₃O_{7-x} (YBCO) superconducting thin films. The channels are periodic, trench-type structures of partially oxygen-deficient YBCO in the fully-oxygenated material and they are patterned using a “laser writing” technique. The technology of channel fabrication and unique electric and magnetic properties of the devices containing vortex channels, together with other experimental studies performed in our laboratory, will be presented in this seminar. The Vilnius Gediminas Technical University (VGTU), founded in 1956, is the top engineering school in Lithuania. It is the second largest university with almost 13 thousand students and almost 2 thousand of the academic teaching staff. The Department of Physics at VGTU, besides its obvious teaching role, actively pursues a variety of advanced research programs, such environmental monitoring of air, water, and soil, renewable energy studies, or computer-based simulation of complex physical processes. There is also an extensive materials science thrust with emphasis on semiconducting and superconducting materials and their nanostructures.

Light refreshments will be provided.