Two Postdoctoral Positions:
Development and Application of Advanced High-Field EPR

Where: The High-Field EPR Group Led by Stephen Hill
National High Magnetic Field Laboratory (MagLab), Tallahassee, FL
Deadline: Until the positions are filled

The first position focuses on development and application of pulsed high-field EPR methods at W-band (94 GHz) and potentially higher frequencies. The successful applicant will have at her or his disposal a state-of-the-art high-power (1 kW peak) W-band spectrometer developed at the University of St. Andrews.[1] This instrument offers true nanosecond time resolution and wideband excitation (1 GHz instantaneous bandwidth), facilitating complex pulse programming using an arbitrary waveform generator, thus enabling a suite of multi-dimensional electron-nuclear (and electron-electron) resonance methodologies. Applicants should be comfortable working on hardware development. However, the end-goal centers on **applications ranging from quantum spin science and materials research to coordination chemistry and structural biology.**

The second position is funded by the **Center for Molecular Magnetic Quantum Materials (M^{2}QM – efrc.ufl.edu**). It involves fundamental high-field EPR investigations of molecular materials developed within M^{2}QM, and via a worldwide network of collaborators. Areas of interest within M^{2}QM that are under active investigation at the MagLab include: understanding decoherence processes and the development of strategies for enhancing coherence in molecular spin qubits; demonstration of multi-qubit entanglement and quantum logic operations in magnetic molecules; and exploitation of magnetoelectric coupling and optical activity for realization of electrically and/or optically switchable spin qubits.

The EPR facility at the NHMFL boasts a wide range of unique pulsed and continuous-wave high-field EPR instruments spanning the range from 9 GHz to 2.5 THz, and magnetic fields up to 45 T. The group comprises six faculty-level researchers, an engineer who assists with instrument development, as well as a cohort of graduate students and postdocs. The group also has strong interactions with EPR and NMR experts in chemistry and biology at both Florida State University and the University of Florida in Gainesville. Further information concerning the MagLab EPR group, including links to recent publications, can be found at:

http://magnet.fsu.edu/usershub/scientificdivisions/emr/index.html

Minimum qualifications: a Ph.D. in Physics, Materials Science, Chemistry, or a related discipline. Expertise in EPR spectroscopy is certainly an advantage, particularly applications of pulsed and/or high-field EPR, or design/development of magnetic resonance instrumentation (radio frequency, microwave, software/hardware interfaces, etc.). However, strong consideration will also be given to candidates with experience in the application of other spectroscopic or magnetic characterization methods to molecular materials. Familiarity with the following application areas is also desirable: molecular materials, including molecular magnets; quantum spin science, e.g., studies of defect states in semiconductors; spectroscopic studies of coordination compounds; and applications of EPR in structural biology.

Questions regarding the position should be directed to Stephen Hill (shill@magnet.fsu.edu). To apply, please send a CV, a cover letter describing your experience and research interests, and the contact information for three references.

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[1]Cruikshank et al., Rev. Sci. Inst. **80**, 103102 (2009); https://doi.org/10.1063/1.3239402