Postdoc offer (theory)
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Insulator-metal transitions in strongly correlated systems for neuromorphic applications
The information age we live in is supported on a physical under-layer of electronic hardware, which originates in condensed matter physics research. The end of Moore's law demands the development of new paradigms. In this context neuromorphic systems emerge as a novel possibility for the direct implementation in hardware of artificial intelligence systems, such as Neural Networks. In recent years we have found that strongly correlated Mott insulators, subject to electric pulsing, can realize the functionality of an electronic neuron. We thus propose to investigate the physics of phase transitions of strongly correlated Mott systems, such as VO2 and V2O3, which are emerging as choice materials for neuromorphic applications. The successful candidate will employ techniques such as DMFT to study strongly correlated electron models in-and out-of-equilibrium, and DFT for realistic compound studies, such as defects, or combinations of DMFT and DFT. They will also develop phenomenological resistor network models to describe, and hopefully propose, experiments on neuromorphic devices. The research work will require the development of numerical codes. The position will be funded by the QMEENC EFRC project based at University of California San Diego. Salary will be according to UCSD regulations and experience.