THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

Mathematics Colloquium

March 7, 2024
3:30 - 4:30 PM
Phillips Hall 332

Spectral lines of general-relativistic hydrogen

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Abstract. After reviewing basics of the spectral theory for non-relativistic quantum-mechanical Hamiltonians of hydrogenic ions, I discuss what impact the incorporation of additional effects such as special relativity, anomalous magnetic moment for the electron, and relativistic gravity have on self-adjointness of the Hamiltonian and its spectrum. I will show how it is possible to fully characterize the discrete energy spectrum and corresponding eigenfunctions in terms of winding numbers of heteroclinic saddle-saddle connectors for a certain dynamical system on a finite cylinder. No previous knowledge of physics will be assumed.