In the first part of the talk we present a method to localize, with absolute certainty, resonances of atoms and molecules. The key tools are complex scaling and the argument principle on the analytic side and interval arithmetic on the computational side (joint work with B.M. Brown, M. Marletta, C. Tretter, M. Wagenhofer).
In the second part of the talk we discuss linear stability of the most common magnetohydrodynamic (MHD) mean-field dynamo models in astrophysics. We formulate antidynamo theorems, regularize the singular MHD dynamo operators and prove that this regularization is spectrally exact (joint work with C. Tretter).