1056-35-1009   **Hamid Hezari*** (`hezari@math.mit.edu`), 77 Mass Ave, MIT/Department of Mathematics, Room 2-306, Cambridge, MA 02139, and **Steve Zelditch**. *Inverse Spectral Problems for Analytic Domains in $\mathbb{R}^n$.*

This is a report of a recent joint work with Steve Zeldtich on inverse spectral problems for analytis domains in $\mathbb{R}^n$. We show that bounded analytic domains in $\mathbb{R}^n$ with mirror symmetries across all coordinate axes are spectrally determined among other such domains. Our approach builds on finding concrete formulas for the wave invariants at a bouncing ball orbit. The wave invariants are calculated from a stationary phase expansion applied to a well-constructed microlocal parametrix for the trace of the resolvent. (Received September 19, 2009)