# The Howland–Kato Commutator Problem

Speaker: Ira Herbst

(University of Virginia)

**Abstract**

In 1987, J. Howland (in his work on a different problem) found two functions, $f(x) = \arctan(x/2)$ and $g(x) = \tanh(x)$ with the property that $i[f(P), g(Q)]$ is a non-negative operator. Here $P = -id/dx$ and $Q$ is multiplication by $x$ in $L^2(R)$.

In a 1991 paper, T. Kato embarked on a systematic investigation into the which real bounded functions, $f$ and $g$, had this property. Although he made some progress, he did not solve the problem. In this talk I will explain the progress which has been made on this problem to date. This is a report of joint work with Richard Froese and Tom Kriete.