NSF Award in Mathematical and Physical Sciences

Principal investigator: Tobin Jay Marks, chemistry, Weinberg College of Arts and Sciences

- **Project:** MRI: Acquisition of a Time-of-Flight GC-Mass Spectrometer
- **Start Date:** September 1, 2009
- **Total Award Amount:** $201,851

**How the results of this project will benefit society:**
Mass spectrometry (MS) is used to identify the chemical composition of a sample and determine its purity by measuring the mass of the molecular constituents in the sample after they are ionized and detected by the mass spectrometer. Chromatography is an isolation technique that precedes the mass spectrometry analysis. It separates a mixture into its constituent chemicals which are then analyzed by the mass spectrometer. These are analytical techniques widely used to characterize the chemical composition of a sample. The mass spectrometer will be used by undergraduate and graduate research students and in undergraduate laboratory classes.

**The problem the project is trying to solve:**
With this award from the Major Research Instrumentation (MRI) program, the Chemistry Department at Northwestern University will acquire a gas chromatograph time-of-flight (GC-TOF) mass spectrometer for use in teaching and research.

**How this project will work:**
A variety of research projects will be investigated including: 1) Organo-f-Element Chemistry - Integrated Synthetic, Mechanistic, Catalytic, and Thermochemical Studies; 2) Enzyme Mimics Based on Supramolecular Coordination Assembly; 3) Reticular Networks Forged for Dynamic Processes; 4) Unlocking the Synthetic Potential of N-Allylhydrazones; and, 5) Molecular Spintronics.

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