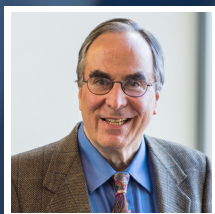


Addressing Chemistry's "Impossible" Problems



Robert Field
Haslam and Dewey Professor, Chemistry



CURRENT RESEARCH

Novel forms of spectroscopy provide insights into both practical and fundamental problems

In quantum mechanics, a particle does not have classical properties like "position" and "momentum"; rather, it is represented by a wave function that assigns a complex number to each possible measurement outcome. Problematically, although the wave function is central to quantum mechanics, it is never directly observable and thus, poses an incredible challenge to characterize and understand. Dr. Robert Field, Haslam and Dewey Professor of Chemistry at Massachusetts Institute of Technology, is highly awarded for his use of high-resolution laser and microwave spectroscopy to observe the structure and intramolecular dynamics of small molecules; in his own words, Dr. Field studies "molecules behaving badly." His research demonstrates that new classes of structural and dynamical questions can be answered by high resolution, multiple resonance spectroscopies, through the use of his unconventional models in order to address problems previously thought to be intractable. In fact, his novel forms of spectroscopy are now able to provide information a million times faster than the spectroscopic methods used by him only a few years ago. Thus, he and his team have created experimental methods, analysis tools, concepts, and intuitive metaphors that will guide spectroscopy toward solutions of a wide range of practical and fundamental problems.

As the author of three books about molecular spectroscopy, awardee of the 1990 Nobel Laureate Signature Award of the American Chemical Society and various other awards and fellowships, and the author of over 380 papers, Dr. Field's research has become a vibrant example of the value of curiosity-based research. Dr. Field has worked to extend the frontiers of spectroscopy to measurements...

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AFFILIATION



Massachusetts Institute of Technology

EDUCATION

- Ph.D., in Chemistry, 1971, Harvard University

AWARDS

- H. P. Broida Prize in Atomic and Molecular Spectroscopy, 1980
- Chemical Physics, American Physical Society, 1980
- Arthur L. Schawlow Prize in Laser Science, American Physical Society, 2009
- E. Bright Wilson Award, American Chemical Society, 2012
- Fellow American Academy of Arts and Sciences, 1998
- and 1 more...

RESEARCH AREAS

Technology, Chemistry, Materials Science / Physics

FUNDING REQUEST

Your contributions will support the continued research of Dr. Robert Field, Haslam and Dewey Professor of Chemistry at MIT, as he uses high-resolution laser and microwave spectroscopy to observe the structure and intramolecular dynamics of small molecules. Donations will provide the necessary \$75K/year required to fund a graduate student, \$100K/year to fund a postdoc, and \$100K for major equipment for each new experimental project. Join in extending the frontiers of spectroscopy to measure structural and dynamical properties that previously have been considered experimentally unknowable!