
E. Charles H. Sykes

Associate Professor of Chemistry
Tufts University

EDUCATION:

Cambridge University, UK (Ph.D.) 1998-2002

Oxford University, UK (Combined B.S. and M.S.) 1994-1998

EMPLOYMENT:

Tufts University (Associate Professor) 2010-Present

Tufts University (Usen Family Career Assistant Professor) 2007-2010

Tufts University (Assistant Professor) 2005-2007

UNC Charlotte (Research Associate, Optics Center) 2004-2005

Pennsylvania State University (Postdoctoral Researcher) 2002-2004

AWARDS:

Camille Dreyfus Teacher Scholar (2011)

NSF CAREER Award (2009)

IUPAC Young Observer (2009)

Arnold and Mabel Beckman Foundation Young Investigator (2008)

Cottrell Scholar of Research Corporation (2008)

Usen Family Career Development Assistant Professorship, Tufts University (2007-2010)

Tufts University Chemistry Department Teaching Award (2008)

Selected as one of 15 US young professors to participate in the 2007 U.S.-Japan Young Researchers Exchange Program in New Instrumentation for Nanoscale Structures (NSF)

Mellon Research Fellowship, Tufts University (2007-2008)

Materials Research Institute Postdoctoral Award for Outstanding Research at The Pennsylvania State University, (2004)

Prize for best graduate seminar in Physical Chemistry, Cambridge University (2000)

Michel Scholar at Queen's College, Oxford University (1996-1998)

PUBLICATIONS:

2011

"Asymmetric Thioethers as Building Blocks for Chiral Monolayers" A. D. Jewell, H. L. Tierney, O. Zenasni, T. R. Lee and E. C. H. Sykes - *Accepted - Topics in Catalysis* "

"Carbamazepine on a carbamazepine monolayer forms unique 1D supramolecular structures" E. V. Iski, B. F. Johnston, A. J. Florence, E. C. H. Sykes and A. J. Urquhart - *Chemical Communications* **2011**.

"Organic thin film induced substrate restructuring; An STM study of the interaction of naphtho[2,3-a]pyrene with Au(111)" E. V. Iski, A. D. Jewell, H. L. Tierney, G. Kyriakou and E. C. H. Sykes - *Journal of Vacuum Science and Technology A*, **2011**, 29, 040601.

"Spontaneous Transmission of Chirality through Multiple Length Scales" E. V. Iski, H. L. Tierney, A. D. Jewell and E. C. H. Sykes - *Chemistry - A European Journal* **2011**, 17, 7205 – 7212. [Cover Story]



"Hydrogen-bonded Networks in Surface-bound Methanol" A. E. Baber, T. J. Lawton and E. C. H. Sykes - *Journal of Physical Chemistry C* **2011**, 115, 9157-9163.

"An Atomic-scale View of Palladium Alloys and their Ability to Dissociate Molecular Hydrogen" A. E. Baber, H. L. Tierney, T. J. Lawton and E. C. H. Sykes - *ChemCatChem* **2011**, 3, 607-614.

"Chirality and Rotation of Asymmetric Surface-Bound Thioethers" H. L. Tierney, J. Han, A. D. Jewell, E. V. Iski, A. E. Baber, D. S. Sholl and E. C. H. Sykes - *Journal of Physical Chemistry C* **2011**, 115, 897-901.

"Regular Scanning Tunneling Microscope Tips can be Intrinsically Chiral" H. L. Tierney, C. J. Murphy and E. C. H. Sykes - *Physical Review Letters* **2011**, 106, 010801.

"The Extraordinary Stability Imparted to Silver Monolayers by Chloride" E. V. Iski, M. El-Kouedi, D. O. Bellisario, C. Calderon, F. Wang, T. Ye and E. C. H. Sykes - *Electrochimica Acta* **2011**, 56, 1652-1661.

2010

"Single Molecule Scanning Tunneling Microscopy" E. V. Iski, M. El-Kouedi, and E. C. H. Sykes *Encyclopedia of Nanoscience and Nanotechnology 2nd Edition*. Edited by Hari Singh Nalwa [Invited Chapter] **2010**

"Gently Lifting Gold's Herringbone Reconstruction: Trimethylphosphine on Au(111)" A. D. Jewell, H. L. Tierney and E. C. H. Sykes - *Physical Review B* **2010**, 82, 205401
Featured in the November 8, 2010 issue of Virtual Journal of Nanoscale Science & Technology

"Adsorption Site Distributions on Cu(111), Cu(221) and Cu(643) as Determined by Xe Adsorption" L. Baker, B. Holsclaw, A. E. Baber, H. L. Tierney, E. C. H. Sykes and A. J. Gellman *Journal of Physical Chemistry C* **2010**, 114, 18566-18575.

"Surface-Mediated Two-Dimensional Growth of the Pharmaceutical Carbamazepine" E. V. Iski, B. F. Johnston, A. J. Florence, A. J. Urquhart and E. C. H. Sykes *ACS Nano* **2010**, 4, 5061-5068.

"Dynamics of Molecular Adsorption at Non-Equilibrium Sites" H. L. Tierney, A. D. Jewell, A. E. Baber, E. V. Iski and E. C. H. Sykes *Langmuir* **2010**, 26, 15350-15355.

"Adsorption, Assembly, and Dynamics of Dibutyl Sulfide on Au{111}" D. O. Bellisario, A. D. Jewell, H. L. Tierney, A. E. Baber and E. C. H. Sykes *Journal of Physical Chemistry C* **2010**, 114, 14583-14589.

"Time-resolved studies of individual molecular rotors" A. D. Jewell, H. L. Tierney, A. E. Baber, E. V. Iski, M. M. Laha and E. C. H. Sykes *Journal of Physics-Condensed Matter* **2010**, 22, 264006-264016.

"Atomic-Scale Geometry and Electronic Structure of Catalytically Important Pd/Au Alloys" A. E. Baber, H. L. Tierney and E. C. H. Sykes *ACS Nano* **2010**, 4, 1637-1645.

"Understanding the Rotational Mechanism of a Single Molecule: STM and DFT Investigations of Dimethyl Sulfide Molecular Rotors on Au(111)" H. L. Tierney, C. E. Calderon, A. E. Baber, E. C. H. Sykes and F. Wang *Journal of Physical Chemistry C* 2010, 114, 3152-3155.

2009

"Scanning Tunneling Microscopy and Single Molecule Conductance Novel Undergraduate Laboratory Experiments" E. V. Iski, M. El-Kouedi and E. C. H. Sykes *Nanotechnology in Undergraduate Education* **2009**, 1010, 123-133.

"Hydrogen Dissociation and Spillover on Individual Isolated Palladium Atoms" H. L. Tierney, A. E. Baber, J. R. Kitchin and E. C. H. Sykes *Physical Review Letters* **2009**, 103, 2461021-2461024.

"Mode-Selective Electrical Excitation of a Molecular Rotor" H. L. Tierney, A. E. Baber, A. D. Jewell, E. V. Iski, M. B. Boucher and E. C. H. Sykes *Chemistry-A European Journal* **2009**, 15, 9678-9680. [Cover Story]



"Importance of Kinetics in Surface Alloying: A Comparison of the Diffusion Pathways of Pd and Ag Atoms on Cu(111)" D. O. Bellisario, J. W. Han, H. L. Tierney, A. E. Baber, D. S. Sholl and E. C. H. Sykes *Journal of Physical Chemistry C* **2009**, *113*, 12863-12869.

"Graphene goes undercover" E. C. H. Sykes *Nature Chemistry* **2009**, *1*, 175-176.

"Molecular Rotors and Motors: Recent Advances and Future Challenges" J. Michl and E. C. H. Sykes *ACS Nano* **2009**, *3*, 1042-1048.

"Identifying Reactive Intermediates in the Ullmann Coupling Reaction by Scanning Tunneling Microscopy and Spectroscopy" M. M. Blake, S. U. Nanayakkara, S. A. Claridge, L. C. Fernandez-Torres, E. C. H. Sykes and P. S. Weiss *Journal of Physical Chemistry A* **2009**, *113*, 13167-13172.

"Cost Effective Nanostructured Materials for the Undergraduate Lab: Nanotextured Aluminum Surfaces" J. T. Brazell, E. C. H. Sykes, P. C. Deguzman, S. Subaran, S. Patel, and M. El-Kouedi *Journal of Nano Education*, **2009**, *1*, 42-47

"Dynamics of Thioether Molecular Rotors: Effects of Surface Interactions and Chain Flexibility" H. L. Tierney, A. E. Baber, E. C. H. Sykes, A. Akimov and A. B. Kolomeisky *Journal of Physical Chemistry C* **2009**, *113*, 10913-10920. [Cover Story]



"Engineering Dislocation Networks for the Directed Assembly of Two-Dimensional Rotor Arrays" D. O. Bellisario, A. E. Baber, H. L. Tierney and E. C. H. Sykes *Journal of Physical Chemistry C* **2009**, *113*, 5895-5898.

"Atomic-Scale Imaging and Electronic Structure Determination of Catalytic Sites on Pd/Cu Near Surface Alloys" H. L. Tierney, A. E. Baber and E. C. H. Sykes *Journal of Physical Chemistry C* **2009**, *113*, 7246-7250. [Cover Story]



2008

"A Quantitative Single-Molecule Study of Thioether Molecular Rotors" A. E. Baber, H. L. Tierney and E. C. H. Sykes *ACS Nano* **2008**, *2*, 2385-2391.

"The real structure of naturally chiral Cu{643}" A. E. Baber, A. J. Gellman, D. S. Sholl and E. C. H. Sykes *Journal of Physical Chemistry C* **2008**, *112*, 11086-11089. [Cover Story]



"Nanoscience Education through the Incorporation of Scanning Tunnelling Microscopy into the Undergraduate Curriculum" E. V. Iski, M. El-Kouedi, A. E. Baber, S. C. Jensen and E. C. H. Sykes *Education in Chemistry* **2008**, *45*, 54-58. [Cover Story]



2007

"Dimethyl sulfide on Cu{111}: Molecular self-assembly and submolecular resolution imaging" S. C. Jensen, A. E. Baber, H. L. Tierney and E. C. H. Sykes *ACS Nano* **2007**, *1*, 423-428.

"A Dibutyl Sulfide Molecular Abacus" *ACS Nano* **2007**, *1*, 2. [Highlight of our paper]

"Adsorption, interaction, and manipulation of dibutyl sulfide on Cu{111}" S. C. Jensen, A. E. Baber, H. L. Tierney and E. C. H. Sykes *ACS Nano* **2007**, *1*, 22-29.

"Dipole-driven ferroelectric assembly of styrene on Au{111}" A. E. Baber, S. C. Jensen and E. C. H. Sykes *Journal of the American Chemical Society* **2007**, *129*, 6368-6369.

"Analyzing the motion of benzene on Au{111}: Single molecule statistics from scanning probe images" B. A. Mantooth, E. C. H. Sykes, P. Han, A. M. Moore, Z. J. Donhauser, V. H. Crespi and P. S. Weiss *Journal of Physical Chemistry C* **2007**, *111*, 6167-6182.

"Long-range electronic interactions at a high temperature: Bromine adatom islands on Cu(111)" S. U. Nanayakkara, E. C. H. Sykes, L. C. Fernandez-Torres, M. M. Blake and P. S. Weiss *Physical Review Letters* **2007**, *98*, 2061081-206108.

2006

"Extraordinary atomic mobility of Au{111} at 80 Kelvin: Effect of styrene adsorption" A. E. Baber, S. C. Jensen, E. V. Iski and E. C. H. Sykes *Journal of the American Chemical Society* **2006**, *128*, 15384-15385.

"The effects of inter-cavity separation on optical coupling in dielectric bispheres" S. P. Ashili, V. N. Astratov and E. C. H. Sykes *Optics Express* **2006**, *14*, 9460-9466.

"Synthesis and characterization of nanowire-based anisotropic conductors" E. C. H. Sykes, A. Andreu, D. A. Deadwyler, K. Daneshvar and M. El-Kouedi *Journal of Nanoscience and Nanotechnology* **2006**, *6*, 1128-1134.

"Dynamics and spectroscopy of hydrogen atoms on Pd{111}" L. C. Fernandez-Torres, E. C. H. Sykes, S. U. Nanayakkara and P. S. Weiss *Journal of Physical Chemistry B* **2006**, *110*, 7380-7384.

2005

"Observation and manipulation of subsurface hydride in Pd{111} and its effect on surface chemical, physical, and electronic properties" E. C. H. Sykes, L. C. Fernandez-Torres, S. U. Nanayakkara, B. A. Mantooth, R. M. Nevin and P. S. Weiss *Proceedings of the National Academy of Sciences of the United States of America* **2005**, *102*, 17907-17911.

"Design and performance of EUV resist containing photoacid generator for sub-100 nm lithography" M. Thiyagarajan, K. E. Gonsalves, K. Dean and E. C. H. Sykes *Journal of Nanoscience and Nanotechnology* **2005**, *5*, 1181-1183.

"Substrate-mediated intermolecular interactions: A quantitative single molecule analysis" E. C. H. Sykes, B. A. Mantooth, P. Han, Z. J. Donhauser and P. S. Weiss *Journal of the American Chemical Society* **2005**, *127*, 7255-7260.

2004

"Benzene on Au {111} at 4 K: Monolayer growth and tip-induced molecular cascades" P. Han, B. A. Mantooth, E. C. H. Sykes, Z. J. Donhauser and P. S. Weiss *Journal of the American Chemical Society* **2004**, *126*, 10787-10793.

2003

"Substrate-mediated interactions and intermolecular forces between molecules adsorbed on surfaces" E. C. H. Sykes, P. Han, S. A. Kandel, K. F. Kelly, G. S. McCarty and P. S. Weiss *Accounts of Chemical Research* **2003**, *36*, 945-953.

"A comparative scanning tunneling microscopy study of physisorbed linear quadrupolar molecules: C₂N₂ and CS₂ on Au{111} at 4 K" P. Han, E. C. H. Sykes, T. P. Pearl and P. S. Weiss *Journal of Physical Chemistry A* **2003**, *107*, 8124-8129.

"Molecule/metal surface interactions evidenced quantum mechanically via tip-induced CS₂ interaction with Friedel oscillations on Au{111}" E. C. H. Sykes, P. Han and P. S. Weiss *Journal of Physical Chemistry B* **2003**, *107*, 5016-5021.

"Molecular conformation of styrene on Ag(100): Relevance to an understanding of the catalytic epoxidation of terminal alkenes" F. J. Williams, D. P. C. Bird, E. C. H. Sykes, A. K. Santra and R. M. Lambert *Journal of Physical Chemistry B* **2003**, *107*, 3824-3828.

2002

"Quantum size effects in catalysis by TiO₂/platinum: the switch from partial oxidation to partial hydrogenation of styrene" E. C. H. Sykes, M. S. Tikhov and R. M. Lambert *Catalysis Letters* **2002**, *82*, 169-173.

"Surface composition, morphology, and catalytic activity of model polycrystalline Titania surfaces" E. C. H. Sykes, M. S. Tikhov and R. M. Lambert *Journal of Physical Chemistry B* **2002**, *106*, 7290-7294.

"Nucleation, growth, sintering, mobility, and adsorption properties of small gold particles on polycrystalline titania" E. C. H. Sykes, F. J. Williams, M. S. Tikhov and R. M. Lambert *Journal of Physical Chemistry B* **2002**, *106*, 5390-5394.

"On the switch between selective oxidation and selective hydrogenation of a terminal alkene on well-defined titania surfaces" E. C. H. Sykes, M. S. Tikhov and R. M. Lambert *Catalysis Letters* **2002**, *78*, 7-11.

2001

"The chemistry of sulfoxy species on clean, oxygenated, and caesiated Ag{100}: A study of surface reactivity by fast XPS and TPR" A. K. Santra, D. P. C. Bird, E. C. H. Sykes, F. J. Williams, A. Goldoni, A. Baraldi and R. M. Lambert *Journal of Physical Chemistry B* **2001**, *105*, 10062-10068.

"Fundamental aspects of enantioselective heterogeneous catalysis: a NEXAFS study of methyl pyruvate and (S)-(-)-1-(1-naphthyl) ethylamine on Pt{111}" J. M. Bonello, E. C. H. Sykes, R. Lindsay, F. J. Williams, A. K. Santra and R. M. Lambert *Surface Science* **2001**, *482*, 207-214.

CURRENT GRADUATE RESEARCHERS:

April Jewell
Timothy Lawton
Emily Lewis
Colin Murphy
Matthew Boucher (with Prof. Flytzani-Stephanopoulos)

CURRENT UNDERGRADUATE RESEARCHERS:

Allister McQuire

GROUP ALUMNI:

Stephen Jensen – Enrolled in doctoral program at Harvard University (Chemistry)
Darin Bellisario - Enrolled in doctoral program at MIT (Chemistry)
Michael Laha – Research Assistant at Rockefeller University
Heather Tierney – Managing Editor of ACS Nano and Nano Letters
Ashleigh Baber – Postdoctoral Fellow at Brookhaven National Lab
Erin Iski - Postdoctoral Fellow at Argonne National Lab

STUDENT AWARDS:

Stephen Jensen: Summer Scholar 2006

Stephen Jensen: UNCC "The Natural World as Art and Science" 1st Prize for student entries 2006

Ashleigh Baber: GAANN Fellowship 2006-07

Stephen Jensen: Prize for best undergraduate science talk at Tufts University Undergraduate Research Conference, 9th March 2007

Ashleigh Baber: Chemistry Department Research Excellence Travel Award 2007

Heather Tierney: Materials Research Society (Fall '07): Best Poster Award in Nanoscale Phenomena in Functional Materials by Scanning Probe Microscopy

Erin Iski: GAANN Fellowship 2007-08

Darin Bellisario: Lt. Commander R.J. Manning Memorial Prize 2008

Darin Bellisario: Max Tishler Prize Scholarship 2008

Erin Iski: Tufts University Award for Outstanding Contributions to Undergraduate Education 2008

Erin Iski: Award for the best oral presentation at the 10th Annual Northeast Student Chemistry Research Conference - April 2008

Erin Iski: Best Poster Prize at the 68th annual Physical Electronics Conference, June 2008.

Heather Tierney: GAANN Fellowship 2008-09

Heather Tierney: American Vacuum Society (Fall 08) Art Zone Competition – 1st place (out of 50 finalists)

Erin Iski: Selected as a member of the Northeastern Section Younger Chemists Committee graduate student German exchange program 2009

Ashleigh Baber: Selected as a member of the US delegation for the Lindau Meeting of Nobel Laureates, Germany 2009

Erin Iski: Best poster prize at the 11th Young Scientists Conference on Chemistry, Germany, March 11-14, 2009

Erin Iski: Award for the best poster presentation at the 11th Annual Northeast Student Chemistry Research Conference - April 2009

April Jewell: 2009 NSF Graduate Research Fellowship

Heather Tierney: The Minerals, Metals, and Materials Society MPMD Division 2010 Student Poster Award

Heather Tierney: Departmental Research Excellence Travel Award - August 2009

Tim Lawton: GAANN Fellowship - August 2009

Michael Laha: Award for the best poster presentation at the 11th Annual Northeast Student Chemistry Research Conference - April 2010

Heather Tierney: Tufts University Award for Outstanding Academic Performance 2010

Heather Tierney: Nottingham Prize at Physical Electronics Conference 2010

Ashleigh Baber: Outstanding Poster Presentation Award at the 2010 Gordon Research Conference on Catalysis- July 2010

Heather Tierney: Selected as 1 of 3 finalists to compete for the Morton M. Traum Surface Science Student Award at the AVS meeting in October - July 2010

Heather Tierney: Awarded an IFSM scholarship to attend the 17th International Microscopy Congress to be held in Rio de Janeiro, Brazil in September - July 2010

Heather Tierney: Awarded the Dorothy M. and Earl S. Hoffman Scholarship to attend the AVS conference in New Mexico

April Jewell: Poster Prize at 240th National ACS Conference in the Division of Colloid and Surface Chemistry in Boston, MA - August 2010

Emily Lewis: GAANN Fellowship - September 2010

Heather Tierney: Morton M. Traum Award for the best student paper based on work leading to a Ph.D. thesis at the AVS Conference in New Mexico - October 2010

INVITED TALKS BY SYKES (2006-Present):

Brandeis Chemistry Department (Host; Iu-Yam Chan) March 28th, 2006

Amherst College Chemistry Department (Host; Karena McKinney) April 14th, 2006

National ACS Fall Meeting (Host; Ludwig Bartels) Sept. 12th, 2006

Boston University, Physical Chemistry Lecture Series (Host; Feng Wang) Feb. 7th, 2007

University of North Carolina at Charlotte (US-Japan exchange) March 7th, 2007

Tohoku University, Japan (US-Japan exchange) May 30th, 2007

Tufts Biomedical Engineering Department (Host; Fiorenzo Omenetto) Sept. 10th 2007

Vassar College, Chemistry Department (Host; Zachary Donhauser) Nov. 1st, 2007

Pittsburgh-Cleveland Catalysis Society, Dec 12th, 2007

Williams College Chemistry Department (Host; Amy Gehring) March 7th, 2008

Wellesley College Chemistry Department (Host; Chris Arumainayagam) July 25th, 2008

Yale University (Host; Eric Altman) Sept 22nd, 2008

University of Maine Chemistry & Physics (Host; Dean Astumian) Nov 14th, 2008

American Chemical Society, Salt Lake City (Hosts; Hajo Freund and Donna Chen) March 22nd-27th, 2009

City College of New York Chemistry Department (Host; Zhonghua Yu) May 11th, 2009

13th International Conference on Surface and Colloid Science, New York City, NY (Host; John Kitchin) June 15th, 2009

Research Corporation Cottrell Scholars' Conference Tuscon AZ (Host; Richard Wiener) July 10th, 2009

Merrimack College, MA (Host; Javier Horta) Sept. 14th, 2009

Johns Hopkins University (Host; Howard Fairbrother) Sept. 29th, 2009

University of New Hampshire (Host; Gonghu Li) Oct. 15th, 2009

Emmanuel College, Boston (Host; Allen Price) Oct. 28th, 2009

American Vacuum Society, San Jose, CA (Host; Yves Chabal) November 8th-13th, 2009

Rice University, Houston TX, (Host: Anatoly Kolomeisky) December 1st, 2009

University of Houston, Houston TX, (Host: Steve Baldelli) December 2nd, 2009

University of South Carolina, (Host; Donna Chen) March 29th, 2010

Electronic and Magnetic Properties of Chiral Structures and their Assemblies, Telluride, CO (Host; Ron Naaman) June 28th-July 2nd 2010

University of Cardiff, Wales, UK (Host; Adam Lee) July 7th, 2010

University of Bath, England, UK (Host; Lorenzo Caggiano) July 9th, 2010

University of Southampton, England, UK (Host; Ali Tavassoli) July 9th, 2010

American Chemical Society, Boston COLL (Host; Chris Baddeley) August 22nd-26th, 2010

American Chemical Society, Boston CATAL (Host; Eric Altman) August 22nd-26th, 2010

American Chemical Society, Boston FUEL (Host; Chang-jun Liu) August 22nd-26th, 2010

Tufts University, Physics Department (Host; Roger Tobin & Cristian Staii) Sept. 17th, 2010

Elementary Reactive Processes at Surfaces, Bordeaux, France (Host; Cedric Crespos) Nov. 30th – Dec. 3rd, 2010

University at Albany – SUNY, College of Nanoscale Science and Engineering (Host; Vince LaBella) March 4th, 2011

Columbia University, EFRC and NSEC Seminar Series (Hosts; Richard Osgood and George Flynn) March 23rd, 2011

Massachusetts Institute of Technology, Physical Chemistry (Host; Sylvia Ceyer) April 12th, 2011

University of Minnesota, Chemistry (Dow Lecture) (Host; Christy Haynes) April 21st, 2011

Nebraska University Center for Materials and Nanoscience (Host; Axel Enders) April 29th, 2011

Gordon Research Conference - Dynamics at Surfaces Newport, RI (Hosts: Geert-Jan Kroes and Greg Sitz) Aug. 7-12th, 2011

CONFERENCE SYMPOSIA ORGANIZED:

American Chemical Society, Salt Lake City (Session – Molecular Rotors and Motors) March 22nd-27th, 2009

13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, New York, NY (Session – Single-Molecule Surface Chemistry) June 14th-19th, 2009

American Chemical Society, Boston (Symposium in honor of Richard Lambert) Aug 22rd-27th, 2010

PEC 2011 (Local Organizing Committee)

SYKES AND SYKES GROUP CONFERENCE PRESENTATIONS:

Nanoscale Science and Engineering Conference. UNC Charlotte 24th-25th Oct 05. **Poster:** “Understanding and Manipulating Surface Chemistry at the Atomic Scale”

American Vacuum Society – Boston, November 1-4th 2005.

Attended

American Physical Society – Baltimore, March 13-17th 2006.

Talk: “Observation and manipulation of subsurface hydride in Pd{111}”

American Physical Society – Baltimore, March 13-17th 2006.

Session Chair: “Challenges and Issues in Nanowire Nanodevices”

Pittsburgh-Cleveland Catalysis Society Spring Meeting 2006:

Talk by student of collaborator (Layton Baker) about Sykes Group data: “Investigation of the atomic and electronic structure of naturally chiral surfaces”

Gordon Research Conference - Chemistry at Interfaces University of New England July 9-14, 2006

Poster: "Atomic-Scale Surface Structure and Dynamics"

American Chemical Society – San Francisco, 10-14th Sept 2006.

Talk: "Surface-Molecule and Molecule-Surface Interactions; Styrene on Au{111}"

American Chemical Society – San Francisco, 10-14th Sept 2006.

Session Chair: "Dynamics of atoms and molecules"

Tufts University Undergraduate Research Conference, 9th March 2007

Student Talk (Stephen Jensen): "Scanning tunnelling microscopy and molecular self-assembly of thioethers"

American Chemical Society – Chicago, 25-29th March 2007.

Student Poster (Ashleigh Baber): "Extraordinary atomic mobility of Au{111} at 80 Kelvin: Effect of styrene adsorption"

American Chemical Society – Chicago, 25-29th March 2007.

Student Talk (Erin Iski): "Incorporation of STM into the undergraduate curriculum using a coadsorbed self-assembled monolayer system"

3rd International Seminar on Teaching Nanoscience with Scanning Probe Microscopy - Chicago, 28th March 2007.

Student Talk (Erin Iski): "Introduction to Molecular Conductance: Utilizing a Nanosurf® EasyScan 2 Scanning Tunneling Microscope in the Undergraduate Laboratory"

The 9th Annual Northeast Student Chemistry Research Conference, April 21st MIT **Student Poster (Erin Iski):** "Incorporation of STM into the P-Chem lab at Tufts and beyond"

The 9th Annual Northeast Student Chemistry Research Conference, April 21st MIT **Student Talk (Ashleigh Baber):** "Small molecules on metal surfaces; structure, dynamics and manipulation"

Gordon Research Conference - Dynamics at Surfaces 12th-17th August 2007.

Student Poster (Ashleigh Baber): "Surface Chemistry of Pd/Cu and Pd/Au Alloys"

Gordon Research Conference - Dynamics at Surfaces 12th-17th August 2007.

Poster: "Single-Molecule Studies of Ferroelectric Self-Assembly and Surface Restructuring"

American Chemical Society – Boston, 19th-23rd August 2007.

Talk: "Hydrogen and water on palladium/gold and palladium/copper surfaces; Structure, spectroscopy, and dynamics"

American Chemical Society – Boston, 19th-23rd August 2007.

Student Poster (Erin Iski): "Electrochemical imaging of surfaces and adsorbates at the atomic-scale"

American Chemical Society – Boston, 19th-23rd August 2007.

Student Talk (Ashleigh Baber): "Ferroelectric texture in a simple organic monolayer system"

American Chemical Society – Boston, 19th-23rd August 2007.

Student Poster (Heather Tierney): "Imaging, spectroscopy and manipulation of water on Au(111), from single molecules to nanoscale ice crystals"

American Chemical Society – Boston, 19th-23rd August 2007.

Student Poster (Collaborator Prof. Feng Wang's Student): "Density functional theory study of the Au (111) surface activation by benzene"

Materials Research Society – Boston, 24th-29th November 2007.

Talk: "Hydrogen and water on palladium/gold and palladium/copper surfaces; Structure, spectroscopy, and dynamics"

Materials Research Society – Boston, 24th-29th November 2007.

Session Chair: "Scanning Probe Studies at the Limits of Resolution"

Materials Research Society – Boston, 24th-29th November 2007.

Student Talk (Ashleigh Baber): "Dipole Driven Ferroelectric Assembly of Styrene on Au(111)"

Materials Research Society – Boston, 24th-29th November 2007.

Student Talk (Erin Iski): "Atomic-Scale Studies of Surfaces under Electrochemical Control"

Materials Research Society – Boston, 24th-29th November 2007.

Student Poster (Heather Tierney): "Palladium/gold and palladium/copper surfaces; Structure, spectroscopy, and dynamics"

American Association for the Advancement of Science Annual Meeting – Boston, 14th-18th February 2008. **Attended.**

Tufts University Undergraduate Research Conference, 4th April 2008

Student Talk (Darin Bellisario): "Novel methods for molecular-self assembly with thioethers"

The 10th Annual Northeast Student Chemistry Research Conference, April 19th 2008 Tufts University **Student Talk (Erin Iski):** "AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces"

The 10th Annual Northeast Student Chemistry Research Conference, April 19th 2008 Tufts University **Student Talk (Darin Bellisario):** "Temperature Effects on the Formation of Dialkyl Sulfide Self-Assembled Monolayers on Au(111)"

The 10th Annual Northeast Student Chemistry Research Conference, April 19th 2008 Tufts University **Student Poster (Ashleigh Baber):** "Single Molecules as Rotors and Motors"

Materials and Structures for Energy, May 9th 2008. Harvard University. **Attended**

30th Annual Symposium on Applied Surface Analysis, June 11-13th 2008 Pennsylvania State University **Talk**: “A Quantitative Single-Molecule Approach to Understanding Surface-Bound Molecular Rotation”

68th Annual Physical Electronics Conference, June 22-25th 2008, University of California at Riverside **Student Poster (Erin Iski)**: “AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces”

68th Annual Physical Electronics Conference, June 22-25th 2008, University of California at Riverside **Talk**: “A Quantitative Single-Molecule Analysis of Thioether Rotors”

68th Annual Physical Electronics Conference, June 22-25th 2008, University of California at Riverside **Student Poster (April Jewell)**: “Novel Approaches to Self-Assembly using Thioethers”

Nanoscale Spectroscopy and Nanotechnology (NSS5-SPSTM2) Conference, July 15-19th Ohio State University **Talk**: “A Quantitative Single-Molecule Analysis of Thioether Rotors”

International Conference on Nanoscience + Technology, July 20-25th 2008, Keystone, Colorado **Student Talk (Ashleigh Baber)**: “Atomic-Scale Geometry and Electronic Structure of Catalytically Important Pd/Au Alloys”

International Conference on Nanoscience + Technology, July 20-25th 2008, Keystone, Colorado **Student Talk (Heather Tierney)**: “Novel energetic pathways to hydrogen spillover on Pd alloys”

International Conference on Nanoscience + Technology, July 20-25th 2008, Keystone, Colorado **Student Talk (Erin Iski)**: “AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces”

International Conference on Nanoscience + Technology, July 20-25th 2008, Keystone, Colorado **Talk**: “A Quantitative Single-Molecule Analysis of Thioether Rotors”

International Conference on Nanoscience + Technology, July 20-25th 2008, Keystone, Colorado **Session Chair**: “Electron Flow Through Molecules”

American Chemical Society, Philadelphia, 17-21st August 2008.
Talk: “Novel Approaches to Self-Assembly using Thioethers”

American Chemical Society, Philadelphia, 17-21st August 2008.
Talk: “A Quantitative Single-Molecule Analysis of Thioether Rotors”

Beckman Foundation Annual Meeting, Newport Beach, CA, 29-30th August 2008.
Poster: “Single-Molecule Self-Assembly, Chirality and Catalysis”

American Vacuum Society – Boston, 19th-24th October 2008.
Student Talk (Ashleigh Baber): “Resolving the Electronic Properties of Catalytically Important Pd/Au Alloys at the Sub-Nanometer Level”

American Vacuum Society – Boston, 19th-24th October 2008.

Student Talk (Darin Bellisario): “Temperature Effects on the Formation of Thioether Self-Assembled Monolayers on Au(111)”

American Vacuum Society – Boston, 19th-24th October 2008.

Student Talk (Heather Tierney): “Novel Pathways to Hydrogen Dissociation and Diffusion on Pd Alloys”

American Vacuum Society – Boston, 19th-24th October 2008.

Student Talk (Erin Iski): “AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces”

American Vacuum Society – Boston, 19th-24th October 2008.

Student Talk (April Jewell): “Tuning the Reactivity and Selectivity of Chiral Kink Sites on Surfaces through Alloying”

American Vacuum Society – Boston, 19th-24th October 2008.

Oral Presentation by Sykes: “A Quantitative Single-Molecule Analysis of Thioether Rotors and Motors”

11th Young Scientists Conference on Chemistry, Germany, March 11-14, 2009.

Student Poster (Erin Iski): “AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces”

American Chemical Society, Salt Lake City, 22nd – 26th March, 2009.

Student Talk (Heather Tierney): “Novel Pathways to Hydrogen Dissociation and Diffusion on Pd Alloys”

American Chemical Society, Salt Lake City, 22nd – 26th March, 2009.

Student Talk (Ashleigh Baber): “Thermal and mechanical activation of single-molecule thioether rotors”

American Chemical Society, Salt Lake City, 22nd – 26th March, 2009.

Student Talk (Heather Tierney): “Monitoring Rotation and Powering Molecular Rotors Electrically”

American Chemical Society, Salt Lake City, 22nd – 26th March, 2009.

Student Talk (Ashleigh Baber): “Resolving the Electronic Properties of Catalytically Important Pd/Au Alloys at the Sub-Nanometer Level”

13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, New York, NY June 14th-19th, 2009.

Student Talk (Heather Tierney): “Monitoring and Inducing Symmetry Breaking at the Single-Molecule Limit”

13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, New York, NY June 14th-19th, 2009.

Student Talk (Ashleigh Baber): “A Quantitative Single-Molecule Analysis of Thioether Rotors”

13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, New York, NY June 14th-19th, 2009.

Student Talk (Darin Bellisario): “A Novel Approach to Self-Assembly with Thioethers”

13th IACIS International Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium, New York, NY June 14th-19th, 2009.

Student Talk (Erin Iski): “AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces”

42nd IUPAC Congress, Glasgow, Scotland, UK August 1st-7th, 2009.

Oral Presentation by Sykes: “Observing, Quantifying and Controlling Rotation at the Single-Molecule Level”

Beckman Foundation Annual Meeting, Newport Beach, CA, 28-29th August 2009.

Sykes Poster: “Single-Molecule Approaches to Self-Assembly, Chirality and Catalysis”

American Vacuum Society – San Jose, 13th-18th November 2009.

Invited talk by Sykes “Single-Molecule Chirality, Catalysis and Rotation”

Materials Research Society – Boston, 30th November – 4th December 2009.

Student Talk (Heather Tierney): “Novel pathways to hydrogen dissociation and spillover on Pd alloys”

Materials Research Society – Boston, 30th November – 4th December 2009.

Student Talk (Ashleigh Baber): “Engineering Pd Islands Supported on Au{111} for Hydrogen Dissociation and Storage”

Materials Research Society – Boston, 30th November – 4th December 2009.

Student Talk (Erin Iski): “A UHV STM study of molecular association and surface composition in the pharmaceutical carbamazepine”

Materials Research Society – Boston, 30th November – 4th December 2009.

Student Talk (April Jewell): “Controlling Every Step of Self-Assembly with Surface Structure, Composition and Temperature”

Assumption College seminar – Worcester, January 2010

Student Talk (Heather Tierney): “Single-molecule surface chemistry and nanoscience”

The Minerals, Metals, and Materials Society – Seattle, 15th – 19th February 2010.

Student Talk (Heather Tierney): “Novel pathways to hydrogen dissociation and diffusion on Pd alloys”

The Minerals, Metals, and Materials Society – Seattle, 15th – 19th February 2010.

Student Poster (Heather Tierney): “Surface Studies of Pd/Cu and Pd/Au Alloys: Composition, Electronic Structure, and Interaction with Hydrogen”

Material Research Society – San Francisco, 5th – 9th April, 2010.

Student Talk (Ashleigh Baber): “Investigation and Control of Single-Molecule Rotors”

Material Research Society – San Francisco, 5th – 9th April, 2010.

Student Talk (Erin Iski): “A Novel Trimer Packing Motif in the Two-dimensional Nanocrystals of the Drug Molecule Carbamazepine on Au(111) and Cu(111) Substrates”

The 12th Annual Northeast Student Chemistry Research Conference, 10th April, 2010 Boston University

Student Talk (April Jewell): "Gently Lifting Gold's Herringbone Reconstruction: Trimethylphosphine on Au(111)"

The 12th Annual Northeast Student Chemistry Research Conference, 10th April, 2010 Boston University

Student Poster (Tim Lawton): “Atomic-Scale Studies on a Curved Cu(111) Crystal”

The 12th Annual Northeast Student Chemistry Research Conference, 10th April, 2010 Boston University

Student Talk (Michael Laha) “Ferroelectric self-assembly of thioethers on gold”

37th Northeast Regional Meeting of the American Chemical Society – Potsdam, 2nd-5th June 2010.

Student Talk (Heather Tierney): “Hydrogen dissociation and spillover on Pd-alloyed surfaces”

37th Northeast Regional Meeting of the American Chemical Society – Potsdam, 2nd-5th June 2010.

Student Talk (Heather Tierney): “Understanding and controlling rotational motion at the single-molecule level”

37th Northeast Regional Meeting of the American Chemical Society – Potsdam, 2nd-5th June 2010.

Student Talk (April Jewell): “Gently Lifting Gold's Herringbone Reconstruction: Trimethylphosphine on Au(111)”

New England Chapter of the American Vacuum Society Meeting – Burlington, MA, 7th June, 2010.

Student Talk (Ashleigh Baber): “Engineering and Atomic-Scale Characterization of Bimetallic Pd Alloys”

New England Chapter of the American Vacuum Society Meeting – Burlington, MA, 7th June, 2010.

Student Talk (April Jewell): “Gently Lifting Gold's Herringbone Reconstruction by Tuning Adsorbate Chemistry”

New England Chapter of the American Vacuum Society Meeting – Burlington, MA, 7th June, 2010.

Student Talk (Timothy Lawton): “Atomic-scale studies of chiral metal surfaces”

70th Physical Electronics Conference – Milwaukee, 15th-18th June 2010

Student Talk (Heather Tierney): “Understanding and controlling single-molecule rotation”

Gordon Conference on Catalysis, New London, NH, 27th June –2nd July, 2010.

Student Poster (Ashleigh Baber): “Engineering and Atomic-Scale Characterization of Bimetallic Pd Alloys for Hydrogen Dissociation”

Gordon Conference on Catalysis, New London, NH, 27th June –2nd July, 2010.

Student Poster (Erin Iski): “Induced Surface Chirality from Single Molecules to Complex 2D Chiral Architectures”

Gordon Conference on Catalysis, New London, NH, 27th June –2nd July, 2010.

Student Poster (Timothy Lawton): “Atomic-Scale Studies on a Curved Cu(111) Crystal”

Gordon Conference on Catalysis, New London, NH, 27th June –2nd July, 2010.

Student Poster (Emily Lewis): “An Atomic-Scale View of Cobalt Chemistry in Alloys”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Invited talk by Sykes: “Atomic-scale view of metal alloy surface chemistry”

240th American Chemical Society National Meeting – Boston, 22nd –26th August, 2010.

Invited talk by Sykes: “Molecular Rotors, Motors and Chirality”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Invited talk by Sykes: “Catalyzing the catalyst: Hydrogen dissociation and spillover on individual isolated palladium atoms”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Student Talk (Tim Lawton): “Atomic-Scale Studies of Chiral Metal Surfaces”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Student Talk (Erin Iski): “Transmission of Molecular Chirality through Multiple Length Scales”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Student Talk (Ashleigh Baber): “Engineering and Atomic-Scale Characterization of Bimetallic Pd Alloys for Hydrogen Dissociation”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Student Poster (April Jewell): “Gently Lifting Gold’s Herringbone Reconstruction by Tuning Adsorbate Chemistry”

240th American Chemical Society National Meeting – Boston, 22nd– 26th August, 2010.

Student Poster (Emily Lewis): “An Atomic-Scale View of Cobalt Chemistry in Alloys”

240th American Chemical Society National Meeting – Boston, 22nd – 26th August, 2010.

Student Talk (Heather Tierney): “Mirror symmetry breaking at the single molecule level”

17th International Microscopy Congress – Rio de Janeiro, 19th-24th September, 2010.

Student Talk (Heather Tierney): “Novel Pathways to Hydrogen Dissociation and Diffusion on Pd Alloys”

57th American Vacuum Society Symposium – Albuquerque, 18th-22nd October, 2010.

Student Talk (Heather Tierney): “Controlling Rotation at the Single-Molecule Level: Turning Rotors into Motors”

57th American Vacuum Society Symposium – Albuquerque, 18th-22nd October, 2010.

Student Talk (April Jewell): “Gently Lifting Gold’s Herringbone Reconstruction by Tuning Adsorbate Chemistry”

57th American Vacuum Society Symposium – Albuquerque, 18th-22nd October, 2010.

Oral Presentation by Sykes: “An atomic-scale view of metal alloy surface chemistry”

57th American Vacuum Society Symposium – Albuquerque, 18th-22nd October, 2010.

Student Poster (Heather Tierney): “Controlling Rotation at the Single-Molecule Level: Turning Rotors into Motors”

REVIEWER FOR JOURNALS:

ACS Nano
Acta Materialia
Angewandte Chemie International Edition
Catalysis Letters
Catalysis Today
Chemistry - A European Journal
Crystal Growth and Design
Journal of Physics: Condensed Matter
Journal of Physical Chemistry B
Journal of Physical Chemistry C
Journal of the American Chemical Society
Langmuir
Nano Letters
Nature
Nature Chemistry
Nature Nanotechnology
Science
Surface Science

REVIEWER OF PROPOSALS:

Israel Science Foundation (ISF)
US-Department of Energy (DOE)
American Chemical Society-Petroleum Research Fund (ACS-PRF)
National Science Foundation (NSF)
Brookhaven National Laboratory Internal Grants (BNL)

TEACHING:

Chem - 133 Quantum Mechanics (Fall 05)

Chem - 133 Quantum Mechanics (Fall 06)

Chem - 91 Stephen Jensen (Spring 06)

Summer Scholars Program - Stephen Jensen (Summer 06)
Honors Thesis - Stephen Jensen (Fall 06/Spring 07)
Chem – 136 Spectroscopy and Molecular Structure (Spring 07)
Chem – 2 Chemical Principles with Lab (Fall 08)
Chem – 191 Seminar in Chemistry (Fall 08)
Chem – 32 Physical Chemistry II, (Spring 09)
Chem – 34 Physical Chemistry II Laboratory, (Spring 09)
Chem – 192 Seminar in Chemistry (Spring 09)
Honors Thesis – Darin Bellisario (Fall 08/Spring 09)
Chem – 133 Quantum Mechanics (Fall 09)
Honors Thesis – Michael Laha (Fall 09/Spring 10)
Chem – 193 Surface Science (Spring 10)
Chem – 293 Professional Skills in Chemical Research (Fall 10)

ADVISING:

Undergraduate Advisor to: Katherine Chui
Keith Hoffman
Victoria Eastman

Pre-major Advisor to: Michael Cunningham
Jake Chiam
Anne Jacob
Patrick Farley
Eve Hamity
Nissa Bagelman
Caleb Shapiro
Sarah Ullman
Elizabeth Siegle
Max Zarin
Prachi Godiwala
Adam Kornetsky
Miriam Briskman
Emily Hellman

DEPARTMENT COMMITTEES:

Chair of Curriculum Committee focusing on Introductory Chemistry 06-07

Member of Graduate Committee 05-06

Member of Graduate Committee 06-07

Member of Graduate Committee 07-08

Member of Graduate Committee 08-09

Member of Faculty External Awards Committee 08-09

Member of Faculty Search Committee 08-09

Chair of Seminar Program Committee 08-09

Member of Graduate Committee 09-10

Member of Faculty Search Committee 10-11

Member of Graduate Committee 10-11

UNIVERSITY COMMITTEES:

Campus Planning Committee 08-12 (Chair: Jeff Zabel)

GSAS Executive Committee 08-12 (Chair: Lynne Pepall)

MISCELLANEOUS SERVICE & OUTREACH:

The Kresge fund provided money to purchase a teaching grade scanning tunneling microscope. The Sykes lab has recently developed a new STM experiment for the physical chemistry lab that was incorporated during spring '07. The experiment involves measuring the conductance of individual thiol molecules and illustrates the principles of scanning probe microscopy, tunneling, and molecular conductance.

Expert consultant for Project MOSART (2005-present). This is a project focusing on developing questions for the Science Education Department at the Center for Astrophysics at the Harvard College Observatory. Project MOSART funded under NSF grant # NSF HER-0412382.

Sykes Group work featured in Steve Zumdahl's general chemistry textbook, 2008.

Data from the Sykes lab has been used by Prof. Bert Reuss of Tufts Geology Department in his lectures to help visualize different types of dislocations in crystals. Prof. Reuss has kindly studied samples on the Geology Department for the Sykes lab.

Computers in Chemistry (Chem 143) David Walt. Sykes group data used in class to show students real problems in research. Useful interaction for both students and Sykes group.

Nanosurf™ website features Sykes lab data on how to prepare surfaces for teaching experiments: <http://www.nanosurf.com>

New undergraduate laboratory designed by Sykes lab featured on James Madison University's SPM education site: <http://spmeducation.virginiananotech.com/articles/show/35>

Sykes interviewed as featured author on ACS Nano's Dec '07 podcast

Sykes selected as a finalist in the Materials Research Society's Fall '07 "Science as Art" competition.

Sykes group work featured in a review of Chiral Surface Chemistry: "Enantioselectivity on Naturally Chiral Metal Surfaces" by Andrew J. Gellman

Images from Sykes group's work are used by Prof. Eric Heller in his physics class at Harvard University to demonstrate scattering phenomena.

Panellist in "Preparing Future Scholars" workshop speaking about "Applying and Interviewing for a Tenure Track Job. Tufts University Oct 3rd 2008.

Tufts University Chemistry Department Teaching Award Spring 2008

Producer of YouTube™ video "Nanotechnology for Alternative Energy Sources" which featured the group's surface alloy work and received ~20,000 hits to date.

Producer of YouTube™ video "Molecular Machines" which featured the group's molecular rotor work which received ~1,000 hits in its 1st month online.

Invited panelist at the 2009 Tufts University New faculty Orientation on Success in Research and Collaboration

The group makes yearly visits to the Social Justice Academy, Hyde Park, MA that feature nanoscience presentations and live demonstrations with a portable scanning tunneling microscope to show students the carbon atoms of graphite.

During the summer months the Sykes group hosts high school teachers from the Social Justice Academy to work on nanoscience presentations for high school level students.

Sykes group data will be featured in the upcoming text "Rates of Chemical and Physical Processes" by Alan Campion, David Oxtoby and Pat Gillis

Serve as a mentor in the Arts and Sciences New Faculty Mentoring Program

Invited Speaker on Mentoring for Graduate Student Success – Tufts University Teaching Conference December 10th 2010

Invited panelist at the 2010 Tufts University New faculty Orientation on Success in Attracting Research Funding