

# Erin V. Iski

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## **Education:**

Tufts University, Medford, MA (Ph.D. in Chemistry) Advisor: Dr. Charles Sykes	2005- Jan. 2011
University of Tulsa, Tulsa, OK (B.S. in Chemistry) Graduated Cum Laude with a GPA of 3.57	2001-2005

## **Teaching Experience:**

**Mentor** -- Science Club for Girls, Cambridge, MA Summer 2010  
Led and set-up hour-long, exploratory, and hands-on science experiments for a group of 20 kindergarten-age girls in an effort to motivate them and spark an early interest in science.

*Tufts University, Medford, MA*

**Primary Organizer** -- Educational Outreach Program in Sykes Lab 2006-2011  
Co-wrote and presented a one hour "Nanoscience for High School: Looking at Atoms and Molecules" presentation at three Boston area high schools reaching over 200 students. Presentation included a live demonstration of atomic resolution with a teaching Scanning Tunneling Microscope (STM).  
Coordinated high school summer internships for two students in the Sykes Lab. Organized program goals, safety training, and provided mentoring, guidance, and supervision for students.

**Guest Lecturer** -- Graduate Surface Science Class March 2010  
Developed two lectures based on the self-assembly of molecules for a graduate level class of 15 students. My teaching skills were assessed by a survey given by the professor, in which students were extremely positive about the classes.

**Teaching Assistant** – Physical Chemistry 2 Lab Spring 2010  
Organized and directed all laboratory procedures in the class of 10 undergraduate students and taught weekly pre-lab lectures.

**Panel Member** – Graduate Student TA Orientation Fall 2008  
Discussed how to be a successful teaching assistant in a science related classroom.

**Teaching Assistant** – Introductory Chemistry Recitation Spring 2006  
Developed teaching skills and the ability to communicate scientific material in front of a class of 40 undergraduate students. Graded weekly homework assignments and monthly exams.

**Teaching Assistant** – Introductory Chemistry Lab Fall 2005/Fall 2006  
Demonstrated knowledge of introductory laboratory instruments and practices for a class of 30 undergraduate students. Graded weekly lab reports and was responsible for assigning students an overall lab grade.

**Research Experience:**

*Tufts University, Medford, MA*

**Doctoral Researcher** 2005-2011  
*Advisor: Dr. Charles Sykes*  
*Physical Chemistry*

Performed surface science experiments using a variety of different Scanning Tunneling Microscopy (STM) techniques on noble metal surfaces. (Ambient, In Situ, Electrochemical, Low Temperature Ultra High Vacuum (LT UHV))  
Acquired expertise with Atomic Force Microscopy (AFM) in both ambient and in situ applications.  
Gained proficiency on electrochemical experiments, including cyclic voltammetry.  
Studied and created ultra-stable, atomically thin, metal halide surfaces via Electrochemical STM.  
Collaborated with theoretical scientists at Boston University, who performed density functional theory calculations on the metal halide film.  
Performed experiments directed at understanding polymorphism of a pharmaceutical compound on a 2D scale with LT UHV-STM at 78 K.  
Collaborated with organic and theoretical chemists at the University of Strathclyde, who synthesized the investigated pharmaceutical compound and performed theoretical analysis to help determine the 2D packing structure.  
Developed an experiment to examine the transmission of chirality from single molecules to complex 2D chiral crystals on the LT UHV-STM at 78 K.

*Delphi Catalysts, Catoosa, OK*

**Chemistry Research Intern**

2004

*Analytical Chemistry and Quality Control*

Performed research involving quality control of the slurry components used in automotive catalytic converters, specifically analyzing the chloride content.  
Developed independent thinking skills and the ability to communicate scientific ideas in a non-academic environment.  
Gained experience in working in the chemical/automotive industry.

*University of Tulsa, Tulsa, OK*

**Undergraduate Researcher**

2003-2004

*Advisor: Dr. John C. DiCesare*

*Analytical Chemistry*

Performed experiments on the development of a nerve agent sensor using sol-gel techniques.  
Gained experience in proper research procedures and documentation.  
Developed the ability to work as part of a team of researchers in an academic environment.

**Awards:**

Delegate to Germany with the Young Chemists Committee of the Northeast Section of the American Chemical Society German Exchange Program to Essen, Germany, (March **2009**).

Poster Prize, Young Chemists Committee of the Northeast Section of the American Chemical Society German Exchange Program in Essen, Germany, (March **2009**).

Best Poster Award, 68th Physical Electronics Conference, (Jun. **2008**).

Outstanding Contribution to Undergraduate Education Award, Tufts University Graduate School of Arts and Sciences and School of Engineering, (May **2008**).

Vertex Excellent Oral Presentation Award, 10<sup>th</sup> Annual Northeast Student Chemist Research Conference, (April **2008**).

GAANN (Graduate Assistance in Areas of National Need) Fellowship, United States Department of Education, (Sept. **2007**-Aug. **2008**).

Finalist in Natural World as Art and Science 2006 Competition, UNC-Charlotte, (**2006**).

## **Publications:**

### *Science Education*

- 1) Scanning Tunneling Microscopy and Single Molecule Conductance: Novel Undergraduate Laboratory Experiments. **Erin V. Iski**, Mahnaz El-Kouedi and E. Charles H. Sykes. *ACS Symposium Series: Nanotechnology in Undergraduate Education 1010*, (2009), Chapter 9, 122-123.
- 2) Nanoscience Education through the Incorporation of Scanning Tunneling Microscopy into the Undergraduate Curriculum. **Erin V. Iski**, Mahnaz El-Kouedi, Ashleigh E. Baber, Stephen C. Jensen and E. Charles H. Sykes. *Education in Chemistry*, 45, (2008) 54-58. [Cover Story]

### *Books/Chapters*

- 3) Single Molecule Scanning Tunneling Microscopy. **Erin V. Iski**, Mahnaz El-Kouedi, and E. Charles H. Sykes. *Encyclopedia of Nanoscience and Nanotechnology 2nd Edition*. [Invited Chapter] In press 2010.

### *Research*

- 4) Surface-Mediated 2D Growth of the Pharmaceutical Carbamazepine. **Erin V. Iski**, Blair T. Johnson, Alastair J. Florence, E. Charles H. Sykes, and Andrew J. Urquhart. *ACS Nano.*, 4, (2010), 5061.
- 5) Dynamics of Molecular Adsorption at Non-Equilibrium Sites. Heather L. Tierney, April D. Jewell, Ashleigh E. Baber, **Erin V. Iski** and E. Charles H. Sykes. *Langmuir*, 26, (2010), 15350.
- 6) Chirality and Rotation of Asymmetric Surface-Bound Thioethers. Heather L. Tierney, Jeong Woo Han, April D. Jewell, **Erin V. Iski**, Ashleigh E. Baber, David S. Sholl and E. Charles H. Sykes. In Press – *J. Phys. Chem. C*. Publication Date (Web): May 20, 2010.
- 7) Time-Resolved Studies of Individual Molecular Rotors. April D. Jewell, Heather L. Tierney, Ashleigh E. Baber, **Erin V. Iski**, Michael M. Laha and E. Charles H. Sykes. *J. Phys. Cond. Matter.*, 22, (2010), 264006.
- 8) Mode Selective Electrical Excitation of a Molecular Rotor. Heather L. Tierney, Ashleigh E. Baber, April D. Jewell, **Erin V. Iski**, Matthew B. Boucher and E. Charles H. Sykes. *Chem-Eur J.* 15, (2009), 9678-9681. [Cover Story]

- 9) Extraordinary Atomic Mobility of Au{111} at 80 Kelvin: Effect of Styrene Adsorption. Ashleigh E. Baber, Stephen C. Jensen, **Erin V. Iski**, and E. Charles H. Sykes. *J. Am. Chem. Soc.*, 128, (2006), 15384 – 15385.
- 10) The Extraordinary Stability Imparted to Silver Monolayers by Chloride. **Erin V. Iski**, Mahnaz El-Kouedi, Darin O. Bellisario, Camillo Calderon, Feng Wang, Tao Ye and E. Charles H. Sykes. *Under review at Electrochimica Acta*
- 11) Transmission of Molecular Chirality through Multiple Length Scales. **Erin V. Iski**, Heather L. Tierney, April D. Jewell, and E. Charles H. Sykes. *In preparation*
- 12) Unexpected Symmetry Breaking at the Single-Molecule Limit. Heather L. Tierney, April D. Jewell, Ashleigh E. Baber, **Erin V. Iski** and E. Charles H. Sykes. *In preparation*

**Presented Papers (Oral Presentations):**

- 1) **Erin V. Iski**, Heather L. Tierney, April D. Jewell, and E. Charles H. Sykes. “Transmission of Molecular Chirality through Multiple Length Scales,” 2010 Materials Research Society Fall Meeting, (Nov. 2010).
- 2) **Erin V. Iski**, Heather L. Tierney, April D. Jewell, and E. Charles H. Sykes. “Transmission of Molecular Chirality through Multiple Length Scales,” 240<sup>th</sup> National Meeting and Exposition of the American Chemical Society, (Aug. 2010).
- 3) **Erin V. Iski**, Blair T. Johnson, Alastair J. Florence, E. Charles H. Sykes, and Andrew J. Urquhart. “A Novel Trimer Packing Motif in the Two-dimensional Nanocrystals of the Drug Molecule Carbamazepine on Au(111) and Cu(111) Substrates,” 2010 Materials Research Society Spring Meeting, (Apr. 2010).
- 4) **Erin V. Iski**, Blair T. Johnson, Alastair J. Florence, E. Charles H. Sykes, and Andrew J. Urquhart. “A UHV STM Study of Molecular Association and Surface Composition in the Pharmaceutical Carbamazepine,” 2009 Materials Research Society Fall Meeting, (Nov. 2009).
- 5) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes. “AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces,” 13<sup>th</sup> International Conference on Surface and Colloid Science (IACIS) and 83<sup>rd</sup> ACS Colloid and Surface Science Symposium, (Jun. 2009).
- 6) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes, “AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces,” American Vacuum Society 55th International Symposium, (Oct. 2008).

- 7) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes, "AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces," International Conference on Nanoscience + Technology 2008, (Jul. 2008).
- 8) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes, "AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces," 10<sup>th</sup> Annual Northeast Student Chemist Research Conference 2008, (April 2008).
- 9) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes, "Imaging Bimetallic Systems Under Electrochemical Control," 2007 Materials Research Society Fall Meeting, (Nov. 2007).
- 10) **E. V. Iski**, M. El-Kouedi, A. E. Baber, S. C. Jensen and E. C. H. Sykes, "Introduction to Molecular Conductance: Utilizing a Nanosurf® EasyScan 2 Scanning Tunneling Microscope in the Undergraduate Laboratory," 3rd International Seminar on Teaching Nanoscience with Scanning Probe Microscopy, (Mar. 2007).
- 11) **E. V. Iski**, M. El-Kouedi, A. E. Baber, S. C. Jensen and E. C. H. Sykes, "Incorporation of Scanning Tunneling Microscopy into the Undergraduate Curriculum Using a Coadsorbed Self-Assembled Monolayer System," 233rd National Meeting and Exposition of the American Chemical Society, (Mar. 2007).

**Presented Papers (Poster Presentations):**

- 1) **E. V. Iski**, H. L. Tierney, A. D. Jewell, and E. C. H. Sykes, "Induced Surface Chirality from Single Molecules to Complex 2D Chiral Architectures," Gordon Research Conference on Catalysis, (Jun. 2010).
- 2) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes. "AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces," 11<sup>th</sup> Annual Northeast Student Chemist Research Conference 2009, (Apr. 2009).
- 3) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes. "AgCl Monolayers on Au(111): Novel, Ultra-Stable and Atomically-Flat Surfaces," Young Chemists Committee of the Northeast Section of the American Chemical Society German Exchange Program in Essen, Germany, (Mar. 2009).
- 4) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes. "AgCl Monolayers on Au(111): Novel, Ultra-stable and Atomically-flat Surfaces," 68th Annual Physical Electronics Conference, (Jun. 2008).

- 5) **E. V. Iski**, D. O. Bellisario, M. El-Kouedi and E. C. H. Sykes. "Electrochemical imaging of surfaces and adsorbates at the atomic-scale," 234th National Meeting and Exposition of the American Chemical Society, (Aug. 2007).
- 6) **E. V. Iski**, M. El-Kouedi, A. E. Baber, S. C. Jensen and E. C. H. Sykes, "Incorporation of STM into the P-Chem lab at Tufts and beyond," 9<sup>th</sup> Annual Northeast Student Chemist Research Conference 2007, (Apr. 2007).
- 7) **E. V. Iski**, T. Harris, and W. T. Potter. "Evaluation of chloride content in automotive catalytic converters, 229<sup>th</sup> National Meeting and Exposition of the American Chemical Society, (Mar. 2005). (*undergraduate research*)
- 8) **E. V. Iski**, S. N. Horne, and J. C. DiCesare. "Development of a nerve agent sensor using sol-gel techniques," 227<sup>th</sup> National Meeting and Exposition of the American Chemical Society, (Mar. 2004). (*undergraduate research*)

### **Leadership Activities:**

Northeast Section of the Young Chemists Committee, Treasurer, 2009 - 2010

Helped to organize the 2010 Career Day, the 12<sup>th</sup> Annual Northeast Student Chemist Research Conference, and the 2010 German Exchange Program.

Networked and socialized with local, young chemists from both academia and industry.

Chemistry Graduate Student Council, Officer, 2006 – 2008

Organized social activities for the graduate students in the department, including the annual rafting trip and bowling tournament.

Acted as a representative for the chemistry graduate students for dealings with the department and the graduate school.

Participated in the Annual Department Open House to introduce perspective graduate students to the Tufts Chemistry Department.

Physical and Analytical Chemistry Journal Club, Co-organizer, 2006 – 2009

Organized and advertised bi-monthly meetings focused on bringing relevant journal articles to the attention of graduate students and faculty.

Sykes Lab, 2005-2011

Reviewed and edited journal articles and grant applications.

Provided training for a variety of students on the instruments in the lab, including chemical engineers on the AFM instrument, and graduate students and undergraduates on the ambient STM instrument.

Organized weekly group meetings.

Mentored the younger graduate students in the lab through various stages of the official requirements of the department.

**References:**

Professor Charles Sykes  
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