

## **Aditya (Ashi) Savara**

Chemical Sciences Division  
Surface Chemistry and Catalysis  
Oak Ridge National Laboratory  
1 Bethel Valley Rd., Oak Ridge, TN 37831

**Position Title:** Staff Scientist, PI

(865) 576-6311 - Office  
(865) 241-5152 - Fax  
[savaraa@ornl.gov](mailto:savaraa@ornl.gov)

### **Education/Training:**

Northwestern University, PhD Chemistry, 2003-2008, Physical Chemistry  
University of Hawaii, BS Chemistry, 2000-2003

### **Research and Professional Experience:**

#### **2011–Pres. Surface Science and Catalysis, ORNL Oak Ridge, TN**

- Kinetic monte carlo simulations of endothermic spillover. Construction of a molecular beam apparatus. Infrared study of aromatic-hydroxyl interactions for a lignin model compound on SBA-15 at pyrolysis temperatures. Insights into the mechanism for acid-base bifunctional catalysis of aldol condensation on metal oxides.

#### **2008–2011 Freund Group, Fritz Haber Institute, MPG Berlin, Germany**

- Role of subsurface hydrogen in the selectivity of isomerization and hydrogenation of *cis*-2-butene over Pd nanoparticles and Pd(111). Non Langmuir-Hinshelwood kinetics for H/D exchange over Pd nanoparticles and Pd(111): influence of subsurface hydrogen.

#### **2003–2008 Weitz Group, Northwestern University Evanston, IL**

- Reaction kinetics of NO<sub>x</sub> reduction over Ba-Y zeolites and related catalysts. First observation that nanoscale pores can alter a reaction mechanism. Discovered the acid catalyzed reduction of NH<sub>4</sub>NO<sub>3</sub> by NO. Enthalpies and entropies of gas adsorption on surfaces, a theoretical investigation.

#### **2002–2003 Jensen Group, University of Hawaii Honolulu, HI**

- Catalyzed dehydrogenation of sodium aluminum hydride by titanium doping.

### **Professional Activities (last 5 years) Honors and Awards:**

ACS ENVR Division Secretary (Fall 2012-Present)  
ACS ENVR Division Webmaster (Fall 2012-Present)  
ACS Petroleum Research Fund Proposal Reviewer

2007 ACS Graduate Student Award in Environmental Chemistry

### **Symposia Organized:**

1. “Catalysis Science: The Next Generation” Division: CATL. 247th ACS National Meeting, Dallas, TX. March 16, 2014.
2. “Heterogeneous Catalysis for Environmental and Energy Applications” Division: ENVR & CATL. 248th ACS National Meeting, San Francisco, CA. August 13-14, 2014.
3. “Elucidation of Mechanisms & Kinetics on Surfaces” Division: COLL & ENVR & CATL. 249th ACS National Meeting, Denver, CO. March 22-26, 2015.
4. “Heterogeneous Catalysis for Environmental and Energy Applications” Division: ENVR & CATL. 250th ACS National Meeting, Boston, MA. August 16-17, 2015.

**Reviewer for:**

Journal of the American Chemical Society, RSC Advances, ACS Catalysis, Chemical Engineering Science, Journal of Physical Chemistry, Physical Chemistry Chemical Physics, ChemSusChem, Applied Catalysis B, Catalysts, Materials Research Society Spring Meeting, International Journal of Hydrogen Energy, American Chemical Society Petroleum Research Fund.

**Cumulative Total Number of Articles Published in Peer Reviewed Journals: 22****Selected Peer Reviewed Publications:**

**Savara, A.**; and Weitz, E.; “Elucidation of Intermediates and Mechanisms in Heterogeneous Catalysis Using Infrared Spectroscopy” *Ann. Rev. Phys. Chem.*, **2014**, *65*, 249-273.

**Savara, A.**; Ludwig, W.; Madix, R.J.; Schauermaun, S.; and Freund, H.-J. “Kinetic Evidence for a Non-Langmuir-Hinshelwood Surface Reaction: H/D Exchange over Pd Nanoparticles and Pd(111).” *ChemPhysChem*, **2013**, *14*, 1686-1695.

**Savara, A.** “Standard States for Adsorption on Solid Surfaces: 2D Gases, Surface Liquids, and Langmuir Adsorbates” *J. Phys. Chem. C*, **2013**, *117*, 15710–15715.

**Savara, A.**; and Weitz, E. “Kinetics of  $\text{NO} + \text{H}^+ + \text{NO}_3^- \rightarrow \text{NO}_2 + \text{HNO}_2$  on BaNa-Y: Evidence for a Diffusion-Limited  $\text{A} + \text{B} \rightarrow \text{0}$  Reaction on a Surface.” *J. Phys. Chem.*, **2010**, *114*, 20621–20628.

**Savara, A.**; Danon, A; Sachtler, W.M.H.; and Weitz, E. “TPD of Nitric Acid on BaNa-Y: Evidence that a Nanoscale Environment Can Alter a Reaction Mechanism.” *Phys. Chem. Chem. Phys*, **2009**, *11*, 1180-1188.

**External Collaborators (Past 48 months):**

- Panos Argyrakis, Department of Physics University of Thessaloniki, Greece.
- Florencia C. Calaza, Fritz-Haber-Institut der Max-Planck-Gesellschaft
- Carine Chan-Thaw, Department of Chimica Inorganica Metallorganica e Analitica, University of Milan
- Karl-Heinz Dostert, Fritz-Haber-Institut der Max-Planck-Gesellschaft
- Hans-Joachim (“Hajo”) Freund, Fritz-Haber-Institute of the Max Planck Society
- Michael Kandziolka, University of Tennessee, Knoxville
- Wei Liu, Fritz-Haber-Institut der Max-Planck-Gesellschaft
- Wiebke Ludwig, Fritz-Haber-Institute of the Max Planck Society
- Laura Prati, Department of Chimica Inorganica Metallorganica e Analitica, University of Milan
- Ilenia Rossetti,, Department of Chimica Inorganica Metallorganica e Analitica, University of Milan
- Svetlana Schauermaun, Fritz-Haber-Institute of the Max Planck Society
- Matthias Scheffler, Fritz-Haber-Institut der Max-Planck-Gesellschaft
- Alexandre Tkatchenko, Fritz-Haber-Institut der Max-Planck-Gesellschaft
- Alberto Villa, Department of Chimica Inorganica Metallorganica e Analitica, University of Milan
- Eric Weitz, Northwestern University
- Celine Hin, Virginia Tech

**Graduate and Postdoctoral Advisors:**

Prof. Eric Weitz, Northwestern University (PhD advisor)

Prof. Hans-Joachim (“Hajo”) Freund, Fritz-Haber-Institute of the Max Planck Society (Postdoc Advisor)

Dr. Svetlana Schauermaun, Fritz-Haber-Institute of the Max Planck Society (Postdoc Advisor)

**Students Mentored:**

- 2010 Karl-Heinz Dostert (Graduate Student) Fritz Haber Institut, Germany
  - 2012 & 2013 Zachary Coin (Undergraduate Student) ORNL / UTK
  - 2012 & 2013 Michael Kandziolka (Undergraduate Student) ORNL / UTK
  - 2013 Subeer Talapatra (Undergraduate Student) ORNL / UVA
  - 2013 Anna Wanhala (Undergraduate Student) ORNL / Albion College
  - 2014 William Hawks (Undergraduate Student) ORNL / UTK
  - 2014 Christa Cody (Undergraduate Student) ORNL / Tennessee Tech
  - 2014 & 2015 Thomas Danielson (Graduate Student) ORNL / Virginia Tech
  - 2015 Stacie Schroll (Undergraduate Student) ORNL / Kellogg Community College
  - 2015 Christopher Elliott (Undergraduate Student) ORNL / Covenant College
- \* Students with “ORNL” listed next to their name worked directly under my supervision at ORNL.