

## LÍNEY ÁRNADÓTTIR

*Assistant Professor*

*School of Chemical, Biological & Environmental Engineering*

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### Academic Background

2007 Ph.D Univ. of Washington, (Chem.Engr.)

2003 M.S. Univ. of Washington, (Chem.Engr.)

2001 B.S. University of Iceland (Chemistry)

### Professional History

2013–present	Assistant Professor,	Oregon State University
2011–2013	Assistant Professor (Sr. Research),	Oregon State University
2008–2011	Post. Doc. (surface analysis)	University of Washington
2007–2008.	Post. Doc. (theoretical catalysis)	University of Washington
2001–2007	Research/Teaching Assistant	University of Washington
2001	Research Assistant	University of Iceland

### Awards and Honors

Paper in ACS Nano titled: “*Adsorption of Water Dimer on Platinum(111): Identification of the –OH ... Pt Hydrogen Bond*” Highlighted in C&EN news.

Electrochemical Society Best Student/ Post-Doc presentation in the Direct Fuel Cells section 2008

Helga Jónsdóttir and Sigurliði Kristjánsson Award for Excellent Academic Achievement 2007

American Vacuum Society, Dorothy M. and Earl S. Hoffman Travel Grant 2005  
American Vacuum Society, Dorothy M. and Earl S. Hoffman Travel Grant 2003

### Invited talks

“Computational studies of complex surface reactions.”, Oct. 2015, PNW-AVS, Timberlinelodge, Mtn. Hood, OR.

“Molecular or atomistic modeling in heterogeneous catalysis”, College seminar Sept. 2015, Vidyasirimedhi Institute (VISTEC), Rayong, Thailand.

“Determining the rate limiting steps of hydrocarbon chain growth on Co catalyst, using Density Functional theory.” Department seminar Spring 2015, Department of Physics, Oregon State University.

“Molecular modeling of catalysis”, Microreactor Workshop, Sept. 2014, The Sirindhorn International Thai-German Graduate School of Engineering and King Mongkut's University of Technology North Bangkok.

“What can we learn from Molecular simulations”, May 2014, Hewlett-Packard, Corvallis, OR.

“Combing multiple surface analysis techniques to determine protein orientation on surfaces”, Spring 2013 ACS National Meeting, Division of Colloid and surface chemistry, session of New Frontiers in Biomaterials.

“Density Functional Theory calculations of metal-water interactions and the role of water and surface defects in chemical reactions.” Department seminar Fall 2012, Department of Physics, Oregon State University.

“ToF-SIMS study of Orientation of Fibronectin fragment on self-assembled monolayers.” Department seminar Winter 2012, Material Science, Oregon State University.

## **Publications**

*Charles T. Campbell, Lynza H. Sprowl, Líney Árnadóttir* “Calculating equilibrium and rate constants for adsorbates: 2D ideal gas, 2D ideal lattice gas, and hindered translator models” submitted to *Journal of Physical Chemistry-C*

*Lynza H. Sprowl, Charles T. Campbell, Líney Árnadóttir* “Hindered Translator and Hindered Rotor Models for Adsorbates: Partition Functions and Entropies” submitted to *Journal of Physical Chemistry-C*

*Florian Ahrend, Ulrich Glebe, Líney Árnadóttir, Joe E. Baio, Daniel A. Fischer, Chernojaye, B.O. Leung, Adam P. Hitchcock, Tobias Weidner, Ulrich Siemeling, Arno Ehresmann,* “Magnetic Field Landscapes Guiding the Chemisorption of Diamagnetic Molecules.” Submitted to *ACS-Nano*

## **In Print / In Press**

*Xiaosong Du, Christopher Durgan, David Matthews, Joshua Motley, Xuebin Tan, Kovit Pholsena, Líney Arnadóttir, Jessica Castle, Peter Jacobs, Robert Cargill, Kenneth Ward, John F. Conley, Gregory Herman* “Fabrication of a Flexible Amperometric Glucose Sensor Using Additive Processes” *ECS Journal of Solid State Science and Technology*, 4 (4), P3039-P3074 (2015) DOI: 10.1149/2.0101504jss

## **Paper Highlighted in C&EN**

*Kenta Motobayashi, Líney Árnadóttir, Chikako Matsumoto, Eric M. Stuve, Hannes Jónsson, Yousoo Kim, and Maki Kawai,* “ Adsorption of Water Dimer on Platinum(111): Identification of the –OH ··· Pt Hydrogen Bond ”, *ACS Nano*, 8 (11) p.11583-11590 (2014) DOI: 10.1021/nn504824z

- Gilad Zorn, Li-Hong Liu, Líney Árnadóttir, Hui Wang, Lara Gamble, David Castner, Mingdi, “X-ray Photoelectron Spectroscopy Investigation of the Nitrogen Species in Photoactive Perfluorophenylazide-Modified Surfaces”, *J. Phys. Chem. C* 118 (1), 376–383 (2014).
- Brendan Flynn, DaeHo Kim, Ben Clark, Alan Telecky, Líney Arnadottir, Janos Szanyi, Douglas A. Keszler, and Gregory S. Herman “In-situ characterization of aqueous-based hafnium oxide hydroxide sulfate thin films,” *Surface and Interface Analysis*, 46 (4), 210-215 (2014) DOI: 10.1002/sia.5205
- Charles T. Campbell, Líney Árnadóttir, Jason R.V. Sellers, “Kinetic Prefactors of Reactions on Solid Surfaces,” *Z.Physikalische Chemie*, 227, pp. 1435-1454 (2013).
- Ulrich Glebe, Joe E. Baio, Líney Arnadottir, Ulrich Siemeling, and Tobias Weidner, “Molecular Suction Pads: Self-Assembled Monolayers of Subphthalocyaninatoboron Complexes on Gold”, *ChemPhysChem*, 14 (6), 115-1166 (2013).
- Líney Árnadóttir, Hannes Jónsson, Eric M. Stuve, “HCO (formyl) and COH surface reaction intermediate on Pt(111) surface”, *Chemical Physics Letters*, 541 32-38 (2012).
- Líney Árnadóttir, Eric M. Stuve, Hannes Jónsson, “Adsorption of water monomer and clusters on platinum(111) terrace, and related steps and kinks II. Surface diffusion.” *Surface Science*, 606 233-238 (2012).
- Wanda Lew, Matthew C. Crowe, Eric Karp, Ole Lytken, Jason A. Farmer, Líney Árnadóttir, Carolyn Schoenbaum, Charles T. Campbell, “The Energy of Adsorbed Hydroxyl on Pt(111) by Microcalorimetry”, *The Journal of Physical Chemistry*, 2011, 115 (23), pp 11586-11594.
- Ulrich Siemeling, Christian Schirmacher, Ulrich Glebe, Clemens Bruhn, Joe E. Baio, Líney Árnadóttir, David G. Castner, Tobias Weidner “Phthalocyaninato complexes with peripheral alkylthio chains: disk-like adsorbate species with central binding site for the coordinative anchoring of ligands on surfaces”, *Inorganica Chimica Acta* 374 (1), 302-312 (2011).
- Orb Acton, Daniel Hutchins, Líney Árnadóttir, Tobias Weidner, Guy G. Ting, Tae-Wook Kim, Nathan Cernetic, David G. Castner, Hong Ma, and Alex K.-Y. Jen, “Spin-Cast and Patterned Organo-Phosphonate Self-Assembled Monolayer Hybrid Dielectrics on Metal Oxide Activated Si.” *Advance Materials*, 23 (16), 1899-1902 (2011).
- Líney Árnadóttir, Eric M. Stuve, Hannes Jónsson, “Adsorption of water monomer and clusters on platinum(111) terrace, and related steps and kinks I. Configurations, energies, and hydrogen bonding.”, *Surface Science* 604 1978-1986 (2010).

Líney Árnadóttir, Hannes Jonsson, and Eric M. Stuve, “The Effect of Co-adsorbed Water on the Stability and Configuration of Formyl (HCO) and Hydroxymethylidyne (COH) Intermediated on Pt(111): A Density Functional Theory Study”, *ECS Transactions* 16 (2), 621 (2008).

Jon K.F. Geirsson, Líney Arnadóttir and Stefan Jonsson, “Short and stereoselective synthesis of polysubstituted cyclohexanones”, *Tetrahedron* 60 (40) 2004.

### Most Recent Student Awards and Honors

Poster awards, Ashean Patel (B.S. ChemE. Senior) 3<sup>rd</sup> place AiChE national meeting, Salt Lake City, Nov. 2015

Poster awards, Dennis Petersen (M.S. student) 2<sup>nd</sup> place, PNW-AVS, Timberline Lodge, Mtn. Hood, Oct. 2015

Poster awards, Ashean Patel (B.S. ChemE. Senior) 1<sup>st</sup> place PNW-AVS, Timberline Lodge, Mtn. Hood, Oct. 2015

Poster awards, Yousif Almulla (B.S. ChemE. Sophomore) and Merissa Schneider-Coppolino (B.S. ChemE. Honors, Senior) 2<sup>nd</sup> place PNW-AVS, Timberline Lodge, Mtn. Hood, Oct. 2015

Poster awards, Dennis Petersen (M.S. student) 1<sup>st</sup> place, College of engineering expo, Portland OR, Feb. 2015

Dennis Petersen (M.S. student) Travel awards to attend ACS national meeting in Denver Colorado, May 2015

Oregon Lottery graduate Scholarship Lynza Halberstadt, (Ph.D. student), Fall 2014.

Poster awards, Ashean Patel (B.S. ChemE. Junior) 2<sup>rd</sup> place AiChE national meeting, Atlanta, Nov. 2014

### Conference Talks

“*DFT Study of the CH Hydrogenation and CH-CH Carbon Coupling Reactions on Different Surface Facets of Co Catalyst*”, AiChE Annual meeting, Salt Lake City, UT, November 2015. Presented by, oral presentation: D. Petersen (M.S. student)

“*Density functional theory study of CO Assisted Water Dissociation*”, AVS-62 International Symposium, San Jose CA, October 2015.

“Computational studies of complex surface reactions.”, Oct. 2015, PNW-AVS, Timberlinelodge, Mtn. Hood, OR.

“*Characterization of an amperometric glucose sensor on a flexible polyimide substrate for continuous glucose monitoring and insulin delivery through single device.*”, AVS-61 International Symposium, Baltimore MD, November 2014.

- “Calculations of rate constant for surface reactions using density functional theory”*, 248<sup>th</sup> ACS National Meeting & Exposition, San Francisco, CA, August 2014.
- “Density functional theory study of Stability and Reactivity of H-C=O and C-OH surface reaction intermediates on Pt(111) and effects of water on the intermediates.”*, 247<sup>th</sup> ACS National Meeting & Exposition, Dallas, TX, March 2014.
- “Density functional theory study of Stability and Reactivity of H-C=O and C-OH surface reaction intermediates on Pt(111) and effects of water on the intermediates.”*, AVS-60 International Symposium Long Beach, CA, October 2013.
- “Density functional theory study of HCO (formyl) and COH surface reaction intermediates on Pt(111) and effects of water on the intermediates.”*, NAM-23, Louisville, KY, June 2013.
- “DFT study of water dissociation and diffusion on metal surfaces, kinks and step.”* AVS-59 International Symposium, Tampa, FL, October 2012.
- “Water diffusion and dissociation on Platinum defects: Density Functional Theory study.”*, Surface Analysis '12, Pacific Northwest National Laboratory, Richland, WA, June 2012.
- “Water Diffusion and Dissociation on Metal Defect Sites, Density Functional Theory Study.”* 221st ECS Meeting, Seattle, WA, May 2012.
- “Water adsorption and diffusion on Pt(111), including kinks and steps.”* 243<sup>rd</sup> ACS National Meeting & Exposition, San Diego, CA, March 2012.
- “ToF-SIMS Study of Orientation of FnIII<sub>9-10</sub> Fibronectin Fragment on Self-Assembled Monolayers.”* AVS-58 International Symposium, Nashville, TN, November 2011.
- “Water adsorption and diffusion on Pt(111), kinks and steps.”* 22<sup>nd</sup> North American Catalysis Society Meeting, Detroit, MI, June 2011.
- “Study of adsorption and orientation of FnIII<sub>7-10</sub> Fibronectin fragment on self-assembled monolayers using Time of Flight secondary ion mass spectrometry.”* AVS-57 International Symposium, Albuquerque, NM, October 2010.
- “Surface characterization of mixed DNA/mercaptoundecanol assembly on gold.”* AVS-57 International Symposium, Albuquerque, NM, October 2010.
- “ToF-SIMS Imaging to Characterize DNA Microarray Surfaces.”* AVS-57 International Symposium, Albuquerque, NM, October 2010.
- “Comparing Fluorescence and ToF-SIMS Imaging of DNA Microarray Spots.”*, 2010 Microscopy and Microanalysis Meeting, Portland, OR, August 2010.

*“ToF-SIMS Study of Fibronectin Orientation/Conformation on Self-Assembled Monolayers.”* Society For Biomaterials, 2010 Annual Meeting & Exposition, Seattle, WA, April 2010.

*“ToF-SIMS Imaging to Characterize DNA Microarray Spots.”*, Society For Biomaterials, 2010 Annual Meeting & Exposition, Seattle, WA, April 2010.

*“Investigation of Surface-Bound Protein Conformation/Orientation Using Time-of-Flight Secondary Ion Mass Spectrometry.”* AVS-56 International Symposium, San Jose, WA, November 2009.

*“Diffusion of water on Pt(111), step and kink and the effect of water on a C:H:O intermediate.”*, Hot topic Poster Talks, Gordon Research Conference on Chemical Reactions At Surfaces, Ventura, CA, February 2009.

*“Water Interaction and Diffusion on Platinum Surfaces”*, 2008 AIChE Annual Meeting & Centennial Celebration, Philadelphia, PA, November 2008.

*“Formyl (HCO) Verses Hydroxymethylidyne (COH) Surface Intermediates on Pt(111)”*, 2008 AIChE Annual Meeting & Centennial Celebration, Philadelphia, PA, November 2008.

*“The effect of coadsorbed water on the stability and configuration of formyl (HCO) and hydroxymethylidyne (COH) intermediates on Pt(111): a density functional theory study”*, 214th ECS Meeting, Honolulu, HI, October 2008.

*“Water diffusion on Pt(111) terrace, kink and steps: density functional theory study of water interaction and diffusion”*, 214th ECS Meeting, Honolulu, HI, October 2008.

*“Density Functional Theory Study of the Interconversion between HCO (formyl) and COH surface reaction intermediate on Pt(111)”*, AVS-54 International Symposium, Seattle, WA, October 2007.

*“The Interaction of Water Molecules with a Flat and Stepped Pt(111) Surface”*, AVS-52 International Symposium, Boston, MA, November 2005.

*“Electrochemistry at elevated temperature with microreactor”*, AVS-50 International Symposium, Baltimore, MD, November 2003.

## Conference Posters

*“Density functional theory calculations of CO<sub>2</sub> dissociation on copper surfaces”*, AiChE national meeting, Salt Lake City, November 2015. Presented by: A. Patel (Undergraduate student) 3<sup>rd</sup> place poster award

*“Hindered Translation Method for Calculating the Entropy of Adsorbed Species Using Density Functional Theory”*, Pacific Northwest Chapter of AVS, annual symposium, Timberline Lodge, Hood River, OR, October 2015. Presented by: L. Halberstadt (Ph.D. student)

*“Understanding the initial steps of iron corrosion: Calculations of H<sub>2</sub>O and OH interactions with iron and iron oxide surfaces”*, Pacific Northwest Chapter of AVS, annual symposium, Timberline Lodge, Hood River, OR, October 2015. Presented by: Q. Pang (Ph.D. student)

*“DFT Investigation of the CH-CH Carbon Coupling and CH Hydrogenation Reactions on Different Surface Facets of Co Catalyst”*, Pacific Northwest Chapter of AVS, annual symposium, Timberline Lodge, Hood River, OR, October 2015. Presented by: D. F. Petersen (M.S. student) 2<sup>nd</sup> place poster award

*“Density functional theory calculations of CO<sub>2</sub> dissociation on copper surfaces”*, Pacific Northwest Chapter of AVS, annual symposium, Timberline Lodge, Hood River, OR, October 2015. Presented by: A. Patel (Undergraduate student) 1<sup>st</sup> place poster award

*“Surface Structure Sensitivity of Carbon-Oxygen Bond Breakage within the Anode of a Fuel Cell”*, Pacific Northwest Chapter of AVS, annual symposium, Timberline Lodge, Hood River, OR, October 2015. Presented by: Y. Almulla and M. Schneider-Coppolino (Undergraduate students) 2<sup>nd</sup> place poster award

*“Density Functional Theory (DFT) study of the rate determining steps of Fischer-Tropsch carbon chain growth”* Engineering EXPO, Portland, OR, March, 2015 Presented by: D. F. Petersen (M.S. student) 1<sup>st</sup> place poster award

*“Kinetic Prefactors of Adsorbed Alkanes on Pt(111): a Density Functional Theory Study”* Engineering EXPO, Portland, OR, March, 2015 Presented by: L. Halberstadt (Ph.D. student)

*“Density Functional Theory Calculations of the initial steps of Iron Corrosion”*, SUNCAT Summer Institute 2015, SLAC National Accelerator Laboratory & Stanford University, CA, Aug. 2014. Presented by: Q. Pang (Ph.D. student)

*“New Hindered Translation Method for Calculating the Entropy of Adsorbed Species”*, SUNCAT Summer Institute 2015, SLAC National Accelerator Laboratory & Stanford University, CA, Aug. 2014. Presented by: L. Halberstadt (Ph.D. student)

*“DFT study of the rate determining steps of carbon chain growth on Co”*, 249<sup>th</sup> ACS National Meeting & Exposition, Denver, CO, March 2015. Presented by: D.F. Petersen (M.S. student)

*“Water Diffusion and dissociation on metal defect sites.”* Gordon Research Conference on Chemical Reactions At Surfaces, Ventura, CA, February, 2015.

- “Density functional theory calculations of CO<sub>2</sub> adsorption and interactions with copper surfaces”*, AiChE national meeting, Atlanta, November 2014. Presented by: A. Patel (Undergraduate student) **2<sup>st</sup> place poster award**
- “Density Functional Theory study of methanol diffusion on Pt(111)”*, Annual symposium Pacific Northwest Chapter of the AVS, EMSL/PNNL, Richland, WA, Sept. 2014. Presented by: L. Halberstadt (Ph.D. student)
- “Surface and Interface Characterization of an Amperometric Glucose Sensor”*, Annual symposium Pacific Northwest Chapter of the AVS, EMSL/PNNL, Richland, WA, Sept. 2014. Presented by: A. Herman (high school student)
- “Water Diffusion and dissociation on metal defect sites.”* Gordon Research Conference on Chemical Reactions At Surfaces, Les Diablerets, Switzerland, April 2013.
- “ToF-SIMS imaging of DNA microarrays: Correlation between fluorescence inhomogeneities and chemical composition.”* Eigenvector University User Poster Session, Seattle, WA, May 2010.
- “ToF-SIMS study of Fibronectin orientation on self-assembled monolayers.”* AVS-56 International Symposium, San Jose, WA, November 2009.
- “Diffusion of water on Pt(111), step and kink and the effect of water on a C:H:O intermediate.”*, Gordon Research Conference on Chemical Reactions At Surfaces, Ventura, CA, February 2009.
- “Interconversion of HCO (formyl) and COH on Pt(111)”*, 2006 Annual meeting of the Pacific Coast Catalysis Society, Seattle, WA, September 2006.
- “The Interaction of Water Molecules with Pt(111) Surface”*, American Conference on Theoretical Chemistry 2005, Los Angeles, CA, July 2005.
- “Direct Methanol Oxidation Pathways”*, 8th Annual Undergraduate Research symposium 2005, Seattle, WA, May 2005.
- “Elevated Temperature studies of Methanol Electro-oxidation on Pt surfaces in an Electrochemical Microreactor System”* Surface Canada 2004, UBC, Vancouver, Canada, May 2004.
- “Development of a High-Temperature Electrochemical Microreactor with Mass Spectrometry for Kinetic Rate Analysis of Methanol Oxidation”* Surface Canada 2004, UBC, Vancouver, Canada, May 2004.



## **Symposia Organization and Professional society service**

- Section Representative Alternate of the Willamette valley section of society for women engineers (SWE)
- Leads the post doc and graduate student professional development chapter of the Willamette valley section of SWE
- Session chair and organizer, division of catalysis and reaction engineering, AiChE national meeting 2016
- Conference chair for PNW-AVS, fall 2017
- Conference Vice chair for PNW-AVS, fall 2016
- Session chair NAM (North American Catalysis Society) Semi-Annual Meeting, Pittsburg, PA, June 2015.
- Session chair PNW-AVS Annual Symposium, Timberlinelodge, OR, Oct 2015.
- Member of the NNIN External Advisory Board on Clean Energy
- Session Chair CENTC summer school 2013 in Seattle Washington
- Member of the Program Committee for the Surface Analysis '12 and PNWAVS Annual Symposium.
- Session chair PNWAVS Annual Symposium, 2012
- Invited speaker in the Job Information forum at the AVS-60 International Symposium, New Orleans, LA, October 2012.

## **Students advised**

### **Current:**

Lynza Halberstadt (Ph.D. student)  
Qin Pang (Ph.D. student)  
Kofi S. Oware (Ph.D. student)  
Jude Ighere (Ph.D. student, co-advised with Alex Greaney)  
Dennis Petersen (MS student)  
Ashaen R. Patel (undergraduate research)  
Jimmy D. Beaty (undergraduate research)  
Merissa Schneider-Coppolino (honors students)  
Nasra A. Aden (undergraduate research)

### **Previous:**

Nicholas A Silva (honors student) (2015)  
Yousif Almulla ( Johnson intern) (2015)  
Alexander Herman (highschool student) (2014)  
Colin F. Dickens (ChemE senior) (2014)  
Matthew J. Bates (Johnson intern) (2014)  
M. Tyler Colesar (honors student) (2013)  
Madeline Wilson (honors student, Johnson intern summer 2013)

## Teaching Evaluations

Oregon State University

Course	Course Title	Role	Credit	Quarter	enrolled	Item 1	Item 2
CBEE 599	Graduate seminar	Instructor		S15	43	4.9	5.1
CHEM 333	Mass transfer	Instructor	3	S15	125	5.1	5.2
CHEM 399	Mass transfer	Instructor	3	W15	17	5.9	5.9
CBEE 414	Process eng. Lab	Co-Instructor	3	F14	40	4.4	4.3
CHEM 399	Mass transfer	Instructor	3	W14	19	5.5	5.8
CBEE 414	Process eng. Lab	Co-Instructor	3	F13	45	4.6	4.8
CHEM 399	Mass transfer	Instructor	3	W13	18	5.1	5.3
CBEE 211	Material Balance	Co-Instructor	3	F12	220/128	4.6	4.8
CHEM 399	Mass transfer	Instructor	3	W12	17	5.4	5.4

University of Washington:

Course	Course Title	Role	Credit	Quarter	enrolled	Item 1	Item 2
CHEME 445	Fuel Cell Eng.	Instructor	3	W08	25	3.7	3.7
CHEM162	General Chem.	TA	3	S02	26	4.2	4.4

Excellent = 6 (highest score), Very good = 5, Good = 4.

Item 1= The course as a whole was; Item 2= The instructor's contribution to the course

## Languages

English (speaking, reading, writing; full proficiency)

Icelandic (speaking, reading, writing, native)

German (some reading, some writing; incomplete proficiency)

Danish (some reading, some writing; incomplete proficiency)

## Professional Society

The American Association for the Advancement of Science (AAAS)

American Chemical Society (ACS)

American Institute of Chemical Engineers (AIChE)

American Vacuum Society (AVS)

The Electrochemical Society (ECS)

The Icelandic Chemical Society (EfnÍs)

Reseracher at Oregon built Environment & Sustainable Technologies Center (BEST).

Member of OSU Material Analysis science Center (MaSC)

Oregon Nanoscience and Microtechnologies institute (ONAMI)

Society for Women Engineering (SWE)