Elad Gross, Ph.D.

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• CURRENT POSITION

Sep. 2014 Assistant professor, Institute of Chemistry, The Hebrew University of Jerusalem, Israel

• EDUCATION

2004-2011 Ph.D. Physical Chemistry, The Hebrew University, Jerusalem, Israel (direct Ph.D. track)

2000-2003 B.Sc. Chemistry (*with excellence*), The Hebrew University, Jerusalem, Israel

• PREVIOUS POSITIONS

2012-2014 Postdoctoral fellow, Department of Chemistry, UC Berkeley and Chemical Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA

2008 Short time scholar – Texas A&M University, College station, TX

• FELLOWSHIPS AND AWARDS

2015 Gerhard Ertl young investigator award finalist.

2015 Golda Meir fellowship.

2012 Gordon Research Conference scholarship.

2008-2010 Israel science administration scholarship ("Eshkol") for excellence.

2010 Yortner-Levine award, given by the Israel Chemical Society.

2009 Best Poster award in the Israel Nano-science conference.

2009 Hebrew University Nano-science award for graduate students.

2009 Best poster award in chemistry in the Hebrew University's faculty day.

2009 Chosen by the American Vacuum Society as one of top three works in surface science

2009 American Vacuum Society Dorothy M. and Earl S. Hoffman Travel grant.

2008 Travel scholarship from the Hebrew University.

2006-2008 CAMBR scholarship for alternative energy research.

2004-2005 Scholarship for M.Sc. students given based on excellence in B.Sc. studies.

• MENTORING

2015- Mentoring two undergraduate students, two master students and one postdoctoral fellow as a PI in the Institute of Chemistry of the Hebrew University

2013-2014 Mentored two graduate students in Somorjai group, UC Berkeley

• CONFERENCES ORGANIZATION

2015 Initiation and organization of an open day for undergraduate students in the institute of chemistry

• TEACHING ACTIVITIES

2004-2009 Teaching assistance – Physical chemistry for undergraduate students, Department of Chemistry, The Hebrew University, Jerusalem, Israel

2004-2008 Laboratory instructor – Physical chemistry for undergraduate students, Department of Chemistry, The Hebrew University, Jerusalem Israel

• PEER REVIEWER OF THE JOURNALS:

- Journal of Catalysis
- Catalysis letters
- Nano Letters
- Nature Communications

• MAJOR COLLABORATIONS:

1. Heterogeneous catalysis, *in-situ* spectroscopy: Gabor A. Somorjai, UC Berkeley
2. Homogenous catalysis, organic synthesis: F. Dean Toste, UC Berkeley
3. Synchrotron measurements (IR spectroscopy): Michael. C. Martin, Hans, A. Bechtel – Advanced Light Source, Lawrence Berkeley national laboratory
4. Synchrotron measurements (X-ray spectroscopy): Dilworth Parkinson Advanced Light Source, Lawrence Berkeley National Laboratory
5. Materials Science and colloidal synthesis: Qiao Zhang, Soochow University, China

• PROPOSAL WRITING:

■ Co-writer of proposals for DOE and Lawrence Berkeley National Laboratory funding:

- *Development and Utilization of Instruments for Molecular Level Studies of Catalyst Surfaces under Reaction Conditions* (with G.A. Somorjai and H. Frei)
- *New Catalytic Environments* (with D.F. Toste)
- *Catalysis at the mesoscale* (with G.A. Somorjai)

■ Wrote 8 granted proposals for beam-time allocation at different synchrotron light sources.

• LIST OF PUBLICATIONS:

Total Published Papers: 21 Papers with PhD advisor: 7
Articles as corresponding author: 17 Total no. of citations: 337 h-index: 7

1. CY Wu, Y. Levratovsky, H. A. Bechtel, M. C. Martin, F. D. Toste and **E. Gross** "High spatial resolution mapping of the catalytic reactivity along the surface of single Pt nanoparticles" *submitted.*

2. E. Gross "Uncovering the deactivation mechanism of Au catalyst with operando high spatial resolution IR and X-ray microspectroscopy measurements", *submitted.*

3. E. Gross, F. D. Toste and G. A. Somorjai "Polymer-encapsulated metallic nanoparticles as a bridge between homogeneous and heterogeneous catalysis" Catalysis Letters 145, **(2015),** 126 (review paper)

4. E. Gross and G. A. Somorjai "Molecular Catalysis Science: Nanoparticle Synthesis and Instrument Development for Studies under Reaction Conditions" J. Catalysis 328, **(2015),** 91 (review paper)

5. S. Sreekumar, Z. C. Baer, **E. Gross**, S. Padmanaban, K. Goulas, G. Gunbas, S. Alayoglu, H. W. Blanch, D. S. Clark and F. D. Toste "Chemocatalytic Upgrading of Tailored Fermentation Products toward Biodiesel" ChemSusChem 7, **(2014),** 2445.

6. E. Gross, X. Z. Shu, S. Alayoglu, H.A. Bechtel, M. C. Martin, F. D. Toste, and G. A. Somorjai "In Situ IR and X-ray High Spatial-Resolution Microspectroscopy Measurements of Multistep Organic Transformation in Flow Microreactor Catalysed by Au Nanoclusters" J. Am. Chem. Soc. 136, **(2014),** 5225

- Highlighted by ALS news
- Highlighted by LBNL news
- Highlighted by C&EN news

7. E. Gross and G. A. Somorjai "Mesoscale nanostructures as a bridge between homogeneous and heterogeneous catalysis" Topics in Catalysis 57, **(2014),** 812 (review paper)

8. E. Gross, J. H. C. Liu, S. Alayoglu, F. D. Toste and G. A. Somorjai "Asymmetric catalysis at the Mesoscale: Gold nanoclusters embedded in hydrogen-bonded chiral self-assembled-monolayer as heterogeneous catalyst for asymmetric reactions" J. Am. Chem. Soc. 135, **(2013)**, 3881.

- Highlighted by C&EN news

9. E. Gross and G. A Somorjai "The role of electronic charge on the catalytic reactivity of metallic nanoparticles" Topic in Catalysis, 56, **(2013)**, 1049 (review paper)

10. E. Gross and M. Asscher "The role of reduced oxide sites in thermal stability, selectivity and reactivity of supported Pd-Au bimetallic clusters Langmuir, 69, **(2013),** 6025.

11. S. Alayoglu, J. Krier, W. D.Michalak, Z. W. Zhu, **E. Gross** and G. A. Somorjai "In-situ Surface and Reaction Probe Studies with Model Nanoparticle Catalysts" ACS catalysis 2, **(2012)**, 2250 (review paper).

12. P. Anbarasan, Z. C. Baer, S. Sreekumar, **E. Gross**, J. B. Binder, H. W. Blanch, D. S. Clark, and F. D. Toste "Integration of chemical catalysis with extractive fermentation to produce fungible fuels" Nature 491, **(2012)**, 235.

- Highlighted by LBNL news
- Highlighted by Nature Chemistry
- Highlighted by USA today

13. E. Gross, J. M. Krier, L. Heinke and G. A. Somorjai "Building Bridges in Catalysis Science. Monodispersed Metallic Nanoparticles for Homogeneous Catalysis and Atomic Scale Characterization of Catalysts under Reaction Conditions". Topics in Catalysis 55, **(2012)**, 13 (review paper).

14.E. Gross, J. H. C. Liu, F. D. Toste and Gabor A. Somorjai "Selectivity control in heterogeneous catalysis by tuning nanoparticles properties and flow-reactor's residence time" Nature Chemistry 4, **(2012),** 947.

- Highlighted by LBNL news
- Highlighted by Materials 360
- Highlighted by Tech beat.

15. Y. Li, J. H. C. Liu, C. A. Witham, W. Y. Huang, M. A. Marcus, S. C. Fakra, P. Alayoglu, Z. W. Zhu, C. M. Thompson, A. Arjun, K. Lee, **E. Gross**, F. D. Toste and G. A. Somorjai "A Pt-Cluster-Based Heterogeneous Catalyst for Homogeneous Catalytic Reactions: X-ray Absorption Spectroscopy and Reaction Kinetic Studies of Their Activity and Stability against Leaching" J. Am. Chem. Soc. 133, **(2011),** 13527.

16. E. Gross and M. Asscher "Structure-Reactivity Correlations in Pd-Au Bimetallic Nanoclusters ", Langmuir, 26, **(2009),** 16226.

17. E. Gross and M. Asscher "Metallic clusters size to density coupling", Phys. Chem. Chem. Phys. 4, **(2009)**, 710.

18. E. Gross, I. Popov and M. Asscher "Morphology and catalytic reactivity of buffer layer assisted grown bi-metallic Pd-Au nano-clusters", J. Phys. Chem. C. 113 **(2009)** 18341.

19. E. Gross, O. Stein and M. Asscher "Metallic nano-clusters growth and film Laser patterning via weakly bound buffer layer", Applied Surface Science, 253, **(2007)**, 6545.

20. E. Gross, M. Lundwall, D. W. Goodman and M. Asscher, "Gold nano-clusters deposited on SiO_2 via water buffer layer, CO-IRAS and CO-TPD measurements", J. Phys. Chem. C. 111, **(2007)**, 16199.

21. E. Gross, Y. Horowitz and M. Asscher, "Water as buffer material for gold nano-clusters growth", Langmuir 21, **(2005)**, 8892.

ORAL PRESENTATIONS AND SEMINARS:

- International conference of homogenous and heterogamous catalysis "Analysis of catalytic reactions with microspectroscopy measurements", Utrecht **2015**
- German Physics Society Conference "Analysis of catalytic reactions with high spatial resolution FTIR microscopy", Berlin **2015**
- Israel Chemical Engineer Society conference "Catalysis At the Mesoscale: going beyond the metallic Site", Israel **2015**
- Materials Research Society conference "Catalytic reactions in confined spaces", San Francisco, CA **2014**

- Chemistry department seminar, The Hebrew University, Israel "Catalysis at the mesoscale" **2013**
- Organic Chemistry and Materials science department seminar, Weizmann institute, Israel "Catalysis at the mesoscale" **2013**
- Chemistry department seminar, Tel Aviv University, Israel "Catalysis at the mesoscale" **2013**
- Chemistry department seminar, Technion, Haifa, Israel "Catalysis at the mesoscale" **2013**
- Chemistry department seminar, Ben-Gurion University "Catalysis at the mesoscale" Israel **2013**
- Chemistry department seminar, Bar Ilan University "Catalysis at the mesoscale" Israel **2013**
- Chevron R&D seminar "Catalysis at the mesoscale" **2013**
- Chemical Science Division Seminar, Lawrence Berkeley National Laboratory "Catalysis at the mesoscale" **2013**
- Materials Research Society conference: "Asymmetric catalysis at the mesoscale" **2013.**
- American Chemical Society conference: "Selectivity control in heterogeneous catalysis by tuning nanoparticles properties and residence time" **2012.**
- The International Symposium of Correlations between Homogeneous and Heterogeneous Catalysis: "Dendrimer encapsulated metal nanoparticles as catalysts for organic reactions" **2011**.
- Nano-science conference of the Hebrew University: "Characterization and catalytic reactivity of Au-Pd bimetallic particles" **2009**.
- American Vacuum Society conference: "The Reactivity of Au-Pd nanoclusters on oxide substrate" **2009**.
- Department of organic chemistry, Weizmann institute: "Metallic clusters on oxide substrate as model catalyst" **2009**.
- American Vacuum Society conference: "Morphology and reactivity of metallic nanoclusters deposited on SiO_2 via water buffer layer" **2008**.
- Nano-science conference in the Hebrew University: "Water as buffer layer for gold nano-clusters growth" **2007**.

Patents:

- Flow cell apparatus for *in-situ* imaging of catalytic reaction with synchrotron-sourced IR beam (filed).