UNIVERSITY OF CALIFORNIA BERKELEY • DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING • 233 HILDEBRAND HALL • BERKELEY, CA 94720-1462
PHONE 510-679-7606 • FAX 510-642-4778 • E-MAIL ASKATZ@BERKELEY.EDU

ALEXANDER KATZ

CURRICULUM VITAE

EDUCATION

Université Louis Pasteur, Institut Le Bel, Strasbourg, France (09/98-12/99)
Postdoctorate in Supramolecular Chemistry

Area: Design and synthesis of crystalline materials based on calixarene complexes as building blocks. Advisor: Professor Mir Wais Hosseini

California Institute of Technology (09/94 – 08/98)
Doctor of Philosophy in Chemical Engineering

Ph.D. Thesis: The Synthesis and Characterization of Molecularly Imprinted Materials. Advisor: Professor Mark E. Davis

1994 University of Minnesota, Twin Cities (09/92 – 08/94)
Master of Science in Chemical Engineering

Master of Science Thesis: A Quartz Resonator-Based Rheometer for the Dynamic Investigation of Viscoelastic Films. Advisor: Professor Michael D. Ward

1992 University of Minnesota, Twin Cities (09/90 – 06/92)
Bachelor of Chemical Engineering, Cum Laude

CURRENT RESEARCH AND TEACHING INTERESTS

Professor of Chemical and Biomolecular Engineering
Department of Chemical Engineering, College of Chemistry, January 2000 – present

I am the principal investigator of a multidisciplinary research group exploring the molecular design, synthesis, and characterization of functional materials consisting of organic-inorganic active-site assemblies – an area in which we lead the world. My curiosity is driven by a need to understand

molecular interactions and chemical reactivity on surfaces, and to molecularly engineer active sites for a variety of applications, including separations, catalysis, and sensing. My approach consists of synthesizing controlled organic-inorganic interfaces, in order to elucidate structure and reactivity relationships. Among my research group discoveries are: (i) grafted calixarenes on oxide support materials, which my research group owns composition of matter rights for; (ii) calixarene-bound metal polyhedra, as a means to stabilizing open coordinatively unsaturated sites and tuning reactivity in supported metal cluster catalysts; (iii) delaminated zeolites synthesized at mild pH that avoid amorphization, including synthesis of grafted Ti-based epoxidation catalysts that exhibit deactivation resistance, high activity, and selectivity; (iv) perfect separations of aromatics from aqueous mixtures involving sugar, and specific adsorption involving lanthanide and actinide cations from aqueous solution, and (v) surface-modified oxides for water dispersion. My research has been featured in Science Concentrates in *C&E News* on numerous occasions, as well as in News and Views in *Nature Chemistry* and *Nature Nanotechnology*. My teaching interests include reactor design/kinetics; mass transport/separations; unit ops; process design design of functional materials electives.

HONORS

- Newman Entrepreneurial Initiative Award (2018)
- Outstanding Faculty of the Year Award for Excellence in Teaching, Tau Beta Pi California Alpha Chapter (UC Berkeley) (2014)
- Best Research Poster Award at the ISHHC-16 Conference, Sapporo, Japan (Michael Nigra – 2013)
- Best Research Poster Award at the EBI Retreat (Alexandre Charmot and Cedric Chung – 2011)
- Visiting Professor, Wolfson Department of Chemical Engineering, Technion – Israel Institute of Technology, Haifa, Israel (2008-2009).
- Fulbright Fellowship (2008-2009).
- Lead PI Recipient of Inaugural Instrumentation Grant Award from Micromeritics Corporation to Berkeley Catalysis Center (2007)
- 3M Untenured Faculty Award (2003-2005).
- Council of International Association of Catalysis Societies (IACS) Young Scientist Prize (2004).
- Department of Chemical and Biomolecular Engineering Teaching Award (2004, 2011, 2013).
- Berkeley AIChE Student Chapter Teacher of the Year Award (2004).
- Hellman Family Faculty Fund Award (2003).
- NSF International Awards Postdoctoral Fellowship (1998-1999).
- Hertz Foundation Graduate Fellowship (1994-1998).
- University of Minnesota Regents Scholarship (1993).
- Institute of Technology Merit Scholarship (1992).
- 3M Departmental Chemical Engineering Award (1992).
- Member of Tau Beta Pi, Golden Key, Phi Kappa Phi (1992).

U.S. PATENTS

"Metal oxide particles with uniform multilayer polymer coatings." United States Patent **9,796,793**. Inventors: Joseph Jankolovits, Oz Gazit, Jim Bohling, John Roper, Alexander Katz.

"Delamination of borosilicate layered zeolite." United States **9,795,951.** Inventors: Xiaoying Ouyang, Stacey I. Zones, Alexander Katz

"*Oxide materials and synthesis by fluoride/chloride anion promoted exfoliation*." United States Patents **9,522,390** and **9,718,049**. Inventors: Isao Ogino, Stacey I. Zones, Alexander Katz.

"*Highly active, selective, accessible, and robust zeolitic Sn-Baeyer-Villiger oxidation catalyst.*" United States Patent **9,687,830**. Inventors: Xiaoying Ouyang, Stacey Zones, Alexander Katz.

"*Oxide materials and synthesis by fluoride/chloride anion promoted exfoliation*." United States Patent **9,522,390**. Inventors: Isao Ogino, Stacey Zones, Alexander Katz.

"*Highly active, selective, accessible, and robust zeolitic Ti-epoxidation catalyst.*" United States Patent **9,457,346**. Inventors: Xiaoying Ouyang, Stacey Zones, Alexander Katz.

"*Synthesis of open metal carbonyl clusters.*" United States Patent **9,266,915**. Inventors: Alexander Katz, Alexander Kuperman, Alexander Okrut, Ron C. Runnenbaum, Xiaoying Ouyang.

"*Synthesis of open metal carbonyl clusters.*" United States Patent **9,243,016**. Inventors: Alexander Katz, Alexander Kuperman, Alexander Okrut, Ron C. Runnenbaum, Xiaoying Ouyang.

"*Calixarene-bound iridium-containing metal colloids*." United States Patent **8,969,607**. Inventors: Alexander Katz, Namal de Silva, Andrew Solovyov, Alexander Kuperman, Cong-Yan Chen, Partha Nandi, Alexander Okrut, Igor Busygin.

"*Bifuctional active sites for adsorption of NOx"* United States Patent **8,703,083**. Inventors: Andrew Solovyov, Alexander Katz, Enrique Iglesia, Paul Fanson.

"*Novel immobilized calixarenes and related compounds and process for their production*" United States Patent **6,951,690** (Novel Composition of Matter). Inventors: A. Katz, E. Iglesia, and J. M. Notestein.

"*Amorphous silica having discrete voids and spatially organized functionalities formed therein*". United States Patent **6,380,266** (Novel Composition of Matter). Inventors: A. Katz and M. E. Davis. (California Institute of Technology)

"*Method for measuring mechanical properties of thin films using a resonator in an anti-resonance regime*" United States Patent **5,764,068**. Inventors: A. Katz and M. D. Ward. (University of Minnesota)

PEER-REVIEWED PUBLICATIONS BEFORE BERKELEY

"Probing solvent dynamics in concentrated polymer films with a high-frequency shear mode quartz resonator" by A. Katz and M. D. Ward*, *J. Appl. Phys.* **1996**, 80, 4153-4163.

"Rational Catalyst Design via Imprinted Nanostructured Materials" by M. E. Davis*, A. Katz, and W. R. Ahmad, *Chem. Mater.* **1996**, *8*, 1820-1839.

"Investigations into the Mechanisms of Molecular Recognition with Imprinted Polymers" by A. Katz and M. E. Davis*, *Macromolecules* **1999**, *32*, 4113 – 4121.

"Molecular imprinting of bulk, microporous silica" by A. Katz and M. E. Davis*, *Nature* **2000**, *403*, 286-289.
Publication has been highlighted as *News of the Week* in *C&E News* on January 24, 2000 (volume 78, issue 4, p. 16) and in *Science News* on March 18, 2000 (volume 157, p. 187).

"Bipyridine - The Most Widely Used Ligand: A Review of Molecules Comprising at Least Two 2,2'-Bipyridine Units" by C. Kaes, A. Katz and M. W. Hosseini*, *Chem. Rev.* **2000**, *100*, 3553-3590.
Publication is featured on the front cover of the journal issue.

PEER REVIEWED PUBLICATIONS AT BERKELEY:

Publication 1:
"A Steady-State Fluorescence-Based Investigation of the Interaction between Protected Thiols and Gold Nanoparticles" by M. M.-Y. Chen and A. Katz*, *Langmuir* **2002**, *18*, 2413-2420.

Publication 2:
"On Route to the Chiral Imprinting of Bulk Silica" by S. Ini, J. L. Defreese, N. Parra-Vasquez and A. Katz*, *Mat. Res. Soc. Symp. Proc.* **2002**, *723*, M2.3.1-M2.3.7.

Publication 3:
"Synthesis and Characterization of Gold-Silica Nanoparticles Incorporating a Mercaptosilane Core-Shell Interface" by M. M.-Y. Chen and A. Katz*, *Langmuir* **2002**, *18*, 8566-8572.

Publication 4:
"The First Single-Step Immobilization of a Calix-[4]-arene onto the Surface of Silica" by A. Katz*, P. Da Costa, A. C. P. Lam and J. M. Notestein, *Chem. Mater.* **2002**, *14*, 3364-3368.

Publication 5:
"The Thermolytic Synthesis of Imprinted Amines in Bulk Silica" by J. D. Bass and A. Katz*, *Chem. Mat.* **2003**, 15, 2757-2763.

Publication 6:
"The Effect of Outer-Sphere Acidity on Chemical Reactivity in a Synthetic Base Heterogeneous Catalyst" by J. D. Bass and A. Katz*, *Angew. Chem. Int. Ed. Engl.* **2003**, 42, 5219-5222.

Publication 7:
"The Synthesis and Catalytic Application of a New Class of Imprinted Silica" by J. D. Bass, S. L. Anderson, and A. Katz*, *Mat. Res. Soc. Symp. Proc.* **2004**, *787*, G1.3.1-G1.3.6.

Publication 8:
"Imprinting Bulk Inorganic Oxides" by J. L. Defreese and A. Katz* in "Molecularly Imprinted Materials: Science and Technoloby" edited by M. Yan and O. Ramstrom, Marcel Dekker, New York (November, **2004**), pp. 307-328.

Publication 9:
"Grafted Metallocalixarenes as Single-Site Surface Organometallic Catalysts" by J. M. Notestein, E. Iglesia, and A. Katz*, *J. Am. Chem. Soc.* **2004**, 126, 16478-16486.
Publication **9** has been highlighted in *C&E News* on September 27, 2004 (volume 82, number 39, p. 24) and as a Science Concentrate in *C&E News* on December 6, **2004** (volume 82, number 9, p. 33).

Publication 10:
"Self-Assembly in Materials Synthesis" by M. V. Tirrell* and A. Katz*, *MRS Bulletin* **2005**, *30*, 700-704. DOI: 10.1557/mrs2005.205.

Publication 11:
"Investigation of the Core-Shell Interface in Gold@Silica Nanoparticles: A Silica Imprinting Approach" by S. Poovarodom, J. D. Bass, S. J. Hwang, and A. Katz*, *Langmuir* **2005**, *21*, 12348-12356.

Publication 12:
"Synthesis of Confined Chiral Organic Catalysts via Imprinting of Silica" by J. L. Defreese and A. Katz*, *Chem. Mater.* **2005**, *17*, 6503-6506.

Publication 13:
"Shape-Selective Covalent Binding in Bulk, Microporous Imprinted Silica" by J. L. Defreese and A. Katz*, *Micropor. Mesopor. Mat.* **2005**, *89*, 25-32.

Publication 14:
"Enhancing Heterogeneous Catalysis via Cooperative Organic-Inorganic Interfaces" by J. M. Notestein and A. Katz*, *Chem.-Eur. J.* **2006**, *12*, 3854-3965 (invited manuscript).

Publication 15:
"Molecular Motion of Tethered Molecules in Bulk and Surface-Functionalized Materials: A Comparative Study of Confinement" by J. L. Defreese, S.-J. Hwang, A. N. G. Parra-Vasquez, A. Katz*, *J. Am. Chem. Soc.* **2006**, *128*, 5687-5694.

Publication 16:
"Acid-Base Bifunctional and Dielectric Outer-Sphere Effects in Heterogeneous Catalysis: A Comparative Investigation of Model Primary Amine Catalysts" by J. D. Bass, A. Solovyov, A. J. Pascall, and A. Katz*, *J. Am. Chem. Soc.* **2006**, *128*, 3737-3747.
Publication **16** has been highlighted as a Science Concentrate in *C&E News* on March 6, **2006** (volume 84, number 10, p. 62).

Publication 17:
"Bifunctional Thermolytic Imprinting of Silica: Synthesis and Characterization of Discrete Thiol-Amine Functional Group Pairs" by J. D. Bass and A. Katz*, *Chem. Mater.* **2006**, *18*, 1611-1620.

Publication 18:
"Energetics of Small Molecule and Water Complexation in Hydrophobic Calixarene Cavities" by J. M. Notestein, A. Katz*, and E. Iglesia*, *Langmuir* **2006**, *22*, 4004-4014.

Publication 19:
"Structural Assessment and Catalytic Consequences of the Oxygen Coordination Environment in Grafted Ti-Calixarenes" by J. M. Notestein, L. R. Andrini, V. I. Kalchenko, F. G. Requejo*, A. Katz*, and E. Iglesia*, *J. Am. Chem. Soc.* **2007**, *129*, 1122-1131.

Publication 20:
"Photoluminescence and Charge Transfer Complexes of Calixarenes Grafted on TiO_2 Nanoparticles" by J. M. Notestein, E. Iglesia, and A. Katz, *Chem. Mater.* **2007**, *19*, 4998-5005.

Publication 21:
"The Role of Outer-Sphere Surface Acidity in Alkene Epoxidation Catalyzed by Calixarene-Ti(IV) Complexes" by J. M. Notestein, A. Solovyov, L. R. Andrini, F. G. Requejo*, A. Katz*, and E. Iglesia*, *J. Am. Chem. Soc.* **2007**, *129*, 15585-15595.

Publication 22:
"Graftable Chiral Ligands for Surface Organometallic Materials: Calixarenes Bearing Asymmetric Centers Directly Attached to the Lower Rim" by A. Solovyov, J. M. Notestein, K. A. Durkin, and A. Katz*, *New J. Chem.* **2008**, *32*, 1314-1325. DOI: 10.1039/B801434P.

Publication 23:
"Primary Amine Confinement at the Interface of Grafted Calixarenes and Silica" by A. Solovyov, T. J. Amundsen, J. J. Daniels, Y.-G. Kim, and A. Katz,* *Chem. Mater.* **2008**, *20*, 6316-6318. DOI: 10.1021/cm801302g.

Publication 24:
"Vanadocalixarenes on Silica: Requirements for Permanent Anchoring and Electronic Communication" by N. de Silva and A. Katz,* *Chem. Mater.* **2009**, *21*, 1852-1860. DOI: 10.1021/cm803392m

Publication 25:
"Mercaptocalixarene-Capped Gold Nanoparticles via Postsynthetic Modification and Direct Synthesis: Effect of Calixarene Cavity-Metal Interactions" by J.-M. Ha, A. Katz,* A. B. Drapailo, and V. I. Kalchenko, *J. Phys. Chem. C.* **2009**, *113*, 1137-1142.

Publication 26:
"Postsynthetic Modification of Gold Nanoparticles with Calix[4]arene Enantiomers: Origin of Chiral Surface Plasmon Resonance" by J.-M. Ha, A. Solovyov, and A. Katz,* *Langmuir* **2009**, *25*, 153-158.

Publication 27:
"Synthesis and Characterization of Accessible Metal Surfaces in Calixarene-Bound Gold Nanoparticles" by J.-M. Ha, A. Solovyov, and A. Katz,* *Langmuir*, **2009**, *25* (18), 10548–10553. DOI: 10.1021/la9013174. DOI: 10.1039/b922300b
Publication **27** has been highlighted as a Science Concentrate in *C&E News* on August 24, **2009** (volume 87, number 34, pages 32-33).

Publication 28:
"Patterned Metal Polyhedra using Calixarenes as Organizational Scaffolds: Ir-4-based Cluster Assemblies" by N. de Silva, A. Solovyov, and A. Katz,* *Dalton Trans.* **2010**, *39,* 2194-2197. DOI: 10.1039/B922300B.
Publication **28** was featured on the cover of *Dalton Transactions*.

Publication 29:
"Accessibility in Calix[8]arene-Bound Gold Nanoparticles: Crucial Role of Induced-Fit Binding" by J.-M. Ha, A. Soloyyov, and A. Katz,* *J. Phys. Chem. C* **2010**, *114,* 16060-16070. DOI: 10.1021/jp104122m. Invited article.

Publication 30:
"Unexpected phosphate salt-catalyzed hydrolysis of glycosidic bonds in model disaccharides: Cellobiose and maltose" by Alexandre Charmot, and Alexander Katz, *Journal of Catalysis*, **2010**, *276*, 1-5. Http://dx.doi.org/10.1016/j.jcat.2010.08.006

Publication 31:
"A Bioinspired Approach for Controlling Accessibility in Calix[4]arene-bound Metal Cluster Catalysts" by N. de Silva, J-M. Ha, A. Solovyov, M.M. Nigra, I. Ogino, S.W. Yeh, K.A. Durkin, and A. Katz,* *Nat. Chem.* **2010**, *2,* 1062-1068. DOI: 10.1038/nchem.860
Publication **31** has been highlighted as a "News and Views" in *Nature Chemistry* (volume 2, pages 1005-1006) by Prof. Graham Hutchings.

Publication 32:
"Grafted Cellulose Strands on the Surface of Silica: Effect of Environment on Reactivity" by O.M. Gazit, A. Charmot, and A. Katz,* *Chem. Commun.* **2011**, *47,* 376-378. DOI: 10.1039/C0CC02105A.

Publication 33:
"Delamination of Layered Zeolite Precursors under Mild Conditions: Synthesis of UCB-1 via Fluoride/Chloride Anion-Promoted Exfoliation" by I. Ogino, M.M. Nigra, S-J. Hwang, J-M. Ha, T. Rea, S.I. Zones, and A. Katz*, *J. Am. Chem. Soc.*, **2011**, 133, 3288–3291. DOI: 10.1021/ja111147z

Publication 34:
"MPV Reduction Using Al^{III}-Calix[4]arene Lewis Acid Catalysts: Molecular-Level Insight Into Effect of Ketone Binding" by P. Nandi, Y.I. Matvieiev, V.I. Boyko, K.A. Durkin, V.I. Kalchenko, and A. Katz*, *J. Cat.*, **2011**, *284*, 42-49.

Publication 35:
"Bioinspired Catalysts for Biofuels: Challenges and Future Directions," Chapter 8, by T.J. Amundsen and A. Katz, *Chemical and Biochemical Catalysis for Next Generation Biofuels* (RSC Energy and Environment Series). Royal Society of Chemistry, Blake Simmons (Editor), doi:10.1039/9781849732857-00156; ISBN:978-1-84973-030-3. Published on 17 August **2011** on http://pubs.rsc.org.

Publication 36:
"Nonaqueous Fluoride/Chloride Anion-Promoted Delamination of Layered Zeolite Precursors: Exfoliation of PREFER" by E.A. Eilertsen, I. Ogino, S-J. Hwang, T. Rea, S. Yeh, S.I. Zones, and A. Katz*, *Chem. Mater.*, **2011**, *23*, 5404-5408. DOI: 10.1021/cm202364q.

Publication 37:
"Silica Supported Aminoxyls as Reactive Materials for NOx Removal" by T. Luts, E. Iglesia, and A. Katz, *Journal of Materials Chemistry* **2011**, *21*, 982-990. This publication has been highlighted as a Hot Article at http://blogs.rsc.org/jm/2010/12/02/hot-article-nox-removal-via-cascade-reactions-using-silica-and-aminoxyls/

Publication 38:
"Grafted Poly(1→4-β-Glucan) Strands on Silica: A Comparative Study of Reactivity as a Function of Grafting Density" by O.M. Gazit and A. Katz*, *Langmuir*, **2012**, *28* (1), 431–437. DOI: 10.1021/la2036482. This publication is available on the web at http://pubs.acs.org/doi/abs/10.1021/la2036482.

Publication 39:
"Stabilization of Coordinatively Unsaturated Ir_4 Clusters with Bulky Calix[4]arene Phosphine Ligands: A Comparative Study of Mechanical and Chemical Effects" by

A. Okrut, O.M. Gazit, N. de Silva, R. Nichiporuk, A. Solovyov, and A. Katz, *Dalton Transactions* **2012**, *41*, 2091-2099, DOI: 10.1039/C1DT11734C.
Publication **39** has been highlighted as a Hot Article at http://blogs.rsc.org/dt/2012/01/05/hot-article-coordinatively-unsaturated-iridium-clusters/ and is available on the web at http://pubs.rsc.org/en/content/articlelanding/2012/dt/c1dt11734c.

Publication 40:
"Chemisorption and Dehydration of Ethanol on Silica: Effect of Temperature on Selectivity" by T. Luts and A. Katz, *Topics in Catalysis*, **2012**, *55*, 84-92. DOI: 10.1007/s11244-012-9771-9.

Publication 41:
"Gold Nanoparticle-Catalyzed Reduction in a Model System: Quantitative Determination of Reactive Heterogeneity of a Supported Nanoparticle Surface" by Michael M. Nigra, Ilke Arslan, Alexander Katz *, *Journal of Catalysis*, **2012**, *295,* 115-121. http://dx.doi.org/10.1016/j.jcat.2012.08.001.

Publication 42:
"Structures and Stability of Irn(CO)m" by M. Chen, J.E. Dyer, B.C. Gates, A. Katz & D.A. Dixon, *Molecular Physics*: *An International Journal at the Interface Between Chemistry and Physics*, **2012**, *110*, 15-13. To link to this invited article: http://dx.doi.org/10.1080/00268976.2012.703885

Publication 43:
"Glucan Adsorption on Mesoporous Carbon Nanoparticles: Effect of Chain Length and Mesoporosity" by P.-W. Chung, A. Charmot, O. Gazit, and A. Katz*, *Langmuir*, *28*, **2012**, 15222-15232.

Publication 44:
"Dialkylimidazolium Ionic Liquids Hydrolyze Cellulose under Mild Conditions," O. M. Gazit and A. Katz*, *ChemSusChem*, **2012**, *8*, 1542-1548. DOI: 10.1002/cssc.201100803.

Publication 45:
"Understanding the Role of Defect Sites in Glucan Hydrolysis on Surfaces" by O. Gazit and A. Katz*, *J. Am. Chem. Soc.*, **2013**, *135* (11), 4398-4402. DOI: 10.1021/ja311918z.

Publication 46:
"Catalytic Consequences of Open and Closed Grafted Al(III)-Calix[4]arene Complexes for Hydride and Oxo Transfer Reactions" by P. Nandi, W. Tang, A. Okrut, X. Kong, S.-J. Hwang, M. Neurock,* and A. Katz*, *Proc. Natl. Acad. Sci. USA* **2013**, *110*, 2484 – 2489. DOI: 10.1073/pnas.1211158110.

Publication 47:
"Heteroatom-Tolerant Delamination of Layered Zeolite Precursor Materials" by I. Ogino, E. A. Eilersten, S.-J. Hwang, T. Rea, D. Xie, X. Ouyang, S. Zones*, and A. Katz*, *Chem. Mater.*, **2013**, *25* (9), 1502-1509. DOI: 10.1021/cm3032785.

Publication 48:
Accessible Gold Clusters Using Calix[4]arene N-heterocyclic Carbene and Phosphine Ligands; by M. M. Nigra, A. J. Yeh, A. Okrut, A.G. DiPasquale, S.W. Yeh, A. Solovyov and A. Katz* *Dalton Trans.*, **2013**, *42*, 12762-12771.
DOI: 10.1039/C3DT50804H.

Publication 49:
Site Requirements for Gold Catalyzed-Reduction of 4-Nitrophenol using Calixarene-Bound Gold Nanoparticles," by M.M. Nigra, J.-M. Ha, A. Katz*. *Catal. Sci. Tech.* **2013**, 3, 2976-2983. Invited article in themed issue: "Gold Catalysis".

Publication 50:
Hydrolysis Catalysis of *Miscanthus* Xylan to Xylose Using Weal-Acid Surface Sites, by P.-W. Chung, A. Charmot, O.A. Olatunji-Ojo, K.A. Durkin, and A. Katz* *ACS Catalysis*, **2014,** *4 (1)*, 302-310. DOI: 10.1021/cs400939p. Publication **51** was featured on the cover of *ACS Catalysis*.

Publication 51:

Role of Delamination in Zeolite-Catalyzed Aromatic Alkylation: UCB-3 versus 3-D Al-SSZ-70, by R.C. Runnebaum, X. Ouyang, J.A. Edsinga, T. Rea, I. Arslan, S.-J. Hwang, S.I. Zones and A. Katz* *ACS Catalysis*, **2014,** *4*, 2364-2368. DOI: 10.1021/cs500285w.

Publication 52:
AlIII−Calix[4]arene Catalysts for Asymmetric Meerwein−Ponndorf−Verley Reduction, by P. Nandi*, A. Solovyov, A. Okrut, and A. Katz* *ACS Catalysis*, **2014,** *4*, 2492-2495. DOI: 10.1021/cs5001976

Publication 53:
"Identification of Binding and Reactive Sites in Metal Cluster Catalysts: Homogeneous–Heterogeneous Bridges," Chapter 9, by M. M. Nigra and A. Katz, *Bridging Heterogeneous and Homogeneous Catalysis: Concepts, Strategies, and Applications*. Wiley VCH, Can Li and Yan Liu (Editors), doi:10.1002/9783527675906; ISBN: 978-3-527-67593-7. Published on 25 April 2014 on http://onlinelibrary.wiley.com/book/10.1002/9783527675906. (Invited Article)

Publication 54:
"Selective Catalytic Dehydration of Tetrahydro-2-furanylmethanol Dehydration to 5-Methyl-2,3-dihydrofuran Over Large-pore Zeolites," T. Luts and A. Katz*, *Top Catal.*, **2014**, *57*, 899–902. DOI 10.1007/s11244-014-0249-9 (Invited Article)

Publication 55:
"Novel Surfactant-free Route to Delaminated All-silica and Titanosilicate Zeolites Derived from a Layered Borosilicate MWW Precursor," by X. Ouyang, Y.-J. Wanglee, S.-J. Hwang, D. Xie, T. Rea, S.I. Zones* and A. Katz*, *Dalton Trans.*, **2014**, *43*, 10417-10429. DOI: 10.1039/C4DT00383G. Publication **56** was featured on the cover of *Dalton Transactions* (Invited Article).

Publication 56:
"Selective Molecular Recognition by Nanoscale Environments in a Supported Iridium Cluster Catalyst," by A. Okrut, R. C. Runnebaum, X. Ouyang, J. Lu, C. Aydin, S.-J. Hwang, S. Zhang, O. A. Olatunji-Ojo, K. A. Durkin, D. A. Dixon, B. C. Gates*and A. Katz*, *Nature Nanotechnology,* **2014**, *9*, 459-465. DOI: 10.1038/NNANO.2014.72.
Publication **56** was featured in the *News and Views* section of *Nature Nanotechnology*, **2014**, *9*, 412-413, as authored by Professor Avelino Corma in an article entitled, "Cluster Catalysis: A Subtle Form of Recognition," DOI: 10.1038/nnano.2014.114, and was also featured in a variety of online news venues," (See for example: http://uanews.ua.edu/2014/05/scientists-demonstrate-improved-catalyst-control-energy-savings-could-result/)

Publication 57:
"Single-Step Delamination of a MWW Borosilicate Layered Zeolite Precursor under Mild Conditions without Surfactant and Sonication" by X. Ouyang, S.-J. Hwang, R. C. Runnebaum, D. Xie, Y.-J. Wanglee, T. Rea, S. I. Zones,* and A. Katz*, *Journal of the American Chemical Society*, **2014**, *136*, 1449−1461.

Publication 58:
"Cooperative Catalysis on Solid Surfaces versus Soluble Molecules," by M. M. Nigra and A. Katz, Cooperative Catalysis: Designing Efficient Catalysts for Synthesis, René Peters (Editor); ISBN: 978-3-527-33689-0. http://www.wiley.com/WileyCDA/WileyTitle/productCd-3527336893.html.

Publication 59:
"Beyond Relationships between Homogeneous and Heterogeneous Catalysis," by D.A. Dixon, A. Katz*, I. Arslan, B.C. Gates, *Catalysis Letters*, **2014**, *144*, 1785-1789. DOI: 10.1007/s10562-014-1332-3. (Invited Perspective).

Publication 60:
"Catalytic Hydrolysis of Cellulose to Glucose Using Weak-Acid Surface Sites," by A. Charmot, P.-W. Chung, A. Katz*, *ACS Sustainable Chemistry and Engineering* **2014**, *2*, 2866-2872.

Publication 61:
"Single-Pot Synthesis of Uniform Glucan Multilayers on Oxide Particles," by J. Jankolovits, O. M. Gazit, Michael M. M. Nigra, J. Bohling, J. A. Roper III, Alexander Katz*, *Advanced Materials Interfaces* **2015**, *2*, 1400465. DOI: 10.1002/admi.201400465.

Publication 62:
"Patterned Grafted Lewis-Acid Sites on Surfaces: Olefin Epoxidation Catalysis Using Tetrameric Ti(IV)-Calix[4]arene Complexes," by L. Winner, G. Daniloff, R. V. Nichiporuk, A. Solovyov*, A. Katz*, *Topics in Catalysis* **2015**, *58*, 441-450. DOI: 10.1007/s11244-015-0385-x.

Publication 63:
"Heteroatom-Substituted Delaminated Zeolites as Solid Lewis-Acid Catalysts," by X. Ouyang, S.-J. Hwang, D. Xie, T. Rea, S. I. Zones*, A. Katz*, *ACS Catalysis* ***2015***, *5*, 3108-3119. DOI: 10.1021/cs5020546.

Publication 64:
"Importance of Internal Porosity for Glucan Adsorption in Mesoporous Carbon Materials," P.-W. Chung, A. Charmot, T. Click, Y. Lin, Y. Bae, J.-W. Chu*, and A. Katz*, *Langmuir* **2015**, *31*, 7288-7295. DOI: 10.1021/acs.langmuir.5b01115.

Publication 65:
"Weak-Acid Sites Catalyze Crystalline-Cellulose Hydrolysis to Glucose in Water: Importance of Carbon Post-Synthetic Surface Functionalization," by A. T. To, P.-W. Chung, A. Katz*, *Angewandte Chemie International Edition in English* **2015**, 54, 11050–11053. Publication 66 has been identified as a frontispiece and hot article. DOI: 10.1002/amoe/201504865.

Publication 66:
*"*Genesis of Delaminated-Zeolite Morphology: 3-D Characterization of Changes by STEM Tomography*,"* by I. Arslan*, J. D. Roehling, I. Ogino, K. J. Batenburg, S. I. Zones, B. C. Gates, A. Katz, *J. Phys. Chem. Lett.* **2015**, *6*, 2598–2602. DOI: 10.1021/acs.jpclett.5b01004.

Publication 67:
"Long-Chain Gucan Adsorption and Depolymerization in Zeolite-Templated Carbon Catalysts," by Po-Wen Chung, Mizuho Yabushita, Anh The To, YounJue Bae, Joseph Jankolovits, Hirokazu Kobayashi, Atsushi Fukuoka*, Alexander Katz*, *ACS Catalysis* **2015**, *5*, 6422–6425. DOI: 10.1021/acscatal.5b01172.

Publication 68:
"Stable Aqueous Dispersions of Hydrophobically Modified Titanium Dioxide Pigments through Polyanion Adsorption: Synthesis, Characterization, and Application in Coatings," by J. Jankolovits, A. Kusoglu, A. Z. Weber, A. Van Dyk, J. Bohling, J. A. Roper, III, C. J. Radke, A. Katz*, *Langmuir* **2016**, *32*, 1929–1938.

Publication 69:
"Unprecedented Selectivity in Molecular Recognition of Carbohydrates by a Metal–Organic Framework," by M. Yabushita, P. Li, V. Bernales, H. Kobayashi, A. Fukuoka,* L. Gagliardi,* O. K. Farha,* A. Katz*, *ChemComm* **2016**, *52*, 7094–7097. DOI: 10.1039/c6cc03266d.

Publication 70:
"*Effect of Coordination Environment in Grafted Single-Site Ti-SiO_2 Olefin Epoxidation Catalysis*," by N. A. Grosso-Giordano, A. Solovyov, S. Hwang, A. Katz*,*Topics in Catalysis* **2016**, *59*, 1110–1122.

Publication 71:
"Silica-Supported Phosphonic Acids as Thermally and Oxidatively Stable Organic Acid Sites," by A. Charmot, A. Solovyov, A. Katz*, *Chemistry of Materials* **2016**, *28*, 6166–6177. DOI: 10.1021/acs.chemmater.6b02027.

Publication 72:
"*Unprecedented Increase in Affinity for Eu(III) over Am(III) through Silica Grafting of a Carbamoylmethylphosphine Oxide-Calix[4]arene Site*," by E. M. May, A. Solovyov, Y. Guo, A. Drapailo, Y. Matveev, V. Kalchenko, H. Nitsche, A. Katz*, *European Journal of Inorganic Chemistry* **2016**, *28*, 4542–4545. DOI: 10.1002/ejic.201600946.

Publication 73:
"*Complete Furanics–Sugar Separations with Metal–Organic Framework NU-1000*," by M. Yabushita, P. Li, H. Kobayashi, A. Fukuoka,* O. K. Farha,* A. Katz*, *ChemComm* **2016**, *52*, 11791–11794. DOI: 10.1039/c6cc05864g. Publication 73 has been featured as a Science Concentrate in *C&E News* 2016, volume 94 (http://cen.acs.org/articles/94/i37/MOF-traps-molecules-gum-bioethanol.html).

Publication 74:
"*Zeolite-Templated Carbon Catalysts for Adsorption and Hydrolysis of Cellulose-Derived Long-Chain Glucans: Effect of Post-Synthetic Surface Functionalization*," by M. Yabushita, K. Techikawara, H. Kobayashi, A. Fukuoka, A. Katz*, *ACS Sustainable Chemistry and Engineering* **2016**, *4*, 6844 - 6851. DOI: 10.1021/acssuschemeng.6b01796.

Publication 75:
"*Stabilizing Single Sites on Solid Supports: Robust Grafted Ti(IV)-Calixarene Olefin Epoxidation Catalysts via Surface Polymerization and Cross-Linking*," by Y. Guo, A. Solovyov, N. Grosso-Giordano, S.-J. Hwang, A. Katz*, *ACS Catalysis* **2016**, *6*, 7760 – 7768. DOI: 10.1021/acscatal.6b01998.

Publication 76:
"*Insights into Supramolecular Sites Responsible for Complete Separation of Biomass-Derived Phenolics and Glucose in Metal-Organic Framework NU-1000*," by M. Yabushita, P. Li, K. A. Durkin, H. Kobayashi, A. Fukuoka, O. K. Farha, and A. Katz*, *Langmuir* **2017**, *33*, 4129 – 4137.

Publication 77:
"Selective Metal–Organic Framework Catalysis of Glucose to 5-Hydroxymethylfurfural Using Phosphate-Modified NU-1000," by M. Yabushita,* P. Li, T. Islamoglu, H. Kobayashi, A. Fukuoka,* O. K. Farha,* and A. Katz*, *Ind. Eng. Chem. Res.* **2017**, *56*, 7141 – 7148. *Invited Article.*

Publication 78:
"*Dialing in Single-Site Reactivity of a Supported Calixarene-Protected Tetrairidium Cluster Catalyst*," by A. Palermo, A. Solovyov, D. Ertler, A. Okrut*, B. C. Gates*, A. Katz*, *Chemical Science* **2017**, *8*, 4951 – 4960.

Publication 79:
"*Role of N-Heterocyclic Carbenes as Ligands in Iridium Carbonyl Clusters*," by S. Zhang, S. D. Foyle, A. Okrut, A. Solovyov, A. Katz*, B. C. Gates*, D. A. Dixon*, *J. Phys. Chem. A* **2017**, *121*, 5029 – 5044.

Publication 80:
"*Effect of Defect Site Pre-Organization on Fe(III) Grafting and Stability: A Comparative Study of Delaminated Zeolite vs. Amorphous Silica Supports*" by N. A. Grosso-Giordano, A. Yeh, A. Okrut, D. J. Xiao, F. Grandjean, G. J. Long,* S. I. Zones,* A. Katz,* *Chemistry of Materials* **2017**, *29*, 6480 – 6392.

Publication 81:
"*Atomically Dispersed Supported Metal Catalysts: Perspectives and Suggestions for Future Research*" by B. C. Gates, M. Flytzani-Stephanopoulos, D. A. Dixon, A. Katz, *Catal. Sci. Technol.* **2017**, *7*, 4259 – 4275.

Publication 82:
"*Nanoporous Gold Assemblies of Calixarene-Phosphine-Capped Colloids*" by C. Schottle, E. Clark, A. Harker, A. Solovyov, A. T. Bell, and A. Katz,* *ChemComm* **2017**, *53*, 10870 – 10873.

Publication 83:
"*Epoxidation of 1-octene under harsh tail-end conditions in a flow reactor I: a comparative study of crystalline vs. amorphous catalysts*" by M. Aigner, N. Grosso-Giordano, A. Okrut, S. I. Zones, A. Katz, *Reaction Chemistry and Engineering* **2017**, *2*, 842 – 851.

Publication 84:
"*Epoxidation of 1-octene under harsh tail-end conditions in a flow reactor II: impact of delaminated-zeolite catalyst surface area and structural integrity on catalytic performance*" by M. Aigner, N. A. Grosso-Giordano, Christian Schöttle, A. Okrut, S. I. Zones, A. Katz, *Reaction Chemistry and Engineering* **2017**, *2*, 852 – 861.

Publication 85:
"*Outer-Sphere Control of Catalysis on Surfaces: A Comparative Study of Ti(IV) Single-Sites Grafted on Amorphous versus Crystalline Silicates for Alkene Epoxidation*" by N. A. Grosso-Giordano, C. Schroeder, A. Okrut, A. Solovyov, C. Schottle, W. Chasse, N. Marinkoyic, H. Koller, S. I. Zones, A. Katz, *Journal of the American Chemical Society* **2018**, *140*, 4956 – 4960.

* denotes corresponding author(s) in list of publications above

INVITED ORAL PRESENTATIONS:

"New Templated Materials for Specific Adsorption and Catalysis" by *A. Katz*, The Clorox Company Research and Development Center, May 17, 2002, Pleasanton, California; ExxonMobil Global Research and Development, June 20, 2002, Clinton, New Jersey; General Electric Global Research and Development, June 21, 2002, Niskayuna, New York.

"On Route to the Imprinting of Multiple Chemical Functionalities on Solid Surfaces: Controlling Nucleation on the Nanometer Length Scale" by *A. Katz*, Neose Technologies Research and Development, June 28, 2002, Horsham, Pennsylvania.

"Functional Materials at the Interface Between Inorganic and Supramolecular Calixarene Chemistry" by *A. Katz*, Department of Chemistry, University of California at Berkeley, Berkeley, California, September 26, 2003.

"Imprinted Materials with (Almost) Unlimited Possibilities: Synthesis of Nanoscale Organization in Bulk Solids" by *A. Katz*, 3M Corporation, October 3, 2003, St. Paul, Minnesota.

"The Design and Synthesis of Imprinted Silica Using Nanoparticle Templates" by *A. Katz*, S. Poovarodom, M. M. Y. Chen, ACS Spring National Meeting, March 31, 2004, Anaheim, California.

"The Design and Synthesis of Functional Materials Based on Molecular Building Blocks" by *A. Katz*, Department of Chemistry "G. Ciamician", University of Bologna, Bologna, Italy, July 22, 2004.

"The Synthesis and Characterization of Bifunctional Hybrid Organic-Inorganic Catalysts" by *A. Katz,* ACS National Meeting, August 25, 2004, Philadelphia, Pennsylvania.

"Organizing Chemical Functional Groups on the Nanoscale for Fun and Function" by *A. Katz,* Department of Chemistry, University of California at Santa Cruz, Santa Cruz, California, October 13, 2004.

"Support and Organizational Effects in Nanostructured Hybrid Organic-inorganic Catalysts" by A. Katz, Aiche National Meeting, November 8, 2004, Austin, Texas.

"Design and Synthesis of Functional Materials via Templating on the Nanoscale" by *A. Katz,* Department of Chemical Engineering, University of Minnesota, Minneapolis, Minnesota, November 11, 2004.

"Design, Synthesis, and Characterization of Bulk Imprinted Silica on Multiple Length Scales" by *A. Katz,* ACS National Meeting, San Diego, California, March 16, 2005.

"Design and Synthesis of Functional Materials on the Nanoscale Using Molecular Templates" by *A. Katz,* Department of Chemical Engineering, California Institute of Technology, Pasadena, California, March 24, 2005.

"Synthesis of Templated Functional Materials Based on Hybrid Organic-Inorganic Building Blocks" by *A. Katz,* Department of Chemistry, University of California at Irvine, Irvine, California, April 21, 2005.

Plenary Lecture: "New Concepts in Synthesis of Solid Acid-Base Catalysts: Composites, Grafting, Immobilization" by *A. Katz,* 5th International Symposium on Acid-Base Catalysis, Puerto Vallarta, Mexico, June 30, 2005.

"New Understandings of Chemical Reactivity on Solids Enabled by Synthesis of Isolated Active Sites" by A. Katz, Department of Chemical Engineering, Princeton University, Princeton, New Jersey, October 26, 2005.

"Calixarenes as Scaffolds for Catalytic Structures" by *J. M. Notestein*, A. Katz, E. Iglesia, AIChE National Meeting, November 3, 2005, Cincinnati, Ohio.

"Enabling Design of Hybrid Organic-Inorganic Materials: Achieving Site Isolation and Nanoscale Functional Group Organization" by A. Katz, Surface Science and Catalysis Seminar, Lawrence Berkeley National Laboratory, November 10, 2005, Berkeley, California.

"On Route to Functional Materials Via Self-Assembly Imprinting of Bulk Silica Using Nanoparticle Templates" by *A. Katz,* MRS National Meeting, November 30, 2005, Boston, Massachusetts.

"Functional Hybrid Organic-Inorganic Materials Based on Nanoscale Templated Active Sites" by *A. Katz,* Fourth Eastern Mediterranean Conference on Chemical Engineering, January 9 - 11, 2006, Dead Sea, Israel.

"Elucidating Chemical Reactivity on Solids via Synthesis of Isolated Active Sites" by *A. Katz*, Department of Chemical and Biological Engineering, University of Colorado at Boulder, Boulder, Colorado, April 25, 2006.

"Controlling Inner-Sphere Ligation of Oxygen to Ti Using a Surface Organometallic Catalysis Approach" by *A. Katz*, 2006 DOE/BES Catalysis Program Meeting, May 23, 2006, Cambridge, Maryland.

"Multifunctional Hybrid Organic-Inorganic Materials Based on Nanoscale Templated Active Sites" by *A. Katz*, Department of Chemical Engineering, Stanford University, Stanford, California, May 30, 2006.

"Hybrid Organic-Inorganic Interfaces for Enhancing Heterogeneous Catalysis" by *A. Katz*, Gordon Conference on Catalysis, June 25 - 30, 2006, New London, New Hampshire.

"Understanding Chemical Reactivity on Solids Using Hybrid Organic-Inorganic Active Sites: Inner- and Outer-Sphere Approaches" by A. Katz, Department of Chemical Engineering, University of Virginia, Charlottesville, Virginia, November 2, 2006.

Virginia Polytechnical Institute, Blacksburg, Virginia, November 3, 2006.

Dow Corporate Research and Development, Midland, Michigan, February 28, 2007.

Philip Morris Research and Development, Richmond, Virginia, May 23, 2007.

"Towards Understanding the Role of Surface in the Heterogenization of Homogeneous Catalysts" by A. Katz, ISHHC XIII, Berkeley, California, July 17, 2006.

"Investigating effect of environment on heterogeneous Ti-catalyzed olefin epoxidation: inner- and outer-sphere ligand effects" by A. Katz, ACS National Meeting, Boston, Massachusetts, August 21, 2007.

"Bioinspired Approaches for Outer-sphere Control of Aminocatalysis and Amine Confinement" by A. Katz, Pacific Coast Catalysis Society Annual Meeting, Pasadena, California, November 2, 2007.

"Advanced Catalysts for Conversion of Biologically Derived Feedstocks" by A. Katz, ACS National Meeting, New Orleans, Louisiana, April 6, 2008.

"Outer-sphere Control of Heterogeneous Aminocatalysis and Ti(IV)-catalyzed Olefin Epoxidation: Cooperativity and Confinement" by A. Katz, ACS National Meeting, New Orleans, Louisiana, April 8, 2008.

"Outer-sphere Control of Heterogeneous Catalysis: Cooperativity and Confinement" by A. Katz, Texas A&M University, College Station, Texas, April 25, 2008.

"Inner- and Outer-sphere Control of Geterogeneous Catalysis: Cooperativity and Confinement" by A. Katz, Fifth Eastern Mediterranean Conference on Chemical Engineering, May 28, 2008, Cetraro, Italy.

"Outer-sphere Control of Heterogeneous Aminocatalysis: Cooperativity and Confinement" by A. Katz, International Symposium on Creation and Control of Advanced Selective Catalysis as the Celebration of the 50th Anniversary of the Catalysis Society of Japan, Kyoto, Japan, July 10, 2008.

"Understanding the Role of Surface from the Perspective of Heterogenizing Homogeneous Catalysts" by A. Katz, Transatlantic Frontiers of Chemistry, Manchester, United Kingdom, August 3, 2008.

"Outer-sphere control of heterogeneous aminocatalysis: support effects and confinement" by A. Katz, 74th Annual Meeting of the Israel Chemical Society, Tel Aviv, Israel, February 9, 2009.

"Structure-Function Relations in Heterogeneous Catalysis: Inner- and Outer-Sphere Effects" by A. Katz, Department of Chemical Engineering, Technion – Israel Institute of Technology, February 11, 2009.

"Structure-Function Relations in Heterogeneous Catalysis: Inner- and Outer-Sphere Effects" by A. Katz, Department of Chemistry, Ben Gurion University of the Negev, Beer-Sheva, Israel, February 23, 2009.

"New Structure-Function Relations for Hybrid Organic-Inorganic Heterogeneous Catalyst Design" by A. Katz, 2009 AICHE Annual Meeting, Nashville, TN, November 10, 2009.

"Controlling Surface Accessibility and Microenvironment in Calixarene-Bound Metal Colloids" by A. Katz, Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, February 16, 2010.

"Understanding Heterogeneous Catalysis via Synthesis of New Organic-Inorganic Interfaces" by A. Katz, Michigan Catalysis Society, Livonia, MI, February 16, 2010.

"Calixarene-Bound Colloids as Site-Isolated and Accessible Nanostructures" by A. Katz, 6th Eastern Mediterranean Chemical Engineering Conference, Belek, Antalya, Turkey, March 9, 2010.

"On Route to Controlling Heterogeneous Catalysis with Calixarene-bound Metals" by A. Katz, 2010 ACS Meeting, San Francisco, CA, March 22, 2010.

"Understanding Heterogeneous Catalysis via Synthesis of New Organic-Inorganic Interfaces" by A. Katz, BASF Catalysts LLC, Iselin, NJ, April 21, 2010.

"Controlling Catalysis in Calixarene-Bound Metal Clusters: Surface Accessibility and Microenvironment" by A. Katz, New York Catalysis Society, New Brunswick, NJ, April 21, 2010.

"Design of Bioinspired Catalysis: Synthesis, Characterization, and Performance" by A. Katz, School of Chemical, Biological, and Materials Engineering, University of Oklahoma, May 5, 2010.

"Bioinspired Catalysis by Design: Synthesis, Characterization, and Function" by A. Katz, Department of Chemical Engineering, Kansas State, October 6, 2010.

"Calixarene-Bound Metal Clusters: Controlling Electronics, Accessibility, and Catalysis on Metal Surfaces Using Organic Ligands" by A. Katz, Molecular Foundry LBL Seminar, November 9, 2010.

"Bioinspired Catalysis by Design: Synthesis, Characterization, and Function" by A. Katz, Department of Chemical and Biomolecular Engineering, Georgia Institute of Technology, November 10, 2010.

"Enhancing and Understanding Biomass Conversion with Porous Hybrid Organic-Inorganic Materials" by A. Katz, Pacifichem Conference, Honolulu, HI, December 17, 2010.

"Understanding Catalysis via Synthesis and Characterization of Organic-Inorganic Interfaces on Silica" by A. Katz, 241st ACS National Meeting, Anaheim, CA, March 29, 2011.

"Calixarene-bound gold clusters: Control of accessibility and catalysis" by A. Katz, 241st ACS National Meeting, Anaheim, CA, March 29, 2011.

"Design of Bioinspired Catalysis: Synthesis, Characterization, and Performance" by A. Katz, Keynote Talk, 22nd North American Catalysis Society Meeting, Detroit, MI, June 8, 2011.

"Grafted Poly(1→4-β-glucan) Strands on Silica: A Comparative Study of Surface Reactivity as a Function of Grafting Density", by O. Gazit, A. Katz, ACS 242, Denver, USA, August 2011.

"Bioinspired Approaches for Enhancing and Understanding Heterogeneous Catalysis" by A. Katz, School of Chemical Engineering, Purdue University, West Lafayette, IN, September 20, 2011.

"Control of Heterogeneous Catalysis via Design of Organic-Inorganic Interfaces" by A. Katz, 2011 DOE/BES Catalysis Sciences Meeting, Annapolis, MD, October 2, 2011.

"Hydrolysis of Poly(1→4-β-glucan) Strands Derived From Cellulose Using Mild Acidity and Temperature", by O. Gazit and A. Katz, AICHE 11, October 2011.

"Catalysis as the Basis for the Innovation in Materials Science", February 21, 2012.

"Design, Synthesis, and Characterization of Bioinspired Heterogeneous Catalysts" by A. Katz, International Symposium on Catalytic Biomass Conversion, Hokkaido University, February 24, 2012.

"Organic Ligand Control of Heterogeneous Catalysis" by A. Katz, Gabor A. Somorjai Award to Enrique Iglesia and James A. Dumesic, 243rd American Chemical Society Meeting, San Diego, California, March 29, 2012.

"Reactive Surfaces for Understanding and Enhancing Biomass Depolymerization" by A. Katz, 7th Eastern Mediterranean Chemical Engineering Conference (EMCC-7), Corfu, Greece, April 29, 2012.

"Delamination of Zeolites Under Mild Conditions" by I. Ogino, S. I. Zones, and A. Katz, ZMPC 2012 International Symposium on Zeolites and Microporous Materials, Hiroshima, Japan, July 28, 2012.

"General Heteroatom-Tolerant Method for Delamination of Layered Zeolite Precursors," by I. Ogino, S. I. Zones, A. Katz, International Symposium on Zeolites and Microporous Crystals (ZMPC) 2012, Hiroshima, Japan, July 30, 2012.

"Enhancing Heterogeneous Catalysis via Design of Organic-Inorganic Interfaces" by A. Katz, the 5th GCOE International Symposium, Tohoku University, Sendai, Japan, September 12, 2012.

"Reactive Surfaces for Cellulose Depolymerization" by A. Katz, Alpha Chi Sigma Award Symposium on Behalf of Enrique Iglesia, 2012 AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 29, 2012.

"Control of Molecular Catalysis on Surfaces Using Calixarene-Inorganic Interfaces" by A. Katz, Department of Chemistry, University of Miami, Coral Gables, Florida, February 1, 2013.

"Engineering Solid Catalysts on the Molecular Level Using Organic-Inorganic Interfaces" by A. Katz, Department of Chemical Engineering, Columbia University, New York, New York, March 26, 2013.

"Control of Molecular Catalysis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Molecular Design Institute, New York University, New York, New York, March 29, 2013.

"Kinetic Consequences of Open Sites in Heterogeneous Catalysis" by A. Katz, Olah Award Symposium in Honor of Alexis T. Bell, 245th American Chemical Society Meeting, New Orleans, Louisiana, April 8, 2013.

"Control of Molecular Catalysis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Department of Chemical System Engineering University of Tokyo August 2, 2013

Keynote Talk: "Control of Molecular Catalysis on Surfaces Using Bioinspired Approaches" by *A. Katz,* ISHHC-16 International Symposium on Relations between Homogeneous and Heterogeneous Catalysis, Hokkaido, University, Sapporo, Japan August 7, 2013.

"The Importance of Open Sites in Gold Catalysis: Oxidation and Reduction Reactions" by M.M. Nigra, A. Katz, ISHHC-16 (16th International Symposium on Relations between Homogeneous and Heterogeneous Catalysis), Sapporo, Japan, Aug. 2013. (Poster) *Won Best Poster Award.*

"The New World Symphony and Technological Leadership" by *A. Katz,* Ambitious Leader's Program for Fostering Future Leaders to Open New Frontiers in Materials Science, Hokkaido University, Sapporo, Japan March 7, 2014

"Beyond Composition: What Differentiates Vacancies on a Metal Surface Catalytically?", by A. Katz, 247th ACS Meeting Energy & Fuels Distinguished Researcher Award Symposium March 17, 2014.

"Heteroatom-Substituted Delaminated SSZ-70 Zeolite Catalysts" by *A. Katz,* 247th ACS Conference Somorjai Award Symposium March 18, 2014.

"Design and Synthesis of a Deactivation-Resistant Ti-Based Olefin Epoxidation Catalyst" by A. Katz, LyondellBasell Houston Technology Center Channelview, Texas March 20, 2014

"The Homogenization of Heterogeneous Catalysis: Reactivity of Single Sites on Surfaces That Have No Parallel in Solution" by *A. Katz,* Department of Chemical & Biological Engineering Iowa State University April 17, 2014.

"Polymerized Overlayers for Synthesis of Deactivation-Resistant Lewis-Acid Catalysts" by A. Katz, 238th ACS Conference Storch Award Symposium August 11, 2014.

"The Homogenization of Heterogeneous Catalysis: Reactivity of Single Sites on Surfaces That Have No Parallel in Solution" by *A. Katz,* Department of Chemistry and Geochemistry, Colorado School of Mines, December 5, 2014.

"The Homogenization of Heterogeneous Catalysis: Reactivity of Single Site on Surfaces That Have No Parallel in Solution" by A. Katz, Catalysis Club of Chicago, Skokie Illinois, March 9, 2015.

"Control of Molecular Cataylsis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Department of Chemical and Biological Engineering, Northwestern University, March 9, 2015.

"Control of Molecular Catalysis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Catalysis Seminar Argonne National Laboratory, March 10, 2015.

"The Homogenization of Heterogeneous Catalysis: Reactivity of Single Sites on Surfaces That Have No Parallel in Solution" by A. Katz, University of Massachusetts, Department of Chemical Engineering Amherst, MA, April 21, 2015.

"Control of Molecular Catalysis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Department of Chemical and Biomolecular Engineering, NYU Poly, April 24, 2015.

"Getting Two Chemical Functional Groups to Work Together Rather Than Ignore Each Other" by A. Katz, Staff Seminar College of Chemistry, University of California, Berkeley, May 5, 2015.

"Control of Molecular Catalysis on Surfaces Using Organic-Inorganic Interfaces" by A. Katz, Eastman Southwall Technologies, Palo Alto, CA, May 8, 2015.

Keynote Talk: "Molecular Engineering of Single-Site Catalysts on Surfaces" by A. Katz, 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 16, 2015.

"New Organic-Inorganic Interfaces for Enhancing Catalysis on Solid Surfaces" by A. Katz, Telluride Scientific Research Center Conference on Catalysis, Telluride, CO, July 8, 2015.

"Organic-Ligand Control of Binding in Supported Molecular Cluster Catalysts" by A. Katz, DOE BES Catalysis Contractor's Meeting, Annapolis, MD, July 21, 2015.

"Functional Nanopores in Carbonaceous and Zeolitic Catalysts" by A. Katz, Gordon Research Conference on Nanoporous Materials and Their Applications, Holderness, NH, August 11, 2015.

"Catalytic Consequences of Layered Zeolite Precursor Delamination" by A. Katz, 8th Sino-U.S. Joint Conference on Chemical Engineering, Shanghai, China, October 15, 2015.

"Control of Cooperative Catalysis on Surfaces Using Molecular Organic-Inorganic Interfaces" by A. Katz, Karlsruhe Institute of Technology, Department of Inorganic Chemistry, November 4, 2015.

"Control of Cooperative Catalysis on Surfaces Using Molecular Organic-Inorganic Interfaces" by A. Katz, Fritz Haber Institute, Department of Physical Chemistry, November 5, 2015.

"On route to carbon catalyst design for polysaccharide depolymerization" by A. Katz, Pacifichem, Honolulu, HI, December 19, 2015.

"Single-Site Catalysis with Supported Tetrairidium Molecular Clusters" by A. Katz, Pacifichem, Honolulu, HI, December 16, 2015.

"Molecular Engineering of Catalysts Derived from Zeolites" by A. Katz, Hokkaido University – UC Berkeley Joint Symposium on Chemical Sciences and Engineering, Hokkaido University, Sapporo, Japan, January 7, 2016.

"Control of Cooperative Catalysis on Surfaces Using Molecular Organic-Inorganic Interfaces" by A. Katz, Department of Chemical Engineering, University College London, London, England, February 29, 2016.

"Factors that affect olefin hydrogenation in supported single-site tetrairidium cluster catalysts" by A. Katz, ENFL Distinguished Researcher Award Symposium in Honor of Stu Soled, 251st American Chemical Society Meeting, San Diego, CA, March 15, 2016.

"Katz-Group and Chevron Collaboration: Opportunities to Open New Areas in Catalysis Science" by A. Katz, Chevron Richmond Technology Center, Richmond, California, March 24, 2016.

"Functional Organic-Inorganic Interfaces for Enhancing Catalysis" by A. Katz, Gordon Research Conference in Catalysis, 2016, Colby-Sawyer College, New London, NH, June 13, 2016.

"Controlling supported noble metal cluster catalysts via ligand effects" by A. Katz, 16th International Congress on Catalysis, Beijing, China, July 4, 2016.

"Adsorption and catalytic depolymerization of long-chain glucan over post-synthetically modified zeolite-templated carbons" by M. Yabushita, K. Techikawara, H. Kobayashi, A. Fukuoka, and A. Katz, Division of Energy and Fuels, 252nd American Chemical Society Meeting, Philadelphia, Pennsylvania, August 22, 2016. Invited Talk.

"Controlling environments for catalytic hydrogen and oxygen transfer on solid supports" by A. Katz, Division of Energy and Fuels, 252nd American Chemical Society Meeting, Philadelphia, Pennsylvania, August 25, 2016. Invited Keynote Talk.

"Functional Organic-Inorganic Interfaces for Separations, Catalysis, and Paints and Coatings" by A. Katz, Dow Chemical Company Central Research and Development, Midland, Michigan, November 1, 2016.

"Lewis and Brønsted Acid Catalysis with Delaminated Zeolites" by A. Katz, AIChE Annual Meeting, Practice Award to Stacey Zones, San Francisco, California, November 16. 2016.

"Molecular Design of Precatalysts and Adsorption Sites" by A. Katz, 8th Eastern Mediterranean Chemical Engineering Conference, Haifa, Israel, February 26, 2017.

"Zeolites as Preorganized Environments for Catalysis" by A. Katz, FEZA Meeting 2017, Sofia, Bulgaria, July 5, 2017. Invited Keynote Lecture.

"Single Site Catalysis: Molecular-design aspects controlling hydrogenation on supported molecular cluster catalysts" by A. Katz, SunCat Catalysis Summer School, Stanford, California, August 17, 2017. Invited Lecture.

"Understanding How Environment Affects Catalysis on Surfaces" by A. Katz, Ohio State University, Department of Chemical and Biomolecular Engineering Colloquium, November 9, 2017.

"Effect of catalyst crystallinity on deactivation for olefin epoxidation utilizing organic hydroperoxide as oxidant" by A. Katz, ACS Meeting New Orleans, March 21, 2018.

"Molecular Design of Adsorption Sites for Biomass-Derived Feedstock Detoxification" by A. Katz, American Process, Thomaston Biorefinery, Thomaston, Georgia, March 23, 2018.

"Detoxification of Biomass Feedstocks with Molecularly Engineered Materials" by A. Katz, POET, Sioux Falls, South Dakota, April 16, 2018.

"Molecular Design of Deactivation-Resistant Lewis-Acid Catalysts (and Materials for Biomass Feedstock Detoxification)" by A. Katz, ExxonMobil Chemicals, Baytown, Texas, April 18, 2018.

"Molecular Design of Deactivation-Resistant Lewis-Acid Catalysts and Corrosion-Resistant Coatings" by A. Katz, Dow Chemical, Lake Jackson, Texas, April 19, 2018.

"Environment on metal surfaces affects catalysis involving hydrogen transfer: insights from a uniform supported molecular catalyst obtained through a combination of precise synthesis, spectroscopy, kinetics, and electronic structure calculations" by A. Katz, Southwest Catalysis Society Spring Symposium, Houston, Texas, April 20, 2018. Invited plenary lecture.

NON-INVITED ORAL PRESENTATIONS:

"Chemical Reactivity Control in Heterogeneous Systems via Imprinting" by *A. Katz*, AIChE National Meeting, November 17, 2000, Los Angeles, California.

"On Route to the Chiral Imprinting of Bulk Silica" by S. Ini, J. L. Defreese and *A. Katz*, AIChE National Meeting, November 5, 2001, Reno, Nevada

"On Route to the Chiral Imprinting of Bulk Silica" by S. Ini, J. L. Defreese and *A. Katz*, MRS National Meeting, April 3, 2002, San Francisco, California.

"Design and Synthesis of Immobilized Calix-[4]-arene Materials for the Specific Adsorption of Organic Molecules from Aqueous Solution" by *A. Katz*, J. Notestein, P. Da Costa, A. Lam, ACS National Meeting, April 7, 2002, Orlando, Florida.

"Investigating the Interaction of protected thiols with gold nanoparticles" by *A. Katz* and M. M. Y. Chen, ACS National Meeting, April 8, 2002, Orlando, Florida.

"The Design and Synthesis of Immobilized Calixarene Adsorbents" by J. M. Notestein, *A. Katz* and E. Iglesia, AIChE National Meeting, November 7, 2002, Reno, Nevada.

"A New Strategy for Synthesizing Imprinted Silica via Thermolysis" by *J. D. Bass* and A. Katz, ACS National Meeting, March 23, 2003, New Orleans, Louisiana.

"Shape-Selective Binding in Templated Nanopores" by *J. L. Defreese* and A. Katz, ACS National Meeting, March 23, 2003, New Orleans, Louisiana.

"Design and Synthesis of Immobilized Calixarenes for Specific Adsorption" by *J. M. Notestein* and A. Katz, ACS National Meeting, March 25, 2003, New Orleans, Louisiana.

"Synthesis of Gold-Silica Core-Shell Nanoparticles Incorporating a Mercaptosilane Interface via Self-Assembly", by M. M. Y. Chen, S. Poovarodom, and *A. Katz*, ACS National Meeting, March 26, 2003, New Orleans, Louisiana.

"The Synthesis of Building Blocks for Templating Silica via Self Assembly: Gold-Silica Nanoparticles Incorporating a Mercaptosilane Core-Shell Interface" by M. M. Y. Chen and *A. Katz*, MRS National Meeting, April 25, 2003, San Francisco, California.

"Control of Heterogeneous Base Catalyst Activity Using Materials Synthesis by Design" by J. D. Bass, S. L. Anderson, N. G. Parra-Vasquez, and *A. Katz*, Russian American Seminar: Advances in the Understanding and Application of Catalysis, Moscow, Russia, May 29, 2003.

"Calixarene-Inorganic Oxide Composites as Scaffolds for Catalytic Structures" by J. M. Notestein, *A. Katz*, and E. Iglesia, Russian American Seminar: Advances in the Understanding and Application of Catalysis, Moscow, Russia, May 30, 2003.

"Organic-Inorganic Composites as Scaffolds for Catalytic Structures" by J. M. Notestein, *A. Katz*, and E. Iglesia, 18th North American Catalysis Society Meeting, June 3, 2003, Cancun, Mexico.

"Design and Synthesis of Immobilized Calixarenes for Specific Adsorption and Catalysis" by *J. M. Notestein*, A. Katz, and E. Iglesia, ACS National Meeting, September 11, 2003, New York, New York.

"The Design and Synthesis of Immobilized Calixarenes for Specific Adsorption and Catalysis" by *J. M. Notestein*, A. Katz, and E. Iglesia, AIChE Annual Meeting, November 17, 2003, San Francisco, California.

"Tuning Active Site Polarity to Control Activity and Leaching in Heterogeneous Catalysis" by *J. D. Bass*, S. L. Anderson, and A. Katz, AIChE Annual Meeting, November 17, 2003, San Francisco, California.

"Shape-Selective Covalent Binding in Bulk Imprinted Silica" by *J. L. Defreese* and A. Katz, AIChE Annual Meeting, November 18, 2003, San Francisco, California.

"On Route to the Colloidal Imprinting of Bulk Silica" by M. M.-Y. Chen, S. Poovaradom, and *A. Katz*, AIChE Annual Meeting, November 19, 2003, San Francisco, California.

"The Synthesis of Selective Heterogeneous Catalysts by Rational Design" by *J. D. Bass*, S. L. Anderson, B. Lee, and A. Katz, AIChE Annual Meeting, November 21, 2003, San Francisco, California.

"The Synthesis and Catalytic Application of a New Class of Imprinted Silica" by J. D. Bass and *A. Katz*, MRS National Meeting, December 3, 2003, Boston, Massachusetts.

"Shape Selective Covalent Binding in Bulk Imprinted Silica" by *J. L. Defreese* and A. Katz, MRS National Meeting, December 4, 2003, Boston, Massachusetts.

"Design and Synthesis of Hybrid Organic-Inorganic Materials for Heterogeneous Bifunctional Acid-Base Catalysis" by *J. D. Bass* and A. Katz, ACS Spring National Meeting, March 30, 2004, Anaheim, California.

"Synthesis and characterization of bifunctional imprinted silica surfaces" by J. D. Bass and *A. Katz*, AIChE National Meeting, November 16, 2006, San Francisco, California.

"The Role of Inner- and Outer-sphere Environment in Alkene Epoxidation Catalyzed by Calixarene-Ti(IV) Complexes" by A. Katz, International Congress on Catalysis, July 18, 2008, Seoul, Korea.

"Support Effects in Epoxidation Catalysis" by J. Ghilarducci, E. Iglesia, and *A. Katz*, 2009 DOE-BES Contractor's Meeting, May 31 - June 3, 2009 (poster).

"Outer-Sphere Effects in Heterogeneous Catalysis" by J. M. Notestein, J. Ghilarducci, A. Solovyov, L. R. Andrini, F. R. Requejo, E. Iglesia, and *A. Katz*, 21st North American Catalysis Society Meeting, June 8, 2009, San Francisco, California.

"Design and Synthesis of Robust Calixarene-Capped Metal Clusters" by A. Katz, 21st Meeting of the North American Catalysis Society, June 10, 2009, San Francisco, California.

"Making Achiral Gold Nanoparticles Chiral: Gold Nanoparticles Capped with Aminocalixarene Enantiomers" by J-M. Ha, A. Solovyov, A. Katz, 2009 AIChE Annual Meeting, Nashville, TN, November 11 2009.

"First Imprinting of Silica with a Nanoparticle Template" by J-M Ha, A. Katz, 2009 AIChE Annual Meeting, Nashville, TN, November 12, 2009.

"Synthesis and Characterization of Accessible Active Sites in Ligand Stabilized Metal Nanoparticles" by J-M Ha, A. Solovyov, N. De Silva, A. Katz, 2009 AIChE Annual Meeting, Nashville, TN, November 13, 2009.

"Calix[4]arene-bound Metal Clusters: Synthesis, Characterization, and Catalysis" by A. Katz, Pacifichem Conference, Honolulu, HI, December 15, 2010.

"Calixarene-based Assembly of Functional Nanomaterials: Chiral Gold Nanoparticles and Amines Confined in Chiral Pockets" by A. Solovyov and A. Katz, Pacifichem Conference, Honolulu, HI, December 16, 2010.

"Delamination of Layered Zeolites under Mild Conditions with High Yield and Reduced Amorphous Content" by I. Ogino, S. I. Zones, and A. Katz, Pacifichem Conference, Honolulu, HI, December 17, 2010.

"Controlling Lewis-Acid Catalyzed MPV Reduction and Olefin Epoxidation via Synthesis of Calixarene-Metal Complexes" by P. Nandi and A. Katz, Gordon Research Conference on Inorganic Reaction Mechanisms, March 6-11th, 2011, Galveston, TX (Poster).

"Al(III)-calix[4]arene-based complexes for MPV reduction: A comparative study of new homogeneous and heterogeneous catalysts" by P. Nandi and *A. Katz,* ACS National Meeting, March 27-31, 2011, Anaheim, CA.

"New class of delaminated zeolite precursors for selective conversion of heavy hydrocarbons" by I. Ogino, M. M. Nigra, S. Hwang, T. Rea, S. I. Zones, and *A. Katz,* ACS National Meeting, March 27-31, 2011, Anaheim, CA.

"Al(III)-Catalyzed MPV Reduction Using Calix[4]arenes as Ox Ligands: Connectivity Requirements for Activity and Enantioselectivity" by P. Nandi, A. Katz, North American Catalysis Society Meeting, June 4-10th, 2011, Detroit, Michigan.

"Delamination of Layered Zeolite Precursors under Mild Conditions" by I. Ogino, E. Eilertsen, J. M. Ha, T. Rea, S. I. Zones, and A. Katz, FEZA Meeting, Valencia, Spain, July 5, 2011.

"Hydrolysis of Poly(1-4-β-glucan) Strands Derived from Cellulose using Mildacidity and Temperature" by O. Gazit and A. Katz, 242nd ACS National Meeting, Denver, CO, August 28, 2011.

"Gold Catalysis Using Calixarene-bound Nanoparticles" by M. M. Nigra and A. Katz, 242nd ACS National Meeting, Denver, CO, August 30, 2011.

"Conversion of Cellobiose into Glucose At near-Neutral pH Using a Recyclable Heterogeneous Catalyst" by O. Gazit and A. Katz, AIChE National Meeting, Minneapolis, MN, October 19, 2011.

"Conversion of Cellobiose into Glucose At near-Neutral pH Using a Recyclable Heterogeneous Catalyst" by P.-W. Chung, O. Gazit, A. Charmot, and A. Katz, AIChE National Meeting, Minneapolis, MN, October 20, 2011.

"Delamination of Layered Zeolite Precursors Under Mild Conditions" by I. Ogino, S. I. Zones, and A. Katz, AIChE National Meeting, Minneapolis, MN, October 20, 2011.

"Gold Catalysis Using Calixarene-Bound Nanoparticles" by M. M. Nigra and A. Katz, AIChE National Meeting, Minneapolis, MN, October 20, 2011.

"Enhancing and Understanding Heterogeneous Catalysis Using Organic-Inorganic Interfaces" by A. Katz, Department of Chemical Engineering, UC Riverside, November 18, 2011.

"Accessible Calixarene-Bound Metal Clusters: Functional Organic-Inorganic Interfaces" by A. Katz, Nano Today 2011 Conference, Kona, HI, December 11 – 15, 2011.

"Calixarene-Modified Gold Nanoparticles for Catalysis" by M. M. Nigra, A. Katz, ACS Spring Meeting, San Diego, CA, March 2012.

"Calixarene-Modified Gold Nanoparticles for Catalysis" by M. M. Nigra, A. Katz, Gordon Conference on Catalysis, New London, NH, June 2012. (Poster)

"Calixarene-Modified Gold Nanoparticles for Catalysis" by M. M. Nigra, A. Katz, 15th ICC, Munich, Germany, July 2012. (Poster)

"Lewis-acid Catalysis using Metallocalixarene Complexes: Bridging the Heterogeneous-homogeneous Gap" by A. Katz, 15th International Congress of Catalysis, Munich, Germany, July 2, 2012.

"Understanding Gold Nanoparticle Catalysis Using Organic Ligands" by M. M. Nigra and A. Katz, ACS Fall Meeting, Philadelphia, PA, August 2012.

"Understanding Gold Nanoparticle Catalysis Using Organic Ligands" by M. M. Nigra and A. Katz, Gold 2012 Conference, Tokyo, Japan, September 6, 2012.

"Open Gold Clusters Bound With Calixarene Ligands" by A. Katz, Gold 2012 Conference, Tokyo, Japan, September 7, 2012.

"New Opportunities in Metal Cluster Catalysis by Using Organic Ligands" by A. Okrut and A. Katz, 2012 AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 29, 2012.

"The Kinetic Consequences of Open Coordination Sites on Gold for Reduction Catalysis in a Model System" by M.M. Nigra, A. Katz, AIChE Annual Meeting, Pittsburgh, PA, October 2012.

"Understanding Gold Nanoparticle Catalysis Using Organic Ligands" by M. M. Nigra and A. Katz, AIChE Annual Meeting, Pittsburgh, PA, October 2012.

"Understanding Homogeneous Au Nanoparticle Reduction Catalysis Using Organic Ligands" by M. Nigra and A. Katz, 2012 AIChE Annual Meeting, Pittsburgh, Pennsylvania, October 29, 2012.

"Molecular-Level Structure-Function Relations in Gold Nanoparticle Catalysis" by M. Nigra and A. Katz, 2012 AIChE Annual Meeting, Pittsburgh, Pennsylvania, November 1, 2012.

"Activity and Shape Selectivity of Delaminated Zeolite UCB-1 for Alkylation of Aromatics" by R. C. Runnebaum, I. Ogino, S. I. Zones, and A. Katz, 2012 AIChE Annual Meeting, Pittsburgh, Pennsylvania, November 1, 2012.

"Kinetic Consequences of Open and Closed Supported Molecular Active Sites" by A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"Understanding Carbon-Catalyzed Cellulose Hydrolysis to Glucose" by C. P.-W. Chung, A. Charmot, O. Gazit, and A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"Hydrogenation Catalysis with Open and Closed Metal Carbonyl Clusters: Synthesis and Characterization of First Open and Sterically Protected Ir_4 Carbonyl Clusters" by A. Okrut, R. C. Runnebaum, X. Ouyang, C. Aydin, J. Lu, S. Hwang, B. C. Gates, and A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"Surfactant-Free Delamination of a MWW Borosilicate Zeolite Precursor in a Single Step" by X. Ouyang, A. Katz, 23rd North American Catalysis Society Meeting, Louisville, KY, Jun. 3rd, 2013.

"Synthesis, Characterization and Catalysis of Delaminated Heteroatom-containing Zeolites" by *X. Ouyang*, R. C. Runnebaum, S. I. Zones, and A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"Catalytic Consequences of Open Metal Clusters Synthesized via Simple Oxidative Treatment" by R. C. Runnebaum, A. Okrut, X. Ouyang, C. Aydin, S.-J. Hwang, C. Aydin, I. Arslan, B. C. Gates, and A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"The Importance of Open Sites in Gold Catalysis: Oxidation and Reduction Reactions" by *M. M. Nigra*, I. Arslan, and A. Katz, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013.

"Microscopic Characterization of Heterogeneous Catalysts in 3-D and in-situ/ex-situ" by I. Arslan, S. Dey, J. Roehling, B. H. Davis, B. C. Gates, A. Katz, D. Perea, and J. Lercher, 23rd North American Catalysis Society Meeting, Louisville, Kentucky, June 3, 2013. Cover art for 23rd NAM conference schedule was provided by UCB-1 tomographic image of material synthesized in Katz laboratory.

"Single-Pot Synthesis of Uniform Glucan multilayers on Oxide Particles" by J. Jankolovits, O. Gazit, M. Nigra, A. Katz, ACS National Meeting, Indianapolis, IN, September 2013. (Poster)

"Catalytic Consequences of Stable Open Metal Clusters Synthesized via Oxidative Treatments" by R.C. Runnebaum, A. Okrut, X. Ouyang, C. Aydin, S.-J. Hwang, B.C. Gates, A. Katz. Rational Catalyst Design Conference sponsored by Catalysis and Reaction Engineering Division, 2013 AIChE Annual Meeting, San Francisco November 3, 2013.

"Controlling Heterogeneous Catalyst Selectivity Using Grafted Metallocalixarene Active Sites" by Y.-J. Wanglee, A. Solovyov, A. Katz, Rational Catalyst Design II Conference sponsored by Catalysis and Reaction Engineering Division, 2013 AIChE Annual Meeting, San Francisco November 4, 2013.

"Delaminated Versus 3-D SSZ-70: A Comparative Study of Zeolite-Catalyzed Toluene Alkylation" by R.C. Runnebaum, X. Ouyang, S.I. Zones, A. Katz. Catalysis with Microporous and Mesoporous Materials IV Conference sponsored by Catalysis and Reaction Engineering Division, 2013 AIChE Annual Meeting, San Francisco November 4, 2013.

"Single-Pot Synthesis of Uniform Glucan multilayers on Oxide Particles" by J. Jankolovits, O. Gazit, M. Nigra, A. Katz. Nanoparticle Coatings & Nanocoatings on Particles I Conference, sponsored by Nanoparticles, 2013 AIChE Annual Meeting, San Francisco November 5, 2013.

"On Route to Recyclable Carbon-Based Heterogeneous Catalysts for Xylan Conversion" by P.-W. Chung, A. Charmot, A. Katz, Catalytic Biomass Conversion to Chemicals I Conference, sponsored by Fuels and Petrochemicals Division, 2013 AIChE Annual Meeting, San Francisco November 6, 2013.

"Molecular-Level Structure-Function Relations in Gold Nanoparticle Catalysis" by M. Nigra, A. Katz, Fundamentals of Supported Catalysis Conference sponsored by Catalysis and Reaction Engineering Division, 2013 AIChE Annual Meeting, San Francisco November 7, 2013.

"Synthesis, Characterization and Catalysis of Delaminated Aluminosilicate Zeolites Derived from MWW-Type Borosilicate Zeolite Precursors, by X. Ouyang, S.-J. Hwang, R.C. Runnebaum, Y.-J. Wanglee, D. Xie, T. Rea, S.I. Zones, Al. Katz. Advances in the synthesis and Application of Porous Materials I Conference, sponsored by Ceramics, 2013 AIChE Annual Meeting, San Francisco November 8, 2013.

"Hydrolysis of Glucans Grafted on Inorganic Oxides: Role of OH-Defect Sites" by O. Gazit, A. Katz. Nanoscale Materials as Catalysts II Conference, sponsored by

Catalysis and Reaction Engineering Division, 2013 AIChE Annual Meeting, San Francisco November 8, 2013.

"Heteroatom-Substituted Delaminated Zeolites: Synthesis and Opportunities" by X. Ouyang, A. Katz, 2013 AIChE Annual Meeting, San Francisco, CA, November 8, 2013.

"Single-step delamination of a MWW borosilicate layered zeolite precursor under mild conditions without surfactant and sonication" by X. Y. Ouyang, S.-J. Hwang, R. C. Runnebaum, D. Xie, Y.-J. Wanglee, T. Rea, S. I. Zones, A. Katz, 2014 FEZA Meeting, Leipzig, Germany, September 8, 2014.

"Understanding the role of delamination in zeolite-catalyzed aromatic alkylation: UCB-3 versus 3-D Al-SSZ-70" by R. C. Runnebaum, X. Ouyang, T. Rea, S.-J. Hwang, I. Arslan, S. I. Zones, A. Katz, 2014 FEZA Meeting, Leipzig, Germany, September 11, 2014.

"Single-step delamination of a MWW borosilicate layered zeolite precursor under mild conditions without surfactant and sonication" by X. Y. Ouyang, S.-J. Hwang, R. C. Runnebaum, D. Xie, Y.-J. Wanglee, T. Rea, S. I. Zones, A. Katz, 2014 AIChE Annual Meeting, Atlanta, GA, November 17, 2014.

"Using Active Site Confinement and Organic Ligand Approaches to Control Catalysis" by M. M. Nigra, A. Katz, M.-O. Coppens, 2014 AIChE Annual Meeting, Atlanta, GA, November 19, 2014.

"Catalytic Hydrolysis Using Weak-Acid Sites on Modified Carbon for Glucose Production from Cellulose" by Anh To, Alexandre Charmot, Po-Wen Chung. Alexander Katz, 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 16, 2015.

"3-D Quantification of Zeolite Delamination on the Nanoscale Using Electron Tomography in the STEM" by Ilke Arslan, Toby Sanders, Ron Runnebaum, Xiaoying Ouyang, Bruce C. Gates, Stacey Zones, Alexander Katz, 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 16, 2015.

"Confinement of Catalytic Active Sites: A Nature-Inspired Approach" by Michael Nigra, Alexander Katz, Marc-Olivier Coppens, 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 19, 2015.

"Single-site catalysis with supported metal clusters" by Daniel Ertler, Alexander Okrut, Andrew Palermo, Andrew Solovyov, Bruce Gates, David Dixon, Alexander Katz, 250th American Chemical Society Meeting, Boston, MA, August 16, 2015.

"Surface modification of inorganic oxide particles for improved dispersion in waterborne coatings" by Joseph Jankolovits, Ant Van Dyk, James Bohling, John Roper, Clayton Radke, Alexander Katz, 250th American Chemical Society Meeting, Boston, MA, August 16, 2015.

"Catalyzing Reactions of Large Molecules on Solid Surfaces" by A. Katz, Pacific Coast Catalysis Society Annual Meeting, Pacific Northwest National Laboratory, Richland, Washington, September 18, 2015.

"Single-Step Delamination of MWW-Precursor ERB-1 without Surfactant and Sonication" by Alexander Okrut, Xiaoying Ouyang, Ron C. Runnebaum, Son-Jong Hwang, Dan Xie, Ying-Jen Wanglee, Ilke Arslan, Thomas Rea, Stacey I. Zones, and Alexander Katz, Pacifichem, December 18, 2015.

"Nanoengineering and Application of Protected but Accessible Metal Cluster Catalysts" by A. Katz, AIChE Annual Meeting, San Francisco, California, November 16. 2016.

"A Comparison of Nanostructured Iridium Catalysts for Ring-Opening" by A. To, X. Ouyang, L. Debefve, T. Rea, A. Palermo, B. C. Gates, A. Kuperman, and A. Katz, 25th North American Meeting of the North American Catalysis Society, Denver, Colorado, June 6, 2017.

"Synthetic Strategies for Controlling Ti^{IV} Active Site Structure Supported on Novel Silicates and Its Impact on Epoxidation Catalysis" by N. Grosso-Giordano, A. Katz, S. Zones, and A. Okrut, 25th North American Meeting of the North American Catalysis Society, Denver, Colorado, June 6, 2017.

CONFERENCE ORGANIZATION AND SERVICE:

Chair of Symposium M, Molecularly Imprinted Materials, MRS National Meeting, April 5, 2002.

Chair of Novel Catalytic Materials II, AIChE National Conference, November 17, 2003.

Chair of Thermophysical Processes in Templating and Imprinting, AIChE National Conference, November 19, 2003.

Co-Chair of Plenary Lectures, Russian American Seminar: Advances in the Understanding and Application of Catalysis, Moscow, Russia, May 29, 2003.

Co-Chair of Opening Section, 5th International Symposium On Acid Base Catalysis, Puerto Vallarta, Mexico, June 28, 2005.

Chair of Advanced Materials Section (Organizer of U.S. Contingent), Fourth Eastern Mediterranean Conference on Chemical Engineering, Dead Sea, Israel, January 9 - 11, 2006.

Chair of Mechanism in Homogeneous and Heterogeneous Catalytic Epoxidation Session, ACS National Conference, Boston, Massachusetts, August 21, 2006.

Chair of Advanced Materials Section, Fifth Eastern Mediterranean Conference on Chemical Engineering, Cetraro, Italy, May 6 – 10, 2008.

Cochair of Kokes Awards Program, 21st North American Catalysis Society Meeting, San Francisco, California, June 7 – 12, 2009.

Organizer of Novel Catalyst Materials Session in CATL Symposium, 238th American Chemical Society National Meeting, Washington, DC, August 16 – 20, 2009.

Chair of Advanced Materials Section, Sixth Eastern Mediterranean Conference on Chemical Engineering, Belek, Antalya, Turkey, March 7 – 12, 2010.

Chair of Advanced Materials Section, Seventh Eastern Mediterranean Conference on Chemical Engineering, Athens, Greece, 2012.

Organizing Committee Board, International Symposium on Relations Between Homogeneous and Heterogeneous Catalysis, Utrecht, Netherlands, 2015.

Co-Chair of Session, 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 19, 2015.

Co-Organizer and Co-Chair of Integrated Biomass Refinery by Precisely Designed Heterogeneous Catalysts, Pacifichem, 2015, Honolulu, HI.

Co-Organizer of Hokkaido University – UC Berkeley Joint Symposium on Chemical Sciences and Engineering, Sapporo, Japan, January 5 – 8, 2016.

Chair of Advanced Materials Section (Organizer of U.S. Contingent), Eighth Eastern Mediterranean Conference on Chemical Engineering, Haifa, Israel, February 26 – March 1, 2017.

Participant, Basic Research Needs Workshop, Catalysis Program of Basic Energy Sciences, Office of Science, U.S. Department of Energy May 8 – 10, 2017.

Pacific Coast Catalysis Society Representative to the North American Catalysis Society Executive Board (2009 – present).

JOURNAL SERVICE:

Co-guest editor of MRS Bulletin "Self Assembly in Materials Synthesis" (10/05) with M. Tirrell.

Editorial Board Member of *Chemistry of Materials* (2006 – 2012).

Editorial Board Member of *Reaction Chemistry & Engineering* (2015–)

UNIVERSITY AND DEPARTMENTAL COMMITTEES AND OTHER:

CBE Undergraduate Vice Chair, Department of Chemical and Biomolecular Engineering (2012 – 2014)
CBE Undergraduate Research & Awards Chair (2007-2009).
University Graduate Fellowship Committee (2007-present).
University Undergraduate Fellowship and Scholarship Committee (2016-present)
Mentor to University Undergraduate Fellows (2017-present)
Chemical Engineering Candidacy Review Committee (2006).
Chemical Engineering Undergraduate Curriculum Committtee (2006).
Faculty Liaison to American Institute of Chemical Engineers (2001 - 2006).
Chemical Engineering Coop Advisor (2002 - 2006).
Faculty Advisor for AIChE Western Regional Student Conference (2005).
Chemical Engineering Colloquium Committee (2000-2002).
Longfellow Science Middle School Outreach, Berkeley, California (2000-2004).

Founder of Berkeley Materials Solutions (dedicated to commercialization of crystalline Ti-silica epoxidation catalysts – NSF SBIR Phase I Award)

STUDENTS SUPERVISED:

Graduate Students:

Nicholas Giordano Grosso, Ph.D. Chemical Engineering (Fall 2014 – present).

Andrew Palermo, Ph.D. Chemical Engineering (Fall 2013 – Fall 2017). Coadvised with Prof. Bruce Gates at UC Davis (UC Davis Graduate School). Present: ExxonMobil Chemicals, Baytown.

Audrey Harker, Ph.D. Chemical Engineering (Fall 2014 – Fall 2016). Graduated with M.S. in Chemical Engineering.

Michael M. Nigra, Ph.D. Chemical Engineering (Fall 2007 – Fall 2013). Current: Specialist, Department of Chemical Engineering, University College London, England) and Upcoming: Assistant Professor, Department of Chemical Engineering, University of Utah.

Einar A. Eilertsen (visiting Ph.D. graduate student from University of Norway, Oslo (11/10 – 03/11)

Jarred Ghilarducci, MS Chemical Engineering (Fall 2006 – 2010)

Ted J. Amundsen, MS Chemical Engineering (Fall 2007 – Fall 2009). Current: Chemical Engineer, Mainstream Engineering.

John D. Daniels, MS Chemical Engineering (Fall 2006 – Spring 2008)

Justin M. Notestein, Ph.D. Chemical Engineering (Fall 2001 – Fall 2006). Current: Asssociate Professor, Department of Chemical and Biological Engineering, Northwestern University.

Reed A. Asay, MS Chemical Engineering (Fall 2004 – Fall 2005). Current: Law School.

John D. Bass, Ph.D. Chemical Engineering (Fall 2000 – Fall 2005). Current: Group Leader of Materials Development and Engineering, Kinestral Technologies.

Jessica L. Defreese, PhD Chemical Engineering (Fall 2000 – Fall 2004). Current: Bristol-Myers-Squibb.

Undergraduate Research Assistants:

Maya Subramanian. 06/18 – present. Zeolite catalysis.

Futianyi Wang. 01/16 – present. Organic-inorganic pigment particles.

Stephen Black 05/14 – 08/15. Glucan-inorganic composite materials.

Shirley Ng 06/14 – 08/15. Characterization of carbon catalysts.

Younjue Bae 04/13 – present. Characterization of carbon catalysts.

Gregory Daniloff, 08/13 – 08/14. Calixarene synthesis. Current: Chemical Engineer, Kinestral Technologies.

Marat Ozarov, 05/11 – 07/12. Zeolite synthesis. Post-graduate: Caltech Chemical Engineering Graduate Student.

Joseph Moseley, 06/11 – 11/11. Reaction engineering.

Bob Rahardjo, 10/10 – 11/11. Reaction engineering. Current: Graduate School, University of Pennsylvania

Tae Kyung Kim, 05/10 – 08/10. Gold clusters as biomarkers. Post-graduate: Hyundai Batteries (Korea).

Yashodhan Bhawe, 08/06 – 07/08. Catalytic calixarene synthesis. Post-graduation: Graduate Student, Chemical Engineering, California Institute of Technology.

Kaidi He, 08/06 – 05/08. Silica surface functionalization.

Yunshao Feng, 05/04 – 05/05. William Gwinn Research Prize Awardee. Post-graduation: Coop with City of San Francisco.

Andrew Pascall, 08/03 – present. Robert and Colleen Haas Fellow. Post-graduatation: Graduate Student, Chemical Engineering, University of California, Santa Barbara.

Saran Poovarodom, 01/03 – 05/04. Post-graduation: Graduate Student, Chemical Engineering, University of Washington.

Sandra Anderson, 01/02 – 05/03. Robert and Colleen Haas Fellow. Post-graduation: Graduate Student, Chemical Engineering, Massachusetts Institute of Technology (NSF Fellow).

Michael Chen, 08/00 – 06/02. John M. Prausnitz Prize Awardee. Post-graduation: Graduate Student, Chemical Engineering, California Institute of Technology (NSF Fellow).

Angus Lam, 06/01 – 09/02. Post-Graduation: United States Air Force (Biochemical Laboratory).

Brian Lee, 06/02 – 06/03. Post-Graduation: Graduate Student, Chemical Engineering, University of Southern California.

Nicholas Parra-Vasquez, 05/00 – 05/02. California Alliance for Minority Participation (CAMP) Special Merit Awardee. Post-graduation: Graduate Student, Chemical Engineering, Rice University.

Visiting Students:

Martina Aigner (M.S. student from Technical University of Munich, Germany) 10/16 – 9/17. Delaminated zeolite olefin epoxidation catalysts using organic hydroperoxide in flow reactor.

Taku Okada (Ph.D. student from Hokkaido University, Japan 10/16 – 4/17. Grafted calixarene Tischenko catalysts.

Lena Winner (Ph.D. student from University of Würzburg, Germany 03/14 – 12/14. Grafted calixarene catalyst synthesis.

Bob Rahardjo (BS ChEn UC Berkeley) 10/10 – 11/11. In-situ FTIR spectroscopy.

Joseph Moseley (BS ChEn UC Berkeley) 06/11 – present. Heterogeneous catalysis.

Einar A. Eilertsen (visiting PhD graduate student from University of Norway, Oslo) 11/10 – 03/11. Zeolite synthesis.

Moritz Herbrich (visiting graduate student from Technical University of Munich, Germany) 04/10 – 08/10.

Manfred Greisel (visiting graduate student from Technical University of Munich, Germany) 06/9 – 10/9.

POSTDOCTORAL FELLOWS:

Dr. Amrita Chakravarty (CSIR-Central Glass & Ceramic Research Institute). Expertise: Organic Chemistry and Colloidal Chemistry.

Dr. Christian Schöttle (University of Karlsruhe). Expertise: Inorganic Colloids Chemistry.

Dr. Manish Kr. Mishra (CSIR-Central Glass & Ceramic Research Institute). Expertise: Colloidal Chemistry and Photocatalysis.

Dr. Mizuho Yabushita (Hokkaido University) 3/15 – 3/17. Expertise: Biomass Catalysis.

Dr. Anh The To (University of Oklahoma) 7/14 – 10/16. Expertise: Heterogeneous Catalysis.

Dr. Yjun Guo (Iowa State University) 7/14 – 11/16. Expertise: Colloid Chemistry.

Dr. Daniel Ertler (University of Würzburg) 9/13 – 8/15. Expertise: Inorganic and Cluster Chemistry.

Dr. Joseph Jankolovits (University of Michigan) 7/12 – 11/16. Expertise: Supramolecular Materials Chemistry.

Dr. Ying-Jen Wanglee (UC Santa Barbara) 5/12 – 5/14. Expertise: Polymer Synthesis on Solids.

Dr. Xiaoying (Richard) Ouyang (UC Santa Barbara) 3/12 – 5/14. Expertise: Zeolite Synthesis. Current: Scientist, Chevron Central Research and Development, Richmond, California.

Dr. Ronald Runnebaum (UC Davis), 10/10 – 2013. Zeolite Catalysis. Current: Assistant Professor, Department of Chemical Engineering, University of California, Davis.

Dr. Po-Wen (Cedric) Chung (Iowa State University), 10/10 – 01/14.
Expertise: Application of Functionalized Mesoporous Carbon Materials in Catalysis. Current: Assistant Professor, Department of Chemistry, Academia Sinica, Taiwan.

Dr. Alexander Okrut (Karlsrühe, Germany) 02/10 – present
Expertise: Inorganic Cluster Chemistry.

Dr. Partha Nandi (Michigan State University) 09/09 – 11/11
Expertise: Inorganic chemistry and homogeneous catalysis. Current: Staff Scientist, ExxonMobil Central Research and Development, Clinton, New Jersey.

Dr. Oz Gazit (Technion Israel Institute of Technology, Haifa, Israel) 07/09 – 12/12
Expertise: Polymer physics. Current: Assistant Professor of Chemical Engineering, Technion Israel Institute of Technology, Haifa, Israel).

Dr. Alexandre Charmot (Poitiers University, Poitiers, France) 07/09 – 2013
Expertise: Heterogeneous catalysis. Current: Entrepreneur.

Dr. Igor Busygin (Åbo Akademi University, Turku, Finland) 06/09 – 5/11
Expertise: Heterogeneous and homogeneous catalysis. Current: Staff Scientist, BASF Central Research and Development, Ludwigshafen, Germany.

Dr. Isao Ogino (UC Davis) 11/09 – 10/11
Expertise: Zeolite synthesis. Current: Assistant Professor of Chemical Engineering, Hokkaido Univeristy, Sapporo, Japan.

Dr. Niladri Maity (India Institute of Technology, Bombay) 08/08 – 07/09
Expertise: Synthesis of heterogeneous catalysts. Current: Postdoctoral Fellow, KAUST.

Dr. Brandon McKenna (University of California, Santa Barbara) 11/07 – 09/08
Expertise: Synthesis of hybrid organic-inorganic materials. Current: Staff Scientist, Haldor Topsoe, Copenhagen, Denmark.

Dr. Yong-Gu Kim (Texas A&M University) 05/07 – 06/09
Expertise: Gold nanoparticle synthesis and characterization. Current: Hyundai, Seoul, Korea.

Dr. Tatiana Luts (University of Leipzig) 04/07 – 11/10
Expertise: Hybrid materials synthesis and characterization. Current: Mother of two young children.

Dr. Jeong-Myeong Ha (University of Minnesota) 10/06 – 06/10
Expertise: Templating and crystal growth. Current: Senior Scientist, Korea Instititute of Science and Technology (KIST).

Dr. Namal de Silva (University of Winsconsin) 05/06 – 2009
Expertise: Inorganic chemistry. Current: Senior Scientist, BASF Catalysts, Iselin, New Jersey.

Dr. Feng Wang (Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China) 08/05 – 10/06. Expertise: Heterogeneous catalysis. Current: Assistant Professor, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China.

Dr. Andrew Solovyov (University of Bonn, Germany) 02/04 – present.
Expertise: Calixarene synthetic chemistry.

Dr. Santiago Ini (Technion University, Israel). 05/01 – 08/02
Expertise: Inorganic chemistry. Current: Teva Pharmaceuticals, Israel.