



## Friedrich Prinz

Leonardo Professor and Senior Fellow at the Precourt Institute for Energy  
Mechanical Engineering

### CONTACT INFORMATION

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Administrator

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### Bio

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#### BIO

Fritz Prinz is the Finmeccanica Professor in the School of Engineering at Stanford University, Professor of Materials Science and Engineering, Professor of Mechanical Engineering, and Senior Fellow at the Precourt Institute for Energy. He also serves as the Director of the Nanoscale Prototyping Laboratory and Faculty Co-director of the NPL-Affiliate Program. A solid-state physicist by training, Prinz leads a group of doctoral students, postdoctoral scholars, and visiting scholars who are addressing fundamental issues on energy conversion and storage at the nanoscale. In his Laboratory, a wide range of nano-fabrication technologies are employed to build prototype fuel cells and capacitors with induced topological electronic states. We are testing these concepts and novel material structures through atomic layer deposition, scanning tunneling microscopy, impedance spectroscopy and other technologies. In addition, the Prinz group uses atomic scale modeling to gain insights into the nature of charge separation and recombination processes. Before coming to Stanford in 1994, he was on the faculty at Carnegie Mellon University. Prinz earned a PhD in Physics at the University of Vienna.

#### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Professor, Materials Science and Engineering
- Affiliate, Stanford Woods Institute for the Environment

#### HONORS AND AWARDS

- Sir Christopher Hinton Lecture, Royal Academy of Engineering (1991)
- Engineer of the Year, American Society of Mechanical Engineers, Pittsburgh, PA Section (1991 - 1992)
- Corresponding member, Austrian Academy of Science, Vienna, Austria (1996)
- Award for Excellence, Literati Club (2002)
- Most Outstanding Paper in the 2001 volume, Rapid Prototyping Journal (2002)
- The AM Strickland Prize for Best Paper in 2005, The Institution of Mechanical Engineers, London, UK (2005)
- Tedori-Callinan Lecture, University of Pennsylvania (2006)
- Fellow, American Association for the Advancement of Science (AAAS) (2007)

- Woodruff Colloquium in the Theme of Energy, Georgia Institute of Technology, Atlanta, GA (2008)
- Munushian Lecture, University of Southern California (2009)

## PROFESSIONAL EDUCATION

- PhD, University of Vienna , Physics (1975)

## LINKS

- Nanoscale Prototyping Laboratory: <https://nplab.stanford.edu>

## Teaching

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### COURSES

#### 2019-20

- Manufacturing Processes and Design: ME 129 (Win)

#### 2018-19

- Mechanical Engineering Design: ME 113 (Spr)

#### 2017-18

- Additive Manufacturing- From Fundamentals to Applications: ME 232 (Sum)
- Mechanical Engineering Design: ME 113 (Spr)

#### 2016-17

- Additive Manufacturing- From Fundamentals to Applications: ME 232 (Sum)
- Mechanical Engineering Design: ME 113 (Spr)

### STANFORD ADVISEES

#### Doctoral Dissertation Reader (AC)

Heungdong Kwon, Tzu-Ling Liu

#### Postdoctoral Faculty Sponsor

Tatsuki Hashimoto, Soonwook Hong, Simin Nie

#### Doctoral Dissertation Advisor (AC)

Settasit Chaikasetsin, Timothy Goh, Zhaoxuan Wang

#### Master's Program Advisor

Yuzi Luo, Akash Ramdas

#### Postdoctoral Research Mentor

Tatsuki Hashimoto

#### Doctoral (Program)

Tyler Howard, Emma Kaeli

## Publications

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### PUBLICATIONS

- **Preface for the Special Issue of Sustainable Manufacturing in 4th Industrial Revolution** *INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING-GREEN TECHNOLOGY*

Prinz, F., Chun, D., Ahn, S.  
2018; 5 (4): 457

- **Implications of Electricity Liberalization for Combined Heat and Power (CHP) Fuel Cell Systems (FCSs): a Case Study of the United Kingdom** *Journal of Power Sources*.  
Prinz, F., B., Colella, W.
- **Design, Construction, and Testing of a Fuel Cell Powered Scooter** *Journal of Power Sources*.  
Prinz, F., B., Colella, W.
- **Modelling Results for the Thermal Management Sub-System of a Combined Heat and Power (CHP) Fuel Cell Systems (FCS)** *Journal of Power Sources*.  
Prinz, F., B., Colella, W.
- **Design Considerations for Effective Control of an Afterburner Sub-System in a Combined Heat and Power (CHP) Fuel Cell System (FCS)** *Journal of Power Sources*.  
Prinz, F., B., Colella, W.
- **Design Options for Achieving a Rapidly Variable Heat-to-Power Ratio in a Combined Heat and Power (CHP) Fuel Cell System** *Journal of Power Sources*.  
Prinz, F., B., Colella, W.
- **Near Net Shape Forming Of Advanced Structural Ceramic Devices**  
Prinz, F., B., Liu, H.
- **Micro-scale Electrochemistry: Application to Fuel Cell**  
Prinz, F., B., O'Hayre, R.
- **Cantilever Tip-Probe Arrays for Simultaneous SECM and AFM Analysis** *Rapid Prototyping Laboratory*  
Tao, Y., Fasching, R., Prinz, F.
- **The Mesicopter: A Meso-Scale Flight Vehicle** *NIAC Phase II Technical Proposal*  
Kroo, I., Prinz, F.
- **Plasma-enhanced atomic layer deposition of superconducting niobium nitride** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A*  
Sowa, M. J., Yemane, Y., Zhang, J., Palmstrom, J. C., Ju, L., Strandwitz, N. C., Prinz, F. B., Provine, J.  
2017; 35 (1)
- **Direct and continuous strain control of catalysts with tunable battery electrode materials** *SCIENCE*  
Wang, H., Xu, S., Tsai, C., Li, Y., Liu, C., Zhao, J., Liu, Y., Yuan, H., Abild-Pedersen, F., Prinz, F. B., Norskov, J. K., Cui, Y.  
2016; 354 (6315): 1031-1036
- **Bimetallic Nickel/Ruthenium Catalysts Synthesized by Atomic Layer Deposition for Low-Temperature Direct Methanol Solid Oxide Fuel Cells** *ACS APPLIED MATERIALS & INTERFACES*  
Jeong, H., Kim, J. W., Park, J., An, J., Lee, T., Prinz, F. B., Shim, J. H.  
2016; 8 (44): 30090-30098
- **Plasma-enhanced atomic layer deposition of barium titanate with aluminum incorporation** *ACTA MATERIALIA*  
Kim, Y., Schindler, P., Dadlani, A. L., Acharya, S., Provine, J., An, J., Prinz, F. B.  
2016; 117: 153-159
- **Plasma-enhanced atomic layer deposition of tungsten nitride** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A*  
Sowa, M. J., Yemane, Y., Prinz, F. B., Provine, J.  
2016; 34 (5)
- **Plasma-Enhanced Atomic Layer Deposition of SiN-AIN Composites for Ultra Low Wet Etch Rates in Hydrofluoric Acid** *ACS APPLIED MATERIALS & INTERFACES*  
Kim, Y., Provine, J., Waich, S. P., Park, J., Phuthong, W., Dadlani, A. L., Kim, H., Schindler, P., Kim, K., Prinz, F. B.  
2016; 8 (27): 17599-17605
- **Correlation of film density and wet etch rate in hydrofluoric acid of plasma enhanced atomic layer deposited silicon nitride** *AIP ADVANCES*  
Provine, J., Schindler, P., Kim, Y., Walch, S. P., Kim, H. J., Kim, K., Prinz, F. B.

2016; 6 (6)

- **Atomically Flat Silicon Oxide Monolayer Generated by Remote Plasma** *JOURNAL OF PHYSICAL CHEMISTRY C*  
Thian, D., Yemane, Y. T., Logar, M., Xu, S., Schindler, P., Winterkorn, M. M., Provine, J., Prinz, F. B.  
2016; 120 (15): 8148-8156
- **Relating Electronic and Geometric Structure of Atomic Layer Deposited BaTiO<sub>3</sub> to its Electrical Properties** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*  
Torgersen, J., Acharya, S., Dadlani, A. L., Petousis, I., Kim, Y., Trejo, O., Nordlund, D., Prinz, F. B.  
2016; 7 (8): 1428-1433
- **Oscillatory barrier-assisted Langmuir-Blodgett deposition of large-scale quantum dot monolayers** *APPLIED SURFACE SCIENCE*  
Xu, S., Dadlani, A. L., Acharya, S., Schindler, P., Prinz, F. B.  
2016; 367: 500-506
- **Plasma-enhanced atomic layer deposition of BaTiO<sub>3</sub>** *SCRIPTA MATERIALIA*  
Schindler, P., Kim, Y., Thian, D., An, J., Prinz, F. B.  
2016; 111: 106-109
- **Self-limiting atomic layer deposition of barium oxide and barium titanate thin films using a novel pyrrole based precursor** *JOURNAL OF MATERIALS CHEMISTRY C*  
Acharya, S., Torgersen, J., Kim, Y., Park, J., Schindler, P., Dadlani, A. L., Winterkorn, M., Xu, S., Walch, S. P., Usui, T., Schildknecht, C., Prinz, F. B.  
2016; 4 (10): 1945-1952
- **Atomic layer deposition by reaction of molecular oxygen with tetrakisdimethylamido-metal precursors** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A*  
Provine, J., Schindler, P., Torgersen, J., Kim, H. J., Karthaler, H., Prinz, F. B.  
2016; 34 (1)
- **Quantifying Geometric Strain at the PbS QD-TiO<sub>2</sub> Anode Interface and Its Effect on Electronic Structures** *NANO LETTERS*  
Trejo, O., Roelofs, K. E., Xu, S., Logar, M., Sarangi, R., Nordlund, D., Dadlani, A. L., Kravec, R., Dasgupta, N. P., Bent, S. F., Prinz, F. B.  
2015; 15 (12): 7829-7836
- **Effects of surface chemistry and microstructure of electrolyte on oxygen reduction kinetics of solid oxide fuel cells** *JOURNAL OF POWER SOURCES*  
Park, J. S., An, J., Lee, M. H., Prinz, F. B., Lee, W.  
2015; 295: 74-78
- **The Use of Contact Mode Atomic Force Microscopy in Aqueous Medium for Structural Analysis of Spinach Photosynthetic Complexes.** *Plant physiology*  
Phuthong, W., Huang, Z., Wittkopp, T. M., Sznee, K., Heinnickel, M. L., Dekker, J. P., Frese, R. N., Prinz, F. B., Grossman, A. R.  
2015; 169 (2): 1318-1332
- **Grain boundary blocking of ionic conductivity in nanocrystalline yttria-doped ceria thin films** *SCRIPTA MATERIALIA*  
An, J., Bae, J., Hong, S., Koo, B., Kim, Y., Guer, T. M., Prinz, F. B.  
2015; 104: 45-48
- **Enhanced Step Coverage of TiO<sub>2</sub> Deposited on High Aspect Ratio Surfaces by Plasma-Enhanced Atomic Layer Deposition** *LANGMUIR*  
Schindler, P., Logar, M., Provine, J., Prinz, F. B.  
2015; 31 (18): 5057-5062
- **Atomic Layer Deposition of Undoped TiO<sub>2</sub> Exhibiting p-Type Conductivity.** *ACS applied materials & interfaces*  
Iancu, A. T., Logar, M., Park, J., Prinz, F. B.  
2015; 7 (9): 5134-5140
- **Variation of Energy Density of States in Quantum Dot Arrays due to Interparticle Electronic Coupling.** *Nano letters*  
Logar, M., Xu, S., Acharya, S., Prinz, F. B.  
2015; 15 (3): 1855-1860
- **Exploring the local electronic structure and geometric arrangement of ALD Zn(O,S) buffer layers using X-ray absorption spectroscopy** *JOURNAL OF MATERIALS CHEMISTRY C*  
Dadlani, A. L., Trejo, O., Acharya, S., Torgersen, J., Petousis, I., Nordlund, D., Sarangi, R., Schindler, P., Prinz, F. B.  
2015; 3 (47): 12192-12198

- **Influence of the grain size of samaria-doped ceria cathodic interlayer for enhanced surface oxygen kinetics of low-temperature solid oxide fuel cell** *JOURNAL OF THE EUROPEAN CERAMIC SOCIETY*  
Bae, J., Hong, S., Koo, B., An, J., Prinz, F. B., Kim, Y.  
2014; 34 (15): 3763-3768
- **Energy States of Ligand Capped Ag Nanoparticles: Relating Surface Plasmon Resonance to Work Function** *JOURNAL OF PHYSICAL CHEMISTRY C*  
Dadlani, A. L., Schindler, P., Logar, M., Walch, S. P., Prinz, F. B.  
2014; 118 (43): 24827-24832
- **Effects of size polydispersity on electron mobility in a two-dimensional quantum-dot superlattice** *PHYSICAL REVIEW B*  
Xu, S., Thian, D., Wang, S., Wang, Y., Prinz, F. B.  
2014; 90 (14)
- **Nanostructuring Materials for Solar-to-Hydrogen Conversion** *JOURNAL OF PHYSICAL CHEMISTRY C*  
Guer, T. M., Bent, S. F., Prinz, F. B.  
2014; 118 (37): 21301-21315
- **MEMS-based thin-film solid-oxide fuel cells** *MRS BULLETIN*  
An, J., Shim, J. H., Kim, Y., Park, J. S., Lee, W., Guer, T. M., Prinz, F. B.  
2014; 39 (9): 798-804
- **Plasma Processing for Crystallization and Densification of Atomic Layer Deposition BaTiO<sub>3</sub> Thin Films.** *ACS applied materials & interfaces*  
An, J., Usui, T., Logar, M., Park, J., Thian, D., Kim, S., Kim, K., Prinz, F. B.  
2014; 6 (13): 10656-10660
- **Localized Charge Transfer Reactions near the Pt-YSZ Interfaces using Kelvin Probe Microscopy** *INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING-GREEN TECHNOLOGY*  
Lee, W., Prinz, F. B.  
2014; 1 (3): 201-205
- **Sol-flame synthesis of cobalt-doped TiO<sub>2</sub> nanowires with enhanced electrocatalytic activity for oxygen evolution reaction.** *Physical chemistry chemical physics*  
Cai, L., Cho, I. S., Logar, M., Mehta, A., He, J., Lee, C. H., Rao, P. M., Feng, Y., Wilcox, J., Prinz, F. B., Zheng, X.  
2014; 16 (24): 12299-12306
- **High performance Bi-layered electrolytes via atomic layer deposition for solid oxide fuel cells** *JOURNAL OF POWER SOURCES*  
Jee, Y., Cho, G. Y., An, J., Kim, H., Son, J., Lee, J., Prinz, F. B., Lee, M. H., Cha, S. W.  
2014; 253: 114-122
- **Electrodeposition and Behavior of Single Metal Nanowire Probes** *ACS NANO*  
Motoyama, M., Prinz, F. B.  
2014; 8 (4): 3556-3566
- **Proton incorporation in yttria-stabilized zirconia during atomic layer deposition** *INTERNATIONAL JOURNAL OF HYDROGEN ENERGY*  
Bae, K., Son, K. S., Kim, J. W., Park, S. W., An, J., Prinz, F. B., Shim, J. H.  
2014; 39 (6): 2621-2627
- **Nanotubular array solid oxide fuel cell.** *ACS nano*  
Motoyama, M., Chao, C., An, J., Jung, H. J., Gür, T. M., Prinz, F. B.  
2014; 8 (1): 340-351
- **Rapid and Controllable Flame Reduction of TiO<sub>2</sub> Nanowires for Enhanced Solar Water-Splitting** *NANO LETTERS*  
Cho, I. S., Logar, M., Lee, C. H., Cai, L., Prinz, F. B., Zheng, X.  
2014; 14 (1): 24-31
- **Digitally-patterned nanoprobe arrays for single cell insertion enabled by wet tapping** *RSC ADVANCES*  
Seo, Y. H., Kim, L. H., Prinz, F. B., Ryu, W.  
2014; 4 (32): 16655-16661
- **Nanostructuring Methods for Enhancing Light Absorption Rate of Si-Based Photovoltaic Devices: A Review** *INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING-GREEN TECHNOLOGY*

- Hong, S., Bae, J., Koo, B., Chang, I., Cho, G. Y., Kim, Y., Cha, S. W., Prinz, F. B.  
2014; 1 (1): 67-74
- **Electrochemical tuning of vertically aligned MoS<sub>2</sub> nanofilms and its application in improving hydrogen evolution reaction** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Wang, H., Lu, Z., Xu, S., Kong, D., Cha, J. J., Zheng, G., Hsu, P., Yan, K., Bradshaw, D., Prinz, F. B., Cui, Y.  
2013; 110 (49): 19701-19706
  - **Approaching the limits of dielectric breakdown for SiO<sub>2</sub> films deposited by plasma-enhanced atomic layer deposition** *ACTA MATERIALIA*  
Usui, T., Donnelly, C. A., Logar, M., Sinclair, R., Schoonman, J., Prinz, F. B.  
2013; 61 (20): 7660-7670
  - **Atomic Scale Verification of Oxide-Ion Vacancy Distribution near a Single Grain Boundary in YSZ.** *Scientific reports*  
An, J., Park, J. S., Koh, A. L., Lee, H. B., Jung, H. J., Schoonman, J., Sinclair, R., Gür, T. M., Prinz, F. B.  
2013; 3: 2680-?
  - **Three-Dimensional Nanostructured Bilayer Solid Oxide Fuel Cell with 1.3 W/cm<sup>2</sup> at 450 °C.** *Nano letters*  
An, J., Kim, Y., Park, J., Gür, T. M., Prinz, F. B.  
2013; 13 (9): 4551-4555
  - **Atomic Layer Deposition of Platinum Catalysts on Nanowire Surfaces for Photoelectrochemical Water Reduction** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Dasgupta, N. P., Liu, C., Andrews, S., Prinz, F. B., Yang, P.  
2013; 135 (35): 12932-12935
  - **Three-Dimensional Nanostructured Bilayer Solid Oxide Fuel Cell with 1.3 W/cm<sup>2</sup> at 450 degrees C** *NANO LETTERS*  
An, J., Kim, Y., Park, J., Guer, T. M., Prinz, F. B.  
2013; 13 (9): 4551-4555
  - **Effect of cation non-stoichiometry and crystallinity on the ionic conductivity of atomic layer deposited Y:BaZrO<sub>3</sub> films** *THIN SOLID FILMS*  
Park, J. S., Kim, Y., An, J., Shim, J. H., Guer, T. M., Prinz, F. B.  
2013; 539: 166-169
  - **Atomistic simulations of grain boundary segregation in nanocrystalline yttria-stabilized zirconia and gadolinia-doped ceria solid oxide electrolytes** *ACTA MATERIALIA*  
Lee, H. B., Prinz, F. B., Cai, W.  
2013; 61 (10): 3872-3887
  - **Ultra-thin platinum catalytic electrodes fabricated by atomic layer deposition.** *Physical chemistry chemical physics*  
An, J., Kim, Y., Prinz, F. B.  
2013; 15 (20): 7520-7525
  - **Aberration-Corrected TEM Imaging of Oxygen Occupancy in YSZ** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*  
An, J., Koh, A. L., Park, J. S., Sinclair, R., Guer, T. M., Prinz, F. B.  
2013; 4 (7): 1156-1160
  - **Enhanced oxygen exchange on surface-engineered yttria-stabilized zirconia.** *ACS nano*  
Chao, C., Park, J. S., Tian, X., Shim, J. H., Gür, T. M., Prinz, F. B.  
2013; 7 (3): 2186-2191
  - **Enhanced Oxygen Exchange on Surface-Engineered Yttria-Stabilized Zirconia** *ACS NANO*  
Chao, C., Park, J. S., Tian, X., Shim, J. H., Guer, T. M., Prinz, F. B.  
2013; 7 (3): 2186-2191
  - **Spatial Variation of Available Electronic Excitations within Individual Quantum Dots** *NANO LETTERS*  
Jung, H. J., Dasgupta, N. P., Van Stockum, P. B., Koh, A. L., Sinclair, R., Prinz, F. B.  
2013; 13 (2): 716-721
  - **Atomic Scale Verification of Oxide-Ion Vacancy Distribution near a Single Grain Boundary in YSZ** *Scientific Reports*  
An, J., Park, J. S., Koh, A. L., Lee, H. B., Jung, H. J., Schoonman, J., Prinz, F. B.  
2013

- **Effects of QD Surface Coverage in Solid-State PbS Quantum Dot-Sensitized Solar Cells** *39th IEEE Photovoltaic Specialists Conference (PVSC)*  
Roelofs, K. E., Brennan, T. P., Trejo, O., Xu, J., Prinz, F. B., Bent, S. F.  
IEEE.2013: 1080–1083
- **Atomic layer deposition of thin-film ceramic electrolytes for high-performance fuel cells** *JOURNAL OF MATERIALS CHEMISTRY A*  
Shim, J. H., Kang, S., Cha, S., Lee, W., Kim, Y. B., Park, J. S., Guer, T. M., Prinz, F. B., Chao, C., An, J.  
2013; 1 (41): 12695-12705
- **Efficiency enhancement of solid-state PbS quantum dot-sensitized solar cells with Al<sub>2</sub>O<sub>3</sub> barrier layer** *JOURNAL OF MATERIALS CHEMISTRY A*  
Brennan, T. P., Trejo, O., Roelofs, K. E., Xu, J., Prinz, F. B., Bent, S. F.  
2013; 1 (26): 7566-7571
- **Effect of Cation Non-Stoichiometry and Crystallinity on the Ionic Conductivity of Atomic Layer Deposited Y:BaZrO<sub>3</sub> Films** *Thin Solid Films*  
Park, J., S., Kim, Y., B., An, J., Shim, J., H., Gür, T., M., Prinz, F., B.  
2013; 539: 166-169
- **Ultra-Thin Catalytic Electrodes for LT-SOFC** *Phys. Chem. Chem. Phys.*  
An, J., Kim, Y., B., Prinz, F., B.  
2013; 15: 7520
- **Editor's Choice (Materials Science: 3D Lowers T)** *Science*  
Prinz, F., B., Lavine, Marc, S.  
2013; 342: 15
- **Three-Dimensional Nanostructured Bilayer Solid Oxide Fuel Cell with 1.3 W/cm<sup>2</sup> at 450C** *Nano Letters*  
An, J., Kim, Y., Park, J., Gur, Turgut, M., Prinz, Fritz, B.  
2013
- **STANFORD ENGINEERS DEVELOP FUEL CELL THAT CAN DELIVER RECORD POWER-PER-SQUARE INCH AT RECORD-LOW TEMPERATURES (<http://engineering.stanford.edu/research-profile/stanford-engineers-develop-fuel-cell-can-deliver-record-power-square-inch-record-lo>)** *Stanford Engineering News*  
Prinz, F., B., Davenport, M.  
2013
- **Nanotubular Array Solid Oxide Fuel Cell** *ACS Nano*  
Motoyama, M., Chao, C., An, J., Jung, H. J., Gür, Turgut, M., Prinz, F. B.  
2013
- **Atomic layer deposition of thin-film ceramic electrolytes for high-performance fuel cells** *J. Mater. Chem. A (feature article)*  
Shim, J. H., Kang, S., Cha, S., Lee, W., Kim, Y. B., Park, J. S., Prinz, F. B.  
2013
- **Enhancing Charge Transfer Kinetics by Nanoscale Catalytic Cermet Interlayer** *ACS APPLIED MATERIALS & INTERFACES*  
An, J., Kim, Y., Guer, T. M., Prinz, F. B.  
2012; 4 (12): 6789-6794
- **Enhancing charge transfer kinetics by nanoscale catalytic cermet interlayer.** *ACS applied materials & interfaces*  
An, J., Kim, Y., Gür, T. M., Prinz, F. B.  
2012; 4 (12): 6790-6795
- **Oxygen diffusion across the grain boundary in bicrystal yttria stabilized zirconia** *SOLID STATE COMMUNICATIONS*  
Park, J. S., Kim, Y., An, J., Prinz, F. B.  
2012; 152 (24): 2169-2171
- **Observing the Nucleation Phase of Atomic Layer Deposition In Situ** *CHEMISTRY OF MATERIALS*  
Mack, J. F., Van Stockum, P. B., Yemane, Y. T., Logar, M., Iwadate, H., Prinz, F. B.  
2012; 24 (22): 4357-4362
- **In Situ Cycle-by-Cycle Flash Annealing of Atomic Layer Deposited Materials** *JOURNAL OF PHYSICAL CHEMISTRY C*  
Langston, M. C., Dasgupta, N. P., Jung, H. J., Logar, M., Huang, Y., Sinclair, R., Prinz, F. B.

2012; 116 (45): 24177-24183

- **Thickness effects of yttria-doped ceria interlayers on solid oxide fuel cells** *JOURNAL OF POWER SOURCES*  
Fan, Z., An, J., Iancu, A., Prinz, F. B.  
2012; 218: 187-191
- **Nickel Silicide Nanowire Arrays for Anti-Reflective Electrodes in Photovoltaics** *ADVANCED FUNCTIONAL MATERIALS*  
Dasgupta, N. P., Xu, S., Jung, H. J., Iancu, A., Fasching, R., Sinclair, R., Prinz, F. B.  
2012; 22 (17): 3650-3657
- **Ab initio kinetic Monte Carlo model of ionic conduction in bulk yttria-stabilized zirconia** *MODELLING AND SIMULATION IN MATERIALS SCIENCE AND ENGINEERING*  
Lee, E., Prinz, F. B., Cai, W.  
2012; 20 (6)
- **Improved oxygen surface exchange kinetics at grain boundaries in nanocrystalline yttria-stabilized zirconia** *MRS COMMUNICATIONS*  
Park, J. S., Holme, T. P., Shim, J. H., Prinz, F. B.  
2012; 2 (3): 107-111
- **High aspect ratio and high breakdown strength metal-oxide capacitors** *APPLIED PHYSICS LETTERS*  
Usui, T., Mollinger, S. A., IANCU, A. T., Reis, R. M., Prinz, F. B.  
2012; 101 (3)
- **Structural and compositional analysis of solid oxide fuel cell electrolytes using transmission electron microscopy** *INTERNATIONAL JOURNAL OF PRECISION ENGINEERING AND MANUFACTURING*  
An, J., Kim, Y. B., Jung, H. J., Park, J. S., Cha, S. W., Guer, T. M., Prinz, F. B.  
2012; 13 (7): 1273-1279
- **Nanoscale impedance and complex properties in energy-related systems** *MRS BULLETIN*  
Lee, W., Prinz, F. B., Chen, X., Nonnenmann, S., Bonnell, D. A., O'Hayre, R. P.  
2012; 37 (7): 659-667
- **Nanostructured Platinum Catalysts by Atomic-Layer Deposition for Solid-Oxide Fuel Cells** *ADVANCED ENERGY MATERIALS*  
Chao, C., Motoyama, M., Prinz, F. B.  
2012; 2 (6): 651-654
- **Oxygen Surface Exchange at Grain Boundaries of Oxide Ion Conductors** *ADVANCED FUNCTIONAL MATERIALS*  
Lee, W., Jung, H. J., Lee, M. H., Kim, Y., Park, J. S., Sinclair, R., Prinz, F. B.  
2012; 22 (5): 965-971
- **Nanoscale membrane electrolyte array for solid oxide fuel cells** *ELECTROCHEMISTRY COMMUNICATIONS*  
Su, P., Prinz, F. B.  
2012; 16 (1): 77-79
- **Enhanced oxygen exchange and incorporation at surface grain boundaries on an oxide ion conductor** *ACTA MATERIALIA*  
Shim, J. H., Park, J. S., Holme, T. P., Crabb, K., Lee, W., Kim, Y. B., Tian, X., Guer, T. M., Prinz, F. B.  
2012; 60 (1): 1-7
- **Effect of High Surface Area Pd Electrodes on SOFC Performance at 350 degrees C** *A4 Symposium on Grand Challenges in Energy Conversion and Storage / 220th Meeting of the Electrochemical-Society (ECS)*  
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