

## Vinayak P. Dravid, PhD

*Abraham Harris Chaired Professor*

*Department of Materials Science & Engineering*

*McCormick School of Engineering and Applied Science*

Founding Director, NUANCE Center & SHyNE Resource

Founder and co-director; Global McCormick

### **Northwestern University**

AB Wing A190 Technological Institute, 2145 Sheridan Road

Evanston, IL 60208

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### **Education and Training:**

IIT Bombay	Bombay, India	Metallurgical Engineering	B.S. Tech.	1984
Lehigh University	Bethlehem, PA	Materials Science & Engineering	Ph.D.	1990

### **Interweaving Research, Education & Outreach Theme**

Vinayak's scholarly interests revolve around "imaging" across diverse length-scales and disparate phenomena; from atoms to animals and from arts to astronomy. His research spans a wide spatial range - from atomic-scale imaging with electron microscopy to animal imaging with magnetic resonance imaging (MRI). His education and outreach contributions encompass microscopy and characterization of arts and artifacts as well as dynamic imaging, methodologies and algorithms inspired by astronomy.

His passion for facilities and instrumentation infrastructure has brought global leadership in the broad field of imaging to Northwestern and the Chicago region. He is a tireless advocate of "inclusive innovation" and committed to enhancing the societal and global appreciation for science and technology through the visually appealing medium of imaging.

### **Specific Research & Scholarly Interests and Contributions**

- Development, implementation and application of novel electron, ion, photon & probe microscopy for hard, soft and hybrid materials, structures and devices.
- Predictive structure-property & form-function relationships at molecular/atomic scale.
- Novel assembly and characterization approaches to "*soft*" and "*hybrid*" materials.
- Nanopatterning & nanostructures for biomedicine, energy and sensor applications
- Facilities/instrumentation as catalyst for innovation and corporate partnership

### **Academic Philosophy**

- *Beyond Knowledge* - Emphasis on creativity, communication and innovation
- Inter-disciplinary, cross-disciplinary, collaborative and teamwork approach; rooted in independent, individual creativity and aspirations
- Seamless integration of research, education and societal outreach; with an emphasis on local and global engagement
- Bloom's Taxonomies for 21<sup>st</sup> Century: synthesis, analysis, creativity and communication

## Professional Appointments and Education

2021-Present	Member, Simpson Querrey Institute for BioNanotechnology
2016-Present	Founding Director, Soft & Hybrid Nanotechnology Experimental (SHyNE) Resource <i>NSF Center of Excellence in Facility Infrastructure in MidWest</i>
2015-Present	Founder, Past Director and Current Co-Director, Global McCormick Initiative (GMI) <i>Conceived, developed and nurtured global research and educational initiatives</i>
2012-Present	President Abraham Harris Chaired Professor; Materials Science and Engineering, Northwestern University
2009-2010	Kellogg School of Management, Executive Development; <i>“Management Skills for Innovative University Leaders”</i>
2000-Present	Full Professor, Materials Science and Engineering, Northwestern University
2001-Present	Founding Director, Northwestern University Atomic and Nanoscale Characterization Experimental (NUANCE) Center
1995-Present	Director, Electron Probe Instrumentation Center (EPIC)
1995-2000	Associate Professor, Materials Science and Engineering, Northwestern University
1990-1995	Assistant Professor, Materials Science and Engineering, Northwestern University
1985-1990	Graduate Research Assistant, Lehigh University, PhD in MS & E, <i>Advisors: Profs. Michael R. Notis and Charles E. Lyman</i>
1984-1985	Research Engineer, Morris Electronics, India; Development of magnetic ferrites
1979-1984	B.S. Tech, Metallurgical Engg., Indian Institute of Technology (IIT) Bombay, India

## Notable Positions, Honors & Awards:

2020	Annual Highly Cited Researchers List by Clarivate Analytics
2019	Fellow, The Microanalysis Society, Inaugural Class of 2019
2018	Annual Highly Cited researchers 2018 List by Clarivate Analytics
2017	Fellow, Royal Microscopical Society, UK.
2014	Elected Honorary Member, The Indian Institute of Metals (IIM), India
2014	Gold Star Award; Core Facilities, for consistent excellence every year since inception
2012	Lee Hsuen Research Fellowship, Chinese Academy of Sciences, PRC
2012	IIT Bombay Distinguished Alumnus Award, India
2011	Elected Faculty Honor Roll for Excellence in Teaching: Northwestern University; Selected by voting UG students for several years
2011	Elected Honorary Member, Materials Research Society of India (MRSI)
2010	Elected Fellow, American Association for Advancement of Science (AAAS)
2010	Elected Fellow, Materials Research Society (MRS)
2010	Elected Fellow, American Physical Society (APS)
2010	Elected Faculty Honor Roll for Excellence in Teaching: Northwestern University; Selected by voting UG students
2009	Elected Fellow, Microscopy Society of America (MSA) - Inauguration Class
2009-	Elected Faculty Honor Roll for Excellence in Teaching: Northwestern University; Selected by voting UG students – several years
2008	Richard M. Fulrath Award, American and Japanese Ceramics Society
2007	6th McBain Memorial Award, National Chemical Laboratory (NCL), India
2006	First McCormick Faculty Excellence Award, Northwestern University

2005	Outstanding Mentor Award, Westinghouse High School Mentor Program
2003	Elected Fellow, American Ceramic Society
2001-2002	Teacher of the Year, MSE Department, Northwestern University
2001-2002	Visiting Faculty Fellow, ASM-IIM
2001-2002	National Institutes of Health (NIH) Sabbatical Faculty Fellowship
2001	Distinguished Alumnus Service Award, IIT Bombay, India
1999-2000	Speaker of the Year, Microbeam Analysis Society (MAS)
1998	Educational Development Award, The Minerals, Metals & Materials Society (TMS)
1998	Kurt F.J. Heinrich Award, Microbeam Analysis Society (MAS)
1997	Robert L. Coble Award, American Ceramic Society (ACerS)
1996	Burton Medal, Microscopy Society of America (MSA)
1995	Faculty Development Award, IBM
1994	Faculty Fellow, Exxon Foundation
1994	Faculty Fellowship, Oak Ridge National Laboratory's HTML
1993	NSF Young Investigator Award (NYI), NSF

### **Selected Leadership Activities**

#### **Organization and Management**

2016-Present	Director, SHyNE Resource: Soft and Hybrid Nanotechnology Experimental Resource, an NSF-NNCI program, is a national resource that provides academic, SMEs researchers access to cutting-edge nanotechnology facilities and expertise. ( <a href="http://www.shyne.northwestern.edu">www.shyne.northwestern.edu</a> )
2001-Present	Director, NUANCE Center: conceived and implemented a diverse yet integrated characterization instrumentation center, comprising EPIC (electron microscopy), Keck-II (surface science), and NIFTI (scanning probe microscopy), with 30+ major instruments worth \$25+ million. <i>Lead the growth of NUANCE Center from two instruments and &lt;30 users to over 30+ major instruments, 110+ faculty affiliates and 800+ users.</i> ( <a href="http://www.nuance.northwestern.edu">http://www.nuance.northwestern.edu</a> )
2015-Present	Founder and Co-Director, Global McCormick Initiative: conceived, formulated and executed Global McCormick Initiative. <i>An integrated school-wide initiative for global engagement and program development in every continent, with over 70 global programs and interactions.</i> ( <a href="http://global.mccormick.northwestern.edu">http://global.mccormick.northwestern.edu</a> )
2012-2015	Founding Director, Global McCormick Initiative Dean and Provost Advisor: International and Global Outreach. Member: NU Strategic Planning for Globalization
2010-Present	Member: Center for Advanced Molecular Imaging (CAMI) Advisory Board
2010-Present	Member: McCormick Areas of Distinction Committee
2010	Member: N.O.W.: McCormick New Opportunities Workshops. Member: Materials Science & Engineering School Advisory Committee, Nanyang Technological University (NTU) Singapore.
2007-Present	Member: Editorial Advisory Board; Bulletin of Materials Science, Bangalore, India.
2010-2013	Co-Chair: NSEC REU Program and Symposium
2010 - 2015	Member: INVO Innovation & New Ventures Faculty Board
2010- Present	Member: College of Engineering Advisory Committee: Nanyang Technological

University (NTU) Singapore.

2010-Present Member: Steering Committee, Provost Taskforce on Global Engagement.  
Member: MSE Long Range Planning Committee  
Member: Presidential Circle, Chicago Council on Global Affairs (CCGA).

2005- Present Member: India Biodesign Initiative.  
Member: International Advisory Committee for the International Conference on Nano Science and Technology, (ICONSAT), I.I.T. Bombay, India

2005 - 2015 Member: External Advisory Board: IIT Bombay, India

2010-Present Member: External Advisory Board: Nanyang Technological University (NTU) Singapore.

2003-Present Member: External Advisory Committee, University of Toronto, Province of Ontario

2007-2016 Board of Directors, IIT Bombay Heritage Fund (IITBHF – US Alumni Association of IIT Bombay, India).

2008-2015 Co-founder and Organizer: ASME Nano Bootcamp, ASME-NU Initiative.

2003-2015 Board Member: NanoInk Scientific Advisory Board

2004-Present Member: Robert H. Lurie Comprehensive Cancer Center.

2008-2015 Founder, Board Member and Chair Scientific Advisory Committee: NanoSonix, Inc., a high-tech start-up.

2008-Present Member: Northwestern University Chemistry of Life Processes (CLP) Corporate & International Outreach/Entrepreneurial Activities Committee.

2008-2013 Member: NU Imaging Advisory Committee.

2009-2013 Co-Chair: NSEC Annual Meeting.

2009-2015 International Advisory Committee: Global Indian Scientists and Technocrats Convention (GIST).

### ***Recent Scientific and Technical Leadership***

2001-Present Co-Founder, steering committee member, Associate Director for Global Programs: International Institute for Nanotechnology (IIN)

2001-2008 Founding member and Co-PI on original proposal, NSF-NSEC

2009-2013 Group Leader, Interdisciplinary Research Group (IRG) of NU NSF-MRSEC

2005-Present Scientific Advisor and Technical Consultant, Art Institute and Museum of Science and Industry, Chicago, Illinois

2009-Present Technical Advisor and Committee Member, Chemistry of Life Processes Institute

2005-Present Developer and Instructor, New Curriculum for Kellogg School of Management (KSM) related to Emerging Technologies

2015-present Initiated Integration: Journalism, (Medill School), Communication (School of Communication) and Business (Kellogg School of Management) in Engineering and Technology Education

2007-Present Scientific Advisor, Reliance Industries (RIL) and RIL Chairman, Mr. Mukesh Ambani, Global conglomerate with largest market capitalization in India (> \$30b).

2012-Present Member, Australian Microscopy and Microanalysis, Research Facility (AMMRF) International Technical and User Advisory Group

2009-2012 Member, National Institutes of Health Biomedical Technology Review Committee

### **Selected Recent Professional Activities**

2018 Symposium Organizer, Machine Learning, M&M Annual Mtg., Baltimore, MD Conference

2016 Chair, National Science Foundation Nanoscale Science & Engineering Conference

2015-16 Mico- and Nanofabrication and Characterization Task Force  
 Several Materials Research Society (MRS) Fall Meeting Symposium Organizer  
 2014-Present Editorial Board, Current Opinion in Solid State & Materials Science  
 2012-Present Editor, Materials Science, Microscopy & Microanalysis, Flagship Journal of the  
 Microscopy Society of America (MSA)  
 2003-Present Co-Founder and Instructor: American Society of Mechanical Engineers (ASME) Nano  
 Training Bootcamp  
 1999-2013 Board of Directors, IIT Bombay Heritage Fund (IITBHF)  
 1995-Present Editorial Board Member, *Journal of Microscopy* (Royal Microscopical Society, UK)

#### **Affiliated Professional Societies**

Microscopical Society of America (MSA)	American Chemical Society (ACS)
Microbeam Analysis Society (MAS)	American Physics Society (APS)
ASM International	Institute of Electrical and Electronics Engineering (IEEE)
The Minerals, Metals, and Materials Society (TMS)	American Society of Mechanical Engineers (ASME)
American Ceramic Society (ACerS)	American Society for Engineering Education (ASEE)
Materials Research Society (MRS)	Royal Microscopy Society (RMS)
Amer. Assoc. for the Adv. of Science (AAAS)	Chicago Council on Global Affairs, President's Circle Sigma XI

#### **Professional Consulting and Advising**

Past consultant to several global companies  
 Expert Scientific Consultant for Fortune 500 companies and start-up enterprises  
 Expert Technical Advisor, Chicago Museum of Science and Industry (MSI)  
 Expert Technical Advisor, Art Institute of Chicago (AIC)  
 Member, Scientific Advisory Board of start-up companies  
 Advisor/Consultant to NGOs & overseas corporations related to technology, energy, & management

#### **Educational and Mentoring Activities**

##### ***Philosophy***

Emphasis on Bloom's taxonomies of higher levels of learning and teaching: *creativity, synthesis, analysis and dissemination.*

- Multidisciplinary approach to materials education.
- Attaining excellence in education via integrating research and teaching, as well as communication and IT in the global context.
- Inculcation of societal appreciation for science and technology via community, national and international outreach activities.

##### ***Teaching Interests and Course/Curricula Development***

Introduction to Materials Science & Engineering, Interface and Defect Phenomena in Materials, Introduction to SEM and TEM, Advanced Analytical Electron Microscopy, Physical Ceramics, Symmetry and Physical Properties, Hierarchy of Structures in Biological and Physical Sciences, Nanopatterning of Functional Structures, Business of Nanotechnology, Energy Strategy and Policy.

Advisor to several high school students, as well as REU, MIN, REST and teacher/student interns:

- Prudent use of modern technology in classroom and in distance learning.

- Development of multi-media approach to UG education.
- Emphasis on concept development and hands-on experimental training.
- Faculty Honor Roll voted by UG students: Several Years.
- Teacher of the Year award from MSE department students
- Consistently in top tier of student reviews in courses taught: CTEC (Course and Teacher Evaluation Council). In all categories, typically score in excess of 5 out of 6.

**Graduated Students & Postdoctoral Scholars (40+ PhD graduates, 50+ Postdocs, 20+ MS, over 1500+ UG students in classes and internships)**

V. Ravikumar	PhD	1996	GE, Global R&D, NY
Michelle St. Louis-Weber	PhD	1997	Intel Corp, CA
Elizabeth C. Dickey	PhD	1997	North Carolina State Univ., NC
Jonathan J. Host	PhD	1997	Hemlock Corp., MI
Thomas Isabell	PhD	1998	JEOL, MA
Henry Lippard	PhD	1998	AllVac, Inc., NC
Steven Kim	PhD	1999	EmiSpec Inc., AZ
Richard Rodriguez	PhD	1999	Intel Corp., CA
Kevin Johnson	PhD	2000	Intel Corp., OR
Conal Murray	PhD	2001	IBM Watson Res. Ctr., NY
Xiwei Lin	PhD	2001	Intel Corp., OR
Luke N. Brewer	PhD	2002	University of Alabama, AL
Kevin L. Klug	PhD	2002	CTC Corp., PA
Murat Guruz	PhD	2002	Hitachi-IBM Alliance, CA
Ming Su	PhD	2004	Worcester Polytechnic Inst., MA
Pradyumna Prabhumirashi	PhD	2006	Intel Corp., Santa Clara, CA
Nasim Alem	PhD	2007	Pennsylvania State University, PA
Suresh Donthu	PhD	2007	Exponent Consulting, CA
Zixiao Pan	PhD	2008	Exponent Consulting, CA
Tao Sun	PhD	2009	Argonne National Laboratory, IL
Soo-Hyun Tark	PhD	2010	Intel Corporation, OR
Mengchun Pan	PhD	2012	Intel Corporation, OR
Bin Liu	PhD	2012	Intel Corporation, CA
Aiming Yan	PhD	2013	Zettl Group, UC-Berkeley, CA
Stan Shihyao Chou	PhD	2013	Sandia National Lab, NM
Shraddha Avasthy	PhD	2013	Intel Corporation, OR
Yi-Kai Huang	PhD	2014	Intel Corporation, OR
Shihhan Lo	PhD	2014	Intel Corporation, OR
Jeff Cain	PhD	2017	UC-Berkeley, CA
Karl Hujsak	PhD	2018	Northwestern University, IL
Fernando Castro	PhD	2018	Northwestern University, IL
Ben Meyers	PhD	2018	Yale University, CT
Eve Hanson	PhD	2018	Citrine Informatics, CA
Xiaoming Zhang	PhD	2019	Apple, Inc.
Yue Li	PhD	2019	Northwestern University, IL

Akshay Murthy	PhD	2020	ASM America, AZ
Jann Grovoqui	PhD	2021	The Aerospace Corporation
Cesar Villa	PhD	2021	Consultant
Sonting Cai	PhD	2021	Northwestern University
Jennifer DiStefano	PhD	2021	Energy Futures Initiative, DC
Liban Jibril	PhD	2022	Northwestern University
Kelly Parker	PhD	2022	Northwestern University
Chamille LeScott	PhD	2022	Northwestern University
Chi Zhang	PhD	2022	Northwestern University
Nathan Wilcox	MS	1994	Intel Corp., CA
Jlnha Hwang	MS	1994	Hongik University, S. Korea
Balaji Chandrasekaran	MS	1999	Applied Materials, CA
Nazir Poonawala	MS	1999	Intel Corp., OR
Ethan Young	MS	2006	Samsung Corp., S. Korea
Michael Miller	MS	2006	Gas Research Institute, IL
Feng Qu	MS	2005	Private Consultant
Ben Murphy	MS	2009	Triton Systems, Boston, MA
Shanwei Fan	MS	2009	Taiwan Semiconductor Manufacturing Co.
James Sbarboro	MS	2011	Neuroquest, Inc., Chicago, IL
David Woo Hyun Chae	MS	2017	Massachusetts Institute of Technology, MA
Aaron Einhorn	MS	2018	Northwestern University
Tzu Hung Chen	MS	2018	Northwestern University, IL
Liren Wang	MS	2019	Northwestern University, IL
Will Kellogg	MS	2019	Intel Corp.
Hong Zhang	Postdoc	1994	Applied Materials, CA
Yun-Yu Wang	Postdoc	1997	IBM Corp., NY
S.C. Cheng	Postdoc	1998	Corning Corp., NY
Weida Qian	Postdoc	1998	Intel Corp., OR
Zhen Liu	Postdoc	1999	Arizona State University., AZ
Yanguo Wang	Postdoc	1999	Beijing University., China
Sylvie Malo	Postdoc	2000	CRSIMAT, CNRS, France
Jinha Hwang	Postdoc	2001	Hongik University, S. Korea
Lei Fu	Postdoc	2002	Photronics, TX
Shu-You Li	Postdoc	2003	Northwestern University, IL
Hao Hu	Postdoc	2007	PriceWaterhouseCoopers, NY
Mohammed Aslam	Postdoc	2007	IIT Bombay, India
Arvind Srivastava	Postdoc	2009	NanoSonix, Inc., IL
Soo-Hyun Tark	Postdoc	2011	Intel Corporation, OR
Mirela Mustata	Postdoc	2011	Northeastern University, MA
Mrinmoy De	Postdoc	2012	Northwestern University, IL
Saurabh Sharma	Postdoc	2012	Northwestern University, IL
Changquiang Chen	Postdoc	2012	University of Iowa, IA
Langli Luo	Postdoc	2013	Pacific Northwest National Laboratory, WA

Fengyuan Shi	Postdoc	2013	University of Illinois at Chicago, IL
Vikas Nandwana	Postdoc	2014	Northwestern University, IL
Shanthi Kanthala	Postdoc	2014	Kashiv Pharm Bridgewater, NJ
Xin Wang	Postdoc	2016	Tianjin University of Technology, China
Qianqian Li	Postdoc	2017	Shanghai University, China
Chiara Musumeci	Postdoc	2017	Linkoping University, Sweden
Neena Gilda	Postdoc	2017	Taiwan Semiconductor Manufacturing
Sungkyu Kim	Postdoc	2018	Brookhaven National Lab, NY
Hee Joon Jung	Postdoc	2018	Northwestern University, IL
Abhalaxmi Singh	Postdoc	2018	University of Illinois at Chicago, IL
Soo Ryoan Ryoo	Postdoc	2018	Dankook University, S. Korea
Yaobin Xu	Postdoc	2018	Pacific Northwest National Laboratory, WA
Poya Yasaei	Postdoc	2018	Exponent Consulting, CA
Qing Tu	Postdoc	2018	Texas A&M, TX
Yuan Li	Postdoc	2018	Northwestern University, China
Paul Das	Postdoc	2021	Intel Corporation, Oregon
Dilip Agrawal	Postdoc	2021	Northwestern University
M. Arslan Shehzad	Postdoc	2021	Intel Corporation, Oregon
Thang Toan Pham	Postdoc	2022	Northwestern University
Dhruv Aggarawal	BS	1994	GE, CT
Jason Ross	BS	1997	Timken Steels, OH
Cyndi Batson	BS	1998	University of California Santa Barbara, CA
April Hixon	BS	1998	Containerless Corp., IL
Howard Gholston	BS/MS	2000	Intel Corp., AZ
Nora Colligan	BS	2002	Samsung Corp., TX
Ethan Chang	BS/MS	2006	Samsung Corp., Korea
Yen Po Lin	BS	2008	Harvard University, MA
Ken D'Aquila	BS	2008	Northwestern University, IL
Felix Richter	BS	2013	Mt. Sinai, NY
Dan Charles	BS	2014	Northwestern University, IL
Conner Dykstra	BS	2014	Sandia National Lab, NM

#### **Representative Funding Support:**

National Science Foundation (NSF); Divisions - DMR, ENG, CMMI, INT, EECS, Chem  
National Science Foundation-Materials Research Science & Engineering Centers (MRSEC)  
National Science Foundation-National Nanotechnology Coordinated Infrastructure (NNCI)  
Air Force Office of Scientific Research (AFOSR)  
Department of Energy (DOE) – Basic Energy Sciences (BES)  
DOE Energy Frontier Research Centers (EFRCs)  
Air Force Center of Excellence (COE)  
DARPA, DOD (ONR, AFOSR, ARO)  
Nanyang Technological University (NTU) Singapore  
Samsung Electronics, IBM, Intel Corp., SRC



## **Selected Representative Service**

### ***Department of Materials Science and Engineering***

2017-Present Chair, Department Faculty Awards Committee  
2015- Present Member, Facility and Center Directors Committee  
2015-Present Member, Search Committee for MSE with IIN Tenure-Track Asst. Professor  
2011-2013 Advisor, Materials Science Student Association (MSSA Graduate Students)  
2005-Present Member, Long Range Planning Committee  
2005-Present Member, Colloquium and Named Lectures Committee

### ***McCormick School of Engineering***

2015-Present Founder and Co-Director, Global McCormick Initiatives (GMI)  
2013 Member, Biomedical Engineering-Mechanical Engineering Faculty Search Committee  
2011-2015 Founder and Director, Global McCormick Initiative (GMI)  
2009-Present Member, Advisory Board: NU-Niles University, Egypt  
2009-Present Member, McCormick New Initiatives Committee  
2008-Present Member, Cancer Center, Program in Engineering and Nanotechnology in Cancer Research  
2007-Present Member, MRSEC Steering Committee  
2005-Present Chair, McCormick Ad-Hoc Committees  
2005-Present Advisor to the Dean, Global Outreach  
1991-Present Faculty Advisor, Local MRS Chapter

### ***University***

2015-present Member, Buffett Institute Leadership Search Committee  
2015-present Member, Ryan Fellowship Award Committee  
2011-present Member, Advisory Board for the Tumor Biology Core  
2011-present Member, Nanoscale Science & Engineering Center; Leader, Integrated Bio-Chip  
2009-present Member, Northwestern University Imaging Advisory Committee  
2009-present Member, NU Advisory Committee on Imaging  
2009-present Member, CLP Corporate & International Outreach & Entrepreneurial Activities Committee  
2009-present Member, Global NU Committee  
2009-present Member, Program Review Panel: Core Facilities  
2009-present Member, Robert H. Lurie Comprehensive Cancer Center Translational Working Group  
2009-present Member, International Institute for Nanotechnology (IIN) Steering Committee  
2007-present Member, One Northwestern Committee  
2006-present Member, Provost Committee on NU Globalization Strategy  
2006-present Member, Program Review of Office of VP Research  
2005-present Member, Vice President of Research Committee on Nanoscience and Nanotechnology  
2005-present Member, Minority Outreach Initiative Committee  
2005-present Director, CCNE Nanofabrication Core  
2005-present Member, IBNAM; Co-PI Baxter Incubator Grant  
2001-present Director, NUANCE Center  
1998-present Member, Intellectual Property Committee

### ***Facility Leadership***

2015-Present Founding Director, SHyNE Resource  
2001-Present Founding Director, NUANCE Center  
2012-2015 Founding Director, Global McCormick

## Journal Publications and Book Chapters

**(670+ archival publications, Google Scholar “h” index 113 as of July 2022)**

672. Yea-Shine Lee, Sina Abedini Dereshgi, Shiqiang Hao, Matthew Cheng, Muhammad Arslan Shehzad, Christopher Wolverton, Koray Aydin, Roberto dos Reis, and Vinayak P. Dravid (2022). Probing the Optical Response and Local Dielectric Function of an Unconventional Si@MoS<sub>2</sub> Core–Shell Architecture. *Nano Lett.* 2022, XXXX, XXX, XXX-XXX; <https://doi.org/10.1021/acs.nanolett.2c01221>; DOI: 10.1021/acs.nanolett.2c01221

671. Xuezheng Lu, Dominic P. Goronzy, Carlos G. Torres-Castanedo, Paul Masih Das, Maryam Kazemzadeh-Atoufi, Anthony McFadden, Corey Rae H. McRae, Peter W. Voorhees, Vinayak P. Dravid, Michael J. Bedzyk, Mark C. Hersam, and James M. Rondinelli (2022). Stability, metallicity, and magnetism in niobium silicide nanofilms. *Phys. Rev. Materials* 6, 064402. <https://doi.org/10.1103/PhysRevMaterials.6.064402>; DOI:10.1103/PhysRevMaterials.6.064402

670. Dilip Kumar Agarwal, Andrew C. Hunt, Gajendra S. Shekhawat, Lauren Carter, Sidney Chan, Kejia Wu, Longxing Cao, David Baker, Ramon Lorenzo-Redondo, Egon A. Ozer, Lacy M. Simons, Judd F. Hultquist, Michael C. Jewett, and Vinayak P. Dravid, (2022). *Anal. Chem.* 2022, 94, 23, 8105–8109 <https://doi.org/10.1021/acs.analchem.2c01221>; DOI:10.1021/acs.analchem.2c01221

669. Luo, Zhong-Zhen; Cai, Songting; Hao, Shiqiang; Bailey, Trevor P; Xie, Hongyao; Slade, Tyler J; Liu, Yukun; Luo, Yubo; Chen, Zixuan; Xu, Jianwei; Luo, Wenjun; Yu, Yan; Uher, Ctirad; Wolverton, Christopher; Dravid, Vinayak P; Zou, Zhigang; Yan, Qingyu; Kanatzidis, Mercouri G; (2022). Valence Disproportionation of GeS in the PbS Matrix Forms Pb 5 Ge 5 S 12 Inclusions with Conduction Band Alignment Leading to High n-Type Thermoelectric Performance. *Journal of the American Chemical Society*. DOI: 10.1021/jacs.2c01706 <https://doi.org/10.1021/jacs.2c01706>

668. Wang, Ying; Liu, Min; Hao, Shiqiang; Li, Yuan; Li, Qianqian; Liu, Fangyang; Lai, Yanqing; Li, Jie; Wolverton, Chris; Dravid, Vinayak P; Jiang, Liangxing (2022). Synergistic defect- and interfacial-engineering of a BiS-based nanoplate network for high-performance photoelectrochemical solar water splitting. *Journal of materials chemistry. A, Materials for energy and sustainability*, 2022-03-01, Vol.1 (14), p.783-784. DOI: 10.1039/D1TA09961B <https://doi.org/10.1039/D1TA09961B>

667. Schwenker, Eric; Kolluru, Venkata Surya Chaitanya; Guo, Jinglong; Zhang, Rui; Hu, Xiaobing; Li, Qiucheng; Paul, Joshua T; Hersam, Mark C; Dravid, Vinayak P; Klie, Robert; Guest, Jeffrey R; Chan, Maria K Y; (2022) Ingrained: An Automated Framework for Fusing Atomic-Scale Image Simulations into Experiments. *Small* (Weinheim an der Bergstrasse, Germany), 2022-04-05, p.e2102960-e2102960 DOI: 10.1002/smll.202102960 (April 05, 2022); <https://doi.org/10.1002/smll.202102960> PMID:35384282

666. San, Xingyuan; Gong, Mingyu; Wang, Jian; Ma, Xiuliang; Dos Reis, Roberto; Smeets, Paul J M; Dravid, Vinayak P; Hu, Xiaobing; (2022). Uncovering the crystal defects within aragonite CaCO<sub>3</sub>; *Proceedings of the National Academy of Sciences - PNAS*, 2022-04-05, Vol.119 (14), <https://doi.org/10.1073/pnas.2122218119>; DOI:10.1073/pnas.2122218119

665. Sil, Aritra; Deck, Michael J; Goldfine, Elise A; Zhang, Chi; Patel, Sawankumar V; Flynn, Steven; Liu, Haoyu; Chien, Po-Hsiu; Poepplmeier, Kenneth R; Dravid, Vinayak P; Bedzyk, Michael J; Medvedeva, Julia E; Hu, Yan-Yan; Facchetti, Antonio; Marks, Tobin J.; (2022). Fluoride Doping in Crystalline and Amorphous Indium Oxide Semiconductors. American Chemical Society Chemistry of Materials, Vol.34 (7), p.3253-3266; DOI: 10.1021/acs.chemmater.2c00053 <https://doi.org/10.1021/acs.chemmater.2c00053>

664. Murthy, Akshay A; Das, Paul Masih; Ribet, Stephanie M; Kopas, Cameron; Lee, Jaeyel; Reagor, Matthew J; Zhou, Lin; Kramer, Matthew J; Hersam, Mark C; Checchin, Mattia; Grassellino, Anna; Reis, Roberto dos; Dravid, Vinayak P; Romanenko, Alexander; (2022). Potential Nanoscale Sources of Decoherence in Niobium based Transmon Qubit Architectures. DOI: 10.48550/arXiv.2203.08710; <https://doi.org/10.48550/arXiv.2203.08710>

663. Belvitch Patrick, Casanova Nancy, Sun Xiaoguang, Camp Sara M, Sammani Saad, Brown Mary E, Mascarhenas Joseph, Lynn Heather, Adyshev Djanybek, Siegler Jessica, Desai Ankit, Seyed-Saadat Laleh, Rizzo Alicia, Bime Christian, Shekhawat Gajendra S, Dravid Vinayak P, Reilly John P, Jones Tiffanie K, Feng Rui, Letsiou Eleftheria, Meyer Nuala J, Ellis Nathan, Garcia Joe G N, Dudek Steven M (2022). A cortactin CTTN coding SNP contributes to lung vascular permeability and inflammatory disease severity in African descent subjects. Elsevier DOI: 10.1016/j.trsl.2022.02.002

662. Walters, Jiahong Shen, Fenghua Ding, Xiuquan Zhou, Christos D. Malliakas, James M. Rondinelli, Mercuri G. Kanatzidis, Chris Wolverton, Vinayak P. Dravid, and Kenneth R. Poepplmeier (2022). Low Thermal Conductivity in Heteroanionic Materials with Layers of Homoleptic Polyhedra J. Am. Chem. Soc. 2022, XXXX, XXX, XXX-XXX DOI: 10.1021/jacs.1c10284

661. Yubo Luo, Zheng Ma, Shiqiang Hao, Songting Cai, Zhong-Zhen Luo, Christopher Wolverton, Vinayak P. Dravid, Junyou Yang, Qingyu Yan, and Mercuri G. Kanatzidis (2022) Thermoelectric Performance of the 2D Bi<sub>2</sub>Si<sub>2</sub>Te<sub>6</sub> Semiconductor. ACS Publications J. Am. Chem. Soc. 2022, XXXX, XXX, XXX-XXX. DOI: 10.1021/jacs.1c12507

660. Hinamoto, Tatsuki; Lee Ye-Shine; Dereshgi, Sina Abedini; DiStefano, Jennifer G.; dos reis, Roberto, Sugimoto, Hiroshi; Aydin Koray; Fujii, Minoru; Dravid, Vinayak P., (2022). Resonance Couplings in Si@MoS<sub>2</sub> Core–Shell Architectures. Small Volume 18, Issue 17 2200413; DOI:10.1002/sml.202200413 <https://doi.org/10.1002/sml.202200413>

659. Shehzad, M Arslan ; Das, Paul Masih ; Tyner, Alexander C ; Cheng, Matthew ; Lee, Yea-Shine ; Goswami, P ; Dos Reis, Roberto ; Chen, Xinqi ; Dravid, Vinayak P.; Synthesis of layered vs planar Mo<sub>2</sub>C: role of Mo diffusion.; 2d materials, 2022-01-01, Vol.9 (1) DOI: 10.1088/2053-1583/ac43fa; Published January 6, 2022) <https://iopscience.iop.org/article/10.1088/2053-1583/ac43fa>

658. Luo Zhong-Zhen, Cai Songting, Hao Shiqiang, Bailey Trevor P, Luo Yubo, Luo Wenjun, Yu Yan, Uher Ctirad, Wolverton Christopher, Dravid Vinayak P, Zou Zhigang, Yan, Qingyu, Kanatzidis, Mercouri G (2021) Extraordinary role of Zn in enhancing thermoelectric performance of Ga-doped n-type PbTe. *Energy & environmental science*, 2022 Vol.15 (1), p.368-375 Royal Society of Chemistry (RSC)  
DOI: 10.1039/d1ee02986j

657. Shunzhi Wang, Sangmin Lee, Jingshan S. Du, Benjamin E. Partridge, Ho Fung Cheng, Wenjie Zhou, Vinayak P. Dravid, Byeongdu Lee, Sharon C. Glotzer and Chad A. Mirkin (2022). The emergence of valency in colloidal crystals through electron equivalents. *Nature/ Nature Materials* 1398 (Accesses) 81 Altmetric. DOI: 10.1038/s41563-021-01170-5

656. Kirsten L. Viola, Maira A. Bicca, Adrian M. Bebenek, Daniel L. Kranz, Vikas Nandwana, Emily A. Waters, Chad R. Haney, Maxwell Lee, Abhay Gupta, Zachary Brahmabhatt, Weijian Huang, Ting-Tung Chang, Anderson Peck, Clarissa Valdez, Vinayak P. Dravid (2022). *Frontiers in Neuroscience*.  
DOI: 10.3389/fnins.2021.768646.

655. Dilip Kumar Agarwal, Vikas Nandwana, Stephen E. Henrich, Vara Prasad V.N. Josyula, C. Shad Thaxton, Chao Qi, Lacy M. Simons, Judd F. Hultquist, Egon A. Ozer, Gajendra S. Shekhawat, Vinayak P. Dravid (2022). Highly sensitive and ultra-rapid antigen-based detection of SARS-CoV-2 using nanomechanical sensor platform. *Elsevier/ Biosensors and Bioelectronics* Volume 195, 1 January 2022, 113647. DOI: 10.1016/j.bios.2021.113647

654. Alexander, Grant C. B; Krantz, Patrick W; Jung, Hee Joon; Davis, Samuel Kenneth; Xu, Yaobin; Dravid, Vinayak P; Chandrasekhar, Venkat; Kanatzidis, Mercouri G.; (2021). Controllable Nonclassical Conductance Switching in Nanoscale Phase-Separated (PbI<sub>2</sub>)<sub>1-x</sub>(BiI<sub>3</sub>)<sub>x</sub> Layered Crystals. *Advanced materials* (Weinheim), Vol.33 (51), p.e2103098-n/a. DOI:10.1002/adma.202103098, <https://doi.org/10.1002/adma.202103098>

653. Ding, Fenghua; Charles, Nenian; Harada, Jaye K; Malliakas, Christos D; Zhang, Chi; dos Reis, Roberto; Griffith, Kent J; Nisbet, Matthew L; Zhang, Weiguo; Halasyamani, P. Shiv; Dravid, Vinayak P; Rondinelli, James M; Poeppelmeier, Kenneth R., (2021). Perovskite-like K<sub>3</sub>TiOF<sub>5</sub> Exhibits (3 + 1)-Dimensional Commensurate Structure Induced by Octahedrally Coordinated Potassium Ions. *Journal of the American Chemical Society*, 2021, Vol.143 (45), p.18907-18916 DOI: 10.1021/jacs.1c05704 <https://doi.org/10.1021/jacs.1c05704>

652. Abedini Dereshgi, Sina; Larciprete, Maria Cristina; Centini, Marco; Murthy, Akshay A; Tang, Kechao; Wu, Junqiao; Dravid, Vinayak P; Aydin, Koray; (2021). Tuning of Optical Phonons in  $\alpha$ -MoO<sub>3</sub>-VO<sub>2</sub> Multilayers. *ACS applied materials & interfaces*, 2021, Vol.13 (41), p.48981-48987  
DOI:10.1021/acsami.1c12320 (October 6, 2021) <https://doi.org/10.1021/acsami.1c12320>

651. Amsterdam, Samuel H; Stanev, Teodor K; Wang, Luqing; Zhou, Qunfei; Irgen-Gioro, Shawn; Padgaonkar, Suyog; Murthy, Akshay A; Sangwan, Vinod K; Dravid, Vinayak P; Weiss, Emily A; Darancet, Pierre; Chan, Maria K. Y; Hersam, Mark C; Stern, Nathaniel P; Marks, Tobin J., (2021). Mechanistic Investigation of Molybdenum Disulfide Defect Photoluminescence Quenching by Adsorbed Metallophthalocyanines. *Journal of the American Chemical Society*, 2021, Vol.143 (41), p.17153-17161 DOI:10.1021/jacs.1c07795; <https://doi.org/10.1021/jacs.1c07795>

650. Pandey, Shobhit A; Zhang, Chi; Ibrahim, Daniah H; Goldfine, Elise A; Wenderott, Jill K; dos Reis, Roberto; Paul, Rick L; Spanopoulos, Ioannis; Kanatzidis, Mercouri; Bedzyk, Michael J; Dravid, Vinayak P; González, Gabriela B; Haile, Sossina M., (2021). Hidden Complexity in the Chemistry of Ammonolysis-Derived “ $\gamma$ -Mo<sub>2</sub>N”: An Overlooked Oxynitride Hydride. *Chemistry of materials*, 2021, Vol.33 (17), p.6671-6684. DOI: 10.1021/acs.chemmater.1c00617, <https://doi.org/10.1021/acs.chemmater.1c00617>

649. Lin, Wenwen; He, Jiangang; Su, Xianli; Zhang, Xiaomi; Xia, Yi; Bailey, Trevor P; Stoumpos, Constantinos C; Tan, Ganjian; Rettie, Alexander J. E; Chung, Duck Young; Dravid, Vinayak P; Uher, Ctirad ; Wolverton, Chris; Kanatzidis, Mercouri G. Ultralow Thermal Conductivity, Multiband Electronic Structure and High Thermoelectric Figure of Merit in TiCuSe. *Advanced materials (Weinheim)*, 2021, Vol.33 (44), p.2104908-n/a DOI: 10.1002/adma.202104908; <https://doi.org/10.1002/adma.202104908>

648. Lee, Sungkyu; Kim, Myeong Soo; Patel, Kapil ; Choi, Hyoju ; Thangam, Ramar; Yoon, Jinho; Koo, Thomas Myeongseok; Jung, Hee Joon; Min, Sunhong; Bae, Gunhyu; Kim, Yuri; Han, Seong-Beom; Kang, Nayeo ; Kim, Minjin; Li, Na; Fu, Hong En; Jeon, Yoo Sang; Song, Jae-Jun; Kim, Dong-Hwee; Park, Steve; Choi, Jeong-Woo; Paulmurugan, Ramasamy; Kang, Yun Chan; Lee, Heon; Wei, Qiang; Dravid, Vinayak P; Lee, Ki-Bum; Kim, Young Keun; Kang, Heemin; (2022). Magnetic Control and Real-Time Monitoring of Stem Cell Differentiation by the Ligand Nanoassembly. *Small (Weinheim an der Bergstrasse, Germany)*, 2021, Vol.17 (41), p.2102892-n/a; DOI: 10.1002/sml.202102892 <https://doi.org/10.1002/sml.202102892>

647. Tirzah Abbott, Stephanie Ribet, Nathaniel Kabat, Paul Smeets, Roberto dos Reis and Vinayak Dravid (2021). Exploring the inner space of outer space: multi-length scale, multimodal characterization of Muonionalusta IVA iron meteorite. *Microscopy and Microanalysis*, 27(S1), 2264-2266. DOI:10.1017/S1431927621008163

646. Jin-Ke Bao, Christos D. Malliakas, Chi Zhang, Songting Cai, Haijie Chen, Alexander J. E. Rettie, Brandon L. Fisher, Duck Young Chung, Vinayak P. Dravid, and Mercouri G. Kanatzidis (2021). “Quasi-Two-Dimensional Heterostructures (KM<sub>1-x</sub>Te)(LaTe<sub>3</sub>) (M = Mn and Zn) with Charge Density Waves” DOI:10.1021/acs.chemmater.0c04923

645. Matthew Cheng, Yea-Shine Lee, Roberto dos Reis, Abishek Iyer, Daniel Chica, Mercouri Kanatzidis and Vinayak Dravid (2021). Structural and chemical analysis of mixed cation antiferromagnetic layered metal chalcophosphate FeCoP<sub>2</sub>S<sub>6</sub>. *Microscopy and Microanalysis*, 27(S1), 140-143. DOI:10.1017/S1431927621001112

644. Roberto dos Reis, Vinayak Dravid, and Stephanie Ribet. (2021). Towards Quantum Image Processing for Electron Microscopy. *Microscopy and Microanalysis*, 27(S1), 1348-1351.

DOI:10.1017/S1431927621005031

643. Steven Flynn, Steven Flynn, Chi Zhang, Kent J. Griffith, Jiahong Shen, Christopher Wolverton, Vinayak P. Dravid, and Kenneth R. Poeppelmeier. (2021). Fluoridation of HfO<sub>2</sub>. *Inorganic Chemistry*, 60(7), 4463-4474. DOI:10.1021/acs.inorgchem.0c03254

642. Dr. Hyeong-U. Kim, Dr. Mansu Kim, Hyunho Seok, Dr. Kyu-Young Park, Ji-Yun Moon, Jonghwan Park, Dr. Byeong-Seon An, Dr. Hee Joon Jung, Prof. Vinayak P. Dravid, Prof. Dongmok Whang, Prof. Jae-Hyun Lee, Prof. Taesung Kim (2021). Realization of Wafer-Scale 1T-MoS<sub>2</sub> Film for Efficient Hydrogen Evolution Reaction. *ChemSusChem*, 14(5), 1344-1350 DOI:10.1002/cssc.202002578

641. Stephanie Ribet, Akshay A. Murthy, Eric W. Roth, Roberto dos Reis, Vinayak P. Dravid (2021). Making the most of your electrons: Challenges and opportunities in characterizing hybrid interfaces with STEM. *Materials Today*, 1369-7021/2021 Elsevier Ltd. DOI:10.1016/j.mattod.2021.05.006

640. Jennifer G. DiStefano, Akshay A. Murthy, Shiqiang Hao, Roberto dos Reis, Chris Wolverton and Vinayak P. Dravid (2021). Topology of transition metal dichalcogenides: The case of the core-shell architecture (*Nanoscale* (2020) 12 (23897-23919) DOI: 10.1039/D0NR06660E

639. Ambrish Kumar, Vikas Nandwana, Soo-Ryoon Ryoo, Samyukta Ravishankar, Bhargy Sharma, Konstantin Pervushin, Vinayak P. Dravid, Sierin Limab (2021). Magnetoferritin enhances T<sub>2</sub> contrast in magnetic resonance imaging of macrophages. *Materials Science and Engineering: C*, 128, 112282. DOI:10.1016/j.msec.2021.112282

638. Sarkar, Sumanta; Hua, Xia; Hao, Shiqiang; Zhang, Xiaomi; Bailey, Trevor P.; Slade, Tyler J.; Yasaei, Poya; Korkosz, Rachel J.; Tan, Gangjian; Uher, Ctirad; Dravid, Vinayak P.; Wolverton, Chris; Kanatzidis, Mercouri G. (2021) Dissociation of GaSb in n-Type PbTe: off-Centered Gallium Atom and Weak Electron-Phonon Coupling Provide High Thermoelectric Performance. *Chem. Mat.* 2021, 33 (5), 1842-1851. doi.org/10.1021/acs.chemmater.0c04854

637. Song, Boao; Yang, Yong; Yang, Timothy T.; He, Kun; Hu, Xiaobing; Yuan, Yifei; Dravid, Vinayak P.; Zachariah, Michael R.; Saidi, Wissam A.; Liu, Yuzi; Shahbazian-Yassar, Reza (2021) Revealing High-Temperature Reduction Dynamics of High-Entropy Alloy Nanoparticles via In Situ Transmission Electron Microscopy. *Nano Letters* (2021) dx.doi.org/10.1021/acs.nanolett.0c04572.

636. Trevor LaMountain, Erik J. Lenferink, Samuel H. Amsterdam, Mark C. Hersam, Nathaniel P. Stern (2021). Valley-selective optical Stark effect of exciton-polaritons in a monolayer semiconductor. *Nature Communications*, 12(1), 1-7. DOI:10.1117/12.2546644

635. Yea-Shine Lee, Jennifer DiStefano, Roberto dos Reis and Vinayak Dravid (2021). Si@ MoS<sub>2</sub> Core-Shell Architecture: Characterizations and Implications for Nanophotonic Applications. *Microscopy and Microanalysis*, 27(S1), 650-652. DOI:10.1017/S1431927621002737
634. Lee, Junhee; Kim, Honghyuk; Gautam, Lakshay; He, Kun; Hu, Xiaobing; Dravid, Vinayak P.; Razeghi, Manijeh, (2021). Study of Phase Transition in MOCVD Grown Ga<sub>2</sub>O<sub>3</sub> from  $\kappa$  to  $\beta$  Phase by Ex Situ and In Situ Annealing *Phototronics*, 8(1) (2021), pp. 17, DOI:10.3390/photronics8010HihgHi017
633. Chamille Lescott, Roberto dos Reis, Mallika Modak, Evan Scott and Vinayak Dravid (2021). Soft Microscopy of Negative Stained Soft Materials: Balancing Dose Rate and Sample Damage. *Microscopy and Microanalysis*, 27(S1), 1408-1411. DOI:10.1017/S1431927621005225
632. Shanfu Liu, Sagar Udyavara, Chi Zhang, Matthias Peter, Tracy L. Lohr, Vinayak P. Dravid, Matthew Neurock, and Tobin J. Marks (2021). "Soft" oxidative coupling of methane to ethylene: lic insights from combined experiment and theory. *Proceedings of the National Academy of Sciences*, 118(23). DOI:10.1073/pnas.2012666118
631. Qian Rong, Jingshan S. Du, Xinqi Chen, Qingju Liu, Vinayak P. Dravid (2021). A Bidirectional Nanomodification Approach for Synthesizing Hierarchically Architected Mixed Oxide Electrodes for Oxygen Evolution. *Nano-Micro Small* (2021) DOI:10.1002/sml.202007287.
630. Akshay Murthy, Stephanie Ribet, Roberto dos Reis and Vinayak Dravid (2021). Spatial Mapping of Electrostatics and Dynamics in Quantum Materials. *Microscopy and Microanalysis*, 27(S1), 1436-1438. DOI:10.1017/S1431927621005328
629. He Kun, Kim Kyoungdoc, Villa Cesar Jared, Ribet Stephanie M, Smeets Paul, Reis Roberto dos, Voorhees Peter W, Hu, Xiaobing, Dravid, Vinayak P (2021). Degeneration Behavior of Cu Nanowires under Carbon Dioxide Environment: An In Situ/Operando Study. *American Chemical Society Nano letters*, 2021-08-25, Vol.21 (16), p.6813-6819 DOI: 10.1021/acs.nanolett.1c01592
62. Kelly Parker, Blaise Kimmel, Milan Mrksich, Roberto dos Reis and Vinayak Dravid (2021). Phase Retrieval Imaging for Soft Materials at Low-Voltage. *Microscopy and Microanalysis*, 27(S1), 1826-1828. DOI:10.1017/S1431927621006681
627. Grovogui, Jann A.; Slade, Tyler J.; Hao, Shiqiang; Wolverton, Christopher; Kanatzidis, Mercouri G.; Dravid, Vinayak P. (2021) Implications of doping on microstructure, processing, and thermoelectric performance. *Journal of Materials Research*, volume 36, pages1272–1284 (2021) DOI:10.1557/s43578-021-00130-8

626. Wang, Ke; Xu, Yaobin; Wu, Han; Yuan, Ruilong; Zong, Meng; Li, Yuan; Dravid, Vinayak; Ai, Wei; Wu, Jinsong (2021) A hybrid lithium storage mechanism of hard carbon enhances its performance as anodes for lithium-ion batteries. Elsevier-Carbon 178 (2021) 443-450 DOI:10.1016/j.carbon.2020.11.095

625. Chatterjee, Kaustav; Dos Reis, Roberto; Harada, Jaye K.; Mathiesen, Jette K.; Bueno, Sandra L.A.; Jensen, Kirsten M.Ø.; Rondinelli, James M.; Dravid, Vinayak; Skrabalak, Sara E. (2021) Durable Multimetal Oxychloride Intergrowths for Visible Light-Driven Water Splitting. Chemistry of Materials, 2021, 33, 1, 347–358 DOI:10.1021/acs.chemmater.0c04037

624. Metcalf, Kevin J.; Kimmel, Blaise R.; Sykora, Daniel J.; Modica, Justin A.; Parker, Kelly A.; Berens, Eric; Dai, Raymond; Dravid, Vinayak P.; Werb, Zena; Mrksich, Milan (2021). Synthetic Tuning of Domain Stoichiometry in Nanobody-Enzyme DOI:10.1021/acs.bioconjchem.0c00578

623. Luo, Zhong Zhen; Cai, Songting; Hao, Shiqiang; Bailey, Trevor P.; Spanopoulos, Ioannis; Luo, Yubo; Xu, Jianwei; Uher, Ctirad; Wolverton, Christopher; Dravid, Vinayak P.; Yan, Qingyu; Kanatzidis, Mercouri G. (2021) Strong Valence Band Convergence to Enhance Thermoelectric Performance in PbSe with Two Chemically Independent Controls. Angewandte Chemie - International Edition, PMID: 32926532, DOI:10.1002/anie.202011765

622. Chica, Daniel G.; Iyer, Abishek K.; Cheng, Matthew; Ryan, Kevin M.; Krantz, Patrick; Laing, Craig; Dos Reis, Roberto; Chandrasekhar, Venkat; Dravid, Vinayak P.; Kanatzidis, Mercouri G. (2021). P2S5 Reactive Flux Method for the Rapid Synthesis of Mono- and Bimetallic 2D Thiophosphates M<sub>2</sub>xM'xP<sub>2</sub>S<sub>6</sub>. Chem. (2021), 60, 6, 3502-3513, DOI:10.1021/acs.inorgchem.0c03577

621. Castano, Ioannina; Evans, Austin M.; Reis, Roberto Dos; Dravid, Vinayak P.; Gianneschi, Nathan C.; Dichtel, William R. (2021). Mapping Grains, Boundaries, and Defects in 2D Covalent Organic Framework Thin Films. Mater.33, 4, 1341-1352, DOI:10.1021/acs.chemmater.0c04382

620. DiStefano, Jennifer G.; Murthy, Akshay A.; Jung, Hee Joon; dos Reis, Roberto; Dravid, Vinayak P. (2021) Structural defects in transition metal dichalcogenide core-shell architectures. Phys. Lett. 118, 223103 (2021), DOI:10.1063/5.0049121

619. Ribet, Stephanie M.; Shindel, Benjamin; dos Reis, Roberto; Nandwana, Vikas; Dravid, Vinayak P. (2021) Phosphate Elimination and Recovery Lightweight (PEARL) membrane: A sustainable environmental remediation approach. PNAS June 2021, 118 (23), DOI: 10.1073/pnas.2102583118

618. Kelly Parker, Justin Modica, Charlene Wilke, Roberto dos Reis, Milan Mrksich and Vinayak Dravid (2021). To Cryo or Not to Cryo? A Consideration of Length Scales During Macromolecule Sample Preparation. Microscopy and Microanalysis, 27(S1), 1404-1407. DOI:10.1017/S1431927621005213

617. Stephanie Ribet, Akshay Murthy, Eric Roth, Xiaobing Hu, Roberto dos Reis and Vinayak Dravid (2021). Emerging Opportunities in STEM to Characterize Soft-Hard Interfaces. Microscopy and Microanalysis, 27(S1), 616-618. DOI:10.1017/S1431927621002610



616. Stephanie Ribet, Benjamin Shindel, Roberto dos Reis, Vikas Nandwana and Vinayak Dravid (2021). Multimodal Characterization of Hierarchically Porous Nanocomposite Materials: The Case Study of the PEARL Membrane. *Microscopy and Microanalysis*, 27(S1), 2006-2009. DOI:10.1017/S1431927621007297
615. Qian Rong, Yuan Li, Shiqiang Hao, Songting Cai, Chris Wolverton, Vinayak P. Dravid, Tianyou Zhai and Qingju Liu (2021). Raspberry-like mesoporous Co-doped TiO<sub>2</sub> nanospheres for a high-performance formaldehyde gas sensor. *Journal of Materials Chemistry A*, 9(10), 6529-6537. DOI:10.1039/d0ta11695e
614. Kevin Ryan, Patrick Krantz, ZHIFU LIU, Daniel Chica, Abishek Iyer, Matthew Cheng, Vinayak Dravid, Mercuri Kanatzidis, Venkat Chandrasekhar (2021). Fabrication and Characterization of Metallic Thiophosphate Heterostructures: A Path Towards Magnetoelectric Transport Devices. *Bulletin of the American Physical Society*.
613. Eric Schwenker, V. S. Chaitanya Kolluru, Jinglong Guo, Xiaobing Hu, Qiucheng Li, Mark C. Hersam, Vinayak P. Dravid, Robert F. Klie, Jeffrey R. Guest, Maria K.Y. Chan (2021). Ingrained--An automated framework for fusing atomic-scale image simulations into experiments. arXiv preprint arXiv:2105.10532.
612. Bhargy Sharma, Joanes Grandjean, Margaret Phillips, Ambrish Kumar, Francesca Mandino, Ling Yun Yeow, Kimberly Jia Yi Low, Vikas Nandwana, Vinayak P. Dravid, Xing Bengang, Sierin Lim, Konstantin Pervushin (2021). Lipocalin-Type Prostaglandin d Synthase Conjugates as Magnetic Resonance Imaging Contrast Agents for Detecting Amyloid  $\beta$ -Rich Regions in the Brain of Live Alzheimer's Disease Mice. *Advanced NanoBiomed Research*, 2100019. DOI:10.1002/anbr.202100019
611. Bo Shen, Liliang Huang, Jiahong Shen, Kun He, Cindy Y. Zheng, Vinayak P. Dravid, Chris Wolverton, and Chad A. Mirkin (2021). Crystal structure engineering in multimetallic high-index facet nanocatalysts. *Proceedings of the National Academy of Sciences*, 118(26). DOI:10.1073/pnas.2105722118
610. Eugenia S. Vasileiadou, Ido Hadar, Mikael Kepenekian, Jacky Even, Qing Tu, Christos D. Malliakas, Daniel Friedrich, Ioannis Spanopoulos, Justin M. Hoffman, Vinayak P. Dravid, and Mercuri G. Kanatzidis (2021). Shedding Light on the Stability and Structure-Property Relationships of Two-Dimensional Hybrid Lead Bromide Perovskites. *Chemistry of Materials*, 33(13), 5085-5107. DOI: 10.1021/acs.chemmater.1c01129
609. Lauren N. Walters, Chi Zhang, Vinayak P. Dravid, Kenneth R. Poeppelmeier, and James M. Rondinelli (2021). First-Principles Hydrothermal Synthesis Design to Optimize Conditions and Increase the Yield of Quaternary Heteroanionic Oxychalcogenides. *Chemistry of Materials*, 33(8), 2726-2741. DOI:10.1021/acs.chemmater.0c02682
608. Hongyao Xie, Shiqiang Hao, Trevor P. Bailey, Songting Cai, Yinying Zhang, Tyler J. Slade, G. Jeffrey Snyder, Vinayak P. Dravid, Ctirad Uher, Christopher Wolverton, and Mercuri G. Kanatzidis (2021). Ultralow Thermal Conductivity in Diamondoid Structures and High Thermoelectric Performance in (Cu<sub>1-x</sub>Ag<sub>x</sub>)(In<sub>1-y</sub>Ga<sub>y</sub>)Te<sub>2</sub>. *Journal of the American Chemical Society*, 143(15), 5978-5989. DOI:10.1021/jacs.1c01801

607. Yaobin Xu, Ke Wang, Zhenpeng Yao, Joohoon Kang, David Lam, Dan Yang, Wei Ai, Chris Wolverton, Mark C. Hersam, Ying Huang, Wei Huang, Vinayak P. Dravid, Jinsong Wu (2021). Lithium/Sodium-Ion Batteries: In Situ, Atomic-Resolution Observation of Lithiation and Sodiation of WS<sub>2</sub> Nanoflakes: Implications for Lithium-Ion and Sodium-Ion Batteries (Small 24/2021). *Small*, 17(24), 2170120. DOI:10.1002/smll.202170120

606. Yaobin Xu, Ke Wang, Zhenpeng Yao, Joohoon Kang, David Lam, Dan Yang, Wei Ai, Chris Wolverton, Mark C. Hersam, Ying Huang, Wei Huang, Vinayak P. Dravid, Jinsong Wu (2021). In Situ, Atomic-Resolution Observation of Lithiation and Sodiation of WS<sub>2</sub> Nanoflakes: Implications for Lithium-Ion and Sodium-Ion Batteries. *Small*, 2100637. DOI:10.1002/smll.202100637

605. Chi Zhang, Roberto dos Reis Kenneth Poeppelmeier and Vinayak Dravid (2021). Show me your "Hand": Direct determination of "handedness" in NaCu<sub>5</sub>S<sub>3</sub> chiral crystal via aberration-corrected scanning transmission electron microscopy. *Microscopy and Microanalysis*, 27(S1), 2652-2654. DOI:10.1017/S1431927621009399

604. Zihao Zhang, Siyu Yao, Xiaobing Hu, Francis Okejiri, Kun He, Pingying Liu, Ziqi Tian, Vinayak P. Dravid, Jie Fu, Xiang Zhu, Sheng Dai (2021). Sacrificial Synthesis of Supported Ru Single Atoms and Clusters on N-doped Carbon Derived from Covalent Triazine Frameworks: A Charge Modulation Approach. *Advanced Science*, 8(3), 2001493. DOI:10.1002/advs.202001493

603. Chongjian Zhou, Yong Kyu Lee, Yuan Yu, Sejin Byun, Zhong-Zhen Luo, Hyungseok Lee, Bangzhi Ge, Yea-Lee Lee, Xinqi Chen, Ji Yeong Lee, Oana Cojocar-Mirédin, Hyunju Chang, Jino Im, Sung-Pyo Cho, Matthias Wuttig, Vinayak P. Dravid, Mercouri G. Kanatzidis & In Chung (2021). Polycrystalline SnSe with a thermoelectric figure of merit greater than the single crystal. *Nature Materials*, 1-7. DOI: 10.1038/s41563-021-01064-6

602. Shengwang Zhou, Peng He, Sonali Dhindwal, Valerie L. Grum-Tokars, Ying Li, Kelly Parker, Justin A. Modica, Reiner Bleher, Roberto dos Reis, Joshua Zuchniarz, Vinayak P. Dravid, Gregory A. Voth, Benoît Roux, and Milan Mrksich (2021). Synthesis, Characterization, and Simulation of Four-Armed Megamolecules. *Biomacromolecules*. DOI:10.1021/acs.biomac.1c00118

601. Li, Y., Eshein, A., Virk, R.K., Eid, A., Wu, W., Frederick, J., VanDerway, D., Gladstein, S., Huang, K., Shim, A.R., Anthony, N.M., Bauer, G.M., Zhou, X., Agrawal, V., Pujadas, E.M., Jain, S., Esteve, G., Chandler, J.E., Bleher, R., de Pablo, J.J., Szleifer, I., Dravid, V.P., Almassalha, L.M., Backman, V. (2021), Nanoscale chromatin imaging and analysis platform bridges 4D chromatin organization with molecular function. *Science Advances* 7(1), pp.eabe4310, 10.1126/sciadv.abe4310, DOI: 10.1126/sciadv.abe4310.

600. Han, J., Park, J., Bak, S.M., Son, S.B., Gim, J., Villa, C., Hu, X., Dravid, V.P., Su, C.C., Kim, Y., Johnson, C., Lee, E. Pb-Based Nanocomposite Anodes: New High-Performance Pb-Based Nanocomposite Anode Enabled by Wide-Range Pb Redox and Zintl Phase Transition. *Advanced Functional Materials* 31(2) 09-13-2020 (2021), pp. 2170008 doi.org/10.1002/adfm.202170008.

599. Lee, J., Kim, H., Gautam, L., He, K., Hu, X., Dravid, V.P., Razeghi, M. Study of Phase Transition in MOCVD Grown Ga<sub>2</sub>O<sub>3</sub> from  $\kappa$  to  $\beta$  Phase by Ex Situ and In Situ Annealing Phototronics, 8(1) (2021), pp. 17, doi.org/10.3390/photronics8010017, doi.org/10.3390/photronics8010017.
598. Chen, Y., Zhuang, X., Goldfine, E.A., Dravid, V.P., Bedzyk, M.J., Huang, W., Facchetti, A., Marks, T.J. (2020) Printable Organic-Inorganic Nanoscale Multilayer Gate Dielectrics for Thin-Film Transistors Enabled by a Polymeric Organic Interlayer. *Advanced Functional Materials*, 30(40), p.2005069, doi.org/10.1002/adfm.202005069.
597. Zhuang, X., Patel, S., Zhang, C., Wang, B., Chen, Y., Liu, H., Dravid, V.P., Yu, J., Hu, Y.Y., Huang, W., Facchetti, A., and Marks, T.J. (2020) Frequency-Agile Low-Temperature Solution-Processed Alumina Dielectrics for Inorganic and Organic Electronics Enhanced by Fluoride Doping. *Journal of The American Chemical Society*, 142(28), pp. 12440-12452, doi.org/10.1021/jacs.0c05161. June 15, 2020
596. Min, S., Jeon, Y.S., Jung, H.J., Khatua, C., Li, N., Bae, G., Choi, H., Hong, H., Shin, J.E., Ko, Han Seok Ko, M.J., Jun, I., Fu, H.E., Kim, S.H., Thangam, R., Song, J.J., Dravid, V.P., Kim, Y.K., and Kang, H. Independent Tuning of Nano-Ligand Frequency and Sequences Regulates the Adhesion and Differentiation of Stem Cells. *Advanced Materials*, 32(40), (2020) P.2004300, doi.org/10.1002/adma.202004300.
595. Luo, Z., Cai, S., Hao, S., Bailey, T.P., Spanopoulos, I., Luo, Y., Xu, J., Uher, C., Wolverton, C., Dravid, V.P., Yan, Q., Kanatzidis, M. Strong Valence Band Convergence to Enhance Thermoelectric Performance in PbSe with Two Chemically Independent Controls. *Angewandte Chemie* 133(1), pp. 272-277 (2020) doi.org/10.1002/ange.202011765
594. Chatterjee, K., dos Reis, R., Harada, J.K., Mathiesen, J.K., LA Bueno, S., Jensen, K.M., Rondinelli, J.M., Dravid, V.P., Skrabalak, S.E. Durable Multimetal Oxychloride Intergrowths for Visible Light-Driven Water Splitting. *Chemistry of Materials*, 33(1) (2020), pp.347-358, doi.org/10.1021/acs.chemmater.0c04037
593. Lim, J.M., Luu, N.S., Park, K.Y., Tan, M. T. Z., Kim, S., Downing, J.R., He, K., Dravid, V.P., Hersam, M.C., Enhancing nanostructured nickel-rich lithium-ion battery cathodes via surface stabilization. *Journal of Vacuum Science & Technology A* 38, 063210 (2020); doi.org/10.1116/6.0000580
592. Xu, X., Barrows, F., Dravid, V.P., Haile, S. M., Phatak, C., Quantifying leakage fields at ionic grain boundaries using off-axis electron holography. *Journal of Applied Physics* 128, 214301 (2020) doi.org/10.1063/5.0031233
591. Dereshgi, S.A, Folland, T.G., Murthy, A.A., Song, X., Tanriover, I., Dravid, V.P., Caldwell, J.D., Aydin, K. Lithography-free IR polarization converters via orthogonal in-plane phonons in  $\alpha$ -MoO<sub>3</sub> flakes. *Nat Commun* 11, 5771 (2020); doi.org/10.1038/s41467-020-19499-x

590. Distefano, J.G., Murthy, A.A., Hao, S., dos Reis, R., Wolverton, C., Dravid, V.P. Topology of transition metal dichalcogenides: the case of the core–shell architecture. *Nanoscale* (2020), Advance Article; DOI: 10.1039/D0NR06660E Invited Review.

589. Du, F., Qiao, B., Nguyen, T.D., Vincent M.P., Bobbala, S., Yi, S., Lescott, C., Dravid, V.P., Olvera de la Cruz, M., Scott, E.A. Homopolymer self-assembly of poly(propylene sulfone) hydrogels via dynamic noncovalent sulfone–sulfone bonding. *Nat Commun* 11, 4896 (2020). DOI: 10.1038/s41467-020-18657-5

588. Modak, M., Bobbala, S., Lescott, C., Liu, Y.G., Nandwana, V., Dravid, V.P., Scott, E.A. Magnetic Nanostructure-Loaded Bicontinuous Nanospheres Support Multicargo Intracellular Delivery and Oxidation-Responsive Morphological Transitions. *ACS Appl Mater Interfaces* (2020 ) doi: 10.1021/acsami.0c15920.

587. Fu, X., Zhao, X., Hu, X., He, K., Yu, Y., Li, T., Tu, Q., Qian, X., Yue, Q., Wasielewski, M.R., Kang, Y. Alternative route for electrochemical ammonia synthesis by reduction of nitrate on copper nanosheets. *Applied Materials Today* (2020) 19, 100620; doi.org/10.1016/j.apmt.2020.100620

586. Song, B., Yang, Y., Rabbani, M., Yang, T. T., He, K., Hu, X., Yuan, Y., Ghildiyal, P., Dravid, V.P., Zachariah, M.R., Saidi, W. A., Liu, Y., Shahbazian-Yassar, R. In Situ Oxidation Studies of High-Entropy Alloy Nanoparticles. *ACS nano* (2020) 14, 11, 15131–15143; doi.org/10.1021/acsnano.0c05250

585. He, K., Sawczyk, M., Liu, C., Yuan, Y.,<sup>1</sup> Song, B., Deivanayagam, R., Nie, A., Hu, X., Dravid, V.P., Lu, J., Sukotjo, C., Lu, Y-P., Král, P., Shokuhfar, T., Shahbazian-Yassar, R. Revealing nanoscale mineralization pathways of hydroxyapatite using in situ liquid cell transmission electron microscopy. *Science Advances* (2020): eaaz7524; PMC7673812

584. Jin-Myoung, L., Kim, S., Luu, N.S., Downing, J.R., Tan T.Z., Park, K-y., Hechter, J., Dravid, V.P., He, K., Hersam, M.C. High Volumetric Energy and Power Density Li<sub>2</sub>TiSiO<sub>5</sub> Battery Anodes via Graphene Functionalization. *Matter* 3, no. 2 (2020): 522-533.

583. Robert E. Warburton, Fernando C. Castro, Siddharth Deshpande, Kenneth Madsen, Kimberly Lundberg Bassett, Roberto Dos Reis, Andrew A. Gewirth, Vinayak P. Dravid, and Jeffrey Greeley. Oriented LiMn<sub>2</sub>O<sub>4</sub> Particle Fracture from Delithiation-Driven Surface Stress. *ACS Applied Materials & Interfaces* (2020).

582. Rozema, N.; Procissi, D.; Bertolino, N.; Viola, K.; Nandwana, V.; Abdul, N.; Pribus, S.; Dravid, V.; Klein, W.; Disterhoft, J.; Weiss, C. Aβ oligomer induced cognitive impairment and evaluation of ACU193-MNS-based MRI in rabbit. *Alzheimer's & Dementia: Translational Research & Clinical Intervention* (2020) Vol6, Issue , DOI: 10.1002/trc2.12087

581. Du, J.; Shin, D.; Stanev, T.; Musumeci, C.; Xie, Z.; Huang, Z.; Lai, M.; Sun, L.; Zhou, W.; Stern, N.; Dravid, V.P.; Mirkin, C. Halide perovskite nanocrystal arrays: Multiplexed synthesis and size-dependent emission. *Science Advances*, (2020) Vol. 6, no. 39, DOI: 10.1126/sciadv.abc4959

580. Nadwana, V.; Ribet, S.; Reis, R.; Kuang, Y.; More, Y.; Dravid, V.P. OHM Sponge: A Versatile, Efficient, and Ecofriendly Environmental Remediation Platform. *Ind. Eng. Chem. Res.* (2020) DOI: 10.1021/acs.iecr.0c01493
579. He, P.; Zuchniarz, J.; Zhou, S.; Modica, J.; Dhindwal, S.; Li, Y.; Voth, G.A.; Mrksich, M.; Dravid, V.P.; Roux, B. Modeling Synthesized Protein Megamolecules: Structure, Dynamics, and Functions. *Biophysical Journal.* (2020) DOI: 10.1016/j.bpj.2019.11.2848
578. Kim, D.; Jung, H.J.; Park, I.K.; Larson, B.W.; Dunfield, S.P.; Xiao, C.; Kim, J.; Tong, J.; Boonmongkolras, P.; Ji, S.G.; Zhang, F.; Pae, S.R.; Kim, M.; Kang, S.B.; Dravid, V.P.; Berry, J.J.; Kim, J.Y.; Zhu, K.; Kim, D.H.; Shin, B. Efficient, stable silicon tandem cells enabled by anion-engineered wide-bandgap perovskites. *Science.* (2020) DOI: 10.1126/science.aba3433
577. Witting, I. T.; Grovogui, J. A.; Dravid, V.P.; Snyder, G.J. Thermoelectric transport enhancement of Te-rich bismuth antimony telluride (Bi<sub>0.5</sub>Sb<sub>1.5</sub>Te<sub>3+x</sub>) through controlled porosity. *Journal of Materiomics.* (2020) DOI: 10.1016/j.jmat.2020.04.001
576. Z. Q. Wang; M. J. Zhang; X. B. Hu; V. P. Dravid; Z. N. Xu; G. C. Guo. CeO<sub>2-x</sub> quantum dots with massive oxygen vacancies as efficient catalysts for the synthesis of dimethyl carbonate. *Chem Commun.* (2020) DOI: 10.1039/c9cc07584d
575. J. G. DiStefano; A. A. Murthy; C. J. Lescott; R. dos Reis; Y. Li; V. P. Dravid. Au@MoS<sub>2</sub>@WS<sub>2</sub> Core-Shell Architectures: Combining Vapor Phase and Solution-Based Approaches. *Journal of Physical Chemistry C.* (2020) DOI: 10.1021/acs.jpcc.9b11365
574. C. Wei; S. A. Dereshgi; X. Song; A. A. Murthy; V. P. Dravid; T. Cao; K. Aydin. Polarization Reflector/Color Filter at Visible Frequencies via Anisotropic  $\alpha$ -MoO<sub>3</sub>. *Advanced Optical Materials.* (2020) DOI: 10.1002/adom.202000088
573. Xu, X.; Liu, Y.; Wang, J.; Isheim, D.; Dravid, V.; Phatak, C.; Haile, S. Variability and origins of grain boundary electric potential detected by electron holography and atom-probe tomography. *Nat. Mater.* (2020). DOI: 10.1038/s41563-020-0656-1
572. Chen, P.; Liu, Y.; Du, J.S.; Meckes, B.; Dravid, V.P.; Mirkin, C. Chain-End Functionalized Polymers for the Controlled Synthesis of Sub-2 nm Particles. *J. Am. Chem. Soc.* (2020) DOI: 10.1021/jacs.0c02244.
571. Cai, S.; Hao, S.; Luo, Y.; Su, X.; Luo, Z.-Z.; Hu, X.; Wolverton, C.; Dravid, V. P.; Kanatzidis, M. G. Ultralow Thermal Conductivity and Thermoelectric Properties of Rb<sub>2</sub>Bi<sub>8</sub>Se<sub>13</sub>. *Chem. Mater.* (2020) DOI: 10.1021/acs.chemmater.0c00703.
570. A. A. Murthy; T. K. Stanev; R. Dos Reis; S. Hao; C. Wolverton; N. P. Stern; V. P. Dravid, Direct Visualization of Electric-Field-Induced Structural Dynamics in Monolayer Transition Metal Dichalcogenides. *ACS Nano* 14 (2), 1569-1576. (2020) DOI: 10.1021/acsnano.9b06581

569. S. Cai; S. Hao; Z. Z. Luo; X. Li; I. Hadar; T. P. Bailey; X. Hu; C. Uher; Y. Y. Hu; C. Wolverton; V. P. Dravid; M. G. Kanatzidis, Discordant nature of Cd in PbSe: off-centering and core-shell nanoscale CdSe precipitates lead to high thermoelectric performance. *Energy & Environmental Science*. (2020) DOI: 10.1039/C9EE03087E
568. Y. Luo; S. Cai; S. Hao; F. Pielhofer; I. Hadar; Z.Z. Luo; J. Xu; C. Wolverton; V. P. Dravid; A. Pfitzner, High-Performance Thermoelectrics from Cellular Nanostructured Sb<sub>2</sub>Si<sub>2</sub>Te<sub>6</sub>. *Joule*. (2019) DOI: 10.1016/j.joule.2019.10.010
567. S. S. Park; Z. J. Urbach; C. A. Brisbois; K. A. Parker; B. E. Partridge; T. Oh; V. P. Dravid; M. O. de la Cruz; C. A. Mirkin, DNA- and Field-Mediated Assembly of Magnetic Nanoparticles into High-Aspect Ratio Crystals. *Advanced Materials*. (2019) DOI: 10.1002/adma.201906626
566. M. R. Wang; Y. Li; J. Fang; C. J. Villa; Y. B. Xu; S. Q. Hao; J. Li; Y. X. Liu; C. Wolverton; X. Q. Chen; V. P. Dravid; Y. Q. Lai, Superior Oxygen Reduction Reaction on Phosphorus-Doped Carbon Dot/Graphene Aerogel for All-Solid-State Flexible Al-Air Batteries. *Advanced Energy Materials*. (2019) DOI: 10.1002/aenm.201902736
565. J. M. Hodges; S. Q. Hao; J. A. Grovogui; X. M. Zhang; T. P. Bailey; X. Li; Z. H. Gan; Y. Y. Hu; C. Uher; V. P. Dravid; C. Wolverton; M. G. Kanatzidis, Chemical Insights into PbSe-x%HgSe: High Power Factor and Improved Thermoelectric Performance by Alloying with Discordant Atoms. *Journal of the American Chemical Society* 140 (51), 18115-18123. (2018) DOI: 10.1021/jacs.8b11050
564. L. Z. Sang; K. L. Bassett; F. C. Castro; M. J. Young; L. Chen; R. T. Haasch; J. W. Elam; V. P. Dravid; R. G. Nuzzo; A. A. Gewirth, Understanding the Effect of Interlayers at the Thiophosphate Solid Electrolyte/Lithium Interface for All-Solid-State Li Batteries. *Chemistry of Materials* 30 (24), 8747-8756. (2018) DOI: 10.1021/acs.chemmater.8b02368
563. H. J. Chen; R. McClain; J. G. He; C. Zhang; J. N. Olding; R. dos Reis; J. K. Bao; I. Hadar; I. Spanopoulos; C. D. Malliakas; Y. H. He; D. Y. Chung; W. K. Kwok; E. A. Weiss; V. P. Dravid; C. Wolverton; M. G. Kanatzidis, Antiferromagnetic Semiconductor BaFMn<sub>0.5</sub>Te with Unique Mn Ordering and Red Photoluminescence. *Journal of the American Chemical Society* 141 (43), 17421-17430. (2019) DOI: 10.1021/jacs.9b09382
562. S. Flynn; A. J. Adekoya; S. Saeed; C. Zhang; V. P. Dravid; G. B. Gonzalez; K. R. Poeppelmeier, (Cu<sub>x</sub>Zn<sub>1-x</sub>)(<sub>0.456</sub>)In<sub>1.084</sub>Ge<sub>0.460</sub>3 ( 0 ≤ x ≤ 1): A Complex, Ordered, Anion-Deficient Fluorite with Unusual Site-Specific Cation Mixing. *Inorganic Chemistry* 58 (22), 15610-15617. (2019) DOI: 10.1021/acs.inorgchem.9b02692
561. Guennadi Evmenenko, Timothy T. Fister, Fernando C. Castro, Xinqi Chen, Byeongdu Lee, D. Bruce Buchholz, Vinayak P. Dravid, Paul Fenter and Michael J. Bedzyk, (2019). Structural analysis of the initial lithiation of NiO thin film electrodes. *Royal Society of Chemistry*; 2019, 21, 8897-8905. DOI: 10.1039/C9CP01527B

560. I. Hadar; X. B. Hu; Z. Z. Luo; V. P. Dravid; M. G. Kanatzidis, Nonlinear Band Gap Tunability in Selenium Tellurium Alloys and Its Utilization in Solar Cells. *Acs Energy Letters* 4 (9), 2137-2143. (2019) DOI: 10.1021/acsenergylett.9b01619
559. E. D. Hanson; L. M. Lilley; J. D. Cain; S. Q. Hao; E. Palacios; K. Aydin; C. Wolverton; T. Meade; V. P. Dravid, Phase engineering and optical properties of 2D MoSe<sub>2</sub>: Promise and pitfalls. *Materials Chemistry and Physics* 225, 219-226. (2019) DOI: 10.1016/j.matchemphys.2018.11.069
558. S. Q. Hao; J. G. He; V. P. Dravid; M. G. Kanatzidis; C. Wolverton, Dimensionally driven crossover from semimetal to direct semiconductor in layered SbAs. *Physical Review Materials* 3 (10). (2019) DOI: 10.1103/PhysRevMaterials.3.106002
557. L. L. Huang; M. Liu; H. X. Lin; Y. B. Xu; J. S. Wu; V. P. Dravid; C. Wolverton; C. A. Mirkin, Shape regulation of high-index facet nanoparticles by dealloying. *Science* 365 (6458), 1159-1163. (2019) DOI: 10.1126/science.aax5843
556. W. Huang; G. Wang; C. Luo; Y. B. Xu; Y. Xu; B. J. Eckstein; Y. Chen; B. H. Wang; J. X. Huang; Y. J. Kang; J. S. Wu; V. P. Dravid; A. Facchetti; T. J. Marks, Controllable growth of LiMn<sub>2</sub>O<sub>4</sub> by carbohydrate-assisted combustion synthesis for high performance Li-ion batteries. *Nano Energy* 64. (2019) DOI:10.1016/j.nanoen.2019.103936
555. B. C. Jang; S. Kim; S. Y. Yang; J. Park; J. H. Cha; J. Oh; J. Choi; S. G. Im; V. P. Dravid; S. Y. Choi, Polymer Analog Memristive Synapse with Atomic-Scale Conductive Filament for Flexible Neuromorphic Computing System. *Nano Letters* 19 (2), 839-849. (2019) DOI: 10.1021/acs.nanolett.8b04023
554. H. J. Jung, J. K. Bao, D. Y. Chung, M. G. Kanatzidis, V. P. Dravid "Unconventional Defects in a Quasi-One-Dimensional KMn<sub>6</sub>Bi<sub>5</sub>." *Nano Letters* 19 (10): 7476-7486 (2019) DOI:10.1021/acs.nanolett.9b03237
553. H. J. Jung, C. C. Stoumpos, M. G. Kanatzidis, V. P. Dravid "Self-passivation of 2D Ruddlesden–Popper perovskite by polytypic surface PbI<sub>2</sub> encapsulation." *Nano Letters* 19 (9): 6109-6117 (2019) DOI: 10.1021/acs.nanolett.9b02069
552. W. Ke; I. Spanopoulos; Q. Tu; I. Hadar; X. Li; G. S. Shekhawat; V. P. Dravid; M. G. Kanatzidis, Ethylenediammonium-Based "Hollow" Pb/Sn Perovskites with Ideal Band Gap Yield Solar Cells with Higher Efficiency and Stability. *J Am Chem Soc* 141 (21), 8627-8637. (2019) DOI: 10.1021/jacs.9b03662
551. S. Kim; J. Cui; V. P. Dravid; K. He, Orientation-Dependent Intercalation Channels for Lithium and Sodium in Black Phosphorus. *Advanced Materials* 31 (46). (2019) DOI: 10.1002/adma.201904623
550. Z. Z. Luo; S. T. Cai; S. Q. Hao; T. P. Bailey; X. L. Su; I. Spanopoulos; I. Hadar; G. J. Tan; Y. B. Luo; J. W. Xu; C. Uher; C. Wolverton; V. P. Dravid; Q. Y. Yan; M. G. Kanatzidis, High Figure of Merit in Gallium-Doped Nanostructured n-Type PbTe-xGeTe with Midgap States. *Journal of the American Chemical Society* 141(40), 16169-16177. (2019) DOI: 10.1021/jacs.9b09249

549. K. W. Nam; S. S. Park; R. dos Reis; V. P. Dravid; H. Kim; C. A. Mirkin; J. F. Stoddart, Conductive 2D metal-organic framework for high-performance cathodes in aqueous rechargeable zinc batteries. *Nature Communications* 10. (2019) DOI: 10.1038/s41467-019-12857-4
548. A. Singh; V. Nandwana; J. S. Rink; S. R. Ryoo; T. H. Chen; S. D. Allen; E. A. Scott; L. I. Gordon; C. S. Thaxton; V. P. Dravid, Biomimetic Magnetic Nanostructures: A Theranostic Platform Targeting Lipid Metabolism and Immune Response in Lymphoma. *ACS Nano* 13 (9), 10301-10311. (2019) DOI:10.1021/acsnano.9b03727
547. G. J. Tan; X. M. Zhang; S. Q. Hao; H. Chi; T. P. Bailey; X. L. Su; C. Uher; V. P. Dravid; C. Wolverton; M. G. Kanatzidis, Enhanced Density-of-States Effective Mass and Strained Endotaxial Nanostructures in Sb-Doped Pb<sub>0.97</sub>Cd<sub>0.03</sub> Te Thermoelectric Alloys. *ACS Applied Materials & Interfaces* 11 (9), 9197-9204. (2019) DOI: 10.1021/acsmi.8b21524
546. Q. Tu; I. Spanopoulos; S. Q. Hao; C. Wolverton; M. G. Kanatzidis; G. S. Shekhawat; V. P. Dravid, Probing Strain-Induced Band Gap Modulation in 2D Hybrid Organic-Inorganic Perovskites. *Acs Energy Letters* 4 (3), 796-802. (2019) DOI: 10.1021/acseenergylett.9b00120
545. J. Yu; Y. Du; Q. Q. Li; L. Zhen; V. P. Dravid; J. S. Wu; C. Y. Xu, In-situ growth of graphene decorated Ni<sub>3</sub>S<sub>2</sub> pyramids on Ni foam for high-performance overall water splitting. *Applied Surface Science* 465, 772-779. (2019) DOI: 10.1016/j.apsusc.2018.09.177
544. X. M. Zhang; S. Q. Hao; G. J. Tan; X. B. Hu; E. W. Roth; M. G. Kanatzidis; C. Wolverton; V. P. Dravid, Ion Beam Induced Artifacts in Lead-Based Chalcogenides. *Microscopy and Microanalysis* 25 (4), 831-839. (2019) DOI: 10.1017/s1431927619000503
543. D. Zheng; R. X. Peng; G. Wang; J. L. Logsdon; B. H. Wang; X. B. Hu; Y. Chen; V. P. Dravid; M. R. Wasielewski; J. S. Yu; W. Huang; Z. Y. Ge; T. J. Marks; A. Facchetti, Simultaneous Bottom-Up Interfacial and Bulk Defect Passivation in Highly Efficient Planar Perovskite Solar Cells using Nonconjugated Small-Molecule Electrolytes. *Advanced Materials* 31 (40). (2019) DOI: 10.1002/adma.201903239
542. H. Xie, X. Su, X. Zhang, S. Hao, T. P. Bailey, C. C. Stoumpos, A. P. Douvalis, X. Hu, C. Wolverton, V. P. Dravid, C. Uher, X. Tang and M. G. Kanatzidis "Origin of Intrinsically Low Thermal Conductivity in Talnakhite Cu<sub>17</sub>.6fe<sub>17</sub>.6s<sub>32</sub> Thermoelectric Material: Correlations between Lattice Dynamics and Thermal Transport." *Journal of the American Chemical Society* 141 (27): 10905-10914 (2019) DOI: 10.1021/jacs.9b05072
541. M. Girard, S. Wang, J. S. Du, A. Das, Z. Huang, V. P. Dravid, B. Lee, C. A. Mirkin and M. Olvera de la Cruz "Particle Analogs of Electrons in Colloidal Crystals." *Science* 364 (6446): 1174-1178 (2019) DOI: 10.1126/science.aaw8237



540. B. D. Myers, E. Palacios, D. I. Myers, S. Butun, K. Aydin and V. P. Dravid "Stimuli-Responsive DNA-Linked Nanoparticle Arrays as Programmable Surfaces." *Nano Letters* 19 (7): 4535-4542 (2019) DOI: 10.1021/acs.nanolett.9b01340
539. T. J. Slade, T. P. Bailey, J. A. Grovogui, X. Hua, X. Zhang, J. J. Kuo, I. Hadar, G. J. Snyder, C. Wolverton, V. P. Dravid, C. Uher, M. G. Kanatzidis "High Thermoelectric Performance in PbSe–NaSbSe<sub>2</sub> Alloys from Valence Band Convergence and Low Thermal Conductivity." *Advanced Energy Materials* (2019) 1901377 DOI: <https://doi.org/10.1002/aenm.201901377>
538. Z-Z Luo, S. Cai, S. Hao, T. P. Bailey, X. Hu, R. Hanus, R. Ma, G. Tan, D. G. Chica, G. J. Snyder, C. Uher, C. Wolverton, V. P. Dravid, Q. Yan and M. G. Kanatzidis "Ultralow Thermal Conductivity and High-Temperature Thermoelectric Performance in N-Type K<sub>2</sub>Sb<sub>8</sub>Se<sub>14</sub>." *Chemistry of Materials* (2019) DOI: 10.1021/acs.chemmater.9b02327
537. Y. H. Gao, S.Z. Liu, X.B. Hu, Q.Q. Ren, Y. Li, V.P. Dravid and C.X. Wang "A Novel Low Cost 2000 Mpa Grade Ultra-High Strength Steel with Balanced Strength and Toughness." *Materials Science and Engineering: A* (2019) DOI: 10.1016/j.msea.2019.05.03537.
536. P. Yasaei, A.A. Murthy, Y. Xu, R. dos Reis, G.S. Shekhawat and V.P. Dravid "Spatial Mapping of Hot-Spots at Lateral Heterogeneities in Monolayer Transition Metal Dichalcogenides." *Advanced Materials* 1808244 (2019) DOI: 10.1002/adma.201808244
535. G. Tan, S. Hao, S. Cai, T.P. Bailey, Z. Luo, I. Hadar, C. Uher, V.P. Dravid, C. Wolverton and M.G. Kanatzidis "All-Scale Hierarchically Structured P-Type Pbse Alloys with High Thermoelectric Performance Enabled by Improved Band Degeneracy." *Journal of the American Chemical Society* 141 (10): 4480-4486 (2019) DOI: 10.1021/jacs.9b00967
534. L. Li, F.C. Castro, J.S. Park, H. Li, E. Lee, T. Boyko, J.W. Freeland, Z. Yao, T.T. Fister, J. Vinson, E.L. Shirley, C. Wolverton, J. Cabana, V.P. Dravid, M.M. Thackeray and M.K.Y. Chan "Probing Electrochemically-Induced Structural Evolution and Oxygen Redox Reactions in Layered Lithium Iridate." *Chemistry of Materials* (2019) DOI: 10.1021/acs.chemmater.8b04591
532. Z.Z. Luo, S. Hao, S. Cai, T.P. Bailey, G. Tan, Y. Luo, I. Spanopoulos, C. Uher, C. Wolverton, V.P. Dravid, Q. Yan and M.G. Kanatzidis "Enhancement of Thermoelectric Performance for N-Type Pbs through Synergy of Gap State and Fermi Level Pinning." *Journal of the American Chemical Society* 141 (15): 6403-6412(2019) DOI: 10.1021/jacs.9b01889
532. G. Evmenenko, T.T. Fister, F.C. Castro, X. Chen, B. Lee, D.B. Buchholz, V.P. Dravid, P. Fenter and M.J. Bedzyk "Structural Analysis of the Initial Lithiation of Nio Thin Film Electrodes." *Physical Chemistry Chemical Physics* 21 (17): 8897-8905 (2019) DOI: 10.1039/C9CP01527B

531. V. Nandwana, S.R. Ryoo, T. Zheng, M.M. You and V.P. Dravid "Magnetic Nanostructure-Coated Thermoresponsive Hydrogel Nanoconstruct as a Smart Multimodal Theranostic Platform." ACS Biomaterials Science & Engineering (2019) DOI: 10.1021/acsbiomaterials.9b00361
530. D. Papkov, N. Delpouve, L. Delbreilh, S. Araujo, T. Stockdale, S. Mamedov, K. Maleckis, Y. Zou, M.N. Andalib, E. Dargent, V.P. Dravid, M.V. Holt, C. Pellerin and Y.A. Dzenis "Quantifying Polymer Chain Orientation in Strong and Tough Nanofibers with Low Crystallinity: Toward Next Generation Nanostructured Superfibers." ACS Nano (2019) DOI: 10.1021/acsnano.8b08725
529. S. Hao, V.P. Dravid, M.G. Kanatzidis and C. Wolverton "Computational Strategies for Design and Discovery of Nanostructured Thermoelectrics." npj Computational Materials 5 (1): 58 (2019) DOI: 10.1038/s41524-019-0197-
529. Chen, P.; Liu, Y.; Du, J.S.; Meckes, B.; Dravid, V.P.; Mirkin, C. "Chain-End Functionalized Polymers for the Controlled Synthesis of Sub-2 nm Particles." J. Am. Chem. Soc. (2020) DOI: 10.1021/jacs.0c02244.
528. P Yasaei, AA Murthy, Y Xu, R dos Reis, GS Shekhawat and VP Dravid "Spatial Mapping of Hot-Spots at Lateral Heterogeneities in Monolayer Transition Metal Dichalcogenides." Advanced Materials 0 (0): 1808244 (2019) DOI: 10.1002/adma.201808244
527. G Tan, S Hao, S Cai, TP Bailey, Z Luo, I Hadar, C Uher, VP Dravid, C Wolverton and MG Kanatzidis "All-Scale Hierarchically Structured P-Type Pbse Alloys with High Thermoelectric Performance Enabled by Improved Band Degeneracy." Journal of the American Chemical Society 141 (10): 4480-4486 (2019) DOI: 10.1021/jacs.9b00967
526. L Li, FC Castro, JS Park, H Li, E Lee, T Boyko, JW Freeland, Z Yao, TT Fister, J Vinson, EL Shirley, C Wolverton, J Cabana, VP Dravid, MM Thackeray and MKY Chan "Probing Electrochemically-Induced Structural Evolution and Oxygen Redox Reactions in Layered Lithium Iridate." Chemistry of Materials (2019) DOI: 10.1021/acs.chemmater.8b04591
525. Z-Z Luo, S Hao, S Cai, TP Bailey, G Tan, Y Luo, I Spanopoulos, C Uher, C Wolverton, VP Dravid, Q Yan and MG Kanatzidis "Enhancement of Thermoelectric Performance for N-Type Pbs through Synergy of Gap State and Fermi Level Pinning." Journal of the American Chemical Society 141 (15): 6403-6412 (2019) DOI: 10.1021/jacs.9b01889
524. G Evmenenko, TT Fister, FC Castro, X Chen, B Lee, DB Buchholz, VP Dravid, P Fenter and MJ Bedzyk "Structural Analysis of the Initial Lithiation of Nio Thin Film Electrodes." Physical Chemistry Chemical Physics 21 (17): 8897-8905 (2019) DOI: 10.1039/C9CP01527B
523. V Nandwana, S-R Ryoo, T Zheng, MM You and VP Dravid "Magnetic Nanostructure-Coated Thermoresponsive Hydrogel Nanoconstruct as a Smart Multimodal Theranostic Platform." ACS Biomaterials Science & Engineering (2019) DOI: 10.1021/acsbiomaterials.9b00361

522. D Papkov, N Delpouve, L Delbreilh, S Araujo, T Stockdale, S Mamedov, K Maleckis, Y Zou, MN Andalib, E Dargent, VP Dravid, MV Holt, C Pellerin and YA Dzenis "Quantifying Polymer Chain Orientation in Strong and Tough Nanofibers with Low Crystallinity: Toward Next Generation Nanostructured Superfibers." ACS nano (2019) DOI: 10.1021/acsnano.8b08725

521. S Hao, VP Dravid, MG Kanatzidis and C Wolverton "Computational Strategies for Design and Discovery of Nanostructured Thermoelectrics." npj Computational Materials 5 (1): 58 (2019) DOI: 10.1038/s41524-019-0197-9

520. S Hao, L Ward, Z Luo, V Ozolins, VP Dravid, MG Kanatzidis and C Wolverton "Design Strategy for High-Performance Thermoelectric Materials: The Prediction of Electron-Doped Kzrcuse3." Chemistry of Materials (2019) DOI: 10.1021/acs.chemmater.9b00840

519. Q Li, Z Yao, E Lee, Y Xu, MM Thackeray, C Wolverton, VP Dravid and J Wu "Dynamic Imaging of Crystalline Defects in Lithium-Manganese Oxide Electrodes During Electrochemical Activation to High Voltage." Nature Communications 10 (1): 1692 (2019) DOI: 10.1038/s41467-019-09408-2

518. I Spanopoulos, I Hadar, W Ke, Q Tu, M Chen, H Tsai, Y He, G Shekhawat, VP Dravid, MR Wasielewski, AD Mohite, CC Stoumpos and MG Kanatzidis "Uniaxial Expansion of the 2d Ruddlesden-Popper Perovskite Family for Improved Environmental Stability." Journal of the American Chemical Society (2019) DOI: 10.1021/jacs.9b01327

517. YZ Liu, XB Hu, YL Zhu, H Wei, VP Dravid and WW Zhang "Effects of Isothermal Oxidation on Microstructure and Mechanical Properties of Thermal Barrier Coatings." Ceramics International 45 (7, Part A): 8815-8823 (2019) DOI: 10.1016-j.ceramint.2019.01.208

516. P-C Chen, M Liu, JS Du, B Meckes, S Wang, H Lin, VP Dravid, C Wolverton and CA Mirkin "Interface and Heterostructure Design in Polyelemental Nanoparticles." Science (New York, N.Y.) 363 (6430): 959-964 (2019) DOI: 10.1126/science.aav4302

515. P Yasaei, Q Tu, Y Xu, L Verger, J Wu, MW Barsoum, G Shekhawat and VP Dravid "Mapping Hot-Spots at Heterogeneities of Few-Layer Ti3c2 Mxene Sheets." ACS nano (2019) DOI: 10.1021/acsnano.8b09103

514. C Villa, S Kim, Y Lu, VP Dravid and J Wu "Cu-Substituted Nif2 as a Cathode Material for Li-Ion Batteries." Acs Applied Materials & Interfaces 11 (1): 647-654 (2019) DOI: 10.1021/acsami.8b15791

513. J Yu, Y Du, Q Li, L Zhen, VP Dravid, J Wu and C-Y Xu "In-Situ Growth of Graphene Decorated Ni3s2 Pyramids on Ni Foam for High-Performance Overall Water Splitting." Applied Surface Science 465: 772-779 (2019) DOI: 10.1016/j.apsusc.2018.09.177

512. Y Xu, J-H Park, Z Yao, C Wolverton, M Razeghi, J Wu and VP Dravid "Strain-Induced Metastable Phase Stabilization in Ga<sub>2</sub>O<sub>3</sub> Thin Films." ACS Applied Materials & Interfaces 11 (5): 5536-5543 (2019) DOI: 10.1021/acsami.8b17731
511. Y Li, GQ Liu, XB Hu, LH Wu, CW Tan, VP Dravid and SZ Liu "A Novel Medium Heavy Alloy (Mha) with Excellent Static/Dynamic Properties and Impact Toughness." Scripta Materialia 162: 311-315 (2019) DOI: 10.1016/j.scriptamat.2018.11.036
510. YB Luo, ST Cai, X Hua, HJ Chen, QH Liang, CF Du, Y Zheng, JH Shen, JW Xu, C Wolverton, VP Dravid, QY Yan and MG Kanatzidis "High Thermoelectric Performance in Polycrystalline SnSe Via Dual-Doping with Ag/Na and Nanostructuring with Ag<sub>8</sub>SnSe<sub>6</sub>." Advanced Energy Materials 9 (2): 8 (2019) DOI: 10.1002/aenm.201803072
509. Y Li, EC Moy, AA Murthy, SQ Hao, JD Cain, ED Hanson, JG DiStefano, WH Chae, QQ Li, C Wolverton, XQ Chen and VP Dravid "Large-Scale Fabrication of MoS<sub>2</sub> Ribbons and Their Light-Induced Electronic/Thermal Properties: Dichotomies in the Structural and Defect Engineering." Advanced Functional Materials 28 (13) (2018) DOI: 10.1002/adfm.201704863
508. V Nandwana, RY Zhou, J Mohapatra, S Kim, PV Prasad, JP Liu and VP Dravid "Exchange Coupling in Soft Magnetic Nanostructures and Its Direct Effect on Their Theranostic Properties." ACS Applied Materials & Interfaces 10 (32): 27233-27243 (2018) DOI: 10.1021/acsami.8b09346
507. Y Li, SQ Hao, JG Distefano, AA Murthy, ED Hanson, YB Xu, C Wolverton, XQ Chen and VP Dravid "Site-Specific Positioning and Patterning of MoS<sub>2</sub> Monolayers: The Role of Au Seeding." ACS nano 12 (9): 8970-8976 (2018) DOI: 10.1021/acsnano.8b02409
506. X Wang, L Wang, JGN Garcia, SM Dudek, GS Shekhawat and VP Dravid "The Significant Role of C-Abl Kinase in Barrier Altering Agonists-Mediated Cytoskeletal Biomechanics." Scientific Reports 8 (1): 1002 (2018) DOI: 10.1038/s41598-018-19423-w
505. A Eshein, Y Li, B Dong, LM Almassalha, JE Chandler, N The-Quyen, KA Hujsak, VP Dravid, C Sun, HF Zhang and V Backman "Sub-10-Nm Imaging of Nucleic Acids Using Spectroscopic Intrinsic-Contrast Photon-Localization Optical Nanoscopy (Siclou)." Optics Letters 43 (23): 5817-5820 (2018) DOI: 10.1364/ol.43.005817
504. JM Hodges, S Hao, JA Grovogui, X Zhang, TP Bailey, X Li, Z Gan, Y-Y Hu, C Uher, VP Dravid, C Wolverton and MG Kanatzidis "Chemical Insights into PbSe-X%HgSe: High Power Factor and Improved Thermoelectric Performance by Alloying with Discordant Atoms." Journal of the American Chemical Society 140 (51): 18115-18123 (2018) DOI: 10.1021/jacs.8b11050
503. M Razeghi, JH Park, R McClintock, D Pavlidis, FH Teherani, DJ Rogers, BA Magill, GA Khodaparast, YB Xu, JS Wu and VP Dravid (2018). A Review of the Growth, Doping & Applications of Beta-Ga<sub>2</sub>O<sub>3</sub> Thin Films. Oxide-Based Materials and Devices IX. D. J. Rogers, D. C. Look and F. H. Teherani. Bellingham, Spie-Int Soc Optical Engineering. 10533.

502. H Liu, Q Li, Z Yao, L Li, Y Li, C Wolverton, MC Hersam, J Wu and VP Dravid "Origin of Fracture-Resistance to Large Volume Change in Cu-Substituted Co<sub>3</sub>O<sub>4</sub> Electrodes." *Adv Mater* 30 (4): 8 (2018) DOI: 10.1002/adma.201704851

501. QQ Li, JS Wu, ZP Yao, YB Xu, MM Thackeray, C Wolverton and VP Dravid "Dynamic Imaging of Metastable Reaction Pathways in Lithiated Cobalt Oxide Electrodes." *Nano Energy* 44: 15-22 (2018) DOI: 10.1016/j.nanoen.2017.11.052

500. GS Shekhawat, S Ramachandran, H Jiryaei Sharahi, S Sarkar, K Hujsak, Y Li, K Hagglund, S Kim, G Aden, A Chand and VP Dravid "Micromachined Chip Scale Thermal Sensor for Thermal Imaging." *ACS nano* 12 (2): 1760-1767 (2018) DOI: 10.1021/acsnano.7b08504

499. QY Lin, JA Mason, Z Li, W Zhou, MN O'Brien, KA Brown, MR Jones, S Butun, B Lee, VP Dravid, K Aydin and CA Mirkin "Building Superlattices from Individual Nanoparticles Via Template-Confined DNA-Mediated Assembly." *Science* 359 (6376): 669-672 (2018) DOI: 10.1126/science.aag0591

498. V Nandwana, A Singh, MM You, GF Zhang, J Higham, TS Zheng, Y Li, PV Prasad and VP Dravid "Magnetic Lipid Nanocapsules (Mlncs): Self-Assembled Lipid-Based Nanoconstruct for Non-Invasive Theranostic Applications." *Journal of Materials Chemistry B* 6 (7): 1026-1034 (2018) DOI: 10.1039/c7tb03160b

497. JS Rink, W Sun, S Misener, JJ Wang, ZJ Zhang, MR Kibbe, VP Dravid, S Venkatraman and CS Thaxton "Nitric Oxide-Delivering High-Density Lipoprotein-Like Nanoparticles as a Biomimetic Nanotherapy for Vascular Diseases." *ACS Appl Mater Interfaces* 10 (8): 6904-6916 (2018) DOI: 10.1021/acscami.7b18525

496. AA Murthy, Y Li, E Palacios, Q Li, S Hao, JG DiStefano, C Wolverton, K Aydin, X Chen and VP Dravid "Optically Active 1d Mos<sub>2</sub> Nanobelts." *ACS Appl Mater Interfaces* **10** (8): 6799-6804 (2018) DOI: 10.1021/acsami.7b16892
495. GJ Tan, SQ Hao, RC Hanus, XM Zhang, S Anand, TP Bailey, AJE Rettie, XL Su, C Uher, VP Dravid, GJ Snyder, C Wolverton and MG Kanatzidis "High Thermoelectric Performance in Snte-Agsbte<sub>2</sub> Alloys from Lattice Softening, Giant Phonon-Vacancy Scattering, and Valence Band Convergence." *ACS Energy Letters* **3** (3): 705-712 (2018) DOI: 10.1021/acseenergylett.8b00137
494. M Islam, L Peng, L Zeng, C Malliakass, DY Chung, BD Buchholz, T Chasapiss, R Li, K Chrissafis, JE Medvedeva, G Trimarchi, M Grayson, T Marks, M Bedzyk, RPH Chang, VP Dravid and MG Kanatzidis "Polyamorphism Induced Multi-Level Electronic States in Phase Change K<sub>2</sub>sb<sub>8</sub>se<sub>13</sub>." *Abstracts of Papers of the American Chemical Society* **255**: 2 (2018)
493. KA Hujsak, BD Myers, J Grovogui and VP Dravid "Stage-Rocked Electron Channeling for Crystal Orientation Mapping." *Sci Rep* **8** (1): 5175 (2018) DOI: 10.1038/s41598-018-23413-3
492. JK Bao, ZT Tang, HJ Jung, JY Liu, Y Liu, L Li, YK Li, ZA Xu, CM Feng, H Chen, DY Chung, VP Dravid, GH Cao and MG Kanatzidis "Unique [Mn<sub>6</sub>bi<sub>5</sub>]<sup>(-)</sup> Nanowires in Kmn<sub>6</sub>bi<sub>5</sub>: A Quasi-One-Dimensional Antiferromagnetic Metal." *J Am Chem Soc* **140** (12): 4391-4400 (2018) DOI: 10.1021/jacs.8b00465
491. QY Lin, E Palacios, W Zhou, Z Li, JA Mason, Z Liu, H Lin, PC Chen, VP Dravid, K Aydin and CA Mirkin "DNA-Mediated Size-Selective Nanoparticle Assembly for Multiplexed Surface Encoding." *Nano Lett* **18** (4): 2645-2649 (2018) DOI: 10.1021/acs.nanolett.8b00509
490. Y He, L Matei, HJ Jung, KM McCall, M Chen, CC Stoumpos, Z Liu, JA Peters, DY Chung, BW Wessels, MR Wasielewski, VP Dravid, A Burger and MG Kanatzidis "High Spectral Resolution of Gamma-Rays at Room Temperature by Perovskite Cspbbr<sub>3</sub> Single Crystals." *Nat Commun* **9** (1): 1609 (2018) DOI: 10.1038/s41467-018-04073-3
489. KA Hujsak, EW Roth, W Kellogg, Y Li and VP Dravid "High Speed/Low Dose Analytical Electron Microscopy with Dynamic Sampling." *Micron* **108**: 31-40 (2018) DOI: 10.1016/j.micron.2018.03.001
488. AA Murthy, TK Stanev, JD Cain, S Hao, T LaMountain, S Kim, N Speiser, K Watanabe, T Taniguchi, C Wolverton, NP Stern and VP Dravid "Intrinsic Transport in 2d Heterostructures Mediated through H-Bn Tunneling Contacts." *Nano Lett* **18** (5): 2990-2998 (2018) DOI: 10.1021/acs.nanolett.8b00444
487. H Kang, HJ Jung, DSH Wong, SK Kim, S Lin, KF Chan, L Zhang, G Li, VP Dravid and L Bian "Remote Control of Heterodimeric Magnetic Nanoswitch Regulates the Adhesion and Differentiation of Stem Cells." *J Am Chem Soc* **140** (18): 5909-5913 (2018) DOI: 10.1021/jacs.8b03001
486. L Zeng, MM Moghadam, DB Buchholz, R Li, DT Keane, VP Dravid, RPH Chang, PW Voorhees, TJ Marks and MJ Bedzyk "Processing-Dependent Thermal Stability of a Prototypical Amorphous Metal Oxide." *Physical Review Materials* **2** (5): 10 (2018) DOI: 10.1103/PhysRevMaterials.2.053401
485. JD Cain, ED Hanson and VP Dravid "Controlled Synthesis of 2d Mx<sub>2</sub> (M = Mo, W; X = S, Se) Heterostructures and Alloys." *Journal of Applied Physics* **123** (20): 9 (2018) DOI: 10.1063/1.5025710

484. H Kang, HJ Jung, SK Kim, DSH Wong, S Lin, G Li, VP Dravid and L Bian "Magnetic Manipulation of Reversible Nanocaging Controls in Vivo Adhesion and Polarization of Macrophages." **ACS nano** **12** (6): 5978-5994 (2018) DOI: 10.1021/acsnano.8b02226
483. FC Castro and VP Dravid "Characterization of Lithium Ion Battery Materials with Valence Electron Energy-Loss Spectroscopy." **Microsc Microanal** **24** (3): 214-220 (2018) DOI: 10.1017/S1431927618000302
482. R Deng, X Su, Z Zheng, W Liu, Y Yan, Q Zhang, VP Dravid, C Uher, MG Kanatzidis and X Tang "Thermal Conductivity in Bi<sub>0.5</sub>Sb<sub>1.5</sub>Te<sub>3+X</sub> and the Role of Dense Dislocation Arrays at Grain Boundaries." **Sci Adv** **4** (6): eaar5606 (2018) DOI: 10.1126/sciadv.aar5606
481. TJ Slade, JA Grovogui, S Hao, TP Bailey, R Ma, X Hua, A Gueguen, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Absence of Nanostructuring in NaPb<sub>1-x</sub>M<sub>2</sub>: Solid Solutions with High Thermoelectric Performance in the Intermediate Temperature Regime." **J Am Chem Soc** **140** (22): 7021-7031 (2018) DOI: 10.1021/jacs.8b04193
480. SM Islam, JD Cain, FY Shi, YH He, LT Peng, A Banerjee, KS Subrahmanyam, Y Li, SL Ma, VP Dravid, M Grayson and MG Kanatzidis "Conversion of Single Crystal (NH<sub>4</sub>)<sub>2</sub>Mo<sub>3</sub>S<sub>13</sub> Center Dot H<sub>2</sub>O to Isomorphic Pseudocrystals of MoS<sub>2</sub> Nanoparticles." **Chemistry of Materials** **30** (11): 3847-3853 (2018) DOI: 10.1021/acs.chemmater.8b01247
479. JS Du, PC Chen, B Meckes, EJ Kluender, Z Xie, VP Dravid and CA Mirkin "Windowless Observation of Evaporation-Induced Coarsening of Au-Pt Nanoparticles in Polymer Nanoreactors." **J Am Chem Soc** **140** (23): 7213-7221 (2018) DOI: 10.1021/jacs.8b03105
478. S Kim, HJ Jung, JC Kim, KS Lee, SS Park, VP Dravid, K He and HY Jeong "In Situ Observation of Resistive Switching in an Asymmetric Graphene Oxide Bilayer Structure." **ACS nano** **12** (7): 7335-7342 (2018) DOI: 10.1021/acsnano.8b03806
477. Q Tu, I Spanopoulos, S Hao, C Wolverton, MG Kanatzidis, GS Shekhawat and VP Dravid "Out-of-Plane Mechanical Properties of 2d Hybrid Organic-Inorganic Perovskites by Nanoindentation." **ACS Appl Mater Interfaces** **10** (26): 22167-22173 (2018) DOI: 10.1021/acсами.8b05138
476. JG DiStefano, Y Li, HJ Jung, SQ Hao, AA Murthy, XM Zhang, C Wolverton and VP Dravid "Nanoparticle@MoS<sub>2</sub> Core-Shell Architecture: Role of the Core Material." **Chemistry of Materials** **30** (14): 4675-4682 (2018) DOI: 10.1021/acs.chemmater.8b01333
475. SM Islam, L Peng, L Zeng, CD Malliakas, DY Chung, DB Buchholz, T Chasapis, R Li, K Chrissafis, JE Medvedeva, GG Trimarchi, M Grayson, TJ Marks, MJ Bedzyk, RPH Chang, VP Dravid and MG Kanatzidis "Multistates and Polyamorphism in Phase-Change K<sub>2</sub>Sb<sub>8</sub>Se<sub>13</sub>." **J Am Chem Soc** **140** (29): 9261-9268 (2018) DOI: 10.1021/jacs.8b05542
474. ZZ Luo, XM Zhang, X Hua, GJ Tan, TP Bailey, JW Xu, C Uher, C Wolverton, VP Dravid, QY Yan and MG Kanatzidis "High Thermoelectric Performance in Supersaturated Solid Solutions and Nanostructured N-Type PbTe-GeTe." **Advanced Functional Materials** **28** (31): 10 (2018) DOI: 10.1002/adfm.201801617

473. Q Li, Y Xu, Z Yao, J Kang, X Liu, C Wolverton, MC Hersam, J Wu and VP Dravid "Revealing the Effects of Electrode Crystallographic Orientation on Battery Electrochemistry Via the Anisotropic Lithiation and Sodiation of Res<sub>2</sub>." **ACS nano** **12** (8): 7875-7882 (2018) DOI: 10.1021/acsnano.8b02203
472. Y Pan, U Aydemir, JA Grovogui, IT Witting, R Hanus, Y Xu, J Wu, CF Wu, FH Sun, HL Zhuang, JF Dong, JF Li, VP Dravid and GJ Snyder "Melt-Centrifuged (Bi,Sb)<sub>2</sub>Te<sub>3</sub> : Engineering Microstructure toward High Thermoelectric Efficiency." **Adv Mater** **30** (34): e1802016 (2018) DOI: 10.1002/adma.2018020
471. HJ Jung, D Kim, S Kim, J Park, VP Dravid and B Shin "Stability of Halide Perovskite Solar Cell Devices: In Situ Observation of Oxygen Diffusion under Biasing." **Adv Mater** **30** (39): e1802769 (2018) DOI: 10.1002/adma.201802769
470. S Sarkar, XM Zhang, SQ Hao, X Hua, TP Bailey, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Dual Alloying Strategy to Achieve a High Thermoelectric Figure of Merit and Lattice Hardening in P-Type Nanostructured Pbte." **ACS Energy Letters** **3** (10): 2593-2601 (2018) DOI: 10.1021/acsenerylett.8b01684
469. Q Tu, I Spanopoulos, P Yasaei, CC Stoumpos, MG Kanatzidis, GS Shekhawat and VP Dravid "Stretching and Breaking of Ultrathin 2d Hybrid Organic-Inorganic Perovskites." **ACS nano** **12** (10): 10347-10354 (2018) DOI: 10.1021/acsnano.8b05623
468. ZZ Luo, SQ Hao, XM Zhang, X Hua, ST Cai, GJ Tan, TP Bailey, RC Ma, C Uher, C Wolverton, VP Dravid, QY Yan and MG Kanatzidis "Soft Phonon Modes from Off-Center Ge Atoms Lead to Ultralow Thermal Conductivity and Superior Thermoelectric Performance in N-Type Pbse-Gese." **Energy & Environmental Science** **11** (11): 3220-3230 (2018) DOI: 10.1039/c8ee01755g
467. Y Li, MB Majewski, SM Islam, S Hao, AA Murthy, JG DiStefano, ED Hanson, Y Xu, C Wolverton, MG Kanatzidis, MR Wasielewski, X Chen and VP Dravid "Morphological Engineering of Winged Au@Mos<sub>2</sub> Heterostructures for Electrocatalytic Hydrogen Evolution." **Nano Lett** **18** (11): 7104-7110 (2018) DOI: 10.1021/acs.nanolett.8b03109
466. H Kang, K Zhang, HJ Jung, B Yang, X Chen, Q Pan, R Li, X Xu, G Li, VP Dravid and L Bian "An in Situ Reversible Heterodimeric Nanoswitch Controlled by Metal-Ion-Ligand Coordination Regulates the Mechanosensing and Differentiation of Stem Cells." **Adv Mater** **30** (44): e1803591 (2018) DOI: 10.1002/adma.201803591
465. W Zhou, QY Lin, JA Mason, VP Dravid and CA Mirkin "Design Rules for Template-Confined DNA-Mediated Nanoparticle Assembly." **Small** **14** (44): e1802742 (2018) DOI: 10.1002/smll.201802742
464. SM Islam, VK Sangwan, Y Li, J Kang, X Zhang, Y He, J Zhao, A Murthy, S Ma, VP Dravid, MC Hersam and MG Kanatzidis "Abrupt Thermal Shock of (Nh<sub>4</sub>)<sub>2</sub>mo<sub>3</sub>s<sub>13</sub> Leads to Ultrafast Synthesis of Porous Ensembles of Mos<sub>2</sub> Nanocrystals for High Gain Photodetectors." **ACS Appl Mater Interfaces** **10** (44): 38193-38200 (2018) DOI: 10.1021/acсами.8b12406
463. S Kim, Z Yao, JM Lim, MC Hersam, C Wolverton, VP Dravid and K He "Atomic-Scale Observation of Electrochemically Reversible Phase Transformations in Snse<sub>2</sub> Single Crystals." **Adv Mater** **30** (51): e1804925 (2018) DOI: 10.1002/adma.201804925



462. LZ Sang, KL Bassett, FC Castro, MJ Young, L Chen, RT Haasch, JW Elam, VP Dravid, RG Nuzzo and AA Gewirth "Understanding the Effect of Interlayers at the Thiophosphate Solid Electrolyte/Lithium Interface for All-Solid-State Li Batteries." *Chemistry of Materials* **30** (24): 8747-8756 (2018) DOI: 10.1021/acs.chemmater.8b02368
461. S Kim, G Evmenenko, YB Xu, DB Buchholz, M Bedzyk, K He, JS Wu and VP Dravid "Thin Film RuO<sub>2</sub> Lithiation: Fast Lithium-Ion Diffusion Along the Interface." *Advanced Functional Materials* **28** (52): 8 (2018) DOI: 10.1002/adfm.201805723
460. YJ Chen, JD Cain, TK Stanev, VP Dravid and NP Stern "Valley-Polarized Exciton-Polaritons in a Monolayer Semiconductor." *Nature Photonics* **11** (7): 431-+ (2017) DOI: 10.1038/nphoton.2017.86
459. Z Xie, P Gordlichuk, QY Lin, B Meckes, PC Chen, L Sun, JSS Du, JH Zhu, Y Liu, VP Dravid and CA Mirkin "Solution-Phase Photochemical Nanopatterning Enabled by High-Refractive-Index Beam Pen Arrays." *ACS nano* **11** (8): 8231-8241 (2017) DOI: 10.1021/acsnano.7b03282
458. ED Hanson, S Mayekar and VP Dravid "Applying Insights from the Pharma Innovation Model to Battery Commercialization-Pros, Cons, and Pitfalls." *Mrs Energy & Sustainability* **4** (2017) DOI: 10.1557/mre.2017.12
457. JS Du, PC Chen, B Meckes, Z Xie, JH Zhu, Y Liu, VP Dravid and CA Mirkin "The Structural Fate of Individual Multicomponent Metal-Oxide Nanoparticles in Polymer Nanoreactors." *Angewandte Chemie-International Edition* **56** (26): 7625-7629 (2017) DOI: 10.1002/anie.201703296
456. X Wang, R Bleher, L Wang, JGN Garcia, SM Dudek, GS Shekhawat and VP Dravid "Imatinib Alters Agonists-Mediated Cytoskeletal Biomechanics in Lung Endothelium." *Scientific Reports* **7** (1): 14152 (2017) DOI: 10.1038/s41598-017-14722-0
455. VP Dravid "Liquid Cell Electron Microscopy (Advances in Microscopy and Microanalysis). Frances M. Ross (Ed.). Cambridge University Press, Cambridge, Uk, 2017, 524 Pp. Isbn: 978-1107116573." *Microscopy and Microanalysis* **23** (6): 1214-1215 (2017)
454. ED Hanson, L Lajaunie, S Hao, BD Myers, F Shi, AA Murthy, C Wolverton, R Arenal and VP Dravid "Systematic Study of Oxygen Vacancy Tunable Transport Properties of Few-Layer MoO<sub>3</sub>-X Enabled by Vapor-Based Synthesis." *Advanced Functional Materials* **27** (17): 1605380 (2017)
453. V Nandwana, SR Ryoo, S Kanthala, KM McMahon, JS Rink, Y Li, SS Venkatraman, CS Thaxton and VP Dravid "High-Density Lipoprotein-Like Magnetic Nanostructures (Hdl-Mns): Theranostic Agents for Cardiovascular Disease." *Chemistry of Materials* **29** (5): 2276-2282 (2017) DOI: 10.1021/acs.chemmater.6b05357
452. X Liao, YK Huang, CA Mirkin and VP Dravid "High Throughput Synthesis of Multifunctional Oxide Nanostructures within Nanoreactors Defined by Beam Pen Lithography." *ACS nano* **11** (5): 4439-4444 (2017) DOI: 10.1021/acsnano.7b00124
451. S Butun, E Palacios, JD Cain, Z Liu, VP Dravid and K Aydin "Quantifying Plasmon-Enhanced Light Absorption in Monolayer Ws<sub>2</sub> Films." *ACS Appl Mater Interfaces* **9** (17): 15044-15051 (2017) DOI: 10.1021/acsami.7b01947

450. GS Shekhawat, AK Srivastava, VP Dravid and O Balogun "Thickness Resonance Acoustic Microscopy for Nanomechanical Subsurface Imaging." **ACS nano** **11** (6): 6139-6145 (2017) DOI: 10.1021/acsnano.7b02170
449. Y Li, D Zhang, I Capoglu, KA Hujsak, D Damania, L Cherkezyan, E Roth, R Bleher, JS Wu, H Subramanian, VP Dravid and V Backman "Measuring the Autocorrelation Function of Nanoscale Three-Dimensional Density Distribution in Individual Cells Using Scanning Transmission Electron Microscopy, Atomic Force Microscopy, and a New Deconvolution Algorithm." **Microsc Microanal** **23** (3): 661-667 (2017) DOI: 10.1017/S1431927617000447
448. Y Li, LM Almassalha, JE Chandler, X Zhou, YE Stypula-Cyrus, KA Hujsak, EW Roth, R Bleher, H Subramanian, I Szleifer, VP Dravid and V Backman "The Effects of Chemical Fixation on the Cellular Nanostructure." **Exp Cell Res** **358** (2): 253-259 (2017) DOI: 10.1016/j.yexcr.2017.06.022
447. QQ Li, ZP Yao, JS Wu, S Mitra, SQ Hao, TS Sahu, Y Li, C Wolverton and VP Dravid "Intermediate Phases in Sodium Intercalation into Mos2 Nanosheets and Their Implications for Sodium-Ion Batteries." **Nano Energy** **38**: 342-349 (2017) DOI: 10.1016/j.nanoen.2017.05.055
446. PC Chen, JS Du, B Meckes, L Huang, Z Xie, JL Hedrick, VP Dravid and CA Mirkin "Structural Evolution of Three-Component Nanoparticles in Polymer Nanoreactors." **J Am Chem Soc** **139** (29): 9876-9884 (2017) DOI: 10.1021/jacs.7b03163
445. Y Li, JG DiStefano, AA Murthy, JD Cain, ED Hanson, Q Li, FC Castro, X Chen and VP Dravid "Superior Plasmonic Photodetectors Based on Au@Mos2 Core-Shell Heterostructures." **ACS nano** **11** (10): 10321-10329 (2017) DOI: 10.1021/acsnano.7b05071
444. H Kang, DSH Wong, X Yan, HJ Jung, S Kim, S Lin, K Wei, G Li, VP Dravid and L Bian "Remote Control of Multimodal Nanoscale Ligand Oscillations Regulates Stem Cell Adhesion and Differentiation." **ACS nano** **11** (10): 9636-9649 (2017) DOI: 10.1021/acsnano.7b02857
443. H Kang, S Kim, DSH Wong, HJ Jung, S Lin, K Zou, R Li, G Li, VP Dravid and L Bian "Remote Manipulation of Ligand Nano-Oscillations Regulates Adhesion and Polarization of Macrophages in Vivo." **Nano Lett** **17** (10): 6415-6427 (2017) DOI: 10.1021/acs.nanolett.7b03405
442. G Evmenenko, TT Fister, DB Buchholz, FC Castro, Q Li, J Wu, VP Dravid, P Fenter and MJ Bedzyk "Lithiation of Multilayer Ni/Nio Electrodes: Criticality of Nickel Layer Thicknesses on Conversion Reaction Kinetics." **Phys Chem Chem Phys** **19** (30): 20029-20039 (2017) DOI: 10.1039/c7cp02448g
441. WH Chae, JD Cain, ED Hanson, AA Murthy and VP Dravid "Substrate-Induced Strain and Charge Doping in Cvd-Grown Monolayer Mos2." **Applied Physics Letters** **111** (14): 143106 (2017) DOI: 10.1063/1.4998284
440. LT Nguyen, A Muktabar, J Tang, VP Dravid, CS Thaxton, S Venkatraman and KW Ng "Engineered Nanoparticles for the Detection, Treatment and Prevention of Atherosclerosis: How Close Are We?" **Drug discovery today** **22** (9): 1438-1446 (2017)

439. JS Du, P-C Chen, VP Dravid and CA Mirkin "Using Stem to Probe the in-Situ Dynamics of Multimetallic Nanoparticles Grown in Polymer Nanoreactors." **Microscopy and Microanalysis** **23** (S1): 872-873 (2017)
438. MM Moghadam, R Li, DB Buchholz, CQ Li, PW Voorhees and VP Dravid "In Situ Crystallization and Morphological Evolution in Multicomponent Indium Oxide Thin Films." **Crystal Growth & Design** **17** (3): 1396-1403 (2017) DOI: 10.1021/acs.cgd.6b01849
437. C Gao, H Li, Y Li, S Kewalramani, LC Palmer, VP Dravid, SI Stupp, M Olvera de la Cruz and MJ Bedzyk "Electrostatic Control of Polymorphism in Charged Amphiphile Assemblies." **J Phys Chem B** **121** (7): 1623-1628 (2017) DOI: 10.1021/acs.jpcc.6b11602
436. KS Chen, R Xu, NS Luu, EB Secor, K Hamamoto, Q Li, S Kim, VK Sangwan, I Balla, LM Guiney, JT Seo, X Yu, W Liu, J Wu, C Wolverton, VP Dravid, SA Barnett, J Lu, K Amine and MC Hersam "Comprehensive Enhancement of Nanostructured Lithium-Ion Battery Cathode Materials Via Conformal Graphene Dispersion." **Nano Lett** **17** (4): 2539-2546 (2017) DOI: 10.1021/acs.nanolett.7b00274
435. FC Castro and VP Dravid "Investigating the Electrochemical Reversibility of Transition Metal Oxide Conversion Materials through Stem-Eels." **Microscopy and Microanalysis** **23** (S1): 2074-2075 (2017)
434. J Wu, Q Li, Z Yao, S Mitra, S Hao, TS Sahu, Y Li, CM Wolverton and VP Dravid "In-Situ Electron Diffraction Studies of Sodium Electrochemistry in Mos 2." **Microscopy and Microanalysis** **23** (S1): 2050-2051 (2017)
433. S Kim, VP Dravid and K He "In Situ Observation of Structural Change in Single-Crystalline Lifepo 4 Nanoflakes During Electrochemical Cycling." **Microscopy and Microanalysis** **23** (S1): 1988-1989 (2017)
432. HJ Sharahi, G Shekhawat, V Dravid, S Park, P Egberts and S Kim "Contrast Mechanisms on Nanoscale Subsurface Imaging in Ultrasonic Afm: Scattering of Ultrasonic Waves and Contact Stiffness of the Tip-Sample." **Nanoscale** **9** (6): 2330-2339 (2017) DOI: 10.1039/c6nr09124e
431. GS Shekhawat, SM Dudek and VP Dravid "Development of Ultrasound Bioprobe for Biological Imaging." **Sci Adv** **3** (10): e1701176 (2017) DOI: 10.1126/sciadv.1701176
430. V Nandwana, SR Ryoo, S Kanthala, A Kumar, A Sharma, FC Castro, Y Li, B Hoffman, S Lim and VP Dravid "Engineered Ferritin Nanocages as Natural Contrast Agents in Magnetic Resonance Imaging." **Rsc Advances** **7** (55): 34892-34900 (2017) DOI: 10.1039/c7ra05681h
429. JS Du, J Park, Q Kim, W Jhe, VP Dravid, D Yang and DA Weitz "Multistage Transformation and Lattice Fluctuation at Agcl-Ag Interface." **J Phys Chem Lett** **8** (23): 5853-5860 (2017) DOI: 10.1021/acs.jpcclett.7b02875
428. ED Hanson, FY Shi, TC Chasapis, MG Kanatzidis and VP Dravid "Two-Dimensional Bismuth-Rich Nanosheets through the Evaporative Thinning of Se-Doped Bi2te3." **Journal of Crystal Growth** **436**: 138-144 (2016) DOI: 10.1016/j.jcrysgro.2015.11.033

427. JD Cain, FY Shi, JS Wu and VP Dravid "Growth Mechanism of Transition Metal Dichalcogenide Monolayers: The Role of Self-Seeding Fullerene Nuclei." *ACS nano* **10** (5): 5440-5445 (2016) DOI: 10.1021/acsnano.6b01705
426. Y Li, JD Cain, ED Hanson, AA Murthy, SQ Hao, FY Shi, QQ Li, C Wolverton, XQ Chen and VP Dravid "Au@Mos<sub>2</sub> Core-Shell Heterostructures with Strong Light-Matter Interactions." *Nano Letters* **16** (12): 7696-7702 (2016) DOI: 10.1021/acs.nanolett.6b03764
425. G Tan, F Shi, S Hao, L-D Zhao, H Chi, X Zhang, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Non-Equilibrium Processing Leads to Record High Thermoelectric Figure of Merit in Pbte-Srte." *Nature Communications* **7**: 12167 (2016) DOI: 10.1038/ncomms12167  
<https://www.nature.com/articles/ncomms12167#supplementary-information>
424. QQ Li, JS Wu, JM Xu and VP Dravid "Synergistic Sodiatio of Cobalt Oxide Nanoparticles and Conductive Carbon Nanotubes (Cnts) for Sodium-Ion Batteries." *Journal of Materials Chemistry A* **4** (22): 8669-8675 (2016) DOI: 10.1039/c6ta02051h
423. B Zhao, X Xie, S Xu, Y Pan, B Yang, S Guo, T Wei, H Su, H Wang, X Chen, VP Dravid, L Huang and W Huang "From Scooh to Sc<sub>2</sub>O<sub>3</sub> : Phase Control, Luminescent Properties, and Applications." *Adv Mater* **28** (31): 6665-6671 (2016) DOI: 10.1002/adma.201600960
422. SQ Hao, VP Dravid, MG Kanatzidis and C Wolverton "Research Update: Prediction of High Figure of Merit Plateau in Sns and Solid Solution of (Pb,Sn)S." *Apl Materials* **4** (10): 104505 (2016) DOI: 10.1063/1.4964491
421. M Owczarek, KA Hujsak, DP Ferris, A Prokofjevs, I Majerz, P Szklarz, H Zhang, AA Sarjeant, CL Stern, R Jakubas, S Hong, VP Dravid and JF Stoddart "Flexible Ferroelectric Organic Crystals." *Nat Commun* **7**: 13108 (2016) DOI: 10.1038/ncomms13108
420. J Yu, Q Li, N Chen, CY Xu, L Zhen, J Wu and VP Dravid "Carbon-Coated Nickel Phosphide Nanosheets as Efficient Dual-Electrocatalyst for Overall Water Splitting." *ACS Appl Mater Interfaces* **8** (41): 27850-27858 (2016) DOI: 10.1021/acsmi.6b10552
419. LD Zhao, SH Lo, Y Zhang, H Sun, G Tan, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Zhao Et Al. Reply." *Nature* **539** (7627): E2-E3 (2016) DOI: 10.1038/nature19833
418. J Yu, Q Li, Y Li, CY Xu, L Zhen, VP Dravid and J Wu "Ternary Metal Phosphide with Triple-Layered Structure as a Low-Cost and Efficient Electrocatalyst for Bifunctional Water Splitting." *Advanced Functional Materials* **26** (42): 7644-7651 (2016)
417. E Lee, J Blauwkamp, FC Castro, J Wu, VP Dravid, P Yan, C Wang, S Kim, C Wolverton, R Benedek, F Dogan, JS Park, JR Croy and MM Thackeray "Exploring Lithium-Cobalt-Nickel-Oxide Spinel Electrodes for >/=3.5 V Li-Ion Cells." *ACS Appl Mater Interfaces* **8** (41): 27720-27729 (2016) DOI: 10.1021/acsmi.6b09073
416. G Evmenenko, TT Fister, DB Buchholz, Q Li, KS Chen, J Wu, VP Dravid, MC Hersam, P Fenter and MJ Bedzyk "Morphological Evolution of Multilayer Ni/Nio Thin Film Electrodes During Lithiation." *ACS Appl Mater Interfaces* **8** (31): 19979-19986 (2016) DOI: 10.1021/acsmi.6b05040

415. Q Li, H Liu, Z Yao, J Cheng, T Li, Y Li, C Wolverton, J Wu and VP Dravid "Electrochemistry of Selenium with Sodium and Lithium: Kinetics and Reaction Mechanism." **ACS nano** **10** (9): 8788-8795 (2016) DOI: 10.1021/acsnano.6b04519
414. K Hujsak, BD Myers, E Roth, Y Li and VP Dravid "Suppressing Electron Exposure Artifacts: An Electron Scanning Paradigm with Bayesian Machine Learning." **Microsc Microanal** **22** (4): 778-788 (2016) DOI: 10.1017/S1431927616011417
413. JA Mason, CR Laramy, CT Lai, MN O'Brien, QY Lin, VP Dravid, GC Schatz and CA Mirkin "Contraction and Expansion of Stimuli-Responsive DNA Bonds in Flexible Colloidal Crystals." **J Am Chem Soc** **138** (28): 8722-8725 (2016) DOI: 10.1021/jacs.6b05430
412. PC Chen, X Liu, JL Hedrick, Z Xie, S Wang, QY Lin, MC Hersam, VP Dravid and CA Mirkin "Polyelemental Nanoparticle Libraries." **Science** **352** (6293): 1565-1569 (2016) DOI: 10.1126/science.aaf8402
411. TR Wei, G Tan, X Zhang, CF Wu, JF Li, VP Dravid, GJ Snyder and MG Kanatzidis "Distinct Impact of Alkali-Ion Doping on Electrical Transport Properties of Thermoelectric P-Type Polycrystalline Sns<sub>2</sub>." **J Am Chem Soc** **138** (28): 8875-8882 (2016) DOI: 10.1021/jacs.6b04181
410. SQ Hao, FY Shi, VP Dravid, MG Kanatzidis and C Wolverton "Computational Prediction of High Thermoelectric Performance in Hole Doped Layered Gese<sub>2</sub>Te<sub>2</sub>." **Chemistry of Materials** **28** (9): 3218-3226 (2016) DOI: 10.1021/acs.chemmater.6b01164
409. JD Cain, ED Hanson, FY Shi and VP Dravid "Emerging Opportunities in the Two-Dimensional Chalcogenide Systems and Architecture." **Current Opinion in Solid State & Materials Science** **20** (6): 374-387 (2016) DOI: 10.1016/j.cossms.2016.06.001
408. BD Myers, QY Lin, H Wu, E Luijten, CA Mirkin and VP Dravid "Size-Selective Nanoparticle Assembly on Substrates by DNA Density Patterning." **ACS nano** **10** (6): 5679-5686 (2016) DOI: 10.1021/acsnano.6b02246
407. V Nandwana, SR Ryoo, S Kanthala, M De, SS Chou, PV Prasad and VP Dravid "Engineered Theranostic Magnetic Nanostructures: Role of Composition and Surface Coating on Magnetic Resonance Imaging Contrast and Thermal Activation." **ACS Appl Mater Interfaces** **8** (11): 6953-6961 (2016) DOI: 10.1021/acsaami.6b01377
406. LD Zhao, G Tan, S Hao, J He, Y Pei, H Chi, H Wang, S Gong, H Xu, VP Dravid, C Uher, GJ Snyder, C Wolverton and MG Kanatzidis "Ultrahigh Power Factor and Thermoelectric Performance in Hole-Doped Single-Crystal Sns<sub>2</sub>." **Science** **351** (6269): 141-144 (2016) DOI: 10.1126/science.aad3749
405. TT Fister, XY Hu, J Esbenshade, X Chen, JS Wu, V Dravid, M Bedzyk, B Long, AA Gewirth, B Shi, CM Schlepütz and P Fenter "Dimensionally Controlled Lithiation of Chromium Oxide." **Chemistry of Materials** **28** (1): 47-54 (2016) DOI: 10.1021/acs.chemmater.5b01809
404. H Ma, J He, DB Xiong, J Wu, Q Li, V Dravid and Y Zhao "Nickel Cobalt Hydroxide @Reduced Graphene Oxide Hybrid Nanolayers for High Performance Asymmetric Supercapacitors with Remarkable Cycling Stability." **ACS Appl Mater Interfaces** **8** (3): 1992-2000 (2016) DOI: 10.1021/acsaami.5b10280

403. L Langli, W Jinsong, L Qianqian, PD Vinayak, RP Kenneth, R Qunli and X Junming "Reactions of Graphene Supported Co<sub>3</sub>O<sub>4</sub> Nanocubes with Lithium and Magnesium Studied by in Situ Transmission Electron Microscopy." *Nanotechnology* **27** (8): 085402 (2016)
402. PC Chen, G Liu, Y Zhou, KA Brown, N Chernyak, JL Hedrick, S He, Z Xie, QY Lin, VP Dravid, SA O'Neill-Slawecki and CA Mirkin "Tip-Directed Synthesis of Multimetallic Nanoparticles." *J Am Chem Soc* **137** (28): 9167-9173 (2015) DOI: 10.1021/jacs.5b05139
401. GJ Tan, FY Shi, JW Doak, H Sun, LD Zhao, PL Wang, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Extraordinary Role of Hg in Enhancing the Thermoelectric Performance of P-Type Snte." *Energy & Environmental Science* **8** (1): 267-277 (2015) DOI: 10.1039/c4ee01463d
400. KL Viola, J Sbarboro, R Sureka, M De, MA Bicca, J Wang, S Vasavada, S Satpathy, S Wu, H Joshi, PT Velasco, K MacRenaris, EA Waters, C Lu, J Phan, P Lacor, P Prasad, VP Dravid and WL Klein "Towards Non-Invasive Diagnostic Imaging of Early-Stage Alzheimer's Disease." *Nat Nanotechnol* **10** (1): 91-98 (2015) DOI: 10.1038/nnano.2014.254
399. V Nandwana, M De, S Chu, M Jaiswal, M Rotz, TJ Meade and VP Dravid "Theranostic Magnetic Nanostructures (Mns) for Cancer." *Cancer Treat Res* **166**: 51-83 (2015) DOI: 10.1007/978-3-319-16555-4\_3
398. JM Xu, JS Wu, LL Luo, XQ Chen, HB Qin, V Dravid, SB Mi and CL Jia "Co<sub>3</sub>O<sub>4</sub> Nanocubes Homogeneously Assembled on Few-Layer Graphene for High Energy Density Lithium-Ion Batteries." *Journal of Power Sources* **274**: 816-822 (2015) DOI: 10.1016/j.jpowsour.2014.10.106
397. EL Que, R Bleher, FE Duncan, BY Kong, SC Gleber, S Vogt, S Chen, SA Garwin, AR Bayer, VP Dravid, TK Woodruff and TV O'Halloran "Quantitative Mapping of Zinc Fluxes in the Mammalian Egg Reveals the Origin of Fertilization-Induced Zinc Sparks." *Nat Chem* **7** (2): 130-139 (2015) DOI: 10.1038/nchem.2133
396. SS Chou, YK Huang, J Kim, B Kaehr, BM Foley, P Lu, C Dykstra, PE Hopkins, CJ Brinker, J Huang and VP Dravid "Controlling the Metal to Semiconductor Transition of Mos<sub>2</sub> and Ws<sub>2</sub> in Solution." *J Am Chem Soc* **137** (5): 1742-1745 (2015) DOI: 10.1021/ja5107145
395. L Fang, J Im, CC Stoumpos, F Shi, V Dravid, M Leroux, AJ Freeman, WK Kwok, DY Chung and M Kanatzidis "Two-Dimensional Mineral [Pb<sub>2</sub>bis3][Aute<sub>2</sub>]: High-Mobility Charge Carriers in Single-Atom-Thick Layers." *J Am Chem Soc* **137** (6): 2311-2317 (2015) DOI: 10.1021/ja5111688
394. Y Zhou, Z Xie, KA Brown, DJ Park, X Zhou, PC Chen, M Hirtz, QY Lin, VP Dravid, GC Schatz, Z Zheng and CA Mirkin "Apertureless Cantilever-Free Pen Arrays for Scanning Photochemical Printing." *Small* **11** (8): 913-918 (2015) DOI: 10.1002/smll.201402195
393. W Sun, S Kewalramani, K Hujsak, H Zhang, MJ Bedzyk, VP Dravid and CS Thaxton "Mesophase in a Thiolate-Containing Diacyl Phospholipid Self-Assembled Monolayer." *Langmuir* **31** (10): 3232-3241 (2015) DOI: 10.1021/la504822q
392. X Yu, L Zeng, N Zhou, P Guo, F Shi, DB Buchholz, Q Ma, J Yu, VP Dravid, RP Chang, M Bedzyk, TJ Marks and A Facchetti "Ultra-Flexible, "Invisible" Thin-Film Transistors Enabled by Amorphous Metal

- Oxide/Polymer Channel Layer Blends." *Adv Mater* **27** (14): 2390-2399 (2015) DOI: 10.1002/adma.201405400
391. G Tan, F Shi, S Hao, H Chi, LD Zhao, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Codoping in Snte: Enhancement of Thermoelectric Performance through Synergy of Resonance Levels and Band Convergence." *J Am Chem Soc* **137** (15): 5100-5112 (2015) DOI: 10.1021/jacs.5b00837
390. X Wang, R Bleher, ME Brown, JG Garcia, SM Dudek, GS Shekhawat and VP Dravid "Nano-Biomechanical Study of Spatio-Temporal Cytoskeleton Rearrangements That Determine Subcellular Mechanical Properties and Endothelial Permeability." *Sci Rep* **5**: 11097 (2015) DOI: 10.1038/srep11097
389. Z Luo, Y Jiang, BD Myers, D Isheim, J Wu, JF Zimmerman, Z Wang, Q Li, Y Wang, X Chen, VP Dravid, DN Seidman and B Tian "3d Lithography. Atomic Gold-Enabled Three-Dimensional Lithography for Silicon Mesostructures." *Science* **348** (6242): 1451-1455 (2015) DOI: 10.1126/science.1257278
388. QY Lin, Z Li, KA Brown, MN O'Brien, MB Ross, Y Zhou, S Butun, PC Chen, GC Schatz, VP Dravid, K Aydin and CA Mirkin "Strong Coupling between Plasmonic Gap Modes and Photonic Lattice Modes in DNA-Assembled Gold Nanocube Arrays." *Nano Lett* **15** (7): 4699-4703 (2015) DOI: 10.1021/acs.nanolett.5b01548
387. L Luo, J Wu, J Luo, J Huang and VP Dravid "Dynamics of Electrochemical Lithiation/Delithiation of Graphene-Encapsulated Silicon Nanoparticles Studied by in-Situ Tem." *Scientific Reports* **4**: 3863 (2014) DOI: 10.1038/srep03863
386. LD Zhao, SH Lo, Y Zhang, H Sun, G Tan, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Ultralow Thermal Conductivity and High Thermoelectric Figure of Merit in Snte Crystals." *Nature* **508** (7496): 373-377 (2014) DOI: 10.1038/nature13184
385. LD Zhao, VP Dravid and MG Kanatzidis "The Panoscopic Approach to High Performance Thermoelectrics." *Energy & Environmental Science* **7** (1): 251-268 (2014) DOI: 10.1039/c3ee43099e
384. GJ Tan, FY Shi, H Sun, LD Zhao, C Uher, VP Dravid and MG Kanatzidis "Snte-Agbite2 as an Efficient Thermoelectric Material with Low Thermal Conductivity." *Journal of Materials Chemistry A* **2** (48): 20849-20854 (2014) DOI: 10.1039/c4ta05530f
383. XY Zhou, GW Wang, LJ Guo, H Chi, GY Wang, QF Zhang, CQ Chen, T Thompson, J Sakamoto, VP Dravid, GZ Cao and C Uher "Hierarchically Structured Tio2 for Ba-Filled Skutterudite with Enhanced Thermoelectric Performance." *Journal of Materials Chemistry A* **2** (48): 20629-20635 (2014) DOI: 10.1039/c4ta05285d
382. S Hao, LD Zhao, CQ Chen, VP Dravid, MG Kanatzidis and CM Wolverton "Theoretical Prediction and Experimental Confirmation of Unusual Ternary Ordered Semiconductor Compounds in Sr-Pb-S System." *J Am Chem Soc* **136** (4): 1628-1635 (2014) DOI: 10.1021/ja411857y
381. RJ Korkosz, TC Chasapis, SH Lo, JW Doak, YJ Kim, CI Wu, E Hatzikraniotis, TP Hogan, DN Seidman, C Wolverton, VP Dravid and MG Kanatzidis "High Zt in P-Type (Pbte)1-2x(Pbse)X(Pbs)X Thermoelectric Materials." *J Am Chem Soc* **136** (8): 3225-3237 (2014) DOI: 10.1021/ja4121583

380. LD Zhao, SH Lo, Y Zhang, H Sun, G Tan, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "Ultralow Thermal Conductivity and High Thermoelectric Figure of Merit in SnSe Crystals." **Nature** **508** (7496): 373-377 (2014) DOI: 10.1038/nature13184

379. Y Lee, SH Lo, C Chen, H Sun, DY Chung, TC Chasapis, C Uher, VP Dravid and MG Kanatzidis "Contrasting Role of Antimony and Bismuth Dopants on the Thermoelectric Performance of Lead Selenide." **Nat Commun** **5**: 3640 (2014) DOI: 10.1038/ncomms4640

378. G Tan, LD Zhao, F Shi, JW Doak, SH Lo, H Sun, C Wolverton, VP Dravid, C Uher and MG Kanatzidis "High Thermoelectric Performance of P-Type SnTe Via a Synergistic Band Engineering and Nanostructuring Approach." **J Am Chem Soc** **136** (19): 7006-7017 (2014) DOI: 10.1021/ja500860m

377. MK Jaiswal, M De, SS Chou, S Vasavada, R Bleher, PV Prasad, D Bahadur and VP Dravid "Thermoresponsive Magnetic Hydrogels as Theranostic Nanoconstructs." **ACS Applied Materials & Interfaces** **6** (9): 6237-6247 (2014) DOI: 10.1021/am501067j

376. DJ Late, SN Shirodkar, UV Waghmare, VP Dravid and CN Rao "Thermal Expansion, Anharmonicity and Temperature-Dependent Raman Spectra of Single- and Few-Layer MoSe<sub>2</sub> and WSe<sub>2</sub>." **Chemphyschem** **15** (8): 1592-1598 (2014) DOI: 10.1002/cphc.201400020

375. YK Huang, JD Cain, L Peng, S Hao, T Chasapis, MG Kanatzidis, C Wolverton, M Grayson and VP Dravid "Evaporative Thinning: A Facile Synthesis Method for High Quality Ultrathin Layers of 2d Crystals." **ACS nano** **8** (10): 10851-10857 (2014) DOI: 10.1021/nn504664p

374. IS Kim, VK Sangwan, D Jariwala, JD Wood, S Park, KS Chen, F Shi, F Ruiz-Zepeda, A Ponce, M Jose-Yacaman, VP Dravid, TJ Marks, MC Hersam and LJ Lauhon "Influence of Stoichiometry on the Optical and Electrical Properties of Chemical Vapor Deposition Derived MoS<sub>2</sub>." **ACS nano** **8** (10): 10551-10558 (2014) DOI: 10.1021/nn503988x

373. YJ Kim, ID Blum, JQ He, MG Kanatzidis, VP Dravid and DN Seidman "Three-Dimensional Atom-Probe Tomographic Analyses of Lead-Telluride Based Thermoelectric Materials." **Jom** **66** (11): 2288-2297 (2014) DOI: 10.1007/s11837-014-1155-0

372. L Luo, J Wu, J Xu and VP Dravid "Atomic Resolution Study of Reversible Conversion Reaction in Metal Oxide Electrodes for Lithium-Ion Battery." **ACS nano** **8** (11): 11560-11566 (2014) DOI: 10.1021/nn504806h

371. A Sebollela, GM Mustata, K Luo, PT Velasco, KL Viola, EN Cline, GS Shekhawat, KC Wilcox, VP Dravid and WL Klein "Elucidating Molecular Mass and Shape of a Neurotoxic Abeta Oligomer." **ACS Chem Neurosci** **5** (12): 1238-1245 (2014) DOI: 10.1021/cn500156r

370. G Ajithkumar, B Yoo, DE Goral, PJ Hornsby, AL Lin, U Ladiwala, VP Dravid and DK Sardar "Multimodal Bioimaging Using Rare Earth Doped Gd<sub>2</sub>O<sub>3</sub>: Yb/Er Phosphor with Upconversion Luminescence and Magnetic Resonance Properties." **J Mater Chem A Mater** **1** (11): 1561-1572 (2013) DOI: 10.1039/C3TB00551H

369. SS Chou, B Kaehr, J Kim, BM Foley, M De, PE Hopkins, J Huang, CJ Brinker and VP Dravid "Chemically Exfoliated MoS<sub>2</sub> as near-Infrared Photothermal Agents." **Angew Chem Int Ed Engl** **52** (15): 4160-4164 (2013) DOI: 10.1002/anie.201209229



368. X Wang, BD Myers, J Yan, G Shekhawat, V Dravid and PS Lee "Manganese Oxide Micro-Supercapacitors with Ultra-High Areal Capacitance." *Nanoscale* **5** (10): 4119-4122 (2013) DOI: 10.1039/c3nr00210a
367. A Achari, KK Datta, M De, VP Dravid and M Eswaramoorthy "Amphiphilic Aminoclay-Rgo Hybrids: A Simple Strategy to Disperse a High Concentration of Rgo in Water." *Nanoscale* **5** (12): 5316-5320 (2013) DOI: 10.1039/c3nr01108a
366. LC Mimun, G Ajithkumar, M Pokhrel, BG Yust, ZG Elliott, F Pedraza, A Dhanale, L Tang, AL Lin, VP Dravid and DK Sardar "Bimodal Imaging Using Neodymium Doped Gadolinium Fluoride Nanocrystals with near-Infrared to near-Infrared Downconversion Luminescence and Magnetic Resonance Properties." *J Mater Chem B* **1** (41): 5702-5710 (2013) DOI: 10.1039/C3TB20905A
365. P Sharma, SK Tuteja, V Bhalla, G Shekhawat, VP Dravid and CR Suri "Bio-Functionalized Graphene-Graphene Oxide Nanocomposite Based Electrochemical Immunosensing." *Biosens Bioelectron* **39** (1): 99-105 (2013) DOI: 10.1016/j.bios.2012.06.061
364. JS Wu, S Padalkar, SJ Xie, ER Hemesath, JP Cheng, G Liu, AM Yan, JG Connell, E Nakazawa, XF Zhang, LJ Lauhon and VP Dravid "Electron Tomography of Au-Catalyzed Semiconductor Nanowires." *Journal of Physical Chemistry C* **117** (2): 1059-1063 (2013) DOI: 10.1021/jp310816
363. GS Shekhawat and VP Dravid "Nanomechanical Sensors: Bent on Detecting Cancer." *Nat Nanotechnol* **8** (2): 77-78 (2013) DOI: 10.1038/nnano.2013.10
362. HM Joshi, M De, F Richter, JQ He, PV Prasad and VP Dravid "Effect of Silica Shell Thickness of Fe<sub>3</sub>O<sub>4</sub>-SiO<sub>2</sub> Core-Shell Nanostructures on MRI Contrast." *Journal of Nanoparticle Research* **15** (3) (2013) DOI: 10.1007/s11051-013-1448-1
361. L Jiang, Y Tang, C Liow, J Wu, Y Sun, Y Jiang, Z Dong, S Li, VP Dravid and X Chen "Synthesis of Fivefold Stellate Polyhedral Gold Nanoparticles with {110}-Facets Via a Seed-Mediated Growth Method." *Small* **9** (5): 705-710 (2013) DOI: 10.1002/smll.201202561
360. J He, LD Zhao, JC Zheng, JW Doak, H Wu, HQ Wang, Y Lee, C Wolverton, MG Kanatzidis and VP Dravid "Role of Sodium Doping in Lead Chalcogenide Thermoelectrics." *J Am Chem Soc* **135** (12): 4624-4627 (2013) DOI: 10.1021/ja312562d
359. SS Chou, M De, J Kim, S Byun, C Dykstra, J Yu, J Huang and VP Dravid "Ligand Conjugation of Chemically Exfoliated Mos<sub>2</sub>." *J Am Chem Soc* **135** (12): 4584-4587 (2013) DOI: 10.1021/ja310929s
358. Y Lee, SH Lo, J Androulakis, CI Wu, LD Zhao, DY Chung, TP Hogan, VP Dravid and MG Kanatzidis "High-Performance Tellurium-Free Thermoelectrics: All-Scale Hierarchical Structuring of P-Type Pbse-Mse Systems (M = Ca, Sr, Ba)." *J Am Chem Soc* **135** (13): 5152-5160 (2013) DOI: 10.1021/ja400069s
357. D Jariwala, VK Sangwan, DJ Late, JE Johns, VP Dravid, TJ Marks, LJ Lauhon and MC Hersam "Band-Like Transport in High Mobility Unencapsulated Single-Layer Mos<sub>2</sub> Transistors." *Applied Physics Letters* **102** (17) (2013) DOI: 10.1063/1.4803920

356. JS Wu, AM Kim, R Bleher, BD Myers, RG Marvin, H Inada, K Nakamura, XF Zhang, E Roth, SY Li, TK Woodruff, TV O'Halloran and VP Dravid "Imaging and Elemental Mapping of Biological Specimens with a Dual-Eds Dedicated Scanning Transmission Electron Microscope." **Ultramicroscopy** **128**: 24-31 (2013) DOI: 10.1016/j.ultramic.2013.01.004
355. K Ahn, K Biswas, J He, I Chung, V Dravid and MG Kanatzidis "Enhanced Thermoelectric Properties of P-Type Nanostructured Pbte–Mte (M = Cd, Hg) Materials." **Energy & Environmental Science** **6** (5): 1529-1537 (2013) DOI: 10.1039/c3ee40482j
354. JQ He, MG Kanatzidis and VP Dravid "High Performance Bulk Thermoelectrics Via a Panoscopic Approach." **Materials Today** **16** (5): 166-176 (2013) DOI: 10.1016/j.mattod.2013.05.004
353. LD Zhao, S Hao, SH Lo, CI Wu, X Zhou, Y Lee, H Li, K Biswas, TP Hogan, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "High Thermoelectric Performance Via Hierarchical Compositionally Alloyed Nanostructures." **J Am Chem Soc** **135** (19): 7364-7370 (2013) DOI: 10.1021/ja403134b
352. JP Cheng, QL Shou, JS Wu, F Lin, VP Dravid and XB Zhang "Influence of Component Content on the Capacitance of Magnetite/Reduced Graphene Oxide Composite." **Journal of Electroanalytical Chemistry** **698**: 1-8 (2013) DOI: 10.1016/j.jelechem.2013.03.017
351. DJ Late, YK Huang, B Liu, J Acharya, SN Shirodkar, J Luo, A Yan, D Charles, UV Waghmare, VP Dravid and CN Rao "Sensing Behavior of Atomically Thin-Layered Mos<sub>2</sub> Transistors." **ACS nano** **7** (6): 4879-4891 (2013) DOI: 10.1021/nn400026u
350. JW Hennek, J Smith, A Yan, MG Kim, W Zhao, VP Dravid, A Facchetti and TJ Marks "Oxygen "Getter" Effects on Microstructure and Carrier Transport in Low Temperature Combustion-Processed a-Inxzo (X = Ga, Sc, Y, La) Transistors." **J Am Chem Soc** **135** (29): 10729-10741 (2013) DOI: 10.1021/ja403586x
349. RV Kashid, DJ Late, SS Chou, YK Huang, M De, DS Joag, MA More and VP Dravid "Enhanced Field-Emission Behavior of Layered Mos<sub>2</sub> Sheets." **Small** **9** (16): 2730-2734 (2013) DOI: 10.1002/sml.201300002
348. E Pedersoli, ND Loh, F Capotondi, CY Hampton, RG Sierra, D Starodub, C Bostedt, J Bozek, AJ Nelson, M Aslam, S Li, VP Dravid, AV Martin, A Aquila, A Barty, H Fleckenstein, L Gumprecht, M Liang, K Nass, J Schulz, TA White, N Coppola, S Bajt, M Barthelmess, H Graafsma, H Hirsemann, C Wunderer, SW Epp, B Erk, B Rudek, A Rudenko, L Foucar, S Kassemeyer, L Lomb, D Rolles, RL Shoeman, J Steinbrener, R Hartmann, A Hartmann, G Hauser, P Holl, N Kimmel, C Reich, H Soltau, G Weidenspointner, WH Benner, GR Farquar, SP Hau-Riege, MS Hunter, T Ekeberg, M Hantke, FRNC Maia, HJ Tobias, S Marchesini, M Frank, L Struder, I Schlichting, J Ullrich, HN Chapman, PH Bucksbaum, M Kiskinova and MJ Bogan "Mesoscale Morphology of Airborne Core-Shell Nanoparticle Clusters: X-Ray Laser Coherent Diffraction Imaging." **Journal of Physics B-Atomic Molecular and Optical Physics** **46** (16) (2013) DOI: 10.1088/0953-4075/46/16/164033
347. N Bhattarai, G Casillas, S Khanal, D Bahena, JJ Velazquez-Salazar, S Mejia, A Ponce, VP Dravid, RL Whetten, MM Mariscal and M Jose-Yacamán "Structure and Composition of Au/Co Magneto-Plasmonic Nanoparticles." **MRS Communications** **3** (3): 177-183 (2013) DOI: 10.1557/mrc.2013.30

346. CA Falaschetti, T Paunesku, J Kurepa, D Nanavati, SS Chou, M De, M Song, JT Jang, A Wu, VP Dravid, J Cheon, J Smalle and GE Woloschak "Negatively Charged Metal Oxide Nanoparticles Interact with the 20s Proteasome and Differentially Modulate Its Biologic Functional Effects." **ACS nano** **7** (9): 7759-7772 (2013) DOI: 10.1021/nn402416h
345. LD Zhao, HJ Wu, SQ Hao, CI Wu, XY Zhou, K Biswas, JQ He, TP Hogan, C Uher, C Wolverton, VP Dravid and MG Kanatzidis "All-Scale Hierarchical Thermoelectrics: Mgte in Pbte Facilitates Valence Band Convergence and Suppresses Bipolar Thermal Transport for High Performance." **Energy & Environmental Science** **6** (11): 3346-3355 (2013) DOI: 10.1039/c3ee42187b
344. K Biswas, J He, ID Blum, C-I Wu, TP Hogan, DN Seidman, VP Dravid and MG Kanatzidis "High-Performance Bulk Thermoelectrics with All-Scale Hierarchical Architectures." **Nature** **489**: 414 (2012) DOI: 10.1038/nature11439
343. J He, J Androulakis, MG Kanatzidis and VP Dravid "Seeing Is Believing: Weak Phonon Scattering from Nanostructures in Alkali Metal-Doped Lead Telluride." **Nano Lett** **12** (1): 343-347 (2012) DOI: 10.1021/nl203626n
342. BD Myers, BL Stevens, DI Rozkiewicz, SA Barnett and VP Dravid "Directed Assembly in Epitaxial Zinc Oxide Films on Focused Ion Beam Modified Sapphire Substrates." **Journal of Vacuum Science & Technology B** **30** (1) (2012) DOI: 10.1116/1.3672006
341. JS Cronin, K Muangnapoh, Z Patterson, KJ Yakal-Kremski, VP Dravid and SA Barnett "Effect of Firing Temperature on Lsm-Ysz Composite Cathodes: A Combined Three-Dimensional Microstructure and Impedance Spectroscopy Study." **Journal of the Electrochemical Society** **159** (4): B385-B393 (2012) DOI: 10.1149/2.053204jes
340. JP Cheng, X Chen, JS Wu, F Liu, XB Zhang and VP Dravid "Porous Cobalt Oxides with Tunable Hierarchical Morphologies for Supercapacitor Electrodes." **Crystengcomm** **14** (20): 6702-6709 (2012) DOI: 10.1039/c2ce26057c
339. SD Strasser, G Shekhawat, JD Rogers, VP Dravid, A Taflove and V Backman "Near-Field Penetrating Optical Microscopy: A Live Cell Nanoscale Refractive Index Measurement Technique for Quantification of Internal Macromolecular Density." **Opt Lett** **37** (4): 506-508 (2012) DOI: 10.1364/OL.37.000506
338. K Song, DJ Sauter, JS Wu, VP Dravid and PC Stair "Evolution of High-Energy Electron Beam Irradiation Effects on Zeolite Supported Catalyst: Metal Nanoprecipitation." **Acs Catalysis** **2** (3): 384-390 (2012) DOI: 10.1021/cs300002c
337. MM De, SS Chou and VP Dravid "Modulation of  $\alpha$ -Chymotrypsin Activity through Monodisperse Nano-Graphene Oxide." **Abstracts of Papers of the American Chemical Society** **243** (2012)
336. GM Mustata, GS Shekhawat, MP Lambert, KL Viola, PT Velasco, WL Klein and VP Dravid "Insights into the Mechanism of Alzheimer's Beta-Amyloid Aggregation as a Function of Concentration by Using Atomic Force Microscopy." **Applied Physics Letters** **100** (13) (2012) DOI: 10.1063/1.3697682
335. A Patil and V Dravid "Embryology of Svc and Ivc Anomalies: Ramifications for Venous Interventions." **American Journal of Roentgenology** **198** (5) (2012)

334. DJ Late, B Liu, HSSR Matte, CNR Rao and VP Dravid "Rapid Characterization of Ultrathin Layers of Chalcogenides on SiO<sub>2</sub>/Si Substrates." **Advanced Functional Materials** **22** (9): 1894-1905 (2012) DOI: 10.1002/adfm.201102913
333. LD Zhao, J He, CI Wu, TP Hogan, X Zhou, C Uher, VP Dravid and MG Kanatzidis "Thermoelectrics with Earth Abundant Elements: High Performance P-Type Pbs Nanostructured with Srs and Cas." **J Am Chem Soc** **134** (18): 7902-7912 (2012) DOI: 10.1021/ja301772w
332. ID Blum, D Isheim, DN Seidman, JQ He, J Androulakis, K Biswas, VP Dravid and MG Kanatzidis "Dopant Distributions in Pbte-Based Thermoelectric Materials." **Journal of Electronic Materials** **41** (6): 1583-1588 (2012) DOI: 10.1007/s11664-012-1972-2
331. DJ Late, B Liu, HS Matte, VP Dravid and CN Rao "Hysteresis in Single-Layer Mos<sub>2</sub> Field Effect Transistors." **ACS nano** **6** (6): 5635-5641 (2012) DOI: 10.1021/nn301572c
330. DJ Late, B Liu, J Luo, A Yan, HS Matte, M Grayson, CN Rao and VP Dravid "Gas and Gase Ultrathin Layer Transistors." **Adv Mater** **24** (26): 3549-3554 (2012) DOI: 10.1002/adma.201201361
329. N Wangoo, G Shekhawat, JS Wu, AKK Bhasin, CR Suri, KK Bhasin and V Dravid "Green Synthesis and Characterization of Size Tunable Silica-Capped Gold Core-Shell Nanoparticles." **Journal of Nanoparticle Research** **14** (8) (2012) DOI: 10.1007/s11051-012-1011-5
328. F Richter, M De, S Chou and VP Dravid "Magnetic Nanostructures for Potential Theranostics." **Abstracts of Papers of the American Chemical Society** **244** (2012)
327. J He, SN Girard, JC Zheng, L Zhao, MG Kanatzidis and VP Dravid "Strong Phonon Scattering by Layer Structured Pbsns<sub>2</sub> in Pbte Based Thermoelectric Materials." **Adv Mater** **24** (32): 4440-4444 (2012) DOI: 10.1002/adma.201201565
326. SN Girard, TC Chasapis, JQ He, XY Zhou, E Hatzikraniotis, C Uher, KM Paraskevopoulos, VP Dravid and MG Kanatzidis "Pbte-Pbsns<sub>2</sub> Thermoelectric Composites: Low Lattice Thermal Conductivity from Large Microstructures." **Energy & Environmental Science** **5** (9): 8716-8725 (2012) DOI: 10.1039/c2ee22495j
325. M Ohta, K Biswas, SH Lo, JQ He, DY Chung, VP Dravid and MG Kanatzidis "Enhancement of Thermoelectric Figure of Merit by the Insertion of Mgte Nanostructures in P-Type Pbte Doped with Na<sub>2</sub>te." **Advanced Energy Materials** **2** (9): 1117-1123 (2012) DOI: 10.1002/aenm.201100756
324. AM Yan, T Sun, KB Borisenko, DB Buchholz, RPH Chang, AI Kirkland and VP Dravid "Multi-Scale Order in Amorphous Transparent Oxide Thin Films." **Journal of Applied Physics** **112** (5) (2012) DOI: 10.1063/1.4750025
323. LD Zhao, J He, S Hao, CI Wu, TP Hogan, C Wolverton, VP Dravid and MG Kanatzidis "Raising the Thermoelectric Performance of P-Type Pbs with Endotaxial Nanostructuring and Valence-Band Offset Engineering Using Cds and Zns." **J Am Chem Soc** **134** (39): 16327-16336 (2012) DOI: 10.1021/ja306527n
322. AL Lipson, S Chattopadhyay, HJ Karmel, TT Fister, JD Emery, VP Dravid, MM Thackeray, PA Fenter, MJ Bedzyk and MC Hersam "Enhanced Lithiation of Doped 6h Silicon Carbide (0001) Via High

Temperature Vacuum Growth of Epitaxial Graphene." *Journal of Physical Chemistry C* **116** (39): 20949-20957 (2012) DOI: 10.1021/jp307220y

321. SS Chou, M De, J Luo, VM Rotello, J Huang and VP Dravid "Nanoscale Graphene Oxide (Ngo) as Artificial Receptors: Implications for Biomolecular Interactions and Sensing." *J Am Chem Soc* **134** (40): 16725-16733 (2012) DOI: 10.1021/ja306767y

320. J He, ID Blum, HQ Wang, SN Girard, J Doak, LD Zhao, JC Zheng, G Casillas, C Wolverton, M Jose-Yacaman, DN Seidman, MG Kanatzidis and VP Dravid "Morphology Control of Nanostructures: Na-Doped Pbte-Pbs System." *Nano Lett* **12** (11): 5979-5984 (2012) DOI: 10.1021/nl303449x

319. P Yang, SC Wang, X Teng, W Wei, VP Dravid and L Huang "Effect of Magnetic Nanoparticles on the Morphology of Polystyrene-B-Poly(Methyl Methacrylate) Diblock Copolymer Thin Film." *Journal of Physical Chemistry C* **116** (43): 23036-23040 (2012) DOI: 10.1021/jp305827x

318. AC Fahrenbach, S Sampath, DJ Late, JC Barnes, SL Kleinman, N Valley, KJ Hartlieb, Z Liu, VP Dravid, GC Schatz, RP Van Duyne and JF Stoddart "A Semiconducting Organic Radical Cationic Host-Guest Complex." *ACS nano* **6** (11): 9964-9971 (2012) DOI: 10.1021/nn303553z

317. P Sharma, V Bhalla, V Dravid, G Shekhawat, W Jinsong, ES Prasad and CR Suri "Enhancing Electrochemical Detection on Graphene Oxide-Cnt Nanostructured Electrodes Using Magneto-Nanobioprobes." *Sci Rep* **2**: 877 (2012) DOI: 10.1038/srep00877

316. SH Lo, JQ He, K Biswas, MG Kanatzidis and VP Dravid "Phonon Scattering and Thermal Conductivity in P-Type Nanostructured Pbte-Bate Bulk Thermoelectric Materials." *Advanced Functional Materials* **22** (24): 5175-5184 (2012) DOI: 10.1002/adfm.201201221

315. DA Bonnell, VP Dravid, PS Weiss, D Ginger, K Jackson, D Eigler, H Craighead, E Isaacs, MC Roco, CA Mirkin and MC Hersam (2011). Enabling and Investigative Tools: Measuring Methods, Instruments, and Metrology.

314. V Tjoa, W Jun, V Dravid, S Mhaisalkar and N Mathews "Hybrid Graphene-Metal Nanoparticle Systems: Electronic Properties and Gas Interaction." *Journal of Materials Chemistry* **21** (39): 15593-15599 (2011) DOI: 10.1039/c1jm12676h

313. K Biswas, J He, Q Zhang, G Wang, C Uher, VP Dravid and MG Kanatzidis "Strained Endotaxial Nanostructures with High Thermoelectric Figure of Merit." *Nat Chem* **3** (2): 160-166 (2011) DOI: 10.1038/nchem.955

312. J Liu, JW Hennek, DB Buchholz, YG Ha, S Xie, VP Dravid, RP Chang, A Facchetti and TJ Marks "Reinforced Self-Assembled Nanodielectrics for High-Performance Transparent Thin Film Transistors." *Adv Mater* **23** (8): 992-997 (2011) DOI: 10.1002/adma.201004198

311. S Mostafa, I Lee, SK Islam, SA Eliza, G Shekhawat, VP Dravid and FS Tulip "Integrated Mosfet-Embedded-Cantilever-Based Biosensor Characteristic for Detection of Anthrax Simulant." *Ieee Electron Device Letters* **32** (3): 408-410 (2011) DOI: 10.1109/Led.2010.2098015

310. S Johnsen, J He, J Androulakis, VP Dravid, I Todorov, DY Chung and MG Kanatzidis "Nanostructures Boost the Thermoelectric Performance of Pbs." *J Am Chem Soc* **133** (10): 3460-3470 (2011) DOI: 10.1021/ja109138p
309. M De and VP Dravid "Alteration of Enzymatic Activity Using Graphene-Based Receptor." *Abstracts of Papers of the American Chemical Society* **241** (2011)
308. SS Chou, M De, HM Joshi, F Richter and VP Dravid "Ultrastabilization of Magnetic Nanostructure with Multi-Functionality: Cellular Interactions." *Abstracts of Papers of the American Chemical Society* **241** (2011)
307. P Pradhan, D Damania, HM Joshi, V Turzhitsky, H Subramanian, HK Roy, A Taflove, VP Dravid and V Backman "Quantification of Nanoscale Density Fluctuations by Electron Microscopy: Probing Cellular Alterations in Early Carcinogenesis." *Phys Biol* **8** (2): 026012 (2011) DOI: 10.1088/1478-3975/8/2/026012
306. T Sun, A Borrasso, B Liu and V Dravid "Synthesis and Characterization of Nanocrystalline Zinc Manganese Ferrite." *Journal of the American Ceramic Society* **94** (5): 1490-1495 (2011) DOI: 10.1111/j.1551-2916.2010.04265.x
305. T Sun, A Borrasso, B Liu and V Dravid "Synthesis and Characterization of Nanocrystalline Zinc Manganese Ferrite." *Journal of the American Ceramic Society* **94** (5): 1490-1495 (2011) DOI: 10.1111/j.1551-2916.2010.04265.x
304. EA Schultz-Sikma, HM Joshi, Q Ma, KW Macrenaris, AL Eckermann, VP Dravid and TJ Meade "Probing the Chemical Stability of Mixed Ferrites: Implications for Mr Contrast Agent Design." *Chem Mater* **23** (10): 2657-2664 (2011) DOI: 10.1021/cm200509g
303. SY Yew, G Shekhawat, N Wangoo, S Mhaisalkar, CR Suri, VP Dravid and YM Lam "Design of Single Peptides for Self-Assembled Conduction Channels." *Nanotechnology* **22** (21): 215606 (2011) DOI: 10.1088/0957-4484/22/21/215606
302. J Wu, Y Sheng Zhao, H Hu, J Huang, JM Zuo and VP Dravid "Construction of an Organic Crystal Structural Model Based on Combined Electron and Powder X-Ray Diffraction Data and the Charge Flipping Algorithm." *Ultramicroscopy* **111** (7): 812-816 (2011) DOI: 10.1016/j.ultramicro.2010.09.004
301. JQ He, JR Sootsman, LQ Xu, SN Girard, JC Zheng, MG Kanatzidis and VP Dravid "Anomalous Electronic Transport in Dual-Nanostructured Lead Telluride." *J Am Chem Soc* **133** (23): 8786-8789 (2011) DOI: 10.1021/ja2006498
300. T Sun, ZX Pan, SJ Xie, ZH Cai, J Wang and VP Dravid "High-Sensitivity Strain Mapping around Epitaxial Oxide Nanostructures Using Scanning X-Ray Nanodiffraction." *Applied Physics Letters* **98** (25) (2011) DOI: 10.1063/1.3598443
299. JS Wu, SH Lo, K Song, BK Vijayan, WY Li, KA Gray and VP Dravid "Growth of Rutile TiO<sub>2</sub> Nanorods on Anatase TiO<sub>2</sub> Thin Films on Si-Based Substrates." *Journal of Materials Research* **26** (13): 1646-1652 (2011) DOI: 10.1557/jmr.2011.190

298. J Androulakis, I Todorov, J He, DY Chung, V Dravid and M Kanatzidis "Thermoelectrics from Abundant Chemical Elements: High-Performance Nanostructured Pbse-Pbs." *J Am Chem Soc* **133** (28): 10920-10927 (2011) DOI: 10.1021/ja203022c
297. MC Pan, YZ Liu, GR Bai, S Hong, VP Dravid and AK Petford-Long "Structure-Property Relationships in Self-Assembled Metalorganic Chemical Vapor Deposition-Grown Cofe2o4-Pbtio3 Multiferroic Nanocomposites Using Three-Dimensional Characterization." *Journal of Applied Physics* **110** (3) (2011) DOI: 10.1063/1.3615888
296. JS Wu, JQ He, MK Han, JR Sootsman, S Girard, IU Arachchige, MG Kanatzidis and VP Dravid "Electron-Beam Activated Thermal Sputtering of Thermoelectric Materials." *Journal of Applied Physics* **110** (4) (2011) DOI: 10.1063/1.3624755
295. TH Han, YK Huang, AT Tan, VP Dravid and J Huang "Steam Etched Porous Graphene Oxide Network for Chemical Sensing." *J Am Chem Soc* **133** (39): 15264-15267 (2011) DOI: 10.1021/ja205693t
294. SN Girard, J He, X Zhou, D Shoemaker, CM Jaworski, C Uher, VP Dravid, JP Heremans and MG Kanatzidis "High Performance Na-Doped Pbte-Pbs Thermoelectric Materials: Electronic Density of States Modification and Shape-Controlled Nanostructures." *J Am Chem Soc* **133** (41): 16588-16597 (2011) DOI: 10.1021/ja206380h
293. K Biswas, J He, G Wang, S-H Lo, C Uher, VP Dravid and MG Kanatzidis "High Thermoelectric Figure of Merit in Nanostructured P-Type Pbte-Mte (M = Ca, Ba)." *Energy & Environmental Science* **4** (11): 4675-4684 (2011) DOI: 10.1039/c1ee02297k
292. M De, SS Chou, HM Joshi and VP Dravid "Hybrid Magnetic Nanostructures (Mns) for Magnetic Resonance Imaging Applications." *Adv Drug Deliv Rev* **63** (14-15): 1282-1299 (2011) DOI: 10.1016/j.addr.2011.07.001
291. D Bahadur and VP Dravid "Hybrid Nanostructures for Diagnostics and Therapeutics." *Adv Drug Deliv Rev* **63** (14-15): 1227 (2011) DOI: 10.1016/j.addr.2011.10.001
290. M De, SS Chou and VP Dravid "Graphene Oxide as an Enzyme Inhibitor: Modulation of Activity of Alpha-Chymotrypsin." *J Am Chem Soc* **133** (44): 17524-17527 (2011) DOI: 10.1021/ja208427j
289. LD Zhao, SH Lo, J He, H Li, K Biswas, J Androulakis, CI Wu, TP Hogan, DY Chung, VP Dravid and MG Kanatzidis "High Performance Thermoelectrics from Earth-Abundant Materials: Enhanced Figure of Merit in Pbs by Second Phase Nanostructures." *J Am Chem Soc* **133** (50): 20476-20487 (2011) DOI: 10.1021/ja208658w
288. F Hu, HM Joshi, VP Dravid and TJ Meade "High-Performance Nanostructured Mr Contrast Probes." *Nanoscale* **2** (10): 1884-1891 (2010) DOI: 10.1039/c0nr00173b
287. SW Fan, AK Srivastava and VP Dravid "Nanopatterned Polycrystalline Zno for Room Temperature Gas Sensing." *Sensors and Actuators B-Chemical* **144** (1): 159-163 (2010) DOI: 10.1016/j.snb.2009.10.054

286. JR Sootsman, JQ He, VP Dravid, S Ballikaya, D Vermeulen, C Uher and MG Kanatzidis "Microstructure and Thermoelectric Properties of Mechanically Robust Pbte-Si Eutectic Composites." **Chemistry of Materials** **22** (3): 869-875 (2010) DOI: DOI 10.1021/cm9016672
285. M Pan, G Bai, Y Liu, S Hong, VP Dravid and AK Petford-Long "Effect of Deposition Temperature on Surface Morphology and Magnetic Properties in Epitaxial Cofe2o4 Thin Films Deposited by Metal Organic Chemical Vapor Deposition." **Journal of Applied Physics** **107** (4) (2010) DOI: 10.1063/1.3312011
284. JQ He, SN Girard, MG Kanatzidis and VP Dravid "Microstructure-Lattice Thermal Conductivity Correlation in Nanostructured Pbte0.7s0.3 Thermoelectric Materials." **Advanced Functional Materials** **20** (5): 764-772 (2010) DOI: 10.1002/adfm.200901905
283. HM Joshi, M De, K Ku, K Barick, M Aslam, S Sharma, T Tomita and V Dravid "Magnetic Nanostructures (Mns) in Biomedicine: Role of Size, Shape and Composition." **Abstracts of Papers of the American Chemical Society** **239** (2010)
282. K Ahn, MK Han, J He, J Androulakis, S Ballikaya, C Uher, VP Dravid and MG Kanatzidis "Exploring Resonance Levels and Nanostructuring in the Pbte-Cdte System and Enhancement of the Thermoelectric Figure of Merit." **J Am Chem Soc** **132** (14): 5227-5235 (2010) DOI: 10.1021/ja910762q
281. S Xie, GE Sterbinsky, BW Wessels and VP Dravid "Defect and Interfacial Structure of Heteroepitaxial Fe3o4/Batio3 Bilayers." **Microsc Microanal** **16** (3): 300-305 (2010) DOI: 10.1017/S1431927610000255
280. J He, JR Sootsman, SN Girard, JC Zheng, J Wen, Y Zhu, MG Kanatzidis and VP Dravid "On the Origin of Increased Phonon Scattering in Nanostructured Pbte Based Thermoelectric Materials." **J Am Chem Soc** **132** (25): 8669-8675 (2010) DOI: 10.1021/ja1010948
279. I Todorov, DY Chung, H Claus, CD Malliakas, AP Douvalis, T Bakas, JQ He, VP Dravid and MG Kanatzidis "Topotactic Redox Chemistry of Nafeas in Water and Air and Superconducting Behavior with Stoichiometry Change." **Chemistry of Materials** **22** (13): 3916-3925 (2010) DOI: 10.1021/cm100252r
278. SN Girard, J He, C Li, S Moses, G Wang, C Uher, VP Dravid and MG Kanatzidis "In Situ Nanostructure Generation and Evolution within a Bulk Thermoelectric Material to Reduce Lattice Thermal Conductivity." **Nano Lett** **10** (8): 2825-2831 (2010) DOI: 10.1021/nl100743q
277. KC Barick, M Aslam, VP Dravid and D Bahadur "Controlled Fabrication of Oriented Co-Doped Zno Clustered Nanoassemblies." **J Colloid Interface Sci** **349** (1): 19-26 (2010) DOI: 10.1016/j.jcis.2010.05.036
276. SH Tark, A Das, S Sligar and VP Dravid "Nanomechanical Detection of Cholera Toxin Using Microcantilevers Functionalized with Ganglioside Nanodiscs." **Nanotechnology** **21** (43): 435502 (2010) DOI: 10.1088/0957-4484/21/43/435502
275. B Liu, T Sun, J He and VP Dravid "Sol-Gel-Derived Epitaxial Nanocomposite Thin Films with Large Sharp Magnetolectric Effect." **ACS nano** **4** (11): 6836-6842 (2010) DOI: 10.1021/nn101952q
274. GS Shekhawat, S Avasthy, AK Srivastava, SH Tark and VP Dravid "Probing Buried Defects in Extreme Ultraviolet Multilayer Blanks Using Ultrasound Holography." **Ieee Transactions on Nanotechnology** **9** (6): 671-674 (2010) DOI: 10.1109/Tnano.2010.2053556



273. P Pradhan, D Damania, HM Joshi, V Turzhitsky, H Subramanian, HK Roy, A Taflove, VP Dravid and V Backman "Quantification of Nanoscale Density Fluctuations Using Electron Microscopy: Light-Localization Properties of Biological Cells." *Appl Phys Lett* **97** (24): 243704 (2010) DOI: 10.1063/1.3524523

272. YG Ha, S Jeong, J Wu, MG Kim, VP Dravid, A Facchetti and TJ Marks "Flexible Low-Voltage Organic Thin-Film Transistors Enabled by Low-Temperature, Ambient Solution-Processable Inorganic/Organic Hybrid Gate Dielectrics." *J Am Chem Soc* **132** (49): 17426-17434 (2010) DOI: 10.1021/ja107079d

271. JR Sootsman, V Jovovic, CM Jaworski, JP Heremans, J He, VP Dravid and MG Kanatzidis (2009). Understanding Electrical Transport and the Large Power Factor Enhancements in Co-Nanostructured Pbte. Materials and Devices for Thermal-to-Electric Energy Conversion. J. Yang, G. S. Nolas, K. Koumoto and Y. Grin. **1166**: 77-82.

270. SN Girard, J He, VP Dravid and MG Kanatzidis (2009). Investigation of Solid-State Immiscibility and Thermoelectric Properties of the System Pbte-Pbs. Materials and Devices for Thermal-to-Electric Energy Conversion. J. Yang, G. S. Nolas, K. Koumoto and Y. Grin. **1166**: 59-64.

269. KC Barick, M Aslam, YP Lin, D Bahadur, PV Prasad and VP Dravid "Novel and Efficient Mr Active Aqueous Colloidal Fe<sub>3</sub>O<sub>4</sub> Nanoassemblies." *Journal of Materials Chemistry* **19** (38): 7023-7029 (2009) DOI: 10.1039/b911626e

268. VP Dravid ""Controlling" Internal Microstructure of Nanopatterned Oxides Via Soft Electron Beam Lithography (Soft-Ebl)." *Journal of Materials Chemistry* **19** (25): 4295-4299 (2009) DOI: 10.1039/b903201k

267. T Sun, S Donthu, M Sprung, K D'Aquila, Z Jiang, A Srivastava, J Wang and VP Dravid "Effect of Pd Doping on the Microstructure and Gas-Sensing Performance of Nanoporous SnO<sub>2</sub> Thin Films." *Acta Materialia* **57** (4): 1095-1104 (2009) DOI: 10.1016/j.actamat.2008.10.049

266. SH Tark, A Srivastava, S Chou, G Shekhawat and VP Dravid "Nanomechanoelectronic Signal Transduction Scheme with Metal-Oxide-Semiconductor Field-Effect Transistor-Embedded Microcantilevers." *Applied Physics Letters* **94** (10) (2009) DOI: 10.1063/1.3093874

265. JR Sootsman, JQ He, VP Dravid, CP Li, C Uher and MG Kanatzidis "High Thermoelectric Figure of Merit and Improved Mechanical Properties in Melt Quenched Pbte-Ge and Pbte-Ge<sub>1-x</sub>Sn<sub>x</sub> Eutectic and Hypereutectic Composites." *Journal of Applied Physics* **105** (8) (2009) DOI: 10.1063/1.3093833

264. Al Guéguen, PFP Poudeu, C-P Li, S Moses, C Uher, J He, V Dravid, KM Paraskevopoulos and MG Kanatzidis "Thermoelectric Properties and Nanostructuring in the P-Type Materials Npb<sub>18-x</sub>Sn<sub>x</sub>mte<sub>20</sub>(M = Sb, Bi)." *Chemistry of Materials* **21** (8): 1683-1694 (2009) DOI: 10.1021/cm803519p

263. KC Barick, M Aslam, PV Prasad, VP Dravid and D Bahadur "Nanoscale Assembly of Amine Functionalized Colloidal Iron Oxide." *J Magn Magn Mater* **321** (10): 1529-1532 (2009) DOI: 10.1016/j.jmmm.2009.02.080

262. SS Chou, YY Kim, A Srivastava, B Murphy, O Balogun, SH Tark, G Shekhawat and VP Dravid "Microcantilever Array with Embedded Metal Oxide Semiconductor Field Effect Transistor Actuators for Deflection Control, Deflection Sensing, and High Frequency Oscillation." *Applied Physics Letters* **94** (22) (2009) DOI: 10.1063/1.3133333
261. KT Thurn, T Paunesku, A Wu, EM Brown, B Lai, S Vogt, J Maser, M Aslam, V Dravid, R Bergan and GE Woloschak "Labeling Tio<sub>2</sub> Nanoparticles with Dyes for Optical Fluorescence Microscopy and Determination of Tio<sub>2</sub>-DNA Nanoconjugate Stability." *Small* **5** (11): 1318-1325 (2009) DOI: 10.1002/sml.200801458
260. Y Nangia, N Wangoo, S Sharma, JS Wu, V Dravid, GS Shekhawat and CR Suri "Facile Biosynthesis of Phosphate Capped Gold Nanoparticles by a Bacterial Isolate Stenotrophomonas Maltophilia." *Applied Physics Letters* **94** (23) (2009) DOI: 10.1063/1.3141519
259. JQ He, S Girard, JR Sootsman, MG Kanatzidis and VP Dravid "Characterization of Pbte-Based Thermoelectric Materials by Scanning/Transmission Electron Microscopy (S/Tem)." *Microscopy and Microanalysis* **15**: 1400-1401 (2009) DOI: 10.1017/S1431927609093106
258. S Xie, Z Pan, J Cheng, GE Sterbinsky, BW Wessels and VP Dravid "Growth and Structural Characterization of Multiferroic Thin Films and Nanopatterns." *Microscopy and Microanalysis* **15**: 1026-1027 (2009) DOI: 10.1017/S1431927609097050
257. B Liu and VP Dravid "Soft Electron Beam Lithography (Soft-Ebl) Patterning of 0-and 1-D Nanostructures of Magnetic and Ferroelectric Oxides." *Microscopy and Microanalysis* **15**: 1024-1025 (2009) DOI: 10.1017/S143192760909655x
256. JS Wu, MP Lambert, PT Velasco, S Gutiontov, S Sharma, HM Joshi, G Shekhawat, WL Klein and VP Dravid "Oligomeric and Fibrillar Amyloid-Beta42 Studied by Cryo-Tem." *Microscopy and Microanalysis* **15**: 944-945 (2009) DOI: 10.1017/S1431927609095762
255. AM Yan, T Sun and VP Dravid "In-Situ Tem Characterization of Nucleation and Growth of Nanopatterned Oxides." *Microscopy and Microanalysis* **15**: 690-691 (2009) DOI: 10.1017/S1431927609096627
254. JS Wu, YS Zhao, JX Huang and VP Dravid "Electron Diffraction of Organic Nanowires." *Microscopy and Microanalysis* **15**: 54-55 (2009) DOI: 10.1017/S1431927609095749
253. SJ Hurst, HD Hill, RJ Macfarlane, J Wu, VP Dravid and CA Mirkin "Synthetically Programmable DNA Binding Domains in Aggregates of DNA-Functionalized Gold Nanoparticles." *Small* **5** (19): 2156-2161 (2009) DOI: 10.1002/sml.200900568
252. SW Fan, AK Srivastava and VP Dravid "Uv-Activated Room-Temperature Gas Sensing Mechanism of Polycrystalline ZnO." *Applied Physics Letters* **95** (14) (2009) DOI: 10.1063/1.3243458
251. HM Joshi, YP Lin, M Aslam, PV Prasad, EA Schultz-Sikma, R Edelman, T Meade and VP Dravid "Effects of Shape and Size of Cobalt Ferrite Nanostructures on Their Mri Contrast and Thermal Activation." *J Phys Chem C Nanomater Interfaces* **113** (41): 17761-17767 (2009) DOI: 10.1021/jp905776g

250. GS Shekhawat, MP Lambert, S Sharma, PT Velasco, KL Viola, WL Klein and VP Dravid "Soluble State High Resolution Atomic Force Microscopy Study of Alzheimer's Beta-Amyloid Oligomers." *Appl Phys Lett* **95** (18): 183701 (2009) DOI: 10.1063/1.3251779

249. KC Barick, M Aslam, JS Wu, VP Dravid and D Bahadur "Defects in Three-Dimensional Spherical Assemblies of Ni-Doped ZnO Nanocrystals." *Journal of Materials Research* **24** (12): 3543-3550 (2009) DOI: 10.1557/Jmr.2009.0446

248. GS Shekhawat, A Chand, S Sharma, Verawati and VP Dravid "High Resolution Atomic Force Microscopy Imaging of Molecular Self Assembly in Liquids Using Thermal Drift Corrected Cantilevers." *Applied Physics Letters* **95** (23) (2009) DOI: 10.1063/1.3266519

247. J He, A Gueguen, JR Sootsman, JC Zheng, L Wu, Y Zhu, MG Kanatzidis and VP Dravid "Role of Self-Organization, Nanostructuring, and Lattice Strain on Phonon Transport in  $\text{NaPb(18-X)Sn(X)BiTe(20)}$  Thermoelectric Materials." *J Am Chem Soc* **131** (49): 17828-17835 (2009) DOI: 10.1021/ja905448b

246. G Shekhawat, A Srivastava, S Avasthy and V Dravid "Ultrasound Holography for Noninvasive Imaging of Buried Defects and Interfaces for Advanced Interconnect Architectures." *Applied Physics Letters* **95** (26) (2009) DOI: 10.1063/1.3263716

245. TF Chancellor, Jr., RJ Russell, V Dravid and TP Lele "Toward in Situ Biochemistry: Combining Chemical Kinetics Approaches with Biomolecular Imaging in Living Cells." *Biotechnol Prog* **24** (1): 89-95 (2008) DOI: 10.1021/bp070110a

244. A Wu, T Paunesku, EM Brown, A Babbo, C Cruz, M Aslam, V Dravid and GE Woloschak "Titanium Dioxide Nanoparticles Assembled by DNA Molecules Hybridization and Loading of DNA Interacting Proteins." *Nano* **3** (1): 27-36 (2008) DOI: 10.1142/S1793292008000836

243. ZJ Xue, CA Corvalan, V Dravid and PE Sojka "Breakup of Shear-Thinning Liquid Jets with Surfactants." *Chemical Engineering Science* **63** (7): 1842-1849 (2008) DOI: 10.1016/j.ces.2007.12.011

242. T Sun, H Hu, ZX Pan, XF Li, J Wang and VP Dravid "In Situ Real-Time Investigation of Kinetics of Nucleation and Growth of Sol-Gel-Derived Functional Oxide Thin Films." *Physical Review B* **77** (20) (2008) DOI: 10.1103/PhysRevB.77.205414

241. S Donthu, N Alem, Z Pan, SY Li, G Shekhawat, V Dravid, KD Benkstein and S Semancik "Directed Fabrication of Ceramic Nanostructures on Fragile Substrates Using Soft-Electron Beam Lithography (Soft-Ebl)." *Ieee Transactions on Nanotechnology* **7** (3): 338-343 (2008) DOI: 10.1109/Tnano.2008.917793

240. L Tetard, A Passian, KT Venmar, RM Lynch, BH Voy, G Shekhawat, VP Dravid and T Thundat "Imaging Nanoparticles in Cells by Nanomechanical Holography." *Nat Nanotechnol* **3** (8): 501-505 (2008) DOI: 10.1038/nnano.2008.162

239. J Wu, M Aslam and VP Dravid "Imaging of Magnetic Colloids under the Influence of Magnetic Field by Cryogenic Transmission Electron Microscopy." *Applied Physics Letters* **93** (8) (2008) DOI: 10.1063/1.2976751

238. N Alem and VP Dravid "Correlative Deformation Mechanisms in NiCo<sub>1-x</sub>O/ZrO<sub>2</sub>(CaO) Directionally Solidified Eutectic Composites with a Confined Metallic Interphase." *Acta Materialia* **56** (16): 4378-4389 (2008) DOI: 10.1016/j.actamat.2008.05.008

237. R Klajn, TP Gray, PJ Wesson, BD Myers, VP Dravid, SK Smoukov and BA Grzybowski "Bulk Synthesis and Surface Patterning of Nanoporous Metals and Alloys from Supraspherical Nanoparticle Aggregates." *Advanced Functional Materials* **18** (18): 2763-2769 (2008) DOI: 10.1002/adfm.200800293

236. L Tetard, A Passian, RM Lynch, BH Voy, G Shekhawat, V Dravid and T Thundat "Elastic Phase Response of Silica Nanoparticles Buried in Soft Matter." *Applied Physics Letters* **93** (13) (2008) DOI: 10.1063/1.2987460

235. KC Barick, M Aslam, VP Dravid and D Bahadur "Self-Aggregation and Assembly of Size-Tunable Transition Metal Doped ZnO Nanocrystals." *Journal of Physical Chemistry C* **112** (39): 15163-15170 (2008) DOI: 10.1021/jp802361r

234. IU Arachchige, J Wu, VP Dravid and MG Kanatzidis "Nanocrystals of the Quaternary Thermoelectric Materials: Ag<sub>2</sub>Bi<sub>2</sub>Te<sub>3</sub> (M = 1-18): Phase-Segregated or Solid Solutions?" *Advanced Materials* **20** (19): 3638-3642 (2008) DOI: 10.1002/adma.200801116

233. Y Wang, W Wei, D Maspoch, J Wu, VP Dravid and CA Mirkin "Superparamagnetic Sub-5 nm Fe@C Nanoparticles: Isolation, Structure, Magnetic Properties, and Directed Assembly." *Nano Lett* **8** (11): 3761-3765 (2008) DOI: 10.1021/nl8020768

232. S Xie, J Cheng, BW Wessels and VP Dravid "Interfacial Structure and Chemistry of Epitaxial CoFe<sub>2</sub>O<sub>4</sub> Thin Films on SrTiO<sub>3</sub> and MgO Substrates." *Applied Physics Letters* **93** (18) (2008) DOI: 10.1063/1.3006060

231. B Myers, Z Pan, S Donthu and V Dravid "Variable-Pressure Soft-Electron Beam Lithography (Vp Soft-Ebl)." *Microscopy and Microanalysis* **13** (S02): 174-175 (2007) DOI: 10.1017/s1431927607079342

230. D White, J Parker, S Li and V Dravid (2007). Particles as Transport Carriers in CMP Slurries. Advances and Challenges in Chemical Mechanical Planarization. G. Zwicker, C. Borst, L. Economikos and A. Philipossian. **991**: 145-150.

229. VP Dravid, M Aslam, S Sharma, G Shekhawat, T Meade, S Tark and Lee (2007). Emerging Nanostructures and Devices for Diagnostics and Therapeutics. 2007 IEEE Sensors, Vols 1-3: 3-4.

228. S Donthu, T Sun and V Dravid "Fabrication and Structural Evaluation of Beaded Inorganic Nanostructures Using Soft Electron-Beam Lithography." *Advanced Materials* **19** (1): 125-+ (2007) DOI: 10.1002/adma.200601223

227. MK Mundra, SK Donthu, VP Dravid and JM Torkelson "Effect of Spatial Confinement on the Glass-Transition Temperature of Patterned Polymer Nanostructures." *Nano Lett* **7** (3): 713-718 (2007) DOI: 10.1021/nl062894c

226. M Aslam, S Li and VP Dravid "Controlled Synthesis and Stability of Co@SiO<sub>2</sub> Aqueous Colloids." *Journal of the American Ceramic Society* **90** (3): 950-956 (2007) DOI: 10.1111/j.1551-2916.2007.01509.x
225. M Aslam, EA Schultz, S Tao, T Meade and VP Dravid "Synthesis of Amine-Stabilized Aqueous Colloidal Iron Oxide Nanoparticles." *Cryst Growth Des* **7** (3): 471-475 (2007) DOI: 10.1021/cg060656p
224. EA Schultz, EK Kohlmeir, PJ Endres, JH Lee, M Aslam, J Cheon, VP Dravid and TJ Meade "Inor 931-Superparamagnetic Multimodal Probes for Magnetic Resonance Imaging." *Abstracts of Papers of the American Chemical Society* **233**: 207-207 (2007)
223. N Alem, VP Dravid and SY Li "Characterization of Ni<sub>3</sub>Co<sub>1-x</sub>O<sub>2</sub>/ZrO<sub>2</sub>(Cao) Directionally Solidified Eutectic (Dse) Ceramic Composites with a Ductile Interphase." *Journal of Materials Research* **22** (7): 1797-1805 (2007) DOI: 10.1557/Jmr.2007.0227
222. VP Dravid and JG Zheng "Response to Comment on "Microwave Plasma Synthesis of Nanostructured Gamma-Al<sub>2</sub>O<sub>3</sub> Powders"." *Journal of the American Ceramic Society* **90** (10): 3369-3369 (2007) DOI: 10.1111/j.1551-2916.2007.01973.x
221. Z Pan, S Li, Z Wang, MF Yu and VP Dravid "Patterning-Controlled Morphology of Spatially and Dimensionally Constrained Oxide Nanostructures." *Applied Physics Letters* **91** (14) (2007) DOI: 10.1063/1.2790496
220. X Wu, A Yamilov, X Liu, S Li, VP Dravid, RPH Chang and H Cao (2006). Zn Photonic Crystal Lasers - Art. No. 612205. *Zinc Oxide Materials and Devices*. F. H. Teherani and C. W. Litton. **6122**: 12205-12205.
219. G Shekhawat, S-H Tark, VP Dravid and Ieee (2006). Mosfet-Embedded Microcantilevers: An All-Electronic Label- and Optics-Free Signal Transduction Paradigm for Bio-Chem Sensing. *2006 Ieee Sensors, Vols 1-3*: 746-748.
218. Z Pan, SK Donthu, N Wu, S Li and VP Dravid "Directed Fabrication of Radially Stacked Multifunctional Oxide Heterostructures Using Soft Electron-Beam Lithography." *Small* **2** (2): 274-280 (2006) DOI: 10.1002/smll.200500314
217. N Alem and VP Dravid "Interfacial Fracture Phenomena in Ceramic Composite Directionally Solidified Eutectics with a Ductile Interphase." *Journal of the American Ceramic Society* **89** (2): 767-772 (2006) DOI: 10.1111/j.1551-2916.2005.00786.x
216. G Shekhawat, SH Tark and VP Dravid "Mosfet-Embedded Microcantilevers for Measuring Deflection in Biomolecular Sensors." *Science* **311** (5767): 1592-1595 (2006) DOI: 10.1126/science.1122588
215. BD Myers and VP Dravid "Variable Pressure Electron Beam Lithography (Vp-Ebl): A New Tool for Direct Patterning of Nanometer-Scale Features on Substrates with Low Electrical Conductivity." *Nano Letters* **6** (5): 963-968 (2006) DOI: 10.1021/nl0601278
214. V Dravid, S Songsermpong, ZJ Xue, CA Corvalan and PE Sojka "Two-Dimensional Modeling of the Effects of Insoluble Surfactant on the Breakup of a Liquid Filament." *Chemical Engineering Science* **61** (11): 3577-3585 (2006) DOI: 10.1016/j.ces.2005.12.026

213. AK Srivastava and VP Dravid "On the Performance Evaluation of Hybrid and Mono-Class Sensor Arrays in Selective Detection of Voccs: A Comparative Study." *Sensors and Actuators B-Chemical* **117** (1): 244-252 (2006) DOI: 10.1016/j.snb.2005.11.034
212. Z Pan, N Alem, T Sun and VP Dravid "Site-Specific Fabrication and Epitaxial Conversion of Functional Oxide Nanodisk Arrays." *Nano Lett* **6** (10): 2344-2348 (2006) DOI: 10.1021/nl061905z
211. T Sun, ZX Pan, VP Dravid, ZY Wang, MF Yu and J Wang "Nanopatterning of Multiferroic BiFeO<sub>3</sub> Using "Soft" Electron Beam Lithography." *Applied Physics Letters* **89** (16) (2006) DOI: 10.1063/1.2364117
210. YG Wang, TH Wang, XW Lin and VP Dravid "Ohmic Contact Junction of Carbon Nanotubes Fabricated by in Situ Electron Beam Deposition." *Nanotechnology* **17** (24): 6011-6015 (2006) DOI: 10.1088/0957-4484/17/24/018
209. M Razeghi, A Evans, S Slivken, JS Yu, JG Zheng and VP Dravid (2005). High-Power Continuous-Wave Mid-Infrared Quantum Cascade Lasers Based on Strain-Balanced Heterostructures. Photonic Materials, Devices, and Applications, Pts 1 and 2. G. Badenes, D. Abbott and A. Serpenguzel. **5840**: 54-63.
208. MI Vidovich, DC Lee, E Wu, BD Myers, VP Dravid and CJ Davidson "Effects of Magnetic Resonance Imaging and Balloon Inflation on Stability of Drug-Eluting Stent Polymer: An in Vitro Study." *Journal of Investigative Medicine* **53** (2): S368-S368 (2005)
207. L Fu, NQ Wu, JH Yang, F Qu, DL Johnson, MC Kung, HH Kung and VP Dravid "Direct Evidence of Oxidized Gold on Supported Gold Catalysts." *J Phys Chem B* **109** (9): 3704-3706 (2005) DOI: 10.1021/jp045117e
206. YG Wang, QH Li, TH Wang, XW Lin, VP Dravid and SX Zhou "In Situ Growth of Nanowire on the Tip of a Carbon Nanotube under Strong Electric Field." *Applied Physics Letters* **86** (13) (2005) DOI: 10.1063/1.1879090
205. YG Wang, HY Wu and VP Dravid "Lamellar Structure and Twist Boundary of Ni<sub>2</sub>O<sub>3</sub> Grown by Flux Method." *Journal of Materials Science* **40** (7): 1725-1729 (2005) DOI: 10.1007/s10853-005-0675-y
204. SK Donthu, Z Pan, GS Shekhawat, VP Dravid, B Balakrishnan and S Tripathy "Near-Field Scanning Optical Microscopy of ZnO Nanopatterns Fabricated by Micromolding in Capillaries." *Journal of Applied Physics* **98** (2) (2005) DOI: 10.1063/1.1949712
203. BD Myers and VP Dravid "Direct Patterning of Nanometer-Scale Structures on Insulating Substrates with Variable Pressure Electron Beam Lithography (Vp-Ebl)." *Microscopy and Microanalysis* **11** (S02): 392-393 (2005) DOI: 10.1017/s1431927605505890
202. G Shekhawat and VP Dravid "Near-Field Acoustic Holography as a High Resolution Sub-Surface Imaging System on Scanning Probe Microscopy Platform: Seeing the Invisible." *Microscopy and Microanalysis* **11** (S02): 362-363 (2005) DOI: 10.1017/s143192760550607x
201. S Donthu, Z Pan, B Myers, G Shekhawat, N Wu and V Dravid "Facile Scheme for Fabricating Solid-State Nanostructures Using E-Beam Lithography and Solution Precursors." *Nano Lett* **5** (9): 1710-1715 (2005) DOI: 10.1021/nl050954t

200. P Prabhuram, VP Dravid, AR Lupini, MF Chisholm and SJ Pennycook "Atomic-Scale Manipulation of Potential Barriers at SrTiO<sub>3</sub> Grain Boundaries." *Applied Physics Letters* **87** (12) (2005) DOI: 10.1063/1.2046734
199. M Su and VP Dravid "Surface Combustion Microengines Based on Photocatalytic Oxidations of Hydrocarbons at Room Temperature." *Nano Lett* **5** (10): 2023-2028 (2005) DOI: 10.1021/nl0515605
198. M Aslam, R Bhojra, N Alem, S Donthu and VP Dravid "Controlled Large-Scale Synthesis and Magnetic Properties of Single-Crystal Cobalt Nanorods." *Journal of Applied Physics* **98** (7) (2005) DOI: 10.1063/1.2073968
197. GS Shekhawat and VP Dravid "Nanoscale Imaging of Buried Structures Via Scanning near-Field Ultrasound Holography." *Science* **310** (5745): 89-92 (2005) DOI: 10.1126/science.1117694
196. M Aslam, L Fu, S Li and VP Dravid "Silica Encapsulation and Magnetic Properties of FePt Nanoparticles." *J Colloid Interface Sci* **290** (2): 444-449 (2005) DOI: 10.1016/j.jcis.2005.04.050
195. M Su, Z Pan, VP Dravid and T Thundat "Locally Enhanced Relative Humidity for Scanning Probe Nanolithography." *Langmuir* **21** (24): 10902-10906 (2005) DOI: 10.1021/la051591f
194. M Aslam, L Fu, M Su, K Vijayamohan and VP Dravid "Novel One-Step Synthesis of Amine-Stabilized Aqueous Colloidal Gold Nanoparticles." *Journal of Materials Chemistry* **14** (12): 1795-1797 (2004) DOI: 10.1039/b402823f
193. NQ Wu, L Fu, M Su, M Aslam, KC Wong and VP Dravid "Interaction of Fatty Acid Monolayers with Cobalt Nanoparticles." *Nano Letters* **4** (2): 383-386 (2004) DOI: 10.1021/nl1035139x
192. M Su, L Fu, NQ Wu, M Aslam and VP Dravid "Individually Addressed Large-Scale Patterning of Conducting Polymers by Localized Electric Fields." *Applied Physics Letters* **84** (5): 828-830 (2004) DOI: 10.1063/1.1645323
191. M Su, M Aslam, L Fu, NQ Wu and VP Dravid "Dip-Pen Nanopatterning of Photosensitive Conducting Polymer Using a Monomer Ink." *Applied Physics Letters* **84** (21): 4200-4202 (2004) DOI: 10.1063/1.1737469
190. AW Metz, JR Ireland, JG Zheng, RP Lobo, Y Yang, J Ni, CL Stern, VP Dravid, N Bontemps, CR Kannewurf, KR Poepelmeier and TJ Marks "Transparent Conducting Oxides: Texture and Microstructure Effects on Charge Carrier Mobility in MOCVD-Derived Cdo Thin Films Grown with a Thermally Stable, Low-Melting Precursor." *J Am Chem Soc* **126** (27): 8477-8492 (2004) DOI: 10.1021/ja039232z
189. LN Brewer, MU Guruz and VP Dravid "Interfacial Fracture Mechanisms in Solid Solution Directionally Solidified Eutectic Oxide Composites." *Acta Materialia* **52** (13): 3781-3791 (2004) DOI: 10.1016/j.actamat.2004.04.016
188. ML Vidovich, DC Lee, E Wu, BD Myers, R McCormick, VP Dravid, RR McCormick and CJ Davidson "Effects of Magnetic Resonance Imaging and Balloon Inflation on Stability of Drug-Eluting Stent Polymer: An in Vitro Study." *American Journal of Cardiology* **94** (6a): 157e-158e (2004)

187. X Wu, A Yamilov, X Liu, S Li, VP Dravid, RPH Chang and H Cao "Ultraviolet Photonic Crystal Laser." *Applied Physics Letters* **85** (17): 3657-3659 (2004) DOI: 10.1063/1.1800888
186. M Su, Z Pan and VP Dravid "A Convenient and Rapid Sample Repositioning Approach for Atomic Force Microscopy." *J Microsc* **216** (Pt 2): 194-196 (2004) DOI: 10.1111/j.0022-2720.2004.01406.x
185. S Rozhok, S Jung, V Chandrasekhar, XW Lin and VP Dravid "Atomic Force Microscopy of Nickel Dot Arrays with Tuning Fork and Nanotube Probe." *Journal of Vacuum Science & Technology B* **21** (1): 323-325 (2003) DOI: 10.1116/1.1539066
184. KL Klug, VP Dravid and DL Johnson "Silica-Encapsulated Magnetic Nanoparticles Formed by a Combined Arc Evaporation/Chemical Vapor Deposition Technique." *Journal of Materials Research* **18** (4): 988-993 (2003) DOI: Doi 10.1557/Jmr.2003.0135
183. M Su, SU Li and VP Dravid "Microcantilever Resonance-Based DNA Detection with Nanoparticle Probes." *Applied Physics Letters* **82** (20): 3562-3564 (2003) DOI: 10.1063/1.1576915
182. L Fu, XG Liu, Y Zhang, VP Dravid and CA Mirkin "Nanopatterning of "Hard" Magnetic Nanostructures Via Dip-Pen Nanolithography and a Sol-Based Ink." *Nano Letters* **3** (6): 757-760 (2003) DOI: 10.1021/nl034172g
181. M Su, S Li and VP Dravid "Miniaturized Chemical Multiplexed Sensor Array." *J Am Chem Soc* **125** (33): 9930-9931 (2003) DOI: 10.1021/ja035727c
180. L Fu, DL Johnson, JG Zheng and VP Dravid "Microwave Plasma Synthesis of Nanostructured Gamma-Al<sub>2</sub>O<sub>3</sub> Powders." *Journal of the American Ceramic Society* **86** (9): 1635-1637 (2003) DOI: DOI 10.1111/j.1151-2916.2003.tb03532.x
179. AJ Blattner, PL Prabhumirashi, VP Dravid and BW Wessels "Origin of Room Temperature Ferromagnetism in Homogeneous (in,Mn)as Thin Films." *Journal of Crystal Growth* **259** (1-2): 8-11 (2003) DOI: 10.1016/S0022-0248(03)01569-0
178. LN Brewer, RA Peascoe, CR Hubbard and VP Dravid "Residual Stress Distributions in the Solid Solution Eutectic, Co<sub>1</sub>-Xnixo/Zro<sub>2</sub>(Cao)." *Journal of the American Ceramic Society* **86** (12): 2188-2194 (2003) DOI: DOI 10.1111/j.1151-2916.2003.tb03629.x
177. XG Liu, L Fu, SH Hong, VP Dravid and CA Mirkin "Arrays of Magnetic Nanoparticles Patterned Via "Dip-Pen" Nanolithography." *Advanced Materials* **14** (3): 231-+ (2002) DOI: Doi 10.1002/1521-4095(20020205)14:3<231::Aid-Adma231>3.0.Co;2-R
176. M Su, X Liu, SY Li, VP Dravid and CA Mirkin "Moving Beyond Molecules: Patterning Solid-State Features Via Dip-Pen Nanolithography with Sol-Based Inks." *J Am Chem Soc* **124** (8): 1560-1561 (2002) DOI: 10.1021/ja012502y
175. LN Brewer, VP Dravid, M Velazquez and A Revcolevschi "Solid Solution Directionally Solidified Eutectic Oxide Composites: Part Ii. Co<sub>1</sub>-Xnixo Single-Crystal Growth and Characterization." *Journal of Materials Research* **17** (4): 768-773 (2002) DOI: Doi 10.1557/Jmr.2002.0112



174. LN Brewer, VP Dravid, G Dhalenne and M Velazquez "Solid-Solution Directionally Solidified Eutectic Oxide Composites: Part I. Eutectic Growth and Characterization." *Journal of Materials Research* **17** (4): 760-767 (2002) DOI: Doi 10.1557/Jmr.2002.0111
173. YG Wang, Z Zhang, VP Dravid, P Kung and M Razeghi "Morphological Characterization of Selectively Overgrown Gan Via Lateral Epitaxy." *Journal of Materials Science* **37** (10): 1951-1957 (2002) DOI: Doi 10.1023/A:1015282711452
172. R Asahi, A Wang, JR Babcock, NL Edleman, AW Metz, MA Lane, VP Dravid, CR Kannewurf, AJ Freeman and TJ Marks "First-Principles Calculations for Understanding High Conductivity and Optical Transparency in Inxcd1-X Films." *Thin Solid Films* **411** (1): 101-105 (2002) DOI: 10.1016/S0040-6090(02)00196-7
171. M Su and VP Dravid "Colored Ink Dip-Pen Nanolithography." *Applied Physics Letters* **80** (23): 4434-4436 (2002) DOI: 10.1063/1.1483911
170. MU Guruz, VP Dravid and YW Chung "Synthesis and Characterization of Single and Multilayer Boron Nitride and Boron Carbide Thin Films Grown by Magnetron Sputtering of Boron Carbide." *Thin Solid Films* **414** (1): 129-135 (2002) DOI: 10.1016/S0040-6090(02)00422-4
169. YG Wang and VP Dravid "Determination of Electrostatic Characteristics at a 24 Degrees, [001] Tilt Grain Boundary in a Sr<sub>2</sub>TiO<sub>3</sub> Bicrystal by Electron Holography." *Philosophical Magazine Letters* **82** (8): 425-432 (2002) DOI: 10.1080/09500830210146461
168. M Su, VP Dravid and CA Mirkin "Direct Patterning of Solid State and Organic Materials by Dip-Pen Nanolithography." *Abstracts of Papers of the American Chemical Society* **224**: U410-U410 (2002)
167. KL Klug and VP Dravid "Observation of Two- and Three-Dimensional Magnesium Oxide Nanostructures Formed by Thermal Treatment of Magnesium Diboride Powder." *Applied Physics Letters* **81** (9): 1687-1689 (2002) DOI: 10.1063/1.1502003
166. SY Chung, SJL Kang and VP Dravid "Effect of Sintering Atmosphere on Grain Boundary Segregation and Grain Growth in Niobium-Doped Sr<sub>2</sub>TiO<sub>3</sub>." *Journal of the American Ceramic Society* **85** (11): 2805-2810 (2002)
165. S Malo, DA Vander Griend, KR Poepelmeier, YG Wang and VP Dravid "Crystal Symmetry of La<sub>3</sub>Cu<sub>2</sub>VO<sub>9</sub> and La<sub>4</sub>Cu<sub>3</sub>MO<sub>12</sub> Derived from the YAlO<sub>3</sub> Hexagonal Structure by Transmission Electron Microscopy." *Solid State Sciences* **3** (1-2): 17-23 (2001) DOI: Doi 10.1016/S1293-2558(00)01127-4
164. MU Guruz, VP Dravid, YW Chung, MM Lacerda, CS Bhatia, YH Yu and SC Lee "Corrosion Performance of Ultrathin Carbon Nitride Overcoats Synthesized by Magnetron Sputtering." *Thin Solid Films* **381** (1): 6-9 (2001) DOI: Doi 10.1016/S0040-6090(00)01415-2
163. LN Brewer, DR Kammler, TO Mason and VP Dravid "Combined Electron Diffraction/Microanalysis Investigation of Crystallography and Cation Distributions in the Transparent Conductive Oxide Cd<sub>1+X</sub>In<sub>2-2x</sub>Sn<sub>x</sub>O<sub>4</sub>." *Journal of Applied Physics* **89** (2): 951-954 (2001) DOI: Doi 10.1063/1.1340736

162. DA Vander Griend, S Malo, SJ Barry, NM Dabbousch, KR Poeppelmeier and Vinayak P Dravid "La<sub>3</sub>Cu<sub>2</sub>VO<sub>9</sub>: A Surprising Variation on the YAlO<sub>3</sub> Structure-Type with 2d Copper Clusters of Embedded Triangles." ***Solid State Sciences*** **3** (5): 569-579 (2001) DOI: 10.1016/S1293-2558(01)01170-0
161. A Wang, JR Babcock, NL Edleman, AW Metz, MA Lane, R Asahi, VP Dravid, CR Kannewurf, AJ Freeman and TJ Marks "Indium-Cadmium-Oxide Films Having Exceptional Electrical Conductivity and Optical Transparency: Clues for Optimizing Transparent Conductors." ***Proc Natl Acad Sci U S A*** **98** (13): 7113-7116 (2001) DOI: 10.1073/pnas.121188298
160. IW Kim, A Madan, MW Guruz, VP Dravid and SA Barnett "Stabilization of Zinc-Blende Cubic AlN in AlN/W Superlattices." ***Journal of Vacuum Science & Technology a-Vacuum Surfaces and Films*** **19** (5): 2069-2073 (2001) DOI: Doi 10.1116/1.1372897
159. CX Guo, O Warschkow, DE Ellis, VP Dravid and EC Dickey "Oxide-Oxide Interfaces: Atomistic and Density Functional Study of Cubic-ZrO<sub>2</sub>(100)Vertical Bar Vertical Bar NiO(111)." ***Journal of the American Ceramic Society*** **84** (11): 2677-2684 (2001) DOI: DOI 10.1111/j.1151-2916.2001.tb01070.x
158. MU Guruz, I Widlow, VP Dravid, YW Chung, ML Wu, M Lacerda, CS Bhatia, YH Yu and SC Lee (2000). Protective Overcoats for Use in Extremely High Density Magnetic Recording.
157. XD Wang, ZQ Liu, A Ambrosini, A Maignan, CL Stern, KR Poeppelmeier and VP Dravid "Crystal Growth, Structure, and Properties of Manganese Orthovanadate Mn<sub>3</sub>(VO<sub>4</sub>)<sub>2</sub>." ***Solid State Sciences*** **2** (1): 99-107 (2000) DOI: Doi 10.1016/S1293-2558(00)00104-7
156. M Razeghi, P Kung, P Sandvik, K Mi, X Zhang, VP Dravid, J Freitas and A Saxler (2000). Leo of Iii-Nitride on Al<sub>2</sub>O<sub>3</sub> and Si Substrates. ***Photodetectors: Materials and Devices V.*** G. J. Brown and M. Razeghi. **3948**: 320-329.
155. N Poonawala, VP Dravid, O Auciello, J Im and AR Krauss "Transmission Electron Microscopy Study of Hydrogen-Induced Degradation in Strontium Bismuth Tantalate Thin Films." ***Journal of Applied Physics*** **87** (5): 2227-2231 (2000) DOI: Doi 10.1063/1.372165
154. ST Kim and VP Dravid "Focused Ion Beam Sample Preparation of Continuous Fibre-Reinforced Ceramic Composite Specimens for Transmission Electron Microscopy." ***J Microsc*** **198 (Pt 2)**: 124-133 (2000)
153. RJ McNeely, JA Belot, TJ Marks, YG Wang, VP Dravid, MP Chudzik and CR Kannewurf "Analysis of the Fluoride Effect on the Phase-Selective Growth of TlBa<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>9-X</sub> Thin Films: Phase Evolution and Microstructure Development." ***Journal of Materials Research*** **15** (5): 1083-1097 (2000) DOI: Doi 10.1557/Jmr.2000.0156
152. JH Hwang, KD Johnson, TO Mason and VP Dravid "Single Grain Boundary Characterization of Nb-Doped SrTiO<sub>3</sub> Bicrystals Using Ac Four-Point Impedance Spectroscopy." ***Applied Physics Letters*** **76** (18): 2621-2623 (2000) DOI: Doi 10.1063/1.126428
151. ML Wu, MU Guruz, VP Dravid, YW Chung, S Anders, FL Freire and G Mariotto "Formation of Carbon Nitride with Sp<sup>3</sup>-Bonded Carbon in C<sub>x</sub>/Zr<sub>n</sub> Superlattice Coatings." ***Applied Physics Letters*** **76** (19): 2692-2694 (2000) DOI: Doi 10.1063/1.126743

150. KD Johnson and VP Dravid "Static and Dynamic Electron Holography of Electrically Active Grain Boundaries in SrTiO<sub>3</sub>." *Interface Science* **8** (2-3): 189-198 (2000) DOI: Doi 10.1023/A:1008706908614
149. VP Dravid and V Ravikumar "Atomic Structure and Properties of the (310) Symmetrical Tilt Grain Boundary (Stgb) in SrTiO<sub>3</sub> - Part II: Comparison with Experimental Studies." *Interface Science* **8** (2-3): 177-187 (2000) DOI: Doi 10.1023/A:1008736805309
148. V Ravikumar, VP Dravid and D Wolf "Atomic Structure and Properties of the (310) Symmetrical Tilt Grain Boundary (Stgb) in SrTiO<sub>3</sub>. Part I: Atomistic Simulations." *Interface Science* **8** (2-3): 157-175 (2000) DOI: Doi 10.1023/A:1008715125452
147. M Henrichsen, JH Hwang, VP Dravid and DL Johnson "Ultrarapid Phase Conversion in Beta "- Alumina Tubes." *Journal of the American Ceramic Society* **83** (11): 2861-2862 (2000)
146. S Malo, D Ko, JT Rijssenbeek, A Maignan, D Pelloquin, VP Dravid and KR Poeppelmeier "Coexistence of Superconductivity and Ferromagnetism in 1212-Ru<sub>1-x</sub>Mxsr<sub>2</sub>gdcu<sub>2</sub>o<sub>8</sub> (M=Ti, V, Nb)." *International Journal of Inorganic Materials* **2** (6): 601-608 (2000) DOI: 10.1016/s1466-6049(00)00075-1
145. DE Ellis, K Mundim, VP Dravid and JW Rylander (1999). Hybrid Classical and Quantum Modeling of Defects, Interfaces, and Surfaces.
144. RW Goettler, S Sambasivan, V Dravid and S Kim (1999). Interfaces in Oxide Fiber-Oxide Matrix Ceramic Composites.
143. KL Klug, DL Johnson and VP Dravid (1999). A Novel Apparatus for the Synthesis of Graphite Encapsulated Metallic Nanocrystals. Advanced Hard and Soft Magnetic Materials. M. Coey, L. H. Lewis, B. M. Ma et al. **577**: 405-408.
142. KD Johnson and VP Dravid "Grain Boundary Barrier Breakdown in Niobium Donor Doped Strontium Titanate Using in Situ Electron Holography." *Applied Physics Letters* **74** (4): 621-623 (1999) DOI: Doi 10.1063/1.123184
141. TC Isabell, PE Fischione, C O'Keefe, MU Guruz and VP Dravid "Plasma Cleaning and Its Applications for Electron Microscopy." *Microsc Microanal* **5** (2): 126-135 (1999) DOI: 10.1017/S1431927699000094
140. ST Kim, VP Dravid and S Sambasivan "Chemical and Morphological Analysis of Sol-Derived K<sub>2</sub>Ca<sub>2</sub>Nb<sub>3</sub>O<sub>10</sub>." *Journal of Materials Research* **14** (4): 1325-1328 (1999) DOI: Doi 10.1557/Jmr.1999.0180
139. ND Browning, JP Buban, HO Moltaji, SJ Pennycook, G Duscher, KD Johnson, RP Rodrigues and VP Dravid "The Influence of Atomic Structure on the Formation of Electrical Barriers at Grain Boundaries in SrTiO<sub>3</sub>." *Applied Physics Letters* **74** (18): 2638-2640 (1999) DOI: Doi 10.1063/1.123922
138. DA Vander Griend, S Boudin, V Caignaert, KR Poeppelmeier, Y Wang, VP Dravid, M Azuma, M Takano, Z Hu and JD Jorgensen "La<sub>4</sub>Cu<sub>3</sub>MoO<sub>12</sub>: A Novel Cuprate with Unusual Magnetism." *Journal of the American Chemical Society* **121** (20): 4787-4792 (1999) DOI: 10.1021/ja984436e

137. RP Rodrigues, JH Hwang and VP Dravid "4-Probe Micropatterning and Electrical Measurements across Individual Grain Boundaries in Electroceramics." *Journal of Electroceramics* **3** (3): 245-254 (1999) DOI: Doi 10.1023/A:1009977400948

136. BG Frost, RP Rodrigues and VP Dravid "Simulation of Electron Phase Shifts by Electrostatic Potential across Electroceramic Interfaces." *Journal of Physics D-Applied Physics* **32** (14): 1734-1738 (1999) DOI: Doi 10.1088/0022-3727/32/14/327

135. RP Rodrigues, DE Ellis and VP Dravid "Electronic Structure of Pristine and Solute-Incorporated SrTiO<sub>3</sub>: Li, Perfect-Crystal Grain-Boundary Geometry, and Acceptor Doping." *Journal of the American Ceramic Society* **82** (9): 2395-2401 (1999) DOI: DOI 10.1111/j.1151-2916.1999.tb02095.x

134. RP Rodrigues, HJ Chang, DE Ellis and VP Dravid "Electronic Structure of Pristine and Solute-Incorporated SrTiO<sub>3</sub>: Li, Grain-Boundary Geometry and Acceptor Doping." *Journal of the American Ceramic Society* **82** (9): 2385-2394 (1999) DOI: DOI 10.1111/j.1151-2916.1999.tb02094.x

133. RP Rodrigues, HJ Chang, DE Ellis and VP Dravid "Electronic Structure of Pristine and Solute-Incorporated SrTiO<sub>3</sub>: I, Perfect-Crystal-Geometry and Acceptor Doping." *Journal of the American Ceramic Society* **82** (9): 2373-2384 (1999) DOI: DOI 10.1111/j.1151-2916.1999.tb02093.x

132. PL Cao, DE Ellis and VP Dravid "First-Principles Study of Initial Stage of Ni Thin-Film Growth on a TiO<sub>2</sub> (110) Surface." *Journal of Materials Research* **14** (9): 3684-3689 (1999) DOI: Doi 10.1557/Jmr.1999.0497

131. YY Wang, SC Cheng and VP Dravid "Anisotropy of Electronic Structure and Spectral Excitations in Oxide Superconductors Via Low Loss EELS." *Micron* **30** (5): 379-394 (1999) DOI: Doi 10.1016/S0968-4328(99)00041-4

130. LN Brewer, DP Endler, S Austin, VP Dravid and JM Collins "Interface Modification for Increased Fracture Toughness in Reaction-Formed Yttrium Aluminum Garnet/Alumina Eutectic Composites." *Journal of Materials Research* **14** (10): 3907-3912 (1999) DOI: Doi 10.1557/Jmr.1999.0529

129. KD Johnson and VP Dravid "Direct Evidence for Grain Boundary Potential Barrier Breakdown Via in Situ Electron Holography." *Microsc Microanal* **5** (6): 428-436 (1999)

128. ML Wu, XW Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Conventional and Ionized Magnetron Sputter-Deposition of Nanocrystalline Titanium Diboride Thin Films." *Tribology Letters* **5** (2-3): 131-134 (1998) DOI: Doi 10.1023/A:1019154010956

127. ML Wu, XW Lin, VP Dravid and YW Chung (1998). Structural Characterization of Cn/Zrn Superlattice Coatings.

126. VP Dravid (1998). Transmission Electron Microscopy, Spectroscopy and Holography of Nanostructured Materials.

125. VP Dravid, EC Dickey and A Revcolevschi (1998). Towards (Predictive) Structure-Property Relationships for Heterophase Interfaces in Oxides.

124. JJ Host, JA Block, K Parvin, VP Dravid, JL Alpers, T Sezen and R LaDuca "Effect of Annealing on the Structure and Magnetic Properties of Graphite Encapsulated Nickel and Cobalt Nanocrystals." **Journal of Applied Physics** **83** (2): 793-801 (1998) DOI: Doi 10.1063/1.366760

123. HE Lippard, CE Campbell, T Bjorklind, U Borggren, P Kellgren, VP Dravid and GB Olson "Microsegregation Behavior During Solidification and Homogenization of Aermet100 Steel." **Metallurgical and Materials Transactions B-Process Metallurgy and Materials Processing Science** **29** (1): 205-210 (1998) DOI: DOI 10.1007/s11663-998-0023-0

122. EC Dickey, VP Dravid, PD Nellist, DJ Wallis and SJ Pennycook "Three-Dimensional Atomic Structure of NiO-ZrO<sub>2</sub>(Cubic) Interfaces." **Acta Materialia** **46** (5): 1801-1816 (1998) DOI: Doi 10.1016/S1359-6454(97)00373-X

121. DB Studebaker, J Zhang, TJ Marks, YY Wang, VP Dravid, JL Schindler and CR Kannewurf "Liquid Source Metal-Organic Chemical-Vapor Deposition of High-Quality Yba<sub>2</sub>cu<sub>3</sub>o<sub>7-x</sub> Films on Polycrystalline Silver Substrates." **Applied Physics Letters** **72** (10): 1253-1255 (1998) DOI: Doi 10.1063/1.121029

120. GR Bai, IF Tsu, A Wang, CM Foster, CE Murray and VP Dravid "In Situ Growth of Highly Oriented Pb(Zr<sub>0.5</sub>ti<sub>0.5</sub>)O<sub>3</sub> Thin Films by Low-Temperature Metal-Organic Chemical Vapor Deposition." **Applied Physics Letters** **72** (13): 1572-1574 (1998) DOI: Doi 10.1063/1.121118

119. JA Block, K Parvin, JL Alpers, T Sezen, R LaDuca, JJ Host and VP Dravid "The Magnetic Properties of Annealed Graphite-Coated Ni and Co Nanocrystals." **IEEE Transactions on Magnetics** **34** (4): 982-984 (1998) DOI: Doi 10.1109/20.706331

118. KW Chang, BW Wessels, W Qian, VP Dravid, JL Schindler, CR Kannewurf, DB Studebaker, TJ Marks and R Feenstra "In Situ Growth and Doping of Oxycarbonate Sr<sub>2</sub>cuo<sub>2</sub>(Co<sub>3</sub>) Epitaxial Thin Films." **Physica C** **303** (1-2): 11-20 (1998) DOI: Doi 10.1016/S0921-4534(98)00218-4

117. HJ Chang, JD Lee, RP Rodrigues, DE Ellis and VP Dravid "Electronic Structure of Mn Acceptor Impurity Incorporated SrTiO<sub>3</sub> Using Embedded Cluster Method." **Journal of Materials Synthesis and Processing** **6** (5): 323-328 (1998) DOI: Doi 10.1023/A:1022699126662

116. JJ Host, VP Dravid and MH Teng "Systematic Study of Graphite Encapsulated Nickel Nanocrystal Synthesis with Formation Mechanism Implications." **Journal of Materials Research** **13** (9): 2547-2555 (1998) DOI: Doi 10.1557/Jmr.1998.0355

115. XW Li, A Gupta, G Xiao, W Qian and VP Dravid "Fabrication and Properties of Heteroepitaxial Magnetite, (Fe<sub>3</sub>o<sub>4</sub>) Tunnel Junctions." **Applied Physics Letters** **73** (22): 3282-3284 (1998) DOI: Doi 10.1063/1.122745

114. JJ Host and VP Dravid (1997). Magnetic Properties and Thermal Stability of Graphite Encapsulated Cobalt Nanocrystals. Nanophase and Nanocomposite Materials II. S. Komarneni, J. C. Parker and H. J. Wollenberger. **457**: 225-230.

113. P Kung, X Zhang, A Saxler, D Walker, M Razeghi, W Qian and VP Dravid "Mocvd Growth of High Quality Gan-Algan Based Structures on Al<sub>2</sub>o<sub>3</sub> Substrates with Dislocation Density Less Than 10<sup>7</sup>) Cm(-

2)." *Journal of the European Ceramic Society* **17** (15-16): 1781-1785 (1997) DOI: Doi 10.1016/S0955-2219(97)00076-9

112. HJ Chang, RP Rodrigues, JH Xu, DE Ellis and VP Dravid "Electronic Structure of Grain Boundaries in SrTiO<sub>3</sub>." *Ferroelectrics* **194** (1-4): 249-262 (1997) DOI: Doi 10.1080/00150199708016097

111. EC Dickey, VP Dravid, SJ Pennycook, PD Nellist and DJ Wallis (1997). Combined-Techniques Approach to Elucidating Crystalline Interface Atomic Structure. Atomic Resolution Microscopy of Surfaces and Interfaces. D. J. Smith. **466**: 45-50.

110. JA Belot, BJ Hinds, J Chen, YY Wang, V Dravid and TJ Marks "New Materials for Superconducting Electronics: Epitaxial Growth of LaSrGaO<sub>4</sub> and PrSrGaO<sub>4</sub> Dielectric Thin Films by MOCVD." *Chemical Vapor Deposition* **3** (2): 78-+ (1997) DOI: DOI 10.1002/cvde.19970030204

109. A Madan, IW Kim, SC Cheng, P Yashar, VP Dravid and SA Barnett "Stabilization of Cubic AlN in Epitaxial AlN/Tin Superlattices." *Physical Review Letters* **78** (9): 1743-1746 (1997) DOI: DOI 10.1103/PhysRevLett.78.1743

108. JH Hwang, VP Dravid, MH Teng, JJ Host, BR Elliott, DL Johnson and TO Mason "Magnetic Properties of Graphitically Encapsulated Nickel Nanocrystals." *Journal of Materials Research* **12** (4): 1076-1082 (1997) DOI: Doi 10.1557/Jmr.1997.0150

107. XW Li, Y Lu, GQ Gong, G Xiao, A Gupta, P LeCoeur, JZ Sun, YY Wang and VP Dravid "Epitaxial La<sub>0.67</sub>Sr<sub>0.33</sub>MnO<sub>3</sub> Magnetic Tunnel Junctions." *Journal of Applied Physics* **81** (8): 5509-5511 (1997) DOI: Doi 10.1063/1.364585

106. ML Wu, XW Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Preparation and Characterization of Superhard Cnx/Zrn Multilayers." *Journal of Vacuum Science & Technology a-Vacuum Surfaces and Films* **15** (3): 946-950 (1997) DOI: Doi 10.1116/1.580784

105. V Ravikumar, RP Rodrigues and VP Dravid "Space-Charge Distribution across Internal Interfaces in Electroceramics Using Electron Holography .2. Doped Grain Boundaries." *Journal of the American Ceramic Society* **80** (5): 1131-1138 (1997)

104. V Ravikumar, RP Rodrigues and VP Dravid "Space-Charge Distribution across Internal Interfaces in Electroceramics Using Electron Holography .1. Pristine Grain Boundaries." *Journal of the American Ceramic Society* **80** (5): 1117-1130 (1997)

103. JJ Host, MH Teng, BR Elliott, JH Hwang, TO Mason, DL Johnson and VP Dravid "Graphite Encapsulated Nanocrystals Produced Using a Low Carbon: Metal Ratio." *Journal of Materials Research* **12** (5): 1268-1273 (1997) DOI: Doi 10.1557/Jmr.1997.0175

102. GP Dimitrakopoulos, VP Dravid, T Karakostas and RC Pond "The Defect Character of Carbon Nanotubes and Nanoparticles." *Acta Crystallographica Section A* **53**: 341-351 (1997) DOI: Doi 10.1107/S0108767397000287

101. TC Isabell and VP Dravid "Resolution and Sensitivity of Electron Backscattered Diffraction in a Cold Field Emission Gun Sem." **Ultramicroscopy** **67** (1-4): 59-68 (1997) DOI: Doi 10.1016/S0304-3991(97)00003-X
100. W Qian, M Skowronski, R Kaspi, M DeGraef and VP Dravid "Nucleation of Misfit and Threading Dislocations During Epitaxial Growth of Gasb on Gaas(001) Substrates." **Journal of Applied Physics** **81** (11): 7268-7272 (1997) DOI: Doi 10.1063/1.365324
99. GQ Gong, A Gupta, G Xiao, W Qian and VP Dravid "Magnetoresistance and Magnetic Properties of Epitaxial Magnetite Thin Films." **Physical Review B** **56** (9): 5096-5099 (1997) DOI: DOI 10.1103/PhysRevB.56.5096
98. EC Dickey, VP Dravid, PD Nellist, DJ Wallis, SJ Pennycook and A Revcolevschi "Structure and Bonding at Ni-Zro2 (Cubic) Interfaces Formed by the Reduction of a Nio-Zro2 (Cubic) Composite." **Microscopy and Microanalysis** **3** (5): 443-450 (1997) DOI: Doi 10.1017/S1431927697970343
97. EC Dickey, VP Dravid and CR Hubbard "Interlamellar Residual Stresses in Single Grains of Nio-Zro2(Cubic) Directionally Solidified Eutectics." **Journal of the American Ceramic Society** **80** (11): 2773-2780 (1997) DOI: DOI 10.1111/j.1151-2916.1997.tb03193.x
96. BR Elliott, JJ Host, VP Dravid, MH Teng and JH Hwang "A Descriptive Model Linking Possible Formation Mechanisms for Graphite-Encapsulated Nanocrystals to Processing Parameters." **Journal of Materials Research** **12** (12): 3328-3344 (1997) DOI: Doi 10.1557/Jmr.1997.0438
95. DB Studebaker, G Doubinina, J Zhang, YY Wang, VP Dravid and TJ Marks (1996). Liquid Source Mocvd of High Quality Yba2cu3o7-X Films on Polycrystalline and Amorphous Substrates. Metal-Organic Chemical Vapor Deposition of Electronic Ceramics Ij. S. B. Desu, D. B. Beach and P. C. Vanbuskirk. **415**: 255-260.
94. TC Isabell, VP Dravid and DN Hill "Crack Interface Interactions in a Tungsten-Yttria-Stabilized-Zirconia Directionally Solidified Eutectic." **Journal of the American Ceramic Society** **79** (2): 412-416 (1996) DOI: DOI 10.1111/j.1151-2916.1996.tb08137.x
93. D Li, XW Lin, SC Cheng, VP Dravid, YW Chung, MS Wong and WD Sproul "Structure and Hardness Studies of Cnx/Tin Nanocomposite Coatings." **Applied Physics Letters** **68** (9): 1211-1213 (1996) DOI: Doi 10.1063/1.115972
92. SC Cheng, YY Wang and VP Dravid "The Intensity of Elastic and Inelastic Multiple Scattering in Eels." **Micron** **27** (2): 167-170 (1996) DOI: Doi 10.1016/0968-4328(96)00024-8
91. SC Cheng, VP Dravid, TJ Goodwin, RN Shelton and HB Radosky "Determination of the Valence of Pr in (Eu1.5-Xprxc0.5)Sr2cu2nbo10 Superconducting Compounds by Electron-Energy-Loss Spectroscopy." **Phys Rev B Condens Matter** **53** (17): 11779-11783 (1996) DOI: 10.1103/PhysRevB.53.11779
90. V Ravikumar, RP Rodrigues and VP Dravid "An Investigation of Acceptor-Doped Grain Boundaries in Srtio3." **Journal of Physics D-Applied Physics** **29** (7): 1799-1806 (1996) DOI: Doi 10.1088/0022-3727/29/7/014

89. XW Lin and VP Dravid "Mapping the Potential of Graphite Nanotubes with Electron Holography." *Applied Physics Letters* **69** (7): 1014-1016 (1996) DOI: Doi 10.1063/1.117970
88. YY Wang, FC Zhang, VP Dravid, KK Ng, MV Klein, SE Schnatterly and LL Miller "Momentum-Dependent Charge Transfer Excitations in Sr<sub>2</sub>CuO<sub>2</sub>Cl<sub>2</sub> Angle-Resolved Electron Energy Loss Spectroscopy." *Phys Rev Lett* **77** (9): 1809-1812 (1996) DOI: 10.1103/PhysRevLett.77.1809
87. Y Lu, XW Li, GQ Gong, G Xiao, A Gupta, P Lecoeur, JZ Sun, YY Wang and VP Dravid "Large Magnetotunneling Effect at Low Magnetic Fields in Micrometer-Scale Epitaxial La<sub>0.67</sub>Sr<sub>0.33</sub>MnO<sub>3</sub> Tunnel Junctions." *Physical Review B* **54** (12): R8357-R8360 (1996) DOI: DOI 10.1103/PhysRevB.54.R8357
86. K Zhang, R Mogilevsky, DG Hinks, J Mitchell, AJ Schultz, Y Wang and V Dravid "Crystal Growth of (La,Sr)<sub>2</sub>CuO<sub>4</sub> by Float Zone Melting." *Journal of Crystal Growth* **169** (1): 73-78 (1996) DOI: Doi 10.1016/0022-0248(95)01003-3
85. MS LouisWeber, VP Dravid, VR Todt, XF Zhang, DJ Miller and U Balachandran "Transport Properties of an Engineered [001] Tilt Series in Bulk YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Bicrystals." *Physical Review B* **54** (22): 16238-16245 (1996) DOI: DOI 10.1103/PhysRevB.54.16238
84. A Gupta, GQ Gong, G Xiao, PR Duncombe, P Lecoeur, P Trouilloud, YY Wang, VP Dravid and JZ Sun "Grain-Boundary Effects on the Magnetoresistance Properties of Perovskite Manganite Films." *Phys Rev B Condens Matter* **54** (22): R15629-R15632 (1996)
83. VR Todt, XF Zhang, DJ Miller, M StLouisWeber and VP Dravid "Controlled Growth of Bulk Bicrystals and the Investigation of Microstructure-Property Relations of YBa<sub>2</sub>Cu<sub>3</sub>O<sub>x</sub> Grain Boundaries." *Applied Physics Letters* **69** (24): 3746-3748 (1996) DOI: Doi 10.1063/1.117209
82. H Zhang, LD Marks, YY Wang, H Zhang, VP Dravid, P Han and DA Payne "Structure of Planar Defects in (Sr<sub>0.9</sub>Ca<sub>0.3</sub>)(1.1)CuO<sub>2</sub> Infinite-Layer Superconductors by Quantitative High-Resolution Electron-Microscopy." *Ultramicroscopy* **57** (1): 103-111 (1995) DOI: Doi 10.1016/0304-3991(94)00142-A
81. N Wilcox, V Ravikumar, RP Rodrigues, VP Dravid, M Vollmann, R Waser, KK Soni and AG Adriaens "Investigation of Grain-Boundary Segregation in Acceptor and Donor-Doped Strontium-Titanate." *Solid State Ionics* **75**: 127-136 (1995) DOI: Doi 10.1016/0167-2738(94)00221-D
80. V Ravikumar, RP Rodrigues, N Wilcox and VP Dravid (1995). Investigation of Grain Boundary Segregation in Donor Doped Strontium Titanate.
79. P Liu, V Dravid, D Freiman, H Zegel and D Weinberg "Persistent Iliac Endarteritis with Pseudoaneurysm Formation Following Balloon-Expandable Stent Placement." *Cardiovasc Intervent Radiol* **18** (1): 39-42 (1995) DOI: 10.1007/bf02807354
78. XK Wang, XW Lin, SN Song, VP Dravid, JB Ketterson and RPH Chang "Properties of Buckytubes and Derivatives." *Carbon* **33** (7): 949-958 (1995) DOI: Doi 10.1016/0008-6223(95)00024-8
77. XK Wang, XW Lin, VP Dravid, JB Ketterson and RPH Chang "Stable Glow-Discharge for Synthesis of Carbon Nanotubes." *Applied Physics Letters* **66** (4): 427-429 (1995) DOI: Doi 10.1063/1.114045



76. VV Ravikumar, D Wolf and VP Dravid "Ferroelectric-Monolayer Reconstruction of the SrTiO<sub>3</sub> (100) Surface." *Phys Rev Lett* **74** (6): 960-963 (1995) DOI: 10.1103/PhysRevLett.74.960
75. YY Wang, H Zhang and VP Dravid "Transmission Eels of Oxide Superconductors with a Cold Field Emission Tem." *Microsc Res Tech* **30** (3): 208-217 (1995) DOI: 10.1002/jemt.1070300303
74. M Stlouisweber, VP Dravid and U Balachandran "Facts and Artifacts of Tem Specimen Preparation for YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-X</sub> Superconductors." *Physica C* **243** (3-4): 273-280 (1995) DOI: Doi 10.1016/0921-4534(95)00007-0
73. VP Dravid, JJ Host, MH Teng, B Elliot, JH Hwang, DL Johnson, TO Mason and JR Weertman "Controlled-Size Nanocapsules." *Nature* **374** (6523): 602-602 (1995) DOI: DOI 10.1038/374602a0
72. XK Wang, XW Lin, VP Dravid, JB Ketterson and RPH Chang "Carbon Nanotubes Synthesized in a Hydrogen Arc-Discharge." *Applied Physics Letters* **66** (18): 2430-2432 (1995) DOI: Doi 10.1063/1.113963
71. YY Wang, SC Cheng, VP Dravid and FC Zhang "Momentum-Transfer Resolved Electron-Energy-Loss Spectroscopy of Solids - Problems, Solutions and Applications." *Ultramicroscopy* **59** (1-4): 109-119 (1995) DOI: Doi 10.1016/0304-3991(95)00022-S
70. D Li, X Chu, SC Cheng, XW Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Synthesis of Superhard Carbon Nitride Composite Coatings." *Applied Physics Letters* **67** (2): 203-205 (1995) DOI: Doi 10.1063/1.114667
69. XK Wang, XW Lin, M Mesleh, MF Jarrold, VP Dravid, JB Ketterson and RPH Chang "The Effect of Hydrogen on the Formation of Carbon Nanotubes and Fullerenes." *Journal of Materials Research* **10** (8): 1977-1983 (1995) DOI: Doi 10.1557/Jmr.1995.1977
68. YY Wang, VP Dravid, N Bulut, PD Han, MV Klein, SE Schnatterly and FC Zhang "Momentum-Transfer-Resolved Electron Energy Loss Spectroscopy of BaBiO<sub>3</sub>: Anisotropic Dispersion of Threshold Excitation and Optically Forbidden Transition." *Phys Rev Lett* **75** (13): 2546-2549 (1995) DOI: 10.1103/PhysRevLett.75.2546
67. VV Ravikumar, RP Rodrigues and VP Dravid "Direct Imaging of Spatially Varying Potential and Charge across Internal Interfaces in Solids." *Phys Rev Lett* **75** (22): 4063-4066 (1995) DOI: 10.1103/PhysRevLett.75.4063
66. Chmaissem, DN Argyriou, DG Hinks, JD Jorgensen, BG Storey, H Zhang, LD Marks, YY Wang, VP Dravid and B Dabrowski "Chromium Clustering and Ordering in Hg<sub>1-x</sub>CrxSr<sub>2</sub>CuO<sub>4+Δ</sub>." *Phys Rev B Condens Matter* **52** (21): 15636-15643 (1995) DOI: 10.1103/PhysRevB.52.15636
65. H Zhang, YY Wang, LD Marks, VP Dravid, PD Han and DA Payne "A Tem Study of the Incommensurate Modulated Structure in Sr<sub>2</sub>CuO<sub>3+X</sub> Superconductors Synthesized under High Pressure .B. Structural Model." *Physica C* **255** (3-4): 257-265 (1995) DOI: Doi 10.1016/0921-4534(95)00620-6
64. YY Wang, H Zhang, VP Dravid, LD Marks, PD Han and DA Payne "A Tem Study of the Incommensurate Modulated Structure in Sr<sub>2</sub>CuO<sub>3+Δ</sub> Superconductor Synthesized under High Pressure .A. Evolution of

the Incommensurate Modulated Structure and the Electronic Structure with Post-Heat Treatment." *Physica C* **255** (3-4): 247-256 (1995) DOI: Doi 10.1016/0921-4534(95)00619-2

63. YY Wang, SC Cheng and VP Dravid "Momentum-Resolved Low-Loss Electron Energy Loss Spectroscopy in Oxide Superconductor." *Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings*: 988-989 (1994)

62. MM Mcgibbon, ND Browning, MF Chisholm, AJ Mcgibbon, SJ Pennycook, V Ravikumar and VP Dravid "Atomic-Resolution Characterization of a SrTiO<sub>3</sub> Grain Boundary in the Stem." *Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings*: 972-973 (1994)

61. XW Lin and VP Dravid "Mapping of the Potential at the End of Buckytubes by Electron Holography." *Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings*: 764-765 (1994)

60. X Lin, XK Wang, VP Dravid, JB Ketterson and RPH Chang (1994). Characterization of a Monolayer Graphitic Structure. Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings. G. W. Bailey and A. J. Garrattreed: 760-761.

59. YY Wang, H Zhang, VP Dravid, H Zhang, LD Marks, P Han and DA Payne "Nano-Probe X-Ray Analysis and High-Resolution Imaging of Planar Defects in High-Pressure Synthesized Infinite-Layer Superconductor." *Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings*: 728-729 (1994)

58. H Zhang, LD Marks, YY Wang, H Zhang, VP Dravid, P Han, DA Payne and MAS Mas; Mas (1994). Quantitative HREM Analysis of Planar Defects in High-Pressure Synthesized Infinite-Layer Superconductor. Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings. G. W. Bailey and A. J. Garrattreed: 720-721.

57. VP Dravid, X Lin, V Ravikumar, R Rodrigues and N Wilcox "Transmission Electron Spectroscopy and Interferometry of Electroceramic Oxides." *Fifty-Second Annual Meeting - Microscopy Society of America/Twenty-Ninth Annual Meeting - Microbeam Analysis Society, Proceedings*: 542-543 (1994)

56. MM McGibbon, ND Browning, MF Chisholm, AJ McGibbon, SJ Pennycook, V Ravikumar and VP Dravid (1994). Atomic-Scale Structure and Chemistry of Interfaces by Z-Contrast Imaging and Electron-Energy-Loss Spectroscopy in the Stem. Epitaxial Oxide Thin Films and Heterostructures. D. K. Fork, J. M. Phillips, R. Ramesh and R. M. Wolf. **341**: 139-144.

55. ND Browning, MM McGibbon, AJ McGibbon, MF Chisholm, SJ Pennycook, V Ravikumar and VP Dravid (1994). Atomic Resolution Characterization of Interface Structure and Chemistry in the Stem.

54. H Zhang, LD Marks, YY Wang, H Zhang, VP Dravid, P Han and DA Payne (1994). Quantitative HREM Analysis of Planar Defects in (Sr<sub>1-x</sub>Cax)(1-y)CuO<sub>2</sub>.

53. MM McGibbon, ND Browning, MF Chisholm, SJ Pennycook, V Ravikumar and VP Dravid (1994). Atomic-Scale Structure and Chemistry of Interfaces by Z-Contrast Imaging and Electron-Energy-Loss

Spectroscopy in the Stem. Defect-Interface Interactions. E. P. Kvam, A. H. King, M. J. Mills, T. D. Sands and V. Vitek. **319**: 233-238.

52. B Han, DA Neumayer, BH Goodreau, TJ Marks, H Zhang and VP Dravid "Cubic Dielectrics for Superconducting Electronics - in-Situ Growth of Epitaxial Sr<sub>2</sub>TaO<sub>6</sub> Thin-Films Using Metalorganic Chemical-Vapor-Deposition." *Chemistry of Materials* **6** (1): 18-20 (1994) DOI: DOI 10.1021/cm00037a006

51. XK Wang, XW Lin, VP Dravid, JB Ketterson and RPH Chang (1994). Growth and Properties of Buckybundles.

50. HH Su, S Kim, VP Dravid and DL Johnson "Microwave Plasma Sintering of Alumina under Oxygen Pressure." *29th Microwave Power Symposium - Proceedings*: 148-151 (1994)

49. X Lin, XK Wang, VP Dravid, RPH Chang and JB Ketterson "Large-Scale Synthesis of Single-Shell Carbon Nanotubes." *Applied Physics Letters* **64** (2): 181-183 (1994) DOI: Doi 10.1063/1.111525

48. VP Dravid, H Zhang, LA Wills and BW Wessels "On the Microstructure, Chemistry, and Dielectric Function of BaTiO<sub>3</sub> MOCVD Thin-Films." *Journal of Materials Research* **9** (2): 426-430 (1994) DOI: Doi 10.1557/Jmr.1994.0426

47. H Zhang, YY Wang, VP Dravid, JL Wagner, DG Hinks and JD Jorgensen "High-Resolution and Analytical Electron-Microscopy of HgBa<sub>2</sub>CuO<sub>4</sub>+ $\Delta$  - a New Copper-Oxide Superconductor." *Physica C* **222** (1-2): 1-6 (1994) DOI: Doi 10.1016/0921-4534(94)90106-6

46. JH Hwang, TO Mason and VP Dravid "Microanalytical Determination of ZnO Solidus and Liquidus Boundaries in the ZnO-Bi<sub>2</sub>O<sub>3</sub> System." *Journal of the American Ceramic Society* **77** (6): 1499-1504 (1994) DOI: DOI 10.1111/j.1151-2916.1994.tb09748.x

45. BJ Hinds, DL Schulz, DA Neumayer, B Han, TJ Marks, YY Wang, VP Dravid, JL Schindler, TP Hogan and CR Kannewurf "Metal-Organic Chemical-Vapor-Deposition Open Flow Thallium Annealing Route to Epitaxial Tl<sub>2</sub>Ba<sub>2</sub>Ca<sub>2</sub>Cu<sub>3</sub>O<sub>10</sub> Thin-Films." *Applied Physics Letters* **65** (2): 231-233 (1994) DOI: Doi 10.1063/1.112638

44. H Zhang, YY Wang, H Zhang, VP Dravid, LD Marks, PD Han, DA Payne, PG Radaelli and JD Jorgensen "Identity of Planar Defects in the Infinite-Layer Copper-Oxide Superconductor." *Nature* **370** (6488): 352-354 (1994) DOI: DOI 10.1038/370352a0

43. VP Dravid, V Ravikumar, MR Notis, CE Lyman, G Dhalenne and A Revcolevschi "Stabilization of Cubic Zirconia with Manganese Oxide." *Journal of the American Ceramic Society* **77** (10): 2758-2762 (1994) DOI: DOI 10.1111/j.1151-2916.1994.tb04673.x

42. MM McGibbon, ND Browning, MF Chisholm, AJ McGibbon, SJ Pennycook, V Ravikumar and VP Dravid "Direct Determination of Grain Boundary Atomic Structure in SrTiO<sub>3</sub>." *Science* **266** (5182): 102-104 (1994) DOI: 10.1126/science.266.5182.102

41. C Beskci, YH Choi, G Labeyrie, E Bigan, M Razeghi, JB Cohen, J Carsello and VP Dravid "Detailed Analysis of Carrier Transport in InAs<sub>0.3</sub>Sb<sub>0.7</sub> Layers Grown on GaAs Substrates by Metalorganic

Chemical-Vapor-Deposition." *Journal of Applied Physics* **76** (10): 5820-5828 (1994) DOI: Doi 10.1063/1.358395

40. B Han, DA Neumayer, DL Schulz, BJ Hinds, TJ Marks, H Zhang and VP Dravid "Insitu Growth of Epitaxial Yal<sub>3</sub> Thin-Films by Metal Organic-Chemical Vapor-Deposition." *Chemistry of Materials* **5** (1): 14-16 (1993) DOI: DOI 10.1021/cm00025a006

39. V Ravikumar and VP Dravid (1993). Atomic-Structure of Sigma = 5 (130) Symmetrical Tilt Boundary in Strontium-Titanate. Atomic-Scale Imaging of Surface and Interfaces. D. K. Biegelsen, D. J. Smith and S. Y. Tong. **295**: 115-120.

38. H Zhang and VP Dravid "Transmission High-Energy Electron-Energy Loss Spectrometry (Eels) of Cuprate Superconductors." *Applied Superconductivity* **1** (1-2): 141-149 (1993)

37. XW Lin, YY Wang, VP Dravid, PM Michalakos and MC Kung "Valence States and Hybridization in Vanadium Oxide Systems Investigated by Transmission Electron-Energy-Loss Spectroscopy." *Phys Rev B Condens Matter* **47** (7): 3477-3481 (1993) DOI: 10.1103/PhysRevB.47.3477

36. H Zhang, YY Wang, VP Dravid, B Dabrowski and K Zhang "Unusual Defect and Domain-Structure in Yba<sub>2</sub>cu<sub>4</sub>o<sub>8</sub> (Y124) Single-Crystals." *Physica C* **207** (1-2): 167-174 (1993) DOI: Doi 10.1016/0921-4534(93)90436-T

35. VP Dravid, X Lin, Y Wang, XK Wang, A Yee, JB Ketterson and RP Chang "Buckytubes and Derivatives: Their Growth and Implications for Buckyball Formation." *Science* **259** (5101): 1601-1604 (1993) DOI: 10.1126/science.259.5101.1601

34. H Zhang, YY Wang, VP Dravid, B Dabrowski, K Zhang, DG Hinks and JD Jorgensen "Anisotropy of Charge-Carriers and Dielectric Function of Yba<sub>2</sub>cu<sub>4</sub>o<sub>8</sub> (Y124)." *Physica C* **208** (3-4): 231-237 (1993) DOI: Doi 10.1016/0921-4534(93)90193-T

33. XK Wang, XW Lin, VP Dravid, JB Ketterson and RPH Chang "Growth and Characterization of Buckybundles." *Applied Physics Letters* **62** (16): 1881-1883 (1993) DOI: Doi 10.1063/1.109530

32. YW Chung, D Li, XW Lin, VP Dravid, MY Chen, MS Wong and WD Sproul "Synthesis and Characterization of Ultrahigh Strength Carbon Nitride Thin-Films Prepared by Magnetron Sputtering." *Vide-Science Technique Et Applications* **49** (267): 181-188 (1993)

31. MY Chen, D Li, X Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Analytical Electron-Microscopy and Raman-Spectroscopy Studies of Carbon Nitride Thin-Films." *Journal of Vacuum Science & Technology A* **11** (3): 521-524 (1993) DOI: Doi 10.1116/1.578765

30. H Zhang and VP Dravid "Transmission High-Energy Electron-Energy-Loss Spectrometry (Eels) Analysis of Hole Formation and Charge-Transfer in P-Type Doped Cuprate Superconductors." *Journal of the American Ceramic Society* **76** (5): 1143-1149 (1993) DOI: DOI 10.1111/j.1151-2916.1993.tb03732.x

29. YY Wang, H Zhang, VP Dravid, D Shi, DG Hinks, Y Zheng and JD Jorgensen "Evolution of the Low-Energy Excitations and Dielectric Function of Ba<sub>1-x</sub>kbio<sub>3</sub>(0-Less-Than-or-Equal-to-x-Less-Than-or-Equal-to-0.50)." *Physical Review B* **47** (21): 14503-14509 (1993) DOI: DOI 10.1103/PhysRevB.47.14503

28. JP Zhang, DJ Li, C Boldt, R Plass, V Dravid, LD Marks, CH Lin, JA Eades, A Sodonis, W Wolbach, JM Chabala and R Levisetti "Microstructure and Properties of Cu-Rich 123 .2. Homogeneous Copper and High Magnetic Jc." *Journal of Materials Research* **8** (6): 1232-1239 (1993) DOI: Doi 10.1557/Jmr.1993.1232
27. MY Chen, X Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Synthesis and Tribological Properties of Carbon Nitride as a Novel Superhard Coating and Solid Lubricant." *Tribology Transactions* **36** (3): 491-495 (1993) DOI: Doi 10.1080/10402009308983188
26. PN Kumta, VP Dravid and SH Risbud "Structural Characterization of Chemically Synthesized Cubic Lanthanum Sulfide ( $\gamma$ -La<sub>2</sub>S<sub>3</sub>)." *Philosophical Magazine B-Physics of Condensed Matter Statistical Mechanics Electronic Optical and Magnetic Properties* **68** (1): 67-84 (1993) DOI: Doi 10.1080/13642819308215283
25. SJ Duray, DB Buchholz, H Zhang, SN Song, DL Schulz, VP Dravid, TJ Marks, JB Ketterson and RPH Chang "Superlattices of Yba<sub>2</sub>cu<sub>3</sub>o<sub>7</sub>- $\Delta$ /Prba<sub>2</sub>cu<sub>3</sub>o<sub>7</sub>- $\Delta$  Grown by the Pulsed Organometallic Beam Epitaxy Method." *Journal of Vacuum Science & Technology a-Vacuum Surfaces and Films* **11** (4): 1346-1348 (1993) DOI: Doi 10.1116/1.578551
24. VP Dravid, H Zhang and YY Wang "Inhomogeneity of Charge-Carrier Concentration Along the Grain-Boundary Plane in Oxide Superconductors." *Physica C* **213** (3-4): 353-358 (1993) DOI: Doi 10.1016/0921-4534(93)90452-V
23. YG Yin, ZC Zhang, XW Lin, VY Dravid and WMH Sachtler "Controlled Preparation of Monometal and Bimetal Clusters in Zeolites." *Abstracts of Papers of the American Chemical Society* **206**: 102-Petr (1993)
22. YY Wang, H Zhang, VP Dravid, PD Han and DA Payne "Anisotropic Dielectric Function and Electronic Structure of the Infinite-Layer Compound (Sr<sub>1-x</sub>Ca<sub>x</sub>)Ycu<sub>2</sub>." *Phys Rev B Condens Matter* **48** (13): 9810-9814 (1993) DOI: 10.1103/PhysRevB.48.9810
21. V Ravikumar and VP Dravid "Atomic Structure of Undoped  $\Sigma = 5$  Symmetrical Tilt Grain Boundary in Strontium Titanate." *Ultramicroscopy* **52** (3-4): 557-563 (1993) DOI: 10.1016/0304-3991(93)90073-7
20. YY Wang, H Zhang and VP Dravid "Electronic-Structure and Dielectric Function of Oxide Superconductors Via Transmission EELS with a Cold Field-Emission Tem." *Ultramicroscopy* **52** (3-4): 523-532 (1993) DOI: Doi 10.1016/0304-3991(93)90069-A
19. B Han, DA Neumayer, TJ Marks, DA Rudman, H Zhang and VP Dravid "Suitability of Metalorganic Chemical-Vapor Deposition-Derived PrBaO<sub>3</sub> Films as Buffer Layers for Yba<sub>2</sub>cu<sub>3</sub>o<sub>7-x</sub> Pulsed-Laser Deposition." *Applied Physics Letters* **63** (26): 3639-3641 (1993) DOI: Doi 10.1063/1.110074
18. VP Dravid, V Ravikumar, G Dhalenne and A Revcolevschi (1992). Experimental-Determination of Relaxation of Interphase Interfaces in Oxide Eutectics.
17. CE Platt, MR Teepe, C Ciofi, H Zhang, VP Dravid, RA Schweinfurth, DJ Vanharlingen, JA Eades, CH Lin, D Strother and R Hammond (1992). Pulsed Laser Deposition and Characterization of Superconducting Ba<sub>1-x</sub>K<sub>x</sub>BiO<sub>3</sub> Thin-Films.

16. VP Dravid, H Zhang, LD Marks and JP Zhang "Combined Hrtm, X-Ray Microchemical and Eels Fine-Structure Analysis of Planar Defects in Yba2cu3o7- Delta." *Physica C* **192** (1-2): 31-34 (1992) DOI: Doi 10.1016/0921-4534(92)90739-Y
15. VP Dravid, XW Lin, H Zhang, SZ Liu and MM Kappes "Transmission Electron-Microscopy of C-70 Single-Crystals at Room-Temperature." *Journal of Materials Research* **7** (9): 2440-2446 (1992) DOI: Doi 10.1557/Jmr.1992.2440
14. VP Dravid and H Zhang "Hole Formation and Charge-Transfer in Y1-Xcaxsr2cu2gao7 a New Oxide Superconductor." *Physica C* **200** (3-4): 349-358 (1992) DOI: Doi 10.1016/0921-4534(92)90388-S
13. JP Zhang, DA Groenke, H Zhang, DI Deloach, B Dabrowski, KR Poeppelmeier, VP Dravid and LD Marks "Local-Structure of Y1-Xcaxsr2cu2gao7 Superconductors." *Physica C* **202** (1-2): 51-60 (1992) DOI: Doi 10.1016/0921-4534(92)90295-N
12. MY Chen, X Lin, VP Dravid, YW Chung, MS Wong and WD Sproul "Growth and Characterization of C-N Thin-Films." *Surface & Coatings Technology* **55** (1-3): 360-364 (1992) DOI: Doi 10.1016/S0257-8972(07)80048-X
11. B Han, D Neumayer, DL Schulz, TJ Marks, H Zhang and VP Dravid "Metalorganic Chemical Vapor-Deposition Route to Epitaxial Neodymium Gallate Thin-Films." *Applied Physics Letters* **61** (25): 3047-3049 (1992) DOI: Doi 10.1063/1.108005
10. VP Dravid, SZ Liu and MM Kappes "Transmission Electron-Microscopy of Chromatographically Purified Solid-State C60 and C70." *Chemical Physics Letters* **185** (1-2): 75-81 (1991) DOI: Doi 10.1016/0009-2614(91)80143-L
9. MR Notis, VP Dravid and CE Lyman (1990). Aem and Hrtm Studies of the Eutectic System Zirconia-Mullite.
8. VP Dravid, MR Notis, CE Lyman and A Revcolevschi (1990). Plan-View Cbed Studies of Nio-Zro2(Cao) Interfaces.
7. VP Dravid, JA Sutliff, AD Westwood, MR Notis and CE Lyman "On the Space Group of Aluminum Oxynitride Spinel." *Philosophical Magazine a-Physics of Condensed Matter Structure Defects and Mechanical Properties* **61** (3): 417-434 (1990) DOI: Doi 10.1080/01418619008231925
6. VP Dravid, CE Lyman, MR Notis and A Revcolevschi "Low-Energy Interfaces in Nio-Zro2(Cao) Eutectic." *Metallurgical Transactions a-Physical Metallurgy and Materials Science* **21** (9): 2309-2315 (1990) DOI: Doi 10.1007/Bf02646977
5. VP Dravid, CE Lyman, MR Notis and A Revcolevschi "High-Resolution Transmission Electron-Microscopy of Interphase Interfaces in Nio-Zro2(Cao)." *Ultramicroscopy* **29** (1-4): 60-70 (1989) DOI: Doi 10.1016/0304-3991(89)90231-3
4. VP Dravid, CM Sung, MR Notis and CE Lyman "Crystal Symmetry and Coherent Twin Structure of Calcium Zirconate." *Acta Crystallographica Section B-Structural Science* **45**: 218-227 (1989) DOI: Doi 10.1107/S0108768189000856
3. VP Dravid, CE Lyman and MR Notis "Crystallography of Phase-Transition of Yba2cu3o7-Delta." *Applied Physics Letters* **52** (11): 933-934 (1988) DOI: Doi 10.1063/1.99225

2. VP Dravid, MR Notis and CE Lyman "Twinning and Microcracking Associated with Monoclinic Zirconia in the Eutectic System Zirconia-Mullite." *Journal of the American Ceramic Society* **71** (4): C219-C221 (1988)

1. VP Dravid, MR Notis and CE Lyman "Electron-Microscopy of Boundary Structure in Calcium Zirconate." *Journal of Materials Science* **22** (12): 4546-4549 (1987) DOI: Doi 10.1007/Bf01132061

## Patents

**22 patents issued in synthesis of nanostructures, nanopatterning, bio-chemical sensing, metrology, instrumentation, and software control.**

1. Dravid, V.P., Wu, J., Xu, J. "Nanocubic Co.sub.3O.sub.4/few-layer graphene composites and related anode components" U.S. Patent 10,581,062 Issued 3 of March 2020.
2. Dravid, V.P. "Magnetic Nanostructures as Theranostic Agents." U.S. Patent 9,801,952 B2. Issued 31 October 2017.
3. Dravid, V.P., Sharma, S., Klein, W.L., Viola, K.L., Tomita, T. "Magnetic Nanostructures as Theranostic Agents." U.S. Patent 9,095,629. Issued 4 August 2015.
4. Dravid, V.P., Donthu, S., Pan, Z. "Method of Making Nanopatterns and Nanostructures and Nanopatterned Functional Oxide Materials." U.S. Patent 8,647,814. Issued: 11 February 2014.
5. Shekhawat, G., Dravid, V.P. "Scanning Near Field Thermoelastic Acoustic Holography (SNFTAH)." U.S. Patent 8,438,927 B2. Issued 14 May 2013.
6. Sikma, E., Aslam, M., Dravid, V.P., Meade, T.J., Ulrich, B.D. "Contrast Agent Compositions and Methods." U.S. Patent 8,337,813. Issued: 25 December 2012.
7. Shekhawat, G., Dravid, V.P. "Scanning Near Field Ultrasound Holography." U.S. Patent 8,316,713. Issued 27 November 2012.
8. Mirkin, C.M., Dravid, V.P., Su, M., Liu, X. "Patterning of Solid State Features by Direct Write Nanolithographic Printing." U.S. Patent 7,811,635 Issued 12 October 2010.
9. Shekhawat, G., Dravid, V.P. "Scanning Near Field Ultrasound Holography." U.S. Patent 7,798,001. Issued 21 September 2010.
10. Shekhawat, G., Dravid, V.P., Tark, S.H., Srivastava, A., "Cascaded MOSFET Embedded Multi-Input Microcantilever." U.S. Patent 7,759,924. Issued 20 July 2010.
11. Mirkin, C.M., Hong, S., Dravid, V.P. "Nanolithography Methods and Products Therefore and Produced Thereby". US Patent 7,722,928. Issued 25 May 2010, and US Patent 7,744,963. Issued 29 June 2010.
12. Srivstrava, A., Dravid, V.P. "Light Induced Gas Sensing at Room Temperature." U.S. Patent Application 12,459,193. Issued: 26 June 2009.
13. Aslam, M., Dravid, V.P., Meade, T.J., Shultz, S.E.A, Ulrich, B.D. "Magnetic Resonance Contrast Agent Composition for Pharmaceutical Formulation for Use as Imaging Enhancing Agent for Imaging Cell, Tissue or Cancer Comprises Longitudinal Contrast Agent Portion and Transverse Contrast Agent Portion." International Patent WO2009036441-A2, A3. Issued 19 March 2009.
14. Dravid, V., Mirkin, C.M., Su, M., Liu, X. "Patterning of Solid State Features by Direct Write Nanolithographic Printing." European Patent EP 1 502 154 B1. Issued: 18 February 2009.
15. Shekhawat, G., Dravid, V.P. "Scanning Near Field Ultrasound Holography." U.S. Patent 7,448,269. Issued 11 November 2008.
16. Dravid, V.P., Mirkin, C.M., Su, M., Liu, X. "Patterning of Solid State Features by Direct Write Nanolithographic Printing." U.S. Patent 7,273,636. Issued: 25 September 2007.

17. Mirkin, C.M., Fu, L., Liu, X., Dravid, V.P. "Patterning Magnetic Nanostructures." U.S. Patent 7,223,438. Issued: 29 May 2007.
18. Su, M., Dravid, V.P. "Nanodisk Sensor and Sensor Array." U. S. Patent 7,155,959. Issued 2 January 2007.
19. Dravid, V.P., Shekhawat, G. "Method and System for Electronic Detection of Mechanical Perturbations Using BIMOS Readouts". U.S. Patent 7,157,897. Issued 2 January 2007.
20. Johnson, L.D., Dravid, V.P., Teng, M.H., Host, J.J., Hwang, J., Elliott, B.R. "Nanoparticle Synthesis Apparatus and Method." U.S. Patent 5,665,277. Issued 9 September 1997.
21. Johnson, L.D., Dravid, V.P. "Evaporator Apparatus and Method for Making Nanoparticles." U.S. Patent 5,618,475. Issued 8 April 1997.
22. Dravid, V.P., Teng, M.H., Host, J.J., Elliott, B.R., Johnson, L.D., Mason, T.O., Weertman, J.R., Hwang, J.H.. "Graphite Encapsulated Nanophase Particles Produced by a Tungsten Arc Method." U.S. Patent 5,472,749. Issued 5 December 1995.

### **Invited Talks and Presentations**

#### **2019**

1. "Nanocombinatorics: Multicomponent Multicomponent Multiplexed and Multifunctional Nanostructures," Chevron, March 2019.
2. "Oil Spill Recovery and Heavy Metal Sequestration via Oleophilic, Hydrophobic, and Magnetic (OHM) Sponge", Chevron, March 2019.
3. "Research Facilities as an Innovation Ecosystem," Reliance Insutries, Ltd, March 2019.
4. "Inspiration from Professor CNR Rao: Experimental Materials Genome at the Nanoscale," ChemPhysMat, February 2019.
5. "Seeing the Invisible: Dynamic Interfacial Phenomena in Energy Materials," Fulrath 43<sup>rd</sup> International Conference and Exposition on Advanced Ceramics and Composites, Daytona Beach, FL, February 2019.
6. "Hybrid" Microscopy: Multimodal, Correlative and Dynamic Characterization of Soft and Hybrid Structures – Microscopy and Microanalysis Conference, Portland, USA August/2019

#### **2018**

7. "Multiplexed Nanopatterning of Multifunctional Materials," Southern University of Science and Technology, Shenzhen, China, December 2018.
8. "Welcome to NUANCE, SHyNE, and the VPD Group!" Center for Hierarchical Materials Design Materials Microscopy Data Workshop, Northwestern University, Evanston, IL, October 2018.
9. "Teaching 'Old' Material 'New' Tricks: Nanopatterning and Microscopy of Multifunctional Materials," International Workshop on Materials Genomics, Materials Genome Institute, Shanghai University, Shanghai, China, October 2018.
10. "Emerging Opportunities in Chalcogenide Thermoelectrics: From Multicomponent Systems to Hierarchical Architecture," The 3<sup>rd</sup> Asian Conference on Thermoelectrics & The 5<sup>th</sup> Micro & Nanoscale Heat Transfer and Energy Workshop, Taipei, Taiwan, October 2018.
11. "Theronostic Magnetic Nanostructures (MNS) in Biomedicine," University of Illinois at Chicago, Chicago, IL, September 2018.
12. "Seeing the Invisible: An Introduction to NUANCE Center and SHyNE Resource," University of Chicago, Chicago, IL, August 2018.



13. "Dynamic Electron Microscopy of Nanostructured Materials," Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, June 2018.
14. "Northwestern Facility Infrastructure: Catalyst for Industrial Research & Partner in Open Innovation," Akishima, Japan, June 2018.
15. "Northwestern Facility Infrastructure: Catalyst for Industrial Research & Partner in Open Innovation," Merck-Millipore, Milwaukee, WI, April 2018.
16. "Research Facilities/Infrastructure: Emerging Perspectives," University of California, Santa Barbara, CA, March 2018.
17. "Teaching 'Old' Materials 'New' Tricks: Nanopatterning and Microscopy of Multifunctional Materials," University of Nebraska-Lincoln, Lincoln, Nebraska, March 2018.
18. "Seeing the Invisible: Interfacial Phenomena in Energy Materials," Indo-US Science and Technology Forum, Kolkatta, India, January 2018.

#### **2017**

19. "Teaching 'Old' Materials 'New' Tricks: Nanopatterning & Microscopy of Multifunctional Materials," Southern University of Science and Technology, Shenzhen, China, October 2017.
20. "Towards Correlative, Multimodal and Adaptive Fluidic-Cell Electron Microscopy," Liquid Phase Electron Microscopy Meeting, Eindhoven, The Netherlands, September 2017.
21. "Theranostic Magnetic Nanostructures (MNS) in Biomedicine," Frontiers in Biomagnetic Particles Meeting, Asheville, NC, June 2017.
22. "Seeing the Invisible: From Waste Heat Conversion to Electrochemical Storage," Washington State University, Pullman, WA, April 2017.
23. "Seeing is Believing: Advanced Electron Microscopy of Dynamic Electrophysical Phenomena," International Conference on Advanced Rechargeable Batteries & allied Materials (ICARBM), Pune, India, March 2017.
24. "Seeing the Invisible: Advanced Electron Microscopy of Energy Materials," Indo-US Science and Technology Forum (IUSSTF), Bangalore, India, March 2017.
25. "Dynamics of Charge and Photon Transport: From Waste Heat Conversion to Electrochemical Storage," Arizona State University, Tempe, AZ, February 2017.
26. "Dynamic Phenomena in Energy Materials: From Waste Heat Conversion to Electrochemical Storage," Pennsylvania State University, State College, PA, February 2017.

#### **2016**

27. "Dynamic Phenomena in Energy Materials: *From Waste Heat Conversion to Electrochemical Storage*," Southern University of Science and Technology of China, Shenzhen, China, December 2016.
28. "'Seeing' the Invisible: From Waste Heat Conversion to Electrochemical Storage," Rice University, Houston, TX, October 2016.
29. "Statics and Dynamics of Energy Materials: *From Waste Heat Conversion to Electrochemical Storage*," University of Southern California, Los Angeles, CA, September 2016.
30. "Temperature-controlled Fluidic-Cell Scanning Electron Microscopy," Microscopy & Microanalysis annual meeting, Columbus, OH, July 2016.
31. "In-situ and Dynamic Microscopy in Materials Research," JEOL, Tokyo, Japan, March 2016.
32. "Infrastructure for Nanotechnology – Greater Chicago and US Midwestern Perspective", FEI, Eindhoven, Netherlands, March 2016.
33. "Advanced Microscopy in Materials Research," FEI, Eindhoven, Netherlands, March 2016.
34. "Emerging Opportunities in Nanotechnology: Hip, Hope or Hype?!" Glenbrook South High School, Glenview, IL, February 2016.

35. "NU-JNC Joint Center on Advanced Materials Research," Indo-US S&T Forum (IUSSTF), New Delhi, India, January 2016.

#### **2015**

36. "Advanced Electron Microscopy in Materials Research," Hitachi Naka Works, Mito, Japan, December 2015.
37. "Science, Technology and Globalization," MRSEC REU/RET Lecture, Northwestern University, Evanston, IL, July 2015.
38. "In-Situ Microscopy of Energy Materials," University of Texas at Austin, Austin, TX, July, 2015.
39. "Facility Infrastructure Strategies," University of Texas at Austin, Austin, TX, July 2015.
40. "From Atoms to Animals: Multimodal Imaging in Cancer Diagnostics and Therapeutics", Cancer Center Symposium Talk, Northwestern University, Evanston, IL, April 2015.
41. "Advanced Materials for Energy," JNCASR, Bangalore, India, March 2015.
42. "Advanced Materials Research – A global collaboration model," Indian Institute of Science (IISc), Bangalore, India, March 2015.
43. "Advances in Electron Microscopy in Materials Science," Nanyang Technological University (NTU), Singapore; February 2015.
44. "In-situ Microscopy of Electrochemical Reactions," IIT Bombay, India, January 2015.
45. "Future Global Collaborations in Energy-related Materials," Faculty Academic Network (FAN) Workshop, Goa, India, January 2015.

#### **2014**

46. "Correlative Microscopy and Characterization: Towards Form-Function Relationship in Biological Systems," Materials Research Society (MRS) Fall Meeting, Boston, MA, December 2014.
47. "In-situ and Ex-situ Electron Microscopy of Energy Materials," University of Connecticut, Storrs, CT, October 2014.
48. "Emerging Nanotechnology," NSERVE, Summer Career Exploration Program, Oakton Community College, Skokie, IL, August 2014.
49. "Strain Mediated Phenomena in Nanostructured Oxides and Chalcogenides," MRS On Demand Webinar Series, Elastic Strain Engineering Live Broadcast, Evanston, IL, May 2014.
50. "Materials for Emerging Energy Paradigm," National Chemical Laboratory (NCL), Pune, India, March 2014.
51. "Advanced Materials Research: Case for Indo-US Collaborative Program," Indo-US Forum (IUSSTF) New Delhi, India, March 2014.
52. "Nano-Bio-Technology in Emerging Biomedicine," ETH Zurich, Zurich, Switzerland, February 2014.
53. "Nano-Bio-Technology in Emerging Biomedicine," University of Basel, Basel, Switzerland, February 2014.
54. "Hierarchical Microstructural Architecture for High-performance Thermoelectrics," TMS RF Mehl Medal Symposium on Frontiers in Nanostructured Materials and Their Applications, 2014 TMS Annual Meeting, San Diego, CA, February 2014.
55. "Magnetic Nanostructure (MNS) Complexes as Theranostic Carriers," IIN-Nanomedicine Workshop, Evanston, IL, February 2014.
56. "Nanotechnology for Energy Conversion and Storage," University of Texas, San Antonio, San Antonio, TX, February 2014.
57. "Nanotechnology for Energy," National Chemical Laboratory (NCL), Pune, India, January 2014.
58. "Global McCormick and Indo-US Collaborative Initiatives," JNCASR, Jakkur, India, January 2014.
59. "Commercial and Business Opportunities in Emerging Nanotechnology," Kothari Group, Chennai, India, January 2014.

60. "Advances in Nano-Bio-Technology," Piramal Life Sciences, Mumbai, India, January 2014.

### **2013**

61. "Strain Mediated Phenomena in Nanostructured Oxides and Chalcogenides," MRS Fall Meeting, Boston, MA, December 2013.
62. "Converting Waste Heat into Electricity: Emergence of High Performance Tailored Nanostructured Thermoelectrics," Center for Nano and Molecular Science, University of Texas, Austin, TX, November 2013.
63. "Theranostic Magnetic Nanostructures (TX-MNS): Combining Non- Invasive Diagnostic Imaging with Targeted and Timed Therapeutic Delivery", Workshop on Targeting and Triggering from Molecules to Materials, University of Massachusetts, Amherst, MA, October 2013.
64. "Nanostructured Thermoelectrics," Nanyang Technical University, Singapore, August 2013.
65. "Bio-Nano-Sensors," Nanyang Technical University, Singapore, August 2013.
66. "Materials and Energy," Indian Institute of Science Global Alumni Meeting, Chicago, IL, July 2013.
67. "Teaching 'Old' Materials 'New' Tricks: Nanopatterning and Microscopy of Multifunctional Materials," Electron Microscopy Society of India (EMSI) annual meeting, Kolkata, India, July 2013.
68. "Nanotechnology," National Chemical Laboratory, Pune, India, June 2013.
69. "Science, Technology, Education & Policy (S.T.E.P.) in the Right Direction for Energy, Environment and Sustainability: Role of Nanoscience and Nanotechnology," 3<sup>rd</sup> International Workshop on Cleanroom Training for Critical and Sustainable Technologies, Bilkent University, Ankara, Turkey, June 2013.
70. "Hierarchical Length-scale Influence in Bulk Nanostructured Thermoelectrics," MRS Spring Meeting, San Francisco, CA, April 2013.
71. "Atomically-layered Structures: Direct Assembly, Defect Structure and Transport Phenomena," MRS Spring Meeting, San Francisco, CA, April 2013.
72. "Emerging Approaches for Nanopatterning of Soft, Hard and Hybrid Structures," SPIE Micro-Nanotechnology Sensors, Systems, and Applications Conference, Baltimore, MD, April 2013.
73. "Emerging Nanotechnology for Biomedicine and Quality of Life: Will 75 Become the New 35?" North Shore Senior Center's Annual Meeting, Northfield, IL January 2013.

### **2012**

74. "Science, Technology, Education and Policy (STEP) in the Right Direction for Energy, Environment and Sustainability: The Role of Nanoscience and Nanotechnology," ICONSAT Hyderabad, India, January 2012.
75. "Business of Energy," Reliance Industry Limited, Mumbai, India, March, 2012.
76. "Business of Energy: Energy, Environment and sustainability: A S.T.E.E.P. Challenge," DOE-COV, Germantown, MD, May 2012.
77. "'Hard' Nanostructures for 'Soft' Biomedicine," Nanyang Technological University, Singapore, May 2012.
78. "Nanotechnology: A Decade Later," Nanyang Technological University, Singapore, May 2012.
79. "High-end Facility Infrastructure for Emerging Materials Research," Bangalore, India, July 2012.
80. "Magnetic Nanostructures in Biomedicine," India, August 2012
81. "Teaching 'Old' Materials 'New' Tricks: Nanopatterning & Microscopy of Multifunctional Materials," Hsuen Lee Award Lecture, Institute for Metals Research (IMR), Shenyang, China, September 2012.
82. "Emerging Electron Microscopy in Nanotechnology Research," Tsinghua University, Beijing, China, September 2012.

### **2011**

83. "Bio-Cryo-Microscopy in Medicine," Keck Foundation Review, Chicago, IL, January 2011.

84. "Magnetic Nanostructures in Biomedicine," IIT Bombay, Bombay, India, February 2011.
85. "Soft Epitaxy of Multifunctional Oxides," Lawrence Workshop, Arizona State University, Tempe, AZ, February 2011.
86. "Materials for Energy," Arizona State University, Tempe, AZ, February 2011.
87. "Nanopatterning of Multifunctional Oxides," University of Texas-San Antonio, San Antonio, TX, March 2011.
88. "Teaching Old Materials New Tricks: Nanopatterning of Multifunctional Oxides," University of Central Florida, Nanotech Center, Orlando, FL, March 2011.
89. "Opportunities for Tri-Lateral US-India-Israel Global Initiative," Evanston, IL, March 2011.
90. "Magnetic Nanostructures for Theranostics Administration of Cancer," Annual ACS Meeting, Anaheim, CA, March 2011.
91. "Hierarchical Length-scale Influence in Nanostructured Thermoelectrics," USC-DOE Workshop on Energy, Los Angeles, CA, April 2011.
92. Hierarchical Length-scale Influence in Nanostructured Thermoelectrics," MRS Spring Meeting and Exhibit, San Francisco, CA, April 2011.
93. "Introduction to NUANCE Center," Nanyang Technological University, Singapore, June 2011.
94. "Teaching 'Old' Materials 'New' Tricks: Nanopatterning and Microscopy of Multifunctional Materials," International Workshop on Advanced Electron Microscopy and Applications in Materials Science, Shanghai, China, June 2011.
95. "Nanopatterned Multifunctional Oxides: From Basic Science to Applied Technologies: Collaborative opportunities with the NU NUANCE Center," Oxford University, London Center for Nanotech (LCN), London, England, August 2011.
96. "Nanopatterning of Functional Oxides; Collaborative Opportunities with the NUANCE Center," JNCASR-NU, India, September 2011.
97. "Making a Mountain out of Mole Hill: Electron Microscopy of Nanostructured Thermoelectrics," Michigan State University, East Lansing, MI, October 2011.
98. "MRSEC Shared Facilities Management Workshop", NUANCE Center, Northwestern University, Evanston, IL, November 2011.
99. "Seeing is Believing: Nanostructures in Alkali Metal Doped Lead Telluride," MRS Fall Meeting, Boston, MA, December 2011.
100. "Promise of Nanotechnology for Society," London Olympia Convention, London, England, December 2011.
101. "Emerging Alternative Energy Sources and Policy Considerations," Imperial College London, London, England, December 2011.
- 2010**
102. "Corollary to Archimedes' Levers: Nano-and Microscale Levers for Seeing and Sensing the Invisible," ICONSTAT 2010, Mumbai, India, February 2010.
103. "Emerging Microscopy and Spectroscopy: A Window to the Nanoworld," ICONSTAT, Mumbai, India, February 2010.
104. "Magnetic Nanostructures (MNS) in Biomedicine: Role of Size, Shape and Composition," ACS Meeting, San Francisco, CA, March 2010.
105. "Teaching 'Old' Materials 'New' Tricks: Site- and Shape-specific Nanopatterning of Multifunctional Materials," CNST Annual Nanotechnology Workshop, University of Illinois, Urbana, IL, May 2010.
106. "Emerging Magnetic Nanostructures for Theranostics," Molecular Imaging & Cancer Symposium, Northwestern University, Evanston, IL, May 2010.
107. "Advanced Characterization for Nanostructures," Nanyang Technological University, Singapore, June 2010.

108. "Emerging Magnetic Nanostructures (MNS) as Theranostic Agents in Biomedicine," Nanotechnology Characterization Laboratory, National Cancer Institute, Frederick, MD, September 2010.
109. "Nanopatterning of Multifunctional Oxides," Osaka University Workshop, Osaka, Japan, October 2010.
110. "Advanced Characterization of Bio-Nano-structures in Medicine", NCI-CCNE Workshop, Bethesda, MD, November 2010.
111. "Research Universities as Innovation Hubs in 21<sup>st</sup> Century", NSF-Nano2 workshop, Arlington, VA, December 2010
112. "Emerging Theranostic Nanostructures in Biomedicine", Nano-Bio Workshop, University of Miami, Coral Gables, FL, December 2010.
113. "National Nanotechnology Initiative: A Decade Later", London Center for Nanotechnology, London, England, December 2010.

#### **2009**

114. "Science, Technology, Education and Policy (STEP)," Vibrant Gujarat Global Investor's Summit, Gujarat, India, January 2009.
115. "Nanotechnology a Decade Later: Prospective and Prospects," Nanotech Conference: Sanken International Symposium, Osaka, Japan, January 2009.
116. "Teaching 'Old' Dogs 'New' Tricks: Synthesis and Nanopatterning of Multifunctional Oxides," Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, April 2009.
117. "Nanotechnology: Hip, Hope or Hype?" Nanotechnology Town Hall Meeting V, Evanston, IL, May 2009.
118. "Teaching Old Materials New Tricks: Nanopatterning and Localized Properties of Multifunctional Oxides," CNM Nanoscience Colloquium, Argonne National Laboratory, Lemont, IL June 2009.
119. "Synthesis, Patterning and Properties of Nanostructured Oxides," INDO-US Joint Conference on Advanced Materials, Bangalore, India, September 2009.
120. "Development of a Scanning Near-Field Ultrasound Holography (SNFUH) System as a Nano-Metrology Toolset for Buried Defects and Sub-Surface Pattern Recognition," Metrology Webinar, Semiconductor Research Corporation, Durham, NC, September 2009.
121. "Towards Targeted In-Vivo Theranostics with Magnetic Nanostructures," 11<sup>th</sup> International Conference on Advanced Materials (ICAM), Rio de Janeiro, Brazil, September 2009.
122. "Corollary to Archimedes' Levers: Nano- and Microscale Levers for Seeing and Sensing the Invisible," Center for Nanoscale Materials Users Meeting, Materials & Fabrication for Nanoelectromechanical Systems (NEMS) Focus Session, Argonne National Laboratory, Aurora, IL, October 2009.
123. "Nanopatterning of Multifunctional Oxides: Teaching Old Materials New Tricks," DFG-NSF Conference, New York, NY, October 2009.
124. "Nanotechnology and Business: Hype, Hope or Hip?" Brinks Hofer Gilson & Lione and the NanoBusiness Alliance (NBA) Nanotechnology Seminar, Chicago, IL, December 2009.

#### **2008**

125. "Nanopatterning of Ceramics," American Ceramics Society Annual Meeting, Daytona Beach, FL, January 2008.
126. "Nanotechnology in Petrochemicals," Reliance Industries Ltd., Mumbai, India, February 2008.
127. "Emerging Bio-Chem Sensor Platform," Baxter Corporation, Round Lake, IL, April 2008.
128. "Teaching 'Old' Materials 'New' Tricks: Site- and Shape-Specific Nanopatterning of Multifunctional Oxides," Nanoscience and Technology Institute (NSTI), Boston, MA, June 2008.

129. "Emerging Microscopy Techniques for Catalyst Characterization," Institute for Sustainability and Energy, Northwestern University, Evanston, IL, August 2008.
130. "Nanotechnology in Petrochemical Industries: Hip, Hype or Horrible?!" Indian Petrochem, Mumbai, India, November 2008.

#### **2007**

131. "Interdisciplinary Nanomechanics: From Acoustic Imaging to Microcantilever-based BioChemSensing," PittCon Waters Symposium, Chicago, IL, February 2007.
132. "Nanotechnology and Business: Hip, Hype or Horrible?" Reliance Industries, Mumbai, India, February 2007.
133. "Disruptive Technology Opportunities in Nanotechnology," Reliance Industries, Mumbai, India, February 2007.
134. "Emerging Nanostructures and Devices for Nano-Bio-Medicine," Children's Memorial Research Center Academic Day, Chicago, IL, April 2007.
135. "Overview of the NUANCE Center," Centerpiece Live, Evanston, IL, May 2007.
136. "Development of Scanning Near Field Ultrasound Holography (SNFUH) System as a Nano-Metrology Toolset for Buried Defects and Sub-Surface Pattern Recognition," SRC Nanolithography Review, Madison, WI, May 2007.
137. "Teaching Old Materials New Tricks: Site -Shape- Specific Patterning of Functional Nanostructures," University of Albany, Albany, NY, May 2007.
138. "Emerging Nanostructures and Devices for Imaging and Therapeutics," Pfizer Meeting, Evanston, IL, June 2007.
139. "Some Assembly Required: Patterning, Lithography and Functional Identity of Nanostructures," McBain Memorial Lecture, National Chemical Laboratory (NCL), Pune, India, July 2007.
140. "Variable Pressure Soft Electron Beam Lithography (VP-e BL)," Microscopy and Microanalysis 2007, Fort Lauderdale, FL, August 2007.
141. "Some Assembly Required: Self-, Directed- and Hierarchical Patterning and Assembly of Functional Nanostructures," University of Zululand, Richards Bay, South Africa, August 2007.
142. "Appropriate Microscopy at Appropriate Resolution (AMAR)," University of California, Berkeley, CA, September 2007.
143. "Nanotechnology: Hip, Hype or Horrible?!" Illinois Engineering Council, Chicago, IL, October 2007.
144. "Emerging Nanostructures and Devices for Biomedicine," IEEE Sensor Council Symposium, Atlanta, GA, October 29, 2007.
145. "Seeing the Invisible: Holography and Interference Scanning Probe Microscopy in the Nonlinear Regime," DSRC -DARPA Workshop, Arlington, VA, November 7-8, 2007.
146. "Seeing and Sensing the Invisible: Emerging Nanostructures and Devices for Biochemical Imaging, Diagnostics and Therapeutics," University of Washington Seattle, WA, November 2007.
147. "Teaching 'Old' Materials 'New' Tricks: Patterning, Microscopy and Functional Identity of Nanostructures," University of Washington Seattle, WA, November 2007.
148. "Some Assembly Required: Nanopatterning of Multifunctional Materials," Nano 2007 Conference, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, December 2007.

#### **2006**

149. "Nanopatterning of Functional Inorganics," IED Detection Symposium, Sandia National Laboratory, Albuquerque, NM, January 2006.
150. "Nondestructive Subsurface Analysis with SPM," University of Pennsylvania Nanoprobe Network, Philadelphia, PA, January 2006.

151. "Top Down Meets Bottom Up: Emerging Paradigms in Bio-Chem Nanosensors," IIT Colloquium Series, Chicago, IL, February 2006.
152. "Emerging Microscopy Techniques: Answers Looking for Appropriate Questions," State Microscopical Society of Illinois Meeting, Chicago, IL, February 2006.
153. "Interdisciplinary Nanomechanics: From Acoustic Imaging to Microcantilever-based Bio-Chem Sensing," University of Illinois, Urbana-Champaign, Urbana, IL, February 2006.
154. "Teaching Old Materials New Tricks: Nanopatterning of Functional Inorganics," Iowa State University Colloquium Series, Ames, IA, March 2006.
155. "Teaching Old Materials New Tricks: Nanopatterning of Functional Inorganics," University of Texas, Austin, TX, March 2006.
156. "Nanostructured Devices," Honeywell visit, Minneapolis, MN, March 2006.
157. "Nanomechanics Based Devices for Imaging and Sensing," NSF-Korea Workshop, Seoul, Korea, April 2006.
158. "Emerging Nanostructures and Devices for Novel Diagnostics and Therapeutics," ENH GE meeting, Evanston, IL, June 2006.
159. "Development of Scanning Near-Field Ultrasound Holography (SNFUH) System as a Nano-Metrology Toolset for Buried Defects and Sub-Surface Pattern Recognition," SRC Nanolithography Review, Madison WI, June 2006.
160. "Status and Future of NUANCE Center," DuPont Corp., Wilmington, DE, June 2006.
161. "Electron Microscopy & Spectroscopy," ASME Nano Bootcamp, Minneapolis, MN, July 2006.
162. "Electron Microscopy and Spectroscopy," NSF Short Course, Evanston, IL, August 2006.
163. "Magnetic Nanostructures for Biomedicine," Nano Meeting, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, August 2006.
164. "Nanopatterning of Inorganics," Nano 2006 Meeting, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, August 2006.
165. "Nanomechanics in Microelectronics: From Ultrasound Holographic Imaging to MOSFET-Embedded Microcantilevers," Intel Visit, Ronler Acres, OR, September 2006.
166. "Getting More out of the Scanning Probe: From Acoustic Holographic Imaging to Bio-Chem Sensing," Frontiers of Microscopy Workshop, West LaFayette, IN, October 2006.
167. "Emerging Bio-Nano-Structures and Devices for Imaging, Diagnostics and Therapeutics," 1<sup>st</sup> International Symposium of Nano Bio Molecular Assembly, Yonsei University, Seoul Korea, October 2006.
168. "MOSFET-Embedded Microcantilevers," IEEE Sensors 2006 conference, Daegu, South Korea, October 2006.
169. "Emerging Nanostructures and Devices for Imaging, Diagnostics and Therapeutics," TDD Bioimaging Symposium, University of Toronto, Toronto, Ontario, November 2006.
170. "Seeing the Invisible: Scanning Near-Field Ultrasound Holography (SNFUH) for Non-Destructive Nanoscale Imaging of Buried and Embedded Structures," FENA Workshop, San Francisco, CA, December 2006.

## **2005**

171. "Integrating Emerging Bio Nano Structures on Engineering Platform: Bottom Up Meets Top Down," Nanotechnology Workshop Organizer, Bombay, India, January 2005.
172. "Novel Electronic Transduction Scheme for Biomolecular Binding Events," APS Annual Meeting, Los Angeles, CA, March 2005.
173. "High Resolution Near-Field Acoustic Holography (NFAH) of Embedded Nanostructures," ASME Nanotechnology Institute, Knoxville, TN, May 2005.
174. "Advanced Microscopy and Spectroscopy: Window to the Nanoworld," Mornings at McCormick-Northwestern University, Evanston, IL, May 2005.

175. "Advanced Microscopy," ASME Nanobootcamp," Washington, DC, July 2005.
  176. "Scanning Near-Field Ultrasound Holography (SNFUH) for Non-Destructive Nanoscale Imaging of Sub-surface and buried features," Seeing at the Nanoscale III, Veeco Inc, Washington, DC, August 2005.
  177. "Scanning Near-Field Ultrasound Holography (SNFUH) for Non-Destructive Nanoscale Imaging of Sub-surface and buried features," Visit with collaborators at University of Oxford, Oxford, England, August 2005.
  178. "Bio-Chem Nanosensors," University of Buenos Aires, Buenos Aires, Argentina, September 2005.
  179. "Integrated Electronic Detection Approach to Biological Warfare Agents using Cantilever Arrays as Hybrid/Parallel Biomechanical Systems," Materials Science and Technology Conference 2005, Pittsburgh, PA, September 2005.
  180. "Some Assembly Required: Building Nanostructures from the Bottom Up Across Length Scales," NanoCommerce/NanoForum, Chicago, IL, October 2005.
  181. "Nanotechnology Programs at Northwestern: Partner in Leadership," Hitachi Corp, San Francisco, CA, October 2005.
  182. "SNFUH Approach for Nano-Metrology," SRC-NIST Workshop, Washington, DC, December 2005.
- 2004**
183. "Nanopatterning of Oxide Sensor Elements," National Institute of Standards and Technology (NIST), Washington, DC, January 2004.
  184. "Teaching Old Materials New Tricks: Site-and Shape Specific Nanopatterning," DPN Workshop, Florida, January 2004.
  185. "New Paradigms in Bio-Chem Sensing via Nanostructured Materials," Argonne National Laboratory, Lemont, IL, February 2004.
  186. "Teaching Old Materials New Tricks: Site-and Shape Specific Nanopatterning on Inorganics," University of Pennsylvania, Philadelphia, PA, February 2004.
  187. "Bio-Chem Nanosensors," University Buenos Aires, Argentina, March 2004.
  188. "Novel Bio-Nano Sensors," Virginia Commonwealth University, Richmond, VA, March 2004.
  189. "Probing the Invisible: Near Field Acoustic Holography & Towards Novel Paradigms in Nano-bio Sensors," AcerS Annual Meeting, Indianapolis, IN, April 2004.
  190. "Site Specific Nanopatterning of Inorganics," Materials Research Society, Spring 2004 Meeting, San Francisco, CA, April 2004.
  191. "Towards Novel Paradigms in Nano-Bio Sensors," Americas Materials Conference: Chile, US, and Brazil, Santiago, Chile, April 2004.
  192. "N3: Nanotechnology and Nanoscience at Northwestern," Nano-Bio Outreach Workshop, Palo Alto, CA, May 2004.
  193. "Site-specific Nanopatterning of Inorganics: Nanodots and Microcantilevers," Dept Colloquium, University of Wisconsin, Milwaukee, WI, May 2004.
  194. "Emerging Bio-Chem Nanosensors," IMTECH, NCL, Pune, and IIT Bombay, India, July 2004.
  195. "Nanoscale Science, Technology and Educational Initiatives at Northwestern," US-India Nano Workshop, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, August, 2004.
  196. "NUANCE Center," US-India Nano Workshop, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, August, 2004.
  197. "To Find a Needle in a Haystack: In-situ Manipulation and Measurements of Nanostructures," CNMS-ORNL, Knoxville, TN, September 2004.
  198. "Nanotechnology Beyond the Hype: Towards High Technology Job Creation and Illinois Leadership," State of Illinois Trade Office Meeting, Chicago, IL, September 2004.



199. "Nanopatterning and Microscopy of Nanostructures," Nanotech Seminar at 3M, Minneapolis, MN, October 2004.
  200. "Novel Electronic Transduction Scheme for Biomolecular Binding Events," DARPA/Simbiosys PI Meeting, Vail, CO, October 2004.
  201. "Integrating Emerging Bio Nano Structures on Engineering Platform: Bottom UP Meets Top Down," Purdue University, West LaFayette, IN, November 2004.
  202. "Probing the Invisible: NFAH," Fall MRS Meeting, Boston MA, November 2004.
  203. "Probing the Invisible: Near Field Acoustic Holography," DARPA meeting, NSF-NIH Workshop, Washington, DC, November 2004.
  204. "Tuning GB Barrier via Thermal Treatment," Boston, MA, November 2004.
  205. "Integrating Emerging Bio Nano Structures on Engineering Platform: Bottom Up Meets Top Down," National Chemical Laboratory, Pune, India, December 2004.
- 2003**
206. "Nanosensors for BCW Agents," Oak Ridge National Laboratory, Oak Ridge, TN, January 2003.
  207. "Functional Nanopatterns for Ferroelectrics," Sandia National Laboratory, Albuquerque, NM, March 2003.
  208. "Inorganic Nanotstructures for Bio-Chem Sensors," Annual AcerS Mtg, Nashville, TN, May 2003.
  209. "Development of Central User Facilities and Multiuser Coordination," Faculty Academic Network Workshop, Palo Alto, CA, June 2003.
  210. "Nanotechnology at Northwestern University," University of Buenos Aires, Buenos Aires, Argentina, June 2003.
  211. "Towards Electronic Nano-Nose," University of Buenos Aires, Buenos Aires, Argentina, June 2003.
  212. "Introduction to NUANCE Center," Veeco Inc., Information Session, Santa Barbara, CA, July 2003.
  213. "Nanopatterning of Functional Inorganics," MRSEC Seminar, Santa Barbara, CA, July 2003.
  214. "Scanning Acoustic Holography," Veeco Inc., Santa Barbara, CA, July 2003.
  215. "Holography and Interference Microscopy," Microscopy Annual Meeting, San Antonio, TX, July 2003.
  216. "Site Specific Nanopatterning," Microscopy Annual Meeting, San Antonio, TX, July 2003.
  217. "Nanopatterning," Integrated Nanosystems Meeting, Palo Alto, CA, September 2003.
  218. "Near Field Holography," SEMATECH, Analytical Manager Meeting, Austin, TX, September 2003.
  219. "Nanopatterning of Inorganics," Brazilian Materials Society Bi-Annual Meeting, Rio de Janeiro, Brazil, October 2003.
  220. "Emerging Issues in Nanoscience and Nanotechnology," IIT Bombay, India, December 2003.
  221. "Advanced Electron Microscopy of Interfaces and Defects," IIT Bombay, India, December 2003.
  222. "Site-and Shape Specific Nanopatterning of Ferroelectrics," Annual Materials Research Meeting, Boston, MA, December 2003.
  223. "Probing Ferroelectric Domain Dynamics," Annual Materials Research Meeting, Boston, MA, December 2003.
  224. "Material Science and Integration of a New Hybrid TiAl- Layer," Annual Materials Research Meeting, Boston, MA, December 2003.
  225. "Miniaturized Electronic Nano-Nose," Annual Materials Research Meeting, Boston, December 2003.
- 2002**

226. "Teaching Old Ceramics New Tricks: Site-Specific Nanopatterning of Functional Inorganics," Gordon Research Conference, Meriden, NH, August 2002.
227. "Nanotitration of Active Grain Boundaries," Electroceramics VIII conference, Rome, Italy, August 2002.
228. "Electron Holography in Materials Science," International Conference on Electron Microscopy, Durban, South Africa, September 2002.
229. "Better Transparency and Conductivity through ALCHEMI," International Conference On Electron Microscopy, Durban, South Africa, September 2002.
230. "Site- and Shape-Specific Nanopatterning of Ceramics," Colloquium, University of Illinois at Urbana-Champaign, Urbana, IL, September 2002.
231. "Nanopatterning of Addressable Functional Inorganic Nanostructures," PASI, Joint Argentina-NSF workshop on Ferroelectrics, Rosario, Argentina, September 2002.
232. "3-D Nanomanipulation in TEM for Nanostructures," ASME Annual Meeting, New Orleans, LA, November 2002.
233. "Nanopatterning of Functional Inorganics," IBM Watson, Yorktown Heights, NY, November 2002.
234. "Nanostructures for Functional Duties," International Conference on Inorganic Materials, IIT Bombay, India, December 2002.
235. "Site-and Target specific Drug Delivery Approaches," International Conference on Inorganic Materials, IIT Bombay, India, December 2002.
236. "Nanopatterning," Annual MRS Meeting, Boston, MA, December 2002.

#### **2001**

237. "Advanced Electron Microscopy in Materials Research at Northwestern University," Nissei Sangyo America, Mountain View, CA, January 2001.
238. "Patterning Magnetic Nanostructures," DPN Workshop, Key West, FL, February, 2001.
239. "Synthesis, Characterization and Patterning of Soft and Hybrid Nanostructures," National Institutes of Health (NIH), Bioengineering Seminar, Bethesda, MD, February 2001.
240. "Electron Holography of Active Structures," University of Oslo Workshop on Advanced Electron Microscopy, Oslo, Norway, March 2001.
241. "Hierarchical Length-Scale Influence on Interfacial Phenomena," MSE Seminar, Lehigh University, Bethlehem, PA, May 2001.
242. "Probing the Invisible: Electron Holography of Electrically Active Interfaces," First European Workshop on Electron Holography, Stockholm, Sweden, June 2001.
243. "In-situ Electron Holography of Active Nanostructures," Workshop on In-Situ EM, National Center for Electron Microscopy, Berkeley, CA, June 2001.
244. "When Electrons Meet Light: Advanced EM of Optical Active Oxides," NU-CNRS Workshop, Evanston, IL, June 2001.
245. "Focused Ion Beam: More than just a fancy IBT," Microscopy and Microanalysis' 2001, Long Beach, CA, August 2001.
246. "When Electrons Meet Light: ALCHEMI of Optical Active Oxides," Microscopy and Microanalysis' 2001, Long Beach, CA, August 2001.
247. "Towards Predictive Structure-Property Relationship for Electrically Active Interfaces," RPI, Materials Science Colloquium, Troy, NY, September 2001.
248. "Synthesis, Patterning and Microscopy of Nanostructures," University of Connecticut, Mansfield, CT, October 2001.
249. "Development and Management of Shared User Facilities," MRSEC Director's Meeting, Brown University, Providence, RI, November, 2001.

250. "Microscopy for Nanotechnology and Vice Versa," IIT Bombay, India, December, 2001.

#### **2000**

251. "How Low Can One Get? Low Voltage Imaging and Spectroscopy with FEG SEM," MAS NY Chapter, MAS Tour Speaker Event, Fishkill, NY, February 2000.

252. "Low Voltage Imaging, Diffraction and Spectroscopy," General Electric, Central R & D, Schenectady, NY, March 2000.

253. "Dynamics of Charged Interfaces in Dielectric and Ferroelectric Thin Films," International Conference of the International Society for Integrated Ferroelectrics (ISIF-00), Aachen, Germany, March 2000.

254. "Probing the Invisible: Electron Microscopy of Nanostructures," Physics and Nanotechnology Initiative, University of Central Florida, Orlando, FL, March 2000.

255. "Towards Structure-Property Relationship for Electroceramic Interfaces," Lehigh University, Bethlehem, PA, March 2000.

256. "Graphite Encapsulated Magnetic (GEM) Nanocrystal: Carriers for Site-Specific Drug Delivery?!" Robert H. Lurie Comprehensive Cancer Center, Evanston, IL, March 2000.

257. "Teaching Old Nanostructures New Tricks," MSE Colloquium, Northwestern University, Evanston, IL, October 2000.

258. "Dynamics of Electrically Active Interfaces," Korea Advanced Institute for Science and Technology, (KAIST), Daejeon, South Korea, October 2000.

259. "Electron Holography and Spectroscopy of Interfaces," Keynote Address, Annual Meeting of the Korean Ceramic Society, Chunchun, South Korea, October 2000.

#### **1999**

260. "Engineering First: Integrating Basic Sciences and Mathematics in Engineering Curricula," IIT Bombay, India, March 1999.

261. "Advanced Electron Microscopy of Nanostructures," Tata Institute for Fundamental Research, Bombay, India, March 1999.

262. "In-Situ Dynamic Studies of Electrically Active Interfaces," MRS Spring Meeting, San Francisco, CA, April 1999.

263. "Electron Holography of Active Interfaces," Annual Meeting of the American Ceramic Society, Indianapolis, IN, April 1999.

264. "Probing the Invisible: Electron Spectroscopy and Holography of Electrically Charged Interfaces." Georgia Tech, Atlanta, GA, May 1999.

265. "Electron Holography of Active Junctions," IBM Watson Research Center, Yorktown Heights, NY, July 1999.

266. "Probing Electrically Active Interfaces," Bell Labs, Lucent Technologies, Murray Hill, NJ, July 1999.

267. "Dynamics of Grain Boundary Space-Charge Potential in Electroceramics," Microscopy and Microanalysis 99, Portland, OR, August 1999.

268. "Analytical Electron Microscopy of Composite Interfaces," Microscopy and Microanalysis 99, Portland, OR, August 1999.

269. "Hierarchy of Length-Scales in Crack Propagation and Fracture," NIST/CRC Invitee Workshop, Gaithersburg, MD, September 1999.

270. "Electron Holography of Active Structures," SEMATECH, Austin, TX, October 1999.

271. "Dynamics of Charged Interfaces via Electron Holography," Motorola, Austin, TX, October 1999.

272. "Electron Holography of Charged Interfaces," Applied Micro Devices, Sunnyvale, CA, November 1999.

273. "Dynamics of Electrically Active Interfaces," MRS Fall Meeting, Boston, MA, November/December 1999.

**1998**

274. "Analytical Electron Microscopy in Materials Science," Naka Works, Hitachi Corporation, Ibaraki, Japan, January 1998.

275. "Electron Probe Instrumentation Center (EPIC)," Advanced Research Laboratory, Hitachi Corporation, Japan, January 1998.

276. "Statics and Dynamics of Interfaces in Electroceramics," US-Japan Workshop on Electrically Charged Interfaces, MIT, Cambridge, MA, March 1998.

277. "In-Situ TEM Studies of Domain Switching Dynamics in Ferroelectric Thin Films," Int. Symp. on Ferroic Domains and Mesoscopic Structures (ISFD-5), Penn State University, University Park, PA, April 1998.

278. "Dynamic TEM of Interfaces and Defects," Ann. Mtg. Ohio Chapter of the AVS, Cleveland, OH, June 1998.

279. "Spectroscopy of Oxide Superconductors," CNRS Workshop on Emerging Issues in HTS, Caen, France, July 1998.

280. "Statics and Dynamics of "Charged" Interfaces in Electroceramics," Microscopy and Microanalysis 98, Atlanta, GA, July 1998.

281. "Anisotropy of Electron Structure and Transport Properties of Oxide Superconductors," Microscopy and Microanalysis 98, Atlanta, GA, July 1998.

282. "Seeing Invisible: Electron Spectroscopy and Holography of Electrically Active Interfaces," Gordon Research Conference, Solid State Studies in Ceramics, Meriden, NH, August 1998.

283. "Transmission Electron Microscopy, Spectroscopy and Holography of Nanostructured Materials," International Conference on Electron Microscopy (ICEM-98), Cancun, Mexico, September 1998.

284. "Probing the Invisible at Electrically Active Interfaces," Cal Tech, Pasadena, CA, October 1998.

285. "Electron Microscopy of Nanostructured Materials," Plenary Lecture, Bi-annual Meeting of the Brazilian Society for Electron Microscopy, Brazil, October 1998.

286. "Analytical Electron Microscopy of Interfaces," Keynote Lecture, Bi-annual Meeting of the Brazilian Society for Electron Microscopy, Brazil, October 1998.

**1997**

287. "AEM of Interfaces," Arizona State University, Tempe, AZ, January 1997.

288. "Crack Propagation in DSEs: Experimental and Simulations," NIST, Gaithersburg, MD, January 1997.

289. "Electrically Active Interfaces in Ceramics," Case Western Reserve University, Cleveland, OH, February 1997.

290. "Interfaces in DSE's of Oxides," Wright-Patterson Air Force Laboratories, Dayton, OH, March 1997.

291. "Introduction to Scanning Microscopy," Annual Meeting of Scanning Microscopy, Chicago, IL, May 1997.

292. "Valence Band EELS," Annual Meeting of Scanning Microscopy, Chicago, IL, May 1997.

293. "Electron Spectroscopy and Holography of Interfaces," Microscopy Society of America Annual Meeting, Cleveland, OH, August 1997.

294. "EBSD in a Cold FEG SEM," Microscopy Society of America Annual Meeting, Cleveland, OH, August 1997.

295. "Statics and Dynamics of Electroceramics," University of Illinois at Urbana-Champaign, Urbana, IL, September 1997.
296. "Hierarchy of Length-Scale Influence in Crack Propagation in Oxide Composites," ASM/TMS Special Symposium, Indianapolis, IN, September 1997.
297. "Interfaces in Electroceramics," MSE Colloquium, Carnegie Mellon University, Pittsburgh, PA, September 1997.
298. "In-Situ Electron Microscopy," Annual Meeting of MRS, Boston, MA, November, 1997.
299. "Dynamics of Electrically Active Interfaces," MRS Annual Meeting, Boston, MA, November 1997.
300. "Seeing the Invisible: Electron Holography of Charged Interfaces," Cavendish Laboratory, Cambridge University, Cambridge, England, December 1997.
301. "Analytical Electron Microscopy in Materials Science," Indian Institute of Science, Bangalore, India, December 1997.

#### **1996**

302. "Length-Scales and Structure-Property Relationships for Internal Interfaces in Oxides," High Temperature Materials Laboratory (HTML), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, February 1996.
303. "Advanced Electron Microscopy of Interfaces and Interfacial Phenomena in Oxides," University of Wisconsin, Milwaukee, WI, April 1996.
304. "Electron Spectroscopy and Holography of Oxide Interfaces," Frontiers of Electron Microscopy in Materials Science, Oak Brook, IL, June 1996.
305. "Sensitivity and Resolution in EBSD/OIM with a cFEG SEM," Frontiers of Electron Microscopy in Materials Science, Oak Brook, IL, June 1996.
306. "EBSD/OIM with cFEG SEM: Yes it is possible!" Microscopy Society of America, Minneapolis, MN, August, 1996.

#### **1995**

307. "Electroceramic Interfaces," IBM T.J. Watson Research Center, NY, February 1995.
308. "Direct Determination of Structure-Property Relationship for Functional Electroceramic Interfaces," Argonne National Laboratory (ANL), Lemont, IL, March 1995.
309. "High Spatial Resolution Spectroscopy of Internal Interfaces," Max Planck Institute Invited Workshop, Ringberg Castle, Germany, April 1995.
310. "Microanalysis at High Spatial Resolution across Internal Interfaces," Microscopy Society of America Annual Meeting, Cincinnati, August 1995.
311. "Direct Determination of Spatially Varying Potential and Charge across Electroceramic Interfaces," Gordon Research Conference on Solid State Studies in Ceramics, Meriden, NH, August 1995.

#### **1994**

312. "Microscopy and Spectroscopy of Ionic Interfaces," Invited Workshop on Ionic Interfaces, Max-Planck Institute, Ringberg Castle, Germany, March 1994.
313. "Dielectric Function and Electronic Structure of Oxide Superconductors." Bhabha Atomic Research Center (BARC) Bombay, India, March 1994.
314. "Synthesis, Characterization and Properties of Buckytubes," Annual Electrochemical Society Meeting, San Francisco, CA, May 1994.
315. "Transmission EELS in Materials Science," EELSI-94 Invited Conference, Leukerbad, Switzerland, July 1994.

316. "Electron Spectroscopy and Interferometry of Electronic Ceramics," Microscopy Society of America, New Orleans, LA, July 1994.
317. "Electron Interferometry and Holography of Real Materials," First International Conference on Electron Holography, Knoxville, TN, August 1994.
318. "Analytical Electron Microscopy in Ceramics Science," Materials Science & Engineering Seminar Series, University of Illinois--Urbana-Champaign, Urbana, IL, October 1994.
319. "Electron Spectroscopy and Holography of Electroceramic Interfaces," MRS Fall Meeting, Boston, MA, November 1994.
320. "Towards Structure-Property Relationship for Electroceramic Interfaces," NIST, Gaithersburg, MD, December 1994.
321. "Interphase Interfaces in Structural Eutectics," General Electric, Corporate R & D, Schenectady, NY, December 1994.

### **1993**

322. "Atomic Structure of Interphase Interfaces in Oxides," Cornell University, Ithaca, NY, September 1993.
323. "Bicrystallography and Plan-View CBED," MSA (EMSA) 93, Cincinnati, OH, August 1993.
324. "Electron Spectroscopy of Internal Interfaces in Ceramics: A Status Update and Forecast," MSA (EMSA) 93, Cincinnati, OH, August 1993.
325. "Electron Holography of Internal Interfaces in Electroceramics: Fact or Fiction?" MSA (EMSA) 93, Cincinnati, OH, August 1993.
326. "Artifacts in AEM of Interfaces: From Specimen Preparation to Data Analysis," Great Lakes EM Society Association (GLEMA), Indianapolis, October 1993.
327. "Analytical Electron Microscopy in Catalysis Research," Amoco R & D, Naperville, IL, July 1993.

### **1992**

328. "High Spatial and Energy Resolution EELS with the HF-2000 ARAEM." First ORNL/UT Workshop on Coherent Beam Electron Microscopy, Knoxville, TN, June 1992.
329. "Atomic Resolution Analytical Electron Microscopy and Electron Holography: Implications for Materials Science," Laboratoire de Chimie des Solides, Universite de Paris-Sud, Orsay, FRANCE, July 1992.
330. "High Spatial and Energy Resolution Analytical Electron Microscopy," First International Symposium on Quantitative Electron Microscopy, National Center for Electron Microscopy, Lawrence Berkeley Laboratory, Berkeley, CA, August 1992.
331. "Space-Group Determination by CBED: G-M Lines, Crosses and HOLZ Interactions," EMSA Annual Meeting, Boston, MA, August 1992.
332. "Determination of Electronic Structure of Oxides by EELS," Workshop on Grain Boundaries in High Tc Superconductors, University of Wisconsin-Madison, Madison, WI, September 1992.
333. "Role of ARAEM in Interface Analysis of High Technology Materials," Wright-Patterson Air Force Laboratory, Dayton, OH, October, 1992.
334. "Electrons' Eyeview of Bucky-Balls, Tubes, Toroids and Whatever Comes Next," ASM/TMS Annual Meeting, Chicago, IL, Nov. 1992.
335. "A Journey into the Nanoworld of Buckytubes and Friends," MRS Annual Meeting, Boston, MA, November 1992.

### **1991**

336. "Progress in Analytical Electron Microscopy of Materials," Argonne National Laboratory (ANL), Lemont, IL, March 1991.

- 337.** "High Resolution and Analytical TEM Studies of Relaxation of Interfaces in Directionally Solidified Eutectics," Center for Solid State Science, Arizona State University, Tempe, AZ, July 1991.
- 338.** "Electron Microscopy Research at Northwestern University," Mid-West Society of Electron Microscopists Annual Meeting, Chicago, IL, May 1991.
- 339.** "Transmission EELS of Hole Formation and Charge Transfer in Oxide Superconductors," Bulk Properties and Critical Currents in Oxide Superconductors Symposia, Argonne National Laboratory (ANL), Lemont, IL, March 1991.