

NITIN P. PADTURE

School of Engineering, Brown University
184 Hope Street, Box D, Barus & Holley Building, Room 608
Providence, RI 02912, USA

Phone: (401)863-2859 FAX (401)863-9025 Email: nitin_padtur@brown.edu

Website: <https://vivo.brown.edu/display/npadtur>

EDUCATION

- **Ph.D.**, Materials Science and Engineering, Lehigh University, Bethlehem, PA, 1991
- **M.S.**, Ceramic Engineering, Alfred University, Alfred, NY, 1987
- **B.Tech.**, Metallurgical Engineering, Indian Institute of Technology, Bombay, 1985

APPOINTMENTS

- **Brown University**, Providence, RI
 - **Otis E. Randall University Professor**, July 2017 - present
 - **Professor**, Materials Science, School of Engineering, January 2012 - present
 - **Director (Founding)**, Initiative for Sustainable Energy, January 2023 - present
 - **Director**, Institute for Molecular & Nanoscale Innovation, January 2014 - June 2021
 - **Visiting Professor**, Department of Physics, Indian Institute of Science, Research, and Education, Pune, India, September - December 2018 (sabbatical leave)
 - **Director**, Center for Advanced Materials Research, July 2012 - June 2014
- **The Ohio State University**, Columbus, OH
 - **College of Engineering Distinguished Professor**, Department of Materials Science & Engineering, January 2009 - December 2011
 - **Director (Founding)**, Center for Emergent Materials, a National Science Foundation (NSF) funded Materials Research Science & Engineering Center (MRSEC), September 2008 - September 2011
 - **Professor (Courtesy Appointment)**, Department of Physics, September 2008 - September 2011
 - **Professor**, Department of Materials Science & Engineering, January 2005 - December 2011
- **University of Connecticut**, Storrs, CT
 - **Professor**, Department of Metallurgy & Materials Engineering, August 2003 - January 2005
 - **Interim Department Head**, Department of Metallurgy & Materials Engineering, June 2003 - June 2004
 - **Visiting Associate Professor**, Materials Department, University of California, Santa Barbara, CA, January - July 2001 (sabbatical leave)
 - **Associate Professor**, Department of Metallurgy & Materials Engineering, August 1998 - August 2003
 - **Assistant Professor**, Department of Metallurgy & Materials Engineering, January 1995 - August 1998
- **National Institute of Standards and Technology (NIST)**, Gaithersburg, MD
 - **Postdoctoral Fellow**, Materials & Engineering Laboratory, August 1991 - December 1994 (Supervisor: Dr. Brian R. Lawn)

MAJOR AWARDS AND DISTINCTIONS

- **Fellow, Materials Research Society**, “for sustained and distinguished contributions to materials research in the areas of advanced composites, high-temperature coatings, and emerging photovoltaics, and outstanding leadership and service to the broader materials community,” 2023
- **Presidential Faculty Award**, “in recognition of a Brown University faculty member who is conducting especially important and innovative scholarship,” Brown University, 2021
- **Otis E. Randall University Professor Endowed Chair**, Brown University, 2017
- **Distinguished Alumnus Award**, “for excellent contributions in materials research and education,” Indian Institute of Technology, Bombay, 2017
- **Distinguished Service Award**, “for outstanding contributions towards the progress of the Institute,” Indian Institute of Technology, Bombay, 2012
- **College of Engineering Distinguished Professorship**, The Ohio State University, 2009
- **Fellow, American Association for the Advancement of Science**, “for outstanding contributions to the field of advanced ceramics and nanomaterials, particularly for understanding of processing and mechanical behavior of ceramic composites/coatings,” 2008
- **Richard M. Fulrath Award**, “for technical contributions relating to processing and characterization of advanced ceramics,” American Ceramic Society, 2007
- **Fellow, American Ceramic Society**, “for notable contributions to ceramic sciences,” 2005
- **Robert L. Coble Award for Young Scholars**, “for outstanding contributions to the understanding and education of the mechanical behavior of ceramics and composites,” American Ceramic Society, 1998
- **Outstanding Junior Faculty Award**, “for outstanding scholarly achievements and sustained professional growth,” School of Engineering, University of Connecticut, 1998
- **Olin Junior Faculty Development Award**, Olin Corporation, 1998
- **ONR Young Investigator Award Grant**, “for exceptional promise for doing creative research and teaching,” Office of Naval Research, 1996
- **Roland B. Snow Award**, “for best of the ceramographic exhibit,” American Ceramic Society, 1990
- **Notable Lectures:**
 - Keynote Lecture, 23rd International Conference on Solid State Ionics (SSI-23), Boston, MA 2022
 - Presidential Faculty Award Public Lecture, Brown University, 2021 ([YouTube recording](#))
 - Keynote Lecture, 22nd International Conference on Solid State Ionics (SSI-22), Pyeongchang, S. Korea, 2019
 - Opening Plenary Lecture, 8th International Coatings Symposium, Tsukuba, Japan, 2018
 - Keynote Lecture, 46th IUPAC World Chemistry Congress, São Paulo, Brazil, 2017
 - Opening Plenary Lecture, ThinFilms 2016 Conference, Singapore, 2016
 - Institute Colloquium, Indian Institute of Technology, Bombay, India, 2016
 - Inaugural Lecture, Provost’s Lecture Series, Brown University, 2016
 - Invited Speaker, National Science Foundation Workshops on Fundamental Research Needs in Ceramics, Arlington, VA, 2016
 - Plenary Lecture, 9th International Conference on High-Performance Ceramics, Guilin, China, 2015

- Keynote Lecture, 14th International European Ceramic Society Conference, Toledo, Spain, 2015
- Opening Plenary Lecture, 54th Annual Congress of the Spanish Ceramic Society, Badajoz, Spain, 2014
- Keynote Lecture, 5th International Congress on Ceramics, Beijing, China, August 2014
- Opening Plenary Lecture, IVth Portuguese-Spanish Congress on Ceramics and Glasses, Aveiro, Portugal, 2011
- Keynote Lecture, European Congress on Advanced Materials and Processes EUROMAT Glasgow, United Kingdom, 2009
- Keynote Lecture, Richard M. Fulrath Award Symposium, MS&T '07 Conference, Detroit, MI, 2007
- Invited Speaker, Gordon Research Conferences, 2001, 2016, and 2018
- Invited Speaker, National Science Foundation Workshops on Fundamental Research Needs in Ceramics, Arlington, VA, 1997

CURRENT RESEARCH INTERESTS

Research interests are in the broad areas of renewable energy and energy efficiency. Specific current topics include the science and engineering of:

- halide perovskite solar cells and modules: synthesis/processing, characterization, properties, device-fabrication, stability, and mechanical reliability;
- high-temperature advanced structural ceramics, composites, and coatings for high-efficiency, fuel-flexible gas-turbine engines for electricity generation and aircraft propulsion.

CURRENT TEACHING INTERESTS

- Introductory Materials Science and Engineering
- Science and Engineering of Composite Materials
- Mechanical Behavior of Materials

PUBLICATIONS*

- 256 refereed-journal papers published, ~5 manuscripts in-preparation or submitted
- 11 conference proceedings and preprints
- 8 patents awarded (7 *United States* and 1 *European*), and 3 patents pending
- 4 invited book chapters

CITATIONS AND IMPACT§

- 94 Google Scholar *h*-Index (94 publications with at least 94 citations each)
- 34,000 Google Scholar citations in total
- ~110 average citations/publication
- 85 publications with 100+ citations each
- Most number of citations for a publication: 4,870

PRESENTATIONS*

- 267 invited/keynote/plenary talks (95 international)

* Please see Supplementary Information section for details.

§ [Google Scholar profile](#)

- 200+ contributed talks and posters at professional conferences

RESEARCH FUNDING RECORD (1995 - present)

- PI or co-PI on Total External Grants: ~\$40 million
- Total N.P. Padture Share of External Grants: ~\$15 million
- Current External Research Grants:
 - N.P. Padture (PI), J.J. Berry (co-PI), K. Zhu (co-PI); “Innovative Interfacial Engineering for Simultaneous Enhancement in Efficiency, Stability, and Reliability in Perovskite Solar Devices;” Department of Energy (Solar Energy Technology Office); \$1,500,000; 36 months.
 - N.P. Padture (PI) “Grain-Boundary Phenomena in Halide-Perovskite Thin Films and Solar Cells;” Office of Naval Research; \$480,000; 42 months.
 - N.P. Padture (PI); “Emergent Opto-Mechanical and Electro-Mechanical Coupled Behavior of Halide Perovskites;” National Science Foundation (Division of Materials Research); \$480,000; 36 months.
 - N.P. Padture (PI); “Synergistic Effects in the Environmental Degradation of Ceramic Coatings in Gas-Turbine Engines and its Mitigation;” Office of Naval Research; \$480,000; 36 months.
 - N.P. Padture (PI); “Durable, Multifunctional, Thermal Barrier Coatings for Marine Gas Turbines;” ReliaCoat LLC (Office of Naval Research STTR Subcontract); \$306,000; 36 months.
 - N.P. Padture (PI) “Acquisition of a Photoluminescence Micro-Spectrometer;” Department of Defense (Defense University Research Instrumentation Program); \$245,000; 12 months.
 - B.W. Sheldon (PI), N.P. Padture (co-PI), J. Luo (co-PI), H. Gao (co-PI); “Toughening Mechanisms in Ceramic Nanocomposites;” Department of Energy (Basic Energy Sciences); \$750,000; 36 months.

MAJOR PROFESSIONAL ACTIVITIES AND SERVICE

- **Member:**
 - American Ceramic Society (since 1985); Fellow (since 2005)
 - American Association for Advancement of Science (since 2002); Fellow (since 2008)
 - Materials Research Society (since 1989); Fellow (since 2023)
- **Editor:** *Acta Materialia* (Impact Factor: 9.209; ~150 manuscripts/year), 2017 - present
- **Editor:** *Scripta Materialia* (Impact Factor: 6.302; ~150 manuscripts/year), 2012 - present
- **Editor:** *Acta Materialia Book Series*, 2021 - present
- **Editorial Advisory Board Member:** *EcoMat* (Impact Factor: 12.213), 2019 - present
- **Editorial Advisory Board Member:** *ACS Energy Letters* (Impact Factor: 23.991), 2021 - present
- **Principal Editor:** *Journal of Materials Research*, 2002 - 2012
- **Associate Editor:** *Journal of the American Ceramic Society*, 1998 - 2012
- **Guest Co-Editor:** *Materials Research Society Bulletin*, October 2024 theme issue on “Perovskite Solar Photovoltaics” with J.J. Berry and E. Ungar (in progress)
- **Guest Co-Editor:** *Physical Chemistry Chemical Physics*, October 2016 theme issue on

- “Hybrid Perovskite Materials and Solar Cells” with S.I. Seok and A. Walsh
- **Guest Co-Editor:** *Materials Research Society Bulletin*, October 2012 theme issue on “Thermal Barrier Coatings” with D.R. Clarke and M. Oechsner
- **Co-Editor:** “Coatings 2005,” Proceedings of MS&T Meeting, Pittsburgh, PA, 2005
- **Co-Editor:** “Thermal Barrier Coatings,” Symp. Proc. MRS Fall Meeting, Boston, MA, 2000
- **Member:** Publications Committee, the American Ceramic Society, 2014 - 2019
- **Ad Hoc Reviewer for 60+ Journals**

- **Lead Co-Organizer:** “Workshop on Sustainable Energy,” Brown University, Providence, RI, 2023
- **Co-Organizer:** “Workshop on Ceramic Materials in Extreme Environments: New Processing Tools and Data-Driven Approaches (virtual),” MRS/ACerS, 2023
- **Lead Co-Organizer:** “nanoGe Fall Meeting (Virtual),” Fundació Scito, 2021
- **Organizer:** “International Materials Symposium,” Brown University, Providence, RI, 2018
- **Lead Co-Organizer:** “International Workshop on Mechanics-Based Design of Advanced Materials,” Perth, Australia, 2008
- **Lead Co-Organizer:** “Coatings 2005” Symposium, MS&T Meeting, Pittsburgh, PA, 2005
- **Lead Co-Organizer:** “Thermal Barrier Coatings” Symposium, MRS Fall Meeting, Boston, MA, 2000
- **Co-Organizer:** “Materials Genome Initiative,” Brown University, Providence, RI, 2012
- **Co-Organizer:** “Solution Process Technology of Inorganic Films, Nanostructures and Functional Materials” Symposium, ICMAT, Singapore, 2011
- **Co-Organizer:** “International Workshop on Novel Magnetic Materials,” Dresden, Germany, 2010
- **Co-Organizer:** “Advanced Ceramic Coatings: Processing, Properties, and Applications” Symposium, PACRIM 8, Vancouver, Canada, 2009
- **Organizer:** “Nano Ceramics,” ACerS Annual Meeting, Indianapolis, IN, 1996
- **Organizer:** “*In Situ* Toughened Materials,” ACerS Fall Meeting, New Orleans, LA, 1995
- **Program Co-Chair:** Basic Science Division, ACerS Annual Meeting, Indianapolis, IN, 2001
- **Program Co-Chair:** Basic Science Division, ACerS Fall Meeting, San Francisco, CA, 2000
- **Member:** International Advisory Committee, Thermal Barrier Coatings VI, Engineering Conferences International, Irsee, Germany, 2022
- **Member:** International Advisory Board, International Conferences Materials and Technologies (CIMTEC 2020), Montecatini Terme, Italy, 2020
- **Member:** Scientific Advisory Committee, 12th International Summit on Organic and Hybrid Solar Cell Stability (ISOS-12), Karlsruhe, Germany, 2019
- **Member:** Program Committee, Solid State Ionics-22, PyeongChang, S. Korea, 2019
- **Member:** International Advisory Board, International Conferences Materials and Technologies (CIMTEC 2018), Salsomaggiore Terme, Italy, 2018
- **Member:** International Advisory Committee, Thermal Barrier Coatings V, Engineering Conferences International, Irsee, Germany, 2018
- **Member:** International Advisory Committee, E-MRS Fall Meeting, Warsaw, Poland, 2012

- **Member:** International Advisory Committee, Thermal Barrier Coatings III, Engineering Conferences International, Irsee, Germany, 2011
- **Member:** International Advisory Board, International Conferences Materials and Technologies (CIMTEC 2010), Montecatini Terme, Italy, 2010
- **Member:** International Scientific Advisory Committee, 3rd International Congress on Ceramics (ICC3), Osaka, Japan, 2010
- **Member:** International Advisory Committee, Thermal Barrier Coatings II, Engineering Conferences International, Irsee, Germany, 2007
- **Member:** International Advisory Board, International Symposium on Advanced Ceramics and Technology for Sustainable Energy Applications, Kenting, Taiwan, 2007
- **Member:** International Advisory Board, EnCera04 Conference, Osaka, Japan, 2004
- **Member:** Executive Committee, Basic Science Division, American Ceramic Society, 1998 - 2002
- **Discussion Leader:** Gordon Research Conference, Solid State Studies in Ceramics, New London, NH, 2010
- **Session Chair:** Chaired ~60 technical sessions at various professional conferences
- **Reviewer for Proposals:** Air Force Office of Scientific Research, Australian Research Council, Austrian Science Fund, Volkswagen Foundation, Civilian Research and Development Foundation, Department of Energy, National Institutes of Health, National Science Foundation
- **Review Panel/Site-Visit Member:** Department of Energy, National Science Foundation, Austrian Science Fund
- **Commissioner:** Atomic Energy Commission, State of Rhode Island, 2015 - 2020
- **Member:** External Advisory Board, Carnegie Mellon University NSF Materials Research Science & Engineering Center (MRSEC), 2009 - 2014

Service at Brown University

- **Founding Director:** Initiative for Sustainable Energy (ISE), 2023 - present
- **Chair:** School of Engineering Faculty Search Committee, 2023 - present
- **Director:** Institute for Molecular and Nanoscale Innovation (IMNI), 2014 - 2021
- **Director:** Center for Advanced Materials Research, 2012 - 2014
- **Director:** NanoTools Core Research Facility, 2014 - 2021
- **Chair:** ISE Executive Committee, 2023 - present
- **Chair:** Physical Sciences Core Research Infrastructure Committee, 2017 - 2021
- **Chair:** Engineering New Building Laboratory Strategy & Design Committee, 2014 - 2017
- **Chair:** IMNI Executive Committee, 2014 - 2021
- **Member:** Office of Research Integrity Committee, 2020 - present
- **Member:** School of Engineering Executive Committee, 2012 - 2013; 2023 - present
- **Member:** University Core Research Infrastructure Executive Committee, 2017 - 2021
- **Member:** Engineering New Building Relocation Committee, 2015 - 2018

- **Member:** Provost's Committee on Chairs & Directors Communications, 2016 - 2017
- **Member:** School of Engineering Faculty Search Committee, 2012
- **Member:** School of Engineering Associate Dean Search Committee, 2012
- **Member:** School of Engineering Graduate Committee, 2012
- **Advisor:** School of Engineering Honors Program, 2022 – 2023

Service at The Ohio State University

- **Founding Director:** Materials Research Science & Engineering Center (MRSEC), 2008 - 11
- **Chair:** MRSEC Executive Committee, 2008 - 11
- **Chair:** Departmental Faculty Search Committee, 2006 - 07
- **Member:** Executive Committee, OSU Materials Week Conferences, 2008 - 11
- **Member:** Departmental Laboratory and Facilities Committee, 2005 - 06
- **Member:** Departmental Outreach Team, 2006 - 08
- **Member:** Departmental Graduate Studies Committee, 2006 - 11
- **Member:** Departmental Long-Range Planning Team, 2005 - 11
- **Member:** Departmental Chair's Advisory Council, 2008 - 11
- **Member:** College of Engineering Research Planning Committee, 2005 - 11

Service at University of Connecticut

- **Interim Department Head:** Department of Materials Science & Engineering, 2003 - 2004
- **Chair:** Departmental Alumni Relations and Awards Committee, 2003 - 04
- **Chair:** Departmental Undergraduate Program Committee, 2001 - 02
- **Chair:** Departmental Faculty Search Committees, 1999 - 2000; 2002 - 03
- **Chair:** Departmental Graduate Program Committee, 1998 - 2000; 2001 - 03
- **Chair:** Departmental Colloquium Committee, 1995 - 96
- **Member:** School of Engineering Academic Council, 2003 - 04
- **Member:** Institute of Materials Science Faculty Advisory Committee, 2003 - 04
- **Member:** Departmental Promotion, Tenure & Reappointment Committee, 2004 - 05
- **Member:** Departmental Faculty Search Committees, 1998 - 99, 2001
- **Member:** School of Engineering Graduate Committee, 1998 - 2001
- **Member:** School of Engineering Department-Head Evaluation Committee, 2001
- **Member:** School of Engineering Department-Head Search Committee, 1998
- **Faculty Advisor:** Materials Research Society Student Chapter at the University of Connecticut (1995 - 2004)

Supplementary Information

LIST OF RESEARCH ADVISEES

Current Advisees

Ph.D.

- Ms. Meaghan Doyle
- Ms. Madhuj Layek
- Mr. Christopher Louzon
- Mr. Anush Ranka

B.S. (Research)

- Mr. Kyumin Kim
- Ms. Madison Dodd

Post-Doctoral Scholars

- Dr. (Mr.) Zhenghong Dai
- Dr. (Mr.) In Seok Yang
- Dr. (Ms.) Cristina López-Pernía

Staff

- Dr. (Mr.) Hector F. Garces

Past Advisees

M.S. (Thesis)

- Dr. (Mr.) David C. Pender, M.S. 1997; Employer: Viridian Glass, Macquaire Links, Australia
- Mr. Hui Ye, M.S. 1997; Employer: Ingageapp, Beijing, China
- Mr. Robert P. Jensen, M.S. 1998; Employer: Taniobis GmbH, Needham, MA
- Dr. (Ms.) Huiwen Xu, M.S. 1999; Employer: Applied Materials, Santa Clara, CA
- Dr. (Ms.) Swarnima Deshpande, M.S. 1999; Employer: unknown
- Mr. Shixiao Zhou, M.S. 1999; Employer: unknown
- Mr. Scott C. Thompson, M.S. 2001; Employer: CoorsTek, Golden, CO
- Ms. Anjali Pandit, M.S. 2002; Employer: University of Nottingham, UK
- Mr. Pavitra Bansal, M.S. 2002; Employer: Engr. Analysis Services, Nottingham, UK
- Ms. Xiaotong Wang, M.S. 2004; Employer: Intel, Chandler, AZ
- Mr. Jason Tresback, M.S. 2005 and M.S. 2008; Employer: Harvard Univ., Cambridge, MA
- Ms. Rebecca Cochran, M.S. 2006; Employer: Owens-Corning, Granville, OH
- Dr. (Mr.) Andrew Gledhill, M.S. 2006; Employer: Diamond Innovations, Worthington, OH
- Dr. (Ms.) Tengfei Jiang, M.S. 2009; Employer: University of Central Florida, Orlando, FL (Assistant Professor)
- Ms. Caitlin Toohey, M.S. 2011; Employer: Portland Public Schools, Portland, OR
- Dr. (Ms.) Yu Liu, Sc.M. 2016; Employer: The Climate Corporation, San Francisco, CA (Technical Staff)



- Mr. Connor Watts, Sc.M. 2019; Employer: U.S. Naval Reactors HQ, Washington DC
- Mr. Ruibang Yi, Sc.M. 2023; Employer: Georgia Institute of Technology (Ph.D. Student)

Ph.D.

- Dr. (Ms.) Juthamas ‘June’ Jitcharoen, Ph.D. 1999
Thesis Title: “Contact-Damage Resistance in Alumina Based Ceramics with Elastic-Modulus-Graded Surfaces”
Employer: Ubon Ratchathani University, Thailand (Professor and Vice President)
- Dr. (Mr.) David C. Pender, Ph.D. 1999
Thesis Title: “Ceramics with Graded Surfaces for Contact Damage Resistance”
Employer: Viridian Glass, Macquaire Links, Australia (General Manager)
- Dr. (Mr.) Kevin W. Schlichting, Ph.D. 2000
Thesis Title: “Failure Modes in Plasma-Sprayed Thermal Barrier Coatings”
Employer: Pratt & Whitney, East Hartford, CT (Associate Director)
- Dr. (Ms.) Jie Wu, Ph.D. 2004
Thesis Title: “Novel Low-Thermal Conductivity Ceramics for Thermal Barrier Coatings”
Employer: Kennametal, Pittsburgh, PA (Senior Technical Staff)
- Dr. (Mr.) Xuezheng Wei, Ph.D. 2004
Thesis Title: “Hydrothermal Synthesis of Barium Strontium Titanate (BST) Powders, and Continuous and Patterned Thin Films”
Employer: Schlumberger, Huston, TX (Senior Technical Staff)
- Dr. (Mr.) Amol D. Jadhav, Ph.D. 2007
Thesis Title: “Processing, Characterization, and Properties of Thermal Barrier Coatings”
Employer: AMD, Santa Clara, CA (Principal Member of Technical Staff)
- Dr. (Ms.) Aysegul Aygun, Ph.D. 2008
Thesis Title: “Novel Thermal Barrier Coatings (TBCs) that are Resistant to High-Temperature Attack by CaO-MgO-Al₂O₃-SiO₂ (CMAS) Glassy Deposits”
Employer: EAG Laboratories, San Jose, CA (Senior Technical Staff)
- Dr. (Mr.) Edward D. Herderick, Ph.D. 2009 IGERT Fellow
Thesis Title: “Synthesis, Characterization, and Property-Measurements of Novel Metal-Oxide-Metal Heterojunction Nanowires with Ferroelectric Functionality”
Employer: The Ohio State University, Columbus, OH (Center Executive Director)
- Dr. (Ms.) Julie R. Drexler, Ph.D. 2011
Thesis Title: “Thermal Barrier Coatings Resistant to Glassy Deposits”
Employer: Boeing, Everett, WA (Technical Staff)
- Dr. (Mr.) Andrew D. Gledhill, Ph.D. 2011
Thesis Title: “Thermal Barrier Coatings Chemo-Mechanically Resistant to Molten Ashes”
Employer: Diamond Innovations, Worthington, OH (Technical Staff)
- Dr. (Mr.) Yuanyuan ‘Alvin’ Zhou, Ph.D. 2016
Thesis Title: “Solution Crystallization, Microstructural Characterization, and Photovoltaic Performance of Trihalide Perovskites” [**Outstanding Thesis Award**]
Employer: Hong Kong Baptist University, Hong Kong (Assistant Professor)
- Dr. (Ms.) Amanda R. Krause, Ph.D. 2016 GAANN Fellow
Thesis Title: “Degradation and Mitigation Mechanisms of Molten Silicate Deposits in Thermal and Environmental Barrier Coatings” [**Outstanding Teaching Assistant Award**]

Employer: Carnegie Mellon University, Pittsburgh, PA (Assistant Professor)

- Dr. (Mr.) Lin Zhang, Ph.D. 2017
Thesis Title: “Processing, Mechanical Properties, and Oxidation Behavior of Ultra-High Temperature Ceramic Composites”
Employer: St. Gobain, China (Technical Staff)
- Dr. (Ms.) Laura R. Turcer, Ph.D. 2020 Hibbitt Fellow
Thesis Title: “Next-Generation Thermal/Environmental Barrier Coatings for Ceramic-Matrix Composites” [**Outstanding Teaching Assistant Award**]
Employer: Saint-Gobain Ceramics, Northborough, MA (Technical Staff)
- Dr. (Mr.) Srinivas K. Yadavalli, Ph.D. 2021
Thesis Title: “Grain-Boundary Studies and Mechanical Behavior of Halide Perovskites for Solar Cells”
Employer: University of Michigan, Ann Arbor, MI (Postdoctoral Researcher)
- Dr. (Mr.) Qizhong Wang, Ph.D. 2021
Thesis Title: “Processing and Mechanical Behavior of Nanocomposites of Ceramics and Carbon-Nanostructures”
Employer: QuantumScape, San Jose, CA (Technical Staff)
- Dr. (Mr.) Min Chen, Ph.D. 2021
Thesis Title: “The Exploration of Lead-Free Halide Perovskite Materials for Solar Cells” [**Outstanding Thesis Award**]
Employer: National Renewable Energy Laboratory, Golden, CO (Postdoctoral Researcher)
- Dr. (Mr.) Zhenghong ‘John’ Dai, Ph.D. 2022
Thesis Title: “Mechanical Behavior of Metal Halide Perovskites for Solar Cell Reliability” [**Outstanding Thesis Award; Findley Award for Best Paper**]
Employer: Brown University, Providence, RI (Postdoctoral Researcher)

Post-Doctoral Researchers

- Dr. (Mr.) Vijay V. Pujar, 1996-98; Employer: UTC Aerospace Systems, San Diego, CA (Technical Fellow)
- Dr. (Ms.) Tania (Bhatia) Kashyap, 1999-2002; Employer: Pratt & Whitney, East Hartford, CT (Senior Director)
- Dr. (Mr.) Fang Wu, 2002-03; Employer: Chengdu University, China (Research Associate)
- Dr. (Mr.) Jing-Jong Shyue, 2005-06; Employer: Academia Sinica and National Taiwan University, Taiwan (Professor)
- Dr. (Ms.) Rosalía Poyato, 2004-06 Fulbright Ramon y Cajal Scholar; Employer: CSIC Institute for Materials Science and University of Seville, Spain (Senior Staff)
- Dr. (Mr.) Sung Sic Hwang, 2005-06 Korean Government Scholar; Employer: SKC Solmics, S. Korea (Director of R&D)
- Dr. (Mr.) Alexander L. Vasiliev, 2004-07; Employer: Kurchatov Institute, Russia (Division Head)
- Dr. (Mr.) Michael D. Rauscher, 2008; Employer: Cornerstone Research Group, Dayton, OH (Technical Staff)
- Dr. (Ms.) Dongsheng Li, 2007-09; Employer: Pacific Northwest National Laboratory, Richland, WA (Senior Staff)
- Dr. (Mr.) Chun-hu Chen, 2010-12; Employer: National Sun Yat-sen University, Taiwan

(Professor)

- Dr. (Mr.) Kongara M. Reddy, 2008-12; Employer: Boise State University, Boise, ID (Research Associate)
- Dr. (Ms.) Bilge S. Senturk, 2012-14; Employer: unknown
- Dr. (Ms.) Wenwen Wu, 2013-14; Employer: Shaanxi Normal University, China (Professor)
- Dr. (Mr.) Onkar Game, 2015-17; Employer: Indian Institute of Technology, Indore (Assistant Professor)
- Dr. (Ms.) Cristina Ramírez, 2015-17; Employer: Institute of Ceramics and Glass, Spain (Staff)
- Dr. (Mr.) Yi Zhang, 2017-18; Employer: Ecole Polytechnique Federal Lausanne, Switzerland (Postdoctoral Researcher)
- Dr. (Mr.) Hamidreza Khassaf, 2017-19; Employer: ASML, Wilton, CT (Senior Engineer)
- Dr. (Ms.) Anh Tran, 2018-19; Employer: unknown
- Dr. (Mr.) Jue Gong, 2018-19; Employer: University of Electronic and Science and Technology, China (Associate Professor)
- Dr. (Ms.) Hadas Sternlicht, 2018-21 Hibbitt Postdoctoral Fellow; Employer: Lawrence Berkeley National Laboratory, Berkeley, CA (Postdoctoral Researcher)
- Dr. (Mr.) Christos E. Athanasiou, 2018-22; Employer: Georgia Institute of Technology, Atlanta, GA (Assistant Professor)

Assistant Professor (Research)

- Dr. (Mr.) Yuanyuan ‘Alvin’ Zhou, Ph.D. 2016-20; Employer: Hong Kong Baptist University, Hong Kong (Assistant Professor)

Visiting International Scientists/Faculty/Students

- Prof. (Mr.) Angel L. Ortiz, 1999-2000, from Universidad de Extremadura, Spain
- Prof. (Mr.) Oscar Borrero, 2003-04; from Universidad de Extremadura, Spain
- Dr. (Mr.) Alexander Vasiliev, 2014-15, from Kruchatov Institute, Russia
- Mr. Xing Li (Ph.D. Student), 2014-15, from Beijing Institute of Technology, China
- Dr. (Ms.) Yingxia Zong (Ph.D. Student), 2016-18, from Qingdao University, China
- Dr. (Mr.) Tanghao Liu (Ph.D. Student), 2016-17, from Peking University, China
- Prof. Dan (Ms.) Liu, 2017-18, from Tianjin Polytechnic University, China
- Dr. (Mr.) Qingshun Dong (Ph.D. student), 2018-19; from Tsinghua University, China
- Dr. (Mr.) Mingyu Hu (Ph.D. Student), 2018-20, from Kunming University of Science & Technology, China
- Dr. (Ms.) Arundhati Sengupta (Postdoctoral Researcher), 2019-20; from Indian Institute for Science, Education & Research, India

LIST OF PUBLICATIONS

Refereed Journal Papers (¶ papers with 100+ citations each on Google Scholar)

1. N.P. Padture and L.D. Pye, “Crystallization Kinetics of a Glass in the Y_2O_3 - Fe_2O_3 - B_2O_3 System using Differential Thermal Analysis,” *Journal of Materials Science Letters*, **10**, 269-71 (1991).

- DOI: [10.1007/BF00735654](https://doi.org/10.1007/BF00735654)
2. N.P. Padture and L.D. Pye, "Glass Formation and Structure of Glasses in the Y_2O_3 - Fe_2O_3 - B_2O_3 System," *Glastechnische Berichte*, **64**, 128-36 (1991). [Link](#)
 3. N.P. Padture and H.M. Chan, "Influence of Grain Size and Degree of Crystallization of Intergranular Glassy Phase on the Mechanical Behaviour of a Debased Alumina," *Journal of Materials Science*, **29**, 2711-15 (1991).
DOI: [10.1007/BF02387741](https://doi.org/10.1007/BF02387741)
 4. S.J. Bennison, N.P. Padture, J.L. Runyan, and B.R. Lawn, "Flaw-Insensitive Ceramics," *Philosophical Magazine Letters*, **64**, 191-95 (1991).
DOI: [10.1080/09500839108214542](https://doi.org/10.1080/09500839108214542)
 5. N.P. Padture and H.M. Chan, "On the Constrained Crystallization of Synthetic Anorthite ($CaO \cdot Al_2O_3 \cdot 2SiO_2$)," *Journal of Materials Research*, **7**, 170-77 (1992).
DOI: [10.1017/S0884291400096837](https://doi.org/10.1017/S0884291400096837)
 6. N.P. Padture and H.M. Chan, "Improved Flaw Tolerance in Alumina Containing 1 vol% Anorthite via Crystallization of the Intergranular Glass," *Journal of the American Ceramic Society*, **75**, 1870-75 (1992).
DOI: [10.1111/j.1151-2916.1992.tb07210.x](https://doi.org/10.1111/j.1151-2916.1992.tb07210.x)
 7. N.P. Padture, "Postfailure Subsidiary Cracking from Indentation Flaws in Brittle Materials," *Journal of Materials Research*, **8**, 1411-17 (1993).
DOI: [10.1557/JMR.1993.1411](https://doi.org/10.1557/JMR.1993.1411)
 - ¶ 8. N.P. Padture, S.J. Bennison, and H.M. Chan, "Flaw-Tolerance and Crack-Resistance Properties of Alumina-Aluminum Titanate Composites with Tailored Microstructures," *Journal of the American Ceramic Society*, **76**, 2312-20 (1993).
DOI: [10.1111/j.1151-2916.1993.tb07770.x](https://doi.org/10.1111/j.1151-2916.1993.tb07770.x)
Times Cited: 123
 9. B.R. Lawn, N.P. Padture, L.M. Braun, and S.J. Bennison, "Model for Toughness-Curves in Two-Phase Ceramics: I, Basic Fracture Mechanics," *Journal of the American Ceramic Society*, **76**, 2235-40 (1993).
DOI: [10.1111/j.1151-2916.1993.tb07759.x](https://doi.org/10.1111/j.1151-2916.1993.tb07759.x)
 10. N.P. Padture, J.L. Runyan, S.J. Bennison, L.M. Braun, and B.R. Lawn "Model for Toughness-Curves in Two-Phase Ceramics: II, Microstructural Variables," *Journal of the American Ceramic Society*, **76**, 2241-47 (1993).
DOI: [10.1111/j.1151-2916.1993.tb07760.x](https://doi.org/10.1111/j.1151-2916.1993.tb07760.x)
 - ¶ 11. F. Guiberteau, N.P. Padture, H. Cai, and B.R. Lawn, "Indentation Fatigue: A Simple Cyclic Hertzian Test for Measuring Damage Accumulation in Polycrystalline Ceramics," *Philosophical Magazine, A* **68**, 1003-16 (1993).
DOI: [10.1080/01418619308219382](https://doi.org/10.1080/01418619308219382)
Times Cited: 214
 12. H. Cai, N.P. Padture, B.M. Hooks, and B.R. Lawn "Flaw Tolerance and Toughness-Curves in Two-Phase Particulate Composites: SiC/Glass System," *Journal of the European Ceramic Society*, **13**, 149-57 (1994).
DOI: [10.1016/0955-2219\(94\)90113-9](https://doi.org/10.1016/0955-2219(94)90113-9)
 13. C-F. Chen, M.E. Perisse, A.E. Ramirez, N.P. Padture, and H.M. Chan "Effect of Grain Boundary Phase on the Thermal Conductivity of Aluminum Nitride Ceramics," *Journal of Materials Science*, **29**, 1595-1600 (1994).
DOI: [10.1007/BF00368932](https://doi.org/10.1007/BF00368932)
 - ¶ 14. N.P. Padture, "In Situ-Toughened Silicon Carbide," *Journal of the American Ceramic Society*, **77**, 519-23 (1994).

- DOI: [10.1111/j.1151-2916.1994.tb07024.x](https://doi.org/10.1111/j.1151-2916.1994.tb07024.x)
Times Cited: 648
- ¶ 15. B.R. Lawn, N.P. Padture, H. Cai, and F. Guiberteau “Making Ceramics ‘Ductile’,” *Science*, **263**, 1114-16 (1994).
DOI: [10.1111/j.1151-2916.1994.tb07024.x](https://doi.org/10.1111/j.1151-2916.1994.tb07024.x)
Times Cited: 408
16. B.R. Lawn, N.P. Padture, F. Guiberteau, and H. Cai “A Model for Microcrack Initiation and Propagation Beneath Hertzian Contacts in Polycrystalline Ceramics,” *Acta Metallurgica et Materialia*, **42**, 1683-93 (1994).
DOI: [10.1016/0956-7151\(94\)90378-6](https://doi.org/10.1016/0956-7151(94)90378-6)
- ¶ 17. F. Guiberteau, N.P. Padture, and B.R. Lawn, “Effect of Grain Size on Hertzian Contact Damage in Alumina,” *Journal of the American Ceramic Society*, **77**, 1825-31 (1994).
DOI: [10.1111/j.1151-2916.1994.tb07057.x](https://doi.org/10.1111/j.1151-2916.1994.tb07057.x)
Times Cited: 302
- ¶ 18. N.P. Padture and B.R. Lawn, “Toughness Properties of a Silicon Carbide with an *in Situ* Induced Heterogeneous Grain Structure,” *Journal of the American Ceramic Society*, **77**, 2518-22 (1994).
DOI: [10.1111/j.1151-2916.1994.tb04637.x](https://doi.org/10.1111/j.1151-2916.1994.tb04637.x)
Times Cited: 331
- ¶ 19. N.P. Padture, C.J. Evans, H.H.K. Xu, and B.R. Lawn “Enhanced Machinability of a Silicon Carbide Ceramic via Microstructural Design,” *Journal of the American Ceramic Society*, **78**, 215-17 (1995).
DOI: [10.1111/j.1151-2916.1995.tb08386.x](https://doi.org/10.1111/j.1151-2916.1995.tb08386.x)
Times Cited: 118
- ¶ 20. H.H.K. Xu, L. Wei, N.P. Padture, B.R. Lawn, and R.L. Yeckley, “Effect of Microstructural Coarsening on Short-Crack Toughness Properties of Si₃N₄,” *Journal of Materials Science*, **30**, 869-78 (1995).
DOI: [10.1007/BF01178419](https://doi.org/10.1007/BF01178419)
Times Cited: 100
21. N.P. Padture and B.R. Lawn, “Fatigue in Ceramics with Interconnecting Weak Interfaces: A Study Using Cyclic Hertzian Contacts,” *Acta Metallurgica et Materialia*, **43**, 1609-17 (1995).
DOI: [10.1016/0956-7151\(94\)00384-T](https://doi.org/10.1016/0956-7151(94)00384-T)
- ¶ 22. N.P. Padture and B.R. Lawn “Contact Fatigue of a Silicon Carbide with a Heterogeneous Grain Structure,” *Journal of the American Ceramic Society*, **78**, 1431-38 (1995).
DOI: [10.1111/j.1151-2916.1995.tb08834.x](https://doi.org/10.1111/j.1151-2916.1995.tb08834.x)
Times Cited: 112
23. H.H.K. Xu, N.P. Padture, and S. Jahanmir, “Effect of Microstructure on Material-Removal Mechanisms and Damage Tolerance in Abrasive Machining of Silicon Carbide,” *Journal of the American Ceramic Society*, **78**, 2443-48 (1995).
DOI: [10.1111/j.1151-2916.1995.tb08683.x](https://doi.org/10.1111/j.1151-2916.1995.tb08683.x)
24. N.P. Padture, D.C. Pender, S. Wuttiaphan, and B.R. Lawn “*In Situ* Processing of Silicon Carbide Layered Structures,” *Journal of the American Ceramic Society*, **78**, 3160-62 (1995).
DOI: [10.1111/j.1151-2916.1995.tb09104.x](https://doi.org/10.1111/j.1151-2916.1995.tb09104.x)
- ¶ 25. L. An, H.M. Chan, N.P. Padture, and B.R. Lawn “Damage-Resistant Alumina-Based Layer Composites,” *Journal of Materials Research*, **11**, 204-10 (1996).
DOI: [10.1557/JMR.1996.0025](https://doi.org/10.1557/JMR.1996.0025)
Times Cited: 135

26. S. Wuttiphan, B.R. Lawn, and N.P. Padture “Crack Suppression in Strongly Bonded Homogeneous/Heterogeneous Laminates: A Study on Glass/Glass-Ceramic Bilayers,” *Journal of the American Ceramic Society*, **79**, 634-40 (1996).
DOI: [10.1111/j.1151-2916.1996.tb07922.x](https://doi.org/10.1111/j.1151-2916.1996.tb07922.x)
- ¶ 27. A. Pajares, L. Wei, B.R. Lawn, N.P. Padture, and C.C. Berndt, “Mechanical Characterization of Plasma-Sprayed Ceramic Coatings on Metal Substrates by Contact Testing,” *Materials Science & Engineering, A* **208**, 158-65 (1996).
DOI: [10.1016/0921-5093\(95\)10071-7](https://doi.org/10.1016/0921-5093(95)10071-7)
Times Cited: 111
- ¶ 28. N.P. Padture and P.G. Klemens, “Low Thermal Conductivity in Garnets,” *Journal of the American Ceramic Society*, **80**, 1018-20 (1997).
DOI: [10.1111/j.1151-2916.1997.tb02937.x](https://doi.org/10.1111/j.1151-2916.1997.tb02937.x)
Times Cited: 260
29. B.A. Latella, B.H. O’Connor, N.P. Padture, and B.R. Lawn, “Hertzian Contact Damage in Porous Alumina Ceramics,” *Journal of the American Ceramic Society*, **80**, 1027-31 (1997).
DOI: [10.1111/j.1151-2916.1997.tb02940.x](https://doi.org/10.1111/j.1151-2916.1997.tb02940.x)
30. D.C. Pender and N.P. Padture, “Surface-Layered Silicon Carbide for Enhanced Contact-Damage Resistance,” *Journal of Materials Science Letters*, **17**, 999-1002 (1998).
DOI: [10.1023/A:1006618202182](https://doi.org/10.1023/A:1006618202182)
- ¶ 31. J. Jitcharoen, N.P. Padture, A.E. Giannakopoulos, and S. Suresh, “Hertzian-Crack Suppression in Ceramics with Elastic-Modulus-Graded Surfaces,” *Journal of the American Ceramic Society*, **81**, 2301-08 (1998).
DOI: [10.1111/j.1151-2916.1998.tb02625.x](https://doi.org/10.1111/j.1151-2916.1998.tb02625.x)
Times Cited: 163
32. H. Ye, V.V. Pujar, and N.P. Padture “Coarsening in Liquid-Phase-Sintered α -SiC,” *Acta Materialia*, **47**, 481-87 (1999).
DOI: [10.1016/S1359-6454\(98\)00371-1](https://doi.org/10.1016/S1359-6454(98)00371-1)
- ¶ 33. S. Suresh, M. Olsson, A.E. Giannakopoulos, N.P. Padture, and J. Jitcharoen, “Engineering the Resistance to Sliding-Contact Damage Through Controlled Gradients in Elastic Properties at Contact Surfaces,” *Acta Materialia*, **47**, 3915-26 (1999).
DOI: [10.1016/S1359-6454\(99\)00205-0](https://doi.org/10.1016/S1359-6454(99)00205-0)
Times Cited: 161
34. R.P. Jensen, W.E. Luecke, N.P. Padture, and S.M. Wiederhorn “High-Temperature Properties of Liquid-Phase-Sintered α -SiC,” *Materials Science and Engineering, A* **282**, 109-14 (2000).
DOI: [10.1016/S0921-5093\(99\)00769-8](https://doi.org/10.1016/S0921-5093(99)00769-8)
35. A.L. Ortiz, F.L. Cumbreira, F. Sánchez-Bajo, F. Guiberteau, H. Xu, and N.P. Padture, “Application of Rietveld Method for Quantitative Analysis of Liquid-Phase-Sintered SiC,” (Spanish), *Boletín de la Sociedad Española de Cerámica y Vidrio*, **39**, 347-350 (2000).
DOI: [10.3989/cyv.2000.v39.i3.855](https://doi.org/10.3989/cyv.2000.v39.i3.855)
36. V.V. Pujar, R.P. Jensen, and N.P. Padture, “Densification of Liquid-Phase-Sintered Silicon Carbide,” *Journal of Materials Science Letters*, **19**, 1011-14 (2000).
DOI: [10.1023/A:1006753213286](https://doi.org/10.1023/A:1006753213286)
37. A.L. Ortiz, F.L. Cumbreira, F. Sánchez-Bajo, F. Guiberteau, H. Xu, and N.P. Padture, “Quantitative Phase-Composition Analysis of Liquid-Phase-Sintered Silicon Carbide Using the Rietveld Method,” *Journal of the American Ceramic Society*, **83**, 2282-86 (2000).
DOI: [10.1111/j.1151-2916.2000.tb01548.x](https://doi.org/10.1111/j.1151-2916.2000.tb01548.x)

- ¶ 38. K.W. Schlichting, K. Vaidyanathan, Y.H. Sohn, E.H. Jordan, M. Gell, and N.P. Padture, “Application of Cr³⁺ Photoluminescence Piezo-Spectroscopy to Plasma-Sprayed Thermal Barrier Coatings for Residual Stress Measurement,” *Materials Science and Engineering, A* **291**, 68-77 (2000).
DOI: [10.1016/S0921-5093\(00\)00973-4](https://doi.org/10.1016/S0921-5093(00)00973-4)
Times Cited: 128
- ¶ 39. K.W. Schlichting, N.P. Padture, and P.G. Klemens, “Thermal Conductivity of Dense and Porous Y₂O₃-Stabilized ZrO₂,” *Journal of Materials Science*, **36**, 3003-12 (2001).
DOI: [10.1023/A:1017970924312](https://doi.org/10.1023/A:1017970924312)
Times Cited: 802
40. A.L. Ortiz, F. Sanchez-Bajo, N.P. Padture, F.L. Cumbreira, and F. Guiberteau, “Quantitative Polytype-Composition Analyses of SiC Using X-ray Diffraction: A Critical Comparison Between the Polymorphic and the Rietveld Methods,” *Journal of the European Ceramic Society*, **21**, 1237-48 (2001).
DOI: [10.1016/S0955-2219\(00\)00332-0](https://doi.org/10.1016/S0955-2219(00)00332-0)
- ¶ 41. N.P. Padture, K.W. Schlichting, T. Bhatia, A. Ozturk, B. Cetegen, E.H. Jordan, M. Gell, S. Jiang, T.D. Xiao, P.R. Strutt, E. Garcia, P. Miranzo, and M.I. Osendi, “Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited by Solution-Precursor Plasma Spray,” *Acta Materialia*, **49**, 2251-57 (2001).
DOI: [10.1016/S1359-6454\(01\)00130-6](https://doi.org/10.1016/S1359-6454(01)00130-6)
Times Cited: 333
42. H. Xu, T. Bhatia, S.A. Deshpande, N.P. Padture, A.L. Ortiz, and F.L. Cumbreira, “Microstructural Evolution in Liquid-Phase-Sintered SiC: Part I, Effect of Starting Powder,” *Journal of the American Ceramic Society*, **84**, 1578-84 (2001).
DOI: [10.1111/j.1151-2916.2001.tb00880.x](https://doi.org/10.1111/j.1151-2916.2001.tb00880.x)
43. S.A. Deshpande, T. Bhatia, H. Xu, N.P. Padture, A.L. Ortiz, and F.L. Cumbreira, “Microstructural Evolution in Liquid-Phase-Sintered SiC: Part II, Effects of Planar Defects Densities and Seeds in the Starting Powder,” *Journal of the American Ceramic Society*, **84**, 1585-90 (2001).
DOI: [10.1111/j.1151-2916.2001.tb00881.x](https://doi.org/10.1111/j.1151-2916.2001.tb00881.x)
- ¶ 44. D.C. Pender, N.P. Padture, A.E. Giannakopoulos, and S. Suresh, “Gradients in Elastic Modulus for Improved Contact-Damage Resistance: Part I, The Silicon Nitride-Oxynitride Glass System,” *Acta Materialia*, **49**, 3255-62 (2001).
DOI: [10.1016/S1359-6454\(01\)00200-2](https://doi.org/10.1016/S1359-6454(01)00200-2)
Times Cited: 117
45. D.C. Pender S.C. Thompson, N.P. Padture, A.E. Giannakopoulos, and S. Suresh, “Gradients in Elastic Modulus for Improved Contact-Damage Resistance: Part II, The Silicon Nitride-Silicon Carbide System,” *Acta Materialia*, **49**, 3263-68 (2001).
DOI: [10.1016/S1359-6454\(01\)00201-4](https://doi.org/10.1016/S1359-6454(01)00201-4)
- ¶ 46. N.P. Padture, M. Gell, and E.H. Jordan, “Thermal Barrier Coatings for Gas-Turbine Engine Applications,” *Science*, **296**, 280-84 (2002).
DOI: [10.1126/science.1068609](https://doi.org/10.1126/science.1068609)
Times Cited: 4,870
47. A.L. Ortiz, T. Bhatia, N.P. Padture, and G. Pezzotti, “Microstructural Evolution in Liquid-Phase-Sintered SiC: Part III, Effect of Nitrogen-Gas Sintering,” *Journal of the American Ceramic Society*, **85**, 1835-40 (2002).
DOI: [10.1111/j.1151-2916.2002.tb00361.x](https://doi.org/10.1111/j.1151-2916.2002.tb00361.x)
48. S.C. Thompson, A. Pandit, N.P. Padture, and S. Suresh, “Stepwise-Graded Si₃N₄-SiC

- Ceramics with Improved Wear Properties,” *Journal of the American Ceramic Society*, **85**, 2059-64 (2002).
DOI: [10.1111/j.1151-2916.2002.tb00404.x](https://doi.org/10.1111/j.1151-2916.2002.tb00404.x)
- ¶ 49. T. Bhatia, A. Ozturk, L. Xie, E.H. Jordan, B.M. Cetegen, M. Gell X. Ma, and N.P. Padture, “Mechanisms of Ceramic Coating Deposition in Solution-Precursor Plasma Spray,” *Journal of Materials Research*, **17**, 2363-72 (2002).
DOI: [10.1557/JMR.2002.0346](https://doi.org/10.1557/JMR.2002.0346)
Times Cited: 185
- ¶ 50. J. Wu, X. Wei, N.P. Padture, P.G. Klemens, M. Gell, E. Garcia, P. Miranzo, and M.I. Osendi, “Low Thermal Conductivity Rare-Earth Zirconates for Potential Thermal-Barrier Coatings Application,” *Journal of the American Ceramic Society*, **85**, 3031-35 (2002).
Times Cited: 828
- ¶ 51. DOI: [10.1111/j.1151-2916.2002.tb00574.x](https://doi.org/10.1111/j.1151-2916.2002.tb00574.x)J. Wu, N.P. Padture, P.G. Klemens, M. Gell, E. Garcia, P. Miranzo, and M.I. Osendi, “Thermal Conductivity of Ceramics in the ZrO₂-GdO_{1.5} System,” *Journal of Materials Research*, **17**, 3193-00 (2002).
DOI: [10.1557/JMR.2002.0462](https://doi.org/10.1557/JMR.2002.0462)
Times Cited: 141
- ¶ 52. K.W. Schlichting, N.P. Padture, E.H. Jordan, and M. Gell, “Failure Modes in Plasma-Sprayed Thermal Barrier Coatings,” *Materials Science and Engineering, A* **342**, 120-30 (2003).
DOI: [10.1016/S0921-5093\(02\)00251-4](https://doi.org/10.1016/S0921-5093(02)00251-4)
Times Cited: 548
53. T. Bhatia, M. Aindow, and N.P. Padture, “Formation of a ‘Self-Assembled’ Cu/ γ -Al₂O₃ Nanocomposite,” *Philosophical Magazine Letters*, **83**, 135-42 (2003).
DOI: [10.1080/0950083021000056614](https://doi.org/10.1080/0950083021000056614)
54. N.P. Padture, “Graded Ceramics for Improved Contact-Damage Resistance,” *Materials Science Forum*, **423-425**, 125-30 (2003). [Link](#)
- ¶ 55. P. Bansal, N.P. Padture, and A.L. Vasiliev, “Improved Interfacial Mechanical Properties of Al₂O₃-13 wt% TiO₂ Plasma-Sprayed Coatings Derived from Nanocrystalline Powders,” *Acta Materialia*, **51**, 2959-70 (2003).
DOI: [10.1016/S1359-6454\(03\)00109-5](https://doi.org/10.1016/S1359-6454(03)00109-5)
Times Cited: 181
56. A. Pandit and N.P. Padture, “Interfacial Toughness of Diamond-Like Nanocomposite (DLN) Thin Films on Silicon Nitride Substrates,” *Journal of Materials Science Letters*, **22**, 1261-62 (2003).
DOI: [10.1023/A:1025406118204](https://doi.org/10.1023/A:1025406118204)
- ¶ 57. D. Andeen, L. Loeffler, N.P. Padture, and F.F. Lange, “Crystal Chemistry of Epitaxial ZnO on (111) MgAl₂O₄ Produced by Hydrothermal Synthesis,” *Journal of Crystal Growth*, **259**, 103-09 (2003).
DOI: [10.1016/S0022-0248\(03\)01589-6](https://doi.org/10.1016/S0022-0248(03)01589-6)
Times Cited: 125
58. N.P. Padture and X. Wei, “Hydrothermal Synthesis of Thin Films of BaTiO₃ Ceramic Nano-Tubes at 200 °C,” *Journal of the American Ceramic Society*, **86**, 2215-17 (2003).
DOI: [10.1111/j.1151-2916.2003.tb03636.x](https://doi.org/10.1111/j.1151-2916.2003.tb03636.x)
- ¶ 59. L. Xie, X. Ma, E.H. Jordan, N.P. Padture, T.D. Xiao, and M. Gell, “Identification of Coating Deposition Mechanisms in the Solution-Precursor Plasma-Spray Process using Model Spray Experiments,” *Materials Science and Engineering, A* **362**, 204-12 (2003).

DOI: [10.1016/S0921-5093\(03\)00617-8](https://doi.org/10.1016/S0921-5093(03)00617-8)

Times Cited: 121

60. X. Wei and N.P. Padture, "Hydrothermal Synthesis of Tetragonal Ba_xSr_(1-x)TiO₃ Powders," *Journal of Ceramic Processing Research*, **5**, 175-78 (2004).
DOI: www.jcpr.or.kr/journal/archive/view/203
- ¶ 61. M. Gell, L. Xie, X. Ma, E.H. Jordan, and N.P. Padture, "Highly Durable Thermal Barrier Coatings Made by the Solution Precursor Plasma Spray Process," *Surface and Coatings Technology*, **177-178**, 97-102 (2004).
DOI: [10.1016/j.surfcoat.2003.06.023](https://doi.org/10.1016/j.surfcoat.2003.06.023)
Times Cited: 221
62. L. Xie, X. Ma, E.H. Jordan, N.P. Padture, T.D. Xiao, and M. Gell, "Deposition Mechanisms in the Solution-Precursor Plasma-Spray Process," *Surface and Coatings Technology*, **177-178**, 103-07 (2004).
DOI: [10.1016/j.surfcoat.2003.06.013](https://doi.org/10.1016/j.surfcoat.2003.06.013)
63. X. Wang and N.P. Padture, "Shear Strength of Ceramics," *Journal of Materials Science*, **39**, 1891-93 (2004).
DOI: [10.1023/B:JMISC.0000016212.61341.52](https://doi.org/10.1023/B:JMISC.0000016212.61341.52)
- ¶ 64. E.H. Jordan, L. Xie, M. Gell, N.P. Padture, B.M. Cetegen, A. Ozturk, X. Ma, J. Roth, T.D. Xiao, and P.E.C. Bryant, "Superior Thermal Barrier Coatings Using Solution Precursor Plasma Spray," *Journal of Thermal Spray Technology*, **13**, 57-65 (2004).
DOI: [10.1007/s11666-004-0050-6](https://doi.org/10.1007/s11666-004-0050-6)
Times Cited: 196
65. L. Xie, X. Ma, E.H. Jordan, N.P. Padture, T.D. Xiao, and M. Gell, "Deposition of Thermal Barrier Coatings Using the Solution-Precursor Plasma-Spray Process," *Journal of Materials Science*, **39**, 1639-46 (2004).
DOI: [10.1023/B:JMISC.0000016163.81534.19](https://doi.org/10.1023/B:JMISC.0000016163.81534.19)
66. J. Wu, N.P. Padture, and M. Gell, "High-Temperature Chemical Stability of Low Thermal Conductivity ZrO₂-Gd₂O₃ Thermal-Barrier Ceramics in Contact with α-Al₂O₃," *Scripta Materialia*, **50**, 1315-18 (2004).
DOI: [10.1016/j.scriptamat.2004.02.020](https://doi.org/10.1016/j.scriptamat.2004.02.020)
67. L. Xie, X. Ma, E.H. Jordan, N.P. Padture, T.D. Xiao, and M. Gell, "Deposition Mechanisms in the Solution-Precursor Plasma-Spray Process," *Surface and Coatings Technology*, **177-178**, 103-07 (2004).
DOI: [10.1016/j.surfcoat.2003.06.013](https://doi.org/10.1016/j.surfcoat.2003.06.013)
- ¶ 68. L. Xie, X. Ma, A. Ozturk, E.H. Jordan, N.P. Padture, B.M. Cetegen, T.D. Xiao, and M. Gell, "Processing Parameter Effects on the Solution Precursor Plasma Spray Process Spray Patterns," *Surface and Coatings Technology*, **183**, 51-61 (2004).
DOI: [10.1016/j.surfcoat.2003.09.071](https://doi.org/10.1016/j.surfcoat.2003.09.071)
Times Cited: 102
- ¶ 69. X. Wang, N.P. Padture, and H. Tanaka, "Contact-Damage-Resistant Ceramic/Single-Wall Carbon Nanotubes and Ceramic/Graphite Composites," *Nature Materials*, **3**, 539-44 (2004).
{**Commentary by B.W. Sheldon, W.A. Curtin, *Nature Materials*, **3**, 505 (2004)**}
DOI: [10.1038/nmat1161](https://doi.org/10.1038/nmat1161)
Times Cited: 483
70. A.L. Ortiz, A.M. Muñoz-Bernabé, O. Borrero-López, A. Domínguez-Rodríguez, F. Guiberteau, and N.P. Padture, "Effect of Sintering Atmosphere on the Mechanical Properties of Liquid-Phase-Sintered SiC," *Journal of the European Ceramic Society*, **24**, 3245-49

(2004).

DOI: [10.1016/j.jeurceramsoc.2003.10.047](https://doi.org/10.1016/j.jeurceramsoc.2003.10.047)

71. L. Xie, E.H. Jordan, N.P. Padture, and M. Gell, “Phase and Microstructural Stability of Solution Precursor Plasma Sprayed Thermal Barrier Coatings,” *Materials Science and Engineering, A* **381**, 189-95 (2004).
DOI: [10.1016/j.msea.2004.04.042](https://doi.org/10.1016/j.msea.2004.04.042)
72. M. Gell, L. Xie, E.H. Jordan, and N.P. Padture, “Mechanisms of Spallation of Solution Precursor Plasma Spray Thermal Barrier Coatings,” *Surface and Coatings Technology*, **188-189**, 101-09 (2004).
DOI: [10.1016/j.surfcoat.2004.08.004](https://doi.org/10.1016/j.surfcoat.2004.08.004)
73. N.P. Padture, “Graded Ceramics for Improved Contact-Damage Resistance: A Review,” *International Journal of Computational Engineering and Science*, **5**, 731-752 (2004).
DOI: [10.1142/S1465876304002654](https://doi.org/10.1142/S1465876304002654)
74. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Room-Temperature Mechanical Properties of α -SiC Ceramics Sintered Using Y_2O_3 - Al_2O_3 Liquid Phase,” (in Spanish) *Boletín de la Sociedad Española de Cerámica y Vidrio*, **44**, 265-69 (2005). [Link](#)
- ¶ 75. X. Wang, N.P. Padture, H. Tanaka, and A.L. Ortiz, “Wear-Resistant Ultra-Fine-Grained Ceramics,” *Acta Materialia*, **53**, 271-77 (2005).
DOI: [10.1016/j.actamat.2004.09.020](https://doi.org/10.1016/j.actamat.2004.09.020)
Times Cited: 105
76. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Effect of Microstructure on Sliding-Wear Properties of Liquid-Phase-Sintered α -SiC,” *Journal of the American Ceramic Society*, **88**, 2159-63 (2005).
DOI: [10.1111/j.1551-2916.2005.00394.x](https://doi.org/10.1111/j.1551-2916.2005.00394.x)
77. X. Wei, A. Vasiliev, and N.P. Padture “Nanotubes Patterned Thin Films of Barium-Strontium Titanate (BST),” *Journal of Materials Research*, **20**, 2140-47 (2005).
DOI: [10.1557/JMR.2005.0264](https://doi.org/10.1557/JMR.2005.0264)
- ¶ 78. A. Jadhav, N.P. Padture, E.H. Jordan, and M. Gell, “Thick Ceramic Thermal Barrier Coatings with High Durability Deposited Using Solution-Precursor Plasma Spray,” *Materials Science and Engineering, A* **405**, 313-20 (2005).
DOI: [10.1016/j.msea.2005.06.023](https://doi.org/10.1016/j.msea.2005.06.023)
Times Cited: 151
79. J.S. Tresback, A.L. Vasiliev, and N.P. Padture, “Engineered Metal—Oxide—Metal Heterojunction Engineered Nanowires,” *Journal of Materials Research*, **20**, 2613-17 (2005).
DOI: [10.1557/JMR.2005.0347](https://doi.org/10.1557/JMR.2005.0347)
80. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Improved Sliding-Wear Resistance Properties in *In Situ*-Toughened Silicon Carbide,” *Journal of the American Ceramic Society*, **88**, 3531-34 (2005).
DOI: [10.1111/j.1551-2916.2005.00628.x](https://doi.org/10.1111/j.1551-2916.2005.00628.x)
81. R. Poyato, B.D. Huey, and N.P. Padture, “Local Piezoelectricity and Ferroelectricity Responses in Nano-tubes-Patterned Thin Films of $BaTiO_3$ Synthesized Hydrothermally at 200 °C,” *Journal of Materials Research*, **21**, 547-51(2006).
DOI: [10.1557/jmr.2006.0069](https://doi.org/10.1557/jmr.2006.0069)
- ¶ 82. R. Poyato, A.L. Vasiliev, N.P. Padture, H. Tanaka, and T. Nishimura, “Aqueous Colloidal Processing of Single-Wall Carbon Nanotubes and their Composites with Ceramics,” *Nanotechnology*, **17**, 1770-77 (2006).
DOI: [10.1088/0957-4484/17/6/038](https://doi.org/10.1088/0957-4484/17/6/038)

Times Cited: 108

- ¶ 83. A.D. Jadhav, N.P. Padture, E.H. Jordan, M. Gell, P. Miranzo, and E.R. Fuller, “Low Thermal Conductivity Plasma-Sprayed Thermal Barrier Coatings with Engineered Microstructures,” *Acta Materialia*, **54**, 3343-49 (2006).
DOI: [10.1016/j.actamat.2006.03.024](https://doi.org/10.1016/j.actamat.2006.03.024)
- Times Cited: 210**
84. A.L. Vasiliev, N.P. Padture, and X. Ma, “Coatings of Metastable Ceramics Deposited by Solution Precursor Plasma Spray: Part I, The ZrO₂-Al₂O₃ Binary System,” *Acta Materialia*, **54**, 4913-20 (2006).
DOI: [10.1016/j.actamat.2006.06.025](https://doi.org/10.1016/j.actamat.2006.06.025)
85. A.L. Vasiliev and N.P. Padture, “Coatings of Metastable Ceramics Deposited by Solution Precursor Plasma Spray: Part II, The ZrO₂-Y₂O₃-Al₂O₃ Ternary System,” *Acta Materialia*, **54**, 4921-28 (2006).
DOI: [10.1016/j.actamat.2006.06.026](https://doi.org/10.1016/j.actamat.2006.06.026)
86. J.-J. Shyue, R.E. Cochran, N.P. Padture, “Transparent-Conducting, Gas-Sensing Nanostructures (Nanotubes, Nanowires, and Thin Films) of Titanium Oxide Synthesized at Near-Ambient Conditions,” *Journal of Materials Research*, **21**, 2894-903 (2006).
DOI: [10.1557/jmr.2006.0352](https://doi.org/10.1557/jmr.2006.0352)
- ¶ 87. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Microstructural Design of Sliding-Wear-Resistant Liquid-Phase-Sintered SiC: An Overview,” *Journal of the European Ceramic Society*, **27**, 3351-57 (2007).
DOI: [10.1016/j.jeurceramsoc.2007.02.190](https://doi.org/10.1016/j.jeurceramsoc.2007.02.190)
- Times Cited: 100**
88. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Effect of Liquid-Phase Content on the Contact-Mechanical Properties of Liquid-Phase-Sintered α -SiC,” *Journal of the European Ceramic Society*, **27**, 2521-27 (2007).
DOI: [10.1016/j.jeurceramsoc.2006.09.012](https://doi.org/10.1016/j.jeurceramsoc.2006.09.012)
89. J.J. Shyue and N.P. Padture, “Template-Directed, Near-Ambient Synthesis of Au—TiO₂—Au Heterojunction Nanowires Mediated by Self-Assembled Monolayers (SAMs),” *Materials Letters*, **61** 182-85 (2007).
DOI: [10.1016/j.matlet.2006.04.100](https://doi.org/10.1016/j.matlet.2006.04.100)
90. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Sliding Wear-Resistant Liquid-Phase-Sintered SiC Processed from α -SiC Starting Powders,” *Journal of the American Ceramic Society*, **90**, 541-45 (2007).
DOI: [10.1111/j.1551-2916.2006.01421.x](https://doi.org/10.1111/j.1551-2916.2006.01421.x)
91. A.L. Vasiliev, R. Poyato, and N.P. Padture, “Single-Wall Carbon Nanotubes at Ceramic Grain Boundaries,” *Scripta Materialia*, **56**, 461-63 (2007).
DOI: [10.1016/j.scriptamat.2006.12.007](https://doi.org/10.1016/j.scriptamat.2006.12.007)
92. E.D. Herderick, J.S. Tresback, A.L. Vasiliev, and N.P. Padture, “Template-Directed Synthesis, Characterization, and Electrical Properties of Au—TiO₂—Au Heterojunction Nanowires,” *Nanotechnology*, **18**, 155204 (2007). {**Front Cover**}
DOI: [10.1088/0957-4484/18/15/155204](https://doi.org/10.1088/0957-4484/18/15/155204)
93. R.E. Cochran, J.-J. Shyue, and N.P. Padture, “Template-Based, Near-Ambient Synthesis of Crystalline Metal-Oxide Nanowires, Nanotubes, and Co-Axial Nanotubes,” *Acta Materialia*, **55**, 3007-14 (2007).
DOI: [10.1016/j.actamat.2007.01.005](https://doi.org/10.1016/j.actamat.2007.01.005)
- ¶ 94. S.S. Hwang, A.L. Vasiliev, and N.P. Padture, “Improved Processing and Oxidation-

Resistance of ZrB₂ Ultra-High Temperature Ceramics Containing SiC Nanodispersoids,” *Materials Science and Engineering*, **464**, 216-24 (2007).

DOI: [10.1016/j.msea.2007.03.002](https://doi.org/10.1016/j.msea.2007.03.002)

Times Cited: 217

95. O. Borrero-Lopez, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Effect of the Nature of the Intergranular Phase on the Sliding-Wear Resistance of Liquid-Phase-Sintered α -SiC,” *Scripta Materialia*, **57**, 505-08 (2007).
DOI: [10.1016/j.scriptamat.2007.05.021](https://doi.org/10.1016/j.scriptamat.2007.05.021)
96. Y. Wang, K.K. Coti, J. Wang, M.M. Alam, J.-J. Shyue, W. Lu, N.P. Padture, and H.-R. Tseng, “Individually Addressable Crystalline Conducting Polymer Nanowires in a Microelectrode Sensor Array,” *Nanotechnology*, **18**, 424021-7 (2007).
DOI: [10.1088/0957-4484/18/42/424021](https://doi.org/10.1088/0957-4484/18/42/424021)
97. J.S. Tresback, A.L. Vasiliev, N.P. Padture, S.-Y. Park, and P.R. Berger, “Characterization and Electrical Properties of Individual Au—NiO—Au Heterojunction Nanowires,” *IEEE Transaction on Nanotechnology*, **6**, 676-81 (2007).
DOI: [10.1109/tnano.2007.908488](https://doi.org/10.1109/tnano.2007.908488)
- ¶ 98. A. Aygun, A.L. Vasiliev, N.P. Padture, and X. Ma, “Novel Thermal Barrier Coatings that are Resistant to High-Temperature Attack by Glassy Deposits,” *Acta Materialia*, **55**, 6734-45 (2007).
DOI: [10.1016/j.actamat.2007.08.028](https://doi.org/10.1016/j.actamat.2007.08.028)
Times Cited: 311
- ¶ 99. M. Gell, E.H. Jordan, M. Teicholz, B.M. Cetegen, N.P. Padture, L. Xie, D. Chen, X. Ma, and J. Roth, “Thermal Barrier Coatings Made by the Solution Precursor Plasma Spray Process,” *Journal of Thermal Spray Technology*, **17**, 124-35 (2008).
DOI: [10.1007/s11666-007-9141-5](https://doi.org/10.1007/s11666-007-9141-5)
Times Cited: 178
100. E. Zapata-Solvas, R. Poyato, D. Gómez-García, A. Domínguez-Rodríguez, V. Radmilovic, and N.P. Padture, “Creep-Resistant Composites of Alumina and Single-Wall Carbon Nanotubes,” *Applied Physics Letters*, **92**, 111912 (2008).
DOI: [10.1063/1.2899945](https://doi.org/10.1063/1.2899945)
101. N.P. Padture and W.A. Curtin, “Comment on ‘Effect of Sintering Temperature on a Single-Wall Carbon Nanotube-Toughened Alumina-Based Composite’,” *Scripta Materialia*, **58**, 989-90 (2008).
DOI: [10.1016/j.scriptamat.2008.01.038](https://doi.org/10.1016/j.scriptamat.2008.01.038)
102. A.D. Jadhav and N.P. Padture, “Mechanical Properties of Solution-Precursor Plasma Sprayed Thermal Barrier Coatings,” *Surface and Coatings Technology*, **202**, 4976-79 (2008).
DOI: [10.1016/j.surfcoat.2008.04.091](https://doi.org/10.1016/j.surfcoat.2008.04.091)
103. J.S. Tresback and N.P. Padture, “Low Temperature Gas Sensing in Individual Metal—Oxide—Metal Heterojunction Nanowires,” *Journal of Materials Research*, **23**, 2047-52 (2008).
DOI: [10.1557/JMR.2008.0270](https://doi.org/10.1557/JMR.2008.0270)
- ¶ 104. D. Li, W. Windl, and N.P. Padture, “Towards Site-Specific Stamping of Graphene,” *Advanced Materials*, **21**, 1243-46 (2009).
DOI: [10.1002/adma.200802417](https://doi.org/10.1002/adma.200802417)
Times Cited: 103
- ¶ 105. N.P. Padture, “Multifunctional Composites of Ceramics and Single-Wall Carbon Nanotubes,” *Advanced Materials*, **21**, 1767-70 (2009).

DOI: [10.1002/adma.200802270](https://doi.org/10.1002/adma.200802270)

Times Cited: 126

106. E.D. Herderick, M.R. Reddy, R.N. Sample, T.I. Draskovic, and N.P. Padture, “Bipolar Resistive Switching in Individual Au—NiO—Au Segmented Nanowires,” *Applied Physics Letters*, **95**, 203505 (2009).
DOI: [10.1063/1.3263733](https://doi.org/10.1063/1.3263733)
107. E. Zapata-Solvas, D. Gómez-García, R. Poyato, A. Domínguez-Rodríguez, and N.P. Padture, “High Temperature Mechanical Behavior of Al₂O₃/Graphite Composites,” *Journal of the European Ceramic Society*, **29**, 3205-09 (2009).
DOI: [10.1016/j.jeurceramsoc.2009.06.002](https://doi.org/10.1016/j.jeurceramsoc.2009.06.002)
108. J.M. Drexler, A. Aygun, D. Li, R. Vaßen, T. Steinke, and N.P. Padture, “Thermal-Gradient Testing of Thermal Barrier Coatings Under Simultaneous Attack by Molten Glassy Deposits and its Mitigation,” *Surface and Coatings Technology*, **204**, 2683-88 (2010).
DOI: [10.1016/j.surfcoat.2010.02.026](https://doi.org/10.1016/j.surfcoat.2010.02.026)
109. E. Zapata-Solvas, D. Gómez-García, R. Poyato, Z. Lee, M. Castillo-Rodríguez, A. Domínguez-Rodríguez, V. Radmilovic, and N.P. Padture, “Microstructural Effects on the Creep Deformation of Alumina/Single-Wall Carbon Nanotubes Composites,” *Journal of the American Ceramic Society*, **92**, 2042-47 (2010).
DOI: [10.1111/j.1551-2916.2010.03681.x](https://doi.org/10.1111/j.1551-2916.2010.03681.x)
110. E.D. Herderick, N. Polomoff, B.D. Huey, and N.P. Padture, “Chemically-Synthesized Novel Metal—Oxide—Metal Segmented Nanowires with High Ferroelectric Response,” *Nanotechnology*, **21**, 335601 (2010).
DOI: [10.1088/0957-4484/21/33/335601](https://doi.org/10.1088/0957-4484/21/33/335601)
- ¶ 111. J.M. Drexler, K. Shinoda, A.L. Ortiz, D. Li, A.L. Vasiliev, A.D. Gledhill, S. Sampath, and N.P. Padture, “Air-Plasma Sprayed Thermal Barrier Coatings that are Resistant to High-Temperature Attack by Glassy Deposits,” *Acta Materialia*, **58**, 6835-44 (2010).
DOI: [10.1016/j.actamat.2010.09.013](https://doi.org/10.1016/j.actamat.2010.09.013)
- Times Cited: 209**
112. T. Kampfrath, A. Maiseyeu, Z. Shah, Z.K. Ying, J.A. Deiuliis, X.H. Xu, N. Kherada, R.D. Brook, K.M. Reddy, N.P. Padture, S. Parthasarathy, L.C. Chen, S. Moffatt-Bruce, Q.H. Sun, H. Morawietz, and S. Rajagopalan, “Chronic Fine Particulate Matter Exposure Induces Systemic Vascular Dysfunction via NADPH Oxidase and TLR4 Dependent Pathways,” *Circulation Research*, **108**, 716-26 (2011). {**Commentary by D.J. Conklin, *Circulation Res.*, **108**, 644 (2011)**}
DOI: [10.1161/circresaha.110.237560](https://doi.org/10.1161/circresaha.110.237560)
- Times Cited: 332**
- ¶ 113. K.M. Reddy, C. Chen, A.D. Gledhill, J.M. Drexler, and N.P. Padture, “High Quality, Transferrable Graphene Grown on Single Crystal Cu(111) Thin Films on Basal-Plane Sapphire,” *Applied Physics Letters*, **98**, 113117 (2011).
DOI: [10.1063/1.3569143](https://doi.org/10.1063/1.3569143)
- Times Cited: 156**
- ¶ 114. B. Núñez-González, A.L. Ortiz, F. Guiberteau, and N.P. Padture, “Effect of MoSi₂ Content on the Sliding-Wear Resistance of ZrC-MoSi₂ Composites,” *Journal of the European Ceramic Society*, **31**, 877-82 (2011).
DOI: [10.1016/j.jeurceramsoc.2010.11.017](https://doi.org/10.1016/j.jeurceramsoc.2010.11.017)
- ¶ 115. J.M. Drexler, A.D. Gledhill, K. Shinoda, A.L. Vasiliev, K.M. Reddy, S. Sampath, and N.P. Padture, “Jet Engine Coatings for Resisting Volcanic Ash Damage,” *Advanced Materials*, **23**, 2419-24 (2011). {**Inside Front Cover**}

DOI: [10.1002/adma.201190077](https://doi.org/10.1002/adma.201190077)

Times Cited: 246

- ¶ 116. A.D. Gledhill, K.M. Reddy, J.M. Drexler, K. Shinoda, S. Sampath, and N.P. Padture, “Mitigation of Damage from Molten Fly Ash to Air-Plasma-Sprayed Thermal Barrier Coatings,” *Materials Science & Engineering A*, **528**, 7214-21 (2011).
DOI: [10.1016/j.msea.2011.06.041](https://doi.org/10.1016/j.msea.2011.06.041)
Times Cited: 126
117. L. Fang, X. Zhao, Y-H. Chiu, D. Ko, K.M. Reddy, N.P. Padture, F. Yang and E. Johnston-Halperin, “Comprehensive Control of Optical Polarization Anisotropy in Semiconducting Nanowires,” *Applied Physics Letters*, **99**, 141101 (2011).
DOI: [10.1063/1.3631630](https://doi.org/10.1063/1.3631630)
118. T. Mroz, L.M. Goldman, A.D. Gledhill, D. Li, and N.P. Padture, “Nanostructured, Infrared-Transparent Magnesium-Aluminate Spinel with Superior Mechanical Properties,” *International Journal of Applied Ceramic Technology*, **9**, 83-90 (2012).
DOI: [10.1111/j.1744-7402.2011.02629.x](https://doi.org/10.1111/j.1744-7402.2011.02629.x)
119. A.D. Gledhill, D. Li, N.P. Padture, T. Mroz, and L.M. Goldman, “Strengthening of Transparent Spinel/Si₃N₄ Nanocomposites,” *Acta Materialia*, **60**, 1570-75 (2012).
DOI: [10.1016/j.actamat.2011.11.053](https://doi.org/10.1016/j.actamat.2011.11.053)
120. C.-H. Chen, K.M. Reddy, and N.P. Padture, “Site-Specific Stamping of Graphene Micro-Patterns Over Large Areas Using Flexible Stamps,” *Nanotechnology*, **23**, 235603 (2012).
DOI: [10.1088/0957-4484/23/23/235603](https://doi.org/10.1088/0957-4484/23/23/235603)
- ¶ 121. J.M. Drexler, C-H. Chen, A.D. Gledhill, K. Shinoda, S. Sampath, and N.P. Padture, “Plasma Sprayed Gadolinium Zirconate Thermal Barrier Coatings that are Resistant to Damage by Molten Ca-Mg-Al-Silicate Glass,” *Surface & Coatings Technology*, **206**, 3911-16 (2012).
DOI: [10.1016/j.surfcoat.2012.03.051](https://doi.org/10.1016/j.surfcoat.2012.03.051)
Times Cited: 135
122. O. Borrero-Lopez, A.L. Ortiz, A.D. Gledhill, T. Morz, L.M. Goldman, and N.P. Padture, “Microstructural Effects on the Sliding Wear of Transparent Magnesium-Aluminate Spinel,” *Journal of the European Ceramic Society*, **32**, 3143-49 (2012).
DOI: [10.1016/j.jeurceramsoc.2012.04.002](https://doi.org/10.1016/j.jeurceramsoc.2012.04.002)
- ¶ 123. J.M. Drexler, A.L. Ortiz, and N.P. Padture, “Composition Effects of Thermal Barrier Coating Ceramics on their Interaction with Molten Ca-Mg-Al-Silicate Glass,” *Acta Materialia*, **60**, 5437-47 (2012).
DOI: [10.1016/j.actamat.2012.06.053](https://doi.org/10.1016/j.actamat.2012.06.053)
Times Cited: 254
- ¶ 124. D.R. Clarke, M. Oeschner, and N.P. Padture, “Thermal Barrier Coatings for More Efficient Gas-Turbines Engines,” *MRS Bulletin*, **37**, 891-98 (2012). **{Front Cover}**
DOI: [10.1557/mrs.2012.232](https://doi.org/10.1557/mrs.2012.232)
Times Cited: 1,393
125. J. Webb, B. Casaday, B. Barker, J. Bons, A.D. Gledhill, and N.P. Padture, “Coal Ash Deposition on Nozzle Guide Vanes: Part 1, Experimental Characteristics of Four Coal Ash Types,” *ASME Journal of Turbomachinery*, **135**, 021033 (2013). **{Best Paper ASME Turbo Expo, Vancouver, Canada}**
DOI: [10.1115/GT2011-45894](https://doi.org/10.1115/GT2011-45894)
126. P.S. Park, K.M. Reddy, D.N. Nath, Z. Yang, N.P. Padture, and S. Rajan, “Ohmic Contact Formation Between Metal and AlGa_N/Ga_N Heterostructure via Graphene Insertion,” *Applied Physics Letters*, **102**, 153501 (2013).
DOI: [10.1063/1.4801940](https://doi.org/10.1063/1.4801940)

127. D. Ko, X. Zhao, K.M. Reddy, O. Restrepo, N. Trivedi, W. Windl, N.P. Padture, F. Yang, and E. Johnston-Halperin, "Defects States and Disorder in Charge Transport in Semiconductor Nanowires," *Journal of Applied Physics*, **114**, 043711 (2013).
DOI: [10.1063/1.4813494](https://doi.org/10.1063/1.4813494)
128. Y. Zhou, H.F. Garces, B.S. Senturk, A.L. Ortiz, and N.P. Padture, "Room Temperature 'One-Pot' Solution Synthesis of Nanoscale CsSnI₃ Orthorhombic Perovskite Thin Films and Particles," *Materials Letters*, **110**, 127-29 (2013).
DOI: [10.1016/j.matlet.2013.08.011](https://doi.org/10.1016/j.matlet.2013.08.011)
- ¶ 129. H. Hu, D. Wang, Y. Zhou, J. Zhang, S. Lv, S. Pang, X. Chen, Z. Liu, N.P. Padture and G. Cui, "Vapour-Based Processing of Hole-Conductor-Free CH₃NH₃PbI₃ Perovskite/C₆₀ Fullerene Planar Solar Cells," *Royal Society of Chemistry Advances*, **4**, 28964-67 (2014).
DOI: [10.1039/C4RA03820G](https://doi.org/10.1039/C4RA03820G)
Times Cited: 159
- ¶ 130. S. Lv, S. Pang, Y. Zhou, N.P. Padture, H. Hu, L. Wang, X. Zhou and G. Cui, "One-Step Solution-Processed Formamidinium Lead Trihalide (FAPbI<sub>(3-x)Cl_x) for Mesoscopic Perovskite-Polymer Solar Cells," *Physical Chemistry Chemical Physics*, **16**, 19206-11 (2014).
DOI: [10.1039/C4CP02113D](https://doi.org/10.1039/C4CP02113D)
Times Cited: 155</sub>
131. B.S. Senturk, H.F. Garces, A.L. Ortiz, G. Dwivedi, S. Sampath, and N.P. Padture, "CMAS-Resistant Plasma Sprayed Thermal Barrier Coatings Based on Y₂O₃-Stabilized ZrO₂ with Al³⁺ and Ti⁴⁺ Solute Additions," *Journal of Thermal Spray Technology*, **23**, 708-15 (2014).
DOI: [10.1007/s11666-014-0077-2](https://doi.org/10.1007/s11666-014-0077-2)
132. H.F. Garces, B.S. Senturk, and N.P. Padture, "In Situ Raman Spectroscopy Studies of High-Temperature Degradation of Thermal Barrier Coatings by Molten Silicate Deposits," *Scripta Materialia*, **76**, 29-32 (2014).
DOI: [10.1016/j.scriptamat.2013.12.008](https://doi.org/10.1016/j.scriptamat.2013.12.008)
- ¶ 133. Y. Kutes, L. Ye, Y. Zhou, S. Pang, B.D. Huey, and N.P. Padture, "Direct Observation of Ferroelectric Domains in Solution-Processed CH₃NH₃PbI₃ Perovskite Thin Films," *Journal of Physical Chemistry Letters*, **5**, 3335-9 (2014).
DOI: [10.1021/jz501697b](https://doi.org/10.1021/jz501697b)
Times Cited: 503
- ¶ 134. A.R. Krause, B.S. Senturk, H.F. Garces, G. Dwivedi, A.L. Ortiz, S. Sampath, and N.P. Padture, "2ZrO₂.Y₂O₃ Thermal Barrier Coatings Resistant to Degradation by Molten CMAS: Part I, Optical Basicity Considerations and Processing," *Journal of the American Ceramic Society*, **97**, 3943-9 (2014).
DOI: [10.1111/jace.13210](https://doi.org/10.1111/jace.13210)
Times Cited: 123
135. A.R. Krause, H.F. Garces, B.S. Senturk, and N.P. Padture, "2ZrO₂.Y₂O₃ Thermal Barrier Coatings Resistant to Degradation by Molten CMAS: Part II, Interactions with Sand and Fly Ash," *Journal of the American Ceramic Society*, **97**, 3950-9 (2014).
DOI: [10.1111/jace.13209](https://doi.org/10.1111/jace.13209)
- ¶ 136. Y. Zhou, M. Yang, W. Wu, A.L. Vasiliev, K. Zhu, and N.P. Padture, "Room-Temperature Crystallization of Hybrid-Perovskite Thin Films via Solvent-Solvent Extraction for High-Performance Solar Cells," *Journal of Materials Chemistry A*, **3**, 8178-84 (2015).
DOI: [10.1039/C5TA00477B](https://doi.org/10.1039/C5TA00477B)
Times Cited: 474
- ¶ 137. Y. Zhou, M. Yang, A. L. Vasiliev, H.F. Garces, Y. Zhao, D. Wang, S. Pang, K. Zhu, and

N.P. Padture, “Growth Control of Compact CH₃NH₃PbI₃ Thin Films *via* Enhanced Solid-State Precursor Reaction for Efficient Planar Perovskite Solar Cells,” *Journal of Materials Chemistry A*, **3**, 9249-56 (2015).

DOI: [10.1039/C4TA07036D](https://doi.org/10.1039/C4TA07036D)

Times Cited: 146

138. B.M. Moshtaghioun, D. Gómez-García, A. Domínguez-Rodríguez, and N.P. Padture, “High-Temperature Creep Deformation of Coarse-Grained Boron Carbide Ceramics,” *Journal of the European Ceramic Society*, **35**, 1423-29 (2015).

DOI: [10.1016/j.jeurceramsoc.2014.11.001](https://doi.org/10.1016/j.jeurceramsoc.2014.11.001)

139. K.M. Reddy, N.P. Padture, A. Punnoose, and C. Hanna, “Magnetoresistance Characteristics in Individual Fe₃O₄ Single Crystal Nanowire,” *Journal of Applied Physics*, **117**, 17E115 (2015).

DOI: [10.1063/1.4914535](https://doi.org/10.1063/1.4914535)

140. K.M. Reddy, N.P. Padture, A. Punnoose, and C. Hanna, “Heterojunction Metal-Oxide-Metal Au-Fe₃O₄-Au Single Nanowire Device for Spintronics,” *Journal of Applied Physics*, **117**, 17D710 (2015).

DOI: [10.1063/1.4913891](https://doi.org/10.1063/1.4913891)

¶ **141.** Y. Zhou, A.L. Vasiliev, W. Wu, M. Yang, S. Pang, K. Zhu, and N.P. Padture, “Crystal Morphologies of Organolead Trihalide in Mesoscopic/Planar Perovskite Solar Cells,” *Journal of Physical Chemistry Letters*, **6**, 2292-97 (2015).

DOI: [10.1021/acs.jpcelett.5b00981](https://doi.org/10.1021/acs.jpcelett.5b00981)

Times Cited: 104

¶ **142.** Z. Zhou, Z. Wang, Y. Zhou, S. Pang, D. Wang, H. Xu, Z. Liu, N.P. Padture, and G. Cui, “Methylamine-Gas-Induced Defect-Healing Behavior of CH₃NH₃PbI₃ Thin Films for Perovskite Solar Cells, *Angewandte Chemie International Edition*, **54**, 9702-09 (2015). {Very Important Paper; Highlighted in August 7, 2015 issue of *Science* as Editor’s Choice}

DOI: [10.1002/anie.201504379](https://doi.org/10.1002/anie.201504379)

Times Cited: 455

143. D.B. Marshall, R.F. Cook, N.P. Padture, M.L. Oyen, A. Pajares, J.E. Bradby, I.E. Reimanis, R. Tandon, T. F. Page, G.M. Pharr, and B.R. Lawn, “The Compelling Case for Indentation as a Functional Exploratory and Characterization Tool,” *Journal of the American Ceramic Society*, **98**, 2671-80 (2015).

DOI: [10.1111/jace.13729](https://doi.org/10.1111/jace.13729)

¶ **144.** C.-S. Jiang, M. Yang, Y. Zhou, B. To, S.U. Nanayakkara, J.M. Luther, W. Zhou, J.J. Berry, J. van de Lagemaat, N.P. Padture, Kai Zhu, and M.M. Al-Jassim, “Carrier Separation and Transport in Perovskite Solar Cells Studied by Nanometer-Scale Profiling of Electrical Potential,” *Nature Communications*, **6**, 8396 (2015).

DOI: [10.1038/ncomms9397](https://doi.org/10.1038/ncomms9397)

Times Cited: 261

¶ **145.** Z. Wang, Y. Zhou, S. Pang, Z. Xiao, J. Zhang, W. Chai, H. Xu, Z. Liu, N.P. Padture, and G. Cui, “Additive-Modulated Evolution of HC(NH₂)₂PbI₃ ‘Black’ Polymorph for Mesoscopic Perovskite Solar Cells,” *Chemistry of Materials*, **27**, 7149-55 (2015).

DOI: [10.1021/acs.chemmater.5b03169](https://doi.org/10.1021/acs.chemmater.5b03169)

Times Cited: 209

¶ **146.** M. Yang, Y. Zhou, Y. Zeng, C.-S. Jiang, N.P. Padture, and K. Zhu, “Square-Centimeter Solution-Processed Planar CH₃NH₃PbI₃ Perovskite Solar Cells with Efficiency Exceeding 15%,” *Advanced Materials*, **27**, 6363-70 (2015).

DOI: [10.1002/adma.201502586](https://doi.org/10.1002/adma.201502586)**Times Cited: 357**

- ¶ 147. Y. Zhou, O.S. Game, S. Pang, and N.P. Padture, “Microstructures of Organolead Trihalide Perovskites for Solar Cells: Their Evolution from Solutions and Characterization,” *Journal of Physical Chemistry Letters*, **6**, 4827-39 (2015). **{Invited Perspective}**
DOI: [10.1021/acs.jpcelett.5b01843](https://doi.org/10.1021/acs.jpcelett.5b01843)
Times Cited: 382
148. R. Naphade, S. Nagane, G.S. Shanker, R. Fernandes, D. Kothari, Y. Zhou, N.P. Padture, and S.B. Ogale, “Hybrid Perovskite Quantum Nanostructures Synthesized by Electrospray Antisolvent-Solvent Extraction and Intercalation,” *ACS Applied Materials & Interfaces*, **8**, 854-61 (2016).
DOI: [10.1021/acsami.5b10208](https://doi.org/10.1021/acsami.5b10208)
149. Y. Zhou, M. Yang, J. Kwun, O.S. Game, Y. Zhao, S. Pang, N.P. Padture, and K. Zhu, “Intercalation Crystallization of Phase-Pure α -HC(NH₂)₂PbI₃ Upon Microstructurally Engineered PbI₂ Thin Films for Planar Perovskite Solar Cells,” *Nanoscale*, **8**, 6265-70 (2016). **{Invited Paper}**
DOI: [10.1039/C5NR06189J](https://doi.org/10.1039/C5NR06189J)
150. Y. Zhou, J. Kwun, H.F. Garces, S. Pang, and N.P. Padture, “Observation of Phase-Retention Behavior of the HC(NH₂)₂PbI₃ Black Perovskite Polymorph Upon Mesoporous TiO₂ Scaffolds,” *ChemComm*, **52**, 7273-75 (2016).
DOI: [10.1039/C6CC02086K](https://doi.org/10.1039/C6CC02086K)
- ¶ 151. Y. Zhou, Z. Zhou, M. Chen, Y. Zong, J. Huang, S. Pang, and N.P. Padture, “Doping and Alloying for Improved Perovskite Solar Cells,” *Journal of Materials Chemistry A*, **4**, 17623-35 (2016). **{Invited Review Paper}**
DOI: [10.1039/C6TA08699C](https://doi.org/10.1039/C6TA08699C)
Times Cited: 172
152. A. Walsh, N.P. Padture, S.I. Seok, “Physical Chemistry of Hybrid Perovskite Solar Cells,” *Physical Chemistry Chemical Physics*, **18**, 27024-25 (2016). **{Editorial}**
DOI: [10.1039/C6CP90212J](https://doi.org/10.1039/C6CP90212J)
- ¶ 153. Y. Zhou, M. Yang, O.S. Game, W. Wu, J. Kwun, M.A. Strauss, Y. Yan, J. Huang, K. Zhu, and N.P. Padture, “Manipulating Crystallization of Organolead Mixed-Halide Thin Films in Antisolvent Baths for Wide-Bandgap Perovskite Solar Cells,” *ACS Applied Materials & Interfaces*, **8**, 2232-37 (2016).
DOI: [10.1021/acsami.5b10987](https://doi.org/10.1021/acsami.5b10987)
Times Cited: 105
- ¶ 154. S. Pang, Y. Zhou, Z. Wang, M. Yang, A.R. Krause, Z. Zhou, K. Zhu, N.P. Padture, and G. Cui, “Transformative Evolution of Organolead Triiodide Perovskite Thin Films from Strong Room-Temperature Solid-Gas Interaction between HPbI₃-CH₃NH₂ Precursor Pair,” *Journal of the American Chemical Society*, **138**, 750-53 (2016).
DOI: [10.1021/jacs.5b11824](https://doi.org/10.1021/jacs.5b11824)
Times Cited: 156
- ¶ 155. A.R. Krause, H.F. Garces, G. Dwivedi, A.L. Ortiz, S. Sampath, and N.P. Padture, “Calcium-Magnesia-Alumino-Silicate (CMAS)-Induced Degradation and Failure of Air Plasma Sprayed Yttria-Stabilized Zirconia Thermal Barrier Coatings,” *Acta Materialia*, **105**, 355-66 (2016).
DOI: [10.1016/j.actamat.2015.12.044](https://doi.org/10.1016/j.actamat.2015.12.044)
Times Cited: 192

156. A.R. Krause, X. Li, and N.P. Padture, “Interaction Between Ceramic Powder and Molten Calcia-Magnesia-Alumino-Silicate (CMAS) Glass, and Its Implication on CMAS-Resistant Thermal Barrier Coatings,” *Scripta Materialia*, **112**, 118-22 (2016).
DOI: [10.1016/j.scriptamat.2015.09.027](https://doi.org/10.1016/j.scriptamat.2015.09.027)
157. Y. Zhou, H.F. Garces, and N.P. Padture, “Challenges in the Ambient Raman Spectroscopy Characterization of Methylammonium Lead Triiodide Perovskite Thin Films,” *Frontiers of Optoelectronics*, **9**, 81-86 (2016). **{Invited Paper}**
DOI: [10.1007/s12200-016-0573-8](https://doi.org/10.1007/s12200-016-0573-8)
- ¶ 158. Y. Zhou, M. Yang, S. Pang, K. Zhu, and N.P. Padture, “Exceptional Morphology-Preserving Evolution of Formamidinium Lead Triiodide Perovskite Thin Films *via* Organic-Cation Displacement,” *Journal of the American Chemical Society*, **138**, 5535-38 (2016).
DOI: [10.1021/jacs.6b02787](https://doi.org/10.1021/jacs.6b02787)
Times Cited: 189
- ¶ 159. Y. Kutes, Y. Zhou, J.L. Bosse, J. Steffes, N.P. Padture and B.D. Huey, “Mapping the Photoresponse of CH₃NH₃PbI₃ Hybrid Perovskite Thin Films at the Nanoscale,” *Nano Letters*, **16**, 3434-41 (2016).
DOI: [10.1021/acs.nanolett.5b04157](https://doi.org/10.1021/acs.nanolett.5b04157)
Times Cited: 140
160. N.P. Padture, “Advanced Structural Ceramics in Aerospace Propulsion,” *Nature Materials*, **15**, 804-09 (2016). **{Invited Perspective}**
DOI: [10.1038/nmat4687](https://doi.org/10.1038/nmat4687)
Times Cited: 1,167
161. B. Moeremans, H.-W. Cheng, Q. Hu, H.F. Garces, N.P. Padture, F.U. Renner, and M. Valtiner, “Lithium-Ion Batteries Electrolytes Mobility at Nano-Confined Graphene Interfaces,” *Nature Communications*, **7**, 12693-1-7 (2016).
DOI: [10.1038/ncomms12693](https://doi.org/10.1038/ncomms12693)
162. Y. Zong, Y. Zhou, M.-G. Ju, H.F. Garces, A.R. Krause, F. Ji, G. Cui, X.C. Zeng, N.P. Padture, and S. Pang, “Thin-Film Transformation of NH₄PbI₃ to CH₃NH₃PbI₃-Perovskite: A Methylamine-Induced Conversion-Healing Process,” *Angewante Chemie International Edition*, **55**, 14723-27 (2016).
DOI: [10.1002/anie.201609529](https://doi.org/10.1002/anie.201609529)
- ¶ 163. N. Wang, Y. Zhou, M.-G. Ju, H.F. Garces, T. Ding, S. Pang, X.C. Zeng, N.P. Padture, and X.W. Sun, “Heterojunction-Depleted Lead-Free Perovskite Solar Cells with Coarse-Grained B-γ-CsSnI₃ Thin Films,” *Advanced Energy Materials*, **6**, 1601130 (2016). **{Front Cover}**
DOI: [10.1002/aenm.201601130](https://doi.org/10.1002/aenm.201601130)
Times Cited: 279
164. A.R. Krause, H.F. Garces, C.E. Herrmann, and N.P. Padture, “Resistance of 2ZrO₂.Y₂O₃ Top-Coat in Thermal/Environmental Barrier Coatings to CMAS Attack at 1500 °C,” *Journal of the American Ceramic Society*, **100**, 3175-87 (2017).
DOI: [10.1111/jace.14854](https://doi.org/10.1111/jace.14854)
- ¶ 165. B. Wu, Y. Zhou, G. Xing, A. Solanki, H.F. Garces, N.P. Padture, and T.C. Sum, “Long Minority-Carrier Diffusion Length and Low Surface-Recombination Velocity in Inorganic Lead-free CsSnI₃ Perovskite Crystal for Solar Cells,” *Advanced Functional Materials*, **27**, 1604818, (2017).
DOI: [10.1002/adfm.201604818](https://doi.org/10.1002/adfm.201604818)
Times Cited: 176
- ¶ 166. B. Chen, X. Zheng, Y. Bai, N.P. Padture, and J. Huang, “Progress in Tandem Solar Cells

Based on Hybrid Organic-Inorganic Perovskites,” *Advanced Energy Materials*, **7**, 1602400 (2017). **{Invited Review Paper}**

DOI: [10.1002/aenm.201602400](https://doi.org/10.1002/aenm.201602400)

Times Cited: 150

167. Y. Liu, C. Ramirez, L. Zhang, W. Wu, and N.P. Padture, “*In Situ* Direct Observation of Toughening in Isotropic Nanocomposites of Alumina Ceramic and Multiwall Carbon Nanotubes,” *Acta Materialia*, **127**, 203-10 (2017).
DOI: [10.1016/j.actamat.2017.01.024](https://doi.org/10.1016/j.actamat.2017.01.024)
168. O.S. Game, G.J. Buchsbaum, Y. Zhou, N.P. Padture, and A.I. Kingon, “Ions Matter: Description of the Anomalous Electronic Behavior in Methylammonium Lead Halide Perovskite Devices,” *Advanced Functional Materials*, **27**, 1606584 (2017).
DOI: [10.1002/adfm.201606584](https://doi.org/10.1002/adfm.201606584)
- ¶ 169. T. Liu, Y. Zong, Y. Zhou, M. Yang, Z. Li, O.S. Game, K. Zhu, R. Zhu, Q. Gong, and N.P. Padture, “High-Performance Formamidinium-Based Perovskite Solar Cells via Microstructure-Mediated δ -to- α Phase Transformation,” *Chemistry of Materials*, **29**, 3246-50 (2017).
DOI: [10.1021/acs.chemmater.7b00523](https://doi.org/10.1021/acs.chemmater.7b00523)
- Times Cited: 112**
170. L. Zhang and N.P. Padture, “Inhomogeneous Oxidation of ZrB₂-SiC Ultra-High-Temperature Ceramic Particulate Composites and its Mitigation,” *Acta Materialia*, **129**, 138-48 (2017).
DOI: [10.1016/j.actamat.2017.02.076](https://doi.org/10.1016/j.actamat.2017.02.076)
171. K.T. Faber, T. Asefa, M. Backhaus-Ricoult, R.K. Brow, J. Chan, S. Dillon, W.G. Fahrenholtz, M.W. Finnis, J.E. Garay, E. Garcia, Y. Gogotsi, S.M. Haile, J.W. Halloran, J. Hu, L. Huang, S. Jacobsen, E. Lara-Curzio, J. LeBeau, W.E. Lee, C.G. Levi, I. Levin, J.A. Lewis, D.M. Lipkin, K. Lu, J. Luo, J.P. Maria, L.W. Martin, S. Martin, G.L. Messing, A. Navrotsky, N.P. Padture, C.A. Randall, G.S. Rohrer, A. Rozenflanz, T. Schaedler, D. Schlom, A. Sehirlioglu, A. Stevensen, T. Tani, V. Tikare, S. Trolier-McKinstry, H. Wang, and B. Yildiz, “The Role of Ceramic and Glass Science Research in Meeting Societal Challenges: Report from an NSF-Sponsored Workshop,” *Journal of the American Ceramic Society*, **100**, 1777-1803 (2017). **{Feature Article; Front Cover}**
DOI: [10.1111/jace.14881](https://doi.org/10.1111/jace.14881)
172. C. Li, Y. Zhou, Y. Chang, Y. Zong, L. Etgar, G. Cui, N.P. Padture, and S. Pang, “Methylammonium-Mediated Evolution of Mixed-Organic-Cation Perovskite Thin Films” A Dynamic Composition-Tuning Process, *Angewante Chemie International Edition*, **56**, 7674-78 (2017).
DOI: [10.1002/ange.201704188](https://doi.org/10.1002/ange.201704188)
173. T. Liu, Y. Zhou, Q. Hu, K. Chen, Y. Zhang, W. Yang, J. Wu, F. Ye, D. Luo, K. Zhu, N.P. Padture, F. Liu, T. Russell, R. Zhu, and Q. Gong, “Fabrication of Compact and Stable Perovskite Films with Optimized Precursor Composition in the Fast-Growing Procedure,” *Science China Materials*, **60**, 608-16 (2017).
DOI: [10.1007/s40843-017-9044-y](https://doi.org/10.1007/s40843-017-9044-y)
174. Y. Zhou and N.P. Padture, “Gas-Induced Formation/Transformation of Organic-Inorganic Halide Perovskites,” *ACS Energy Letters*, **2**, 2166-76 (2017). **{Invited Perspective}**
DOI: [10.1021/acsenergylett.7b00667](https://doi.org/10.1021/acsenergylett.7b00667)
175. Y. Zong, N. Wang, L. Zhang, M.-G. Ju, X.C. Zeng, X.W. Sun, Y. Zhou, and N.P. Padture, “Homogenous Alloys of Formamidium Lead Triiodide and Cesium Tin Triiodide for Efficient Ideal-Bandgap Perovskite Solar Cells,” *Angewandte Chemie International Edition*,

129, 12832-36 (2017). **{Very Important Paper; Inside Back Cover}**

DOI: [10.1002/anie.201705965](https://doi.org/10.1002/anie.201705965)

176. F. Ji, S. Pang, L. Zhang, Y. Zong, G. Cui, N.P. Padture, and Y. Zhou, “Simultaneous Evolution of Uniaxially Oriented Grains and Ultralow-Density Grain-Boundary Network in CH₃NH₃PbI₃ Perovskite Thin Films Mediated by Precursor Phase Metastability,” *ACS Energy Letters*, **2**, 2727-32 (2017).

DOI: [10.1021/acseenergylett.7b00980](https://doi.org/10.1021/acseenergylett.7b00980)

177. S.K. Yadavalli, Y. Zhou, and N.P. Padture, “Exceptional Grain Growth in Formamidinium Lead Iodide Perovskite Thin Films Induced by the δ -to- α Phase Transformation,” *ACS Energy Letters*, **3**, 63-64 (2018).

DOI: [10.1021/acseenergylett.7b01150](https://doi.org/10.1021/acseenergylett.7b01150)

- ¶ 178. Z. Xiao, Y. Zhou, H. Hosono, T. Kamiya, and N.P. Padture, “Bandgap Optimization of Perovskite Semiconductors for Photovoltaic Applications,” *Chemistry: A European Journal*, **24**, 2305-16 (2018). **{Invited Minireview}**

DOI: [10.1002/chem.201705031](https://doi.org/10.1002/chem.201705031)

Times Cited: 115

- ¶ 179. M.-G. Ju, M. Chen, Y. Zhou, H.F. Garces, J. Dai, L. Mai, N.P. Padture, and X.C. Zeng, “Earth-Abundant Nontoxic Titanium (IV)-based Vacancy-Ordered Double Perovskite Halides with Tunable 1.0 to 1.8 eV Bandgaps for Photovoltaic Applications,” *ACS Energy Letters*, **3**, 297-304 (2018). **{Editor’s Choice}**

DOI: [10.1021/acseenergylett.7b01167](https://doi.org/10.1021/acseenergylett.7b01167)

Times Cited: 313

180. C. Ramírez, Q. Wang, M. Belmonte, P. Miranzo, M.I. Osendi, B.D. Sheldon, and N.P. Padture, “Direct *In situ* Observation of Toughening Mechanisms in Nanocomposites of Silicon Nitride and Reduced Graphene-Oxide,” *Scripta Materialia*, **149**, 40-43 (2018).

DOI: [10.1016/j.scriptamat.2018.02.004](https://doi.org/10.1016/j.scriptamat.2018.02.004)

- ¶ 181. M. Chen, M.-G. Ju, A.D. Carl, Y. Zong, R.L. Grimm, J. Gu, X.C. Zeng, Y. Zhou, and N.P. Padture, “Cesium Titanium (IV) Bromide Thin Films Based Stable Lead-Free Perovskite Solar Cells,” *Joule*, **2**, 558-70 (2018).

DOI: [10.1016/j.joule.2018.01.009](https://doi.org/10.1016/j.joule.2018.01.009)

Times Cited: 429

182. Y. Wang, Y. Zhou, T. Zhang, M.-G. Ju, L. Zhang, M. Kan, Y. Li, X.C. Zeng, N.P. Padture, and Y. Zhao, “Integration of a Functionalized Graphene Nano-Network into a Planar Perovskite Absorber for High-Efficiency Large-Area Solar Cells,” *Materials Horizons*, **5**, 868-73 (2018).

DOI: [10.1039/C8MH00511G](https://doi.org/10.1039/C8MH00511G)

183. L.R. Turcer, A.R. Krause, H.F. Garces, L. Zhang, and N.P. Padture, “Environmental-Barrier Coating Ceramics for Resistance Against Attack by Molten Calcia-Magnesia-Aluminosilicate (CMAS) Glass: Part I, YAlO₃ and γ -Y₂Si₂O₇,” *Journal of the European Ceramic Society*, **38**, 3905-13 (2018).

DOI: [10.1016/j.jeurceramsoc.2018.03.021](https://doi.org/10.1016/j.jeurceramsoc.2018.03.021)

- ¶ 184. L.R. Turcer, A.R. Krause, H.F. Garces, L. Zhang, and N.P. Padture, “Environmental-Barrier Coating Ceramics for Resistance Against Attack by Molten Calcia-Magnesia-Aluminosilicate (CMAS) Glass: Part II, β -Yb₂Si₂O₇ and β -Sc₂Si₂O₇,” *Journal of the European Ceramic Society*, **38**, 3914-24 (2018).

DOI: [10.1016/j.jeurceramsoc.2018.03.010](https://doi.org/10.1016/j.jeurceramsoc.2018.03.010)

Times Cited: 148

¶

185. Y. Zong, Y. Zhou, Y. Zhang, L. Zhang, M.-G. Ju, Z. Li, M. Chen, S. Pang, X.C. Zeng, and N.P. Padture, “Continuous Grain-Boundary Functionalization for High-Efficiency Perovskite Solar Cells with Exceptional Stability,” *CHEM*, **4**, 1404-15 (2018). {**Commentary by B.R. Sutherland, *Joule*, 2, 814 (2018)**}
DOI: [10.1016/j.chempr.2018.03.005](https://doi.org/10.1016/j.chempr.2018.03.005)
Times Cited: 173
186. T. Liu, Y. Zhou, Z. Li, L. Zhang, M.-G. Ju, D. Luo, Y. Yang, M. Yang, D. Kim, W. Yang, N.P. Padture, M.C. Beard, X.C. Zeng, K. Zhu, Q. Gong, and R. Zhu, “Stable Formamidinium-Based Perovskite Solar Cells via *In situ* Grain Encapsulation,” *Advanced Energy Materials*, **8**, 1800232 (2018). {**Back Cover**}
DOI: [10.1002/aenm.201800232](https://doi.org/10.1002/aenm.201800232)
- ¶ 187. C. Ramírez, S. Yadavalli, H.F. Garces, Y. Zhou, and N.P. Padture, “Thermo-Mechanical Behavior of Organic-Inorganic Halide Perovskites for Solar Cells,” *Scripta Materialia*, **150**, 36-41 (2018). {**Invited Viewpoint Article**}
DOI: [10.1016/j.scriptamat.2018.02.022](https://doi.org/10.1016/j.scriptamat.2018.02.022)
Times Cited: 106
- ¶ 188. M.-G. Ju, M. Chen, Y. Zhou, J. Dai, L. Ma, N.P. Padture, and X.C. Zeng, “Towards Eco-friendly and Stable Perovskite Materials for Photovoltaics,” *Joule*, **2**, 1231-41 (2018). {**Invited Perspective**}
DOI: [10.1016/j.joule.2018.04.026](https://doi.org/10.1016/j.joule.2018.04.026)
Times Cited: 220
- ¶ 189. L.R. Turcer and N.P. Padture, “Towards Multifunctional Thermal Environmental Barrier Coatings (TEBCs) Based on Rare-Earth-Pyrosilicate Solid-Solution Ceramics,” *Scripta Materialia*, **154**, 111-17 (2018). {**Invited Viewpoint Article**}
DOI: [10.1016/j.scriptamat.2018.05.032](https://doi.org/10.1016/j.scriptamat.2018.05.032)
Times Cited: 119
190. Y. Zong, Z. Zhou, M. Chen, N.P. Padture, and Y. Zhou, “Lewis-Adduct Mediated Grain-Boundary Functionalization for Efficient, Stable Ideal-Bandgap Perovskite Solar Cells,” *Advanced Energy Materials*, **8**, 1800997 (2018).
DOI: [10.1002/aenm.201800997](https://doi.org/10.1002/aenm.201800997)
191. W. Li, S.K. Yadavalli, D. Lizarazo-Ferro, M. Chen, Y. Zhou, N.P. Padture, and R. Zia, “Sub-Grain Special Boundaries in Halide Perovskite Thin Films Restrict Carrier Diffusion,” *ACS Energy Letters*, **3**, 2669-70 (2018).
DOI: [10.1021/acsenergylett.8b01704](https://doi.org/10.1021/acsenergylett.8b01704)
- ¶ 192. W. Dunlap-Shohl, Y. Zhou, N.P. Padture, and D.B. Mitzi, “Synthetic Approaches for Halide Perovskite Thin Films,” *Chemical Reviews*, **119**, 3193-3295 (2019). {**Invited Review Paper**}
DOI: [10.1021/acs.chemrev.8b00318](https://doi.org/10.1021/acs.chemrev.8b00318)
Times Cited: 485
- ¶ 193. M. Chen, M.-G. Ju, M. Hu, Z. Dai, Y. Hu, Y. Rong, H. Han, X.X. Zeng, Y. Zhou, and N.P. Padture, “Lead-Free Dion-Jacobson Tin Halide Perovskites for Photovoltaics,” *ACS Energy Letters*, **4**, 276-77 (2019).
DOI: [10.1021/acsenergylett.8b02051](https://doi.org/10.1021/acsenergylett.8b02051)
Times Cited: 100
- ¶ 194. Q. Dong, J. Li, Y. Shi, M. Chen, L.K. Ono, Y. Qi, Y. Zhou, N.P. Padture, and L. Wang, “Improved SnO₂ Electron Transport Layers Solution-Deposited at near Room Temperature for Rigid or Flexible Perovskite Solar Cells with High Efficiencies,” *Advanced Energy Materials*, **9**, 1900834 (2019).

DOI: [10.1002/aenm.201900834](https://doi.org/10.1002/aenm.201900834)

Times Cited: 106

- ¶ 195. M. Chen, M.-G. Ju, H.F. Garces, A.D. Carl, L.K. Ono, Z. Hawash, Y. Zhang, T. Shen, Y. Qi, R.L. Grimm, D. Pacifici, X.C. Zeng, Y. Zhou, and N.P. Padture, “Highly Stable and Efficient All-Inorganic Lead-Free Perovskite Solar Cells with Native-Oxide Passivation,” *Nature Communications*, **10**, 16 (2019).

DOI: [10.1038/s41467-018-07951-y](https://doi.org/10.1038/s41467-018-07951-y)

Times Cited: 584

- ¶ 196. Y. Zhou, H. Sternlicht, and N.P. Padture, “Transmission Electron Microscopy of Halide Perovskite Materials and Devices,” *Joule*, **3**, 641-61 (2019). **{Invited Perspective}**

DOI: [10.1016/j.joule.2018.12.011](https://doi.org/10.1016/j.joule.2018.12.011)

Times Cited: 100

197. H. Khassaf, S.K. Yadavalli, O.S. Game, Y. Zhou, N.P. Padture, and A.I. Kingon, “Comprehensive Elucidation of Ion Transport and its Relation to Hysteresis in Methyammonium Lead Iodide Perovskite Thin Films,” *Journal of Physical Chemistry C*, **123**, 4029-34 (2019).

DOI: [10.1021/acs.jpcc.8b11285](https://doi.org/10.1021/acs.jpcc.8b11285)

198. H. Khassaf, S.K. Yadavalli, Y. Zhou, N.P. Padture, and A.I. Kingon, “Effect of Grain Boundaries on Charge Transport in Methyammonium Lead Iodide Perovskite Thin Films,” *Journal of Physical Chemistry C*, **123**, 5321-25 (2019).

DOI: [10.1021/acs.jpcc.9b00538](https://doi.org/10.1021/acs.jpcc.9b00538)

- ¶ 199. N.P. Padture, “Environmental Degradation of High-Temperature Protective Coatings for Ceramic-Matrix Composites in Gas-Turbine Engines,” *npj Materials Degradation*, **3**, 11 (2019). **{Invited Perspective}**

DOI: [10.1038/s41529-019-0075-4](https://doi.org/10.1038/s41529-019-0075-4)

Times Cited: 111

200. Y. Zhang, H. Yang, M. Chen, N.P. Padture, O. Chen, and Y. Zhou, “Fusing Nanowires into Thin Films: Fabrication of Graded-Heterojunction Perovskite Solar Cells with Enhanced Performance,” *Advanced Energy Materials*, **9**, 1900243 (2019).

DOI: [10.1002/aenm.201900243](https://doi.org/10.1002/aenm.201900243)

201. M. Que, Z. Dai, H. Yang, H. Zhu, Y. Zong, W. Que, N.P. Padture, Y. Zhou, and O. Chen, “Quantum-Dot-Induced Cesium-Rich Surface Imparts Enhanced Stability to Formamidinium Lead Iodide Perovskite Solar Cells,” *ACS Energy Letters*, **4**, 1970-75 (2019).

DOI: [10.1021/acsenergylett.9b01262](https://doi.org/10.1021/acsenergylett.9b01262)

202. W. Li, M.S.R. Huang, S.K. Yadavalli, D. Lizarazo-Ferro, Y. Zhou, A. Zaslavsky, N.P. Padture, and R. Zia, “Direct Characterization of Carrier Diffusion in Halide-Perovskite Thin Films Using Transient Photoluminescence Imaging,” *ACS Photonics*, **6**, 2375-80 (2019).

DOI: [10.1021/acsp Photonics.9b00778](https://doi.org/10.1021/acsp Photonics.9b00778)

- ¶ 203. J. Jiang, X. Sun, X. Chen, B. Wang, Z. Chen, Y. Hu, Y. Guo, L. Zhang, Y. Ma, L. Gao, F. Zheng, L. Jin, M. Chen, Z. Ma, Y. Zhou, N.P. Padture, K. Beach, H. Terrones, Y. Shi, D. Gall, T.-M. Lu, E. Wertz, J. Feng, and J. Shi, “Carrier Lifetime Enhancement in Halide Perovskite via Remote Epitaxy,” *Nature Communications*, **10**, 4145 (2019).

DOI: [10.1038/s41467-019-12056-1](https://doi.org/10.1038/s41467-019-12056-1)

Times Cited: 120

204. Y. Guan, M. Xu, W. Zhang, D. Li, X. Hou, L. Hong, Q. Wang, Z. Zhang, A. Mei, M. Chen, Y. Zhou, N.P. Padture, Y. Hu, Y. Rong, and H. Han, “*In situ* Transfer of CH₃NH₃PbI₃ Single Crystals in Mesoporous Scaffolds for Efficient Perovskite Solar Cells,” *Chemical Science*,

11, 474-81 (2020).

DOI: [10.1039/C9SC04900B](https://doi.org/10.1039/C9SC04900B)

205. Q. Wang, C. Ramírez, C.S. Watts, O. Borrero-López, A.L. Ortiz, B.W. Sheldon, and N.P. Padture, “Fracture, Fatigue, and Sliding-Wear Behavior of Nanocomposites of Alumina and Reduced Graphene-Oxide,” *Acta Materialia*, **186**, 29-39 (2020).

DOI: [10.1016/j.actamat.2019.12.035](https://doi.org/10.1016/j.actamat.2019.12.035)

- ¶ 206. M. Hu, M. Chen, P. Guo, H. Zhou, J. Deng, Y. Yao, Y. Jiang, J. Gong, Z. Dai, Y. Zhou, F. Qian, X. Chong, J. Feng, R.D. Schaller, K. Zhu, N.P. Padture, and Y. Zhou, “Sub-1.4 eV Bandgap Inorganic Perovskite Solar Cells with Long-Term Stability,” *Nature Communications*, **11**, 151 (2020).

DOI: [10.1038/s41467-019-13908-6](https://doi.org/10.1038/s41467-019-13908-6)

Times Cited: 115

207. S.K. Yadavalli, Z. Dai, H. Zhou, Y. Zhou, and N.P. Padture, “Facile Healing of Cracks in Organic-Inorganic Halide Perovskite Thin Films,” *Acta Materialia*, **187**, 112-21 (2020).

DOI: [10.1016/j.actamat.2020.01.040](https://doi.org/10.1016/j.actamat.2020.01.040)

208. C.E. Athanasiou, H. Zhang, C. Ramírez, J. Xi, T. Baba, X. Wang, W. Zhang, N.P. Padture, I. Szlufarska, and B.W. Sheldon, “High-Toughness Carbon-Nanotube-Reinforced Ceramics via Ion-Beam Engineering of Interfaces,” *Carbon*, **163**, 169-77 (2020).

DOI: [10.1016/j.carbon.2020.02.075](https://doi.org/10.1016/j.carbon.2020.02.075)

- ¶ 209. X. Liu, C.E. Athanasiou, N.P. Padture, B.W. Sheldon, and H. Gao, “A Machine Learning Approach to Fracture Mechanics Problems,” *Acta Materialia*, **190**, 105-12 (2020).

DOI: [10.1016/j.actamat.2020.03.016](https://doi.org/10.1016/j.actamat.2020.03.016)

Times Cited: 157

210. W. Zhao, Q. Dong, J. Zhang, S. Wang, M. Chen, C. Zhao, M. Hu, S. Jin, N.P. Padture, and Y. Shi, “Asymmetric Alkyl Diamine Based Dion-Jacobson Low-Dimensional Perovskite Solar Cells with Efficiency Exceeding 15%,” *Journal of Materials Chemistry A*, **8**, 9919-26 (2020).

DOI: [10.1039/D0TA02706E](https://doi.org/10.1039/D0TA02706E)

211. Y. Zhang, M. Chen, Y. Zhou, W. Li, Y. Lee, H. Kanda, X. Gao, R. Hu, K.G. Brooks, R. Zia, S. Kinge, N.P. Padture, and M.K. Nazeeruddin, “The Synergism of DMSO and Diethyl Ether for Highly Reproducible and Efficient MA_{0.5}FA_{0.5}PbI₃ Perovskite Solar Cells,” *Advanced Energy Materials*, **10**, 2001300 (2020).

DOI: [10.1002/aenm.202001300](https://doi.org/10.1002/aenm.202001300)

212. F. Qian, J. Gong, M. Hu, C. Ge, N.P. Padture, Y. Zhou, and J. Feng, “*p-p* Orbital Interaction via Magnesium Isovalent Doping Enhances Optoelectronic Properties of Halide Perovskites,” *ChemComm*, **56**, 15639-42 (2020).

DOI: [10.1039/d0cc02150d](https://doi.org/10.1039/d0cc02150d)

213. F. Qian, M. Hu, H. Gong, C. Ge, Y. Zhou, J. Guo, M. Chen, Z. Ge, N.P. Padture, Y. Zhou, and J. Feng, “Enhanced Thermoelectric Performance in Lead-Free Inorganic CsSn_{1-x}Ge_xI₃ Perovskite Semiconductors,” *Journal of Physical Chemistry C*, **124**, 11749-53 (2020).

DOI: [10.1021/acs.jpcc.0c00459](https://doi.org/10.1021/acs.jpcc.0c00459)

214. S.K. Yadavalli, Z. Dai, M. Hu, Q. Dong, W. Li, Y. Zhou, R. Zia, and N.P. Padture, “Mechanisms of Exceptional Grain Growth and Stability in Formamidinium Lead Triiodide for Perovskite Solar Cells,” *Acta Materialia*, **193**, 10-18 (2020).

DOI: [10.1016/j.actamat.2020.03.036](https://doi.org/10.1016/j.actamat.2020.03.036)

215. Y. Zhou, Y. Yin, X. Zuo, L. Wang, T.-D. Li, Y. Zhou, N.P. Padture, Z. Yang, Y. Guo, Y. Xue, K. Kisslinger, M. Cotlet, C.-Y. Nam, and M.H. Rafailovich, “Enhancing Chemical Stability and Suppressing Ion Migration in CH₃NH₃PbI₃ Perovskite Solar Cells via Direct

- Backbone Attachment of Polyesters on Grain Boundaries,” *Chemistry of Materials*, **32**, 5104-17 (2020).
DOI: [10.1021/acs.chemmater.0c00995](https://doi.org/10.1021/acs.chemmater.0c00995)
216. M. Chen, Q. Dong, F.T. Eickemeyer, Y. Liu, Z. Dai, A.D. Carl, B. Bahrami, A.H. Chowdhury, R.L. Grimm, Y. Shi, Q. Qiao, S.M. Zakeeruddin, M. Grätzel, and N.P. Padture, “High Performance Lead-Free Solar Cells Based on Tin-Halide Perovskite Thin Films Functionalized by a Divalent Organic Cation,” *ACS Energy Letters*, **5**, 2223-30 (2020).
DOI: [10.1021/acsenergylett.0c00888](https://doi.org/10.1021/acsenergylett.0c00888)
217. Zhang, G. Dun, Q. Feng, R. Zhao, R. Liang, Z. Gao, T. Hirtz, M. Chen, X. Geng, M. Liu, Y. Huang, X. Zheng, K. Qin, X. Tan, D. Xie, Y. Yang, H. Tian, Y. Zhou, N.P. Padture, X. Wang, J. Hong, and T.-L. Ren, “Encapsulated X-ray Detector enabled by All-Inorganic Lead-free Perovskite Film with High Sensitivity and Low Detection Limit,” *IEEE Transactions on Electron Devices*, **67**, 3191-98 (2020).
DOI: [10.1109/TED.2020.2998763](https://doi.org/10.1109/TED.2020.2998763)
218. L.R. Turcer and N.P. Padture, “Rare-Earth Pyrosilicate Solid-Solution Environmental-Barrier Coating Ceramics for Resistance Against Attack by Molten Calcia-Magnesia-Aluminosilicate (CMAS) Glass,” *Journal of Materials Research*, **35**, 2373-84 (2020).
{Invited Paper}
DOI: [10.1557/jmr.2020.132](https://doi.org/10.1557/jmr.2020.132)
219. C.E. Athanasiou, M.Y. Jin, C. Ramírez, N.P. Padture, and B.W. Sheldon, “High Toughness Inorganic Solid Electrolytes *via* the Use of Reduced Graphene-Oxide,” *Matter*, **3**, 212-19 (2020). **{Commentary by J.L. Lutkenhaus and P. Flouda, *Matter*, 3, 12 (2020)}**
DOI: [10.1016/j.matt.2020.05.003](https://doi.org/10.1016/j.matt.2020.05.003)
220. J. Song, Y. Zhou, N.P. Padture, and B.D. Huey, “Anomalous 3D Nanoscale Photoconduction in Hybrid Perovskite Semiconductors Revealed by Tomographic Atomic Force Microscopy,” *Nature Communications*, **11**, 3308 (2020).
DOI: [10.1038/s41467-020-17012-y](https://doi.org/10.1038/s41467-020-17012-y)
221. T. Shen, Q. Tan, Z. Dai, N.P. Padture, and D. Pacifici, “Arrays of Plasmonic Nanostructures for Absorption Enhancement in Perovskite Thin Films,” *Nanomaterials*, **10**, 1342 (2020).
DOI: [10.3390/nano10071342](https://doi.org/10.3390/nano10071342)
222. J. Kong, H. Wang, J.A. Röhr, M. Cotlet, Z.S. Fishman, Y. Zhou, M. Li, M. Cotlet, G. Kim, C. Karpovich, F. Antonio, N.P. Padture, and A.D. Taylor, “Perovskite Solar Cells with Enhanced Fill Factors *via* Polymer-Capped Solvent Annealing,” *ACS Applied Energy Materials*, **3**, 7231-38 (2020).
DOI: [10.1021/acsaem.0c00854](https://doi.org/10.1021/acsaem.0c00854)
223. Z. Dai, S.K. Yadavalli, M. Hu, M. Chen, Y. Zhou, and N.P. Padture, “Effect of Grain Size on the Fracture Behavior of Organic-Inorganic Halide Perovskite Thin Films for Solar Cells,” *Scripta Materialia*, **185**, 47-50 (2020).
DOI: [10.1016/j.scriptamat.2020.03.044](https://doi.org/10.1016/j.scriptamat.2020.03.044)
224. S.K. Yadavalli, M. Hu, Z. Dai, M. Chen, Y. Zhou, and N.P. Padture, “Electron-Beam-Induced Cracking in Organic-Inorganic Halide Perovskite Thin Films,” *Scripta Materialia*, **187**, 88-92 (2020).
DOI: [10.1016/j.scriptamat.2020.05.062](https://doi.org/10.1016/j.scriptamat.2020.05.062)
225. H.F. Garces, A. Tran, H. Sternlicht, M. Miller, M. Resnick, S. Marino, W.B. Choi, and N.P. Padture, “Sea-Salt-Induced Moderate-Temperature Degradation of Thermally-Sprayed MCrAlY Bond-Coats,” *Surface & Coatings Technology*, **404**, 126459 (2020).
DOI: [10.1016/j.surfcoat.2020.126459](https://doi.org/10.1016/j.surfcoat.2020.126459)
226. L.R. Turcer, A. Sengupta, and N.P. Padture, “Low Thermal Conductivity in High-Entropy

Rare-Earth Pyrosilicate Solid-Solutions for Thermal Environmental Barrier Coatings,” *Scripta Materialia*, **191**, 40-45 (2021).

DOI: [10.1016/j.scriptamat.2020.09.008](https://doi.org/10.1016/j.scriptamat.2020.09.008)

227. H. Liu, M. Shen, P. Zhou, Z. Guo, X. Liu, W. Yang, M. Gao, M. Chen, H. Guan, N.P. Padture, Y. Yu, and S. Sun, “Linking Melem with Conjugated Schiff-Base Bond to Boost Photocatalytic Efficiency of Carbon Nitride for Overall Water Splitting,” *Nanoscale*, **13**, 9315-21 (2021).

DOI: [10.1039/D1NR01940F](https://doi.org/10.1039/D1NR01940F)

228. E. Garcia, H.F. Garces, L.R. Turcer, N.P. Padture, and S. Sampath, “Crystallization Behavior of Air-Plasma-Sprayed Ytterbium-Silicate-Based Environmental Barrier Coatings,” *Journal of the European Ceramic Society*, **41**, 3696-3705 (2021).

DOI: [10.1016/j.jeurceramsoc.2020.12.051](https://doi.org/10.1016/j.jeurceramsoc.2020.12.051)

229. J. Tong, J. Gong, M. Hu, S.K. Yadavalli, Z. Dai, F. Zhang, C. Xiao, J. Hao, M. Yang, M.A. Anderson, E.L. Ratcliff, J.J. Berry, N.P. Padture, Y. Zhou, and K. Zhu, “High-Performance Methylammonium-Free Ideal-Bandgap Perovskite Solar Cells,” *Matter*, **4**, 1365-76 (2021).

DOI: [10.1016/j.matt.2021.01.003](https://doi.org/10.1016/j.matt.2021.01.003)

- ¶ 230. Q. Dong, C. Zhu, M. Chen, C. Jiang, J. Gao, Y. Feng, Z. Dai, S.K. Yadavalli, M. Hu, X. Cao, Y. Li, Y. Huang, Z. Liu, Y. Shi, L. Wang, N.P. Padture, and Y. Zhou, “Interpenetrating Interfaces for Efficient Solar Cells with High Operational Stability and Mechanical Robustness,” *Nature Communications*, **12**, 973 (2021).

DOI: [10.1038/s41467-021-21292-3](https://doi.org/10.1038/s41467-021-21292-3)

Times Cited: 158

231. J. Liu, M. Hu, Z. Dai, W. Que, N.P. Padture, and Y. Zhou, “Correlations Between Electrochemical Ion Migration and Anomalous Device Behaviors in Perovskite Solar Cells,” *ACS Energy Letters*, **6**, 1003-14 (2021). {Invited Perspective}

DOI: [10.1021/acsenergylett.0c02662](https://doi.org/10.1021/acsenergylett.0c02662)

232. A.R. Krause, H.F. Garces, and N.P. Padture, “High-Temperature Interactions Between Yttria-Stabilized Zirconia Thermal Barrier Coatings and Na-Rich Calcia-Magnesia-Aluminosilicate Deposits,” *Ceramics International*, **47**, 19505-14 (2021).

DOI: [10.1016/j.ceramint.2021.03.288](https://doi.org/10.1016/j.ceramint.2021.03.288)

233. S.K. Yadavalli, M. Hu, and N.P. Padture, “On the Multiplying Factor for the Estimation of the Average Grain Size in Thin Films,” *Scripta Materialia*, **196**, 113478 (2021).

DOI: [10.1016/j.scriptamat.2021.113748Z](https://doi.org/10.1016/j.scriptamat.2021.113748Z)

- ¶ 234. Dai, S.K. Yadavalli, M. Chen, A. Abbaspourtamijani, Y. Qi, and N.P. Padture, “Interfacial Toughening with Self-Assembled Monolayers Enhances Perovskite Solar Cell Reliability,” *Science*, **372**, 618-22 (2021). [Free Full Article Access](#) {Commentary by **E. Ochoa-Martinez and J.V. Milić**, *Nature Energy*, (2021)}

DOI: [10.1126/science.abf5602](https://doi.org/10.1126/science.abf5602)

Times Cited: 267

235. M.A. Smith, M. Chen, Z. Dai, C. Antolini, G.K. Jayasekara, S.K. Yadavalli, B.J. Reinhart, N.P. Padture, and D. Hayes, “Real-Time Investigation of Sn(II) Oxidation in Pb-Free Halide Perovskites by X-Ray Absorption and Mössbauer Spectroscopy,” *ACS Applied Energy Materials*, **4**, 4327-32 (2021).

DOI: [10.1021/acsaem.1c01143](https://doi.org/10.1021/acsaem.1c01143)

- ¶ 236. Q. Dong, M. Chen, Y. Liu, F.T. Eickemeyer, W. Zhao, Z. Dai, Y. Yin, C. Jiang, J. Feng, S. Jin, S. Liu, S.M. Zakeeruddin, M. Grätzel, N.P. Padture, and Y. Shi, “Flexible Perovskite Solar Cells with Simultaneously Improved Efficiency, Operational Stability, and Mechanical Reliability,” *Joule*, **5**, 1587-1601 (2021). {Front Cover} [Free Full Article Access](#)

DOI: [10.1016/j.joule.2021.04.014](https://doi.org/10.1016/j.joule.2021.04.014)**Times Cited: 104**

237. X. Liu, C.E. Athanasiou, N.P. Padture, B.W. Sheldon, and H. Gao, “Knowledge Extraction and Transfer in Data-Driven Fracture Mechanics,” *Proceedings of the National Academy of Sciences*, **118**, e2104765118 (2021).
DOI: [10.1073/pnas.2104765118](https://doi.org/10.1073/pnas.2104765118)
238. Q. Wang, C.S. Watts, C.E. Athanasiou, Z. Dai, M. Hu, B.W. Sheldon, and N.P. Padture, “The Effect of Atmosphere on the Flash-Sintering of Nanoscale Titania Ceramics,” *Scripta Materialia*, **199**, 113894 (2021).
DOI: [10.1016/j.scriptamat.2021.113894](https://doi.org/10.1016/j.scriptamat.2021.113894)
239. C. Zhang, M. Chen, F. Fu, H. Zhu, T. Feurer, W. Tian, C. Zhu, K. Zhou, S. Jin, S.K. Zakeeruddin, A.N. Tiwari, N.P. Padture, M. Grätzel, and Y. Shi, “CNT-Based Bifacial Perovskite Solar Cells Toward Highly Efficient 4-Terminal Tandem Photovoltaics,” *Energy and Environmental Science*, **15**, 1536-44 (2022).
DOI: [10.1039/D1EE04008A](https://doi.org/10.1039/D1EE04008A)
240. S. Thakur, Z. Dai, P. Karna, N.P. Padture, and A. Giri “Tailoring the Thermal Conductivity of Two-Dimensional Metal Halide Perovskites,” *Materials Horizons*, **9**, 3087-94 (2022).
DOI: [10.1039/D2MH01070D](https://doi.org/10.1039/D2MH01070D)
241. S.K. Yadavalli, Z. Dai, M. Chen, and N.P. Padture, “Delineation and Passivation of Grain-Boundary Channels in Metal Halide Perovskite Thin Films for Solar Cells,” *Advanced Materials Interfaces*, **9**, 2102585 (2022). **{Editor’s Choice}**
DOI: [10.1002/admi.202102585](https://doi.org/10.1002/admi.202102585)
242. C.E. Athanasiou, X. Liu, M.Y. Jin, E. Nimon, S. Visco, C. Lee, M. Park, J. Yun, N.P. Padture, H. Gao, and B.W. Sheldon, “Rate-dependent Deformation of Amorphous Sulfide Glass Electrolytes for Solid-State Batteries,” *Cell Reports Physical Sciences*, **3**, 100845 (2022).
DOI: [10.1016/j.xcrp.2022.100845](https://doi.org/10.1016/j.xcrp.2022.100845)
243. S. Li, Z. Dai, L. Li, N.P. Padture, and P. Guo, “Time-Resolved Vibrational-Pump Visible-Probe Spectroscopy for Thermal Conductivity Measurements of Metal-Halide Perovskites,” *Review of Scientific Instruments*, **93**, 053003 (2022).
DOI: [10.1063/5.0083763](https://doi.org/10.1063/5.0083763)
244. M. Chen, Q. Dong, C. Xiao, X. Zheng, Z. Dai, Y. Shi, J.M. Luther, and N.P. Padture, “Lead-Free Flexible Perovskite Solar Cells with Interfacial Native Oxide Have >10% Efficiency, and Simultaneously Enhanced Stability and Reliability,” *ACS Energy Letters*, **7**, 2256-64 (2022).
DOI: [10.1021/acsenergylett.2c01130](https://doi.org/10.1021/acsenergylett.2c01130)
245. P.M. Stathatou, C.E. Athanasiou, M. Tsezos, J.W. Goss, C. Blackburn, F. Tzourlomis, A. Mershin, B.W. Sheldon, N.P. Padture, E.M. Darling, H. Gao, and N. Gershenfeld, “Investigating Lead Removal at Trace Concentrations from Water by Inactive Yeast Cells,” *Communications Earth & Environment*, **3**, 132 (2022).
DOI: [10.1038/s43247-022-00463-0](https://doi.org/10.1038/s43247-022-00463-0)
246. H. Sternlicht, D.W. McComb, and N.P. Padture, “Interaction of Ytterbium Pyrosilicate Environmental-Barrier-Coating Ceramics with Molten Calcia-Magnesia-Aluminosilicate Glass: Part I, Microstructures,” *Acta Materialia*, **241**, 118360 (2022).
DOI: [10.1016/j.actamat.2022.118360](https://doi.org/10.1016/j.actamat.2022.118360)
247. H. Sternlicht, D.W. McComb, and N.P. Padture, “Interaction of Ytterbium Pyrosilicate Environmental-Barrier-Coating Ceramics with Molten Calcia-Magnesia-Aluminosilicate Glass: Part II, Interfaces,” *Acta Materialia*, **241**, 118359 (2022).

- DOI: [10.1016/j.actamat.2022.118359](https://doi.org/10.1016/j.actamat.2022.118359)
248. Z. Dai, S. Li, X. Liu, M. Chen, C.E. Athanasiou, B.W. Sheldon, H. Gao, P. Guo, and N.P. Padture, “Dual-Interface Reinforced Flexible Perovskite Solar Cells for Enhanced Performance and Mechanical Reliability,” *Advanced Materials*, **34**, 2205301 (2022).
DOI: [10.1002/adma.202205301](https://doi.org/10.1002/adma.202205301)
249. C.E. Athanasiou, X. Liu, B. Zhang, T. Cai, C. Ramírez, N.P. Padture, J. Luo, B.W. Sheldon, and H. Gao, “Integrated Simulation, Machine Learning, and Experimental Approach to Characterizing Fracture Instability in Indentation Pillar-Splitting of Materials,” *Journal of Mechanics and Physics of Solids*, **170**, 105092 (2023).
DOI: [10.1016/j.jmps.2022.105092](https://doi.org/10.1016/j.jmps.2022.105092)
250. Z. Dai, M.C. Doyle, X. Liu, M. Hu, Q. Wang, C.E. Athanasiou, Y. Liu, B.W. Sheldon, H. Gao, S. Lou, and N.P. Padture, “The Mechanical Behavior of Metal-Halide Perovskites: Elasticity, Plasticity, Fracture, and Creep,” *Scripta Materialia*, **223**, 115064 (2023).
DOI: [10.1016/j.scriptamat.2022.115064](https://doi.org/10.1016/j.scriptamat.2022.115064)
251. S. Li, Z. Dai, C.A. Kocoj, E.I. Altman, N.P. Padture, and P. Guo, “Photothermally Induced, Reversible Phase Transition in Methylammonium Lead Triiodide,” *Matter*, **6**, 460-74 (2023).
DOI: [10.1016/j.matt.2022.11.004](https://doi.org/10.1016/j.matt.2022.11.004)
252. X. Zheng, Z. Li, Y. Zhang, M. Chen, T. Liu, C. Xiao, J.B. Patel, D. Kucauskas, A. Magomedov, R.A. Scheidt, X. Wang, S.P. Harvey, Z. Dai, D. Morales, H. Pruett, B.M. Wieliczka, A.R. Kirmani, N.P. Padture, K.R. Graham, Y. Yan, M.K. Nazeeruddin, M.D. McGehee, Z. Zhu, and J.M. Luther, “Co-Deposition of Hole-Selective Contact and Absorber for Improving the Processibility of Perovskite Solar Cells,” *Nature Energy*, **8**, 462-72 (2023).
DOI: [10.1038/s41560-023-01227-6](https://doi.org/10.1038/s41560-023-01227-6)
253. N.P. Padture, “The Promise of Metal-Halide-Perovskite Solar Photovoltaics: A Brief Review,” *MRS Bulletin*, **48**, 983-98 (2023). **{Invited Review for the 50th Anniversary Issue}**
DOI: [10.1557/s4377-023-00585-6](https://doi.org/10.1557/s4377-023-00585-6)
254. Z. Dai and N.P. Padture, “The Mechanical Reliability of Metal-Halide Perovskites and Photovoltaics: Challenges and Opportunities,” *Nature Energy*, in press (2023). **{Invited Perspective}**
DOI: [10.1038/s41560-023-01378-6](https://doi.org/10.1038/s41560-023-01378-6)
255. X. Liu, C.E. Athanasiou, C. López-Pernía, T. Zhu, N.P. Padture, B.W. Sheldon, and H. Gao, “Tailoring Toughening Effects in Two-Dimensional Nanomaterials-Reinforced Ceramic Composites,” *Journal of Applied Mechanics*, **91**, 011003 (2024).
[Link](#)
256. I.S. Yang, Z. Dai, A. Ranka, D. Chen, K. Zhu, J.J. Berry, P. Guo, and N.P. Padture, “Simultaneous Enhancement of Efficiency and Operational Stability of Mesoscopic Perovskite Solar Cells via Interfacial Toughening,” *Advanced Materials*, in press (2023). **{Invited Paper}**
DOI: [10.1002/adma.202308819](https://doi.org/10.1002/adma.202308819)

Patents Awarded

1. N.P. Padture, M. Gell, and P.G. Klemens, “Ceramic Materials for Thermal Barrier Coatings,” *U.S. Patent*, [No. 6,015,630](#) (2000).
2. S. Suresh, A.E. Giannakopoulos, N.P. Padture, and J. Jitcharoen, “Functionally-Graded Materials,” *European Patent*, [No. 0968153](#) (2002).
- ¶ 3. S. Suresh, A.E. Giannakopoulos, M. Olsson, R. Thampuran, O. Jorgensen, N.P. Padture, and J. Jitcharoen, “Functionally-Graded Materials and the Engineering of Tribological

Resistance at Surfaces,” *U.S. Patent*, [No. 6,641,893](#) (2003).

Times Cited: 105

4. M. Gell, X. Ma, E.H. Jordan, N.P. Padture, L. Xie, D. Xiao, and A. DeCarminé, “Coatings, Materials, Articles, and Methods of Making Thereof,” *U.S. Patent*, [No. 7,563,503](#) (2009).
5. K. Zhu, M. Yang, Y. Zhou, and N.P. Padture, “Methods for Producing Halide Perovskite Films,” *U.S. Patent*, [No. 10,411,209](#) (2019).
6. N.P. Padture and Y. Zhou, “Method of Making Coated Substrates,” *U.S. Patent*, [No. 10,714,269](#) (2020).
7. K. Zhu, M. Yang, Y. Zhou, and N.P. Padture, “Organo-Metal Halide Perovskites Films and Methods of Making the Same,” *U.S. Patent*, [No. 10,910,569](#) (2021). (UK Patent No. 3298630; European Patent No. DE 60 2016 075 907.1)
8. K. Zhu, M. Yang, Y. Zhou, and N.P. Padture, “Methods for Producing Perovskite Halide Films,” *U.S. Patent*, [No. 11,387,420](#) (2022).

Conference Proceedings and Preprints

1. N.P. Padture, H.M. Chan, B.R. Lawn, and M.J. Readey, “The Role of Crystallization of an Intergranular Glassy Phase in Determining Grain Boundary Residual Stresses in Debased Aluminas,” *MRS Symp. Proc.*, Vol. **170**, Tailored Interfaces in Composites, Eds. C. Pantano and E. Chen, Mater. Res. Soc., Pittsburgh, PA, pp. 245-50 (1990).
2. N.P. Padture, S.J. Bennison, J.L. Runyan, J. Rödel, H.M. Chan, and B.R. Lawn, “Flaw Tolerant Al₂O₃-Al₂TiO₅ Composites,” *Ceram. Trans.*, Vol. **19**, Advanced Composite Materials, Ed. M.D. Sacks, American Ceramic Society, Westerville, OH, pp. 715-21 (1991).
3. N.P. Padture, “Microstructural Effects in the Machining of Ceramics,” *Supergrind '95 Proc.*, Eds. I.D. Marinescu and F. Gray, The Industrial Diamond Association of America, Skyland, NC, pp. 167-82 (1995).
4. N.P. Padture, D.C. Pender, and J. Jitcharoen, “Microstructural Tailoring of Ceramics for Mechanical Properties,” *Proc. VIth Natl. Cong. Mech. Props. Solids*, Eds. A. Pajares, F.L. Cumbreira and F. Guiberteau, University of Extremadura, Badajoz, Spain, pp. 19-29 (1998).
5. K.W. Schlichting, N.P. Padture, and P.G. Klemens, “Thermal Conductivity of Zirconia Containing Ytria,” *Proc. Therm. Cond.*, Vol. **25**, Eds. C. Uher and D. Morelli, Technomic Publishing Co., Lancaster, PA, pp. 162-67 (2000).
6. X. Ma, T.D. Xiao, J. Roth, L. Xie, E.H. Jordan, N.P. Padture, M. Gell, and J.R. Price, “Thick Thermal Barrier Coatings with Controlled Microstructures Using Solution Precursor Plasma Spray Process,” *Proc. Intl. Thermal Spray Conf.*, Ed. D. von Hofe, ASM International, Materials Park, OH, pp. 1103-09 (2004).
7. X. Ma, J. Roth, T.D. Xiao, M. Gell, E.H. Jordan, and N.P. Padture, “Advanced Ceramic Coatings for Structural, Environmental and Functional Applications — Solution Precursor Plasma Spraying,” *Ceram. Engr. Sci. Proc.*, Vol. **25**, pp. 381-88 (2004).
8. E. Zapata-Solvas, R. Poyato, D. Gómez-García, A. Domínguez-Rodríguez, and N.P. Padture, “High-Temperature Mechanical Properties of Al₂O₃/SWNT (10 vol%) and Al₂O₃/Graphite (10 vol%) Composites,” (in Spanish) *TRATERMAT '05*, Eds. A. Domínguez-Rodríguez, J.A. Odriozola, D. Gómez-García and F. Guteriérrez Mora, CSIC and University of Seville, Seville, Spain, pp. 369-74 (2005).
9. M. Gell, F. Wu, E.H. Jordan, N.P. Padture, B.M. Cetegen, L. Xie, A. Ozturk, A.D. Jadhav, D. Chen, and X. Ma, “The Solution Precursor Plasma Spray Process for Making Durable Thermal Barrier Coatings,” *Proc. ASME Turbo Expo*, ASME, New York, Vol. **2**, pp. 905-11 (2005).
10. A.L. Vasiliev and N.P. Padture, “Microstructural Study of Metastable ZrO₂-Al₂O₃ and ZrO₂-

Y₂O₃-Al₂O₃ Coatings Deposited Using Solution-Precursor Plasma Spray (SPPS) Process,” *Microscopy and Microanalysis*, Vol. 12, pp. 742-44 (2006).

11. M. Layek, I.S. Yang, Z. Dai, A. Ranka, T. Cai, B.W. Sheldon, E. Chason, and N.P. Padture, “Elastic Modulus of Polycrystalline Halide Perovskite Thin Films on Substrates,” arXiv, 2307.07071 (2023). <http://arxiv.org/abs/2307.07071>

Book Section (Invited)

1. N.P. Padture, “Hertzian Contacts,” in *Encyclopedia of Materials: Science and Technology*, Eds. K.H.J. Buschow, R.W. Cahn, M.C. Flemings, B. Ilschner, E. Kramer, and S. Mahajan, Elsevier, New York, NY (2001) pp. 3750-52.
DOI: [10.1016/B0-08-043152-6/00669-0](https://doi.org/10.1016/B0-08-043152-6/00669-0)
2. S.K. Kumar and N.P. Padture, “Materials in Aircraft Industry,” in *Metallurgical Design and Industry — Prehistory to the Space Age*, Eds. C.L. Briant and B. Kaufman, Springer, New York, NY (2018) pp. 271-346.
ISBN: [978-3-319-93755-7](https://www.isbn-international.org/product/978-3-319-93755-7)
3. E. Bakan, D. Mack, G. Mauer, R. Vaßen, J. Lamon, and N.P. Padture, “High Temperature Materials for Power Generation in Gas Turbines,” in *Advanced Ceramics for Energy Conversion and Storage*, Ed. O. Guillon, Elsevier, Amsterdam (2020) pp. 3-62.
ISBN: [978-0-08-102726-4](https://www.isbn-international.org/product/978-0-08-102726-4)
4. Y. Zhou and N.P. Padture, “Microstructures and Grain Boundaries of Halide Perovskite Thin Films,” in *Perovskite Photovoltaics and Optoelectronics – Fundamentals to Advanced Applications*, Ed. T. Miyasaka, Wiley, New York, NY (2021) pp. 81-101.
ISBN: [978-3-527-34748-3](https://www.isbn-international.org/product/978-3-527-34748-3)

LIST OF INVITED TALKS PRESENTED[#]

1. “Crack-Resistance and Strength Properties of Some Alumina-Based Ceramics,” National Institute of Standards and Technology, Gaithersburg, MD, September 1991.
2. “Toughening of Structural Ceramics,” Ohio University, Athens, OH, May 1992.
3. “Flaw Tolerance and Toughness-Curves in Two-Phase Ceramics,” Ames Laboratory, Iowa State University, Ames, IA, February 1993.
4. “Flaw Tolerance and Toughness-Curves in Two-Phase Ceramics,” Johns Hopkins University, Baltimore, MD, March 1993.
5. “Toughness-Curves in Two-Phase Ceramic Composites: Model and Experiment,” Annual Meeting of the American Ceramic Society, Cincinnati, OH, April 1993.
6. “Microstructural Tailoring of Structural Ceramics: Toughness and Contact Damage,” General Electric Corporate R&D Laboratory, Schenectady, NY, September 1993.
7. “Microstructural Tailoring of Structural Ceramics: Toughness and Contact Damage,” Michigan Technological University, Houghton, MI, October 1993.
8. “Contact Fatigue in Polycrystalline Ceramics,” DuPont Central Research and Development, Wilmington, DE, March 1994.
9. “Microstructural Design of Structural Ceramics: Toughness and Contact Damage,” University of Connecticut, Storrs, CT, August 1994.
10. “Microstructural Design of Structural Ceramics: Toughness and Contact Damage,”

[#] Does not include co-authored invited talks presented by other co-authors.

[†] Talk presented abroad.

Northwestern University, Evanston, IL, October 1994.

11. “*In Situ*-Toughened Silicon Carbide,” Fall Meeting of the American Ceramic Society, Los Angeles, CA, October 1994.
12. “*In Situ*-Toughened Silicon Carbide,” Rational Design & Processing of Ceramics Workshop, University of California, San Diego, CA, June 1995.
13. “Microstructural Effects in the Machining of Ceramics,” Supergrind ’95, Industrial Diamond Association of America, Storrs, CT, November 1995.
14. “Novel Contact-Damage Resistant Ceramics,” Air Force Office of Scientific Research Review Meeting, Hueston Woods, OH, May 1996.
- † 15. “*In Situ*-Toughened Silicon Carbide: Microstructural Tailoring and Mechanical Behavior,” International Conference on Advances in Metallurgy, Bangalore, India, July 1997.
16. “Microstructural Tailoring of Ceramics for Mechanical and Thermal Properties,” Meeting of the CT Chapter of the Metals/Materials/Minerals Society, Cromwell, CT, March 1997.
17. “Novel Concepts in Contact-Damage-Resistant Ceramics and Thermal-Barrier Ceramics,” National Institute of Standards and Technology, Gaithersburg, MD, March 1997.
18. “Microstructural Tailoring of Ceramics for Mechanical Properties,” Yale University, New Haven, CT, April 1997.
19. “Novel Concepts in Contact-Damage-Resistant Ceramics and Thermal-Barrier Ceramics,” Air Force Office of Scientific Research Review Meeting, Cincinnati, OH, May 1997.
20. “Microstructural Tailoring of Structural Ceramics: Challenges and Opportunities,” National Science Foundation Workshop on Fundamental Research Needs in Ceramics, Arlington, VA, June 1997.
21. “*In Situ* Processing and Mechanical Behavior of Novel Ceramics,” Office of Naval Research Review Meeting, Woods Hole, MA, June 1997.
- † 22. “Microstructural Tailoring of Ceramics for Mechanical and Thermal Properties,” International Materials Research Congress, Cancún, Mexico, September 1997.
23. “Tailoring of Ceramic Micro-and Macro-Structures for Mechanical Properties,” Purdue University, West Lafayette, IN, November 1997.
24. “Novel Concepts in Contact-Damage-Resistant Ceramics and Thermal-Barrier Ceramics,” New England Chapter of the American Ceramic Society, Auburn, MA, December 1997.
25. “Microstructural Tailoring of Ceramics for Mechanical Properties,” Olin Corporation, New Haven, CT, February 1998.
26. “Microstructural Tailoring of Ceramics for Mechanical and Thermal Properties,” State University of New York, Stony Brook, NY, April 1998.
27. “NSF Workshop on Fundamental Research Needs in Ceramics: Report of the Working Group on Structural and Electromechanical Ceramics,” Annual Meeting of the American Ceramic Society, Cincinnati, OH, May 1998.
28. “Microstructure, Toughness, Contact Damage, and Fatigue: *In Situ* -Reinforced SiC,” Annual Meeting of the American Ceramic Society, Cincinnati, OH, May 1998.
29. “Novel Concepts in Contact-Damage-Resistant Ceramics and Thermal-Barrier Ceramics,” Air Force Office of Scientific Research Review Meeting, Cincinnati, OH, May 1998.
- † 30. “YAG-Based Thermal Barrier Coatings,” US-Europe Joint Workshop on Thermal Barrier Coatings, Irsee, Germany, May 1998.
31. “*In Situ* Processing and Mechanical Behavior of SiC Ceramics,” Office of Naval Research Review Meeting, Woods Hole, MA, May 1998.
- † 32. “Microstructural Tailoring of Ceramics for Mechanical Properties,” VIth National Conference on the Mechanical Properties of Materials, Badajoz, Spain, June 1998.
- † 33. “*In Situ* Processing of and Hertzian-Crack Suppression in Novel Ceramics Microstructures,”

- World Ceramics Congress, Florence, Italy, June 1998.
34. "Novel Concepts in Contact-Damage-Resistant Ceramics," Air Force Office of Scientific Research Review Meeting, Indianapolis, IN, April 1999.
 - † 35. "Thermal Barrier Coatings Based on Zirconia Ceramics: Nanostructure, Microstructure, Properties and Performance," United Engineering Foundation Conference on Nanomaterials, Québec City, Canada, August 1999.
 36. "Tailoring of Micro- and Macro-Structure of Ceramics for Mechanical Properties," Army Research Laboratory, Aberdeen Proving Grounds, MD, October 1999.
 37. "Novel Concepts in Contact-Damage-Resistant Ceramics," Air Force Office of Scientific Research Review Meeting, St. Louis, MO, May 2000.
 38. "Thermo-Mechanical Properties of YSZ-Based TBCs Processed Using Conventional and Solution-Precursor Plasma-Spray Processes," Office of Naval Research Review Meeting, Woods Hole, MA, May 2000.
 - † 39. "Microstructural Tailoring of Ceramics for Mechanical Properties," Instituto de Ceramica y Vidrio, Madrid, Spain, July 2000.
 - † 40. "Novel Concepts in Contact-Damage-Resistant Ceramics," Universitat Politècnica de Catalunya, Barcelona, Spain, July 2000.
 41. "Thermal Barrier Coatings," Instituto de Ciencia de Materiales, Madrid, Spain, July 2000.
 42. "Novel Concepts in Contact-Damage-Resistant Ceramics," University of California, Santa Barbara, CA, September 2000.
 43. "Solution-Precursor Plasma Spray: A New Method for the Deposition of Nanostructured Ceramic Coatings," University of California, Santa Barbara, CA, March 2001.
 44. "Solution-Precursor Plasma Spray: A New Method for the Deposition of Nanostructured Ceramic Coatings," Rockwell Science Center, Thousand Oaks, CA, May 2001.
 45. "Contact-Damage-Resistant Ceramics with Gradients in Elastic Modulus," University of California, Santa Barbara, CA, May 2001.
 46. "Novel Concepts in Thermal Barrier Coatings," Gordon Conference on Solid State Studies in Ceramics, Meriden, NH, August 2001.
 47. "Fundamental Studies in Novel Contact-Damage-Resistant Ceramics," Air Force Office of Scientific Research Review Meeting, Snowbird, UT, August 2001.
 48. "Advanced Thermal Barrier Coatings for Industrial Gas-Turbine Engines," Advanced Gas Turbine Systems Research Materials Workshop, Greenville, SC, October 2001.
 - † 49. "Novel Concepts in Thermal Barrier Coatings for Gas-Turbine Engines," Indian Institute of Technology, Bombay, India, January 2002.
 50. "Chemical Solution Precursor Routes to Nanoceramics," Office of Naval Research and Defense Advanced Research Projects Agency Workshop, Arlington, VA, March 2002.
 51. "Contact-Damage-Resistant Si-Based Ceramics," Annual Meeting of the American Ceramic Society, St. Louis, MO, May 2002.
 52. "Processing and Mechanical Properties of Nanoceramics," Defense University Research Initiative on Nanotechnology Review Meeting, Cambridge, MA, April 2002.
 53. "Towards Durable Thermal Barrier Coatings with Novel Microstructures Deposited Using Solution-Precursor Plasma Spray", Office of Naval Research Review Meeting, Woods Hole, MA, May 2002.
 54. "Novel Concepts in Contact-Damage- and Wear-Resistant Ceramics," Air Force Office of Scientific Research Review Meeting, Bar Harbor, ME, August 2002.
 - † 55. "Graded Ceramics," Functionally Graded Materials 2002, Beijing, China, October 2002.
 - † 56. "Next Generation Ceramic Thermal Barrier Coatings," Kyoto Institute of Technology, Kyoto, Japan, October 2002.

- † 57. “Novel Concepts in Ceramic Thermal Barrier Coatings,” National Institute of Advanced Industrial Science and Technology, Synergy Ceramics, Nagoya, Japan, October 2002.
- † 58. “Novel Concepts in Contact-Damage Resistant Ceramics,” National Institute for Materials Science, Tsukuba, Japan, October 2002.
- † 59. “Next Generation Ceramic Thermal Barrier Coatings,” Instituto de Ceramica y Vidrio, Madrid, Spain, March 2003.
- † 60. “Next Generation Ceramic Thermal Barrier Coatings,” Universidad de Sevilla, Seville, Spain, March 2003.
- † 61. “Next Generation Ceramic Thermal Barrier Coatings,” Universidad de Extremadura, Badajoz, Spain, March 2003.
- † 62. “Highly Durable Solution-Precursor Plasma-Sprayed TBCs,” Engineering Foundation Conference on Thermal/Environmental Barrier Coatings, Irsee, Germany, August 2003.
63. “Next Generation Ceramic Thermal Barrier Coatings,” National Institute of Standards and Technology, Gaithersburg, MD, September 2003.
64. “Advanced Thermal Barrier Coatings,” South Carolina Institute of Energy Studies at Clemson University, Clemson, SC, October 2003.
- † 65. “Advanced Ceramic Coatings,” International Ceramic Congress, Chennai, India, January 2004.
66. “Next Generation Ceramic Thermal Barrier Coatings,” Ohio State University, Columbus, OH, January 2004.
- † 67. “Contact-Damage-Resistant Ceramics,” IXth National Congress on the Mechanical Properties of Materials, Huelva, Spain, June 2004.
68. “Nano- and Micro-Scale Tailoring of Structural and Functional Ceramics,” Ohio State University, Columbus, OH, July 2004.
69. “Ultra-Thick Thermal Barrier Coatings,” South Carolina Institute of Energy Studies at Clemson University, Clemson, SC, September 2004.
- † 70. “Novel Thermal Barrier Coatings,” Engineering Ceramics Conference, Osaka, Japan, November 2004.
- † 71. “Advances in Nanomaterials,” Ubonratchathani University, Ubonratchathani, Thailand, November 2004.
72. “Thermal Properties of Ceramics,” Diamond Innovations, Columbus, OH, March 2005.
- † 73. “Novel 1-D and 2-D Functional Nanostructures,” International Conference on Materials for Advanced Technologies (ICMAT), Singapore, July 2005.
74. “Research Opportunities in Ultra-High Temperature Materials,” Air Force Office of Scientific Research Workshop on Ultra-High Temperature Materials, Washington DC, September 2005.
75. “Superior Ultra-Thick Thermal Barrier Coatings,” South Carolina Institute of Energy Studies at Clemson University, Clemson, SC, October 2005.
- † 76. “Novel 1-D, 2-D, and 3-D Multi-Functional Nanomaterials,” National Chemical Laboratory, Pune, India, December 2005.
77. “Thermal Barrier Coatings,” General Electric Aviation, Evendale, OH, March 2006.
78. “Materials Challenges and Opportunities in Nanotechnology,” Central Ohio Chapter of the American Ceramic Society, Columbus, OH, April 2006.
79. “Novel 1-D and 2-D Nanostructures of Functional Oxides,” Physics Department, The Ohio State University, Columbus, OH, May 2006.
80. “Novel Thermal Barrier Coatings for Resistance Against CMAS Degradation,” Office of Naval Research Review Meeting, Falmouth, MA, May 2006.
- † 81. “Next Generation Thermal Barrier Coatings,” International Workshop on Mechanical

Properties of Advanced Materials, Fuenteheridos, Spain, June 2006.

82. “Novel 1-D, 2-D, and 3-D Nanomaterials and Nanoceramics for Functional and Structural Applications,” Engineering Foundation Conference on Novel & Emerging Ceramics & Composites, Kona, Hawaii, June 2006.
83. “Novel 1-D and 2-D Nanostructures of Functional Oxides,” Material Science & Technology Conference, Cincinnati, OH, October 2006.
84. “Superior Ultra-Thick Thermal Barrier Coatings,” South Carolina Institute of Energy Studies at Clemson University, Clemson, SC, October 2006.
- † 85. “Novel Concepts in 0-D, 1-2, 2-D, and 3-D Nanomaterials for Functional and Structural Applications,” University Vienna, Vienna, Austria, October 2006.
- † 86. “Novel Concepts in 0-D, 1-2, 2-D, and 3-D Nanomaterials for Functional and Structural Applications,” Hungarian Academy of Sciences, Budapest, Hungary, November 2006.
- † 87. “Novel 1-D, 2-D, and 3-D Nanomaterials and Nanoceramics for Functional and Structural Applications,” 3rd International Symposium on Advanced Ceramics, Singapore, December 2006.
- † 88. “Novel 1-D, 2-D, and 3-D Nanomaterials and Nanoceramics for Functional and Structural Applications,” Institute of Materials Research and Engineering, Singapore, December 2006.
- † 89. “Novel 1-D, 2-D, and 3-D Nanomaterials and Nanoceramics for Functional and Structural Applications,” National Chemical Laboratory, Pune, India, December 2006.
90. “Engineered Top-Coats for Advanced Thermal Barrier Coatings,” International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 2007.
91. “Next Generation Thermal Barrier Coatings,” Annual Meeting of the Metals/Materials/Minerals Society (TMS), Orlando, FL, February 2007.
92. “Novel Thermal Barrier Coatings for Resistance Against CMAS Degradation,” Office of Naval Research Review Meeting, Golden CO, May 2007.
93. “Novel Concepts in Ceramic Coatings and Composites,” Wright Patterson Air Force Base, Dayton, OH, June 2007.
- † 94. “Nanowires, Nanotubes, Thin Films, and Nanocomposites for Functional and Structural Applications,” National Chemical Laboratory, Pune, India, August 2007.
- † 95. “Engineered Top-Coats for Advanced Thermal Barrier Coatings,” Engineering Conferences International Workshop on Thermal Barrier Coatings, Irsee, Germany, August 2007.
96. “Novel Processing of Advanced Thermal Barrier Coatings,” Materials Science & Technology (MS&T) Conference, Detroit, MI, September 2007.
97. “Novel Concepts in 1-D, 2-D, and 3-D Functional and Structural Nanoceramics: Nanowires, Nanotubes, Thin Films, and Nanocomposites,” Richard M. Fulrath Award Symposium, Materials Science & Technology (MS&T) Conference, Detroit, MI, September 2007.
{Keynote Lecture}
98. “Synthesis, Characterization, Device Fabrication, and Properties of Novel Functional-Oxide Nanowires,” Materials Science & Technology (MS&T) Conference, Detroit, MI, September 2007.
99. “Novel Concepts in Advanced Structural Ceramics: Thermal Barrier Coatings and Contact-Damage-Resistant Nanocomposites,” Pennsylvania State University, State College, PA, October 2007.
- † 100. “Novel Concepts in Advanced Structural Ceramics: Thermal Barrier Coatings and Contact-Damage-Resistant Nanocomposites,” Ceramic Society of Japan Annual Meeting, Nagaoka, Japan, March 2008.
- † 101. “Novel Concepts in 1-D, 2-D, and 3-D Functional and Structural Nanoceramics: Nanowires, Nanotubes, Thin Films, and Nanocomposites,” National Institute of Materials Science,

Tsukuba, Japan, March 2008.

102. Novel Concepts in Nanomaterials for Functional and Structural Applications: Nanowires, Nanotubes and Nanocomposites,” Ohio Nano Summit, Mason, OH, April 2008.
103. “Materials Engineering of Nanowires, Nanotubes, and Nanocomposites,” Tulane University, New Orleans, May 2008.
104. “Novel Thermal Barrier Coatings,” ONR Review Meeting, Woods Hole, MA, May 2008.
- † 105. “Ceramic/Carbon Nanotubes Composites — A Case of Multifunctional Composites with Truly Engineered Grain Boundaries,” International Workshop on Mechanics-Based Design of Advanced Materials, Composites and Coatings, Perth, Australia, July 2008.
106. “Center for Emergent Materials, An NSF-Funded Materials Research Science and Engineering Center at the Ohio State University,” Ohio State University Materials Week, Columbus, OH, September 2008.
107. “Structural and Functional Nanocomposites with Hierarchical Structures in 1-D, 2-D, and 3-D,” Materials Science & Technology Conference, Pittsburgh, PA, October 2008.
108. “Center for Emergent Materials, A NSF-Funded Materials Research Science and Engineering Center at the Ohio State University,” National Science Foundation Materials Research Science and Engineering Centers Directors’ Meeting, Arlington, VA, October 2008.
109. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” Northwestern University, Evanston, IL, November 2008.
110. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” University of Michigan, Ann Arbor, MI, January 2009.
111. “Novel Concepts in Structural Ceramics: Thermal Barrier Coatings and Contact-Damage-Resistant Ceramic Nanocomposites,” Case Western Reserve University, Cleveland, OH, February 2009.
- † 112. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” Universidad de Sevilla, Seville, Spain, March 2009.
- † 113. “Fracture and Microstructure Design of Ceramics and Composites,” Universidad de Sevilla, Seville, Spain, March 2009.
- † 114. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” Universidad de Extremadura, Badajoz, Spain March 2009.
115. “Novel Thermal Barrier Coatings,” Office of Naval Research Review Meeting, Woods Hole, MA, May 2009.
116. “Nanostructured Ceramics and Composites,” Engineering Conferences International Workshop on Nanomaterials, Colorado Springs, CO, June 2009.
- † 117. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” International Conference on Materials for Advanced Technologies (ICMAT), Singapore, June 2009.
- † 118. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” International Workshop on Nanotechnology and Advanced Functional Materials, National Chemical Laboratory, Pune, India, July 2009.
- † 119. “Novel Concepts in Ceramic Thermal Barrier Coatings,” EUROMAT’09, Glasgow, United Kingdom, September 2009.
- † 120. “A Perspective on Structural Nanoceramics and Nanocomposites,” EUROMAT’09,

Glasgow, United Kingdom, September 2009. **{Keynote Lecture}**

121. “Degradation of Thermal Barrier Coatings from Deposits and Its Mitigation,” Department of Energy Workshop, Orlando, FL, October 2009.
122. “Extreme Materials Engineering: From Jet-Engine Turbines to Graphene Devices,” Physics Colloquium, The Ohio State University, Columbus, OH, January 2010.
- † 123. “Towards Rational Tailoring of Functional and Structural Nanomaterials: Nanowires (1-D), Graphene (2-D), and Nanocomposites (3-D),” Instituto de Ciencia de Materiales de Madrid, Spain, March 2010.
- † 124. “Novel Concepts in Advanced Structural Ceramics: Thermal Barrier Coatings and Multifunctional Nanocomposites,” Instituto de Ceramica y Vidrio, Madrid, Spain, March 2010.
125. “Novel Thermal Barrier Coatings,” International Conference on Metallurgical Coatings and Thin Films, San Diego, CA, April 2010.
126. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Woods Hole, MA, May 2010.
- † 127. “Interdisciplinary Materials Research at the Ohio State University,” International Workshop on Novel Magnetic Materials, Dresden, Germany, August 2010.
128. “A Perspective on Mechanical Properties of Nanoceramics and Nanocomposites,” Materials Science & Technology (MS&T) Conference, Houston, TX, October 2010.
129. “Degradation of Thermal Barrier Coatings from Deposits and Its Mitigation,” Department of Energy Workshop, State College, PA, October 2010.
- † 130. “Extreme Materials Engineering: From Jet-Engine Turbines to Graphene Devices,” National Chemical Laboratory, Pune, India, December 2010.
131. “Extreme Materials Engineering: From Jet-Engine Turbine Coatings to Carbon Nanotube Composites to Graphene Devices,” Brown University, RI, February 2011.
132. “Carbon-Based Materials for Spintronics,” National Science Foundation Materials Research Science and Engineering Centers Directors’ Meeting, Humacao, Puerto Rico, March 2011.
133. “Extreme Materials Engineering: From Jet-Engine Turbine Coatings to Carbon Nanotubes Composites to Graphene Devices,” University of California, Riverside, CA, May 2011.
134. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Charleston, SC, May 2011.
- † 135. “Extreme Materials Engineering: From Jet-Engine Turbines to Graphene Devices,” Indian Institute of Technology, Bombay, India, July 2011.
- † 136. “Engineered Thermal Barrier Coatings for Extreme Environments,” Engineering International Conference on Thermal Barrier Coatings, Irsee, Germany, August 2011.
137. “Materials Engineering at the Frontiers of Energy Efficiency: From Spintronics to Gas-Turbine Engines,” Indian Institute of Technology Faculty Alumni Network Symposium on Materials in Energy, Boston, MA, October 2011.
138. “Thermal Barrier Coatings for Resistance Against Attack by Molten Silicate Deposits from CMAS Sand, Volcanic Ash, or Coal Fly Ash Ingested by Gas-Turbine Engines,” Materials Science and Technology (MS&T) Conference, Columbus, OH, October 2011.
139. “Rational Tailoring of 1-D (Nanowires), 2-D (Graphene) and 3-D (Ceramic/Carbon Nanotubes Composites) Functional and Structural Nanomaterials,” Materials Science and Technology (MS&T) Conference, Columbus, OH, October 2011.
140. “Structural Nanoceramics and Nanocomposites: Challenges and Opportunities,” Materials Science and Technology (MS&T) Conference, Columbus, OH, October 2011.
141. “Degradation of Thermal Barrier Coatings from Deposits and Its Mitigation,” Department of Energy Workshop, Columbus, OH, October 2011.

- † 142. “Renaissance of Advanced Structural Ceramics: Challenges and Opportunities,” VIth Portuguese-Spanish Congress on Ceramics & Glasses, Aveiro, Portugal, November 2011. **{Opening Plenary Lecture}**
- 143. “Extreme Materials Engineering: From Jet-Engine Turbine Coatings to Carbon Nanotubes Composites to Graphene Devices,” Boston University, Boston, MA, February 2012.
- 144. “Advances in Some Structural Ceramics: Thermal Barrier Coatings and Ceramic/Carbon Nanotubes Composites,” Harvard University, Cambridge, MA, May 2012.
- 145. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Charleston, SC, May 2012.
- † 146. “Perspective on Nanoceramics, Ceramic Nanocomposites and Carbon Nanomaterials,” NANO2012, Rhodes, Greece, August 2012.
- † 147. “Perspective on Nanoceramics, Ceramic Nanocomposites and Carbon Nanomaterials,” European Materials Research Society Fall Meeting, Warsaw, Poland, September 2012.
- 148. “Extreme Materials Engineering: From Jet-Engine Turbine Coatings to Carbon Nanotubes Composites to Graphene Devices,” University of Connecticut, Storrs, CT, October 2012.
- 149. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Bozeman, MT, May 2013.
- 150. “Thermal Barrier Coatings for Protection Against Extreme Conditions in High-Efficiency Gas-Turbine Engines,” New England Section of the American Ceramic Society, Marlborough, MA, May 2013.
- 151. “Some Advances in Ceramic Coatings and Nanocomposites,” United Technologies Research Center, East Hartford, CT, May 2013.
- 152. “Advanced Thermal Barrier Coatings for Next Generation Syngas-Fueled Gas-Turbine Engines,” Department of Energy Workshop, Pittsburgh, PA, June 2013.
- † 153. “Thermal Barrier Coatings for Protection Against Extreme Conditions in High-Efficiency Gas-Turbine Engines,” International Conference on Materials for Advanced Technologies, Singapore, July 2013.
- † 154. “Some Advances in Structural Ceramics: Thermal Barrier Coatings and Novel Nanocomposites,” National Institute for Materials Science, Tsukuba, Japan, July 2013.
- 155. “Attack of Thermal Barrier Coatings in Gas-Turbine Engines by Molten Silicate Deposits (Sand, Ash) and its Mitigation,” International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 2014.
- 156. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Charlottesville, VA, May 2014.
- 157. “Advanced Thermal Barrier Coatings for Next Generation Syngas-Fueled Gas-Turbine Engines,” Department of Energy Workshop, Pittsburgh, PA, May 2014.
- † 158. “Attack of Thermal Barrier Coatings by Molten Silicate Deposits (Sand, Ash) and its Mitigation,” Engineering Conferences International on Thermal Barrier Coatings, Irsee, Germany, June 2014.
- † 159. “Engineered Thermal Barrier Coatings for Extreme Environments,” Max Planck Institute, Düsseldorf, Germany, June 2014.
- † 160. “Some Advances in Ceramic Coatings and Nanocomposites,” 5th International Congress on Ceramics, Beijing, China, August 2014. **{Keynote Lecture}**
- † 161. “Thermal Barrier Coatings for More Efficient Gas-Turbine Engines in Aircraft and Power Generation,” Qingdao Institute of Bioenergy & Bioprocess Technology, Chinese Academy of Sciences, Qingdao, China, August 2014.
- † 162. “Some Advances in Ceramic Coatings and Nanocomposites,” Spanish Ceramics & Glass Society Congress, Badajoz, Spain, November 2014. **{Opening Plenary Lecture}**

- † 163. “Advanced Ceramics for More Efficient Gas-Turbine Engines,” International Workshop on Structural Materials, Coorg, India, February 2015.
- 164. “Recent Advances in Perovskite Solar Cells,” National Chemical Laboratory, Pune, India, March 2015.
- 165. “Advanced Thermal Barrier Coatings for Next Generation Syngas-Fueled Gas-Turbine Engines,” Department of Energy Workshop, Pittsburgh, PA, April 2015.
- 166. “Thermal and Environmental Barrier Coatings for High-Efficiency Gas-Turbine Engines in Aircraft and Power Plants: Environmental Degradation and Its Mitigation,” New England - Tsinghua University Workshop on Gas Turbine Engines, Cambridge, MA, May 2015.
- 167. “Novel Thermal Barrier Coatings and Environmental Barrier Coatings,” Office of Naval Research Review Meeting, Charlottesville, VA, May 2015.
- † 168. “Advanced Ceramics for More Efficient Gas-Turbine Engines,” 14th International Conference of the European Ceramic Society, Toledo, Spain, June 2015. **{Keynote Lecture}**
- † 169. “Advanced Ceramics for More Efficient Gas-Turbine Engines,” 9th International Conference on High-Performance Ceramics, Guilin, China, November 2015. **{Plenary Lecture}**
- † 170. “Low-Cost, Efficient Perovskite Solar Cells,” Weihua Solar Company, Xiamen, China, November 2015.
- † 171. “Low-Cost, Efficient Perovskite Solar Cells,” Trina Solar Energy Company, Changzhou, China, November 2015.
- † 172. “The Role of Materials in Energy Applications: From Gas-Turbine Engines to Perovskite Solar Cells,” Shanghai Jiao Tong University, Shanghai, China, November 2015.
- 173. “*Surya Namaskar* (Sun Salutation): Harnessing Solar Energy Efficiently, Cheaply, and Safely,” Provost’s Lecture Series, Brown University, Providence, RI, February 2016. **{Inaugural Lecture}**
- † 174. “Perovskite Solar Cells: The Promise of Cheap, Efficient, Clean Energy,” Indo-US Workshop on Advanced Materials, Coorg, India, February 2016.
- † 175. “Perovskite Solar Cells: The Promise of Cheap, Efficient, Clean Energy,” Indian Institute of Science, Education, and Research, Pune, India, February 2016.
- 176. “Hostile-Environment Degradation and its Mitigation in Ceramic Coatings for Gas-Turbine Engines,” Office of Naval Research, Arlington, VA, March 2016.
- † 177. “Molten Silicates (Sand, Fly Ash, Volcanic Ash) Attack of Gas-Turbine Engine Hot-Section Ceramic Coatings and its Mitigation,” Helmholtz Symposium on Materials and Coatings for High Temperatures, Cambridge, U.K., April 2016.
- 178. “The Unprecedented Promise of Organic-Inorganic Hybrid Perovskite Thin-Film Solar Cells: Materials-Science Challenges and Opportunities,” Workshop on Microstructural Evolution in Organic-Inorganic Hybrid Perovskite Thin Films, Brown University, Providence, RI, May 2016.
- 179. “Hostile-Environment Degradation and its Mitigation in Ceramic Coatings for Gas-Turbine Engines,” ONR Review Meeting, Charlottesville, VA, June 2016.
- † 180. “The Unprecedented Promise of Perovskite Solar Cells for Cheap and Efficient Clean Energy,” University of Seville, Seville, Spain, June 2016.
- † 181. “The Unprecedented Promise of Perovskite Solar Cells for Cheap and Efficient Clean Energy,” Institute for Ceramics and Glass, Madrid, Spain, June 2016.
- † 182. “Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines: Aircraft Propulsion and Electricity-Generation,” Thin Films 2016, Singapore, July 2016. **{Plenary Lecture}**
- † 183. “Harnessing the Power of the Sun: The Unprecedented Promise of Perovskite Solar Cells for Cheap and Efficient Clean Energy,” Indian Institute of Technology, Bombay, India, July 2016. **{Institute Colloquium}**

184. “The Unprecedented Promise of Perovskite Solar Cells for Cheap and Efficient Clean Energy,” Gordon Research Conference on Solid State Studies in Ceramics, South Hadley, MA, August 2016.
185. “Microstructures of Hybrid Perovskites for Solar Cells: Their Evolution from Solutions and Characterization,” University of Nebraska, Lincoln, NE, August 2016.
186. “Harnessing Solar Energy Efficiently, Cheaply, and Safely,” Rhode Island College, Providence, RI, September 2016.
187. “New Paradigms in Advanced Ceramic Coatings and Composites,” NSF Workshop on Emerging Opportunities in Ceramics and Glass Science,” Arlington, VA, September 2016
188. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” Washington University, St. Louis, MO, September 2016.
189. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” University of Central Florida, Orlando, FL, January 2017. **{Distinguished Lecture}**
190. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” University of Massachusetts, Dartmouth, MA, February 2017.
191. “Ceramic Coatings for More Efficient Gas-Turbine Engines,” TMS Annual Meeting, San Diego, CA, February 2017.
192. “Hostile-Environment Degradation and its Mitigation in Ceramic Coatings for Gas-Turbine Engines,” Office of Naval Research, Arlington, VA, March 2017.
193. “Scalable Processing of High-Quality Perovskite Thin Films for High-Efficiency Solar Cells,” MRS Spring Meeting, Phoenix, AZ, April 2017.
194. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” Stony Brook University, Stony Brook, NY, April 2017.
195. “Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines for Aircraft Propulsion and Electricity Generation,” Army Research Laboratory, Aberdeen Proving Grounds, MD, May 2017.
196. “Grain Boundary Engineering in Hybrid Organic-Inorganic Perovskites,” ONR Review Meeting, Baltimore, MD, May 2017.
197. “Hostile-Environment Degradation and its Mitigation in Ceramic Coatings for Gas-Turbine Engines,” ONR Review Meeting, Williamsburg, VA, June 2017.
- † 198. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” 46th IUPAC World Chemistry Congress, São Paulo, Brazil, July 2017. **{Keynote Lecture}**
199. “Tailoring of Microstructures and Grain-Boundary Networks in Hybrid-Perovskite Thin Films for Efficient, Stable Solar Cells,” 254th American Chemical Society Meeting & Exposition, Washington D.C., August 2017.
- † 200. “The Renaissance of Advanced Structural Ceramics: Novel Coatings and Composites,” International Symposium on Advanced Ceramic Materials, Badajoz, Spain, October 2017.
- † 201. “Tailoring of Microstructures, Grain-Boundary Networks in Hybrid-Perovskite Thin Films for Efficient, Stable Solar Cells,” Universitat Jaume I, Castellón, Spain, October 2017.
- † 202. “Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines for Aircraft Propulsion and Electricity Generation,” German Space Center (DLR), Cologne, Germany, January 2018.
- † 203. “Synthesis/Processing, and Microstructural Tailoring of Halide Perovskite Thin Films for Large-Area, Efficient, and Stable Solar Cells,” University of Cologne, Cologne, Germany, January 2018.
- † 204. “Synthesis/Processing, and Microstructural Tailoring of Halide Perovskite Thin Films for Large-Area, Efficient, and Stable Solar Cells,” Helmholtz Zentrum (Lise-Meitner), Berlin, Germany, January 2018.

205. "Synthesis/Processing, and Microstructural Tailoring of Pb-Based and Pb-Free Halide Perovskite Thin Films for Large-Area, Efficient, and Stable Solar Cells," Brookhaven National Laboratory, Center for Functional Nanomaterials, Upton, NY, March 2018.
206. "Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines," 3M Company Research Center, Minneapolis, MN, May 2018.
207. "Hostile-Environment Degradation and its Mitigation in Ceramic Coatings for Gas-Turbine Engines," ONR Review Meeting, Williamsburg, VA, June 2018.
208. "Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines," Eastern NY ASM Symposium, GE Central R&D, Niskayuna, NY, June 2018.
- † 209. "Towards Multifunctional Thermal-Barrier and Environmental-Barrier Coatings," Engineering Conferences International on Thermal Barrier Coatings V, Irsee, Germany, June 2018.
210. "The Unprecedented Promise of the New Perovskite Solar Cells," International Materials Symposium, Brown University, Providence, RI, July 2018.
- † 211. "Synthesis/Processing, and Microstructural Tailoring of Halide Perovskite Thin Films for Large-Area, Efficient, and Stable Solar Cells," 22nd International Conference on Photochemical Conversion & Storage of Solar Energy, Hefei, China, July 2018.
- † 212. "The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy," Tianjin Polytechnic University, Tianjin, China, August 2018.
213. "Ceramics Science of Perovskite Solar Cells," Gordon Research Seminar on Solid State Studies in Ceramics, South Hadley, MA, August 2018.
214. "Ceramic Thermal-Barrier and Environmental-Barrier Coatings for Extreme Environments," Gordon Research Conference on Solid State Studies in Ceramics, South Hadley, MA, August 2018.
215. "Synthesis/Processing, and Microstructural Tailoring of Pb-Based and Pb-Free Halide Perovskite Thin Films for Large-Area, Efficient, and Stable Solar Cells," SPIE Conference on Organic, Hybrid, and Perovskite Photovoltaics XIX (OP213), San Diego, CA, August 2018.
216. "Grain-Boundary Engineering in Hybrid Organic-Inorganic Perovskites," ONR Review Meeting, Atlanta, GA, September 2018.
- † 217. "The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy for a Sustainable Future," Indian Institute for Science, Education, and Research, Pune, India, October 2018.
218. "Microstructural Tailoring of Pb-Based and Pb-Free Halide Perovskite Thin Films for Large-Area, Efficient and Stable Solar Cells," MRS Fall Meeting, Boston, MA, November 2018.
- † 219. "Multifunctional Ceramic Coatings for Hostile Environments," 8th International Coatings Symposium, Tsukuba, Japan, December 2018. **{Opening Plenary Lecture}**
- † 220. "Multifunctional Ceramic Coatings for Hostile Environments," AIST, Tsukuba, Japan, December 2018.
221. "The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy for a Sustainable Future," International Conference on Advanced Ceramics and Composites, Daytona Beach, FL, January 2019.
222. "The Materials Science of Halide-Perovskites Solar Cells," California Institute of Technology, Pasadena, CA, February 2019.
223. "Grain-Boundary Engineering in Hybrid Organic-Inorganic Perovskites," ONR Review Meeting, Golden, CO, April 2019.
- † 224. "Nano-/Micro-structural Tailoring of Multi-dimensional Halide Perovskites for Scalable, Efficient, and Stable Solar Cells," HOPV19, Rome, Italy, May 2019.

225. “Chemo-Thermo-Mechanical Degradation of Ceramic Coatings for Gas-Turbine Engines and its Mitigation,” ONR Review Meeting, Williamsburg, VA, May 2019.
226. “The Unprecedented Promise of Perovskite Solar Cells for Cheap, Efficient, Clean Energy,” New England Energy Forum, Worcester, MA, June 2019. **{Keynote Lecture}**
- † 227. “Microstructural and Ion-Diffusion Effects in Halide Perovskites for Solar Cells,” 22nd Solid-State Ionics-22, Pyeongchang, S. Korea, June 2019. **{Keynote Lecture}**
- † 228. “Advanced Ceramic Coatings and Nanocomposites,” SLC Solmics, Seoul, S. Korea, June 2019.
- † 229. “Nano-/Micro-structural Tailoring of Pb-based and Pb-free Multi-dimensional Halide Perovskites for Scalable, Efficient, and Stable Solar Cells,” International Conference on Materials for Advanced Technologies, Singapore, June 2019.
- † 230. “Advanced Ceramic Coatings for More Efficient Gas-Turbine Engines for Aircraft Propulsion and Electricity Generation,” Institute for High Performance Computing, Singapore, June 2019.
- † 231. “Towards Multifunctional Thermal-Barrier and Environmental-Barrier Coatings,” ASM Suspension Spray + EBCs Symposium, Boucherville, QC, Canada, September 2019.
232. “Advanced Ceramic Coatings for Hostile Environments within Efficient Gas-Turbine Engines for Aircraft Propulsion and Electricity Generation,” Rensselaer Polytechnic Institute, Troy, NY, September 2019.
- † 233. “The Materials Science of Halide Perovskites and Solar Cells,” Indian Institute for Science, Education, and Research, Pune, India, October 2019.
- † 234. “The Materials Science of Halide Perovskites and Solar Cells,” NanoGe Fall Meeting, Berlin, Germany, November 2019.
235. “The Fascinating Materials Science of Halide Perovskites and Solar Cells,” Stony Brook University, August 2020. (Webinar)
236. “The Materials Science of Halide Perovskites and Solar Cells,” NanoGe Fall Meeting, October 2020. (Virtual)
237. “Microstructures of Halide Perovskites,” MRS Spring/Fall Meeting, November 2020. (Virtual)
238. “Chemo-Thermo-Mechanical Degradation of Ceramic Coatings for Gas-Turbine Engines and its Mitigation,” ONR Review Meeting, December 2020. (Webinar)
239. “The Promise of Innovations in Solar Photovoltaics,” Brown University, April 2021. **{Presidential Faculty Award Public Lecture}** (Webinar) [YouTube Recording](#)
240. “The Materials Science of Halide Perovskites and Solar Cells,” ACS Spring Meeting, April 2021. (Virtual)
241. “Grain Boundary and Interfacial Phenomena in Halide Perovskites and Solar Cells,” ONR Review Meeting, June 2021. (Webinar)
242. “The Materials Science of Halide Perovskites and Solar Cells,” SPIE Organic, Hybrid, and Perovskite Photovoltaics XXII (OHPV), San Diego, CA, August 2021. **{Keynote Lecture}**
243. “The Materials Science of Halide Perovskites and Solar Cells,” Georgia Institute of Technology, October 2021. (Webinar)
244. “The Materials Science of Halide Perovskites and Solar Cells,” University of Rhode Island, N. Kingston, RI, October 2021.
245. “Chemo-Thermo-Mechanical Degradation of Ceramic Coatings for Gas-Turbine Engines and its Mitigation,” ONR Review Meeting, November 2021. (Webinar)
246. “The Degradation of High-Temperature Ceramic Coatings for Gas-Turbine Engines and its Mitigation,” Tokyo University of Technology, November 2021. (Webinar)
247. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via*

- Microstructural and Interfacial Tailoring,” MRS Fall Meeting, Boston, MA, December 2021.
248. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” International Conference on Advanced Materials and Mechanical Characterization, December 2021. (Webinar)
249. “Grain Boundary and Interfacial Phenomena in Halide Perovskites and Solar Cells,” ONR Review Meeting, May 2022. (Webinar)
250. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” 23rd Solid-State Ionics-23, Boston, MA, July 2022. **{Keynote Lecture}**
251. “The Promise of Halide Perovskite Solar Photovoltaics,” Boston University, Boston, MA, September 2022.
- † 252. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Interfacial Tailoring,” Sungkyun International Solar Forum SISF 2022, Seoul, S. Korea, November 2022.
253. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” MRS Fall Meeting, Boston, MA, November 2022.
254. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” CubicPV LLC, December 2022. (Webinar)
255. “Addressing the Stability and Reliability Challenges in Perovskite Photovoltaics *via* Microstructural and Interfacial Tailoring,” National Renewable Energy Laboratory, Golden, CO, April 2023.
256. “Grain Boundary and Interfacial Phenomena in Halide Perovskites and Solar Cells,” ONR Review Meeting, Chapel Hill, NC, May 2023.
257. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” S&T Digital International Conference on Advances in Photovoltaic Materials and Devices, June 2023. (Webinar)
- † 258. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” Indian Institute for Science, Education and Research, Pune, India, June 2023.
259. “The Promise of Innovations in Solar Photovoltaics,” Yale University, New Haven, CT, September 2023.
260. “The Promise of Innovations in Solar Photovoltaics,” University of Arizona, Tucson, AZ, September 2023.
261. “Addressing the Stability and Reliability Challenges in Perovskite Solar Cells *via* Microstructural and Interfacial Tailoring,” Materials Science and Technology (MS&T) Conference, Columbus, OH, October 2023.
262. “The Unprecedented Promise of Perovskite Photovoltaics,” The Ohio State University, Columbus, OH, October 2023. **{IMR Distinguished Lecture}**
263. “The Unprecedented Promise of Perovskite Photovoltaics,” University of Illinois, Chicago, IL, October 2023. **{Engineering Distinguished Seminar}**
264. “Challenges and Opportunities in the Mechanical Reliability of Perovskite Solar Photovoltaics,” Sustainable Energy Workshop, Brown University, Providence, RI, October 2023.
- † 265. “The Promise of Perovskite Solar Photovoltaics,” Indian Institute of Technology, Mumbai, India, November 2023
266. “Making High-Efficiency Halide-Perovskite Solar Photovoltaics More Durable: Challenges and Opportunities,” MRS Fall Meeting, Boston, MA, November 2023.

- † **267.** “ Making High-Efficiency Halide-Perovskite Solar Photovoltaics More Durable: Challenges and Opportunities,” nanoGe Materials for Sustainable Development Conference, Barcelona, Spain, March 2024. (To be presented)