

CURRICULUM VITAE

CHANG-YONG NAM

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Education

Ph.D.	University of Pennsylvania	Philadelphia, PA	Materials Science and Engineering	2002 – 2007
M.S.	Korea Adv. Inst. Sci. Tech. (KAIST)	Daejeon, South Korea	Materials Science and Engineering	1999 – 2001
B.E.	Korea University	Seoul, South Korea	Metallurgical Engineering	1993 – 1999
		(Leave of Absence, Military Service in Republic of Korea Army,		1995 – 1997)

Appointments

2019 – p	Scientist w/ continuing appointment	Center for Functional Nanomaterials, Brookhaven National Laboratory
2016 – 2019	Scientist	Center for Functional Nanomaterials, Brookhaven National Laboratory
2013 – 2016	Associate Scientist	Center for Functional Nanomaterials, Brookhaven National Laboratory
2010 – 2013	Assistant Scientist	Center for Functional Nanomaterials, Brookhaven National Laboratory
2007 – 2010	Goldhaber Distinguished Fellow	Center for Functional Nanomaterials, Brookhaven National Laboratory
2014 – p	Adjunct Professor	Dept. Materials Sci. & Chem. Engineering, Stony Brook University
2019 – p	Adjunct Professor	Dept. Electrical & Computer Engineering, New Jersey Institute of Tech.
2001 – 2002	Commissioned Researcher	Materials Research Div., Korea Institute of Science and Technology (KIST)
2001 Spring	Visiting Research Assistant	Brown University, Division of Engineering

Awards/Distinctions

2022	Battelle Inventor of the Year	Battelle Memorial Institute / Brookhaven National Lab.
2021	Top-10 Areas of Amazing Science at Brookhaven Lab	Brookhaven National Laboratory
2021	Winner, 2021 DOE National Labs Accelerator Pitch Event	Lawrence Livermore National Lab. / U.C. Davis
2020	Create the Future 2020 Design Contest Top-100 Entry	Tech Briefs
2022, 2018, 2011	Spotlight Award	Brookhaven National Laboratory
2007 – 2010	Goldhaber Distinguished Fellowship	Brookhaven National Laboratory
2003	Passed Ph.D. Qualifying Exam with Distinction	University of Pennsylvania, Dept. Mater. Sci. Eng.
2002 – 2007	Graduate Research Fellowship	University of Pennsylvania, Dept. Mater. Sci. Eng.
2001	Brain Korea 21 Financial Award for Abroad Research	Korea Advanced Institute of Science and Technology
1999 – 2001	Korean Government Scholarship	Korea Advanced Institute of Science and Technology
1999	Merit-based Scholarship	Korea University

Research Synopsis

- Development and application of atomic layer deposition (ALD) techniques, including vapor-phase infiltration (VPI) / sequential infiltration synthesis (SIS), towards microelectronics and energy conversion applications
- Device physics and materials processing in organic/hybrid semiconductors, semiconductor nanowires, and two-dimensional materials
- Application of self-assembled block copolymers

Research Support and Grant Activities

Current

Team Member, U.S. Department of Energy (DOE), Office of Science, Funding for the CFN, BNL, Contract No. DE-SC0012704 (~\$24M/yr, continuous annual renewal).

Co-PI, Quantum Information Science and Research Infrastructure Funding, DOE, “Quantum Materials: Integrated Multimodal Characterization and Processing (QM-IMCP)”, 10/01/2021 – 9/30/2024 (~\$1M co-PI portion out of \$6.2M)

PI, Technology Maturation Funding, BNL, “VIPP: Vapor-Infiltration Photoresist Process”, 10/01/2021 – 6/30/2023 (\$50k)

Co-PI, Republic of Korea, Ministry of Trade, Industry and Energy (MoTIE), “Development of Mass Production Technology and Systems for Boron Nitride Nanotubes used for Space Engineering”, 04/01/2022 – 12/31/2025 (\$220K co-PI portion out of total \$1.8M)

Co-PI, Semiconductor Research Corporation (SRC) Grant, “Novel Organic-Inorganic Hybrid EUV Dry Resists Deposited by Molecular Atomic Layer Deposition (MALD)”, 01/01/2021 – 12/31/2023 (\$112K co-PI portion out of total \$300K)

Past

Co-PI, U.S. DOE, Office of Energy Efficiency & Renewable Energy (EERE), Hydrogen and Fuel Cell R&D Grant, Contract No. DE-EE0008423 “Electrolyzer Integrated Modular Nano-Array Monolithic Catalytic Reactors for Low Pressure/Temperature and High Flux Synthetic Fuel Production”, 10/01/2018 – 6/30/2022 (\$170K co-PI portion out of total \$2M)

PI, CFN Intra-Department Grant, BNL, “Application of Vapor-Phase Materials Infiltration in Polymer Templates”, 09/01/2018 – 05/31/2022 (~\$300K)

PI, CFN Intra-Department Grant, BNL, “High-Performance Greenhouse Gas Sensing Architecture Based on Metal Oxide Nanostructures Derived from Polymer Nanotemplates”, 03/01/2018 – 09/28/2021 (~\$450K)

PI, Laboratory Directed Research and Development (LDRD) Grant for COVID-19, BNL, “Engineered Substrates for 3D Molecular-Imprint-Based Early COVID-19 POC Detection”, 08/01/2020 – 01/31/2021 (\$36K)

PI, CFN Director’s Research Funding, BNL, “Utilization of Resonant Energy Transfer in Ultrathin Si Solar Cells”, 2012 – 2014 (\$300K).

Team Member, Global Research Laboratory (GRL) Grant, National Research Foundation of Korea, “Development of Flexible and Printed Perovskite/Organic Integrated Photovoltaic Modules with Ultrahigh Efficiency, Long-Term Stability and Large-Area Reproducibility”, 06/01/2017 – 02/28/2020 (\$2.48M)

CFN User Program

Objectives

- Providing scientific and technical expertise & developing collaborative research projects on the following targeted subject areas: (a) Materials processing and device physics in organic/hybrid semiconductors, nanowires, and two-dimensional materials (particularly toward optoelectronic and photovoltaic device applications); (b) Application of ALD techniques, including VPI / SIS, for microelectronics, hybrid nanocomposites, membranes, nanopatterning, and catalysis
- User Proposal Administration: Proposal feasibility review, reviewer assignment, and resource allocation for Materials Synthesis and Characterization Facility (Electronic Nanomaterials Group)

Scientific Facility Development

(a) Plasma-enhanced ALE system, 2021 – 2023; (b) Thermal ALD system, 2021; (c) Scanning photocurrent microscopy (SPCM) system, 2017; (d) ALD system tailored to infiltrations synthesis, 2016; (e) Photoelectrochemical (PEC) water splitting characterization facility, 2012; (f) Organic photovoltaic device fabrication and optoelectronic characterization facility, 2010

Committee Service

CFN NSRC Representative for Microelectronics Working Group (2021 – p); CFN Summer Sunday Organizer, Chair (2021) and co-Chair (2020); CFN Colloquium Committee Chair, 2020 – p; Research Staff (Interface Sci. Catalysis Group) hiring committee, 2022; Scientist Continuing Appointment Promotion Review Committee, 2022; Senior Scientific Associate Promotion Review Committee, 2020; Scientific Associate (Soft-Bio Nanomaterials Group) hiring committee, 2020; Plasma-enhanced ALD procurement/technical evaluation committee, 2017 – 2018; CFN Colloquium committee, 2017 – 2022; Scientific Associate (Soft-Bio Nanomaterials Group) hiring committee, 2016; Technical Associate (Operation and ES&H Group) hiring committee, 2012

Research Advisors

Postdoctoral: Charles T. Black (Brookhaven National Laboratory)

Ph.D.: John (Jack) E. Fischer (University of Pennsylvania, deceased)

M.S.: Dang-Moon Wee (Korea Advanced Institute of Science and Technology)

Research Collaborators (Past 5 Years)

B. Chaplin (U. Illinois, Chicago), M. Cotlet (BNL), G. Doerk (BNL), Y.F. Ding (U. Colorado), M. Eisaman (Stony Brook U.), D. Englund (MIT), R. Finke (Colorado State U.), P.X. Gao (U. Conn.), R.B. Grubbs (Stony Brook U.), D. Hwang (Stony Brook U.), K.S. Hwang (Kyung Hee Univ.), I.N. Ivanov (ORNL), J.Y. Kim (UT Dallas), S. Kim (U. Illinois Chicago), T. Koga (Stony Brook U.), K. Lee (GIST), S.W. Lee (U. Conn.), H.Q. Lin (U. Buffalo), M.Z. Liu (BNL), J.H. Moon (Sogang Univ.), D. Nykypanchuk (BNL), X. Qu (BNL), M.H. Rafailovich (Stony Brook U.), C. Ross (MIT), J. Sadowski (BNL), E. Stavitski (BNL), K. Yager (BNL), J.K. Yoo (LANL), F.Y. Zhang (U. Tennessee, Knoxville)

Invited Seminars and Talks

106. Stony Brook University, Department of Materials Science and Chemical Engineering, Nov. 2022, Stony Brook NY, Invited Lecture, Title: “Application of Atomic Layer Deposition Techniques for Microelectronics”
105. Stony Brook University, Department of Materials Science and Chemical Engineering, Nov. 2022, Stony Brook NY, Department Colloquium, Title: “Vapor-Phase Infiltration for Energy-Efficient, Extremely Downscaled Semiconductor Devices”
104. Materials Science & Technology (MS&T) 2022, Oct. 2022, Pittsburgh, Invited Talk, Title: “Microelectronics Application of Vapor-phase infiltration – Atomic Layer Deposition Derived Organic-Inorganic Hybridization Technique”
103. EMD Electronics / Intermolecular, September 2022, San Jose CA, Invited Seminar, Title: “Organic-Inorganic Hybrid EUV Photoresists Derived from Vapor-Phase Infiltration”
102. Molecular Vista, September 2022, San Jose CA, Invited Seminar, Title: “Vapor-Phase Infiltration (VPI) Synthesis of Organic-Inorganic Hybrids”
101. 2022 Center for Integrated Nanotechnologies (CINT) User Meeting, September 2022, Virtual, Invited Talk, Title: “Vapor-Phase Infiltration: Enhancing Functionalities of Self-Assembled Block Copolymer Templates”

101. SRC, NMP Technology Transfer e-Workshop, September 2022, Virtual, Invited Talk, Title: “Novel Organic-Inorganic Hybrid EUV Dry Resists Deposited by Molecular Atomic Layer Deposition (MALD)”
100. 2022 SUNY-Applied Materials Research Institute (SAMRI) Workshop, September 2022, Virtual, Invited Talk, Title: “Introduction to Quantum Materials Press (QPress) and 2D Materials Characterization Capabilities at Center for Functional Nanomaterials, Brookhaven National Laboratory”
99. US-Korea Conference (UKC) 2022, August 2022, Arlington VA, Invited Talk, Title: “Development of Hybrid EUV Resists by Atomic Layer Deposition”
98. University of Science and Technology (UST) Global Mentoring Conference, July 2022, Virtual (South Korea), Invited Talk, Title: “Vapor-Phase Infiltration for Microelectronics Applications”
96. Stony Brook University, Garcia Center for Polymers at Engineered Interfaces, July 2022, Stony Brook NY, Invited Lecture, Title: “Overview of Atomic Layer Deposition”
95. IMEC, Advanced Patterning Group, June 2022, Leuven, Belgium, Invited Seminar, Title: “Atomic Layer Deposition Derived Organic-Inorganic Hybrid EUV Resists and Applications of Vapor-Phase Infiltration”
94. EUVL Workshop, June 2022, Virtual (Berkeley CA), Invited Talk, Title: “Atomic Layer Deposition Derived Organic-Inorganic Hybrid EUV Resists”
93. 241st Electrochemical Society (ECS) Meeting, June 2022, Vancouver BC, Canada, Invited Talk, Title: “Vapor-Phase Infiltration for Microelectronics Applications”
92. 2022 NSLS-II & CFN Joint Users' Meeting, May 2022, Upton NY (virtual), Invited Talk, “Introduction to CFN: Microelectronics Related Capabilities”
91. 2022 Materials Research Society (MRS) Spring Meeting, May 2022, Honolulu HI (virtual), Invited Talk, Title: “Vapor-Phase Infiltration (VPI): An Emerging Hybrid Synthesis and Nanopatterning Method Derived from Atomic Layer Deposition (ALD) for Microelectronics Applications”
90. The Ohio State University, Department of Materials Science and Engineering, May 2022, Columbus OH, Invited Seminar, Title: “Vapor-Phase Infiltration (VPI): An Emerging Organic-Inorganic Hybrid Synthesis and Nanopatterning Method Derived from Atomic Layer Deposition (ALD) for Microelectronics Applications”
89. 2022 TMS 151th Annual Meeting & Exhibition, March 2022, Anaheim CA, Invited Talk, Title: “Vapor-phase infiltration synthesis of functional organic-inorganic hybrid nanocomposites”
88. UKC 2021, December 2021, Garden Grove CA, Invited Talk, Title: “Controlling Switching Stochasticity in Hybrid Memristors by Vapor-Phase Infiltration”
87. Stony Brook University, Department of Materials Science and Chemical Engineering, Nov. 2021, Stony Brook NY (virtual), Invited Lecture, Title: “Atomic Layer Deposition Techniques for Microelectronics Applications”
86. 34th International Microprocesses and Nanotechnology Conference (MNC 2021), Oct. 2021, Virtual, Invited Talk, Title: “Vapor-Phase Infiltration for Microelectronics Applications”
85. Materials Science & Technology (MS&T) 2021, Oct. 2021, Columbus OH (in-person/virtual hybrid due to COVID-19), Invited Talk, Title: “Grain Boundary Passivation for Enhancing Stability of Hybrid Perovskite Solar Cells”
84. 12th International Symposium on Natural Sciences, Research Institute of Basic Sciences, Incheon National University, Oct. 2021, Incheon, South Korea (virtual due to COVID-19), Invited Talk, Title: “Vapor-Phase Infiltration for Microelectronics Applications”
83. 2021 SSRL/LCLS Users Meeting, Sept. 2021, Stanford CA (virtual due to COVID-19), Invited Talk, Title: “Vapor-Phase Infiltration for Microelectronics Applications”
82. Garcia Center for Polymers at Engineered Interfaces, Stony Brook University, July 2021, Stony Brook NY (virtual due to COVID-19), Invited Lecture, Title: “Electron Microscopy”
81. Garcia Center for Polymers at Engineered Interfaces, Stony Brook University, June 2021, Stony Brook NY (virtual due to COVID-19), Invited Lecture, Title: “Overview of Atomic Layer Deposition”
80. 2021 EUVL Workshop, June 2021, Virtual, Invited Talk, Title: Synthesis of Organic-Inorganic Hybrid EUV Resists by Atomic Layer Deposition
79. Northrop Grumman/Brookhaven Lab Workshop, May 2021, Invited Talk, Title: Vapor-phase infiltration for microelectronics applications
78. 2021 TMS 150th Annual Meeting & Exhibition, March 2021, Virtual, Invited Talk, Title: “Direct Backbone Attachment of Polyesters on Grain Boundaries Enhances Chemical Stability and Suppressing Ion Migration in CH₃NH₃PbI₃ Hybrid Perovskite Solar Cells”
77. UKC 2020, December 2020, Virtual, Invited Talk, Title: “Ultrathin Amorphous Titanium Oxide Field-Effect Transistors with Large Gate-Induced Electron Mobility Modulation”
76. MS&T 2020, Nov. 2020, Virtual, Invited Talk, Title: “Polymer Additives for Stable Hybrid Perovskite Solar Cells”
75. INL and BNL Energy Research and Technology Forum, Oct. 2020, Virtual, Invited Talk, Title: “Materials Deposition and Synthesis Capabilities at CFN”
74. International Webinar on Frontiers in Materials for Technological Applications (FIMTA 2020), CSIR-Institute of Minerals and Materials Technology, August 2020, Keynote Lecture, Title: “Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis”
73. Garcia Center for Polymers at Engineered Interfaces, Stony Brook University, June 2020, Stony Brook NY (virtual due to COVID-19), Invited Lecture, Title: “Overview of Atomic Layer Deposition”

72. 2020 EUVL Workshop, June 2020, Berkeley CA (virtual due to COVID-19), Invited Talk, Title: "Vapor-phase infiltration synthesis of organic-inorganic hybrid nanocomposite resists towards EUVL"
71. 2020 NSLS-II & CFN Users' Meeting, May 2020, Upton NY (virtual due to COVID-19), Invited Talk, Title: "Electron microscopy"
70. 237th ECS Meeting, May 2020, Montreal Canada (conference cancelled due to COVID-19), Invited Talk, Title: "Nanopatterning functional metal oxide nanostructures by vapor-phase infiltration in polymer templates"
69. 2020 TMS 149th Annual Meeting & Exhibition, Feb. 2020, San Diego CA, Invited Talk, Title: "Vapor-phase infiltration synthesis of organic-inorganic hybrid nanocomposite resists for next generation lithography"
68. Texas A&M University, Department of Chemistry, Nov. 2019, College Station TX, Invited Seminar, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
67. University of Houston, Department of Physics, Nov. 2019, Houston TX, Invited Colloquium, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
66. Rice University, Department of Materials Science and Nanoengineering, Nov. 2019, Houston TX, Invited Seminar, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
65. SIS2019: Workshop on Sequential Infiltration Synthesis (SIS), Oct. 2019, Milan Italy, Invited Talk, Title: "Functional hybrids and inorganic nanostructures generated by infiltration synthesis"
64. MS&T 2019, Oct. 2019, Portland OR, Invited Talk, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
63. University of New Mexico, Department of Chemistry, Albuquerque NM, Sept. 2019, Invited Seminar, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by vapor-phase inorganic infiltration in polymer templates"
62. 2019 CINT Meeting, Santa Fe NM, Sept. 2019, Invited Talk, Title: "2D heterostructure Research at the Center Functional Nanomaterials (CFN) at Brookhaven National Laboratory"
61. Stony Brook University, Department of Materials Science and Chemical Engineering, Sept. 2019, Stony Brook NY, Invited Lecture, Title: "Overview of atomic layer deposition"
60. Lawrence Berkeley National Laboratory, Molecular Foundry, Invited Seminar, Sept. 2019, Berkeley CA, Title: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
59. UKC 2019, August 2019, Rosemont IL, Invited Talk, Title: "Functional Hybrids and Inorganic Nanostructures Derived from Infiltration Synthesis in Polymer Templates"
58. Argonne National Laboratory, Center for Molecular Engineering, August 2019, Lemont IL, Invited Seminar: "Functional organic-inorganic hybrids and inorganic nanostructures generated by infiltration synthesis"
57. Garcia Center for Polymers at Engineered Interfaces, Stony Brook University, July 2019, Stony Brook NY, Invited Lecture, Title: "Overview of Atomic Layer Deposition"
56. 2019 IEEE Long Island Systems, Applications and Technology (LISAT) Conference, May 2019, Farmingdale NY, Invited Talk, Title: "Application of Atomic Layer Deposition for Functional Organic-Inorganic Hybrids and Nanostructured Semiconductor Devices"
55. Brookhaven National Laboratory, Center for Functional Nanomaterials, March 2019, Upton NY, Invited Colloquium, Title: "Materials Innovation in Hybrid Nanocomposites, Nanofabrication, and Semiconductor Nanostructures by Atomic Layer Deposition"
54. University of Pittsburgh, Department of Mechanical Engineering and Materials Science, Feb. 2019, Pittsburgh PA, Invited Seminar, Title: "Atomic Layer Deposition Techniques Towards Materials Innovation in Hybrid Nanocomposite, Nanofabrication, and Semiconductor Nanostructures"
53. Massachusetts Institute of Technology (MIT), Micro-Nano Seminar Series, Nov. 2018, Boston MA, Invited Seminar, Title: "Infiltration Synthesis by Atomic Layer Deposition: Hybrid Nanocomposite and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
52. The 70th Southeastern Regional Meeting of American Chemical Society (ACS), Nov. 2018, Augusta GA, Invited Talk, "Infiltration Synthesis via Atomic Layer Deposition: CMOS-Compatible Synthesis and Photodetector-Integration of Parallel-Aligned Ultrathin ZnO Nanowire Arrays"
51. Georgia Institute of Technology, Dept. Materials Science and Engineering, Nov. 2018, Atlanta GA, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition: Materials Hybridization and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
50. Stony Brook University, Department of Materials Science and Chemical Engineering, Oct. 2018, Stony Brook NY, Invited Lecture, Title: "Overview of atomic layer deposition"
49. Korea Atomic Energy Research Institute (KAERI), August 2018, Daejeon, South Korea, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition for Materials Hybridization and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
48. Electronics and Telecommunications Research Institute (ETRI), August 2018, Daejeon, South Korea, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition for Materials Hybridization and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
47. IUMRS-ICEM 2018, August 2018, Daejeon, South Korea, Invited Talk, "Fully CMOS-Compatible Synthesis and Photodetector-Integration of Ultrathin, Parallel-Aligned ZnO Nanowire Arrays by Infiltration Synthesis"

46. Korea Institute of Industrial Technology (KITECH), August 2018, Incheon, South Korea, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition for Materials Hybridization and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
45. UKC 2018, August 2018, Queens NY, Invited Talks, "Materials Nanopatterning via Vapor-Phase Infiltration in Polymer Templates by Atomic Layer Deposition"; "Application of Quantum Dot Sensitization on Two-Dimensional Semiconductors for Improved Light Harvesting"
44. Gwangju Institute of Science and Technology (GIST), School of Materials Science and Engineering, July 2018, Gwangju, South Korea, Invited Seminar, "Infiltration Synthesis via Atomic Layer Deposition for Materials Hybridization and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
43. Hanyang University, Div. Materials Science and Engineering, July 2018, Seoul, South Korea, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition: Synthesis of Hybrid Nanocomposite and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
42. Garcia Center for Polymers at Engineered Interfaces, Stony Brook University, July 2018, Stony Brook NY, Invited lecture, "Overview of Atomic Layer Deposition"
41. Center for Plastic Electronics Annual Symposium, Imperial College of London, June 2018, London, United Kingdom, Invited Talk, "Regulating Internal Morphology of Polymer:Fullerene Bulk Heterojunction Solar Cells with Tertiary Polymer Components"
40. University of South Florida, College of Engineering, April 2018, Tampa FL, Invited Seminar, "Infiltration Synthesis by Atomic Layer Deposition: Synthesis of Hybrid Nanocomposite and Metal Oxide Nanostructures with Enhanced Physical and Optoelectronic Properties"
39. 2018 SPIE Defense and Commercial Sensing (DCS) Symposium, April 2018, Orlando FL, Invited Talk, "Application of Quantum Dot Sensitization on Two-Dimensional Semiconductors for Improved Light Harvesting"
38. Stony Brook University, Dept. Materials Science and Chemical Engineering, Feb. 2018, Stony Brook NY, Department Colloquium, "Materials Infiltration by Atomic Layer Deposition: Synthesis of Hybrid Nanocomposite and Metal Oxide Nanostructures with Enhanced Mechanical and Optoelectronic Properties"
37. Auburn University, Dept. Physics, January 2018, Auburn AL, Department Colloquium, "Direct Patterning Semiconductor Nanostructures and Synthesis of Hybrid Materials via Material Infiltration by Atomic Layer Deposition"
36. University of Nevada, Reno, Dept. Chemical and Materials Engineering, Dec. 2017, Reno NV, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Material Infiltration by Atomic Layer Deposition"
35. Boston University, Dept. Mechanical Engineering, Nov. 2017, Boston MA, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Material Infiltration by Atomic Layer Deposition"
34. Naval Research Laboratory, August 2017, Washington DC, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Material Infiltration by Atomic Layer Deposition"
33. UKC 2017, August 2017, Washington DC, Invited Talk, "Ultrahigh Elastic Strain Energy Storage in Organic-Inorganic Hybrid Polymer Nanopillars Generated by Metal Oxide Infiltration Synthesis"
32. University of Colorado Boulder, Dept. Mechanical Engineering, July 2017, Boulder CO, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Material Infiltration by Atomic Layer Deposition"
31. Stony Brook University, The Garcia Center for Polymers at Engineered Interfaces, June 2017, Stony Brook NY, Invited Lecture, "Introduction to Organic and Hybrid Solar Cells"
30. Stevens Institute of Technology, Dept. Mechanical Engineering, May 2017, Hoboken NJ, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Infiltration Synthesis"
29. KSEA Northeast Regional Conference, April 2017, Newark NJ, Invited Talk, "Application of Resonant Energy Transfer for Enhanced Light Harvesting in Ultrathin Inorganic Solar Cell and Two-Dimensional Layered Semiconductors"
28. University of Central Florida, NanoScience Technology Center, Orlando FL, February 2017, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Infiltration Synthesis"
27. University of Texas at Dallas, Dept. Materials Science and Engineering, Richardson TX, August 2016, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Infiltration Synthesis"
26. UKC 2016, August 2016, Dallas TX, Invited Talk, "Application of Resonant Energy Transfer for Enhanced Light Harvesting in Ultrathin Inorganic Solar Cell and Two-Dimensional Layered Semiconductors"
25. Oak Ridge National Laboratory, Center for Nanophase Materials Sciences, June 2016, Oak Ridge TN, Invited Seminar, "Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures via Infiltration Synthesis"
24. KSEA Northeast Regional Conference, April 2016, Englewood NJ, Invited Talk, "Overview of Device Nanostructuring for Efficient Polymer and Hybrid Solar Cells"
23. 2016 TMS 145th Annual Meeting & Exhibition, Feb. 2016, Nashville TN, Invited Talk, "Inorganic Infiltration in Polymer Templates via Atomic Layer Deposition: Pathway for Synthesis of Hybrid Materials and Direct Patterning Inorganic Nanostructures"
22. New Jersey Institute of Technology, Dept. Electrical & Computer Eng., Jan. 2016, Newark NJ, Department Seminar, "Device Nanostructuring for Efficient Polymer and Hybrid Solar cells"
21. Stony Brook University, Dept. of Mater. Sci. Eng., Oct. 2015, Stony Brook NY, Department Colloquium, "Application of Nanofabriation for Energy Conversion and Electronic Devices"
20. University of Connecticut, Dept. of Mater. Sci. Eng., April 2015, Storrs CT, Department Seminar, "Direct Patterning of Arbitrary Metal Oxide Nanostructures Using Polymer Template Nanoreactors"

19. Stony Brook University, Dept. of Mater. Sci. Eng., December 2014, Stony Brook NY, Department Colloquium, "Nanostructuring Materials for Energy Applications"
18. Korea Institute of Science and Technology (KIST), Center for BioMicrosystems, October 2014, Seoul, Korea, Invited Seminar, "Infiltration Synthesis of Metal Oxide Nanostructures in Polymer Templates"
17. Stony Brook University, The Garcia Center for Polymers at Engineered Interfaces, July 2014, Stony Brook NY, Invited Lecture, "Overview of Organic Solar Cells"
16. Nanotech 2014, June 2014, National Harbor MD (Washington DC), Invited Talk, "Metal Oxide Nanopatterning via Infiltration Synthesis in Polymer Templates"
15. 2014 Advanced Energy Conference, April 2014, Albany NY, Invited Talk, "Charge Transport in Organic Polymer Solar cells"
14. Stony Brook University, Dept. of Mater. Sci. and Eng., Feb. 2014, Stony Brook NY, Invited Seminar, "Infiltration Synthesis of Metal Oxide Nanostructures in Polymer Templates"
13. UKC 2013, August 2013, East Rutherford NJ, Invited Talk, "Infiltration Synthesis of Metal Oxide Nanopatterns on Diblock Copolymer Templates"
12. UKC 2012, August 2012, Los Angeles CA, Invited Talk, "Recent Progress in Organic Bulk Heterojunction Solar Cells"
11. City University of New York, Queens College, Dept. of Chemistry and Biochemistry, March 2011, Flushing NY, Department Seminar, "Device Nanostructuring for Efficient Organic Blend Solar Cells"
10. Brookhaven National Laboratory, Center for Functional Nanomaterials, June 2010, Upton NY, Invited Seminar, "Nanostructuring for Efficient Energy Conversion Devices"
9. Temple University, Dept. of Mech. Eng., May 2010, Philadelphia PA, Invited Seminar, "Nanostructuring for Efficient Energy Conversion Devices"
8. KSEA Northeast Regional Conference, May 2010, Somerset NJ, Invited Talk, "Nanostructured Contacts for Efficient Plastic Solar Cells"
7. KAIST, Graduate School of EEWS, Nov. 2009, Taejon, Korea, Invited Seminar, "Nanostructuring for Efficient Plastic Solar Cells and Thermoelectric Devices"
6. PennEnergy Colloquium, Nov. 2009, University of Pennsylvania, Philadelphia PA, Invited Seminar, "Nanostructuring for High Performance Organic Bulk Heterojunction Solar Cells"
5. NSLS-CFN User Meeting, May 2009, BNL, Upton NY, Invited Talk, "High Performance Air-Processed Polymer-Fullerene Solar Cells Having Nanostructured Electrical Contacts"
4. Columbia University Nanocenter Summer Retreat, April 2009, Short Hills NJ, Invited Talk, "High Performance All Air-Processed Polymer-Fullerene Solar Cells"
3. Korea University, Dept. of Mater. Sci. and Eng., November 2008, Seoul, Korea, "Invited Seminar", "Structure-Property Relations in Nanoscale: Polythiophene-Methanofullerene Solar Cells and Gallium Nitride Nanowires"
2. Pohang University of Science and Technology (POSTECH), Dept. of Mater. Sci. and Eng., Nov. 2008, Pohang, Korea, Invited Seminar, "Structure-Property Relations in Nanoscale: Polythiophene-Methanofullerene Solar Cells and Gallium Nitride Nanowires"
1. Brookhaven National Laboratory, Center for Functional Nanomaterials, Jan. 2007, Upton NY, Invited Seminar, "Gallium nitride nanowires: Polar Surface Controlled Growth, Ohmic Contact Patterning by Focused Ion Beam Induced Direct Pt Deposition; Variable Range Hopping, and Resonant Electromechanical Properties"

Media Coverage

14. "Brookhaven Lab's Chang-Yong Nam Named a Battelle 'Inventor of the Year'", BNL Newsroom, May 2022
13. "Top-10 Areas of Amazing Science at Brookhaven Lab in 2021", BNL Newsroom, Dec. 2021
12. "Next-Gen Semiconductor Manufacturing Tech Wins DOE National Pitch Competition", BNL Newsroom, Nov. 2021
11. "Layered Graphene with a Twist Displays Unique Quantum Confinement in 2-D", BNL Newsroom, August 2021
10. "Synthesis Method Expands Material Possibilities", BNL Feature, April 2021
9. Top 100, the Create the Future 2020 Design Contest, "Hybrid Organic-Inorganic Photoresists for Next-Generation Microelectronics", Tech Brief Media Group, Dec. 2020
8. "Stabilizing High-Efficiency Solar Cells", BNL Newsroom, Newswise, April 2020
7. "Enhancing Materials for Hi-Res Patterning to Advance Microelectronics", BNL Newsroom, Phys.org, Newswise, August 2019
6. "Adding an Inert Polymer to Plastic Solar Cells Enables High Efficiency and Easy Production", Stony Brook University Newsroom; Phys.org; BNL Newsroom, July 2018
5. "Tubular Science Improves Polymer Solar Cells", U.S. DOE Basic Energy Sciences website; Newswise; Phys.org, June 2018
4. "Understanding the Generation of Light-Induced Electrical Current in Atomically Thin Nanomaterials", BNL Newsroom; Newswise, May 2018
3. "Scientists Engineer Nanoscale Pillars to Act Like Memory Foam", BNL Features; UConn Today; Phys.org; Hopkins Materials; Chemical Industry Digest, December 2017
2. "Scientists Set Record Resolution for Drawing at the One-Nanometer Length Scale", BNL Newsroom; Newswise; U.S. DOE Basic Energy Science Highlights; April 2017
1. "Quantum Dots Enhance Light-to-Current Conversion in Layered Metal Dichalcogenide Semiconductors", BNL Newsroom; ScienceDaily, April 2016

Synergistic Activities

Journal Editorship

- Associate Editor, *Frontiers of Materials*, Semiconducting Materials and Devices, 2020 – p
- Subject Editor/Advisor, *JOM*, 2017 – 2019

Grant Proposal Review Panel

- U.S. DOE Office of Basic Energy Sciences, 2022, 2012
- U.S. DOE Office of Basic Energy Sciences, SBIR/STTR, 2021, 2019
- U.S. DOE Experimental Program to Stimulate Competitive Research (EPSCoR) Implementation Grants, 2011
- NSF, DMR, Electronic and Photonic Materials (EPM) Program, 2021
- NSF, CBET, DMREF, 2019
- NSF, DMR Polymer Program, 2017
- BNL, LDRD (Laboratory Directed Research and Development) funding, 2021
- ACS Petroleum Research Fund, 2021, 2017, 2016
- European Research Council (ERC), Starting Grants, 2018
- Brain Kore (BK) 21, Internal Program Review Panel, Pohang University of Science and Technology (POSTECH), 2022, 2021
- Korean American Scientists and Engineers Association (KSEA), Young Investigator Grant (YIG), 2020, 2019
- The Chinese University of Hong Kong, General Research Fund/Early Career Scheme, 2013
- The City University of New York Research Award Program (PSC-CUNY), 2011

Symposium Organizer

21. Program Committee, ALD 2023 (23rd Conference on Atomic Layer Deposition), July 2023, Bellevue WA
20. Organizing Chair, “Advances in Emerging Electronic Nanomaterials: Synthesis, Enhanced Properties, Integration, and Applications” Symposium, MS&T 2022, October 2022, Pittsburgh PA
19. Organizing Chair, Materials Science and Engineering Symposium, UKC 2022, August 2022, Arlington VA
18. Organizing Chair, “Advanced Metrology Needs for Addressing Critical Microelectronics Challenges” Workshop, 2022 NSLS-II & CFN Joint Users’ Meeting, May 2022, Upton NY (virtual)
17. Organizing Chair, Materials Science and Engineering Symposium, UKC 2021, December 2021, Garden Grove CA
16. Co-Organizer, SIS 2020 Workshop, December 2020, Virtual
15. Organizer, Symposium on Advances in Synthesis and Integration Methods for Enhanced Properties, and Applications in Emerging Nanomaterials, MS&T 2020, November 2020, Virtual
14. Organizing Chair, Materials Science and Engineering Symposium, UKC 2020, December 2020, Virtual
13. Organizing Chair, Materials Science and Engineering Symposium, UKC 2019, August 2019, Rosemont IL
12. Organizer, 2019 Functional Nanomaterials Symposium, TMS 148th Annual Meeting & Exhibition, March 2019, San Antonio TX
11. Co-Organizer, Next Generation Semiconductor Materials Symposium, IUMRS-ICEM 2018, August 2018, Daejeon, South Korea
10. Co-Organizer, Materials Science and Engineering Symposium, UKC 2018, August 2018, New York NY
9. Program Committee, ALD 2018, July 2018, Incheon, South Korea
8. Co-Organizer, 2018 Functional Nanomaterials Symposium, TMS 147th Annual Meeting & Exhibition, March 2018, Phoenix AZ
7. Co-Organizer, 2017 Functional Nanomaterials Symposium, TMS 146th Annual Meeting & Exhibition, Feb. 2017, San Diego CA
6. Co-Organizer, International Symposium on Science and Technology of 2D Materials, Feb. 2017, University of Central Florida, Orlando FL
5. Co-Organizer, Workshop on “Two-Dimensional van der Waals Semiconductors for Energy Conversion Applications”, 2016 NSLS-II & CFN Joint Users’ Meeting, Upton NY
4. Technical Review Committee, 2015 – 2020, TechConnect Nanotech Conference
3. International Advisory Committee, 2015 – 2016, International Conference on Advances in Functional Materials (AFM)
2. Co-Organizer, Symposium K on “Hierarchically Structured Materials for Energy Conversion and Storage”, 2012 Materials Research Society (MRS) Fall Meeting November 2012, Boston MA
1. Organizing Chair, MRS-Joint Symposium on “Ion Beam and Nanomaterials”, XVIII International Materials Research Congress (IMRC), August 2009, Cancún, Mexico

K-12 Outreach

- Co-Organizer, Annual Math and Science Olympiad, Korea-American Scientists and Engineers Association NY Metropolitan Chapter, Queens NY (2010 – p)
- Guest lectures at Research Scholar Program for High School Students, Garcia Center for Polymers at Engineered Interfaces, Stony Brook University (2014 – p)

Journal Article Reviewer

Proceedings of the National Academy of Sciences (PNAS), Advanced Materials, Advanced Electronic Materials, Advanced Functional Materials, Advanced Energy Materials, Advanced Optical Materials, Advanced Materials Interfaces, Advanced Intelligent Systems, ChemCatChem, Physica Status Solidi, Nano Letters, ACS Nano, ACS Applied Materials & Interfaces, ACS Applied Nano Materials, ACS Applied Polymer Materials, Macromolecules, ACS Sustainable Chemistry & Engineering, Chemistry of Materials, ACS Energy Letters, ACS Omega, Langmuir, Journal of Physical Chemistry, Nanoscale, RSC Advances, Journal of Materials Chemistry, PCCP, ChemPhysChem, ChemCom, Organic Electronics, Applied Physics Letters, Journal of Applied Physics, AIP Advances, Nanotechnology, Scientific Reports

Professional Society Affiliation

- The Minerals, Metals and Materials Society (TMS)
 - Functional Materials Division (FMD): Council Nominations & Awards Committee Member (2021 – 2022)
 - FMD Nanomaterials Committee: Elected Committee Vice Chair (2021 – p), Elected Committee Secretary (2019 – 2021), Elected *JOM* advisor (2017 – 2019), and Committee Member (2016 – p)
- Materials Research Society (MRS)
- American Vacuum Society (AVS)
- The International Society for Optics and Photonics (SPIE)
- Korean American Scientists and Engineers Association (KSEA)
 - Elected Technical Group Councilor, Materials Science and Engineering (2021 – p)
 - Treasurer, then Auditor of New York Metropolitan Chapter (2010 – 2018)

Course Development/Teaching

- ESM 542, Modern Electron Microscopy, 3-credit graduate course, Stony Brook University, Department of Materials Science and Chemical Engineering (2017 – p)
- ECE 618-853, Renewable Energy Systems, 3-credit online graduate course, New Jersey Institute of Technology (NJIT), Department of Electrical & Computer Engineering (2019 – p)

Supervision/Mentoring

- *Postdocs (3)*: Nikhil Tiwale, 2018 – 2021, currently Staff Scientist at CFN, BNL; Son Hoang, 2013 – 2014, currently Senior Data Scientist at EMD Electronics / Intermolecular; Mingfeng Wang, 2012, currently Assistant Professor at Nanyang Tech. Univ., Singapore
- *Ph.D. (7)*: Wonil Lee (Stony Brook U., Mater. Sci. Chem. Eng.), 2020 – p; Dan Le, DOE SCGSR (Univ. Texas at Dallas, Mater. Sci. Chem. Eng.), 2022; Ashwath Subramanian (Stony Brook U., Mater. Sci. Chem. Eng.), 2018 – 2022, currently Process Engineer at Lam Research; Sayantani Sikder (Stony Brook U., Mater. Sci. Chem. Eng.), 2019 – 2021; William Serrano-Garcia, Visiting Ph.D. student (U. South Florida), 2018 – 2019; Lei Wang (Stony Brook U., Mater. Sci. Chem. Eng.), 2016 – 2017; Chang-Yeol Cho, Visiting Ph.D. student (Sogang U., Korea), 2012 – 2013, currently Researcher at KRICT
- *M.S. (3)*: Ashwath Subramanian (Stony Brook U., Mater. Sci. Chem. Eng.), 2017 – 2018; Sulman Khan (Stony Brook U., Mater. Sci. Chem. Eng.), 2017; Xinyi Ye (Stony Brook U., Mater. Sci. Chem. Eng.), 2016 – 2017
- *Undergraduate (4)*: Brandon Yalin (Stony Brook U., Physics), 2016 – 2018, currently Research Engineer at NSLS-II, BNL; James Townley, Summer Undergrad Laboratory Intern (Univ. Penn., Mater. Sci. Eng.), 2016; Hugh Bullen (Stony Brook U., Mater. Sci. Chem. Eng.), 2012 – 2014, currently Process Engineer at Intel; Jovan Kamcev (Stony Brook U., Mater. Sci. Chem. Eng.), 2011 – 2012, formerly an NSF Graduate Fellow, currently Assistant Professor at Univ. Michigan Ann Arbor, Chem. Eng.
- *Visiting Faculty (2)*: Squib Ahmed, Visiting Faculty (Assistant Professor, SUNY Buffalo State Univ.), 2021 – 2022; Mohammad Sohel, Visiting Faculty (Associate Professor, CUNY Hostos Community College), Summer 2014; Yongwoo Kwon, Visiting Faculty (Professor, Hongik University), Summer 2019
- *Ph.D. Dissertation Committee (20)*, Stony Brook Univ., Mater. Sci. Chem. Eng.: Yifan Yin, 2021 – p; Yuchen Zhou, 2021; Chenyu Zhou, 2021 – 2022; Jia-Shiang Chen, 2020; Yixin Xu, 2019 – p; Jiajie Cen, 2019; Shuhao Zhang, 2017 – 2020; Zhenhua Yang, 2016 – 2017; Danhua Yan, 2016 – 2017; Mani Sen, 2017; Hongfei Li, 2016; Levent Sandogdular, 2013 – 2016; Cheng Pan, 2010 – 2013; *Mechanical Eng.*: Seungkuk Kuk, 2020 – 2021; Zhen Wang, 2020; *Dept. Chemistry*: Deokkyu Choi, 2021; Amanda Carr, 2020; *Univ. South Florida, School of Eng.*: William Serano-Garcia, 2021; *Univ. Connecticut, Dept. Mater. Sci. Eng.*: Zhongyuan Li, 2022 – p; *Univ. Texas at Dallas, Dept. Mater. Sci. Eng.*: Dan Le, 2022 – p

Full List of Publications: 108 refereed publications; 12 submitted; 14 in preparation; 1 US patent, 9 US patent applications, 1 US Provisional Patent Application; 7 Record of Inventions

†: Corresponding Author

<https://scholar.google.com/citations?user=IODT2zIAAAAJ&hl=en>

Peer-Reviewed Articles

108. **C.-Y. Nam**, Y.S. Chu†, S.P. Rao, G. Carini, “Advanced Microelectronics Metrology Workshop”, *Synchrotron Radiation News*, in press (2022), <https://doi.org/10.1080/08940886.2022.2135946>
107. S.T. Russell, S. Bae, A. Subramanian, N. Tiwale, G. Doerk, **C.-Y. Nam**, M. Fukuto, K.G. Yager†, “Priming Self-Assembly Pathways by Stacking Block Copolymers”, *Nature Communications* **13**, 6947 (2022)

106. Z. Ren, C. Li, K. Xie, S. Mangla, **C.-Y. Nam**, F. Camino, H. Wang, J. Yuan, P. Yan†, “Smart material based multilayered microbeam structures for spatial self-deployment and reconfiguration: a residual stress approach”, *Composite Structures*, in press (2022)
105. A. Subramanian, N. Tiwale, K. Kisslinger, **C.-Y. Nam**†, “Reduced Stochastic Resistive Switching in Organic-Inorganic Hybrid Memristors by Vapor-Phase Infiltration”, *Advanced Electronic Materials*, 2200172 (2022)
104. W.-I. Lee, A. Subramanian, S. Mueller, K. Levon, **C.-Y. Nam**†, M. Rafailovich†, “Potentiometric Biosensors Based on Molecular-Imprinted Self-Assembled Monolayer Films for Rapid Detection of Influenza A Virus and SARS-CoV-2 Spike Protein”, *ACS Applied Nano Materials* **5**, 5045 (2022)
103. C. Jewell, A. Subramanian, **C.-Y. Nam**†, R. Finke†, “Understanding the “Anti-Catalyst” Effect with Added CoO_x Water Oxidation Catalyst in Dye-Sensitized Photoelectrolysis Cells: Carbon Impurities in Nanostructured SnO₂ Are the Culprit”, *ACS Applied Materials & Interfaces* **14**, 25326 (2022)
102. Y. Liu, S. Lee, Y. Lin, M. Li, M. Cotlet, **C.-Y. Nam**, J.-K. Lee†, “Near-Band-Edge Enhancement in Perovskite Solar Cells via Tunable Surface Plasmons”, *Advanced Optical Materials*, 2201116 (2022)
101. K.M. Lee, M. Brito, J. DeCoster, K. Linskens, K. Mehdi, W.-I. Lee, E. Kim, H. Kim, G. Kwon, **C.-Y. Nam**, T. Kim†, “Influence of oxidizing and reducing pretreatment on the catalytic performance of CeO₂ for CO oxidation”, *Molecular Catalysis* **528**, 112465 (2022)
100. L. Hu, V.T. Bui, S. Pal, W. Guo, A. Subramanian, K. Kisslinger, S. Fan, **C.-Y. Nam**, Y. Ding, H. Lin†, “In situ growth of crystalline and polymer-incorporated amorphous ZIFs in polybenzimidazole achieving hierarchical nanostructures for carbon capture”, *Small*, 2201982 (2022)
99. Y.R. Kim, J. Kim, H. Kim†, H. Back, G. Kim, A. Gu, **C.-Y. Nam**, J.-H. Kim, H. Suh†, K. Lee†, “Conjugated polyelectrolytes for stable perovskite solar cells based on methylammonium lead triiodide”, *Journal of Materials Chemistry A* **10**, 3321 (2022)
98. L.-Y. Shi†, A. Subramanian, S. Lee, K. Kisslinger, **C.-Y. Nam**†, C.A. Ross†, “Selective Sequential Infiltration Synthesis of ZnO in the Liquid Crystalline Phase of Silicon-containing Rod-Coil Block Copolymers”, *Nanoscale* **14**, 1807 (2022)
97. A. Subramanian, N. Tiwale, W.-I. Lee, **C.-Y. Nam**†, “Templating Functional Materials Using Self-Assembled Block Copolymer Thin-Film for Nanodevices”, *Frontiers in Nanotechnology* **3**, 766690 (2021); invited review
96. Y. Zhou, N. Tiwale, Y. Yin, A. Subramanian, M. Rafailovich†, **C.-Y. Nam**†, “Effects of Polymer Grain Boundary Passivation on Organic-Inorganic Hybrid Perovskite Field-Effect Transistors”, *Applied Physics Letters* **119**, 183303 (2021)
95. K.-C. Feng, J. Li, L. Wang, Y.-C. Chuang, H. Liu, A. Pinkas-Sarafova, C.-C. Chang, **C.-Y. Nam**, M. Simon, M. Rafailovich†, “Combination of 3D Printing and ALD for Dentin Fabrication from Dental Pulp Stem Cell Culture”, *ACS Applied Bio Materials* **4**, 7422 (2021)
94. C.F. Jewell, A. Subramanian, **C.-Y. Nam**†, R.G. Finke†, “Ultrathin Alumina Passivation for Improved Photoelectrochemical Water Oxidation Catalysis of Tin Oxide Sensitized by a Phosphonate-Functionalized Perylene Diimide First Without, and Then With, CoO_y”, *Sustainable Energy & Fuels* **5**, 5257 (2021)
93. Z. Dai†, Z. Gao, S. Pershoga, N. Tiwale, A. Subramanian, Q. Zhang, C. Eads, S.A. Tenney, R.M. Osgood, **C.-Y. Nam**, J. Zang, A.T.C. Johnson, J.T. Sadowski†, “Quantum-well bound states in graphene heterostructure interfaces”, *Physical Review Letters* **127**, 086805 (2021)
92. Y. Zhou, Y. Yin, X. Zuo, L. Wang, T.-D. Li, Y. Xue, A. Subramanian, Y. Fang, Y. Guo, Z. Yang, M. Cotlet, **C.-Y. Nam**†, M. Rafailovich†, “Improving thermal stability of perovskite solar cells by suppressing ion migration using copolymer grain encapsulation”, *Chemistry of Materials* **33**, 6120 (2021)
91. N. Tiwale, A. Subramanian, G. Freychet, E. Gann, K. Kisslinger, M. Lu, A. Stein, J. Kim, **C.-Y. Nam**†, “Hybrid resist synthesis by ex-situ vapor-phase infiltration of metal oxides into conventional organic resists”, *Proceedings of SPIE* **11612**, Advances in Patterning Materials and Processes XXXVIII, 116120A (2021)
90. B. Yalin, A.C. Liapis†, M.D. Eisaman, D. Nykypanchuk, **C.-Y. Nam**†, “Optical simulation of ultimate performance enhancement in ultrathin Si solar cells by semiconductor nanocrystal energy transfer sensitization”, *Nanoscale Advances* **3**, 991 (2021)
89. Y.-C. Chuang†, L. Wang, K.-C. Feng, A. Subramanian, C.-C. Chang, M. Simon, **C.-Y. Nam**, M. Rafailovich†, “The Role of Titania Surface Coating by Atomic Layer Deposition in Improving Osteogenic Differentiation and Hard Tissue Formation of Dental Pulp Stem Cells”, *Advanced Engineering Materials* **23**, 2100097 (2021)
88. J. Mohan, H. Hernandez-Arriaga, Y.C. Jung, **C.-Y. Nam**, E.H.R. Tsai, J. Heo, R.M. Wallace, S.J. Kim†, J. Kim†, “Ferroelectric dipole relaxation with scaling of Hf_{0.5}Zr_{0.5}O₂ on silicon”, *Applied Physics Letters* **118**, 102903 (2021)
87. T. Onaya†, T. Nabatame†, Y.C. Jung, H. Hernandez-Arriaga, J. Mohan, H.S. Kim, N. Sawamoto, **C.-Y. Nam**, E.H.R. Tsai, T. Nagata, J. Kim, A. Ogura, “Precise analysis in ferroelectric switching properties and ferroelectric phase of low-temperature fabricated Hf_{0.5}Zr_{0.5}O₂ thin films”, *APL Materials* **9**, 031111 (2021)
86. N. Tiwale, A. Subramanian, Z. Dai, J.T. Sadowski, **C.-Y. Nam**†, “Large mobility modulation in ultrathin amorphous titanium oxide transistors”, *Communications Materials* **1**, 94 (2020)
85. A.C. Liapis, A. Subramanian, S. Cho, K. Kisslinger, **C.-Y. Nam**†, S.-H. Yun†, “Conformal Coating of Freestanding Particles by Vapor-Phase Infiltration”, *Advanced Materials Interfaces* **7**, 2001323 (2020)
84. 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**†, 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 (2020)

83. S. Lee, A. Subramanian, N. Tiwale, K. Kisslinger, M. Mumtaz, L.-Y. Shi, K. Aissou, **C.-Y. Nam**†, C.A. Ross†, “Resolving Triblock Terpolymer Morphologies by Vapor-Phase Infiltration”, *Chemistry of Materials* **32**, 5309 (2020)
82. B. Zhang, H.-J. Lin, H. Gao, X. Lu, **C.-Y. Nam**, P.-X. Gao†, “Perovskite-Sensitized β -Ga₂O₃ Nanorod Arrays for Highly Selective and Sensitive NO₂ Detection at High Temperature”, *Journal of Materials Chemistry A* **8**, 10845 (2020)
81. H. Back, G. Kim, H. Kim, **C.-Y. Nam**, J. Kim, T. Kim, B. Park, J.R. Durrant, K. Lee†, “Highly stable inverted methylammonium lead tri-iodide perovskite solar cells achieved by surface re-crystallization”, *Energy & Environmental Science* **13**, 840 (2020)
80. N. Tiwale, A. Subramanian, K. Kisslinger, M. Lu, J. Kim, A. Stein, **C.-Y. Nam**†, “Infiltration synthesis of hybrid nanocomposite resists for advanced nanolithography”, *Proceedings of SPIE* **11326**, Advances in Patterning Materials and Processes XXXVII, 113260J (2020)
79. A. Subramanian, N. Tiwale, G. Doerk, K. Kisslinger, **C.-Y. Nam**†, “Enhanced Hybridization and Nanopatterning via Heated Liquid-Phase Infiltration into Self-Assembled Block Copolymer Thin Films”, *ACS Applied Materials and Interfaces* **12**, 1444 (2020)
78. S. Kuk, Z. Wang, H. Yu, **C.-Y. Nam**, J.-H. Jeong†, D. Hwang†, “Nanosecond laser scribing for see-through CIGS thin film solar cells”, *Progress in Photovoltaics* **28**, 135 (2020)
77. Z. Ren†, J. Yuan†, X. Su, R. Bauer, Y. Xu, S. Mangla, F. Camino, **C.-Y. Nam**, M. Lu, Yong. Shi†, “Current divisions and distributed Joule heating of two-dimensional grid microstructures”, *Microsystem Technologies* **27**, 3339 (2021)
76. Z. Ren†, J. Yuan†, X. Su, S. Mangla, **C.-Y. Nam**, M. Liu, S.A. Tenney, Y. Shi, “Electro-thermal modeling and experimental validation for multilayered metallic microstructures”, *Microsystem Technologies* **27**, 2041 (2021)
75. Z. Ren†, J. Yuan, X. Su, S. Mangla, **C.-Y. Nam**, M. Liu, F. Camino, Y. Shi, “Thermal-mechanical modeling and experimental validation for multilayered metallic microstructures”, *Microsystem Technologies* **27**, 2579 (2021)
74. N. Tiwale, A. Subramanian, K. Kisslinger, M. Lu, J. Kim, A. Stein, **C.-Y. Nam**†, “Advancing the next generation nanolithography with infiltration synthesis of hybrid nanocomposite resists”, *Journal of Materials Chemistry C* **7**, 8803 (2019)
73. A. Subramanian, G. Doerk, K. Kisslinger, D.H. Yi, R.B. Grubbs, **C.-Y. Nam**†, “Direct Infiltration Synthesis of Three-Dimensional Electroactive ZnO Nanomesh Using Self-Assembled Block Copolymer Thin Films”, *Nanoscale* **11**, 9533 (2019)
72. A. Subramanian, N. Tiwale, **C.-Y. Nam**†, “Review of Recent Advances in Applications of Vapor-Phase Material Infiltration Based on Atomic Layer Deposition”, *JOM* **71**, 185 (2019)
71. L. Wang, Y. Zhou, Y. Yang, A. Subramanian, K. Kisslinger, X. Zhuo, Y.-C. Chuang, Y. Yin, **C.-Y. Nam**†, M. Rafailovich†, “Suppression of carbon monoxide poisoning in proton exchange membrane fuel cells via gold nanoparticle/titania ultrathin film heterogeneous catalysts”, *ACS Applied Energy Materials* **2**, 3479 (2019)
70. W. Tang, X. Lu, S. Du, S. Hoang, S. Wang, **C.-Y. Nam**†, P.-X. Gao†, “Ceria-based Nanoflake Arrays Integrated on 3D Cordierite Honeycombs for Efficient Low-Temperature Diesel Oxidation”, *Applied Catalysis B* **245**, 623(2019)
69. W. Teng, J. Weng, X. Lu, L. Wen, A. Subramanian, **C.-Y. Nam**, P. Gao†, “Alkali-Metal Poisoning Effect of Total CO and Propane Oxidation over Co₃O₄ Nanocatalysts”, *Applied Catalysis B* **256**, 117859 (2019)
68. D.H. Yi, **C.-Y. Nam**, G. Doerk, C.T. Black, R.B. Grubbs†, “Infiltration synthesis of diverse metal oxide nanostructures from epoxidized diene–styrene block copolymer templates”, *ACS Applied Polymer Materials* **1**, 672 (2019)
67. J. Zheng, B. Lienhard, G. Doerk, M. Cotlet, E. Bersin, H. S. Kim, Y.-C. Byun, **C.-Y. Nam**, J. Kim, C.T. Black, D. Englund†, “Top-down fabrication of high-uniformity nanodiamonds by self-assembled block copolymer masks”, *Scientific Reports* **9**, 6914 (2019)
66. F.-Y. Shih, D. Choi, Q. Wu, **C.-Y. Nam**, R.B. Grubbs†, “ipso-Arylative ring-opening polymerization as a route to electron-deficient conjugated polymers”, *Angewandte Chemie International Edition* **58**, 288 (2019)
65. L. Wang, Y. Zhou, J. Timoshenko, S. Liu, Q. Qiao, K. Kisslinger, M. Cuiffo, Y.-C. Chuang, X. Zuo, Y. Xue, Y. Guo, C. Pan, H. Li, **C.-Y. Nam**, S. Bliznakov, P. Liu, A.I. Frenkel, Y. Zhu, M.H. Rafailovich†, “Designing Nanoplatelet Alloy/Nafion Catalytic Interface for Optimization of PEMFCs: Performance, Durability, and CO Resistance”, *ACS Catalysis* **9**, 1446 (2019)
64. Y. Shmueli†, J. Jiang, Y. Zhou, G. Yuan, S.K. Satija, S. Lee, **C.-Y. Nam**, T. Kim, G. Maron, D. Gersappe, M.H. Rafailovich, “Simultaneous in-situ X-ray scattering and infrared imaging of polymers extrusion in additive manufacturing”, *ACS Applied Polymer Materials* **1**, 1559 (2019)
63. Y. Morimitsu, D. Salatto, N. Jiang, M. Sen, S. Nishitsuji, M.K. Endoh, B.M. Yavitt, A. Subramanian, **C.-Y. Nam**, R. Li, M. Fukuto, Y. Zhang, L. Wiegart, A. Fluerasu, K. Tanaka, T. Koga†, “Structurally-neutral densely packed homopolymer adsorbed chains for directed self-assembly of block copolymer thin films”, *Macromolecules* **52**, 5157 (2019)
62. L. Wang, D. Yan, D.W. Shaffer, X. Ye, B.H. Layne, J.J. Concepcion, M. Liu, **C.-Y. Nam**†, “Improved Stability and Performance of Visible Photoelectrochemical Water Splitting on Solution-Processed Organic Semiconductor Thin Films by Ultrathin Metal Oxide Passivation”, *Chemistry of Materials* **30**, 324 (2018)
61. E.S. Muckley, L. Collins, A.V. Ievlev, B.G. Sumpter, X. Ye, K. Kisslinger, **C.-Y. Nam**†, I.N. Ivanov†, “Light-activated hybrid nanocomposite film for water and oxygen sensing”, *ACS Applied Materials & Interfaces* **10**, 31745 (2018)
60. Z. Yang, Y. Guo, H. Li, Y. Zhou, X. Zuo, Y. Yu, C. Pan, J. Strzalka, **C.-Y. Nam**†, M. Rafailovich†, “Roles of Interfacial Tension in Regulating Internal Organization of Low Bandgap Polymer Bulk Heterojunction Solar Cells by Polymer Additives”, *Advanced Materials Interface* **5**, 1800435 (2018)

59. M. Li, J.-S. Chen, P.K. Routh, P. Zhal, **C.-Y. Nam**†, M. Cotlet†, “Distinct Optoelectronic Signatures for Charge Transfer and Energy Transfer in Quantum Dot-MoS₂ Hybrid Photodetectors Revealed by Photocurrent Imaging Microscopy”, *Advanced Functional Materials* **28**, 1707558 (2018)
58. Z. Yang, M. Moffa, Y. Liu, H. Li, L. Persano, A. Camposeo, R. Saija, M.A. Lati, O.M. Marggo, D. Pisignano†, **C.-Y. Nam**, E. Zussman, M.H. Rafailovich†, “Electrospun Conjugated Polymer/Fullerene Hybrid Fibers: Photoactive Blends, Conductivity through Tunneling-AFM, Light-Scattering, and Perspective for Their Use in Bulk-Heterojunction Organic Solar Cells”, *Journal of Physical Chemistry C* **112**, 3058 (2018)
57. N. Jiang, X. Di, D. Salatto, **C.-Y. Nam**, M. Fukuto, M.K. Koga, T. Koga†, “Self-organization of triblock copolymer melt chains physisorbed on non-neutral surface”, *ACS Omega* **3**, 17805 (2018)
56. K. Dusoe†, X. Ye, K. Kisslinger, A. Stein, S.-W. Lee, **C.-Y. Nam**†, “Ultra-high elastic strain energy storage in metal-oxide-infiltrated patterned hybrid polymer nanocomposites”, *Nano Letters* **17**, 7416 (2017)
55. X. Ye, J. Kestell, K. Kisslinger, M. Liu, R.B. Grubbs, J.A. Boscoboinik, **C.-Y. Nam**†, “Effects of residual solvent molecules facilitating the ZnO infiltration synthesis in a non-reactive polymer”, *Chemistry of Materials* **29**, 4535 (2017)
54. **C.-Y. Nam**†, A. Stein, “Extreme Carrier Depletion and Super-Linear Photoconductivity in Ultrathin Parallel-Aligned ZnO Nanowire Array Photodetectors Fabricated by Infiltration Synthesis”, *Advanced Optical Materials* **5**, 1700807 (2017)
53. H. Li, Z. Yang, C. Pan, S.K. Satija, D. Xu, D. Gersappe, **C.-Y. Nam**†, M.H. Rafailovich†, “A new strategy to engineer polymer bulk heterojunction solar cells with thick active layers via self-assembly of tertiary columnar phase”, *Nanoscale* **9**, 11511 (2017)
52. V.R. Manfrinato, A. Stein, L. Zhang, **C.-Y. Nam**, K.G. Yager, E.A. Stach†, C.T. Black†, “Aberration-Corrected Electron Beam Lithography at the One Nanometer Length scale”, *Nano Letters* **17**, 4562 (2017)
51. S. Hoang, X. Lu, W. Tang, S. Wang, S. Du, **C.-Y. Nam**, Y. Ding, P.-X. Gao†, “High performance diesel oxidation catalysts using ultra-low Pt loading on titania nanowire array integrated cordierite honeycombs”, *Catalysis Today* **320**, 2 (2019)
50. J. Kestell†, K. Mudiyansele, X. Ye, **C.-Y. Nam**, D.J. Stacchiola, J.T. Sadowski, J.A. Boscoboinik†, “Stand-Alone Polarization-Modulation Infrared Reflection Absorption Spectroscopy Instrument Optimized for the Study of Catalytic Processes at Elevated Pressures”, *Review of Scientific Instruments* **88**, 105109 (2017)
49. S. Hoang, A. Ashraf, M.D. Eisaman, D. Nykypanchuk†, **C.-Y. Nam**†, “Enhanced Photovoltaic Performance of Ultrathin Si Solar Cells via Semiconductor Nanocrystal Sensitization: Energy Transfer vs. Optical Coupling Effects”, *Nanoscale* **8**, 5873 (2016)
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