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❖ Education

Feb. 1992 – Jan. 1997 Ph.D., Materials Science, University of Delaware.
Dissertation: Interface Characterization of an SCS-6/Ti-22Al-23Nb Composite
Advisor: Prof. Ian W. Hall

Sept. 1984 – Aug. 1987 M.Eng., Metallic Materials and Heat Treatments, China Academy of Railway Sciences, Beijing, China.
Thesis: Plasma Boronizing of Steel
Advisor: Prof. Yang Deng

Feb. 1978 – Jan. 1982 B.Eng., Metallic Materials and Heat Treatments, Zhenjiang Institute of Agricultural Machinery (currently Jiangsu University), Jiangsu, China
Senior thesis: Gas Carbonitriding of Spheroidal Graphite Cast Iron for Enhanced Wear Resistance
Advisor: Prof. Qifu Luo

❖ Professional Experience

May 2001 – present Professor (Sept. 2016 - present), Associate Professor (Sept. 2005), and Assistant Professor, Department of Materials Science and Engineering
Director, W. M. Keck Center for Advanced Microscopy and Microanalysis
University of Delaware

Oct. 2019 – present NVLAP/NIST Program Assessor for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM)
NVLAP - National Voluntary Laboratory Accreditation Program

Apr. 1999 – May 2001 Scientist (2000 - 2001), Metrology Engineer (1999 - 2000), R&D, Rodel Inc. (Currently DuPont), Delaware.

May 1997 – Apr. 1999 Laboratory Manager (1998 - 1999) and Transmission Electron Microscopy Specialist (TEM, PLM, PCM, 1997 - 1999), Batta Laboratories Inc., Delaware.

Jan. – May 1997 Post-doctor, Department of Physics and Astronomy, University of Delaware.
Advisor: Prof. George Hadjipanayis

Nov. 1996 – Jan. 1997 Laboratory Assistant, Institute of Energy Conversion, University of Delaware

Sept. 1987 – Jan. 1992 Dept. Head and Lecturer (1989 - 1992), Assistant Professor (1987 - 1989), Department of Mechanical Engineering, Jiangnan University, Wuxi, China

Feb. 1982 – Aug. 1984 Assistant Engineer, Qishuyan Locomotive & Rolling Stock Technology Research Institute, Changzhou, China

❖ Research

Research interests

My general research interest centers on the characterization of novel structures and composites using transmission electron microscopy (TEM) and scanning electron microscopy (SEM). Expertise includes electron crystallography and e-beam associated spectroscopy. Active efforts are on the process-structure-property relationships of advanced composites, mesoporous crystals, functionalized nanostructures and assemblies, thin films and interfaces.

Publications (total citations 6988, h-index 42, Google Scholar as of 8/12/2020)

Refereed journal publications

1. Chun-yen Hsu, Yuying Zhang, Prashant Karandikar, Fei Deng, Chaoying Ni, Mechanical Properties of α-SiC and Correlation to SiC/Si Interface at Nanoscale from Reaction Bonded SiC/Si Composites (RBSC), *Applied Composite Materials*, 27, 2020, 433-445, https://doi.org/10.1007/s10443-020-09825-3

2. Xiazhang Li, Hui-Yin H Li, David Charles Martin, Chaoying Ni, Si-thiol Supported Atomic-scale Palladium as Efficient and Recyclable Catalyst for Suzuki Coupling Reaction, *Nanotechnology*, 31, 2020, 355704, https://doi.org/10.1088/1361-6528/ab9473

3. Jie Li, Yuxiang Yang, Zhiyong Han, Min Zhao, Hongming Yuan, Chaoying Ni, Degradation of Tetrachloroguaiacol by an Enzyme Embedded in a Magnetic Composite Cage Structure of MNPs@ALG@SiO_2, *Biochemical Engineering Journal*, submitted

4. Xiazhang Li, Xiangyu Yan, Chengli He, Sujuan Ma, Shixiang Zuo, Chao Yao, Chaoying Ni, Upconversion fluoride/attapulgite nanocomposite for visible light driven photocatalytic nitrogen fixation, *Journal of Photochemistry and Photobiology A: Chemistry*, submitted

5. Tianshi Wang, Zhigang Gui, Chaoying Ni, and Anderson Janotti, Why the electron mobility in GaN is much higher than in ZnO, *Physical Review Materials*, submitted

6. Qiong Xu, Aibin Ma, Bassiouny Saleh, Reham Fathi, Yuhua Li, Jinghua Jiang, Chaoying Ni, Dry Sliding Wear Behavior of AZ91 Alloy Processed by Rotary-Die Equal Channel Angular Pressing, *Journal of Materials Engineering and Performance*, 29, 2020, 3961–3973

7. Jianzhong Su, Wei-Jun Cai1, Jean Brodeur, Baoshan Chen, Najid Hussain, Yichen Yao, Chaoying Ni, Jeremy Testa, Ming Li, Xiaohui Xie, Wenfei Ni, K. Michael Scaboo, Yuanyuan Xu, Jeffrey Cornwell, Cassie Gurbisz, Michael S. Owens, George G. Waldbusser, Minhan Dai, W. Michael Kemp, A bay-wide self-regulated pH buffer mechanism in response to eutrophication and acidification in Chesapeake Bay, *Nature Geoscience*, 13, 441-447(2020), DOI: https://doi.org/10.1038/s41929-020-0445-x

8. Xiazhang Li, Chengli He, Da Dai, Shixiang Zuo, Xiangyu Yan, Chao Yao, Chaoying Ni, Nano-mineral induced nonlinear optical $LiNbO_3$ with abundant oxygen vacancies for photocatalytic

nitrogen fixation: boosting effect of polarization, *Applied Nanoscience*, 2020. https://doi.org/10.1007/s13204-020-01443-6

9. Theresa P. Ginley, Yuying Zhang, Chaoying Ni, and Stephanie Law, Epitaxial growth of Bi_2Se_3 in the (0015) Orientation on GaAs (001), *J. Vac. Sci. Technol. A*, 38(2), 023404.1-7 https://doi.org/10.1116/1.5139905

10. Xiazhang Li, Zhendong Wang, Haiyang Shi, Da Dai, Shixiang Zuo, Chao Yao, Chaoying Ni, Full spectrum driven SCR removal of NO over hierarchical $CeVO_4$/attapulgite nanocomposite with high resistance to SO_2 and H_2O, *Journal of Hazardous Materials*, 386, 2020, 121977 https://doi.org/10.1016/j.jhazmat.2019.121977

11. Qiong Xu, Aibin Ma, Yuhua Li, Jiapeng Sun, Yuchun Yuan, Jinghua Jiang, Chaoying Ni, Microstructure evolution of AZ91 alloy processed by a combination method of equal channel angular pressing and rolling, *Journal of Magnesium and Alloys*, 8(1), March 2020, 192-198 https://doi.org/10.1016/j.jma.2019.05.012

12. Asad Muhammad Iqbal, Ghulam Hassnain Jaffari, Syed Ismat Shah, Syed Khurshid Hasanain, Chaoying Ni, John Q. Xiao, Role of Morphology, Crystal Orientation and Stoichiometry in the Electrical Response of Perovskite $EuTiO_3$ Ceramics, *Journal of the European Ceramic Society*, 40(4), 2020, 1250-1257 https://doi.org/10.1016/j.jeurceramsoc.2019.11.001

13. Qiong Xu, Aibin Ma, Bassiouny Saleh, Yuhua Li, Yuchun Yuan, Jinghua Jiang, Chaoying Ni, Enhancement of strength and ductility of SiCp/AZ91 composites by RD-ECAP processing, *Materials Science and Engineering: A*, 771, 2020, 138579 https://doi.org/10.1016/j.msea.2019.138579

14. Bo E. Tew, Yuying Zhang, Areej Shahid, Matthew R. Lewis, Chaoying Ni, Joshua M. O. Zide, Growth and Thermal Characterization of TbAs Nanoparticles Grown by Inert Gas Condensation, *Journal of Electronic Materials*, 2020, 1-6 http://doi.org/10.1007/s11664-019-07737-y

15. Xinxin Wang, Hongxia Yin, Yuxia Guan, Yuxiang Yang, Yan Huang, Hongming Yuan, Xiangnong Liu, Chaoying Ni, Graphene Oxide Covalently Grafted Fe_2B@ SiO_2 Nanoparticles for Epirubicin Loading and Releasing, *Journal of nanoscience and nanotechnology*, 20(4), 2020, 2104-2113(10) https://doi.org/10.1166/jnn.2020.17360

16. Carly Byron, Shi Bai, Gokhan Celik, Magali S. Ferrandon, Cong Liu, Chaoying Ni, Ali Mehdad, Massimiliano Delferro, Raul Lobo, and Andrew V. Teplyakov, Role of Boron in Enhancing the Catalytic Performance of Supported Platinum Catalysts for the Nonoxidative Dehydrogenation of *n*-Butane, *ACS Catalysis*, 2020, 10, 2, 1500-1510. https://doi.org/10.1021/acscatal.9b04689

17. Zhengxin Li, Meng Jia, Samantha Doble, Emily Hockey, Han Yan, Joseph Avenoso, Daniel Bodine, Yuying Zhang, Chaoying Ni, John T Newberg, Lars Gundlach, Energy Band Architecture of a Hierarchical ZnO/Au/Cu_xO Nanoforest by Mimicking Natural Superhydrophobic Surfaces, *ACS Appl. Mater. Interfaces*, 2019 https://doi.org/10.1021/acsami.9b13610

18. Xinxin Wang, Hongxia Yin, Yuxia Guan, Yuxiang Yang, Yan Huang, Hongming Yuan, Xiangnong Liu, Chaoying Ni, Graphene Oxide Covalently Grafted Fe_2B@ SiO_2 Nanoparticles for Epirubicin Loading and Releasing, *Journal of Nanoscience and Nanotechnology*, 20(4), 2020, 2104-2113(10) DOI: https://doi.org/10.1166/jnn.2020.17360

19. Changhao Liu, Isao Noda, D. Bruce Chase, Yuying Zhang, Jing Qu, Meng Jia, Chaoying Ni, John F. Rabolt, Crystallization Retardation of Ultrathin Films of Poly [(R)-3-hydroxybutyrate] and a Random Copolymer Poly [(R)-3-hydroxybutyrate-co-(R)-3-hydroxyhexanoate] on an Aluminum Oxide Surface, *Macromolecules*, 52(19), 2019, 7343-7352 https://doi.org/10.1021/acs.macromol.9b01214

20. Chun-yen Hsu, Yuying Zhang, Yunsong Xie, Fei Deng, Prashant Karandikar, John Q Xiao, Chaoying Ni, *In-situ* measurement of SiC/Si interfacial tensile strength of reaction bonded SiC/Si composite, *Composites Part B: Engineering*, 175, 2019, 107116 https://doi.org/10.1016/j.compositesb.2019.107116

21. Yuying Zhang, Chun-Yen Hsu, Prashant Karandikar, Chaoying Ni, Interfacial zone surrounding the diamond in reaction bonded diamond/SiC composites: interphase structure and formation mechanism, *Journal of the European Ceramic Society*, 39(16), 2019, 5190-5196. https://doi.org/10.1016/j.jeurceramsoc.2019.08.019

22. Yue Zhao, Shizhao Kang, Pingping Yao, Yi Zhao, Xiangnong Liu, Yuxiang Yang, Chaoying Ni, Construction of Carbon Dots Coated Magnetic Hollow Silica Spheres, *Journal of nanoscience and nanotechnology*, 19(11), 2019, 7456-7463 https://doi.org/10.1166/jnn.2019.16673

23. Yan Huang, Jie Li, Yuxiang Yang, Hongming Yuan, Qinmei Wei, Xiangnong Liu, Yi Zhao, Chaoying Ni, Characterization of enzyme-immobilized catalytic support and its exploitation for the degradation of methoxychlor in simulated polluted soils, *Environmental Science and Pollution Research*, 2019, 1-13 https://doi.org/10.1007/s11356-019-05937-x

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26. Chun-Yen Hsu, Kathryn Scrafford, Chaoying Ni, Fei Deng, Study of tensile properties of multiwalled carbon nanotube/polyether ether ketone polymer composites at the nanoscale, *Polymer Engineering & Science*, 59(6), 2019, 1209-1214 https://doi.org/10.1002/pen.25103

27. Juan Xu, Huada Cao, Chaoying Ni, Yan Wang, Jianyu Cao, Zhidong Chen, Design and synthesis of sandwich-like $CoNi_2S_4$@C@NiCo-LDH microspheres for supercapacitors, *J Solid State Electrochem*, (2019), 1-10 https://doi.org/10.1007/s10008-019-04246-0

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29. Xiazhang Li, Haiyang Shi, Xiangyu Yan, Shixiang Zuo, Yuying Zhang, Qun Chen, Chao Yao, Chaoying Ni, Rational construction of direct Z-scheme doped perovskite/palygorskite nanocatalyst for photo-SCR removal of NO: Insight into the effect of Ce incorporation, *Journal of Catalysis*, 369 (2019), 190-200 https://doi.org/10.1016/j.jcat.2018.11.009

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39. Xiaoyu Han, Pingping Yao, Chao Cheng, Hongmin Yuan, Yuxiang Yang, Chaoying Ni, Preparation and *In Vivo* Biodistribution of Ultra-Small Superparamagnetic Iron Oxide Nanoparticles with High Magnetic Targeting Response, *Journal of Nanoscience and Nanotechnology*, 18(2), 2018, 879-886(8), DOI: https://doi.org/10.1166/jnn.2018.14110

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42. Xiazhang Li, Feihong Li, Xiaowang Lu, Shixiang Zuo, Zhongyu Li, Chao Yao, Chaoying Ni, Microwave hydrothermal synthesis of $BiP_{1-x}V_xO_4$/attapulgite nanocomposite with efficient photocatalytic performance for deep desulfurization, *Powder Technology*, 327, 2018, 467-475, https://doi.org/10.1016/j.powtec.2018.01.005

43. Zuocheng Dai, Yan Huang, Huan Yang, Pingping Yao, Yuxiang Yang, Chaoying Ni, Preparation and Biological Applications of Graphene Oxide Functionalized Water-Based Magnetic Fluids, *Journal of Nanoscience and Nanotechnology*, 18(1), 2018, 735-742, DOI: https://doi.org/10.1166/jnn.2018.13926

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60. Xiazhang Li, Wei Zhu, Xiangyu Yan, Xiaowang Lu, Chao Yao, Chaoying Ni, Hierarchical La0.7Ce0.3FeO3/halloysite nanocomposite for photocatalytic degradation of antibiotics, *Applied Physics A*, (2016) 122, 723. doi:10.1007/s00339-016-0240-3

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Transmission Electron Microscopy, *ACS Macro Lett.*, 2015, 4, 897-900, DOI: 10.1021/acsmacrolett.5b00479

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Publications in conference proceedings

179. Yuying Zhang, Justin Wynn, Prashant Karandikar, Chaoying Ni, Structural Evolution of Reaction Bonded Interfacial Zone of Diamond/SiC, Microscopy and Microanalysis, Volume 25, Supplement S2, August 2019 , pp. 2074-2075, https://doi.org/10.1017/S1431927619011103

180. Yuying Zhang, Chun-Yen Hsu, Yong Zhao, Prashant Karandikar, Chaoying Ni, *In situ* Measurement of Diamond/SiC Interfacial Strength, Microscopy and Microanalysis, Volume 25, Supplement S2, August 2019, pp. 848-849, https://doi.org/10.1017/S1431927619004975

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183. Qiong Xu, Aibin Ma, Yuhua Li, Chaoying Ni, Microstructure of a High Strength AZ91 Alloy Processed by Severe Plastic Deformation, Volume 24, Supplement S1 (Proceedings of Microscopy & Microanalysis 2018), August 2018, pp. 2176-2177 https://doi.org/10.1017/S1431927618011364

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185. Sean Fudger, Eric Klier, Prashant Karandikar, Chaoying Ni, Evaluation of Intermetallic Reaction Layer Formation within Steel Encapsulated Metal Matrix Composites, *TMS 2016 145th Annual Meeting Supplemental Proceedings*, Feb. 14-18, 2016, Nashville, Tennessee, 109-117.

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187. Sean Fudger, Eric Klier, Prashant Karandikar, Brandon McWilliams, Chaoying Ni, Mechanical Properties of Steel Encapsulated Metal Matrix Composites, *Advanced Composites for Aerospace, Marine, and Land Applications II*, 2015, 121-136.

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189. Hongtao Lin, Lan Li, Yi Zou, Fei Deng, Chaoying Ni, Sylvain Danto, J. David Musgraves, Kathleen Richardson, Stephen T. Kozacik, Maciej Murakowski, Dennis Prather, Juejun Hu, Planar chalcogenide glass mid-infrared photonics, *Proceedings of SPIE - The International Society for Optical Engineering* 02/2014; DOI:10.1117/12.2035688.

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chemical sensing using high-Q chalcogenide glass resonators, 2013/11/3, Sensors, 2013 IEEE, Baltimore, MD, 1-4, 10.1109/ICSENS.2013.6688278.

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194. Brian G. Willis, Rahal Gupta and Chaoying Ni, Atomic Layer Deposition for Nanoelectrode devices, *ECS Transactions - Las Vegas, NV,* Volume 33, Atomic Layer Deposition Applications 6, October 2010, 25-35.

195. Emre Yassitepe, C. Ni, S. Ismat Shah, Rapid route to synthesize $CuIn_{1-x}Ga_xSe_2$ films by tip sonication, Proceedings of the Society of Vacuum Coaters Annual Meeting, Orlando, FL, April 2010

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201. C. Vahlas, I. W. Hall, P. Chevalier, C.-Y Ni, Thermodynamic and experimental modeling of interfacial reactivity in metal matrix composites, *Key Engineering Materials Proceedings of the 1st International Conference on Ceramic and Metal Matrix Composites*, CMMC 96. Part 1 (of 2) Sep 9-12 1996 v 127-131, San Sebastian, Spain, 1997 Transtec Publ Ltdd. Zurich Switzerland, 359-366.

202. I.W. Hall, C.Y. Ni, C. Vahlas, Interactions between Ti-22Al-23Nb and SiC/C mixtures, *Proceedings of the 4th International Symposium on Processing and Fabrication of Advanced Materials*, Cleveland, OH, Oct. 29 - Nov. 2, 1995, TMS (1996), 385-393.

203. Chaoying Ni, I. W. Hall, C. Vahlas, Diffusion and reactions at the interface of an SCS-6/Ti-22Al-23Nb composite, *Proceedings of the 9th Conference of the American Society for Composites*, Delaware, Sept. 20-22, 1994, 530-537.

Book chapters

204. Chaoying Ni, Scanning Electron Microscopy, In: Wang Q., Chung Y. (Ed.) Encyclopedia of Tribology: Springer Reference (www.springerreference.com). Springer-Verlag Berlin Heidelberg, 2013. DOI: 10.1007/SpringerReference_341143 2012-08-22 13:57:34 UTC.

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206. Hui-Yin (Harry) Li, Rui Liu, Carl Behrens, and Chaoying Ni, Chapter 7 Industrial Application of Chiral Technologies, Wiley, 2011, 253-296

Patents

207. Yuxiang Yang, Chaoying Ni, Yan Huang, Xiaoyu Han, Hongxia Yin, Method of TiO2 nanotube based electrodes for perovskite solar cells (基于 TiO2 纳米管的钙钛矿电池电极的制备方法), 申请公布号 CN 110400875 A, 申请公布日 2019.11.01, Chinese, 2019

❖ Presentations and posters

Invited talks (presented by Chaoying Ni)

1. Mechanical and thermal characteristics of interfaces and defects in diamond/SiC composites, 44th International Conference and Expo on Advanced Ceramics and Composites (ICACC), Daytona Beach, Florida, January 26 - January 31, 2020

2. Probing interfacial structure and property of reaction bonded diamond/SiC - microscopic approaches, M&M 2019, Portland, August 8, 2019

3. Interfacial characteristics of reaction bonded diamond/SiC composites, 43rd International Conference and Expo on Advanced Ceramics and Composites (ICACC), Daytona Beach, Florida, January 27 - February 1, 2019.

4. *In-situ* electron microscopy for probing material structures and properties, Villanova University, November 16, 2018

5. Structural and thermal properties of SiC/Si composites and interfaces, Hohai University, Nanjing, China, March 28, 2018.

6. *In-Situ* Electron Microscopy for Probing Properties and Dynamics in Materials, Changzhou University, Changzhou, China, March 26, 2018.

7. Residual stress induced mechanical property enhancement, National Chung Hsing University, Taichung, Taiwan, Oct. 18, 2017

8. Structural and thermal properties of silicide/Si thin films and interfaces, TACT 2017, Oct. 15-18, International Thin Films Conference, National Dong Hwa University, Hualien, Taiwan Oct. 17, 2017

9. Thermal transport in SiC/Si composites and interfaces, Jiangnan University, China, Oct. 9, 2017

10. Opportunities and challenges of dynamic transmission electron microscopy, Suzhou University of Science and Technology, Suzhou, China, March 30, 2017.

11. Current status of in-situ transmission electron microscopy, Changzhou University, Changzhou, China, March 28, 2017.

12. Probing structural responses to environmental stimuli via in-situ electron microscopy, Changzhou University, Changzhou, China, Nov. 18, 2015.

13. *In-situ* electron microscopy for intrinsic material properties and mechanisms, Hohai University, Nanjing, China, Nov. 19, 2015.

14. Structural and property characteristics of advanced carbides and thin films, Hohai University, Nanjing, China, Nov. 24, 2015.

15. Structural and property evaluation of multifunctional ceramic composites, November 26, 2016, The 9th International Conference on Multifunctional Materials and Applications (ICMMA 2015), Suzhou, China, November 26-28, 2015.

16. Methods and applications of *in-situ* transmission electron microscopy, Changzhou University, Changzhou, China, August 15, 2014

17. Hongtao Lin, Lan Li, Yi Zou, Fei Deng, Chaoying Ni, Juejun Hu, Sylvain Danto, Kathleen Richardson, Stephen Kozacik, Maciej Murakowski, Dennis Prather, J. David Musgraves, Planar chalcogenide glass mid-infrared photonics, SPIE Photonics West, San Francisco, February 13 - 18, 2014. (presented by Juejun Hu)

18. Advanced Electron Microscopy: Recent Progress and Applications, Suzhou University of Science and Technology, China, July 6, 2013

19. Modifying CNT assemblies via photon induced simultaneous surface activation and polymer deposition, Huaiying Institute of Technology, China, June 20, 2013.

20. Recent Progress in *In-Situ* Transmission Electron Microscopy: Challenges and Opportunities, Changzhou University, China, June 18, 2013

21. CNT functionalization via simultaneous Xe-VUV light irradiation and photon induced polymer coatings, Eastern Analytical Symposium, Somerset, New Jersey, November 14, 2012.

22. Auriga FIB/SEM CrossBeam^{TM} and Its Applications in Solar Cell Research, Institute of Energy Conversion, University of Delaware, March 23, 2012

23. SPM applications in biomaterial research and tribology, a talk in the workshop Nano Surface Metrology - Featuring Atomic Force and 3D Optical Microscopy, Delaware, February 8, 2012.

24. A universal SEM testing stage for in-situ mechanoelectric evaluation of nano- and microstructures, Suzhou University of Science and Technology, China, June 20, 2011.

Other oral presentations (presented by Chaoying Ni or otherwise indicated; a partial list)

25. Yuying Zhang, Chun-Yen Hsu, Prashant Karandikar, Chaoying Ni, *In-situ* study on diamond/SiC interfacial strength of reaction bonded diamond/SiC composite, 44th International Conference and Expo on Advanced Ceramics and Composites (ICACC), Daytona Beach, Florida, January 26 - January 31, 2020 (presented by Yuying Zhang)

26. Interface and Thermal Properties of Reaction Bonded Diamond/SiC Composites, 34th International Thermal Conductivity Conference (ITCC) & 22nd International Thermal Expansion Symposium (ITES), Wilmington, Delaware, June 17 – 20, 2019 (presented by Yuying Zhang)

27. Yuying Zhang, Chun-Yen Hsu, Prashant Karandikar, Jinsheng Li, Chaoying Ni, Interface Characteristics of Reaction Bonded Silicon Carbide Composites, Microscopy & Microanalysis 2018, Baltimore, August 2018, (presented by Yuying Zhang).

28. Qiong Xu, Aibin Ma, Yuhua Li, Chaoying Ni, Microstructure of a High Strength AZ91 Alloy Processed by Severe Plastic Deformation, Microscopy & Microanalysis 2018, Baltimore, August 2018, (presented by Qiong Xu).

29. Chun-yen Hsu, Chaoying Ni, *In-situ* Tensile Test of Reaction Bonded SiC/Si Composite Interfaces, Microscopy & Microanalysis 2018, Baltimore, August 2018, (presented by Chun-yen Hsu).

30. Yuying Zhang C. Hsu, P. Karandikar, S. Aubuchon and Chaoying, Temperature dependent thermal properties of reaction bonded silicon carbide (RBSC) composites, 42nd International Conference and Expo on Advanced Ceramics and Composites, Florida, Jan. 21-26, 2018 (presented by Yuying Zhang).

31. Chun-yen Hsu, Yuying Zhang, Prashant Karandikar, Fei Deng, and Chaoying Ni, *In-situ* study on SiC/Si interfacial strength of reaction bonded SiC/Si composites" 42nd International Conference and Expo on Advanced Ceramics and Composites, Florida, Jan. 21-26, 2018 (presented by Chen-yen Hsu).

32. Tianshi Wang, Zhigang Gui, Anderson Janotti, Chaoying Ni, First principle calculations of phonon-limited electron mobility in GaN, Bulletin of the American Physical Society, APS March Meeting 2018, Monday–Friday, March 5-9, 2018; Los Angeles, California (Tianshi Wang)

33. Chun-yen Hsu, Qing Zhang, Kazumi Saito, Chaoying Ni and Fei Deng, Mechanical properties of multi-walled carbon nanotube/PEEK polymer composites at nanoscale, 21st International Conference on Composite Materials - ICCM21, Xi'an, China, 20-25 August, 2017 (presented by Chen-yen Hsu).

34. Tianshi Wang, Chaoying Ni, Anderson Janotti, First-principles calculation of band alignment and p-type doping in $ZnSnN_2$, March Meeting 2017 - American Physical Society, March 13 – 17, 2017, New Orleans, Louisiana, (presented by Tianshi Wang)

35. Sean Fudger, Dimitry Sediako, Chaoying Ni, Prashant Karandikar, Residual Stress Analysis Within Steel Encapsulated Metal Matrix Composites via Neutron Diffraction, TMS 2017 146th Annual Meeting, February 26 - March 2, 2017, San Diego, California, (presented by Sean Fudger)

36. Sean Fudger, Eric Klier, Prashant Karandikar, Chaoying Ni, Evaluation of Intermetallic Reaction Layer Formation within Steel Encapsulated Metal Matrix Composites, TMS 2016 145th Annual Meeting, Feb. 14-18, 2016, Nashville, Tennessee, (presented by Sean Fudger)

37. Tianshi Wang, Chaoying Ni, and Prashant Karandikar, Microstructual Characteristics of Reaction-Bonded B_4C/SiC Composite, TMS 2016 145th Annual Meeting Proceedings: Characterization of Minerals, Metals, and Materials, Feb. 14-18, 2016, Nashville, Tennessee, (presented by Tianshi Wang)

38. Chun-yen Hsu, Fei Deng, Prashant Karandikar, Chaoying Ni, SiC-Si interfacial thermal and mechanical properties of reaction bonded SiC/Si ceramic composites, APS March Meeting, Monday–Friday, March 14–18, 2016; Baltimore, Maryland

39. Sean Fudger, Eric Klier, Prashant Karandikar, Brandon McWilliams, Chaoying Ni, Mechanical properties of steel encapsulated metal matrix composites, TMS 2015 144th Annual Meeting & Exhibition, Orlando, Florida, March 15 – 19, 2015. (presented by Sean Fudger)

40. Jinglin Liu, Bin Wei, Jennifer Sloppy, Liangqi Ouyang, Chaoying Ni, David C Martin, In Situ Electrochemical Deposition of Poly (3, 4-ethylenedioxythiophene)(PEDOT), Microscopy & Microanalysis 2015 Meeting. M&M 2015, August 2-6, Oregon Convention Center, Portland, Oregon.

41. Halise Celik, Xin Fan, Wenrui Wang , Jun Wu , Chaoying Ni , Kyung-Jin Lee , John Xiao , Virginia Lorenz, Magneto-optic-Kerr-effect-based spin-orbit torque magnetometer, ACS March Meeting, Denver, Colorado, March 3-7, 2014. (presented by Halise Celik)

42. Light-induced polymer vaporization and deposition for CNT assembles, Tsinghua-UD Workshop on Nanotechnology for Energy and Environment, Shenzhen, Guangdong Province Jan 9 - 12, 2013 China.

43. Recyclable Transition Metal Catalyst System for Pharmaceutical Processes, DBI Research Symposium, Delaware, August 20, 2013.

44. Fei Deng, Chaoying Ni, Stephen C. Hawkins, Properties improvement of carbon nanotube fiber and carbon nanotube fiber/polymer composites by photon irradiation, Proceedings of the 36th Symposium on Composite Materials, Sendai, Japan, October 20, 2011. (presented by Fei Deng)

45. Chelsea Haughn, Hao Shen, Chaoying Ni, Michael Mackay and Matt Doty, Fluorescent Resonance Energy Transfer Between Colloidal Quantum Dots in Polystyrene Thin Films, MRS Spring Meeting, San Francisco, California, April, 2011. (presented by Chelsea Haughn)

46. G. Hassnain Jaffari, Abdullah Ceylan, Chaoying Ni, S. Ismat Shah, Enhancement of surface spin disorder in hollow $NiFe_2O_4$ nanoparticles, APS March Meeting, Portland, Oregon, March 15-19, 2010. (presented by G. Hassnain Jaffari)

47. Xing Chen, Karl Unruh, Qi Lu, Ali Bakhtyar, Chaoying Ni and John Q. Xiao, Fabrication and Magnetic Properties of Metal Oxide Nanotubes via Electrospinning and Thermal Treatment, MRS Fall Meeting, Boston, 2010. (presented by Xing Chen)

48. Weigang Wang, Chaoying Ni, Takahiro Moriyama, Jun Wan, Ed Nowak, John Xiao, Tunneling Magnetoresistance in Magnetic Tunnel Junctions with a (Zn, Cr)Te electrode, APS March Meeting, Baltimore, MD, March 13-17, 2006. (presented by Weigang Wang)

49. Scott Edward Buzby, Chaoying Ni and S. Ismat Shah, Plasma assisted-MOCVD synthesis of N-doped TiO_2 for visible-light photocatalysis, MRS Fall Meeting, Boston, November, 2005. (presented by Scott Edward Buzby)

Posters (partial list)

1. Yuying Zhang, Chun-Yen Hsu, Yong Zhao, Prashant Karandikar, Chaoying Ni, *In situ* Measurement of Diamond/SiC Interfacial Strength, M&M 2019, Portland, August 4-8, 2019

2. Yuying Zhang, Chun-yen Hsu, Prashant Karandikar, Chaoying Ni, Structural and Thermal Properties of Reaction Bonded SiC/Si Composite, 2017 MRS Fall Meeting and Exhibit, Boston, Nov. 26 - Dec. 1, 2017.

3. Tianshi Wang, Zhigang Gui, Prashant Karandikar, Anderson Janotti, Chaoying Ni, The Impact of Electron-Phonon Interaction on the Lattice Thermal Conductivity in SiC, 2017 MRS Fall Meeting and Exhibit, Boston, Nov. 26 - Dec. 1, 2017.

4. Tianshi Wang, Anderson Janotti, Chaoying Ni, “Strong effect of phonon-electron interaction on thermal conductivity of silicon carbide," MSEG and ASM Open House & Poster Presentations, May 11, 2017, Newark, DE.

5. Tianshi Wang, Anderson Janotti, Chaoying Ni, “First-principles study of the effect of electron-phonon scattering on heat transport in 3C-SiC," DFT hands on workshop and beyond, July 31-Aug. 11, 2017, Berlin, Germany.

6. Chun-yen Hsu, Fei Deng, Prashant Karandikar, Chaoying Ni, SiC-Si interfacial thermal and mechanical properties of reaction bonded SiC/Si ceramic composites, APS Spring Meeting, Baltimore, 2016.

7. Chun-yen Hsu, Fei Deng, Bo Yuan, Prashant Karandikar, Robert Opila, Chaoying Ni, Nano-mechanical properties of SiC in reaction bonded SiC/Si ceramic matrix composites, MRS fall meeting and exhibit, Boston, November, 2015.

8. Chang Liu, Fei Deng, Harry Li and Chaoying Ni, Recyclable Transition Metal Catalyst System for Pharmaceutical Processes, DBI Research Symposium, August, 2013

9. Fei Deng, N. Rujisamphan, Chang Liu, Stephen C. Hawkins, S. Ismat Shah, Chaoying Ni, Light-induced polymer coatings on the surface of carbon nanotube forest and yarn, MRS Fall Meeting, Boston, 2012.

10. Fei Deng, N. Rujisamphan, Stephen C. Hawkins, S. Ismat Shah1, Chaoying Ni, Poly (3-hexylthiophene) coated well-aligned multi-walled carbon nanotubes for organic solar cell, MRS Fall Meeting, Boston, 2012.

11. Nopporn Rujsiamphan, Fei Deng, Chaoying Ni, S. Ismat Shah, Understanding the inter-diffusion and blending in P3HT/PCBM bilayers by electron microscopy and coarse-grained simulation, MRS Fall Meeting and Exhibit, Boston, Boston, 2012.

12. Caifeng Chen, Andong Wang, Chaoying Ni, Jun Liu, Preparation and Piezoelectric Properties of a Novel PZT Fiber Ceramic, MRS Fall Meeting and Exhibit, Boston, Boston, 2011.

13. Z. G. Huang, Rui Liu, Li Zhang, Chaoying Ni, and Harry Li, Si-Thiol supported palladium catalyst for Suzuki coupling reaction, ACS meeting, Washington D.C., 2009.

14. Jennifer Atchison, Linyou Cao, Bora Garipcan, Chaoying Ni, Bahram Nabet, Instability and Transport of Metal Catalyst in the Growth of Silicon Nanostructures. MRS Fall Meeting and Exhibit, Boston, Boston, November, 2006.

15. Linyou Cao, Lee Laim, Chaoying Ni, Bahram Nabet, Jonathan Spanier, Synthesis and Characterization of Diamond-Hexagonal Si and Ge Nanocones, MRS Fall Meeting and Exhibit, Boston, Boston, November, 2005.

❖ Recent Research (as PI)

1. Computational modeling of interfacial thermal conductance and electron mobility in advanced materials
   NSF DMR180041
   7/1/2018-6/30/2019

2. Thermal Transport in SiC and Diamond Based Composites
   II-VI Foundation
   7/1/2017 – 6/30/2020

3. First-principles calculations of electron transport in SiC, ZnO and GaN
   NSF DMR170057
   6/5/2017 – 6/6/2018

4. Low dimensional carbon based materials and composites
   Super Cone, LLC
   1/1/2017 – 12/31/2021

5. Graphene and composites for advanced catalysis and extreme environment
   DDH Advanced Materials & Systems, Inc.
   7/1/2015 – 6/30/2017

6. Reaction Bonded SiC-Si and B_4C-SiC-Si Ceramic Matrix Composites: Formation, Microstructure and Properties
   II-VI Foundation
   7/1/2014 – 6/30/2017

7. Recyclable Porous-SiO_2 Supported Transition Metal Catalysts for Active Pharmaceutical Ingredients (APIs)
   Co-PIs: David Martin & Harry Li
   UD DBI Center for Advanced Technology
   5/1/2012 – 4/30/2014

8. Synthesis and Polymorphism of Pharmaceutical Compounds
   Wilmington PharmaTech
   7/1/2007 – 6/30/2011

❖ Recent Research (as Co-PI, participant, or contributor/advisor)

9. Thermal conductivity of two-dimensional layered hybrid perovskites
   University of Delaware Research Foundation
   PI: Joseph Feser, Co-PI: Chaoying Ni
   4/1/2018 – 3/31/2019

10. Chipscale photonic sensors for Delaware water and air quality monitoring
    Delaware EPSCoR Seed Grant Program
    PI: Juejun Hu, Co-PI: Chaoying Ni
    4/1/2012 – 3/31/2013

11. Research Infrastructure Improvement Program (RII-3), Meeting Delaware's 21st Century Water and Energy Challenges through Research, Education, and Innovation
    PI: Donald Sparks; Co-PIs: Stephanie Smith, John Rabolt, Kent Messer, Venugopal Kalavacharla, Karl Steiner (Former Co-Principal Investigator)
    NSF EPSCoR
    6/1/2013 – 5/31/2018

12. NIH COBRE III: Molecular Design of Advanced Biomaterials
    PI: Tatyana Polenova
    Sub-project: Microscopy and Mechanical Testing Core (Co-PI: Xinqiao Jia)
    9/30/2014 – 7/31/2019

13. NIH COBRE III: Osteoarthritis: Prevention and Treatment
    PI: Thomas S. Buchanan
    Sub-project: Cytomechanics Core (Co-PI: Liyun Wang)
    8/1/2012 – 4/30/2017

❖ Courses Taught

- MSEG624 (MSEG667) Practical Electron Microscopy in Materials Science
- MSEG608 Structure of Materials (course owner: Prof. Pochan): co-teaching
- MSEG602 Structure of Materials (course owner: Prof. Pochan): co-teaching
- MSEG603 Structure of Materials (course owner: Prof. Rabolt): co-teaching

❖ Undergraduates, Graduates, Other Students and Visiting Scientists Supervision

- Current:
  PhD graduates (3)

- Previous:
  Sponsored PhDs and other graduates (12)
  Sponsored post-doctors (5)
  Sponsored/hosted visiting professors and scientists (20)
  Sponsored/hosted undergraduates (4)
  Hosted high school students' research (5+)

❖ Scientific Community Service

Reviewer/referee/panelist for the following scientific journals and funding agencies:

- Journal of Hazardous Materials
- Materials Science in Semiconductor Processing
- Molecular Catalysis
- Research
- ACS Applied Nano Materials
- Ceramics International
- Journal of the European Ceramic Society
- Energy
- Journal of Physics and Chemistry of Solids
- International Materials Reviews
- Semiconductor Science and Technology
- Journal of Materials Chemistry C
- ACS Biomaterials Science and Engineering
- PLOS ONE
- Advanced Energy Materials
- Chemical Engineering Journal
- Critical Reviews in Environmental Science and Technology
- Journal of Power Sources
- RSC Advances
- ACS Applied Materials & Interfaces
- ACS Nano
- Journal of Alloys and Compounds
- Langmuir
- Microscopy and Microanalysis
- Scripta Materialia
- Materials Science and Engineering B
- Materials Science in Semiconductor Processing
- Composite Interfaces
- Materials Research Express
- Powder Technology
- Electrochimica Acta
- Materials Chemistry and Physics
- Applied Catalysis B: Environmental
- Nanoscience and Nanotechnology Letters
- Microporous & Mesoporous Materials
- Nanotechnology
- Applied Surface Science
- Journal of Colloid and Interface Science
- Materials Research Bulletin
- Journal of Applied Physics
- Journal of Physics D: Applied Physics
- Journal of Crystal Growth
- Journal of Physical Chemistry, C
- Proceedings of MMM-Intermag Conference
- Composites Science and Technology

- U.S. Army Research Office, RDRL-ROE (Engineering Sciences Directorate)
- National Science Foundation (NSF)
- U.S. Civilian Research and Development Foundation (CRDF)
- 2020 Louisiana Board of Regents Support Fund Departmental Enhancement Biological Sciences Review Panel
- 2020 DoD DoD National Defense Science and Engineering Graduate (NDSEG) Review Panel

Societies and other services:

- Symposium organizer and chair of "*In-situ* Methods for Probing Properties and Dynamics in Materials", Microscopy & Microanalysis 2018, August 05-09, 2018, Baltimore, Maryland
- Symposium organizer and chair of "Analytical Electron Microscopy", Microscopy & Microanalysis 2016, July 24-28, 2016, Columbus, Ohio

- Guest Editor of the Editorial Board, Journal of Changzhou University (Natural Science Edition), since 2018

- Member of Microscopy Society of America
- Member of Materials Research Society
- Member of America Physical Society
- Member of America Chemical Society

- PhD thesis committees (current: 21; past: 43)