

Curriculum Vitae

Zhenhai Xia

Department of Materials Science and Engineering, Department of Chemistry

University of North Texas

Denton, TX76203

Tel: (940) 369-5805

e-mail: Zhenhai.Xia@unt.edu

HIGHLIGHT ACCOMPLISHMENTS

- Significant teaching and research experience in the broad area of Materials Science, Mechanical Engineering and Chemistry departments.
- Comprehensive research including modeling and simulation, and experiment in the areas of (i) catalytic materials for clean energy conversion and storage (fuel cell, metal-air batteries, supercapacitors and solar cells), (ii) biological and biomimetic materials (e.g., gecko, mussel threads, nerves), (iii) Light-matter interactions in 2D materials for next generation quantum information science and energy harvesting, and (iv) advanced composite materials/alloys.
- Internationally recognized as award recipient by several international professional organizations
- PI and/or Co-PI on grants totaling over \$18.5 M in funding awarded by NSF, NASA, AFOSR, ARL, NAVAIR, private foundations and industry
- Authored one book, 7 book chapters and near 200 publications in peer-reviewed journals, including 3 in *Science* and 4 in *Nature* series. Received 2 patents, one of which has been licensed to companies to produce automotive parts
- Over 18,000 citations (over 15 highly-cited papers/0.1% hot papers selected by *Web of Science*). Listed as the researchers in top 100,000 worldwide, or in top 2% of their subfield discipline, by career-long composite citation index "c-score"
- Supervised 16 Postdoc./visiting scholars, 24 Ph.D. students, and 15 M.S. students. Over 10 students have become university professors and leading scientists in NASA, FDA, etc.
- Gave over 170 plenary/invited talks and seminar presentations in international conferences and universities worldwide
- Chairperson of the Materials Science and Engineering Department for 4 years
- Collaboration with faculty from Biology and Medical Sciences, and doctors from hospitals
- Served as chair of ASME multifunctional materials technical committee, and review panelist of NSF (e.g., MRSEC) and DOE, and funding agencies worldwide, and associate editor of *Frontiers*

Table of Contents

I. Education and Work Experience	3
II. Honors and Awards	4
III. Technical Publications/Patents:	4
A. Book:	4
B. Book Chapters:	4
C. Papers in refereed journals:	5
D. Papers in conference proceedings	18
E. Technical Reports	21
F. Patents	21
IV. Invited talks/Seminar Presentations	21
V. Funding Efforts	31
A. External Funding:	31
B. Internal Funding:	34
VI. Teaching	34
A. Courses Taught:	34
B. Course Development	35
C. Graduate Students	35
VII. Professional Activities	37
A. Professional Society Affiliations	37
B. Department Committee Service at UNT	37
C. College/University Committees Service	37
D. Technical Committees and Conference Organized	37
E. Reviews: Technical Papers	38
F. Reviews: Research Proposals and Panel Review	39
G. Community Service	40

I. Education and Work Experience

- 2014-pres. Professor, Joint appointment
Department of Materials Science and Engineering, Department of Chemistry, University of North Texas, TX
- 2011-2014 Associate Professor, Joint appointment
Department of Materials Science and Engineering, Department of Chemistry, University of North Texas, TX
- 2010-2010 Associate Professor (**Tenured**),
Department of Mechanical Engineering, University of Akron, Akron, OH
- 2006-2009 Assistant Professor,
Department of Mechanical Engineering, University of Akron, Akron, OH
- 2000-2005 Postdoc./Senior Researcher
Solid Mechanics, Division of Engineering, Brown University, Providence, RI
- 1997-1999 Visiting Scientist/Alexander von Humboldt Scholar,
Institute of Materials Research, German Aerospace Center, Cologne, Germany.
- 1995-1998 Chair of Department of Materials Science and Engineering, Hebei University of Technology, Tianjin, China
- 1993-1995 Associate Director of Graduate School, Hebei University of Technology, China
- 1996-1999 *Full* Professor
Department of Materials Science and Engineering, Hebei University of Technology, Tianjin, China
- 1992-1996 Associate Professor
Department of Materials Science and Engineering, Hebei University of Technology, Tianjin, China
- 1990-1992 Assistant Professor

Department of Materials Science and Engineering, Hebei University of Technology,
Tianjin, China

1999-2000 Postdoctoral. School of Engineering, Brown University
1987-1990 Ph.D. in Materials Science and Engineering, Northwestern Polytechnic University
1984-1987 M.S. in Materials Science and Engineering, Northwestern Polytechnic University
1980-1984 B.S. in Mechanical Engineering, Hefei University of Technology

II. Honors and Awards

- *Vebleo Scientist Award*, Vebleo, 2020
- *IAAM Scientist Award*, the International Association of Advanced Materials (IAAM), 2020
- *SOMIYA Award*, International Union of Materials Research Society (IUMRS), 2019
- *Associate Editor, Frontiers in Energy Materials*, 2018-
- *Nanoscience Research Leader Award 2015*, Science Letters
- *Editorial Broad*, Chinese Journal of Chemistry, 2018-2020
- *Associate Editor*, Journal of Nanoscience Letters, 2014-2017
- *Editorial Broad*, ISRM Materials Science Journal, 2010-2018
- *Firestone Research Award*, University of Akron, 2007
- *Humboldt Fellowship Award*, Alexander von Humboldt Foundation, Germany, 1997
- *Distinguished Teaching Award*, Tianjin Committee of China Education Association, 1996
- *Young Scientist Award*, Hebei Province, China, 1996
- *Top Ten Young Teachers*, Hebei Education Committee, China, 1995
- *Young Scientist Award*, Tianjin Committee of Science & Technology, China, 1995

III. Technical Publications/Patents:

A. Book:

1. Z.H. Xia, Book: “Biomimetic Principles and Design of Advanced Engineering Materials” (2016), *Wiley*. 320 pages, ISBN: 978-1-118-53307-9

B. Book Chapters:

1. Quan Xu, Travis Shihao Hu, Xiaowei Wang, Jie Wang, Zhenhai Xia, Syntheses, Mechanisms and Applications of Bioinspired Self-cleaning Surfaces, In *Biomimicry for Materials, Design and Habitats: Innovations and Applications*, Chapter 19, Elsevier, 2020
2. Zhenghang Zhao, Lipeng Zhang, Chun-Yu Lin, and Zhenhai, Book chapter: Carbon-Based Metal-Free Catalysts: Design and Applications, In *Design principles for heteroatom-doped carbon materials as metal-free catalysts*, Chapter 1, 1-33(2018) *Wiley*, 850 pages, ISBN: 978-3-527-34341-6

3. Lili Li and Zhenhai Xia, Book Chapter: “Role of Interfaces in Mechanical Properties of Ceramic Matrix Composites”, *Advance in Ceramic matrix composites, Second Edition*, Eds. I. M. Low. Chapter 15, 355-374(2017), *Elsevier*, ISBN: 978-0-08-102167-5
4. Z.H. Xia, L.Li, Book Chapter: “Understanding Interfaces and Mechanical Properties of Ceramic Matrix Composites”, *Advance to Ceramic matrix composites*, Eds. I. M. Low. (2013) *Woodhead Publishing*. DOI: 10.1533/9780857098825.2.267
5. Z.H. Xia and W.A. Curtin, Book Chapter: “Multiscale modeling and simulation of composite materials and structures”, Eds. Y. Kown, D. Allen and R. Talreja. (2008) *Springer*.
6. Z. H. Xia, Book chapter: “A New Handbook for Mechanical Engineers”, Eds., R. L. Chen, and T. L. Lu, Beijing. *Chinese Light-Industry Press*, 995pp (1994).
7. Z.H. Xia “Metal Matrix Composites (Text Book)”, *Hebei Institute of Technology*, 102pp (1992).

C. Papers in refereed journals:

1. Chuangang Hu, Lele Gong, Ying Xiao, Yifei Yuan, Nicholas M Bedford, Zhenhai Xia, Lu Ma, Tianpin Wu, Yi Lin, John W Connell, Reza Shahbazian-Yassar, Jun Lu, Khalil Amine, Liming Dai, High-Performance, Long-Life, Rechargeable Li–CO₂ Batteries based on a 3D Holey Graphene Cathode Implanted with Single Iron Atoms, *Advanced Materials*, 1907436, 2020.
2. Nan Li, Kun Zhang, Keyu Xie, Wenfei Wei, Yong Gao, Maohui Bai, Yuliang Gao, Qian Hou, Chao Shen, Zhenhai Xia, Bingqing Wei, Reduced-Graphene-Oxide-Guided Directional Growth of Planar Lithium Layers, *Advanced Materials*, 32, 2020, 1907079.
3. Xiaowei Wang, Chao Yang, Jun Li, Xi'an Chen, Keqin Yang, Xiaochun Yu, Dajie Lin, Qingcheng Zhang, Shun Wang, Jichang Wang, Zhenhai Xia and Huile Jin, Insights of Heteroatoms Doping-Enhanced Bifunctionalities on Carbon Based Energy Storage and Conversion, *Advanced Functional Materials*, 2020, <https://doi.org/10.1002/adfm.202009109>
4. Cuixia Cui, Yong Gao, Jun Li, Chao Yang, Meng Liu, Huile Jin, Zhenhai Xia, Liming Dai, Yong Lei, Jichang Wang, Shun Wang, Origins of Boosted Charge Storage on Heteroatom-Doped Carbons, *Angewandte Chemie*, 132, 8002-8007, 2020.
5. Lei Wang, Bo Song, Yiming Li, Lele Gong, Xin Jiang, Ming Wang, Shuai Lu, Xin-Qi Hao, Zhenhai Xia, Yuan Zhang, Saw Wai Hla, Xiaopeng Li, Self-Assembly of Metallo-Supramolecules under Kinetic or Thermodynamic Control Characterization of Positional Isomers Using Scanning Tunneling Spectroscopy, *Journal of the American Chemical Society*, 2020, 142, 9809-9817.
6. V Hasannaemi, X Wang, R Salloom, Z Xia, J Schroers, S Mukherjee, Nanomanufacturing of Non-Noble Amorphous Alloys for Electrocatalysis, *ACS Applied Energy Materials*, 2020. <https://doi.org/10.1021/acsaem.0c02221>
7. Detao Zhang, Lele Gong, Jun Ma, Xiaowei Wang, Lipeng Zhang, and Zhenhai Xia, Disperse Multimetal Atom-Doped Carbon as Efficient Bifunctional Electrocatalysts for Oxygen Reduction and Evolution Reactions: Design Strategies, *J. Phys. Chem. C*, 124, 27387-27395, 2020.

8. Lele Gong, Xiaowei Wang, Tao Zheng, Jerry Liu, Jie Wang, Yu-Chia Yang, Jing Zhang, Xiao Han, Lipeng Zhang, Zhenhai Xia, Catalytic Mechanism and Design Principle of Coordinately Unsaturated Single Metal Atom-Doped Covalent Triazine Frameworks with High Activity and Selectivity for CO₂ Electroreduction, *Journal of Materials Chemistry A*, 2021, DOI: 10.1039/D0TA10875H
9. C Liu, Y Yang, Z Xia, Deformation mechanism in Al 0.1 CoCrFeNi Σ 3 (111)[110] high entropy alloys–molecular dynamics simulations, *RSC Advances* 10 (46), 27688-27696 (2020).
10. Jiameng Ma, Qiuming Zhi, LeLe Gong, Yang Shen, Defeng Sun, Yongjian Guo, Lipeng Zhang, Zhenhai Xia, A Universal Descriptor Based on pz-Orbital for the Catalytic Activity of Multi-doped Carbon Bifunctional Catalysts for Oxygen Reduction and Evolution, *Nanoscale*, 12, 19375-19382, 2020.
11. Yunxiang Gao, Lipeng Zhang, Zhenhai Xia, Chang Ming Li, Liming Dai, Hole-punching for enhancing electrocatalytic activities of 2D graphene electrodes: Less is more, *The Journal of Chemical Physics*, 153, 2020, 074701.
12. Tao Zheng, Xiaobing Hu, Feng He, Qingfeng Wu, Bin Han, Chen Da, Junjie Li, Zhijun Wang, Jincheng Wang, Ji-jung Kai, Zhenhai Xia, CT Liu, Tailoring nanoprecipitates for ultra-strong high-entropy alloys via machine learning and prestrain aging, *Journal of Materials Science & Technology*, 69, 156-167, 2020.
13. Rahman Daiyan, Xiaofeng Zhu, Zizheng Tong, Lele Gong, Amir Razmjou, Ru-Shi Liu, Zhenhai Xia, Xunyu Lu, Liming Dai, Rose Amal, Transforming active sites in nickel–nitrogen–carbon catalysts for efficient electrochemical CO₂ reduction to CO, *Nano Energy*, 2020, 105213.
14. Lele Gong, Detao Zhang, Yang Shen, Xiaowei Wang, Jing Zhang, Xiao Han, Lipeng Zhang, Zhenhai Xia, Enhancing Both Selectivity and Activity of CO₂ Conversion by Breaking Scaling Relations with Bimetallic Active Sites Anchored in Covalent Organic Frameworks, *Journal of Catalysis*, 390, 126-134, 2020.
15. Jun Ma, Pengsong Li, Xiao Lin, Yijun Huang, Yang Zhong, Lipeng Zhang, Xiaoming Sun, Daojin Zhou, Wen-Feng Lin, Zhenhai Xia, Electronic coupling strategy to boost water oxidation efficiency based on the modelling of Trimetallic Hydroxides Ni_{1-x-y}Fe_xCry (OH)₂: from theory to experiment, *Chemical Engineering Journal*, 402, 2020, 126144.
16. Vahid Hasannaemi, Chun-Yu Lin, Zhenhai Xia, Sundeep Mukherjee, Hydrogen oxidation reaction response of noble-metal based bulk metallic glasses, *Electrochimica Acta*, 353, 2020, 136616.
17. Hui Yang, Xu Wang, Tao Zheng, Nelly Cantillo Cuello, Gabriel Goenaga, Thomas A. Zawodzinski, He Tian, Joshua T. Wright, Robert W. Meulenberg, Xiangke Wang, Zhenhai Xia, and Shengqian Ma, Chromium Nitride-Encapsulated Hollow Chromium-Nitrogen-Carbon Capsules Boosting Oxygen Reduction Catalysis in Proton Exchange Membrane Fuel Cell, *CCS Chemistry*, 1-25, 2020
<https://doi.org/10.31635/ccschem.020.202000645>
18. Xiaoxiao Dong, Rui Zhang, Yu Tian, Melvin A Ramos, Travis Shihao Hu, Zhihang Wang, Hong Zhao, Lipeng Zhang, Yiyang Wan, Zhenhai Xia, Quan Xu, Functionally graded gecko

- setae and the biomimics with robust adhesion and durability, *ACS Applied Polymer Materials*, 2020, 2, 2658-2666.
19. William Yi Wang, Bin Gan, Deye Lin, Jun Wang, Yiguang Wang, Bin Tang, Hongchao Kou, Shunli Shang, Yi Wang, Xingyu Gao, Haifeng Song, Xidong Hui, Laszlo J. Kecskes, Zhenhai Xia, Karin A. Dahmen, Peter K. Liaw, Jinshan Li, and Zi-Kui Liu, High-throughput Investigations of Configurational-Transformation-Dominated Serrations in CuZr/Cu Nanolaminates, *Journal of Materials Science & Technology*, 2020, 53, 192-199.
 20. Zengxi Wei, Jian He, Yulu Yang, Zhenhai Xia, Yuezhan Feng, Jianmin Ma, Fe, V-co-doped C₂N for electrocatalytic N₂-to-NH₃ conversion, *Journal of Energy Chemistry*, 53, 2020, 303-308.
 21. Yong Gao, Jing Zhang, Nan Li, Xiao Han, Xian Luo, Keyu Xie, Bingqing Wei and Zhenhai Xia, Design Principles of Pseudocapacitive Carbon Anode Materials for Ultrafast Sodium and Potassium-ion Batteries, *Journal of Materials Chemistry A*, 2020, 8, 7756 – 7764.
 22. Yu-Chia Yang, Cuixia Liu, Chun-Yu Lin, Zhenhai Xia, Core Effect of Local Atomic Configuration and Design principles in Al_xCoCrFeNi High-Entropy Alloys, *Scripta Materialia*, 178, 2020, 181-186.
 23. Yong Gao; Jing Zhang; Xian Luo; Yiyang Wan; Zhenghang Zhao; Xiao Han; Zhenhai Xia, Energy Density-Enhancement Mechanism and Design Principles for Heteroatom-doped Carbon Supercapacitors, *Nano Energy*, 72, 2020, 104666.
 24. Yunjie Xiong, Yunan Ma, Liangliang Zou, Shaobo Han, Hong Chen, Shuai Wang, Meng Gu, Yang Shen, Lipeng Zhang, Zhenhai Xia, Jun Li, Hui Yang, N-doping induced tensile-strained Pt nanoparticles ensuring an excellent durability of the oxygen reduction reaction, *Journal of Catalysis* 382 (2020) 247–255.
 25. Mingchang Zhang, Huiqing Fan, Yong Gao, Nan Zhao, Chao Wang, Jiangwei Ma, Longtao Ma, Arun Kumar Yadav, Weijia Wang, Wee Siang Vincent Lee, Ting Xiong, Jun Min Xue, Zhenhai Xia, Pre-addition of cations to electrolytes for aqueous 2.2 V high voltage hybrid supercapacitor with super-long cycling life and its energy storage mechanism, *ACS Appl. Mater. Interfaces* 2020, 12, 15, 17659-17668
 26. Y Zhang, Z Xia, F Liu, Z Qin, X Lu, Controllable growth of two-dimensional iron carbide in steels under accumulation deformation, *Micron*, 102794, 2020.
 27. X Zhu, D Zhang, CJ Chen, Q Zhang, RS Liu, Z Xia, L Dai, R Amal, X Lu, Harnessing interplay of Fe-Ni atom pairs embedded in nitrogen-doped carbon for bifunctional oxygen electrocatalysis, *Nano Energy*, 104597, 2020.
 28. Xia Z. and Xiang Z., Editorial: Catalysts for Clean Energy Conversion and Storage. *Front. Mater.* 7:43 (2020). doi: 10.3389/fmats.2020.00043
 29. Lili Li, Zhenhai Xia, Yanqing Yang, M.N. Yuan, Atomistic simulations on Nanoimprinting of copper by aligned carbon nanotube arrays under a high-frequency mechanical vibration, *Nanotechnology*, 31 045303, 2020.
 30. Yonghao Zhu, Detao Zhang, Lele Gong, Xiaowei Wang, Jing Zhang, Lipeng Zhang, Liming Dai, Zhenhai Xia, Catalytic Origin and Universal Descriptors of Heteroatom-Doped Photocatalysts for Solar Fuel Production, *Nano Energy* 63, 2019, 103819.

31. Z Xia, CM Li, L Dai, Controlled Surface Elemental Distribution Enhances Catalytic Activity and Stability, *Matter* 1 (6), 1447-1449, 2019.
32. Lele Gong, Detao Zhang, Chun-Yu Lin, Yonghao Zhu, Jing Zhang, Xiao Han, Lipeng Zhang, Zhenhai Xia, Catalytic Mechanisms and Design Principles for Single-Atom Catalyst in Highly-Efficient CO₂ Conversion, *Advanced Energy Materials*, 9, 1902625, 2019.
33. Quan Xu, Chun-Yu Lin, Meng Xu, Qiang Zhao, Rui Zhang, Xiaoxiao Dong, Yida Zhang, Yu Yian, Zhenhai Xia, Metal Coordination-Mediated Functionally Grading and Self-Healing in Mussel Byssus Cuticle, *Advanced Science*, 1902043, 2019.
34. Jun Ma, Lele Gong, Yang Shen, Defeng Sun, Bowen Liu, Dong Liu, Lipeng Zhang, Zhenhai Xia, Detrimental effects and prevention of acidic electrolytes on oxygen reduction reaction catalytic performance of heteroatom-doped graphene catalysts, *Frontiers in Energy Materials*, 2019. doi: 10.3389/fmats.2019.00294
35. Xuan Liu, Gang Sha, Qinli Wu, Yaojian Liang, Jiating Huang, Ke Jin, Yunfei Xue, Benpeng Wang, Linjing Wang, Lu Wang, Fuchi Wang, Qunbo Fan, Zhenhai Xia, Phase stability of a high-entropy Al-Cr-Fe-Ni-V alloy with exceptional mechanical properties: First-principles and APT investigations, *Computational Materials Science* 170 (2019) 109161.
36. Detao Zhang, Jing Zhang, Lele Gong, Yonghao Zhu, Lipeng Zhang, and Zhenhai Xia, Graphene-Covered Transition Metal Halide Molecules as Efficient and Durable Electrocatalysts for Oxygen Reduction and Evolution Reactions, *Physical Chemistry and Chemical Physics*, 21, 23094-23101, 2019.
37. Yiyang Wan, Yong Gao, Jie Wang, Yanqing Yang, and Zhenhai Xia, Rapid Water Harvesting and Nonthermal Drying in Humid Air by N-Doped Graphene Micropads, *Langmuir*, 35, 12389-12399, 2019.
38. Yurong An, Xiaoli Fan, Shiyao Wang, Zhifen Luo, Yan Hu and Zhenhai Xia, Pmma-XO (X=C, Si, Ge) monolayer as promising anchoring materials for lithium-sulfur battery: a first-principles study, *Nanotechnology*, 30, 085405, 2019.
39. Zhenghang Zhao, Jason D'Souza, Fuyi Chen and Zhenhai Xia, Rational design of efficient transition metal core-shell electrocatalysts for oxygen reduction and evolution reactions, *RSC Adv.*, 9, 536-542, 2019.
40. M Li, W Li, W Cai, X Zhang, ZZ Wang, J Street, WJ Ong, Z Xia, Q Xu, A self-healing hydrogel with pressure sensitive photoluminescence for remote force measurement and healing assessment, *Materials Horizons* 6, 703-710, 2019.
41. Yonghao Zhu, Detao Zhang, Lele Gong, Lipeng Zhang, Zhenhai Xia, Catalytic Activity Origin and Design principles of Graphitic Carbon Nitride Electrocatalysts for Hydrogen Evolution, *Front. Mater. - Energy Materials*, 6, 16, 2019. DOI: 10.3389/fmats.2019.00016
42. Yiyang Wan, Yong Gao, Zhenhai Xia, Highly Switchable Adhesion of N-Doped Graphene Interfaces for Robust Micromanipulation, *ACS Applied Materials & Interfaces*, 11, 2019, 5544-5553.
43. Lipeng Zhang, Chun-Yu Lin, Detao Zhang, Lele Gong, Yonghao Zhu, Zhenghang Zhao, Quan Xu, Hejun Li, Zhenhai Xia, Guiding Principles for Designing Highly-Efficient Metal-free Carbon Catalysts, *Advanced Materials*, 29, 1805252 (2018).

44. Q Xu, X Wu, Z Wang, TS Hu, J Street, Y Luo, Z Xia, Temperature-induced tunable adhesion of gecko setae/spatulae and their biomimics, *Materials Today: Proceedings* 5 (12), 25879-25893, 2018
45. Y Pu, Y Liu, D Liu, Z Zhou, S Ding, Z Xia, M Li, First-principles screening visible-light active delafossite ABO₂ structures for photocatalytic application, *International Journal of Hydrogen Energy* 43 (36), 17271-17282, 2018.
46. D Liu, Y Liu, Z Zhou, S Ding, Z Xia, M Li, New Theoretical Strategy for the Correlation of Oxygen Evolution Performance and Metal Catalysts Adsorption at BiVO₄ Surfaces, *The Journal of Physical Chemistry C* 122 (44), 25195-25203, 2018
47. Lin, Chun-Yu; Zhang, Jing; Xia, Zhenhai, Coordination-Dependent Catalytic Activity and Design Principles of Metal-Organic Frameworks as Efficient Electrocatalysts for Clean Energy Conversion, *Journal of Physical Chemistry C*, 123, 2018, 214-221.
48. Yong Gao, Yiyang Wan, Bingqing Wei, and Zhenhai Xia, Capacitive Enhancement Mechanisms and Design Principles of High-Performance Graphene Oxide-Based All-Solid-State Supercapacitors, *Adv. Funct. Mater.* 28, 2018, 1706721.
49. Jianing Guo, Chun-Yu Lin, Zhenhai Xia, and Zhonghua Xiang, A Pyrolysis-Free Covalent Organic Polymer for Oxygen Reduction, *Angewandte Chemie*, 130 (38), 12747-12752 (2018)
50. Zhenghang Zhao, Chun-Yu Lin, Jinlong Tang, Zhenhai Xia, Catalytic Mechanism and Design Principles for Heteroatom-Doped Graphene Catalysts in Dye-Sensitized Solar Cells, *Nano Energy*, 49, 2018, 193-199.
51. Nan Zhang, Fuyi Chen, Danmin Liu, Zhenhai Xia, Electrochemical oxygen reduction reaction in alkaline solution at a low overpotential on (220)-textured Ag surface, *ACS Applied Energy Materials*, 1 (8), 4385-4394 (2018), DOI: 10.1021/acsaem.8b01009
52. M Li, Q Xu, X Wu, W Li, W Lan, L Heng, J Street, Z Xia, Tough Reversible Adhesion Properties of a Dry Self-cleaning Biomimetic Surface, *ACS Appl. Mater. Interfaces*, 2018, 10 (31), pp 26787–26794.
53. Qiang Kang, HaiTao Jiang, Yun Zhang, Zhe Xu, Hui Li and Zhen Hai Xia, Effect of various Ca content on microstructure and fracture toughness of extruded Mg-2Zn alloys, *Journal of Alloys and Compounds* 742 (2018) 1019-1030
54. Quan Xu, Riguo Su, Yusheng Chen, Sreeprasad Theruvakkattil Sreenivasan, Neng Li, XuSheng Zheng, Junfa Zhu, Haibin Pan, Weijun Li, Chunming Xu, Zhenhai Xia, Liming Dai, Metal Charge Transfer Doped Carbon Dots with Reversibly Switchable, Ultra-High Quantum Yield Photoluminescence, *ACS Applied Nano Materials* 1,1886-1893, 2018.
DOI: 10.1021/acsanm.8b00277
55. Chun-Yu Lin, Detao Zhang, Zhenghang Zhao, Zhenhai Xia, Covalent Organic Framework Electrocatalysts for Clean Energy Conversion, *Advanced Materials*, 29, 1703646 (2018)
56. Yiyang Wan, Zhenhai Xia, Dynamic Effect of Graphene Adhesion and Gecko-inspired Graphene Micromanipulators, *MRS Advances*, 3, 2018, 1-6, doi.org/10.1557/adv.2018.51
57. Zhi-chao Li, Ning Dang, Hai-tao Jiang, Zhenhai Xia, Influence of Temperature on the Texture Distribution in Two-phase Region Hot Deformation of Grain-oriented Silicon Steel, *Journal of Materials Engineering and Performance*, 26,5439-5445(2017), DOI: 10.1007/s11665-017-2993-z.

58. Peng-tao Li, Yan-Qing Yang, Zhenhai Xia, Xian Luo, Na Jin, Yong Gao, and Gang Liu, Molecular dynamic simulation of nanocrystal formation and tensile deformation of TiAl alloy. *RSC Adv.*, 2017, 7, 48315–48323.
59. Zhichao Li, Ning Dang, Haitao Jiang and Zhenhai Xia, Mechanism of Texture and Precipitates Evolution in CGO Silicon Steel During High-Temperature Annealing Process, *Journal of Materials Engineering and Performance*, 26,5432-5438, 2017,
60. Zhichao Li, Haotao Jiang, Zhenhai Xia, Precipitation and Microstructural Evolution of Second Phase Particles in Grain-Oriented Silicon Steel with Cu Content, *Journal of Materials Engineering*, 2, 2017.
61. Adnan Qaseem, Fuyi Chen, Xiaoqiang Wu, Nan Zhang, Zhenhai Xia, Ag, Co/graphene interactions and its effect on electrocatalytic oxygen reduction in alkaline media, *Journal of Power Sources*, 370, 1–13, 2017.
62. Li Tao, Chun-Yu Lin, Shuo Dou, Shi Feng, Dawei Chen, Dongdong Liu, Jia Huo, Zhenhai Xia, and Shuangyin Wang, Creating Coordinatively Unsaturated Metal Sites in Metal-Organic-Frameworks as Efficient Electrocatalysts for the Oxygen Evolution Reaction: Insights into the Active Centers, *Nano Energy*, 41, 417-425(2017).
63. Nan Zhang, Fuyi Chen, Xiaoqiang Wu, Qiao Wang, Adnan Qaseema and Zhenhai Xia, Activity origin of core–shell and alloy AgCu bimetallic nanoparticles for oxygen reduction reaction, *Journal of Materials Chemistry A* 5, 7043-7054(2017), DOI: 10.1039/x0xx00000x
64. Zhijuan Liu, Zhenghang Zhao, Yanyong Wang, Shuo Dou, Dafeng Yan, Dongdong Liu, Zhenhai Xia, and Shuangyin Wang, In-situ Exfoliated Edge-rich, Oxygen-functionalized Graphene from Carbon Fibers for Oxygen Electrocatalysis, *Advanced Materials*, 29, 1606207 (2017)
65. Chun-Yu Lin, Lipeng Zhang, Zhenghang Zhao, Zhenhai Xia, Design Principles for Covalent Organic Frameworks as Efficient Electrocatalysts in Clean Energy Conversion and Green Oxidizer Production, *Advanced Materials*, 29, 1606635 (2017)
66. Haitao Jiang, Shangwu Zeng, Shiwei Tian, Bo Wu, Aimin Zhao, Zhenhai Xia, Microstructural Evolution and Dynamic Recrystallization Behavior of β - γ TiAl-based Alloy during Hot Compression Process, *Advanced Engineering Materials*, 19, 1600546 (2017),
67. Qing Yin, Zhiqing Wang, Rajiv Mishra, and Zhenhai Xia, Atomic simulations of twist grain boundary structures and deformation behaviors in aluminum, *AIP advances*, 7, 015040 (2017).
68. Z.H. Xia, Hydrogen evolution: guiding principles, *Nature Energy*, 1, 16155(2016)
69. Zhenghang Zhao and Zhenhai Xia, Design Principles for Dual-Element-Doped Carbon Nanomaterials as Efficient Bifunctional Catalysts for Oxygen Reduction and Evolution Reactions, *ACS Catalysis*, 6, 1553–1558 (2016).
70. Q. Xu, W. Zhang, C. Dong, T.S. Sreepasad, Z.H. Xia, Biomimetic self-cleaning surfaces: synthesis, mechanism and applications. *J. R. Soc. Interface* 13, 20160300 (2016).
71. Jianbing Niu, Zhenhai Xia, Template-Directed Growth and Mechanical Properties of Carbon Nanotube-Graphene Junctions with Nano-Fillets: Molecular Dynamic Simulation, *RSC Advances*, 6, 56077–56082 (2016).

72. Chun-Yu Lin, Zhenghang Zhao, Jianbing Niu, Zhenhai Xia, Synthesis, Properties and Applications of 3D Carbon Nanotube-Graphene Junctions, *Journal of Physics D, Applied Physics*, 49, 443001 (2016).
73. Y Cen, Y Yao, Q Xu, Z Xia, RD Sisson, J Liang, Fabrication of TiO₂-graphene composite for the enhanced performance of lithium batteries, *RSC Advances* 6, 66971-66977(2016)
74. Sun, Q., Luo, X., Yang, Y. Q., Xia, Z. H., Zhang, R. J., Lou, J. H., Xue, C. L Evaluation on the interfacial fracture toughness of fiber-reinforced titanium matrix composites by push out test, *Composite Interfaces*, 7,557-569(2016).
75. Wenrui Zhang, Mingtao Li, Aiping Chen, Leigang Li, Yuanyuan Zhu, Zhenhai Xia, Ping Lu, Philippe Boullay, Lijun Wu, Yimei Zhu, Judith MacManus Driscoll, Quanxi Jia, Honghui Zhou, Jagdish Narayan, Xinghang Zhang, and Haiyan Wang, Two-Dimensional Layered Oxide Structures Tailored by Self-Assembled Layer Stacking via Interfacial Strain, *ACS Appl. Mater. Interfaces*, 8, 16845–16851 (2016).
76. Sheng Ouyang, Yanqing Yang, Ming Han, Zhenhai Xia, Bin Huang, Xian Luo, Guangming Zhao, and Yanxia Chen, Structure of A–C type intervariant interface in non-modulated martensite in a Ni–Mn–Ga alloy, *ACS Appl. Mater. Interfaces*, 8, 16985–16996 (2016).
77. H. Luo, H. Li, Z. Xia, Y. Chu, J. Zheng, Z. Hou, Q. Fu, Novel insights into L-cysteine adsorption on transition metal doped graphene: influences of the dopant and the vacancy, *RSC Advances*, 6, 29830-29839 (2016)
78. Jingxiang Zhao, Carlos R. Cabrera, Zhenhai Xia, Zhongfang Chen, Single–sided fluorine–functionalized graphene: a metal–free electrocatalyst with high efficiency for oxygen reduction reaction, *Carbon*, 104, 56-63(2016).
79. Anli Shen, Weijun Xia, Lipeng Zhang, Shuo Dou, Zhenhai Xia and Shuangyin Wang, Charge Transfer Induced Activity of Graphene for Oxygen Reduction, *Nanotechnology*, 27,185402 (2016)
80. Z. Zhao, Z.H. Xia, Interactions between Dopants in Dual-Doped Graphene Nanoribbons as Metal-Free Bifunctional Catalysts for Fuel Cell and Metal-Air Batteries, *MRS Advances*, 1, 421-425(2016), doi:10.1557/adv.2016.32
81. Zhenghang Zhao, Lipeng Zhang, and Zhenhai Xia, Electron Transfer and Catalytic Mechanism of Organic Molecule-Adsorbed Graphene Nanoribbons as Efficient Catalysts for Oxygen Reduction and Evolution Reactions, *J. Phys. Chem. C*, 120, 2166–2175 (2016)
82. Li Lili, Xia Zhenhai, Yang Yanqing, Han Ming, Molecular dynamics study on tensile behavior of SiC nanofiber/C/SiC nanocomposites, *Acta Physica Sinica* 67,117101(2015).
83. Jintao Zhang, Zhenghang Zhao, Zhenhai Xia, and Liming Dai, A metal-free bifunctional electrocatalyst for oxygen reduction and oxygen evolution reactions, *Nature Nanotechnology*, 10, 444–452(2015).
84. Quan Xu, Yiyang Wan, Shihao Hu, Tony Liu, Dashuai Tao, Peter H. Niewiarowski, Yu Tian, Yue Liu, Liming Dai, Yanqing Yang, and Zhenhai Xia, Robust Self-cleaning and Micromanipulation Capabilities of Gecko Spatulae and their Bio-mimics, *Nature Communications*, 6, 8949 (2015). (Featured Image on Nature Comm. website and Facebook)

85. Zhenghang Zhao, Mingtao Li, Lipeng Zhang, Liming Dai, Zhenhai Xia, Design Principles for Heteroatom-doped Carbon Nanomaterials as Highly-efficient Catalysts for Fuel Cells and Metal–air Batteries, *Advanced Materials*, 27, 6834–6840 (2015).
86. Yuhua Xue, Yong Ding, Jianbing Niu, Zhenhai Xia, Ajit Roy, Hao Chen, Jia Qu, Zhong Lin Wang, and Liming Dai, Rationally designed graphene-nanotube 3D architectures with a seamless nodal junction for energy storage and conversion, *Science Advances* 1, 1400198 (2015).
87. Jintao Zhang, Zhenhai Xia, Liming Dai, Carbon-based electrocatalysts for advanced energy conversion and storage, *Science Advances*, 1, e1500564 (2015).
88. Zhenhai Xia, Bioinspired catalysts for energy conversion in fuel cells, metal-air batteries and water splitting. *Sci. Lett.* 4, 190(2015).
89. Quan Xu, Yao Liu, Chun Gao, Jianfei Wei, Hongjun Zhou, Yusheng Chen, Chenbo Dong, Theruvakkattil Sreenivasan Sreepasad, Neng Li, and Zhenhai Xia, Synthesis, mechanistic investigation, and application of photoluminescent sulfur and nitrogen co-doped carbon dots, *J. Mater. Chem. C* 3, 9885-9893(2015).
90. Lipeng Zhang, Quan Xu, Jianbing Niu, and Zhenhai Xia, Role of Lattice Defects in Catalytic Activities of Graphene Clusters for Fuel Cells, *Physical Chemistry and Chemical Physics*, 17, 16733—16743 (2015). (Featured back cover)
91. S. Ouyang, Y.Q. Yang, M. Han, Z.H. Xia, B. Huang, X. Luo, G.M. Zhao, W.Zhang, Twin relationships between nanotwins inside A-C type variant pair in Ni-Mn-Ga alloy, *Acta Materialia*, 84, 484-496 (2015).
92. Zheng Liu, Matin Amani, Sina Najmaei, Quan Xu, Xiaolong Zou, Wu Zhou, Ting Yu, Caiyu Qiu, A. Glen Birdwell, Frank J. Crowne, Robert Vajtai, Boris I. Yakobson, Zhenhai Xia, Madan Dubey, Pulickel M. Ajayan and Jun Lou, Strain and structure heterogeneity in MoS₂ atomic layers grown by chemical vapour deposition, *Nature Communications* 5, 5246 (2014).
93. Quan Xu, Mingtao Li, Lipeng Zhang, Jianbing Niu, Zhenhai Xia, Dynamic Adhesion Forces between Microparticles and Substrates in Water, *Langmuir* 30, 11103–11109(2014).
94. Jianbing Niu, Mingtao Li, and Zhenhai Xia, Growth Mechanisms and Mechanical Properties of 3D Carbon Nanotube-Graphene Junctions: Molecular Dynamic Simulations, *RSC Advances* 4, 33848–33854(2014).
95. T. Sujidkul, Craig E. Smith, Zhijun Ma, Gregory N. Morscher, Z.H. Xia, Correlating Electrical Resistance Change with Mechanical Damage in Woven SiC/SiC Composites: Experiment and Modeling, *Journal of American Ceramic Society*, 97, 2936–2942(2014).
96. Qing Zhang, Kathryn Scrafford, Mingtao Li, Zeyuan Cao, Zhenhai Xia, Pulikel M. Ajayan, Bingqing Wei, Anomalous Capacitive Behaviors of Graphene Oxide Based Solid State Supercapacitors, *Nano Letters* 14, 1938–1943(2014).
97. Mingtao Li, Lipeng Zhang, Quan Xu, Jianbing Niu, Zhenhai Xia, N-doped Graphene as Catalysts for Oxygen Reduction and Oxygen Evolution Reactions: Theoretical Considerations, *Journal of Catalysis* 314, 66–72(2014).
98. Lipeng Zhang, Jianbing Niu, Mingtao Li, Zhenhai Xia, Catalytic Mechanisms of Sulfur-Doped Graphene as Efficient Oxygen Reduction Reaction Catalysts for Fuel Cells, *Journal of Physical Chemistry C* 118, 3545–3553 (2014).

99. Jianbing Niu, Mingtao Li, Wonbong Choi, Liming Dai, and Zhenhai Xia, Growth of Junctions in 3D Carbon Nanotube-Graphene Nanostructures: A Quantum Mechanical Molecular Dynamic Study, *Carbon* 67, 627-634 (2014).
100. Lili Li, Jianbing Niu, Yanqing Yang, Zhenhai Xia, Fracture and toughening mechanisms in SiC nanofiber reinforced SiC matrix nanocomposites with amorphous carbon coatings, *Computational Materials Science*, 83 255–260(2014).
101. Q. Xu, Y.Q. Yao, Z.J. Ma, J.Y. Liang, Z.H. Xia, Interfacial Energy and Friction between Carbon Nanotubes and Polymer Matrix, *Mechanics of advanced materials and structures*, 21, 393-401 (2014).
102. Jianbin Niu, Lili Li, Quan Xu, and Zhenhai Xia, Toughening mechanisms in Carbon Nanotube-Reinforced Amorphous Carbon Matrix Composites, *Computers, Materials & Continua* 38, 31-41(2013).
103. I. Jeon, S. Zhang, L. Zhang, H. Choi, Z.H. Xia, L.M. Dai, J. Baek, Edge-selectively sulfurized graphene nanoplatelets as efficient metal-free electrocatalysts for oxygen reduction reaction: contribution from electron spin, *Advanced Materials*, 25, 6138–6145 (2013).
104. Quan Xu, Mingtao Li, Jianbing Niu and Zhenhai Xia, Dynamic Enhancement of Microparticles on Adhesion Forces, *Langmuir*, 29, 13743–13749 (2013).
105. I. Jeon, H. Choi, M. Choi, J.M. Seo, S. Jung, M. Kim, S. Zhang, L. Zhang, Z.H. Xia, L.M. Dai, N. Park, J. Baek Facile, scalable synthesis of edge-halogenated graphene nanoplatelets as efficient metal-free electrocatalysts for oxygen reduction reaction, *Scientific Reports*, 3, 1810 (2013) **(reported by numerous media)**
106. H. Singh Arora, Q. Xu, Z.H. Xia, X. Thomas, N. Dahotre, J. Schroers, S. Mukherjee, Wettability of Nano-textured Metallic Glass Surfaces, *Scripta Materialia*, 69, 732–735(2013).
107. Na Jin, Yanqing Yang, Xian Luo, Zhenhai Xia, Development of CVD Ti-containing films, *Prog. Mat. Sci.*, 58, 1490–1533 (2013).
108. Z.J.Ma, S.H.Hu, J.S. Tan, N. Njus, Z.H. Xia, In vitro and in-vivo Mechanical Behaviors of Human Peripheral Nerves, *Journal of biomedical materials Research Part A*, 9, 2718-2725 (2013)
109. Shihao Hu, Zhenhai Xia, Liming Dai, Advanced Gecko-Foot-Mimetic Dry Adhesives Based on Carbon Nanotubes, *Nanoscale* 5, 475-486 (2013).
110. F. Solá, J.B. Niu, Z.H. Xia, Heating Induced Microstructural Changes in Graphene/Cu Nanocomposites, *J. Phys. D: Appl. Phys.* 46, 065309 (2013).
111. Jie Wen, Fred K. Choy, and Zhenhai Xia, Wavelet Denoising in Electrical Resistance Based Damage Detection of Carbon Fiber Composite Materials, *Journal of Materials Science Research*, 2, 84-100(2013).
112. S.H.Hu, Peter H. Niewiarowski, and Z.H. Xia, “Sticky yet Clean - The secrets of gecko adhesive system”, *G.I.T. Laboratory Journal Europe*, 16, 14-16 (2012)
113. Q.Xu, Y.Q. Yao, Z.J. Ma, Z.H. Xia, Measurement of Interfacial Energy and Friction between Carbon Nanotubes and Polymer Matrix by a Micro-pullout Test, *Science of Advanced Materials* 4, 888-892 (2012)

114. Shihao Hu, Stephanie Lopez, Peter H. Niewiarowski and Z.H. Xia, Dynamic Self-Cleaning of Gecko Setae via Digital Hyperextension, *Journal of Royal Society Interface* 9, 2781-2790(2012). **(reported by numerous media and newspapers, including New York Times)**
115. Francisco Solá, Zhenhai Xia, Marisabel Lebrón-Colón and Michael A. Meador, Transmission electron microscopy of single wall carbon nanotube/polymer nanocomposites: A first-principles study, *Phys. Status Solidi RRL*, 6, 349-351 (2012). **(Featured cover)**
116. Shihao Hu, Zhenhai Xia, Rational Design and Nanofabrication of Gecko Inspired Dry Adhesives, *Small*, 8, 2464-2468 (2012).
117. Z.H. Xia, T. Sujidkul, Jianbing Niu, Craig E. Smith, Gregory N. Morscher, Modeling of Electromechanical Behavior of Woven SiC/SiC Composites, *Composites A*, 43, 1730–1737 (2012).
118. L. Li, F. Solá, Z.H. Xia, Y.Q. Yang, Effect of amorphous carbon coatings on the mechanical behavior of silicon carbide nanowires, *Journal of Applied Physics*, 111, 094306 (2012).
119. L.P. Zhang, J.B. Niu, L.M. Dai, Z.H. Xia, Effect of Microstructure of Nitrogen-Doped Graphene on Oxygen Reduction Activity in Fuel Cells, *Langmuir* 28, 7542–7550(2012).
120. Yuan, M. N.; Yang, Y. Q.; Xia, Z. H., Modeling of push-out test for interfacial fracture toughness of fiber-reinforced composites, *Advanced Composite Materials*, 21, 401-412(2012)
121. S.H. Hu, Z.H. Xia and X.S. Gao, "Strong Adhesion and Friction Coupling in Hierarchical Carbon Nanotube Arrays for Dry Adhesive Applications", *ACS Applied Materials & Interfaces*, 4, 1972–1980(2012).
122. Shuangyin Wang, Lipeng Zhang, Zhenhai Xia, Ajit Roy, and Liming Dai, BCN Graphene as Efficient Metal-free Electrocatalyst for Oxygen Reduction Reaction, *Angewandte Chemie, International Edition*, 51,4209-4212(2012)
123. Abhishek K. Kothari, Shihao Hu, Zhenhai Xia, Erkan Konca, Brian W. Sheldon, Enhanced Fracture Toughness in Carbon Nanotube Reinforced Amorphous Silicon Nitride Nanocomposite Coatings, *Acta Materialia* 60, 3333–3339(2012).
124. T. Sujidkul, and Z.H. Xia, Coupled Thermal-mechanical Modeling of Carbon Fibers Reinforced Polymer Composites for Damage Detection, *Composites B* 43, 1631–1636(2012).
125. Lili Li, Zhenhai Xia and Yanqing Yang, Friction Reduction in Nanoimprinting by a High-frequency Vibration Perturbation, *Journal of Computational and Theoretical Nanoscience*, 9, 35-40 (2012).
126. A. C. Ritts, Q. S. Yu, H. Li, S.J. Lombardo, X. Han and Z.H. Xia, J. Lian, Plasma Treated Multi-Walled Carbon Nanotubes (MWCNTs) for Epoxy Nanocomposites, *Polymers* 3, 2142-2155(2011).
127. L. Li, J. B. Niu, Z.H. Xia, Y.Q. Yang, J.Y. Liang, Nanotube/matrix interfacial friction and sliding in composites with amorphous carbon matrix, *Scripta Materialia*, 65, 1014–1017(2011).
128. L.P. Zhang, Z.H. Xia, Mechanisms of Oxygen Reduction Reaction on Nitrogen-Doped Graphene for Fuel Cells, *Journal of Physical Chemistry C*, 115, 11170–11176 (2011).

129. Du, Feng; Qu, Liangti; Xia, Zhenhai; Feng, Lianfang; Dai, Liming, Membranes of Vertically-aligned Superlong Carbon Nanotubes, *Langmuir* 27, 8437-8443(2011).
130. Craig E. Smith, Gregory N. Morscher, and Z.H. Xia, Electrical Resistance as a Nondestructive Evaluation Technique for SiC/SiC Ceramic Matrix Composites under Creep-Rupture Loading, *International Journal of Applied Ceramic Technology*, 8, 298-307(2011).
131. Jie Wen, Zhenhai Xia and Fred Choy, Damage Detection of Carbon Fiber Reinforced Polymer Composites via Electrical Resistance Measurement, *Composites B*, 42, 77-86(2011).
132. Byrne, E.M.; Letertre, A.; McCarthy, M.A.; Curtin, W.A.; Xia, Z. Optimizing load transfer in multiwall nanotubes through interwall coupling: Theory and simulation, *Acta Materialia*, 58, 6324-6333(2010).
133. Hui Ouyang, Zhenhai Xia and Jiang Zhe, Voltage-controlled flow regulating in nanofluidic channels with charged polymer brushes, *Microfluidics and Nanofluidics*, 9, 915-922(2010).
134. Hu, Shihao; Jiang, Haodan; Xia, Zhenhai; Gao, Xiaosheng, Friction and Adhesion of Hierarchical Carbon Nanotube Structures for Biomimetic Dry Adhesives: Multiscale Modeling, *ACS Applied Materials & Interfaces*, 2, 2570-2578(2010).
135. H.N. Duan, Z.H.Xia, J.Y. Liang, Fabrication of Y-junction Metal Nanowires by AAO Template-assisted AC Electrodeposition, *Nano-Micro Letters* 2, 290-295(2010)
136. H.N. Duan, J.Y. Liang, Z.H. Xia, Synthetic Hierarchical Nanostructures: Growth of Carbon Nanofibers on Microfibers by Chemical Vapor Deposition, *Materials Science and Engineering B*, 166 (2010) 190–195.
137. K.P. Gong, Feng Du, Z.H. Xia, M. Durstock and L.M. Dai, “Nitrogen-Doped Carbon Nanotube Arrays with High Electrocatalytic Activity for Oxygen Reduction”, *Science*, 323, 760-764(2009).
138. E.M. Byrne, M.A. McCarthy, Z. H. Xia, and W. A. Curtin, “Multi-Wall Nanotubes can be Stronger than Single-Wall Nanotubes and Implications for Nanocomposite Design”, *Physical Review Letters*, 103, No. 045502, (2009).
139. O. Hui, Z.H. Xia and J. Zhe, “Static and Dynamic Responses of Polyelectrolyte Brushes under External Electric Field”, *Nanotechnology*, 20, 195703 (2009).
140. L. Li, Z.H. Xia, W.A. Curtin and Y.Q. Yang, Molecular Dynamics Simulations of Interfacial Sliding in Carbon-Nanotube/Diamond Nanocomposites, *Journal of American Ceramic Society*, 92 [10] 2331–2336 (2009).
141. T. Lisle, F. Zhang, W. A. Curtin, Z.H. Xia, Multiscale Modeling of Ductile-Fiber-Reinforced Composites, *Composites Science and Technology*, 108, 1887-1895(2009).
142. X.F. Wei, Z.H. Xia, S.C. Wong and A. Baji, “Modeling of mechanical properties of electrospun nanofiber network”, *International Journal of Experimental and Computational Biomechanics*, 1, 49-57(2009).
143. A. K. Kothari, E. Konca, B. W. Sheldon, K.Q. Jian, H. Li, Z.H. Xia, W.Y. Ni, R. Hurt , “Mechanical behavior of anodic alumina coatings reinforced with carbon nanofibers”, *J. Mater. Sci.*, 44, 6020–6027(2009).
144. L.T. Qu, L.M. Dai, M. Stone, Z.H. Xia, and Z.L. Wang, “Carbon Nanotube Arrays with Strong Shear Binding-On and Easy Normal Lifting-Off”. *Science*, 322 238-242(2008).

145. Z. H. Xia, and W. A. Curtin, “Damage Detection via Electrical Resistance in CFRP Composites under Cyclic Loading”, *Composites Science and Technology*, 68, 2526-2534 (2008).
146. Z.H. Xia, J. Lou and W.A. Curtin, A Multiscale Experiment on Tribological Behavior of Aligned Carbon Nanotube/Ceramic Composites, *Scripta Materialia*, 58, 223-226(2008)
147. C. E. Smith, G. N. Morscher and Z.H. Xia, “Monitoring damage accumulation in ceramic matrix composites using electrical resistivity” *Scripta Materialia* 59, 463–466(2008).
148. Z. H. Xia, P. Guduru and W. A. Curtin, “Enhancing Mechanical Properties of Multi-Wall Carbon Nanotubes via sp^3 Inter-wall Bridging”, *Physical Review Letters*, 98, 245501 (2007)
149. Z. H. Xia, and W. A. Curtin, “Modeling of mechanical damage detection in CFRPs via electrical resistance”, *Composites Science and Technology*, 67,1518-1529 (2007)
150. P. R. Guduru, and Z. H. Xia, “Shell Buckling of Imperfect Multiwalled Carbon Nanotubes—Experiments and Analysis”, *Experimental Mechanics*, 47, 153–161 (2007)
151. Gregory N. Morscher, Craig E. Smith, and Z.H. Xia, “Electrical Resistance Tested as a Nondestructive Evaluation Technique for Silicon Carbide/Silicon Carbide Composites”, *Research & Technology*, 2007, pp-137-138, NASA Glenn Research Center, NASA/TM-2008-215054
152. Qingkai Yu, Guoting Qin, Hao Li, Z.H. Xia, Yibo Nian, and Shin-Shem Pei, “Mechanism of Horizontally Aligned Growth of Single-Wall Carbon Nanotubes on R-Plane Sapphire”, *Journal of Physical Chemistry B*, 110, 22676-22680(2006).
153. Z. H. Xia, and W. A. Curtin, “Pullout forces and friction in multiwall carbon nanotubes,” *Physical Review B* 69, 233408 (2004)
154. Z. H. Xia, L. Riester, W. A. Curtin, H. Li, B. W. Sheldon, J. Liang, B. Chang and J. Xu, “Direct observation of toughening mechanisms in carbon-nanotube ceramic matrix composites”, *Acta Materialia*, 52, 931-944 (2004).
155. Z.H. Xia, W. A. Curtin, and B. W. Sheldon, “A New Method to Evaluate the Fracture Toughness of Thin Films”, *Acta Materialia*, 52, 3507-3517 (2004)
156. Z. H. Xia, W. A. Curtin, B. W. Sheldon “Fracture Toughness of Highly-ordered Carbon Nanotube/Alumina Nanocomposites”, *Journal of Engineering Materials and Technology*, 126, 238-244 (2004).
157. Z. H. Xia, W. A. Curtin, B. W. Sheldon, “Mechanical Properties of Highly-ordered Nanopore Alumina Membranes ”, *Reviews on Advanced Materials Science*, 6, 131-139 (2004).
158. Zhang J., Sun B.D., Xia Z.H, “Layered structure of Ni-Al multi-layered metal-intermetallic composites fabricated by in-situ reactions” *Transactions of nonferrous metals society of China*, 14 (6): 1117-1122 (2004)
159. Z. H. Xia, T. Okabe, J. B. Park, W. A. Curtin, and N. Takeda, “Quantitative Damage Detection in CFRP Composites: Coupled Mechanical and Electrical Models”, *Composites Science and Technology*, 63, 1411-1422 (2003).
160. P.W.M. Peters, W. Zeng, J. Hemptenmacher, Z Xia, Fatigue Life of SCS-6/Timetal® 834 at Room Temperature and 600° C: Experiments and Modeling, *Composite Materials, Testing and Design*, 4, (2003) DOI: 10.1520/STP38417S

161. Z.H. Xia and W. A. Curtin, "Shear-lag vs. Finite element models for stress transfer in fiber-reinforced composites", *Composite Science and Technology*, 62, 1141-1149 (2002).
162. Z.H. Xia and W. A. Curtin, "Green's function vs. Shear-lag models of damage failure in fiber-reinforced composites", *Composite Science and Technology*, 62, 1279-1288 (2002).
163. Z.H. Xia, W. A. Curtin and P.W.M. Peters, "Multiscale Modeling of Failure In Metal Matrix Composites", *Acta Materialia*, 49, 273-287 (2001).
164. Z.H. Xia and W. A. Curtin, "Life Prediction of Titanium MMCs under Low-Cycle Fatigue", *Acta Materialia*, 49, 1633-1646 (2001).
165. Z.H. Xia and W. A. Curtin, "Multiscale modeling of damage and failure in aluminum-matrix composites", *Composites Science and Technology*, 61, 2247-2257 (2001).
166. P.W.M. Peters, Z.H. Xia, J. Hemptenmacher, and H. Assler, "Influence of interfacial stress transfer on fatigue crack growth in SiC-fiber reinforced titanium alloys", *Composites Part A*, 32,561-567 (2001).
167. Z. H. Xia and W. A. Curtin, "Design of fiber/coating systems for high strength in ceramic matrix composites", *Cer. Eng. Sci. Proc.* 22, 371-378 (2001).
168. Z.H. Xia and W. A. Curtin, "Tough to Brittle Transitions in Ceramic Matrix Composites with Increasing Interfacial Shear Stress", *Acta Materialia*, 48, 4879-4892 (2000).
169. J. Hemptenmacher, P.W.M. Peters, H. Assler, Z. Xia, Fatigue of a SiC-Fibre Reinforced Titanium Matrix Composite: Experimental Results and Modelling, *Microstructural Investigation and Analysis*, 4, 190-195 (2000).
170. Z.H. Xia and P.W.M. Peters and H.J. Dudek, "Finite Element Modeling of Fatigue Crack Initiation in Fiber Reinforced Titanium Alloys", *J. Composites Part A*, 31, 1031-1037(2000).
171. Z.H.Xia, J.H. Liu and S.Q. Zhu, "Fabrication of laminated metal-intermetallic composites by interlayer in-situ reactions", *Journal of Materials Science*, 34, 3731-3735 (1999).
172. Z. H. Xia, "Interaction of Cracks in Interfacial Reaction Zone and its Effects on Mechanical Behaviors of Coated Fiber/Matrix Composites", *Zeitschrift für Metallkunde*, 87, No.8, 661-665 (1996).
173. Z. H. Xia and S.Q. Zhu, "Interaction of the Cracks in Continuous Fiber-Reinforced Metal-Matrix Composites", *Acta Metallurgica Sinica* 31, 91-96.(1996).
174. Z. H. Xia, "Role of Coating in Tensile Strength of Long Fiber Reinforced Metal-Matrix Composites", *Acta Metallurgica et Materialia* 41, 2097-2104 (1993).
175. Z. H. Xia, "Effect of Heat Treatment and Coating on Tensile Strength of Carbon Fibers", *Acta Materiae Compositae Sinica* 10, 41-46(1993).
176. Z. H. Xia, "Model for Infiltration Kinetics of Liquid Metals and its Application", *Acta Metallurgica Sinica (English Edition)* 5B, 206-213 (1992).
177. Z. Lin, Z.Y. Mao and Z. H. Xia, "Study on Infiltration and Solidification of Metal-Matrix Composites", *Nonferrous Alloy and Special Casting* 15. No.4, 1-7 (1992).
178. Xia Z. H., Mao Z. Y., Zhou Y. H. and Shang B. L., "Fabrication of Fiber-Reinforced Metal-Matrix Composites by Variable Pressure Infiltration" *Metallurgical Transactions* 23B, 295-302 (1992).

179. Lin Z. G. and Xia Z. H., "Investigation of Liquid Metal Infiltration Processing", *Metals Science and Technology* 12, No.6, 68-72(1992).
180. Xia Z. H. and Zhu S.Q., "Control of Interfacial Reaction in Metal-Matrix composites", *Journal of Hebei Institute of Technology* 22, 56-60(1992).
181. Li H. L., Mao Z.Y. ,Bao L.S. and Xia Z. H., "Hydrodynamics resistance in liquid infiltration for metal-matrix composite materials", *Foundry Technology*, No.4, 45-49 (1991).
182. Xia Z. H. Mao Z.Y. and Zhou Y.H., "Model for Infiltration Kinetics of Liquid Metals and its Application", *Acta Metallurgica Sinica* 27, B426-B432 (1992).
183. Xia Z. H., Mao Z.Y. and Zhou Y. H., "Effect of Fiber Distribution on Infiltration Behavior and Mechanical Properties of Metal-Matrix Composites" *Zeitschrift für Metallkunde* 82, 766-768 (1991).
184. Xia Z. H., Mao Z.Y. and Zhou Y. H., "Effect of Reaction at the Interface with SiC-Ni Duplex Coating on Mechanical Properties of C/Al Composites" *Materials Science Progress*, 5, 443-448 (1991)
185. Xia Z. H., Mao Z.Y. and Zhou Y. H., "Effect of Interfacial Reaction on Mechanical Properties of Fiber-Reinforced Composites" *Journal of Hebei Institute of Technology* 20, No.4,88-91 (1991).
186. Xia Z. H., Mao Z.Y. and Zhou Y. H., "Low-pressure Casting of Carbon Fiber Reinforced Aluminum Composites", *Acta Materiae Compositae Sinica* 8, No.7, 7-12 (1991).
187. Xia Z. H., Mao Z.Y., Li H. L. and Zhou Y. H., "Relationship between Microstructure and Anti-Oxidation properties of Coatings on Carbon Fibers", *Acta Aeronautica et Astronautica Sinica* 11,B463-468 (1990).
188. Xia Z. H.Zhou Y.H., "Mechanism of Filtration of Molten Metals by Cellular Filters", *Hot-Working Technology*, No.6, 14-23 (1989).
189. Xia Z. H., Peng H. Y., Li H. L.,Mao Z.Y. and Zhou Y. H., "A New Technique of Forming Gradient SiC/Si Coating on Carbon Fibers and Characteristics of the Coating" *Acta Materiae Compositae Sinica* 6, No.4, 78-83 (1989).
190. Xia Z. H. and Zhou Y. H., "A Pressure-Regulating Technique for Fabrication of Metal-Matrix Composites", *Materials Engineering* 1. No.6, 23-26 (1989).
191. Xia Z. H. and Zhou Y. H., "The Complex Degassation of Aluminum Alloy in the Counter-Pressure Casting", *Hot-Working Technology*, No.7, 16-20 (1987).
192. Xia Z. H. and Zhou Y. H., "The Filtration of Aluminum Alloy in the Counter-Pressure casting", *Foundry*. No.8, 17-20 (1987).

D. Papers in conference proceedings

193. Yiyang Wan, Yong Gao, Zhenhai Xia, Highly Switchable Adhesion of N-Doped Graphene Interfaces for Robust Micromanipulation, 56th Annual Technical Meeting of the Society of Engineering Science (SES2019), October 13 - 15, 2019, Washington University, St. Louis, MO, U.S.A.
194. Z. Zhao, C. Lin, Z.H. Xia, Design principles of heteroatom-doped carbon catalysts for dye-sensitized solar cells, International Conference on Electrochemical Energy Science and Technology (EEST2018), Niagara Falls, Ontario, Canada, Aug. 13-17, 2018

195. Z.H. Zhao and Z.H. Xia, Rational design of novel carbon catalysts for clean energy conversion and storage, Nano-Micro Conference 2017, June 19-23 2017, Shanghai China, 89-90(2017)
196. Md Salah Uddin, Jaehyung Ju, Zhenhai Xia, Hyperelastic Multi-Scale Modeling of a Thermoplastic Polyurethane Elastomer Using Molecular Mechanics, ASME Proceedings of the ASME 2015 International Mechanical Engineering Congress & Exposition IMECE 2015 November 13-19, 2015, Houston, Texas, USA, IMECE2015-50150.
197. L Zhang, Z Xia, Theoretical study of nitrogen boron co-doped graphene as efficient oxygen reduction reaction catalysts for fuel cell, Abstracts of Papers of The American Chemical Society, 245, 2013
198. Z.H. Xia and J.Y. Liang, integrated study on interfaces in nanocomposites and nanoimprinting, NSF CMMI Annual meeting, July 2012
199. L. Li, J.B. Niu, and Z.H. Xia, Interfacial Friction of Carbon Nanotubes in Ceramic Nanocomposites, ICCE-S2012, Crete, Greece, May 2012,
200. S. H. Hu, and Z.H. Xia, Friction Enhanced Adhesion in Biomimetic Nanostructures, Advances in Heterogeneous Material Mechanics (2011), eds: J.H. Fan, J. Zhang, HB. Chen and Z.H. Jin, DEStech Publications, Inc. Proceedings of 3rd International Conference on Heterogeneous Material Mechanics (ICHMM-2011) May 22-26, 2011, Shanghai (Chong Ming Island), China, pp.1146-1149.
201. Z.H. Xia and J.Y. Liang, Modeling of Nanoimprint of Nanotube Arrays on Metals, NSF CMMI Annual meeting, 2010
202. Z.H. Xia and J.Y. Liang, Interfacial Friction of Carbon Nanotubes in Amorphous Carbon Nanocomposites, NSF CMMI Annual meeting, 2009
203. Lili Li, Zhenhai Xia and Yanqing Yang, Nanoimprinting of Metals by Highly-Grafted Nanotube Arrays, 2008 MRS Fall Meeting Symposium EE proceedings
204. Z.H. Xia, W. A Curtin, "Detection of Penetration and Delamination Damage in Quasi-isotropic CFRP Laminates by Electrical Resistance", The sixth Japan Conference on Structural Safety and Reliability, Kyoto, Japan (2007).
205. J.Y. Liang, and Z.H. Xia, "Synthesis and Mechanical properties of cobalt nanowires", MicroNano China, Hainan, (2007)
206. Z.H. Xia, William A Curtin, Pradeep Guduru, Multiscale Modeling of Frictional Behavior of Highly-Ordered Carbon Nanotube/Ceramic Nanocomposites, 2006 MRS Meeting, Boston, online publication, 0978-GG15-04
(http://www.mrs.org/s_mrs/bin.asp?CID=7651&DID=187153&DOC=FILE.PDF)
207. Z.H. Xia, J.Y. Liang, Biomimetic Nanocontact and Adhesion of Carbon Nanotubes for Dry Adhesives, 2006 MRS Meeting, Boston, online publication, 0978-GG15-04
208. Z. H. Xia and W. A. Curtin, "Coupled electrical mechanical modeling of multifunctional CFRPs for damage detection", *ECF-16* (2005).
209. P.W.M. Peters, H. Assler, J. Hemptenmacher, and Z.H. Xia, "Fatigue behavior of SCS-6/TIMETAL 834 at Room temperature and 600°C", *ECCM-9*, 215-122 (2000).

210. J. Hemptenmacher, P. W.M. Peters, H. Assler, Z.H Xia, Fatigue of A SiC-Fibre Reinforced Titanium Matrix Composite: Experimental Results And Modelling, Microstructural Investigation and Analysis, p190-195, Editor(s): B. Jouffrey, Wiley-VCH Verlag GmbH, Weinheim, online: 9 May 2006
211. Z.H. Xia and P.W.M. Peters.(1999): Analysis on the Influence of Interface on Fatigue life of Titanium matrix Composites, Proceedings of *Interfacial Phenomena in Composite Materials*, pp99, Berlin
212. Z.H. Xia, H. Assler, H.J. Dudek and P.W.M. Peters, “Modeling of multiple cracking interaction and its influence on the strength of single fibre composites” *9th International Conference on Modern Materials & Technologies*, Florence, Italy, June 14-19, (1998)
213. Z.H. Xia, P.W.M. Peters and H.J. Dudek, “Fracture and life of Titanium matrix composites subjected to fatigue loading”, *4th International Conference on Engineering Structural Integrity Assessment*, Cambridge, UK, September (1998)
214. Z.H. Xia, P.W.M. Peters and H.J. Dudek, “Modeling of Fatigue crack growth in SiC-fiber reinforced Titanium alloy”, *8th International Workshop Computational Mechanics of Materials*, Stuttgart, Germany, October 8-9, 1998
215. Zhang J. and Xia Z.H., “Micromechanics analysis of toughening mechanisms in intermetallic/metal layered composites”, *International conference on non-Ferrous metals and special casting*, Shanghai (1998).
216. Xia Z. H. and Zhu S.Q., “ Effects of Fiber Distribution and Temperature on Solidification Microstructure of Metal Matrix in Fiber-Reinforced Composites” *Proceedings of the China-Japan International Conference on Casting Engineering'94*, Beijing, 420-423. (1994).
217. Xia Z. H., Mao Z.Y. and Zhou Y. H., “Interface Reaction and Mechanical Properties of C/Al Composites with SiC Coating”, *Interfacial Phenomena in Composite Materials'91*, Belgium, (1991).
218. Xia Z. H., “Toughening Metal-Matrix Composites” *3rd Chinese Youth Symposium on Materials Science*, Youth branch, C-MRS, China, 1991, 385-388 (1991).
219. Xia Z. H., Mao Z.Y. and Zhou Y. H. “Pressure-Regulating Infiltration Model and Process for Fiber-Reinforced Composites”, *C-MRS International'90*, China, July, 1990, 45-48(1990).
220. Xia Z. H., LI H. L., Mao Z.Y. and Zhou Y. H., “Infiltration Analysis and Fabrication of Fiber-Reinforced Metal Matrix Composites by Low-Pressure Casting”, *CAE/DLR Symposium on Engineering Materials*, Beijing, 1990, Selected Papers in Scientific and Technical International Cooperation Program 2, CAE, 292-307(1991).
221. Lin Z. G., Xia Z. H., Mao Z.Y. and Zhou Y. H., “A Study of Infiltration of Low Pressure Casting FRM”, *CAE/DLR Symposium on Engineering Materials*, Beijing, 1990, Selected Papers in Scientific and Technical International Cooperation Program 2, CAE, 247-264 (1990).
222. Xia Z. H., Mao Z.Y. and Zhou Y. H., “Solidification of Metal-Matrix Composites” *2nd Symposium on Engineering Materials*, Chinese Aeronautic Society, Chengde, China, (1989).
223. Xia Z. H., “Compatibility of Coatings with Molten Metals”, *Proceedings of 2nd Chinese Youth Symposium on Materials Science*, Youth branch, C-MRS, Qingdao, China, 432-433 (1989).

E. Technical Reports

1. Z. H. Xia, and W.A. Curtin, Report: “STTR Phase II: Damage Detection via electrical resistance in CFRPs: multiscale modeling”, IMPACT Technologies Inc. June, 2006
2. Z. H. Xia, and W.A. Curtin, Final Report: “STTR Phase II: Damage Detection via electrical resistance in CFRPs: A Fast way to detect the area of the damage”, IMPACT Technologies Inc. June, 2005
3. Z. H. Xia, and W.A. Curtin, Final Report: “STTR Phase I: Damage Detection via electrical resistance in CFRPs: Modeling Task”, IMPACT Technologies Inc. May, 2004
4. Z. H. Xia, Final Report: “Tipover analysis of HI-STORM 100B spent nuclear fuel storage casks”, HI-286301, Holtec International, Inc., 2004
5. Z. H. Xia, Final Report: “Modeling of Tensile behavior and fatigue crack growth in SiC fiber reinforced titanium matrix composites”, Sponsored by Alexander von Humboldt Foundation, Germany, July 1999
6. Z. H. Xia, Project Report: “D-19 motorcycle aluminum wheel mold and vacuum and pressure casting” Huacan Inc., May 1997
7. Z. H. Xia, Project Review II: “Design and Fabrication of Layered intermetallic Composites with high toughness”, sponsored by Tianjin Department of Science and Technology, June 1995

F. Patents

1. A Variable-Pressure Casting Technology and Equipment. (China Patent, No. 9424620.6), inventor: Z. H. Xia, disclosure completed July 1995
2. J.S. Tan, N. Njus, Z.H. Xia, and Z.J. Ma, An Instrument to Measure Intra-Operative Nerve Tension, US Patent, USPTO: 61/585,890, 2012.

IV. Invited talks/Seminar Presentations

1. “Design principles of heteroatom-doped carbon nitride photocatalysts for solar fuel production”, Vebleo Scientist Award Lecture, Webinar, November 18, 2020 (**Invited Talk**)
2. “Bioinspired Material Surfaces with Switchable Adhesion”, "IAAM Scientist Award Lecture" in the Advanced Materials Lecture Series. the International Association of Advanced Materials (IAAM), Webinar, September 25, 2020 (**Invited Talk**)
3. “Bioinspired Smart Surfaces with Switchable Adhesion”, University of South Florida, Tampa, FL, March 6, 2020. (**Invited Talk**)
4. “Catalytic Origin and Design Principles of Heteroatom-doped Carbon and COF Electrocatalysts for Clean Energy Conversion”, University of South Florida, Tampa, FL, March 3, 2020. (**Invited Talk**)

5. “Core Effect of Local Atomic Configuration and Design Principles in $\text{Al}_x\text{CoCrFeNi}$ High-entropy Alloys”, TMS annual meeting, San Diego, CA, February 23-27, 2020
6. “Highly Switchable Adhesion of N-Doped Graphene Interfaces for Robust Micromanipulation”, 56th Annual Technical Meeting of the Society of Engineering Science (SES2019), October 13 - 15, 2019, Washington University, St. Louis, MO, U.S.
7. “Catalytic Origin and Universal Descriptors of Heteroatom-Doped Semiconductor Photocatalysts for Solar Fuel Production”, MRS Fall Meeting, Boston, MA, December 1-5, 2019.
8. “Guiding Principles for Designing Metal-Coordinated Frameworks as Electrocatalysts for Clean Energy Conversion”, MRS Fall Meeting, Boston, MA, December 1-5, 2019.
9. “Electrically Modulated Highly Switchable Adhesion of N-Doped Graphene Interfaces for Robust Micromanipulation”, MRS Fall Meeting, Boston, MA, December 1-5, 2019.
10. “Computational Screening and Design Principles of COF Materials as High-Performance Catalysts for Clean Energy Conversion”, ACS Fall Conference, San Diego, CA, August 25-30, 2019 (**Invited Talk**)
11. “Design Principles of Carbon-based Materials as High-Performance Catalysts for Clean Energy Conversion”, University of New South Wales, Sydney, Australia, August 7, 2019 (**Invited Talk**)
12. “A Universal Design principle of Heteroatom-Doped Semiconductor Photocatalysts for Solar Fuel Production”, 2019 International Conference on Electrochemical Energy, Sydney, Australia, August 4-8, 2019 (**Invited Talk**)
13. “Multiscale Modeling of Mechanical Behavior of $\text{Al}_x\text{CrCoFeNi}$ High-Entropy Alloy”, Xi’an Technological University, China, July 7, 2019 (**Invited Talk**)
14. “Design Principles of Carbon-based Materials as High-Performance Catalysts for Clean Energy Conversion”, University of Strasbourg, Strasbourg, France, May 27, 2019 (**Invited Talk**)
15. “Design Principles of Carbon-based Materials as High-Performance Catalysts for Clean Energy Conversion”, Forum of Materials Chemistry, Xi’an, China, May 11-12, 2019 (**Plenary Talk**)
16. “Multiscale Modeling of Mechanical Behavior of $\text{Al}_x\text{CrCoFeNi}$ High-Entropy Alloy”, Symposium on Phase Field, Guilin, China, April 27-29, 2019 (**Invited Talk**)
17. “Design Principles of Carbon-based Materials as High-Performance Catalysts for Clean Energy Conversion”, China University of Science and Technology, Wuhan, China, April 25, 2019 (**Invited Talk**)
18. “Guiding Principles of Carbon-based Materials as High-Performance Catalysts for Clean Energy Conversion”, Zhengzhou University, Zhengzhou, China, April 19, 2019 (**Invited Talk**)
19. “Bioinspired Smart Surfaces with Switchable Adhesion”, Northwestern Polytechnical University, Xi’an China, April, 20, 2019 (**Invited Talk**)
20. “Bioinspired Smart Surfaces with Switchable Adhesion”, Impact Dynamics Forum, Xi’an China, June 11, 2019 (**Plenary Talk**)

21. “Electrically-Modulated Switchable Adhesion of N-Doped Graphene Interfaces for Robust Micromanipulation” ICCES-2019, Tokyo, Japan, March 25-29, 2019. **(Keynote Talk)**
22. “Biomimetic Wrinkle Graphene Surfaces with Switchable Adhesion” TMS-2019, San Antonio, TX, USA, March 10-14, 2019.
23. “Bioinspired materials for water vapor harvesting”, IMECE 2018, Pittsburg, PA, USA, November 11-16 2018.
24. “Metal-Organic-Frameworks as Efficient Electrocatalysts for Oxygen Evolution Reaction: Insights into the Active Centers”, IMECE 2018, Pittsburg, PA, USA, November 11-16 2018.
25. “Multiscale Modeling of Mechanical Behavior of Al_xCrCoFeNi High-Entropy Alloy”, MRS Fall Meeting, Boston, MA, November 25-30, 2018.
26. “Multiple Coordinative of ZIFs with Transition Metal in Metal-Organic-Frameworks as Efficient Electrocatalysts for Energy Conversion”, MRS Fall Meeting, Boston, MA, November 25-30, 2018.
27. “Design Principles of Heteroatom-doped Carbon as Efficient Catalysts for Dye-sensitized Solar Cells”, EEST-2018, August 13-17, 2018, Niagara Falls, Canada. **(Invited)**.
28. “Multiscale Modeling of Mechanical Behavior of Al_xCrCoFeNi High-Entropy Alloy”, ICMMP-2018, Xi’an, China, June 18-21, 2018. **(Keynote)**
29. “DFT Computational Screening of Metal-Containing Catalytic Materials for Clean Energy Conversion” 2018 International Conference on Multiscale Modeling and Simulation of Materials (ICM³), Xi’an China, July 1-5, 2018. **(Keynote)**
30. “Multiscale Modeling of Mechanical Behavior of Al_xCrCoFeNi High-Entropy Alloy”, Beijing University of Science and Technology, Beijing, China, June 25, 2018. **(Invited)**
31. “Design Principles of Carbon Nanomaterials as Efficient Catalysts for Clean Energy Conversion and Storage”, Central University of China, June 7, 2018, Taiyuan, Shanxi, P.R. China. **(Invited)**.
32. “Computational Investigations of Mechanical Behavior of Al_xCrCoFeNi High-entropy Alloy,” TMS 2018, March 11-15, 2018 Phoenix, Arizona, USA.
33. “Design Principles of Carbon Nanomaterials as Efficient Catalysts for Clean Energy Conversion and Storage”, 2018 International Forum on Micro-Nano Functional Materials, March 2-3, 2018, Wuhan, Hubei, P.R. China. **(Plenary talk)**.
34. “Multiscale Modeling of Growth and Mechanical Behavior of 3D CNT-Graphene Nanoarchitectures”, MURI Annual Meeting, Cleveland, OH, Jan. 17, 2018.
35. “Defect-Induced Catalytic Activities for Carbon Nanomaterials”, MRS Fall Meeting, Boston, MA, Nov. 26-Dec. 1, 2017. **(Invited)**.
36. “Self-cleaning and controlled adhesion of gecko feet and their bioinspired micromanipulators”, MRS Fall Meeting, Boston, MA, Nov. 26-Dec. 1, 2017.
37. “Rational design and fast screening of high-performance Carbon-based Electrocatalysts for Clean Energy Conversion”, 1st Forum of Materials Genome Engineering, Guangzhou, China, Nov. 21-23, 2017 **(Invited)**.

38. “Design Principles for Covalent Organic Frameworks as Efficient Electrocatalysts in Clean Energy Conversion and Green Oxidizer Production”, IMECE 2017, Tampa, FL, Nov. 5-10, 2017.
39. “Design Principles of Heteroatom-doped Carbon-based Electrocatalysts for Clean Energy Conversion”, The First International Conference for Functional Carbon, Taipei, Taiwan, Nov. 1-4, 2017 **(Invited)**.
40. “Bioinspired Micromanipulation Design based on Gecko Self-cleaning”, 3rd Intl Symp. on New and Advanced Materials and Technologies for Energy, Environment and Sustainable Development, Cancun, Mexico, Oct. 22-26, 2017 **(Keynote)**
41. “Design Principles of Efficient Carbon-based Electrocatalysts for Clean Energy Conversion and Storage”, International Conference for Advances in Functional Materials, Los Angeles, USA, Aug. 14-17, 2017.
42. Design Principles of Heteroatom-Doped Graphene Catalysts for Fuel Cells and Dye-Sensitized Solar Cells, RACI-2107, Melbourne, Australia, July 20-26, 2017
43. Design Principles of Heteroatom-Doped Graphene Catalysts for Clean energy conversion, Symposium of carbon frontier-2107, Sydney, Australia, July 19, 2017**(Invited)**
44. “Computational Investigations of Mechanical Behavior of $Al_xCrCoFeNi$ High-Entropy Alloy ”, Beijing Institute of Technology, Beijing, China, July 12, 2017. **(Invited)**
45. “Computational Investigations of Mechanical Behavior of $Al_xCrCoFeNi$ High-Entropy Alloy ”, Beijing University of Science and Technology, Beijing, China, June 11, 2017. **(Invited)**
46. “Rational design of novel carbon catalysts for clean energy conversion and storage”, Nano-Micro Conference 2017, June 19-23 2017, Shanghai China. **(Invited)**
47. “Design Principles of Efficient Carbon-based Electrocatalysts for Clean Energy Conversion and Storage”, Huazhong University of Technology, June 24 2017, Wuhan, China. **(Invited)**
48. “Design Principles of Efficient Carbon-based Electrocatalysts for Clean Energy Conversion and Storage”, Xi’an Jiaotong University, June 4 2017, Xi’an, China. **(Invited)**
49. “Modeling of Interfaces in Carbon Nanotube/Ceramic Nanocomposites”. MACH-2017, Baltimore, April 4-7, 2017.
50. “Modeling of Failure and Toughening Mechanisms in Nanocomposites”. ICMMP-2016, Hong Kong, December 4-7, 2016. **(Invited)**
51. “Self-cleaning Mechanism of Gecko Feet and Biomimetic Micromanipulators ”, IMECE 2016, Phoenix, USA, November 11-16 2016.
52. “Multiscale modeling of Mechanical properties of 3D Carbon Nanotube-Graphene Nanostructures”, IMECE 2016, Phoenix, USA, November 11-16 2016.
53. “Dual Element-Doped Graphene as Efficient Catalysts for Fuel Cells and Metal-air Batteries”, IMECE 2016, Phoenix, USA, November 11-16 2016.
54. “Design Principles of Heteroatom-Doped Nanocarbon Electrocatalysts for Fuel cells and Metal-air Batteries”, World carbon Conference, Penn state, Pennsylvania, USA, July 11-17 2016. **(Invited)**

55. “Self-cleaning Mechanism of Gecko Feet and Bioinspired Micromanipulators”, University of Science and Technology, Beijing, China, October 19 2016. **(Invited)**
56. “Self-cleaning Mechanisms and Bioinspired Micromanipulators”, Wuhan University of Technology, Wuhan, China, October 15 2016. **(Invited)**
57. “Design Principles of Heteroatom-doped Carbon Nanomaterials as Electrocatalysts for Fuel Cells and Dye-sensitized Solar Cells”, *Beijing* University of Chemical Technology, Beijing, China, October 21 2016. **(Invited)**
58. “Self-cleaning Mechanism of Gecko Feet and Bioinspired Micromanipulators”, Dalian Jiaotong University, Dalian, China, October 16 2016. **(Invited)**
59. “Heteroatom-Doped Graphene as metal-free Catalysts for Oxygen Reduction and Evolution Reactions”, Beijing University of Chemical Technology, Beijing, China, July 11, 2016. **(Invited)**
60. “Dynamics Self-cleaning Mechanism of Gecko Feet and Bioinspired Micromanipulators”, Peking University, Beijing, China, June 28 2016. **(Invited)**
61. “Heteroatom-Doped Graphene as Bifunctional Catalysts for Oxygen Reduction and Evolution Reactions”, Northwestern Polytechnical University, Xi’an, China, July 3, 2016. **(Invited)**
62. “Adhesion and Self-cleaning Mechanism of Gecko Feet and Bioinspired Micromanipulators”, Southwest University, Mianyang, China, July 11, 2016. **(Invited)**
63. “Mechanisms of Self-cleaning Mechanism of Gecko Feet and Bioinspired Micromanipulators”, Beijing University of Technology, Beijing, China, June 11, 2016. **(Invited)**
64. “Dynamics Self-cleaning of Gecko Feet and their Bioinspired Micromanipulators ”, MRS Spring Meeting, Phoenix, *March 28- April 1*, 2016.
65. “Rational Design of Heteroatom-Doped Graphene as Bifunctional Catalysts for Oxygen Reduction and Evolution Reactions in Fuel Cells and Metal-air Batteries”, MRS Spring Meeting, Phoenix, *March 28- April 1*, 2016.
66. “Stress-enhanced catalytic activities of carbon nanomaterials for energy conversion”. The U.S. National Committee for Theoretical and Applied Mechanics (USNC/TAM), Austin, Texas, April 3, 2016. **(Invited)**
67. “Rational Design of Heteroatom-Doped Carbon Nanomaterials as Efficient Electrocatalysts for Fuel cells and Metal-air Batteries”. University of Nebraska-Lincoln, Lincoln, January15, 2016. **(Invited)**
68. “Growth Mechanisms and Mechanical and Thermal Properties of 3D Carbon Nanotube-Graphene Junctions”, MRS Fall Meeting, Boston, Dec. 5, 2015. **(Invited)**
69. “The mechanical properties and Thermal Transport of Junctions in 3D Carbon Nanotube-Graphene Nanostructures”, ASME Congress, 11/18/2015 (Houston, Texas)
70. “Catalytic Mechanisms of Doped Graphene as Efficient Catalysts for Fuel Cells and Metal-air Batteries”, ASME Congress, 11/17/2015 (Houston, Texas)
71. “Mechanism of Gecko Self-cleaning Adhesives”, ASME Congress, 11/17/2015 (Houston, Texas)

72. “Getting a Valuable Ph.D. Degree—Science and Engineering Graduate Education in America”, Northwestern Polytechnical University, Xi’an, China, July 3, 2015. (Invited)
73. “*Gecko-mimicking adhesives*”, China University of Petroleum, Beijing, China, June 4, 2015. **(Invited)**
74. “Bio-inspired Design of Materials for Engineering Applications”, Behang University, Beijing, China, June 5, 2015. **(Invited)**
75. “Bio-inspired Design of Materials for Engineering Applications”, Wuhu Institute of Technology, Wuhu, China, July 7, 2015. **(Invited)**
76. “Self-cleaning mechanism of polymer/carbon nanotube composites”, ASME Congress, 11/18/2014 (Montreal, Canada)
77. “Growth Mechanism and mechanical properties of 3D Carbon Nanotube-Graphene Nanostructure”, ASME Congress, 11/18/2014 (Montreal, Canada)
78. “Heteroatom-Doped Carbon Nanomaterials as Efficient Electrodes for Fuel cells”, ASME Congress, 11/16/2014 (Montreal, Canada)
79. “*Hetero-doped Graphene as Efficient Catalysts for Fuel Cells and Metal-air batteries*”, *International conference, GRAPCHINA 2014*, Ningbo, China, September 1-3, 2014. **(Invited)**
80. “*Graphene Nanoplatelets as Efficient Catalysts for Fuel Cells and Metal-air batteries*”, China University of Petroleum, Beijing, China, May 29, 2014. **(Invited)**
81. “Getting a Valuable Ph.D. Degree—Science and Engineering Graduate Education in America”, Hefei University of Technology, Hefei, China, July 5, 2014. **(Invited)**
82. “Heteroatom-doped carbon nanomaterials for clean energy conversion and storage”, *German Aerospace Center*, Cologne, Germany, April 5, 2014 **(Invited)**
83. “*Growth Mechanism and mechanical properties of Carbon Nanotube-Graphene Junctions*”, ASME Congress, 11/17/2013 (San Diego, CA)
84. “*Nitrogen-Doped Carbon Nanomaterials as Efficient Electrodes for Fuel cells and Dye-sensitized Solar Cells*”, ASME Congress, 11/18/2013 (San Diego, CA)
85. “*Self-cleaning mechanisms of Gecko Setae at Microscale*”, ASME Congress, 11/17/2013 (San Diego, CA)
86. “*Modeling of Nitrogen-Doped Carbon Nanomaterials as Efficient Electrodes for Fuel cells and Dye-sensitized Solar Cells*”, Poster, MRS Meeting, Boston, December 4, 2013.
87. “*Self-cleaning mechanism of gecko setae at microscale*”, MRS Meeting, Boston, December 4, 2013.
88. “*Hetero-doped Graphene Nanoplatelets as Efficient Catalysts for Fuel Cells*”, Hebei University of Technology, Tianjin, China, July 10, 2013. **(Invited)**
89. “*X-doped Graphene Nanoplatelets as Efficient electrodes for Fuel Cells*”, Xi’an Jiaotong University, Xi’an, China, June 28, 2013. **(Invited)**
90. “Rational Design of 3D Nanoscale Architectures for Structural and Energy Applications”, Northwestern Polytechnical University, Xi’an, China, June 26, 2013. **(Invited)**
91. “Bio-Inspired Design of Carbon Nanomaterials for Dry Adhesives”, Peking University, Beijing, China, June 17, 2013. **(Invited)**

92. “Growth of Carbon Nanotube-Graphene Junctions: A Quantum Mechanical Molecular Dynamic Study”, Air Force MURI annual meeting, Washington D.C., June 9-12, 2013.
93. “Modeling of Interfaces in Carbon Nanotube Reinforced Ceramic Nanocomposites”, ICCE-2013, Seattle, WA, May 2013 **(Keynote)**
94. “Carbon nanomaterials for efficient catalysts in fuel cells and metal air batteries”, MRS-2012 Workshop Series: Dynamics of High-Performance Materials at Extreme Conditions, Boston, November 30, 2012. **(Invited)**
95. “Dynamic Self-Cleaning in Gecko Setae via Digital Hyperextension”, MRS Meeting, Boston, November 25, 2012.
96. “Catalytic Mechanisms of Nitrogen-Doped Carbon Nanomaterials as Efficient Electrodes for Fuel Cells and Metal-Air Batteries”, MRS Meeting, Boston, November 25, 2012.
97. “Molecular Design of Carbon Nanomaterials as Efficient Catalysts for Fuel Cells and Metal-Air Batteries”, Nanotechnology for Defense Conference, NT4D-2012, Las Vegas, NV, August 2012
98. “Characterization of Nitrogen-Doped Graphene and its Catalytic Mechanism in Fuel Cells”, ASME, IMECE 2012, Houston, TX, Nov. 9-15, 2012
99. “Doped carbon-based nanomaterials as efficient catalysts for oxygen reduction reaction in fuel cells”, ASME, IMECE 2012, Houston, TX, Nov. 9-15, 2012
100. “Modeling of Electromechanical Behavior of Woven SiC/SiC Composites”, ASC 27th Annual Conference, 15th US-Japan Conference on Composite Materials ASTM-D30 Meeting, Arlington, Texas, October 1-3, 2012.
101. “Digital Hyperextension of Gecko feet and its Contribution to Easy Detachment and Self-cleaning”, ASME, IMECE 2012, Houston, TX, Nov. 9-15, 2012
102. “Bioinspired Design of Carbon Nanotube Arrays for High-Performance Dry Adhesives”, ICMMP-2012, Gold Coast, Australia, July 2012 **(Keynote)**
103. “Multi-doped Graphene and its Application in Clean Energy Conversion and Storage”, Northwestern Polytechnic University, Xi’an, China, July, 2012 **(Invited)**
104. “Nanomaterials for Bio-inspired Functional Structures”, Hebei University of Technology, Tianjin, China, July 2012 **(Invited)**
105. “Modeling of Nanomaterials and Structures”, Hebei University of Technology, Tianjin, China, July 2012 **(Invited)**
106. “Nitrogen-doped Carbon Nanomaterials as Efficient Catalytic Electrodes for Fuel Cells”, Beijing University of Chemical technology, Beijing, China, June 2012 **(Invited)**
107. “Carbon Nanomaterials for Bio-inspired Functional Structures and Clean Energy”, Hebei University of Technology, Tianjin, China, June 2012 **(Invited)**
108. “Fabrication of Tunable 3D Nanotube Architectures: Multiscale-Multiphysics Modeling”, DoD MURI kickoff meeting, Dayton, 1/2012
109. “Bioinspired Design of Carbon Nanomaterials for dry adhesives”, University of Texas – Arlington, 3/2012, (Arlington, Texas) **(Invited)**
110. “Bio-inspired Design of Materials for Engineering Applications”, Northwestern Polytechnic University, 6/2011, (Xi’an, China) **(Invited)**

111. "Real-Time, In-situ Sensing of Ulnar Nerve Strain for Injury Prevention and Diagnosis", ABIA Annual meeting, 8/2011 (Akron, OH)
112. "Modeling of Nitrogen-Doped Graphene as efficient Catalysts for Fuel Cells", ASME Congress, 11/2011 (Denver, CO)
113. "Measurement of the Interfacial strength between Carbon Nanotubes and Polymer Matrix by a Micro-pullout Test", ASME Congress, 11/2011 (Denver, CO)
114. "The Effect of Dynamic Digital Hyperextension on the Self-cleaning Ability of Gecko's Foot Pad", ASME Congress, 11/2011 (Denver, CO)
115. "Mechanical Behaviors of Peripheral Nerves", ASME Congress, 11/2011 (Denver, CO)
116. "Crack-Interface Interaction in Carbon Nanotube-Reinforced Amorphous Carbon Matrix Composites", MRS 2011, 12/2011, Boston, MA
117. "Nitrogen-doped Carbon Nanomaterials as Efficient Electrocatalytic Electrodes for Fuel Cells", Northwestern Polytechnic University, 12/2011, (Xi'an, China) **(Invited)**.
118. "Frictional adhesion enhancement in carbon nanostructures", 3rd International Conference on Heterogeneous Material Mechanics (ICHMM-2011) May 22-26, 2011, Shanghai
119. "Integrated Studies of Interfaces in Nanocomposites and Nanoimprinting", NSF CMMI Annual Meeting 1/2011, Atlanta.
120. "Carbon-based nanomaterials for clean energy conversion and functional structures", Northwestern Polytechnic University, 12/2010, (Xi'an, China) **(Invited)**
121. "Mechanical properties of nerve fibers measured by AFM," *ASME Congress*, 11/10, (Vancouver, BC, Canada)
122. "Electro-mechanical Behavior of Polymer Brushes for Smart Nanovalves: Molecular Dynamics Simulation," *ASME Congress*, 11/10, (Vancouver, BC, Canada)
123. "Friction and Adhesion Behavior of Single-Walled Carbon Nanotube on Nano-Roughness Surface," *ASME Congress*, 11/10, (Vancouver, BC, Canada)
124. "Interfacial Friction of Carbon Nanotubes in Nanocomposites and Biomimetic Nanostructures", NASA Glenn Research Center, 10/2010, (Cleveland, OH) **(Invited)**
125. "Nanomaterials - An Overview and Some Applications of Interest to Diebold", *Diebold Technology*, 8/10, (Canton, OH) **(Invited)**
126. "Bioinspired Design of Nanomaterials for Dry Adhesives", *University of North Texas*, 5/10, (Denton, TX) **(Invited)**
127. "Biologically Inspired Design of Nanomaterials for Dry Adhesives", *Nano-Bio: The Next Transformative Convergence*, 10/09, (Roanoke, VA) **(Invited)**
128. "Design of Fiber/Coating Systems for High Strength in Ceramic Matrix Composites," 7/09, (Northwestern Polytechnic University, Xi'an, China) **(Invited)**
129. "Multiscale Models of Damage Accumulation and Failure in Fiber-reinforced Composites," 7/09, (Northwestern Polytechnic University, Xi'an, China) **(Invited)**
130. "Multifunctional composites for damage detection and life prediction," 7/09, (Northwestern Polytechnic University, Xi'an, China) **(Invited)**

131. “Biologically Inspired Nanomaterials for Dry Adhesives, 7/09, (Hefei University of Technology, Hefei, China) **(Invited)**
132. “Biomimetic Nanomaterials for Dry Adhesives, 7/09, (Northwestern Polytechnic University, Xi’an, China) **(Invited)**
133. “Mechanical Properties of Nanofiber reinforced ceramic composites, 6/09, (Northwestern Polytechnic University, Xi’an, China) **(Invited)**
134. “Biologically Inspired Design of Nanomaterials for Dry Adhesives, 6/09, (Shanghai Jiaotong University, Shanghai, China) **(Invited)**
135. ” Frictional and Adhesion Force of Nanotube Arrays for Biomimetic Dry Adhesives,” *ASME Congress*, 11/08, (Boston, MA)
136. “Damage Detection in Ceramic Matrix Composites Using Electrical Resistivity”, *ASME Congress*, 11/08, (Boston, MA)
137. “Mechanical Properties of Nanofiber composites: Modeling and Experiment ”, College of Polymer Science and Polymer Engineering, University of Akron, 4/08, (Akron, OH) **(Invited)**
138. “Electrical Resistance of Ceramic Matrix Composites for Damage Detection and Life-Prediction” 32nd International Conference & Exposition on Advanced Ceramics and Composites, 1/08, (Daytona, FL)
139. “Multiscale Modeling of Carbon Nanotube Adhesion for Dry Adhesives”, MRS Fall Meeting, 11/07 (Boston, MA)
140. “Nano-contact and Adhesion Force of Nanotube Arrays for Biomimetic Dry Adhesives”, *ASME Congress*, 10/07, (Seattle, WA)
141. “Multiscale Models of Multifunctional Composites for On-Board Damage Detection and Failure Prevention”, AFOSR Annual meeting, 6/07 (Monterey, CA)
142. “Novel Micro-nano hybrid braided fabric composites”, Ohio Aerospace Institute, 5/07, (Cleveland, OH) **(Invited)**
143. “Biologically Inspired Nano-Contact and Adhesion of Fibrillar Nanostructures ”, College of Polymer Science and Engineering, University of Akron, 4/07, (Akron, OH) **(Invited)**
144. “Models of Multifunctional Composites for Damage Detection and Life Prediction”, NASA Glenn Research Center, 3/07, (Cleveland, OH) **(Invited)**
145. “Multiscale Modeling of Frictional Behavior of Highly-Ordered Carbon Nanotube/Ceramic Nanocomposites”, *ASME Congress*, 10/06, (Chicago, IL)
146. “Multiscale Modeling of Carbon Nanotube Adhesion for Dry Adhesives”, MRS Fall Meeting, 11/06 (Boston, MA)
147. “Modeling of Frictional Behavior of Highly-Ordered Carbon Nanotube/Ceramic Nanocomposites”, MRS Fall Meeting, 11/06 (Boston, MA)
148. “Multiscale Models of Multifunctional Composites for On-Board Damage Detection and Failure Prevention”, AFOSR Annual meeting, 9/06 (Seattle, WA)
149. “Tribological Testing and Modeling of Highly-Ordered Nanotube/Ceramic Nanocomposites”, *ASME Congress*, 11/05, (Orland, FL)

150. "Damage detection in CFRP by electric resistance change", *ASME Congress*, 11/05, (Orland, FL)
151. "Atomistic Simulations of Carbon Nanotube Buckling", *ASME Congress*, 11/05, (Orland, FL)
152. "Multiscale Modeling of Composite Materials", Qualcomm Research Center, 10/05 (San Jones, CA).
153. "Multiscale modeling of multifunctional composites as damage detection sensor", 8/05, US AFOSR (Santa Fe, NM)
154. "Multiscale Modeling of Composite Materials", Goodyear Research Center, Akron, OH, 5/04
155. "Mechanical Testing and Multiscale Modeling of Toughening in Carbon-Nanotube Ceramic Composites", University of Akron, 10/05 (Akron, OH)
156. "Multiscale Modeling of Fatigue Crack Growth and Life Prediction of Composite Materials", Michelin Technical Research Center, 5/05 (Greenville, SC). **(Invited)**
157. "Mechanical Testing and Multiscale Modeling of Toughening in Carbon-Nanotube Ceramic Composites", Saint Louise University, 4/05 (Saint Louise, MO)
158. "Multiscale Modeling of Carbon-Nanotube Ceramic Composites", University of North Carolina at Charlotte, 3/05 (Charlotte, NC)
159. "Mechanical properties of carbon nanotube reinforced composites," Carbon'04, 6/04 (Providence, RI).
160. "Modeling of fiber reinforced composites," Holtec, 7/04 (Trenton, NJ). **(Invited)**
161. "A new method for the measurement of fracture toughness of thin film", MRS, 12/03 (Boston, MA).
162. "Mechanical properties of nanotube/alumina composites", International Conference on nanomaterials and Nanotechnology, 8/03 (Crete, Greece).
163. "Mechanical behavior of ceramic coatings reinforced with carbon nanotubes", MRS, 12/02 (Boston, MA).
164. "Quantitative Damage Detection in CFRP Composites: Coupled Mechanical and Electrical Models", ASME Congress, 11/02 (New Orleans, LA).
165. "Shear-lag vs. FEM and Green's function models for composite failure", Am. Soc. Comp., 9/01 (Blacksburg, VA).
166. "Design of fiber/coating systems for high strength in ceramic matrix composites", 25th Annual Conference of American Ceramics Society 01/01 (Cocoa Beach, FL).
167. "Tough to Brittle Transitions in Ceramic Matrix Composites with Increasing Interfacial Shear Stress", *ASME Congress*, 11/00, (Orland, FL)
168. "Computer Simulation for Advanced Materials", *Hebei University of Technology*, January 11, 2000 (Tianjin, China) **(Invited)**
169. "Modeling of Fatigue in SiC Fiber reinforced Titanium Alloys", *German Aerospace Center*, 3/25/98 (Cologne, Germany)

170. “Fracture and life of Titanium matrix composites subjected to fatigue loading”, 4th *International Conference on Engineering Structural Integrity Assessment*, 9/98 (Cambridge, UK).
171. “Modeling of multiple cracking interaction and its influence on the strength of single fibre composites” 9th *International Conference on Modern Materials & Technologies*, , 6/98 Florence, Italy
172. “Modeling of Fatigue crack growth in SiC-fiber reinforced Titanium alloy”, 8th *International Workshop Computational Mechanics of Materials*, , 10/98 (Stuttgart, Germany)
173. “Effects of Fiber Distribution and Temperature on Solidification Microstructure of Metal Matrix in Fiber-Reinforced Composites” *China-Japan International Conference on Casting Engineering’94*, 9/1994 (Beijing, China)
174. “Fabrication of fiber-reinforced composites by variable-pressure infiltration”, Beijing Aeronautic and Astronautic University, May 18, 1994 (Beijing China)
175. “Infiltration Analysis and Fabrication of Fiber-Reinforced Metal Matrix Composites by Low-Pressure Casting”, *Germany-China Symposium on Engineering Materials*, 10/91 (Beijing China)

V. Funding Efforts

A. External Funding:

1. **Co-PI, Project Title:** Supplement GOALI: Friction Stir Join-ing of Bulk Metallic Glasses and Their Composites **Sponsor:** National Science Foundation - NSF **Project Period:** 7/13/2020 - 6/30/2021 **Award:** \$70,000.00 (with PI Sundeep Mukherjee)
2. **Co-PI**, GOALI: Friction Stir Joining of Bulk Metallic Glasses and Their Composites, NSF CMMI, 1762545, **\$369,296**, July 15, 2018-July 14, 2021(with PI Sundeep Mukherjee)
3. **PI**, *Electromechanics of Bioinspired Switchable-Surface Nanocomposites*, NSF CMMI-1662288, **\$ 398,335**, Sept. 2017- Aug. 2021.
4. **Co-PI**, *Technical Proposal for Advanced Ballistics Technology Materials Development, Characterization and Computational Modeling Activities*, US Army Research Laboratory (ARL), ARLBAA_W911NF-12-R-0011-03-Mod_26MAR15, **\$5,952,508**, October 1, 2016-February 30, 2020 (with R. Misha, Lead PI)
5. **Co-PI**, *Cold Spray Coatings*, US Army Research Laboratory, W911NF-15-2-0026, **\$100,000**, (total award: \$6,935,610), August 31, 2015-August 30, 2018 (with J. Du, R. Misha, PI, Dr. David Luzzi, Northeastern University)
6. **Co-PI**, *Nanomanufacturing of Hierarchical Metallic Glasses as High-performance Electrocatalysts*, NSF CMMI-1561886, **\$316,000**, Sept. 1, 2016- Aug. 31, 2021 (with PI Sundeep Mukherjee)

7. **PI**, REU Supplement: *Collaborative Research: Nanomanufacturing of High-Performance Graphene-Based Catalytic Electrodes for Renewable Energy*, NSF CMMI-1545153, **\$5,000**, 2015- 2017
8. **PI**, REU Supplement: *Collaborative Research: Multifunctional Nanocomposites with Reversible Switch and Controlled Release Surfaces*, NSF CMMI-1547089, **\$5,000**, 2015- 2016
9. **SP, MRI**: Acquisition of a Computer Cluster for the Computational Chemistry Program at the University of North Texas, NSF CHE- 1531468; **\$400,000**, 2015-2018, **PI**: Thomas Cundari
10. **PI**, *Collaborative Research: Nanomanufacturing of High-Performance Graphene-Based Catalytic Electrodes for Renewable Energy*, NSF CMMI-1363123, **\$212,314**, 2014- 2017
11. **PI**, *Collaborative Research: Multifunctional Nanocomposites with Reversible Switch and Controlled Release Surfaces*, NSF CMMI-1266319, **\$369,000**, 7/1/2013- 6/30/2016 (with Dr. Dai at CWRU)
12. **Co-PI, PFI: AIR (Technology Translation) Low-cost, Metal-free, Carbon-based Oxygen Reduction Catalysts for Highly-efficient Fuel Cells**, NSF, IIP- 1343270, **\$150,000**, 2013 – 2015. (with Dr. Dai at CWRU)
13. **Co-PI**, *Tunable 3D Nanotube Architectures*, **DoD MURI**, FA9550-12-1-0037, **\$7,000,000**, 2011-2016. (with Dr. Dai as PI at CRWU),
14. **PI**, REU Supplement: *Integrated Studies on the Interfaces in Nanocomposites and Nanoimprinting*, NSF, CMMI- 1242879, **\$6,000**, 2012- 2014
15. **PI**, *Integrated Studies on the Interfaces in Nanocomposites and Nanoimprinting*, NSF, CMMI-0825990, **\$250,000**, 2008- 2014 (with Dr. Jianyu Liang at WPI)
16. **PI**, *MRI: Acquisition of an AFM/Raman Integrated System for Bio/Nano Functional Materials and Devices Research and Education*, NSF MRI-0923053, total: **\$372,000**, 2009 - 2010.
17. **PI**, *Real-Time, In-situ Sensing of Ulnar Nerve Strain for Injury Prevention and Diagnosis*, Austen BioInnovation Institute, **\$100,000**, 2010 - 2012
18. **PI**, *Damage Detection and Life Prediction Methodology for Ceramic Matrix Composites: Experiments and modeling*, NASA-GSRP, **\$60,000**, 2007-2009.
19. **Co-PI**, *The Mechanistic Study on N-doped Carbon Nanomaterials as Highly Efficient Cathode for Fuel Cells*, NSF CMMI-1000768, **\$420,000**, 6/01/2010-5/31/2013, (with Dr. Dai, and Dr. Liu, Cast Western Reserve University)
20. **Co-PI**, Phase I STTR (#N10A-T010) with NAVAIR on "Analysis and Modeling of Foreign Object Damage (FOD) in Ceramic Matrix Composites (CMC's)". AlphaSTAR Corporation (with Dr. Morscher), **\$100,000**, 2010-2011.

21. **Co-PI**, *Physics-based Life Prediction Model Incorporating Environmental Effects for SiC/SiC Ceramic Matrix Composites, Phase I*, **Air Force SBIR, \$100,000**, (with Dr. Morscher, University of Akron), 2010-2011.
22. **Co-PI**, *Physics-Based Multiscale Modeling of Multifunctional Nanoceramic Composites for Subsonic Engine Components*, **NASA NAR 06-SSFW2-0043, \$703,012**, 2007-2011. (with W.A. Curtin, Brown University)
23. **Co-PI**, *Multiscale Models of Multifunctional Composites for On-Board Damage Detection and Failure Prevention*, **AFOSR-DARPA FA9550-04-1-0402, \$400,000**, 2007-2008. (with W.A. Curtin, Brown University)
24. **Subcontractor**, *AFOSR STTR Phase I: Damage Detection via electrical resistance in CFRPs: Modeling Task*, **IMPACT Technologies Inc., 2004, \$100,000**
25. **Subcontractor**, *AFOSR STTR Phase II: 3D Parametric Models of damage detection in CFRP components*, **IMPACT Technologies Inc., 2005, \$500,000**
26. **PI**, “*Fatigue behavior of Titanium matrix composites*,” **Alexander von Humboldt Foundation**, Germany, 1999-2000, **\$50,000**.
27. **PI**, “*Preparation of Layered Composites through Bionics Approaches*,” **Hebei Natural Science Foundation**, China, 1996-97, **¥60,000**.
28. **PI**, “*Micromechanics analysis of crack propagation and toughening mechanisms in layered composites*,” **Tianjin Science and Technology Association**, 1996-97, China, **¥17,000**.
29. **PI**, “*A Variable-Pressure Casting Technology for Aluminum Alloys*,” **Hebei Province Department of Science and Technology**, China, 1993-95, **¥50,000**.
30. **PI**, “*Variable-Pressure Infiltration of Al-Matrix Composites*,” **Hebei Province Education Department**, China, 1991-92, **¥50,000**.
31. **PI** “*Fabrication of Al- and Mg-Matrix Composite by Pressure Infiltration*,” **National Natural Science Foundation**, China, China, 1990-91, **¥30,000**.
32. **PI**, “*Variable-Pressure Casting of Aluminum Motor Wheel*,” **Huacang Inc. (Group)**, 1994, China, **¥800,000**
33. **PI**, “*Production line of Variable-Pressure Casting for Aluminum Alloys*,” **Shengli Aluminum Company**, China, 1995, **¥820,000**
34. **PI** “*Variable-Pressure Casting Technology and Equipment*,” **Hengshui Aluminum Product Corporation, China**, 1995, **¥670,000**
35. **PI** “*Variable-Pressure Casting and molding Design for Aluminum Motorcycle Parts*,” **Weichang Corporation**, China, 1996, **¥600,000**
36. **PI**, “*Design of Variable-Pressure Casting Machine*”, **Behai Oil Inc.**, China, 1996, **¥100,000**

B. Internal Funding:

1. **PI**, *Strengthening Research Collaboration and Student Exchange with Top University and Material Programs in China*, UNT, \$13,000, Sept. 2016-Aug. 2017
2. **PI**, *The Second International Conference on Metallic Metals and Processing*, UNT, \$10,000, Jan. 2014-Oct. 2014
3. **PI**, *Biomimetic design of Gecko feet*, UNT, \$10,000, Sept. 2013-Aug. 2014
4. **PI**, *Biomimetic Design of Flight Muscle*, UA Summer Faculty Research Fellowship, \$10,000, April, 2009
5. **PI**, *Adhesion and Self-Cleaning of Gecko and Bio-mimetic Adhesives*, UA, \$8,000, April, 2007
6. **PI**, *Measurement of the Interface in Nanocomposites*, COE, \$6, 500, June, 2007

VI. Teaching

A. Courses Taught:***Undergraduate Courses at UNT:***

1. MTSE3100 *Materials Science and Engineering LAB I*
2. MTSE4600 *Computational Materials Science*
3. MTSE4040 *Transport Phenomena in Materials Science*
4. MTSE4020 *Materials in Medicine*

Graduate Courses:

1. MTSE5100 *Principles of Materials Science and Engineering*
2. MTSE5400 *Advanced Polymer Chemistry and Physics*
3. MTSE5710 *Computational Materials Science*

Undergraduate Courses at U. Akron:

6. ME4600:336 *Analysis of Mechanical Components*
7. ME4600:260 *Engineering Analysis –I*
8. ME4600:484 *Mechanical Engineering Lab: Rapid manufacturing*

Graduate Courses at U. Akron:

9. ME4600:609-801 *Finite Element Analysis I*
10. ME4600:690-804 *Special Topic: Multiscale and Multiphysics Modeling*

Courses taught at Hebei University of Technology

11. Metal Matrix Composites (undergraduate)
12. Metal Solidification and Casting (undergraduate)
13. Energy, Mass and Moment Transfer (graduate)

14. Mechanical Design (undergraduate)

B. Course Development

1. Special Topic: Multiscale and Multiphysics Modeling (Graduate level, UA)
2. Metal Matrix Composites (undergraduate) (at Hebei University of Technology)
3. Materials Science and Engineering Lab II –Computational Materials Science module (undergraduate)

C. Graduate Students

1. Graduated Students

<i>Name</i>	<i>Degree – year</i>	<i>Positions after graduation</i>
Y. Gao	Ph.D 2020	Associate Professor, Xi'an Technological University
K. Wang	Ph.D 2019	Assistant Professor, Behang University
Y. Wan	Ph.D 2019	Research Scientist, Applied Materials Inc., CA
C. Lin	Ph.D 2018	Research Scientist, U.S. Food and Drug Administration (FDA)
Z. Zhao	Ph.D 2017	Research Associate, Stanford University
M. Uddin	Ph.D 2016	Assistant Professor, University of Texas of the Permian Basin
C. Xia	Ph.D. 2015	Professor, Nanjing Forestry University (co-advisor)
C. Smith	Ph.D-2014	Research scientist, NASA Glenn Research Center, OH
J. Niu	Ph.D-2014	Research scientist, Samsung Research America (SRA), CA
T. Sujidkul	Ph.D-2014	Lecture, University of Florida, FL
Q. Xu	Ph.D-2013	Professor, China Petroleum University, Beijing
L.P. Zhang	Ph.D-2013	Associate professor, Beijing University of Chemical Technology
L. Li	Ph.D-2013	Associate professor at Donghua University of Technology, China
S.H. Hu	Ph.D-2012	Assistant professor at California State University at Los Angeles
J. Wen	Ph.D.-2011	Research Engineer, Steven & Associates Inc., OH
J. Zhang	Ph.D.-1999	Professor at Shanghai Jiaotong University, China
Y. Shen	M.S.-2020	Engineer of China Petroleum and Chemical Management Co.
J. Ma	M.S.-2020	Engineer of Sailun Group Co.
H. Ouyang	M.S.-2010	Assistant Professor at University of Texas, Dallas
C. Smith	M.S.-2009	Research scientist at NASA Glenn Research Center , OH
X.F. Mo	M.S.-1999	Group leader at Beijing Institute of Aerospace Materials, China
Y.Z. Zhao	M.S.-1997	Professor of Anyang University of Technology, China

2. Current Students

Ph.D. Devendra Ray	January 2021-
Ph.D. Jie Wang	September 2019-

Ph.D. Xiaowei Wang September 2019-
 Ph.D. Yu-Chia Yang January 2017-

3. Postdoctoral Research Associates/Visiting Scholars

Tao Zheng	2019- 2020	Northwestern Polytechnical University, Xi'an, China
Yong Gao	2016-2018	Northwestern Polytechnical University, Xi'an, China
Yiyang Wan	2019-2020	UNT.
Chun-Yu Lin	2019-2020	UNT.
Lili Li	2007-2012	Fujian University of Technology, China
Zhijun Ma	2010-2012	Xi'an polytechnical University, China
Mingtao Li	2012-2014	Xi'an Jiaotong University, China
Lipeng Zhang	2013-2014	University of Tennessee
Haitao Jiang	2015-2016	Beijing University of Science and Technology, China
Jinlong Tang	2016-2017	Southwestern University of Technology, China
Zhichao Li	2016-2017	Beijing University of Science and Technology, China
Yong Zhang	2017-2018	Dalian JiaoTong University, China
Cuixia Liu	2017-2018	Xi'an University of Technology, China
Yingying Liu	2017-2018	Changan University, Xi'an, China
Jing Zhang	2017-2018	Northwestern Polytechnical University, Xi'an, China
Jianjun Zhang	2018-2019	North China Electrical University, Beijing, China

4. Undergraduate Academic advisor

- | | | |
|--------------------|--------------------------|------------------------|
| • Joe Taras | Dominic Ortega | Bitten Reid |
| • Ryan Stump | Ryu Jihun | Aku Banini |
| • Kimberly Saviers | Rudy Arce | Yuzhe Li (2019-) |
| • Jeff Klein | Randa Franzen | Advik Chesetti (2019-) |
| • Ben Weber | Licha Tancharoensuksavai | |
| • Tim Moore, | Calvin Mikler | |
| • Michael Stack | Xiaowei Wang (2016-2019) | |
| • Tyler Hunt | Yuele Wang (2018-2019) | |

5. High school student at Texas Academy of Mathematics and Science (TAMS)

- Jerry Liu (TAMS 2019-)
- Jason Dsouza (high school 2016-2017)
- Daniel Zhong (TAMS 2015-2016)
- Tony Liu (TAMS 2014-2015)
- Kelvin Ong (TAMS 2013-2014)
- Justin Zhong (TAMS 2012-2013)
- Mathews Roy (TAMS 2012-2013)

VII. Professional Activities

A. Professional Society Affiliations

- American Society of Mechanical Engineers (ASME)
- American Society for Composites
- Materials Research Society (MRS)
- The Minerals, Metals, and Materials Society (TMS)
- American Chemical Society (ACS)

B. Department Committee Service at UNT

- Faculty Search Committee 2018-2019
- Faculty Annual Review Committee 2018
- Chair of Search Committee for faculty position, 2015-2016
- ABET committee at UNT
- Graduate Advisory Committee
- Undergraduate Advisory Committee
- Qualifier exam committee
- Faculty search committee of computational materials science cluster
- Committee of graduate thesis
- Strategic plan committee

C. College/University Committees Service

- College White Paper Review 2020
- College White Paper Review 2018
- College RTP committee at UNT, 2011-2016
- College Teaching and Research Award committee, 2016
- Department Chair Reappointment Committee, 2015
- University Committees: Hebei University of Technology
- University Promotion/Tenure Candidate Evaluation Committee, Hebei University of Technology 1995-1997
- Promotion/Tenure Candidate Evaluation Committee of Materials Department, chairperson, Hebei University of Technology 1995-1997
- University Academic Committee for recommendations of grant funding, Hebei University of Technology 1995-1997.
- University Academic Degree Evaluation Committee, Hebei University of Technology 1995-1997

D. Technical Committees and Conferences Organized

- Advisory Board Member at the “International Conference on Chemical Engineering & Catalysis (Chemicat-2020)”, Washington DC, March 1-3, 2021
- Chair of organization Committee, 2018 International Symposium on Multi-scale Modeling and Simulation of Materials, Xi'an, 2018

- Organization Committee, International Conference of Metallic Materials and Processing (ICMMP-2018),
- Chair of Multifunctional Materials Technical Committee, Materials Division, ASME, 2015-2016
- Vice Chair of Multifunctional Materials Technical Committee, Materials Division, ASME, 2014-2015
- Member of Organization Committee, 22nd International Conference on Advanced Materials and Nanotechnology, Osaka, Japan, 2017
- Member of Organization Committee, International Conference of Metallic Materials and Processing (ICMMP-2016),
- Chair of Organization Committee, International Conference of Metallic Materials and Processing (ICMMP-2014),
- Member of Organization Committee, International Conference of Metallic Materials and Processing (ICMMP-2012),
- Member of Multifunctional Materials Technical Committee, ASME Materials Division, 2006-present
- Member of Mechanics of soft materials Technical Committee, ASME Materials Division, 2010-present
- Topic organizer, 2012 ASME International Mechanical Engineering Congress & Exposition
- Session Chair, ICCSE-2019, Tokyo, Japan, 2019
- Session Chair, Micro-Nano Conference, Shanghai, China, 2017
- Session Chair, SIPS conference, Cancun, Mexico, 2017
- Session Chair, Bio-inspired materials and structures, ASME conference, 2007-2021
- Session Chair, Materials for Energy Applications, ASME conference, 2010-2021
- Session Co-Chair, Mechanics of Soft Materials, ASME conference, 2010
- Session Co-Chair, 3rd International Conference on Heterogeneous Material Mechanics (ICHMM-2011) May 22-26, 2011, Shanghai

E. Reviews: Technical Papers

1. ACS Nano
2. ACS Sustainable Chemistry & Engineering
3. ACS Applied Materials and Interfaces
4. Advanced Materials
5. Advanced Energy Materials
6. Advanced Functional Materials
7. ASME Journal of Applied Mechanics,
8. ASME Journal of Engineering Materials and Technology,
9. ASME conference
10. Composites Part A

11. Composites Part B
12. Composite Science and Technology
13. Computational Materials Science
14. Electrochemistry Communications
15. Extreme Mechanics Letters
16. Frontiers in Materials
17. International Journal of Applied Mechanics
18. ISRM Materials Science
19. Ionics
20. Joule
21. Journal of Materials Science
22. Journal of Aerospace Engineering
23. Journal of Materials Chemistry A
24. Journal of Materials Processing Technology
25. Journal of Hydrogen Power
26. Journal of Computing in Civil Engineering
27. Journal of Reinforced Plastics and Composites
28. Journal of Chemical Physics
29. Journal of Physics D: Applied Physics
30. Journal of the Mechanics and Physics of Solids
31. Langmuir
32. Materials Chemistry and Physics
33. Modelling Simulation Mater. Sci. Eng.
34. Nature
35. Nature Communications
36. Nature Energy
37. Nanoscale
38. Nanotechnology
39. Nano Letters
40. Nano Energy
41. Nondestructive Testing and Evaluation
42. Polymer Engineering and Science
43. Physical Review B,
44. Physical Review Letter
45. Physical Chemistry & Chemical Physics
46. Science
47. Science Advances
48. Small
49. Renewable & Sustainable Energy Review

F. Reviews: Research Proposals and Panel Review

* European Research Council, ERC Consolidator Grant review 7/2020

- * Hong Kong Research Council 5/2020
- * European Science Foundation, Proposal review, 1/2020
- * NSF Panel Review: MRSEC 9/2019
- * Hong Kong Research Council 4/2019
- * Swiss Science Foundation, proposal review 1/2019
- * NYU Abu Dhabi, proposal review 10/2019
- * NSF Panel Review 10/2018
- * SNSF review 12/2018
- * DOE BES review 3/2018
- * DOE APRA-E review 3/2018
- * Hong Kong Research Council 2/2018
- * The Canada Foundation For Innovation 2/2017
- * NSF CAREER Panel Review: MOM, 10/2017
- * Qiu Shi Outstanding Young Scholar Award review, 4/2017
- * NSF Panel Review: CBET- Catalysis, 9/2016
- * NYUAD Research review committee, 8/2016
- * Proposal review, Pazy Foundation, Israeli, 6/2016
- * Swiss Science Foundation, proposal review 12/2016
- * NSF Panel Review: CMMI-Mechanics of Materials, 2/2015
- * NSF proposal review, 8/2015
- * Hong Kong Research Council 5/2015
- * US Army Research Center, proposal review 2/2015
- * Proposal review, U.S. International Science and Technology Center (ISTC) 5/2015
- * Proposal review, Iceland Foundation, 5/2014
- * Proposal review, U.S. Civilian Research and Development Foundation (CRDF), 4/2014
- * Panel Review: European Science Foundation, Amsterdam, Netherlands 5/2014
- * Proposal review, Hong Kong Research Council, 3/2015, 3/2014, 3/2013
- * NSF Panel Review: CMMI, 1/2013
- * Proposal review, U.S. Civilian Research and Development Foundation (CRDF), 4/2012
- * Proposal review, Research Grant Council (RGC) of Hong Kong, 3/2012
- * NSF Panel Review: CMMI, 10/2012
- * NSF Panel Review: MRI, 6/2010, 6/2011
- * NSF Panel Review: IGERT, 6/2009
- * Peer Review for ERDC (U.S. Army Corps) 3/2010
- * R &D Department of Hebei University of Technology
- * Hebei Natural Science Foundation

G. Community Service

- Chinese Scholar Association, Denton, 2014.
- Workshop for high school teacher, May 2009.
- Served Akron Public School's Science and Technology EXPO as a judge, Feb.2008.

- Served Huacang Cooperation (Group), Huabei Oil field of China, as a Senior Technical Consultant, 1993-1994