

Rong-Guang (Reggie) Xu (徐荣广), Ph.D

Department of Mechatronics Engineering and Physics & Engineering Physics, Morgan State University, Baltimore, MD, 21251

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Education

George Washington University	Mechanical & Aerospace Engineering	Ph.D.	May 2017
Johns Hopkins University	Materials Science & Engineering	M.S.E.	May 2012
Johns Hopkins University	Physics	M.A.	May 2012
Texas A&M University	Condensed Matter & Solid-State Physics	M.S.	May 2007
Wuhan University	Applied Physics	B.S.	Jun 2001

Appointments

Department of Mechatronics Engineering and Physics & Engineering Physics, Morgan State University
Visiting Research Professor 2026/01-present

Division of Thoracic Surgery, Brigham and Women's Hospital and Harvard Medical School
Postdoctoral Research Fellow 2023/01-2025/12
(Jointly supported by Dept. of Biochemistry & Molecular Biology, University of Texas Medical Branch)

Department of Mechanical & Aerospace Engineering, George Washington University
Post-Doctoral Scientist 2020-2022

Department of Mechanical & Aerospace Engineering, George Washington University
Research Associate 2017-2020
(Jointly supported by Dept. of Mechanical & Aerospace Engineering, West Virginia University)

NSF and AccelerateGW Innovation Corps (I-Corps™) Teams: Compression and Friction Properties of Lubricants in Boundary Lubrication
Entrepreneurial Lead (EL) 2018-2019

Department of Mechanical & Aerospace Engineering, West Virginia University
Adjunct Assistant Professor 2017-2019

Department of Mechanical & Aerospace Engineering, George Washington University
Professional Lecturer: MAE 6239 "Computational Nanosciences" Fall 2022
Professional Lecturer: MAE 6239 "Computational Nanosciences" Fall 2021
Professional Lecturer: MAE 6239 "Computational Nanosciences" Fall 2020
Professional Lecturer: MAE 6207 "Theory of Elasticity" Fall 2019
Professional Lecturer: MAE 6239 "Computational Nanosciences" Fall 2018

Complete Publication List

1. Fan Liu, Xihang Jiang, Guangyu He, **Rong-Guang Xu**, Zi Chen, and Lifeng Wang, "Machine Learning-Based Multi-Point Load Sensing for Smart Skins", **Advanced Materials Technologies**, e00768 (2025)
2. Fan Bai, An Yan, Yifan Fu, Israr Khan, Yueye Huang, Fei Cao, Gbenga A Martins, **Rong-Guang Xu**, Xin Lin, Ruixue Wang, Zhitong Chen, "Acoustic Cavitation-Assisted Plasma Generation in Liquid Media", **Advanced Materials Technologies**, e00719 (2025)

3. Mohammad E. Torki, Fan Liu, **Rong-Guang Xu**, Yunfeng Chen, Jeffery Fredberg, and Zi Chen, “Bridging the Gap in Cancer Cell Behavior Against Matrix Stiffening: Insights from a Trizonal Model”, **eLife** 14 (2025)
4. Yuan Xiang, Lei Lu, Ye Luo, **Rong-Guang Xu**, Guangyong Zeng, Yongsheng Leng, "Understanding the Termination Effect of $\text{Ti}_3\text{C}_2\text{T}_x$ MXene Membrane on Water Structure and Interaction with Alginate Foulants: A Molecular Dynamics Study”, **Langmuir**, **41**, 975 (2025).
5. Shilu Wang, Rongqing Geng, **Rong-Guang Xu***, “An Overview of Generative Artificial Intelligence in Medical Education”, **Journal of the College of Physicians and Surgeons--Pakistan: JCPSP**, **35**, 793-796 (2025) (* corresponding author)
6. Misbahud Din, Souvik Paul, Sana Ullah, Haoyi Yang, **Rong-Guang Xu**, Nurul Aisha Zainal Abidin, Allan Sun, Yiyao Catherine Chen, Rui Gao, Bari Chowdhury, Fangyuan Zhou, Stephenie Rogers, Mariel Miller, Atreyee Biswas, Liang Hu, Zhichao Fan, Christopher Zahner, Jing Fan, Zi Chen, Megan Berman, Lingzhou Xue, Lining Arnold Ju, and Yunfeng Chen, “Multi-parametric Thrombus Profiling Microfluidics Detects Intensified Biomechanical Thrombogenesis Associated with Hypertension and Aging”, **Nature Communication**, **15**, 9067 (2024).
7. **Rong-Guang Xu***, Gunan Zhang, Tianchen Liu, Yuan Xiang, and Yongsheng Leng*, “On the Nucleation Rate of Confinement Induced Liquidlike-to-Solidlike Phase Transitions”, **Lubricants**, **12**(12), 420 (2024) (* corresponding author)
8. Joseph Sutlive, Betty Liu, Stacey Kwan, Jennifer Pan, Kun Gou, **Rong-Guang Xu**, Ali Ali, Hassan Khalil, Maximilian Ackermann, Zi Chen, and Steven Mentze, “Buckling Forces and the Wavy Folds between Pleural Epithelial Cells” **BioSystems**, **240**, 105216 (2024).
9. Gunan Zhang, **Rong-Guang Xu**, Yuan Xiang, and Yongsheng Leng, "Contact Stiffness and Damping in Atomic-Scale Friction: An Approximate Estimation from Molecular Dynamics Simulations" **Tribology Letters**, **72**, 24 (2024).
10. **Rong-Guang Xu**, Gunan Zhang, Yuan Xiang, and Yongsheng Leng, “On the Friction Behavior of SiO_2 Tip Sliding on the Au(111) Surface: How Does an Amorphous SiO_2 Tip Produce Regular Stick-Slip Friction and Friction Duality?” **Langmuir**, **39**, 6425 (2023).
11. Xuanling Zhou, Peijian Chen*, **Rong-Guang Xu***, Cun Zhang, Jiazhen Zhang “Interfacial Friction of vdW Heterostructures Affected by In-Plane Strain” **Nanotechnology**, **34**, 015708 (2023). (* corresponding author)
12. **Rong-Guang Xu**, Gunan Zhang, Yuan Xiang, Jonathon Garcia, and Yongsheng Leng, “Will Polycrystalline Platinum Tip Sliding on a Gold(111) Surface Produce Regular Stick-Slip Friction?”, **Langmuir**, **38**, 6808 (2022).
13. **Rong-Guang Xu***, Zhitong Chen, Peijiang Chen and Guangjian Peng, “Special Issue: Mechanical Properties of Advanced Multifunctional Coatings”, **Coatings**, **12**(5), 599 (2022). (* corresponding author)
14. **Rong-Guang Xu***, Yuan Xiang, Gunan Zhang, Qi Rao, and Yongsheng Leng, “Nucleation of Frank Dislocation during the Squeeze-Out Process in Boundary Lubrication: a molecular dynamics study”, **Materials**, **15**(3), 997 (2022). (* corresponding author)
15. Yuan Xiang, **Rong-Guang Xu**, and Yongsheng Leng, “How Alginate Monomers Contribute to Organic Fouling on Polyamide Membrane Surfaces?”, **Journal of Membrane Science**, **643**, 120078 (2022)

16. Rofiques Salehin*, **Rong-Guang Xu** and Stefanos Papanikolaou, “Colloidal Shear thickening fluids using variable shaped functional star particles: A molecular dynamics study”, **Materials**, **14**(22), 6867 (2021). (* Master student supervised)
17. **Rong-Guang Xu***, Hengxu Song, Yongsheng Leng and Stefanos Papanikolaou “A Molecular Dynamics Simulations Study of the Influence of Prestrain on the Pop-in Behavior and Indentation Size Effect in Cu Single Crystals”, **Materials**, **14**(18), 5220 (2021). (* corresponding author)
18. Mengzhe Li, Zhikai Wang, **Rong-Guang Xu**, Xiaoliang Zhang, Zhitong Chen, and Qiu Wang “Advances in Plasma-assisted Ignition and Combustion for Combustors of Aerospace Engines”, **Aerospace Science and Technology**, **117**, 106952 (2021).
19. **Rong-Guang Xu***, Qi Rao, Yuan Xiang, Motong Bian and Yongsheng Leng “Computational Simulations of Nanoconfined Argon Film through Adsorption-Desorption in a Uniform Slit Pore”, **Coatings**, **11**(2), 177 (2021). (* corresponding author)
20. Dayu Ye, Guannan Liu, Feng Gao, **Rong-Guang Xu**, Fengtian Yue “A Multi-field Coupling Model of Gas Flow in Fractured Coal Seam”, **Advances in Geo-Energy Research**, **5**(1), 104-118 (2021)
21. **Rong-Guang Xu**, Yuan Xiang, Stefanos Papanikolaou, and Yongsheng Leng, “On the Shear Dilation of Polycrystalline Lubricant Films in Boundary Lubricated Contacts”, **Journal of Chemical Physics**, **152**, 104708 (2020).
22. Yuan Xiang, **Rong-Guang Xu**, and Yongsheng Leng, “Molecular Simulations of Zwitterion/Cations Interactions and Ion Effect on Hydration Behavior of a Zwitterion Brush”, **Langmuir**, **36**, 7648 (2020).
23. Zhitong Chen, **Rong-Guang Xu**, Peijian Chen, Guangjian Peng, and Qiu Wang, “Potential Applications of Self-organized Pattern Cold Atmospheric Plasma-activated Liquids”, **IEEE Transactions on Plasma Science**, **48**, 3455 (2020).
24. Yuan Xiang, Shengjie Gao, **Rong-Guang Xu**, Wenzhuo Wu, and Yongsheng Leng, “Phase Transition in Two-Dimensional Tellurene Under Mechanical Strain Modulation”, **Nano Energy**, **58** 202-210 (2019).
25. **Rong-Guang Xu** and Yongsheng Leng, “Squeezing and Stick-slip Friction Behaviors of Lubricants in Boundary Lubrication”, **Proceedings of the National Academy of Science of the United States of America (PNAS)**, **115**(26) 6560 (2018). (*featured in GW Today: <https://gwtoday.gwu.edu/seas-researchers-tackle-fundamental-science-new-paper>*)
26. **Rong-Guang Xu***, Zhitong Chen, Michael Keidar and Yongsheng Leng, “The Impact of Radicals in Cold Atmospheric Plasma on the Structural Modification of Gap Junction: A Reactive Molecular Dynamics Study”, **International Journal of Smart and Nano Material**, **10**:2, 144-155 (2018). (* corresponding author)
27. **Rong-Guang Xu***, Yuan Xiang, Qi Rao, and Yongsheng Leng, “On the Asymptotic Expressions of Critical Energy Barrier in Prandtl-Tomlinson Model”, **International Journal of Smart and Nano Material**, **10**:2, 107-115 (2018). (* corresponding author)
28. Yuan Xiang, **Rong-Guang Xu**, and Yongsheng Leng, “Molecular Dynamics Simulations of the Hydration Behaviors of a Zwitterion Brush Array and Its Antifouling Property in an Aqueous Environment”, **Langmuir**, **34**, 2245 (2018).
29. **Rong-Guang Xu**, Yuan Xiang, and Yongsheng Leng, “Computational Simulations of Solvation Force and Squeezing Out of Dodecane Chain Molecules in an Atomic Force Microscopy”, **Journal of Chemical Physics**, **147**, 054706 (2017). (*“highly downloaded paper” notice from Journal of Chemical Physics 2018*)

30. Yuan Xiang, **Rong-Guang Xu**, and Yongsheng Leng, “Molecular Dynamics Simulations of a Poly(ethylene glycol)-Grafted Polyamide Membrane and Its Interaction with a Calcium Alginate Gel”, **Langmuir**, **32**, 4424 (2016).
31. **Rong-Guang Xu** and Yongsheng Leng, “Contact Stiffness and Damping of Liquid Films in Dynamic Atomic Force Microscopy”, **Journal of Chemical Physics**, **144**, 154702 (2016). (*“highly downloaded paper” notice from Journal of Chemical Physics 2018*)
32. **Rong-Guang Xu** and Yongsheng Leng, “Solvation Force Simulations in Atomic Force Microscopy”, **Journal of Chemical Physics**, **140**, 214702 (2014). (*outstanding poster competition winner at the Transformational Technologies in Molecular Simulations (TTMS) Workshop, University of Wisconsin, Madison, WI, May 2014*)
33. **Rong-Guang Xu**, Michael L. Falk, and Timothy P. Weihs, “Interdiffusion of Al-Ni Multilayers: A Continuum and Molecular Dynamics Study”, **Journal of Applied Physics**, **114**, 163511 (2013)
34. F. Rizzi. M. Salloum, Y.M. Marzouk, **R.-G. Xu**, M. L. Falk, T. P. Weihs, G. Fritz and O. M. Knio, “Bayesian Inference of Atomic Diffusivity in a Binary Ni/Al System Based on Molecular Dynamics”, **Multiscale Modelling & Simulations**, **9** (1): 486-512 (2011)
35. Yong Ding, **Rong-Guang Xu**, and Bo-Qiang Ma, “Effect of Asymmetric Strange-Anistrange Sea to the NuTeV Anomaly”, **Physics Letters B**, **607**: 102 (2005)
36. Yong Ding, **Rong-Guang Xu**, and Bo-Qiang Ma, “Nucleon Sea in the Effective Chiral Quark Model”, **Physical Review D**, 094014 (2005)
37. Feng Huang, **Rong-Guang Xu** and Bo-Qiang Ma, “Contribution of Sigma Meson Cloud to Proton’s Antiquark Distribution”, **High Energy Physics & Nuclear Physics (Now Chinese Physics C)**, **29** (1): 14 (2005)
38. Feng Huang, **Rong-Guang Xu** and Bo-Qiang Ma, “Sigma Meson Cloud and Proton’s Light Flavor Sea Quarks”, **Physics Letters B**, **602**: 67 (2004)

Book Chapter

39. Tianyu Tang, Yingjie Lu, Fan Bai, **Rong-Guang Xu**, and Zhitong Chen, “Cold Atmospheric Plasma for Biomedical and Agricultural Applications”, In book: **Pulsed Discharge Plasmas: Characteristics and Applications**, pp 761-788 “Part of the book series: Springer Series in Plasma Science and Technology (SSPST)” (2023)

Conference Paper

40. Johan J. Nunez-Quispe, Fan Liu, Vanessa Liu, Adriel A. Gonzales-Martell, Isaac Ming, **Rong-Guang Xu**, Litong Jiang, Haning Xiu, Zi Chen, “Design and Validation of an Origami Paper-Based Gripper”, Proceedings of the ASME 2024 International Mechanical Engineering Congress and Exposition, **IMECE2024-146920**, V010T12A014 (2024)
41. Johan J. Nunez-Quispe, Fan Liu, Isaac Ming, Vanessa Liu, **Rong-Guang Xu**, Litong Jiang, Adriel A. Gonzales-Martell, Haning Xiu, Zi Chen, “Development of a Novel Origami Paper-Based Gripper”, **International Conference on Computational & Experimental Engineering and Sciences** **32**(2):1-2, (2024)

Contribution to Proposal Writing

- University of Maryland - Baltimore Life Science Discovery Accelerator (UM-BILD) proposal: Using Force-Enhanced Adhesion to Improve Nasal Drug Delivery Efficiency (PI: Prof. Zheng Li, Co-PI: **Rongguang Xu** (2025)) (\$30,000 (Cohort 3) funded; \$75,000 (Cohort 4) pending)

- AHA (American Heart Association) Transformational Project Award: Unraveling the Biomechanical Regulation of Platelet Adhesiveness by Membrane Cholesterol in Arterial Thrombosis (PI: Prof. Yunfeng Chen (2025)) (**Funded on 09/2025, \$30,000.00, 07/2025-06/2028**)
- NSF International Space Station (ISS) proposal (Extension): Unveiling the Mechanical Roles of Gravity and Buoyancy in Embryonic Brain and Heart Torsion (PI: Zi Chen (2024)).
- NIH STTR-Phase1: Reusable, Transparent, and Reconfigurable N95-equivalent Respirator Masks: Design, Fabrication, and Trials for Enhanced Adoption (PIs: Alice Chun (SEEUS95 Inc.) and Zi Chen (2024)). (**Funded on 09/2024, \$259,505.00, 09/2024-09/2025**)
- ACS Petroleum Research Fund (ACS PRF) proposal: Phase Behaviors and Shear Properties of Hybrid Nanoconfined Fluids. (PI: Yongsheng Leng (2022)).
- NSF proposal: Unraveling Phase Behaviors and Shear Properties of Base Fluids in Boundary Lubrication. (PI: Yongsheng Leng (2022)).
- NSF proposal: Unraveling Phase Behaviors and Shear Properties of Base Fluids in Boundary Lubrication. (PI: Yongsheng Leng (2021)).
- NSF proposal: Computational Simulation and Cyber Software Development for Nanoscale Friction. (PI: Yongsheng Leng (2020)). (**Funded on 06/22/2020, \$326.429.00, 07/01/2020-06/30/2023**)
- NSF I-Corp: Compression and friction properties of lubricants in boundary lubrication. Recipient as the Entrepreneurial Lead (EL) (PI: Yongsheng Leng, Industrial Mentor: Tsineng (Tony) Ying and David Powell (2019).) (**\$50.000 was funded from 02/15/2019 to 08/15/2019**)
- NSF proposal: Computational nanotribology of liquid films in boundary lubrication. (PI: Yongsheng Leng (2018)).
- NSF proposal: Collaborative Research: Piezotronics in 2D chiral-chain van der Waals solid of Tellurene by experimental and computational studies. (PIs: Yongsheng Leng and Wenzhuo Wu (Purdue U) (2018)).
- NSF proposal: Computational simulation studies of membrane fouling mechanisms and design new antifouling membranes. (PI: Yongsheng Leng (2017)). (**Funded on 07/05/2018, \$293.870.00, 07/15/2018-06/30/2021**)
- NSF proposal: Computational driven dynamics of nanotribology Contacts – A New Computational Tool to Study Friction in Slow Driven Systems. (PI: Yongsheng Leng (2017)).
- NSF proposal: Computer simulations of cold atmospheric plasma anti-cancer therapy. (PIs: Michael Keidar and Yongsheng Leng (2016)).

Teaching Experience

- Professional lecturer: MAE 6239 “Computational Nanosciences” (Fall/2022, GWU, **overall rating 5.0/5.0**)
- Professional lecturer: MAE 6239 “Computational Nanosciences” (Fall/2021, GWU, **overall rating 4.5/5.0**)
- Professional lecturer (additional): MAE 6239 “Computational Nanosciences” (Fall/2020, GWU, with Prof. Yongsheng Leng, **overall rating 4.3/5.0**)
- Professional lecturer: MAE 6207 “Theory of Elasticity” (Fall/2019, GWU, **overall rating 5.0/5.0**)
- Professional lecturer: MAE 6239 “Computational Nanosciences” (Fall/2018, GWU, **overall rating 4.9/5.0**)
- Instructor (additional): MAE 3166 “Materials Science and Engineering” (Fall/2017, GWU)

- WID (Writing in Discipline) teaching assistant and lab engineer: MAE 3167W “Mechanics and Materials Lab” (Spring/2017, Spring/2016, Spring/2015, Spring/2014, GWU)
- Teaching assistant and lab instructor: 171.101 “General Physics I” and 173.111 “General Physics Lab I” (Fall/2007, Fall/2008, JHU)
- Teaching assistant and lab instructor: 171.102 “General Physics II” and 173.112 “General Physics Lab II” (Spring/2008, Spring/2009, JHU)
- Teaching assistant and lab instructor: PHYS 201 and 202 “College Physics” I and II (Fall/2005, Spring/2006, Fall/2006, Spring/2007, TAMU)

Research Interests and Areas of Expertise

- **Multiscale Multiphysics Modeling and Simulation:** Molecular Dynamics (MD) simulations, Monte Carlo (MC) simulations, density functional theory (DFT), quantum chemistry (QC), solid mechanics, dislocation dynamics, continuum contact mechanics, nanomechanics, multiscale materials modeling ranging from quantum to continuum mechanics.
- **Machine-Learning-Based Modeling:** supervised machine learning (classification and regression): Neural Networks, support vector machines, and decision trees. Unsupervised machine learning: Principal component analysis (PCA) and K-Means Clustering.
- **Mechanical Behaviors at Interfaces:** nanotribology with applications in energy, friction, wear, and lubrication. squeezing and shearing behaviors of simple and complex liquid films in nanoscale confined geometry. hydration force and hydrophilic/hydrophobic interactions in the aqueous system.
- **Surface Force Apparatus (SFA) and Atomic Force Microscopy (AFM):** theoretical and computational modeling.
- **Mechano-Medicine:** mechanobiology, vascular biology and biomedicine, force-regulated molecular binding between VWF A1 and GPIIb/IIIa, integrin conformational changes and mechano-signaling.
- **Biomembrane Force Probe (BFP) and High-throughput Microfluidic Platform:** computational modeling
- **Rare Event and Enhanced Sampling method:** metadynamics, umbrella sampling, PCTP (predict-correct trajectory propagation), forward flux sampling.
- **Bio-inspired Structural Design and Analysis:** biomimetic materials/devices
- **Multistable Structure and Metamaterials:** mechanical metamaterials, topological mechanics, Maxwell lattice, origami structures.
- **Plasma Medicine:** computational modeling of plasma-tumor interactions in cancer treatment
- **2D materials:** 2D piezoelectric materials for energy harvesting.
- **Crystal Plasticity:** molecular dynamics simulations of nanoindentation of polycrystals under multiaxial stress.
- **Glass and Jamming Transition:** collective jamming in a randomly packed ensemble. Fluid-to-jammed transition.
- **Reactive Materials:** formation reactions in nanostructured multilayer foils.

Special Job Skills and Training

- The AccelerateGW’s Innovation Corps (I-Corps™) Site Program (10/2018 – 11/2018)
- The National Science Foundation’s Innovation Corps (I-Corps™) Program (01/2019 – 07/2019)

- Coursera certificate: Machine Learning (09/18/2021)

Research Experience

- DoD project: Light-weight Thermoelectric Nanocomposites with Low Thermal Conductivity and High Figure-of-Merit near Room-temperature. Morgan State University, PI: Prof. Yucheng Lan, Dereje Seifu and Zheng Li (09/2025 – present)
- AHA (American Heart Association) project: Unraveling the Biomechanical Regulation of Platelet Adhesiveness by Membrane Cholesterol in Arterial Thrombosis, Department of Biochemistry & Molecular Biology, The University of Texas Medical Branch, PI: Prof. Yunfeng Chen (07/2025 – present)
- NIH project: Inhibiting Biomechanical Platelet Aggregation to Prevent Arterial Thrombosis without Compromising Hemostasis, Department of Biochemistry & Molecular Biology, The University of Texas Medical Branch, PI: Prof. Yunfeng Chen (01/2023 – present)
- NSF project: ISS: Unveiling the Mechanical Roles of Gravity and Buoyancy in Embryonic Brain and Heart Torsion, Brigham and Women's Hospital and Harvard Medical School, PI: Prof. Zi Chen (09/2023 – 12/2024)
- MURI (Multidisciplinary University Research Initiative) project: Active and Reconfigurable Topological Mechanical Metamaterials from the Nanoscale to the Macroscale, Brigham and Women's Hospital and Harvard Medical School, PI: Prof. Zi Chen (01/2024 – 12/2024)
- NSF project: Computational Simulation and Cyber Software Development for Nanoscale Friction. The George Washington University, PI: Prof. Yongsheng Leng (06/2020 – 12/2022)
- ACS PRF (Petroleum Research Fund) project: Molecular Simulation Studies of Complex Geological Fluids in Clay Confinements. The George Washington University, PI: Prof. Yongsheng Leng. (09/2020 – 09/2022)
- NSF project: Collaborative Research: Integrated experimental and computational studies for understanding the interplay of photoreactive materials and persistent contaminants The George Washington University, PI: Prof. Hanning Chen and Prof. Danmeng Shuai. (05/2019 – 08/2019)
- DOE project: Nanoindentation of micrograins in polycrystals under multiaxial stress: Control of abrupt & stochastic plastic events. West Virginia University, PI: Prof. Stefanos Papanikolaou. (09/2017 – 08/2018)
- PSCoR (program to stimulate competitive research) project: Smart fluid: mechanical control of fluid viscosity using 3D-printed functional particles. West Virginia University, PI: Prof. Stefanos Papanikolaou. (09/2017 – 08/2018)
- NSF career project: Squeezing and shear behaviors of liquid films in confined geometry. The George Washington University, PI: Prof. Yongsheng Leng. (09/2012 – 01/2018)
- Applied molecular dynamics simulations to investigate the formation reactions under rapid heating/steep concentration gradients in reactive multilayer foils such as Al-Ni, Ni-Zr, Al-Zr, and Mo-Si binary systems. Department of Materials Science & Engineering, Johns Hopkins University, PI: Prof. Michael Falk (09/2009 - 08/2012)
- Did research in high energy particle physics in Prof. Bo-Qiang Ma's group at Peking University. (09/2002 - 06/2004)
- Completed the graduation thesis in June 2001. "Application of Evolutionary Algorithm to Calculate Energy Pedigree of the Hydrogen in the Quantum-dot Quantumwells." The thesis was awarded "the excellent graduation thesis".

Presentation in Conferences/Workshops

1. **Rong-Guang Xu**, Zi Chen, and Yunfeng Chen, “Rate-Dependent Dissociation Mechanism of VWF-Platelet Binding under Pulling Force: Insights from Molecular Dynamics and Monte Carlo Simulations”, IMECE2024, Portland, Oregon, Nov 17-21, 2024.
2. **Rong-Guang Xu**, Zi Chen, and Yongsheng Leng, “On the Effect of Crystallographic Orientation of the Confining Surfaces on the Phase Behaviors and Shear Properties of Molecular Thin Cyclohexane Films”, IMECE2024, Portland, Oregon, Nov 17-21, 2024.
3. **Rong-Guang Xu**, Joseph Sutlive, Betty S. Liu, Stacey A. Kwan, Jennifer M. Pan, Kun Gou, Ali B. Ali, Hassan A. Khalil, Maximilian Ackermann, Zi Chen, Steven J. Mentzer, “Buckling Forces and the Wavy Folds between Pleural Epithelial Cells”, BRI (Brigham Research Institute) Lung Research Day, Brigham and Women’s Hospital, October 30, 2024.
4. **Rong-Guang Xu**, Shilu Wang, and Zi Chen, “Unveiling the Role of Physical Force in Embryonic Development and Symmetry Breaking”, The David J. Sugarbaker, M.D. Lectureship in Thoracic Surgery, Brigham and Women’s Hospital, October 1, 2024.
5. **Rong-Guang Xu**, Xuetao Mou, Zhenhai Li, and Zi Chen, “How histone post-translational modifications impact nucleosome structure and accessibility: A molecular dynamics study”, NIDA Genetics and Epigenetics Cross-Cutting Research Team Meeting, NIH, Bethesda, MD, May 23-24, 2024.
6. **Rong-Guang Xu**, Shilu Wang, and Zi Chen, “Unveiling the Role of Physical Force in Embryonic Development and Symmetry Breaking”, The Gerald and Elaine Schuster Lectureship in Thoracic Surgery, Brigham and Women’s Hospital, May 14, 2024.
7. **Rong-Guang Xu**, Yunfeng Chen, and Zi Chen, “Investigating the Impact of Force Loading Rate on VWF-Platelet Binding: Insights from Molecular Dynamics and Monte Carlo Simulations”, 98th New England Complex Fluids, Tufts University, MA, March 22, 2024.
8. **Rong-Guang Xu**, Shilu Wang, and Zi Chen, “Unveiling the Role of Physical Force in Embryonic Development and Symmetry Breaking”, The David J. Sugarbaker, M.D. Lectureship in Thoracic Surgery, Brigham and Women’s Hospital, December 12, 2023.
9. **Rong-Guang Xu**, Yunfeng Chen, and Zi Chen, “Rate-Dependent Dissociation Mechanism of Binding between VWF-A1 and GPIIb/IIIa under Pulling Force”, 96th New England Complex Fluids, Brandeis University, MA, Sep 22, 2023.
10. **Rong-Guang Xu**, Xuetao Mou, Zhenhai Li, and Zi Chen, “How histone post-translational modifications impact nucleosome structure and accessibility: A molecular dynamics study”, NIDA Genetics and Epigenetics Cross-Cutting Research Team Meeting, NIH, Bethesda, MD, May 16-17, 2023.
11. **Rong-Guang Xu** and Yongsheng Leng, “Will Polycrystalline Platinum Tip Sliding on a Gold(111) Surface Produce Regular Stick-Slip Friction?”, Tribology Gordon Conference, Bates College, Lewiston, ME, June 26 – July 01, 2022.
12. **Rong-Guang Xu** and Yongsheng Leng, “Friction Simulation of a Polycrystalline Platinum Tip on a Gold(111) Surface”, 76th STLE Annual Meeting & Exhibition, Orlando, May 15-19, 2022.
13. Gunan Zhang, **Rong-Guang Xu** and Yongsheng Leng, “Squeezing Behaviors of Octamethylcyclotetrasiloxane (OMCTS) under Extreme Compression”, 76th STLE Annual Meeting & Exhibition, Orlando, May 15-19, 2022.
14. **Rong-Guang Xu**, “Nanotribological Properties of Lubricant Film in Boundary Lubrication”, Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, Beijing, July 23, 2019. (invited)

15. **Rong-Guang Xu**, “Nanotribological Properties of Lubricant Film in Boundary Lubrication”, Beijing Computational Science Research Center, Beijing, July 21, 2019. (invited)
16. **Rong-Guang Xu** and Yongsheng Leng, “Dislocations Associated with Stick-Slip Friction of Lubricants in Boundary Lubrication”, 74th STLE Annual Meeting & Exhibition, Nashville, May 19-23, 2019.
17. **Rong-Guang Xu** and Hengxu Song, Stefanos Papanikolaou, and Yongsheng Leng, “Dislocations Associated with Stick-Slip Friction of Lubricants in Boundary Lubrication”, the 9th International Conference on Multiscale Materials Modeling, Osaka, Japan, Oct. 28 – Nov. 2, 2018.
18. **Rong-Guang Xu** and Yongsheng Leng, “Challenges in Computational Nanotribology”, State Key Laboratory of Tribology, Tsinghua University, Beijing, Oct. 19, 2018. (invited)
19. **Rong-Guang Xu** and Yongsheng Leng, “Squeezing and Stick-slip Friction Behaviors of Lubricants in Boundary Lubrication”, Tribology Gordon Conference, Bates College, Lewiston, ME, June 24 – June 29, 2018.
20. **Rong-Guang Xu** and Yongsheng Leng, “Understanding squeezing and shear behaviors of liquid films in confined geometry through computational simulations”, State Key Laboratory of Tribology, Tsinghua University, Beijing, May 11, 2017. (invited)
21. **Rong-Guang Xu** and Yongsheng Leng, “Friction Behavior of Cyclohexane Film Under Nanoconfinement”, 74th STLE Annual Meeting & Exhibition, Atlanta, May 21-25, 2017.
22. **Rong-Guang Xu** and Yongsheng Leng, “Contact Stiffness and Damping of Liquid Films in Dynamic Atomic Force Microscopy”, Tribology Gordon Conference, Bates College, Lewiston, ME, June 26 – July 1, 2016.
23. **Rong-Guang Xu** and Yongsheng Leng, “Solvation Force Simulations in Atomic Force Microscopy (AFM)”, Transformational Technologies in Molecular Simulations (TTMS) Workshop, University of Wisconsin, Madison, WI, May 19-22, 2014.
24. **Rong-Guang Xu** and Yongsheng Leng, “Solvation Force Simulations in Atomic Force Microscopy (AFM)”, 12th U.S. National Congress on Computational Mechanics USNCCM12, Raleigh, NC, July 22-25, 2013
25. Michael L. Falk, **Rong-Guang Xu**, Timothy P. Weihs and Todd C. Hufnagel, “Interdiffusion and Phase Transitions during Exothermic Reactions in Al/Ni Multilayered Foils”, CECAM Workshop: Reactive Multilayers Foils – Bridging the gap from Thermodynamics, Modelling, and Experiments, CECAM-HQ-EPFL, Lausanne, Switzerland, July 8-10, 2013. (invited)
26. Michael L. Falk, **Rong-Guang Xu**, Timothy P. Weihs, and Todd C. Hufnagel, “Interdiffusion and Phase Transitions during Exothermic Reactions in Al/Ni Multilayered Foils: A Molecular Dynamics Study,” Materials Research Society Fall Meeting, OO2.05, Boston, November 2012.
27. **Rong-Guang Xu** and Michael L. Falk, “Simulating Phase Formation during Exothermic Reactions in Al/Ni and Al/Zr Multilayered Foils”, APS March Meeting, Dallas, TX, March 21-25, 2011.
28. F. Rizzi, M. Salloum, Y.M. Marzouk, **R.-G. Xu**, M. L. Falk, T. P. Weihs, G. Fritz, O. M. Knio. “Bayesian Inference of Atomic Diffusivity in a Binary Ni/Al System based on Molecular Dynamics,” presented at SIAM Conference on Computational Science and Engineering, February 28 - March 4, 2011, Reno, NV.
29. **Rong-Guang Xu** and Michael L. Falk, “Molecular Dynamics Studies of Phase Transformations during Rapid Heating of Nanolayer Foils”, TMS Annual Meeting & Exhibition, San Diego, CA, February 27 – March 3, 2011.

30. Timothy P. Weihs, Sara Barron, Todd Hufnagel, Steve Kelly, Michael L. Falk, **Rong-Guang Xu**, Omar Knio, Francesco Rizzi, Geoffrey Campbell, and Judy Kim, “In Situ Studies and Simulations of Rapid, Self-Propagating Phase Transformations in Nanolayer Foils”, TMS Annual Meeting & Exhibition, San Diego, CA, February 27 – March 3, 2011.

Honors & Awards

- IMECE Faculty Travel Grant sponsored by NSF, 2024
- Admera Health 10x Single-Cell Sequencing Grant Contest: 2nd Prize, 2024
- The Third Place in the Competition: Medical Device Development: Advancing from Product to Market, Harvard Clinical & Translational Science Center, Harvard Catalyst, 2023
- Travel Award of Tribology Gordon Conference, Bates College, Lewiston, ME, 2018
- “Highly downloaded paper” notice from The Journal of Chemical Physics 2018
- Innovation Investment Management Compant LLC International Graduate Student Endowment Fellowship, George Washington University, 2017
- Student Travel Award of Tribology Gordon Conference, Bates College, Lewiston, ME, 2016
- Graduate Research Fellowship, George Washington University, 2013 – 2016
- Outstanding Poster Competition Winner at the Transformational Technologies in Molecular Simulations (TTMS) Workshop, University of Wisconsin, Madison, WI, May 2014
- High Pass in Ph.D. Qualifying Exam, George Washington University, December 2013
- Donald E. Kerr Sir. & Barbara Kerr Stanley Fellowship, Johns Hopkins University, 2007
- Excellent Undergraduate Thesis Award, School of Physics, Wuhan University, 2001
- RenMing Outstanding Student Scholarship for Excellent Undergraduate, Wuhan University, 1998, 1999, 2000

Synergistic Activities

- **Journal Peer Review Services**: Nature Communications; Scientific Reports; Journal of Chemical Physics; Langmuir; Journal of Applied Physics; Materials and Design; Applied Surface Science; Tribology Letters; Friction; Journal of the Electrochemical Society; Physics Letters A; Journal of Molecular Graphics and Modelling; Journal of Molecular Modeling; International Journal of Adhesion and Adhesives; Molecular Simulation; AIP Advance; International Journal of Mechanical Sciences; International Journal of Advanced Manufacturing Technology; ECS Journal of Solid State Science and Technology; International Journal of Smart and Nano Materials; Advances in Materials Science and Engineering; Plasma Science and Technology; MDPI: Sustainability; Applied Sciences; Lubricant; Water; Catalysts; Processes.
- **Leading Guest Editor** of Special Issue "Mechanical Properties of Advanced Multifunctional Coatings" in MDPI “coatings”. (impact factor: 3.4)

Technical Skills

Computational: LAMMPS, GROMACS, NAMD, VASP, Gaussian, COMSOL/Multiphysics, Abaqus, C/C++, Fortran, Python, Mathematica, MathWorks MATLAB, AutoCAD, SolidWorks, VMD/OVITO/PyMOL, Materials Studio, LaTeX.

Technical: AFM, 3D Printing, Arduino Platform, Piezoelectric actuator.