

WEI GAO

Update Date	Feb, 2022	
Contact Information	Mechanical Engineering One UTSA Circle San Antonio, TX 78249	Phone: 210-458-5567 E-mail: wei.gao@utsa.edu Research Website: www.gao-group.org
Employments	The University of Texas at San Antonio, San Antonio, Texas <i>Assistant Professor</i> , Department of Mechanical Engineering	2016/8-present
	Northwestern University, Evanston, Illinois <i>Postdoctoral Fellow</i> , Department of Mechanical Engineering	2014/8-2016/7
	Hyundai-Enova Innovative Tech Center, Torrance, California <i>Mechanical Engineer</i>	2007/8-2009/5
Education	The University of Texas at Austin, Texas <i>Ph.D.</i> , Engineering Mechanics	2009/8-2014/7
	University of California, Irvine, California <i>M.S.</i> , Mechanical Engineering	2006/9-2007/7
	Tsinghua University, Beijing, China <i>M.S.</i> , Solid Mechanics	2003/9-2006/7
	Sichuan University, Chengdu, China <i>B.S.</i> , Engineering Mechanics	1999/9-2003/7
Awards & Honors	CAREER Award, National Science Foundation	2021
	GREAT Award, UT San Antonio	2017
	Max L. Williams Endowed Graduate Fellowship, UT Austin	2013
	NSF CMMI Fellowship for Workshop on Multiscale Modeling	2010
	Graduate Fellowship, UC Irvine	2006
	Excellent Thesis Award, Sichuan University	2003
	Graduate with 1 st rank in the department, Sichuan University	2003
	First Class Scholarship, Sichuan University	2001-2003
Teaching	Undergraduate Course <ul style="list-style-type: none">• Mechanics of Solids (2016F, 2017S, 2020S)<ul style="list-style-type: none">– Averaged evaluation: 4.0/5• Machine Element Design (2017F, 2018S, 2018F, 2019F, 2020F)<ul style="list-style-type: none">– Averaged evaluation: 4.1/5	

Graduate Course

- Computational Materials (2019S)
 - Evaluation: 5/5, self-developed new course

Mentor Undergraduate Senior Design Team

- Lead a team to design soft robotic solar tracking device 2019
- Lead a team to design roof-mounted solar tracking device 2020

Mentoring

- **Postdoc:** Fei Shuang (2021 -)
- **PhD Students:** Arman Ghasemi (2016 - 2021), Daniela Posso (2020 -), Daniel O. Millan (2020 -)
- **MS Students:** Joel Gomez (2019-), Colton Kubena (2019-), Rohan Nagarkar (2019-), Alberto Samaniego (2020 -), Sagar Pate (2018 - 2020), Heber Martinez Barron (2017-2019), Riccardo Manno (2017-2018).
- **Undergraduate Students:** Veronica Salazar (2019 -), Mohammed Ahmed (2020-), Logan Heck (2020 -), Danny Perez (2018-2019), Carlos Quesada (2018-2019), Sarah Robinson (2017-2018), Wyatt Evans (2017-2018)

Academic Service

- Symposium organizer “*Multiscale Modeling of Phase Transitions, Dislocations, and Twinning in Materials*” in Society of Engineering Science Conference (2022).
- Symposium organizer “*Mechanics of Multifunctional Low-Dimensional Materials*” in 19th U.S. National Congress on Theoretical and Applied Mechanics (USNC/TAM) (2022).
- Guest-editor of JOM, The Journal of The Minerals, Metals & Materials Society (TMS) on the topic of “*Nanomechanics of Low-dimensional Materials*” (2019-2020).
- Topic organizer on “*Multifunctional Nanomaterials*” in American Society of Mechanical Engineer (2017-2020).
- Symposium organizer of “*Mechanics of 2D materials*” in Society of Engineering Science Conference (2016)
- Member of SES, ASME, MRS, TMS and USACM
- NSF panelist
- Reviewer for *Nature Communication*, *Nano Letters*, *ACS Nano*, *J. of Mechanics and Physics of Solids*, *J. App. Mechanics*, *Extreme Mechanics Lett.*, *Nanotechnology*, *J. Phy. D: App. Phy.*, *International J. of Solids and Structures*, *Composite Materials*.

RESEARCH GRANTS

1. National Science Foundation, **PI**, “*CAREER: Atomistic Investigation of Phase Transition in Nanostructured Silicon – Towards Convergent Understanding with Mechanics-Informed Machine Learning Potential*”, \$500,723 (9/1/2021 - 8/31/2026, CMMI-2046218).

2. National Science Foundation, **PI**, “*Stress modulated phase transition in 2D TMDC materials*”, \$326,162 (9/1/2019 - 8/31/2022, CMMI-1930783).
3. National Science Foundation, **Co-PI**, “*EAGER: Developing and bio-Inspired assembly of highly scalable electromagnetic soft actuators for active elbow brace*”, \$189,918 (8/1/2018 - 6/30/2021, CBET-1840834, PI: Amir Jafari, UTSA).
4. AFOSR contract via Clarkson Aerospace, **Co-PI**, “*Scalable Synthesis of Transition Metal Dichalcogenides Engineered by the Pulsed Laser Ablation in Liquids Technique for 3D Printed Architectures*”, \$199,073 (2/1/2021-1/31/2023, PI: Kelley Nash, UTSA).
5. National Institute of Health, **Co-PI**, “*Proteoglycans and age-related deterioration of bone toughness*”, \$2,334,480 (7/1/2019 - 6/30/2024, R01AR076190-01, PI: Xiaodu Wang, UTSA and Jean Jiang, UT Health San Antonio).
6. CPS Energy Corporation, **PI**, “*Development of Autonomous Soft Robotic Solar Tracking System for Building-Integrated Photovoltaic Applications*”, \$231,000 (9/1/2019 - 8/31/2021, Co-PI: Yongcan Cao, UTSA).
7. UTSA VPR Office, **Co-PI**, “*Transdisciplinary Investigation of Electromechanical Coupling-driven Properties of New 2D Materials*”, \$20,000 (9/1/2019 - 8/31/2020, PI: Ethan C. Ahn, UTSA).
8. UTSA VPR Office, **PI**, “*GREAT: Advanced Materials based on Two-dimensional Building Blocks - Computational Design based on Chemistry and Topology*”, \$20,000 (9/1/2017 - 8/31/2018).

PUBLICATION

After joining UTSA (2017-now):

1. Y. Peng , R. Ji , T. Phan , **W. Gao**, V. Levitas and L. Xiong, [An Atomistic-to-Microscale Computational Analysis of the Dislocation Pileup-induced Local Stresses near an Interface in Plastically Deformed Two-phase Materials](#), *Acta Materialia*, 117663, 2022.
2. Y. Han, J. Gomez, R. Hua, P. Xiao, **W. Gao**, J. Jiang, and X. Wang, [Removal of glycoaminoglycans affects the in situ mechanical behavior of extrafibrillar matrix in bone](#), *Journal of the Mechanical Behavior of Biomedical Materials*, 123, 104766, 2021.
3. Y. Li , C. Wei , S. Huang , A. Ghasemi , **W. Gao**, C. Wu , V. Mochalin, [In Situ SEM Tensile Testing of Two-Dimensional Ti₂C and Ti₃C₂ Titanium Carbide Films \(MXenes\)](#), *ACS Applied Nano Materials*, 4, 5, 5058–5067, 2021.
4. A. Ghasemi, **W. Gao***, [A Method to Apply Piola-Kirchhoff Stress in Molecular Statics Simulation](#), *Computational Materials Science*, 195, 110496, 2021. (**Editor’s Choice**)
5. A. Ghasemi, **W. Gao***, [Atomistic Mechanism of Stress Modulated Phase Transition in Monolayer MoTe₂](#), *Extreme Mechanics Letters*, 40, 100946, 2020.
6. A. Ghasemi, **W. Gao***, [A Method to Predict Energy Barriers in Stress Modulated Solid-solid Phase Transitions](#), *Journal of the Mechanics and Physics of Solids*, 137, 103857, 2020.
7. A. Ghasemi, P. Xiao, **W. Gao***, [Nudged elastic band method for solid-solid transition under finite deformation](#), *The Journal of Chemical Physics*, 151, 054110, 2019.

8. R. Manno, **W. Gao***, I. Benedetti, [Engineering the crack path in lattice cellular materials through bio-inspired micro-structural alterations](#), *Extreme Mechanics Letters*, 26, 8–17, 2019.
9. N. Ebrahimi, S. Nugroho, A. F. Taha, N. Gatsis, **W. Gao**, A. Jafari, [Dynamic actuator selection and robust state-feedback control of networked soft actuators](#), *IEEE International Conference on Robotics and Automation (ICRA)* 2857-2864, 2018
10. C. Wu, T. Taghvaei, C. Wei, A. Ghasemi, G. Chen, N. Leventis, **W. Gao**, [Multi-scale progressive failure mechanism and mechanical properties of nanofibrous polyurea aerogels](#), *Soft Matter*, 14, 7801-7808, 2018. (Featured on the cover)
11. R. Crespo, **W. Gao**, L. Mao, M. Roenbeck, H. Nguyen, J. Paci, J. Huang, S. Nguyen, H. Espinosa, [The role of water in mediating interfacial adhesion and shear strength in graphene oxide](#), *ACS Nano*, 12 (6), 6089–6099, 2018.
12. I. Benedetti, H. Nguyen, R. Soler-Crespo, **W. Gao**, L. Mao, A. Ghasemi, J. Wen, S. Nguyen, H. Espinosa, [Formulation and Validation of a Reduced Order Model of 2D Materials Exhibiting a Two-Phase Microstructure as Applied to Graphene Oxide](#), *Journal of the Mechanics and Physics of Solids*, 112, 66-88, 2018.
13. I. Benedetti, R. Crespo, A. Pedivellano, **W. Gao**, H. Espinosa, [A continuum damage model for functionalized graphene membranes based on atomistic simulations](#), *Key Engineering Materials*, 754, 173-176, 2017.
14. P. Wang, **W. Gao**, J. Wilkerson, K. Liechti, R. Huang, [Cavitation of water by volume controlled stretching](#), *Extreme Mechanics Letters*, 59, 2017.
15. Z. Meng, R. Crespo, W. Xia, **W. Gao**, L. Ruiz, H. Espinosa and S. Keten, [A coarse-grained model for the mechanical behavior of graphene oxide](#), *Carbon*, 117, 476-487, 2017.
16. R. Yang[‡], A. Zaheri[‡], **W. Gao[‡]**, C. Hayashi and H. D. Espinosa, [AFM Identification of Beetle's Exocuticle – Bouligand Structure and Nanofiber Anisotropic Elastic Properties](#), *Advanced Functional Materials*, 1603993, 2017. (Featured on the cover and reported by Science Newsline and Science Daily)
17. R. Crespo[‡], **W. Gao[‡]**, P. Xiao, X. Wei, J. Paci, G. Henkelman, H. Espinosa. [Engineering the Mechanical Properties of Monolayer Graphene Oxide at the Atomic Level](#), *Journal of Physical Chemistry Letters*, 7, 2702-2707, 2016.
18. P. Wang, **W. Gao** and R. Huang. [Entropic Effects of Thermal Rippling on van der Waals Interactions between Monolayer Graphene and a Rigid Substrate](#), *Journal of Applied Physics*, 119, 074305, 2016.

Before joining UTSA:

19. R. Ramachandramoorthy[‡], **W. Gao[‡]**, R. Bernal and H. Espinosa. [High Strain Rate Tensile Testing of Silver Nanowire - Rate Dependent Brittle-to-ductile Transition](#). *Nano Letters*, 16, 1, 2016.
20. **W. Gao**, K.M. Liechti and R. Huang. [Wet adhesion of Graphene](#), *Extreme Mechanics Letters*, 3, 130-140, 2015.
21. **W. Gao**, R. Huang. [Thermomechanics of monolayer graphene: rippling, thermal expansion and elasticity](#). *Journal of Mechanics and Physics of Solids*, 66, 42-58, 2014.
22. **W. Gao**, P. Xiao, G. Henkelman, K.M. Liechti, R. Huang. [Interfacial adhesion between graphene and silicon dioxide substrate by density functional theory with van der Waals corrections](#). *J. Phys. D: Appl. Phys.* 47, 255301, 2014.

23. Z. Cao, P. Wang, **W. Gao**, L. Tao, J. W. Suk, R. S. Ruoff, D. Akinwande, R. Huang, K. M. Liechti. [A Blister test for interfacial adhesion of large-scale transferred graphene.](#) *Carbon*, 68, 390-400, 2014.
24. P. Wang, **W. Gao**, Z. Cao, K.M. Liechti, R. Huang. [Numerical analysis of circular graphene bubbles.](#) *Journal of Applied Mechanics*, 80, 040905, 2013.
25. K. Yue, **W. Gao**, R. Huang, K.M. Liechti. [Analytical methods for the mechanics of graphene bubbles.](#) *Journal of Applied Physics*, 112, 083512, 2012.
26. **W. Gao**, R. Huang. [Effect of surface roughness on adhesion of graphene membranes.](#) *Journal of Physics D: Applied Physics*, 44, 452001, 2011.
27. Q. Lu, **W. Gao**, R. Huang. [Atomistic simulation and continuum modeling of graphene nanoribbons under uniaxial tension.](#) *Modelling and simulation in materials science and engineering*, 19, 054006, 2011.
28. G. Wang, X. Feng, T. Wang, **W. Gao**. [Surface effects on the near-tip stresses for mode-I and mode-III cracks.](#) *Journal of Applied Mechanics*, 75, 011001, 2008.
29. G. Huang, **W. Gao**, S. Yu. [Model for the adsorption-induced change in resonance frequency of a cantilever.](#) *Applied physics letters*, 89(4), 043506, 2006.
30. **W. Gao**, S. Yu, G. Huang. [Finite element characterization of the size-dependent mechanical behavior in nanosystems.](#) *Nanotechnology*, 17, 1118, 2006.

SCHOLARLY PRESENTATIONS

Invited Presentations:

1. Invited Seminar, Aerospace Engineering and Engineering Mechanics, UT Austin, 2021.
2. Invited **Keynote** Talk, 16th U.S. National Congress on Computational Mechanics, July 25-29, 2021, A Virtual Event.
3. Invited Seminar, Mechanical & Industrial Engineering, New Jersey Institute of Technology, 2021.
4. Invited Seminar, UTSA Physics Department, 2019.
5. Invited **Keynote** Talk, 13th World Congress on Computational Mechanics, New York, 2018.
6. Invited Seminar, UT Health Science Center at San Antonio, 2018.
7. Invited **Keynote** Talk on behalf of Prof. Horacio Espinosa, ASME Applied Mechanics and Materials Conference, Seattle, 2015.

Other Conference Presentations:

8. Materials Research Society Spring Conference, online, 2021.
9. Society of Engineering Science Conference, online, 2020.
10. Society of Engineering Science Conference, Salt Lake City, 2019.
11. US National Congress on Computational Mechanics (USNCCM15), Austin, TX, 2019.
12. TMS 148th Annual Meeting & Exhibition, San Antonio, TX, 2019.
13. ASME International Mechanical Engineering Congress & Exposition, Pittsburgh, PA, 2018.
14. National Congress for Theoretical and Applied Mechanics, Chicago, IL, 2018.
15. Society of Engineering Science Conference, College Park, MD, 2016.
16. Society of Experimental Mechanics International Congress, Orlando, FL, 2016.
17. ASME Applied Mechanics and Materials Conference, Seattle, 2015.
18. 17th US National Congress on Theoretical & Applied Mechanics, East Lansing, Michigan, 2014.
19. ASME International Mechanical Engineering Congress & Exposition, Houston, TX, 2012.
20. United States Association for Computational Mechanics, U. S. National Congress, Minneapolis, MN, 2011.
21. NSF CMMI Engineering Research and Innovation Conference, Atlanta, GA, 2011.