

Matt Pharr

Assistant Professor and J. Mike Walker '66 Faculty Fellow
Department of Mechanical Engineering, Texas A&M University

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Education

- May 2014 Ph.D. in Engineering Sciences, *Harvard University*
Dissertation: *Diffusion, Deformation, and Damage in Lithium-ion Batteries and Microelectronics*
- May 2010 S.M. in Engineering Sciences, *Harvard University*
- May 2008 B.S. in Mechanical Engineering & B.A. in Materials Science, *Rice University*

Professional Appointments

- Aug. 2016 – present *Texas A&M University*
Department of Mechanical Engineering
Department of Materials Science & Engineering (courtesy)
Assistant Professor
- Aug. 2014 – July 2016 *University of Illinois at Urbana-Champaign*
Department of Materials Science and Engineering
Postdoctoral Research Associate

Awards and Honors

- Sept. 2020 J. Mike Walker '66 Faculty Fellowship
- July 2020 Montague-Center for Teaching Excellence Scholars Award
- Jan. 2020 NSF CAREER Award
- Apr. 2019 Kaneka Junior Faculty Award
- Mar. 2019 Peggy L. & Charles Brittan '65 Outstanding Undergraduate Teaching Award
- Nov. 2017 Haythornthwaite Research Initiation Grant Award through ASME AMD
- Sept. 2013 National Science Foundation Graduate Research Fellowship
- Jan. 2011 Harvard University Distinction in Teaching Award
- May 2010 Harvard University Distinction in Teaching Award
- Apr. 2010 National Defense Science and Engineering Graduate Fellowship
- Apr. 2010 Department of Energy Office of Science Graduate Fellowship (declined)
- Mar. 2010 Winston Chen Graduate Fellowship, Harvard University
- May 2008 Alan J. Chapman Award – Mechanical Engineering, Rice University

Apr. 2007 W. L. Moody Engineering Scholarship, Rice University
 May 2006 Louis J. Walsh Scholarship in Engineering, Rice University
 Mar. 2004 Rice University Trustee Distinguished Scholarship

Teaching Experience

Jan. 2020 – present Instructor, MEEN 467/625: Mechanical Behavior of Materials, *Texas A&M University* (2 semesters).
 PICA overall mean scores: 4.1 / 5 (467, Spring 2020), 4.0 / 5 (625, Spring 2020).

Aug. 2018 – present Instructor, MEEN 475: Materials in Design, *Texas A&M University* (1 semester).
 PICA overall mean scores: 4.2 / 5 (Fall 2018).

Aug. 2016 – present Instructor, MEEN 360: Materials and Manufacturing Selection in Design, *Texas A&M University* (6 semesters).
 PICA overall mean scores: 4.2 / 5 (Fall 2016), 4.3 / 5 (Spring 2017), 4.2 / 5 (Fall 2017), 4.4 / 5 (Fall 2018), 4.3 / 5 (Fall 2019).

Sept. 2011 – May 2014 Leverett House Non-Resident Tutor, *Harvard University*

Sept. 2010 – Dec. 2010 Teaching fellow, AP 282: Solids: Structures and Defects, *Harvard University*

Jan. 2010 – May 2010 Teaching fellow, ES 120: Introduction to the Mechanics of Solids, *Harvard University*

Aug. 2007 – Aug. 2008 College Mentor, *Rice University*

Aug. 2006 – Dec. 2006 Teaching assistant, MECH 211: Statics and Dynamics, *Rice University*

Publications

†denotes equal contribution to the manuscript #denotes corresponding author

- J51. Leonard Fifield[#], **Matt Pharr**, David Staack, Suresh Pillai, Larry Nichols, James McCoy, Tony Faucette, Tucker Bisel, Min Huang, Md Kamrul Hasan, Lucas Perkins, Scott Cooley, and Mark Murphy. “Direct Comparison of Cobalt-60, Electron Beam and X-ray Doses on Characteristics of Low-density Polyethylene, Polypropylene Homopolymer, Polyolefin Elastomer and Chlorobutyl Rubber Medical Device Polymers.” *Radiation Physics and Chemistry* 109505 (2021).
- J50. Richard J.-Y. Park, Christopher M. Eschler, Cole D. Fincher, Andres F. Badel, Pinwen Guan, **Matt Pharr**, Brian W. Sheldon, W. Craig Carter, Vekatasubramanian Viswanathan, and Yet-Ming Chiang[#]. “Semi-Solid Alkali Metal Electrodes Enabling High Critical Current Densities in Solid Electrolyte Batteries.” *Nature Energy* 6, 314-322 (2021).
- J49. Leonard Fifield[#], **Matt Pharr**, David Staack, Suresh Pillai, Larry Nichols, James McCoy, Tony Faucette, Tucker Bisel, Min Huang, Md Kamrul Hasan, Lucas Perkins, Scott Cooley, and Mark Murphy. “Direct Comparison of Gamma, Electron Beam and X-ray Irradiation Effects on Single-Use Blood Collection Devices with Plastic Components.” *Radiation Physics and Chemistry* 180, 109282 (2021).

- J48. David A. Santos, Justin L. Andrews, Yang Bai, Peter Stein, Yuting Luo, Yuwei Zhang, **Matt Pharr**, Bai-Xiang Xu[#], and Sarbajit Banerjee[#]. “Bending Good Beats Breaking Bad: Phase Separation Patterns in Individual Cathode Particles upon Lithiation and Delithiation.” *Materials Horizons* 7, 3275-3290 (2020).
- J47. Veronica Augustyn[#], Ruocun Wang, Nina Balke, **Matt Pharr**, and Craig Arnold. “Deformation during Electrosorption and Insertion-type Charge Storage: Origins, Characterization, and Design of Materials for High Power.” *ACS Energy Letters* 5 (11), 3548-3559 (2020). **Selected for front cover of the November 2020 issue of ACS Energy Letters.**
- J46. Justin Andrews, Peter Stein, David Santos, Cody Chalker, Luis R De Jesus, Rachel Davidson, Michelle Gross, **Matt Pharr**, James Batteas, Bai-Xiang Xu[#], and Sarbajit Banerjee[#]. “Curvature-Induced Modification of Mechano-Electrochemical Coupling and Nucleation Kinetics in a Cathode Material.” *Matter* 3 (5), 1754-1773 (2020).
- J45. Cole D. Fincher[†], Haley Turman[†], Aaron French, Matthew Chancey, Jonathan Gigax, Eda Aydogan, Dexin Zhao, Digvijay Yadav, Kelvin Xie, Yongqiang Wang, Mike Borden, Lin Shao, Stuart A. Maloy, and **Matt Pharr**[#]. “Damage Relief in Ion-Irradiated Inconel 718 via Annealing.” *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms* 479, 157-162 (2020).
- J44. Seunghyun Lee[†], Cole D. Fincher[†], Russell Rowe, Arber Shasivari, Edwin Torres, Michael Ecker-Randolph, and **Matt Pharr**[#]. “Making something out of nothing: enhanced flaw tolerance and rupture resistance in elastomer-void “negative” composites.” *Extreme Mechanics Letters* 40, 100845 (2020).
- J43. Yusheng Lei, Yimu Chen, Ruiqi Zhang, Yuheng Li, Qizhang Yan, Seunghyun Lee, Yugang Yu, Hsinhan Tsai, Woojin Choi, Kaiping Wang, Yanqi Luo, Yue Gu, Xinran Zheng, Chunfeng Wang, Chonghe Wang, Hongjie Hu, Yang Li, Baiyan Qi, Muiyang Lin, Zhuorui Zhang, Shadi A. Dayeh, **Matt Pharr**, David P. Fenning, Yu-Hwa Lo, Jian Luo, Kesong Yang, Jinkyong Yoo, Wanyi Nie, and Sheng Xu[#]. “A fabrication process for flexible single-crystal perovskite devices.” *Nature* 583, 790-795 (2020).
- J42. Qing Zhou, Frank Gardea[#], Zhen Sang, Seunghyun Lee, **Matt Pharr**, and Svetlana A. Sukhishvili[#]. “A Tailorable Family of Elastomeric-to-Rigid, 3D Printable, Interbonding Polymer Networks.” *Advanced Functional Materials* 30, 2002374 (2020). **Highlighted by EurekAlert!**: (https://www.eurekalert.org/pub_releases/2020-08/taunm081420.php).
- J41. Seunghyun Lee, Omid Zargar, Carl Reiser, Qing Li, Anastasia Muliana, Scott A. Finlayson, Francisco E. Gomez[#], and **Matt Pharr**[#]. “Time-dependent Mechanical Behavior of Sweet Sorghum Stems.” *Journal of the Mechanical Behavior of Biomedical Materials* 106, 103731 (2020).
- J40. Cole D. Fincher, Yuwei Zhang, George M. Pharr, and **Matt Pharr**[#]. “Elastic and Plastic Characteristics of Sodium Metal.” *ACS Applied Energy Materials* 3 (2), 1759-1767 (2020).
- J39. Rachel Davidson, Ankit Verma, David Santos, Feng Hao, Cole D. Fincher, Dexin Zhao, Vahid Attari, Parker Schofield, Jonathan Van Buskirk, Antonio Fraticelli-Cartagena, Theodore E. G. Alivio, Raymundo Arroyave, Kelvin Xie, **Matt Pharr**, Partha P. Mukherjee[#], and Sarbajit Banerjee[#]. “Mapping Mechanisms and Growth Regimes of Magnesium Electrodeposition at High Current Densities.” *Materials Horizons* 7, 843-854 (2020).

- J38. Cole D. Fincher, Daniela Ojeda, Yuwei Zhang, George M. Pharr, and **Matt Pharr**[#]. “Mechanical Properties of Metallic Lithium: from Nano to Bulk Scales.” *Acta Materialia* 186, 215-222 (2020).
- J37. KunHyuck Lee, Xiaoyue Ni, Jong Yoon Lee, Hany Arafa, David Pe, Shuai Xu, Raudel Avila, Masahiro Irie, Joo Hee Lee, Ryder L. Easterlin, Dong Hyun Kim, Ha Uk Chung, Omolara O. Olabisi, Selam Getaneh, Esther Chung, Marc Hill, Jeremy Bell, HoKyung Jang, Claire Liu, Jun Bin Park, Jungwoo Kim, Sung Bong Kim, Sunita Mehta, **Matt Pharr**, Andreas Tzavelis, Jonathan T. Reeder, Ivy Huang, Yujun Deng, Zhaoqian Xie[#], Charles R. Davies[#], Yonggang Huang[#], John A. Rogers[#]. “Mechano-acoustic sensing of physiological processes and body motions via a soft wireless device placed at the suprasternal notch.” *Nature Biomedical Engineering* 4 (2), 148-158 (2020).
- J36. Philipp Mayer[†], Nandhini Sivakumar[†], Michael Pritz, Matjia Varga, Andreas Mehmman, Seunghyun Lee, Alfredo Salvatore, Michele Magno, **Matt Pharr**, Helge C. Johannssen, Gerhard Troester, Hanns Ulrich Zeilhofer, and Giovanni Antonio Salvatore[#]. “Flexible and Lightweight Devices for Wireless multi-Color Optogenetic Experiments Controllable via Commercial Cell Phones.” *Frontiers in Neuroscience* 13 (819), 1-14 (2019).
- J35. Yuwei Zhang, Yuting Luo, Cole Fincher, Sarbajit Banerjee, and **Matt Pharr**[#]. “Chemo-Mechanical Degradation in V₂O₅ Thin Film Cathodes of Li-ion Batteries during Electrochemical Cycling.” *Journal of Materials Chemistry A* 7, 23922-23930 (2019).
- J34. Yuwei Zhang, Coleman Fincher, Scott McProuty, and **Matt Pharr**[#]. “In-operando imaging of polysulfide catholytes for Li-S batteries and implications for kinetics and mechanical stability.” *Journal of Power Sources* 434, 226727 (2019).
- J33. Rachel D. Davidson[†], Yenny Cubides[†], Cole Fincher, Peter Stein, Chelsea McLain, Bai-Xiang Xu, **Matt Pharr**, Homero Castaneda[#], and Sarbajit Banerjee[#]. “Tortuosity but not Percolation: Design of Exfoliated Graphene Nanocomposite Coatings for Extended Corrosion Protection of Aluminum Alloys.” *ACS Applied Nano Materials* 2, 3100-3116 (2019).
- J32. Seunghyun Lee and **Matt Pharr**[#]. “‘Sideways’ and stable crack propagation in a silicone elastomer.” *Proceedings of the National Academy of Sciences of the United States of America* 116 (19), 9251-9256 (2019). **Highlighted by EurekAlert!**: (https://www.eurekalert.org/pub_releases/2019-05/tau-tar052919.php), **Scienmag**: (<https://scienmag.com/texas-am-researcher-makes-breakthrough-discovery-in-stretchable-electronics-materials/>), **Science Codex**: (<https://www.sciencecodex.com/texas-am-researcher-makes-breakthrough-discovery-stretchable-electronics-materials-626463>), **Bioengineer.org**: (<https://bioengineer.org/texas-am-researcher-makes-breakthrough-discovery-in-stretchable-electronics-materials/>), **Health Medicine Network**: (<http://healthmedicinet.com/texas-am-researcher-makes-breakthrough-discovery-in-stretchable-electronics-materials/>), **AZO Materials**: (<https://www.azom.com/news.aspx?newsID=51340>).
- J31. Rachel Davidson, Ankit Verma, David Santos, Feng Hao, Coleman Fincher, Sisi Xiang, Jonathan van Buskirk, Kelvin Xie, **Matt Pharr**, Partha Mukherjee[#], and Sarbajit Banerjee[#]. “Formation of Magnesium Dendrites during Electrodeposition.” *ACS Energy Letters* 4, 375-376 (2019).
- J30. Mohammad Humood, Joseph Lefebvre, Yan Shi, Mengdi Han, Coleman D. Fincher, **Matt Pharr**, John A. Rogers, and Andreas A. Polycarpou[#]. “Fabrication and

- Mechanical Cycling of Polymer Microscale Architectures for 3D MEMS Sensors.” *Advanced Engineering Materials* 21, 1801254 (2019). **Highlighted by Advanced Science News:** (<https://www.advancedsciencenews.com/bio-inspired-kirigami-architectures-for-resilient-miniature-sensors/>).
- J29. Yuwei Zhang, Yuting Luo, Coleman Fincher, Scott McProuty, Garrett Swenson, Sarbajit Banerjee, and **Matt Pharr**[#]. “In-Situ Measurements of Stress Evolution in Composite Sulfur Cathodes.” *Energy Storage Materials* 16, 491-497 (2019).
- J28. Ruocun Wang, James B. Mitchell, Qiang Gao, Wan-Yu Tsai, Shelby Boyd, **Matt Pharr**, Nina Balke, and Veronica Augustyn[#]. “Operando Atomic Force Microscopy Reveals Mechanics of Structural Water Driven Battery-to-Pseudocapacitor Transition.” *ACS Nano* 12 (6), 6032-6039 (2018). **Highlighted by Science Daily:** (<https://www.sciencedaily.com/releases/2018/05/180524112309.htm>), **Phys Org:** (<https://phys.org/news/2018-05-microscopy-advance-reveals-unexpected-role.html>), **Energy Daily:** (http://www.energy-daily.com/reports/Microscopy_advance_reveals_unexpected_role_for_water_in_energy_storage_material_999.html), **EurekaAlert!** (https://www.eurekaalert.org/pub_releases/2018-05/ncsu-ma052418.php), **EDIWeekly:** (<https://www.ediweekly.com/researchers-discover-surprising-role-for-water-in-energy-storage/>), **MRS Bulletin:** (<https://www.cambridge.org/core/journals/mrs-bulletin/article/energy-focus-structural-water-plays-key-role-in-hybrid-energystorage-device/54B0CA55C2EC84637FED54EC50956572/core-reader>)
- J27. Xinge Yu[†], Heling Wang[†], Xin Ning[†], Rujie Sun, Hassan Albadawi, Marcela Salomao, Alvin C. Silva, Yang Yu, Limei Tian, Ahyeon Koh, Chan Mi Lee, Aditya Chempakasseril, Peilin Tian, **Matt Pharr**, Jianghong Yuan, Yonggang Huang[#], Rahmi Oklu[#], and John A. Rogers[#]. “Needle-shaped ultrathin piezoelectric microsystem for guided tissue targeting via mechanical sensing.” *Nature Biomedical Engineering* 2, 165-172 (2018). **Selected for front cover of March 2018 issue of Nature Biomedical Engineering.**
- J26. Hongjie Hu[†], Xuan Zhu[†], Chonghe Wang[†], Lin Zhang, Xiaoshi Li, Seunghyun Lee, Zhenlong Huang, Ruimin Chen, Zeyu Chen, Chunfeng Wang, Yue Gu, Yimu Chen, Yusheng Lei, Tianjiao Zhang, NamHeon Kim, Yuxuan Guo, Yue Teng, Wenbo Zhou, Yang Li, Akihiro Nomoto, Simone Sternini, Qifa Zhou, **Matt Pharr**, Francesco Lanza di Scalea, and Sheng Xu[#]. “Stretchable ultrasonic transducer arrays for three-dimensional imaging on complex surfaces.” *Science Advances* 4 (3), eaar3979 (2018). **Highlighted by Science Daily:** (<https://www.sciencedaily.com/releases/2018/03/180323141345.htm>), **Medgadget:** (<https://www.medgadget.com/2018/04/stretchable-stick-on-ultrasound-patches-image-even-on-curved-surfaces.html>), **Bioengineering Today:** (<https://bioengineeringtoday.org/imaging/new-stretchable-electronics-better-ultrasound-imaging>), **Aerospace Manufacturing and Design:** (<http://magazine.aerospacemanufacturinganddesign.com/article/may-2018/flexible-ultrasound-patch.aspx>)
- J25. Mohammad Humood, Yan Shi, Mengdi Han, Joseph Lefebvre, Zheng Yan, **Matt Pharr**, Yihui Zhang, Yonggang Huang, John A. Rogers, and Andreas A. Polycarpou[#]. “Fabrication and Deformation of 3D Multilayered Kirigami Microstructures.” *Small* 14, 1703852 (2018). **Selected for front cover of March 15, 2018 issue of Small.**

- J24. Yuhao Liu^{†#}, **Matt Pharr^{†#}**, and Giovanni Salvatore^{†#}. “Lab-on-Skin: A Review of Flexible and Stretchable Electronics for Wearable Health Monitoring.” *ACS Nano* 11 (10), 9614-9635 (2017). **Highlighted by Nanowerk:** (<https://www.nanowerk.com/spotlight/spotid=48153.php>), **Daily Beast:** (<https://www.thedailybeast.com/is-the-next-fitbit-a-tattoo?ref=wrap?ref=wrap>), **Dark Daily:** (<https://www.darkdaily.com/in-the-field-of-nano-scale-diagnostics-many-researchers-are-developing-lab-on-skin-technologies-that-can-monitor-many-clinical-laboratory-biomarkers/>).
- J23. Taisong Pan[†], **Matt Pharr[†]**, Yinji Ma[†], Rui Ning, Zheng Yan, Renxiao Xu, Xue Feng, Yonggang Huang, and John A. Rogers[#]. “Experimental and Theoretical Studies of Serpentine Interconnects on Ultrathin Elastomers for Stretchable Electronics.” *Advanced Functional Materials* 27 (37), 1702589 (2017).
- J22. Joselle M. McCracken[†], Sheng Xu[†], Adina Badea, Kyung-In Jang, Zheng Yan, David J. Wetzel, Kewang Nan, Qing Lin, Mengdi Han, Mikayla A. Anderson, Jung Woo Lee, Zijun Wei, **Matt Pharr**, Renhan Wang, Jessica Su, Stanislav S. Rubakhin, Jonathan V. Sweedler, John A. Rogers[#], and Ralph G. Nuzzo[#]. “Deterministic Integration of Biological and Soft Materials onto 3D Microscale Cellular Frameworks.” *Advanced Biosystems* 1 (9), 1700068 (2017). **Selected for front cover of September 2017 issue of Advanced Biosystems.**
- J21. Garrett Hardin[†], Yuwei Zhang[†], Coleman Fincher, and **Matt Pharr[#]**. “Interfacial Fracture of Nanowire Electrodes of Lithium-Ion Batteries.” *Journal of the Minerals, Metals & Materials Society* 69 (9), 1519-1523 (2017).
- J20. Xiufeng Wang, Yinji Ma[#], Yeguang Xue, Haiwen Luan, **Matt Pharr**, Xue Feng, John A. Rogers, and Yonggang Huang[#]. “Collapse of liquid-overfilled strain-isolation substrates in wearable electronics.” *International Journal of Solids and Structures* 117, 137-142 (2017).
- J19. Yinji Ma[†], **Matt Pharr[†]**, Liang Wang, Jeonghyun Kim, Yuhao Liu, Yeguang Xue, Rui Ning, Xiufeng Wang, Ha Uk Chung, Xue Feng, John A. Rogers[#], and Yonggang Huang[#]. “Soft Elastomers with Ionic Liquid-Filled Cavities as Strain Isolating Substrates for Wearable Electronics.” *Small* 13 (9), 1602954 (2017).
- J18. Jianghong Yuan[#], **Matt Pharr**, X. Feng, John A. Rogers, and Yonggang Huang, “Design of stretchable electronics against impact.” *Journal of Applied Mechanics* 83 (10), 101009 (2016).
- J17. Jianghong Yuan, Y. Shi, **Matt Pharr**, X. Feng, John A. Rogers, and Yonggang Huang[#]. “A mechanics model for sensors imperfectly bonded to the skin for determination of the Young’s moduli of epidermis and dermis.” *Journal of Applied Mechanics* 83 (8), 084501 (2016).
- J16. **Matt Pharr[†]**, Yong Seok Choi[†], Dongwoo Lee, Kyu Hwan Oh, and Joost J. Vlassak[#]. “Measurements of stress and fracture in germanium electrodes of lithium-ion batteries during electrochemical lithiation and delithiation.” *Journal of Power Sources* 304, 164-169 (2016).
- J15. Yong Seok Choi, **Matt Pharr**, Kyu Hwan Oh, and Joost J. Vlassak[#]. “A simple technique for measuring the fracture energy of lithiated thin-film silicon electrodes at various lithium concentrations.” *Journal of Power Sources* 294, 159-166 (2015).

- J14. **Matt Pharr**, Zhigang Suo, and Joost J. Vlassak#. "Variation of stress with charging rate due to strain-rate sensitivity of silicon electrodes of Li-ion batteries." *Journal of Power Sources* 270, 569-575 (2014).
- J13. Yong Seok Choi, **Matt Pharr**, Chan Soon Kang, Seoung-Bum Son, Seul Cham Kim, Kee-Bum Kim, Hyunchul Roh, Se-Hee Lee, Kyu Hwan Oh, and Joost J. Vlassak#. "Microstructural evolution induced by micro-cracking during fast lithiation of single crystalline silicon." *Journal of Power Sources* 265, 160-165 (2014).
- J12. **Matt Pharr**, Zhigang Suo, and Joost Vlassak#. "Measurements of the Fracture Energy of Lithiated Silicon Electrodes of Li-Ion Batteries." *Nano Letters* 13 (11), 5570-5577 (2013).
- J11. Kejie Zhao, **Matt Pharr**, Lauren Hartle, Joost J. Vlassak, and Zhigang Suo#. "Fracture and Debonding in Lithium-ion Batteries with Electrodes of Hollow Core-Shell Nanostructures." *Journal of Power Sources* 218, 6-14 (2012).
- J10. **Matt Pharr**, Kejie Zhao, Xinwei Wang, Zhigang Suo, and Joost J. Vlassak#. "Kinetics of Initial Lithiation of Crystalline Silicon Electrodes of Lithium-Ion Batteries." *Nano Letters* 12 (9), 5039-5047 (2012).
- J9. Kejie Zhao, Georgios Tritsarlis, **Matt Pharr**, Wei L. Wang, Onyekwelu Okeke, Zhigang Suo, Joost J. Vlassak, and Efthimios Kaxiras#. "Reactive Flow in Silicon Electrodes Assisted by the Insertion of Lithium." *Nano Letters* 12 (8), 4397-4403 (2012).
- J8. **Matt Pharr**, Jeong-Yun Sun, and Zhigang Suo#. "Rupture of a Highly Stretchable Acrylic Dielectric Elastomer." *Journal of Applied Physics* 111 (10), 104114 (2012).
- J7. Kejie Zhao, **Matt Pharr**, Qiang Wan, Wei L. Wang, Efthimios Kaxiras, Joost J. Vlassak, and Zhigang Suo#. "Concurrent Reaction and Plasticity during Lithiation of Crystalline Silicon in Lithium-ion Batteries." *Journal of the Electrochemical Society* 159 (3), A238-A243 (2012).
- J6. **Matt Pharr**, Kejie Zhao, Zhigang Suo#, Fan-Yi Ouyang, and Pilin Liu. "Concurrent Electromigration and Creep in Lead-Free Solder." *Journal of Applied Physics* 110 (8), 083716 (2011).
- J5. Kejie Zhao, Wei L. Wang, John Gregoire, **Matt Pharr**, Zhigang Suo, Joost J. Vlassak, and Efthimios Kaxiras#. "Lithium-Assisted Plastic Deformation of Silicon Electrodes in Lithium-Ion Batteries: A First-Principles Theoretical Study." *Nano Letters* 11 (7), 2962-2967 (2011).
- J4. Kejie Zhao, **Matt Pharr**, Shengqiang Cai, Joost J. Vlassak, and Zhigang Suo#. "Large Plastic Deformation in High-Capacity Lithium-Ion Batteries Caused by Charge and Discharge." *Journal of the American Ceramic Society* 94 (1), S226-S235 (2011).
- J3. Kejie Zhao, **Matt Pharr**, Joost J. Vlassak, and Zhigang Suo#. "Inelastic Hosts as Electrodes for High-Capacity Lithium-Ion Batteries." *Journal of Applied Physics* 109 (1), 016110 (2011).
- J2. Kejie Zhao, **Matt Pharr**, Joost J. Vlassak, and Zhigang Suo#. "Fracture of Electrodes in Lithium-Ion Batteries Caused by Fast Charging." *Journal of Applied Physics* 108 (7), 073517 (2010).
- J1. **Matt Pharr**, Yutai Katoh, and Hongbin Bei. "Dependence of Fracture Toughness on Crystallographic Orientation in Single-Crystalline Cubic (β) Silicon Carbide." *U.S. Department of Energy Journal of Undergraduate Research* 6, 59-64 (2006).

Conference Presentations & Invited Talks

- T56. "Mechanics of Materials for High-Capacity Rechargeable Batteries." Materials Science and Engineering, University of Houston, Virtual, Apr. 2021.
- T55. "Mechanical Properties of Metal Anodes of Rechargeable Batteries." Materials Research Symposium, Virtual, Apr. 2021.
- T54. "Mechanical Behavior of Metal Anodes for Next-Generation Rechargeable Batteries." Society of Photographic Instrumentation Engineers Defense + Commercial Sensing, Virtual, Apr. 2021.
- T53. "Mechanics of Materials for High-Capacity Rechargeable Batteries." Frontiers in Mechanical Engineering and Sciences, Virtual, Dec. 2020.
- T52. "Mechanical Properties of Alkali Metal Anodes of Rechargeable Batteries." American Society of Mechanical Engineering International Mechanical Engineering Congress and Exhibition, Virtual, Nov. 2020.
- T51. "Mechanical Failure of Lithium Metal." Society of Engineering Science 57th Annual Technical Meeting, Virtual, Oct. 2020.
- T50. "Sideways and stable crack propagation in silicone elastomers." International Conference on Plasticity, Damage, and Fracture, Riviera Maya, Mexico, Jan. 2020.
- T49. "Mechanics of High-Capacity Lithium-ion Battery Electrode Materials." American Society of Mechanical Engineering International Mechanical Engineering Congress and Exhibition, Salt Lake City, UT, Nov. 2019.
- T48. "Sideways and stable crack propagation in silicone elastomers." American Society of Mechanical Engineering International Mechanical Engineering Congress and Exhibition, Salt Lake City, UT, Nov. 2019.
- T47. "Mechanics of Metallic Lithium and Sodium Anodes." Society of Engineering Science 56th Annual Technical Meeting, St. Louis, MO, Oct. 2019.
- T46. "'Sideways' and stable crack propagation in a silicone elastomer." Society of Engineering Science 56th Annual Technical Meeting, St. Louis, MO, Oct. 2019.
- T45. "In-situ Measurements of Stress Evolution in Composite Sulfur Cathodes." The Electrochemical Society 235th Meeting, Dallas, TX, May 2019.
- T44. "Sideways and stable crack propagation in silicone elastomers." American Physical Society March Meeting, Boston, MA, Mar. 2019.
- T43. "Mechanics of sulfur cathodes during electrochemical cycling." Small Scale Mechanical Behavior Symposium, Texas A&M University, College Station, TX, Dec. 2018.
- T42. "Electro-chemo-mechanics of high-capacity Li-S batteries." American Society of Mechanical Engineering International Mechanical Engineering Congress and Exhibition, Pittsburgh, PA, Nov. 2018.
- T41. "Electro-chemo-mechanics of high-capacity Li-S batteries." Society of Engineering Science 55th Annual Technical Meeting, Madrid, Spain, Oct. 2018.
- T40. "Mechanical measurements in high-capacity Li-ion battery electrodes." 18th U.S. National Congress for Theoretical and Applied Mechanics, Chicago, IL, June 2018.
- T39. "Mechanical Design Strategies in Wearable/Flexible Electronics." The Electrochemical Society 233rd Meeting, Seattle, WA, May 2018.
- T38. "Stress and fracture in high-capacity Li-ion battery electrodes." The Minerals, Metals & Materials Society, Phoenix, AZ, Mar. 2018.

- T37. "Experimental Studies of Plasticity and Fracture in Lithium-Ion Batteries." International Conference on Plasticity, Damage, and Fracture, San Juan, Puerto Rico, Jan. 2018.
- T36. "Serpentine Interconnects on Ultrathin Elastomers for Stretchable Electronics." American Society of Mechanical Engineering International Mechanical Engineering Congress and Exhibition, Tampa, FL, Nov. 2017.
- T35. "Serpentine interconnects on ultrathin elastomers for stretchable electronics." Society of Engineering Science 54th Annual Technical Meeting, Boston, MA, July 2017.
- T34. "Soft Elastomers with Ionic Liquid-Filled Cavities as Strain Isolating Substrates for Wearable Electronics." Materials Research Society, Phoenix, AZ, Apr. 2017.
- T33. "Measurements of Stress and Fracture in Germanium Electrodes of Li-Ion Batteries." Materials Research Society, Phoenix, AZ, Apr. 2017.
- T32. "Mechanics of Lithium-Ion Batteries and Stretchable Electronics." Department of Electrical and Computer Engineering, University of Houston, Houston, TX, Dec. 2016.
- T31. "Strain Isolation of Wearable Electronics through Liquid-Filled Substrates." Society of Engineering Science 53rd Annual Technical Meeting, College Park, MD, Oct. 2016.
- T30. "Measurements of Stress and Fracture in Germanium Electrodes of Li-ion Batteries." Society of Engineering Science 53rd Annual Technical Meeting, College Park, MD, Oct. 2016.
- T29. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Mechanical Engineering, Texas A&M University, College Station, TX, Sept. 2016.
- T28. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Materials Science, Texas A&M University, College Station, TX, Sept. 2016.
- T27. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Mechanical Engineering, Texas A&M University, College Station, TX, Mar. 2016.
- T26. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Aerospace Engineering and Engineering Mechanics, University of Texas at Austin, Austin, TX, Mar. 2016.
- T25. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Materials Engineering, Auburn University, Auburn, AL, Feb. 2016.
- T24. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Materials Science and Engineering, University of Florida, Gainesville, FL, Feb. 2016.
- T23. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Mechanical Engineering, Stanford University, Palo Alto, CA, Feb. 2016.
- T22. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN, Jan. 2016.
- T21. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, Jan. 2016.
- T20. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Mechanical Engineering, University of Houston, Houston, TX, Dec. 2015.
- T19. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC, Nov. 2015.
- T18. "Deformation and Fracture of Silicon Electrodes in Lithium-Ion Batteries." Materials Research Society, San Francisco, CA, Apr. 2015.

- T17. "Stress, Deformation, and Fracture of High-Capacity Anodes." Materials Research Society, San Francisco, CA, Apr. 2015.
- T16. "Skin-Mounted Diagnostic Devices." Materials Research Society, San Francisco, CA, Apr. 2015.
- T15. "Concurrent electromigration and creep in lead-free solder." 13th International Workshop on Stress-Induced Phenomena in Microelectronics, Austin, TX, Oct. 2014.
- T14. "Deformation and Fracture of Silicon Electrodes in Lithium-Ion Batteries." Society of Engineering Science 51st Annual Technical Meeting, West Lafayette, IN, Oct. 2014.
- T13. "Lithium-Ion Batteries: Diffusion, Deformation, and Damage." Department of Mechanical Engineering, University of Colorado Boulder, Boulder, CO, Feb. 2014.
- T12. "Deformation and Failure of Lithium-Ion Batteries and Microelectronics." Department of Engineering Science and Mechanics, Virginia Tech, Blacksburg, VA, Feb. 2014.
- T11. "Fracture Energy of Lithiated Silicon Electrodes of Lithium-ion Batteries." Society of Engineering Science 50th Annual Technical Meeting, Providence, RI, June 2013.
- T10. "Kinetics of Initial Lithiation of Crystalline Silicon." Society of Engineering Science 49th Annual Technical Meeting, Atlanta, GA, Oct. 2012.
- T9. "Rupture of a Highly Stretchable Dielectric Elastomer." Society of Engineering Science 49th Annual Technical Meeting, Atlanta, GA, Oct. 2012.
- T8. "Fracture and Debonding in Coated Hollow Nanostructured Electrodes of Lithium-Ion Batteries." The Electrochemical Society 221st Meeting, Seattle, WA, May 2012.
- T7. "Rupture of a Highly Stretchable Dielectric Elastomer." American Physical Society March Meeting, Boston, MA, Mar. 2012.
- T6. "Small and Soft Electrodes for High-Capacity Lithium-ion Batteries." Materials Research Society, Boston, MA, Nov. 2011.
- T5. "Fracture of Electrodes in Lithium-ion Batteries Caused by Fast Charging." American Society of Mechanical Engineers Applied Mechanics and Materials Conference, Chicago, IL, May 2011.
- T4. "Inelastic Hosts as Electrodes for High-Capacity Lithium-ion Batteries." Materials Research Society, San Francisco, CA, Apr. 2011.
- T3. "Dissolution of Copper in Pb-Free Solder Joints." The Minerals, Metals & Materials Society, San Diego, CA, Mar. 2011.
- T2. "Coupled Creep and Diffusion in Flip Chip Solder Bumps." American Society of Mechanical Engineers International Mechanical Engineering Congress & Exposition, Vancouver, BC, Nov. 2010.
- T1. "Fracture of VHB." New England Workshop on the Mechanics of Materials and Structures, Cambridge, MA, Sept. 2010.

Research Funding

- F14. "The Influence of Mechanical Loading on the Hydrolysis of Biodegradable Polymer Implants." NSF-CMMI-MOMS. PI: Anastasia Muliana; co-PI: Matt Pharr and Kumbakonam Rajagopal. 9/1/2021 – 8/31/2024. \$551,017.
- F13. "Filling Data Gaps Related to Material Effects in Polymer Medical Products from E-Beam and X-ray Sterilization." DOE - National Nuclear Security Administration -

- Pacific Northwest National Laboratory - AgriLife. PI: Matt Pharr; co-PI: David Staack. 9/19/2020 – 3/31/2021. \$50,000.
- F12. “CAREER: Electro-Chemo-Mechanics of Li and Na Metal: Toward Dendrite- and Damage-Free Metallic Anodes of Rechargeable Batteries.” NSF-DMR-MMN. PI: Matt Pharr; co-PI: none. 6/1/2020 – 5/31/2025. \$556,720.
- F11. “Electromigration in Lithium Metal.” Texas A&M T3 Triads for Transformation. PI: Matt Pharr; co-PI: Sarbajit Banerjee and Patrick Shamberger. 1/1/2020 – 12/31/2021. \$32,000.
- F10. “Filling Data Gaps Related to Material Effects in Polymer Medical Products from E-Beam and X-ray Sterilization.” DOE - National Nuclear Security Administration - Pacific Northwest National Laboratory - AgriLife. PI: Matt Pharr; co-PI: David Staack. 9/19/2019 – 9/18/2020. \$259,000.
- F9. “A Brain-Inspired Approach to Rapid and Energy Efficient Information Processing: AI on the Fly.” Texas A&M X-grants. PI: Sarbajit Banerjee, co-PI: Patrick Shamberger and Stan Williams co-I: Raymundo Arroyave, Perla Balbuena, James Batteas, Lei Fang, Bani Mallick, Samuel Palermo, Matt Pharr, Xiaofeng Qian, and Kelvin Xie. 9/1/2019 – 8/31/2022. \$1,429,791.
- F8. “Filling Data Gaps Related to Material Effects in Polymer Medical Products from E-Beam and X-ray Sterilization.” DOE - National Nuclear Security Administration - Pacific Northwest National Laboratory - AgriLife. PI: David Staack; co-PI: Matt Pharr. 8/24/2018 – 8/23/2019. \$140,047.
- F7. “Strain Modulation of 2D Materials as a Means of Enhancing Electrocatalytic Activity.” Texas A&M Energy Institute. PI: Matt Pharr; co-PI: Sarbajit Banerjee and Xiaofeng Qian. 8/1/2018 – 7/31/2019. \$50,000.
- F6. “Biomechanical Properties of Bioenergy Sorghum: Changes in Gene Expression Due to Mechanical Stimulation.” NSF-CMMI-BMMB. PI: Anastasia Muliana; co-PI: Matt Pharr and Scott Finlayson. 5/15/2018 – 4/30/2022. \$396,688.
- F5. “Simulate Proton Beam Radiation Damage – Annealing of Irradiation Damage in Inconel Windows.” DOE-National Nuclear Security Administration – Los Alamos National Laboratory. PI: Matt Pharr; co-PI: Lin Shao. 4/2/2018 – 6/15/2019. \$115,592.
- F4. “Engineering superior bioenergy sorghum: genetic/physiological variations in biomechanical properties.” Texas A&M T3 Triads for Transformation. PI: Matt Pharr; co-PI: Anastasia Muliana and Scott Finlayson. 4/1/2018 – 3/31/2020. \$35,000.
- F3. “Electro-chemo-mechanics of lithium metal anodes for high-capacity batteries.” Haythornthwaite Foundation Research Initiation Grant: American Society of Mechanical Engineering Applied Mechanics Division. PI: Matt Pharr. 11/1/2017 (one time gift). \$20,000.
- F2. “Virtual/Augmented Reality-based Immersive Learning; MEEN 360: Materials and Manufacturing Selection in Design.” Center for Teaching Excellence - Texas A&M Student Success Faculty Fellows Grant Program. PI: Matt Pharr. 10/1/2017 – 12/1/2018. \$10,000.
- F1. “Design Optimization of Additively Manufactured and Self-Folding Structures Considering Multiple Functionalities.” Air Force Research Laboratory: Minority Leaders Program / Texas A&M Data-Driven Discovery of Models (AFRL MLP/TAMU D3M). PI:

Darren Hartl; co-PI: Richard Malak, Greg Huff, and Matt Pharr. 3/1/2017 – 2/28/2018.
~\$400,000 split among ~13 faculty and 5 research projects.

Service and Synergistic Activities

External Professional Service

- Guest editor for a special issue on “Advanced Nanoindentation in Materials” in the journal *Materials* (2016 - 2017)
- Review editor and editorial board member for *Frontiers in Electronics – Flexible Electronics* (2020 - present)
- Conference Organization:
 - Symposium chair for Soft Robotics symposium at MRS (2017)
 - Symposium chair for Mechanics of Energy Storage and Conversion symposium at MRS (2017)
 - Organized symposia on Energy Materials and Electrochemistry at SES (2017, 2019, 2020)
 - Symposium chair for Battery Characterization – Stress and Strain symposium at ECS (2019)
 - Organized symposium on Mechanical Behavior at Micro/Nano-Scale at MRS (2021)
- Peer Reviewer:
 - Review panelist for the Division of Materials Research of the National Science Foundation (2017, 2020, 2021)
 - Reviewer for the American Chemical Society Petroleum Research Fund (2020)
 - Panelist for the National Defense Science and Engineering Graduate Fellowship (2015)
 - Journal reviewer for: *Nature Nanotechnology*, *Nature Communications*, *Nature Electronics*, *Proceedings of the National Academy of Sciences*, *Nano Letters*, *Physical Review Letters*, *Advanced Functional Materials*, *ACS Nano*, *Advanced Materials*, *Science Advances*, *Acta Materialia*, *Matter*, *ACS Energy Letters*, *Advanced Energy Materials*, *Energy Reports*, *Proceedings of the Royal Society A*, *Applied Physics Letters*, *Journal of the Mechanics and Physics of Solids*, *Extreme Mechanics Letters*, *Trends in Chemistry*, *Communications Chemistry*, *Energy Storage Materials*, *Journal of Applied Mechanics*, *Journal of Applied Physics*, *Physical Review B*, *Engineering Fracture Mechanics*, *International Journal of Solids and Structures*, *Applied Mechanics Reviews*, *Advanced Energy Materials*, *International Journal of Plasticity*, *Journal of Materials Research*, *Mechanics of Materials*, *Materialia*, *Modelling and Simulation in Materials Science and Engineering*, *IEEE Sensors Journal*, *ACS Sensors*, *International Journal of Applied Mechanics*, *MRS Advances*, *Polymer Testing*, *International Journal of Fracture*, *European Journal of Mechanics - A/Solids*, *ASME Journal of Electrochemical Energy Conversion and Storage*, *Journal of Propulsion and Power*, *Materials Science and Engineering B*, *Journal of Materials Science*, and *Experimental Mechanics*.

University and Community Service

- Reviewer for Postdoctoral Scholar Travel Awards (2016)

- MEEN Seminar Committee (2016 - 2017)
- Mechanical Engineering Shared Services Committee (2017 - 2019)
- Represented Texas A&M University at the Los Alamos National Lab sponsored 'ReACT' workshop at the Colorado School of Mines in Golden, CO (2018)
- Led workshops during the Youth Adventure Program (2018, 2019)
- Led workshops during at the STEM 4 Innovation Conference for K-12 Education (2018, 2019)
- Led workshops/lab tours for high school students through AggieSTEM (2017 – 2019)
- Provided feedback on NSF GRFP proposals for Texas A&M students (2018)
- Greens Prairie STEM night: head organizer and participant (2020)
- Presented to the TAMUS Louis Stokes Alliance for Minority Participation (LSAMP) program on success in academia (2019)
- Zachry transition ad-hoc committee (2018)
- Engineering Honors Faculty (2018 – present)
- MEEN Educational Development Committee (2018 – present)
- Faculty Advisory Committee (2020 – present)
- STEM Night at Greens Prairie Elementary (2019)
- Faculty Host for the Summer 2019 International Research Internship Program (2019)

Student Advising

Ph.D. Students Advised

5. Jungho Shin, 2020 – present
4. Md Kamrul Hasan, 2019 – present
3. Omid Zargar (co-chair with Anastasia Muliana), 2018 – present
2. Yuwei Zhang, "Chemo-Mechanics of Functional Thin Films for Lithium-ion Batteries and Neuromorphic Computing Devices". 2021
1. Seunghyun Lee, "Mechanical Behavior of a Silicone Elastomer, Elastomer Composites, and a Natural Composite." 2020.

M.S. Students Advised

3. Cole Fincher, "Small-Scale Mechanical Behavior of Metal Electrodes." 2020.
2. Haley Turman, "Investigation of the Effect of Annealing on Irradiated Alloy 718." 2019.
1. Garrett Hardin, "Mechanics of Electrodes in High-Capacity Lithium-Ion Batteries." 2018.

Undergraduate and High School Students Advised

35. Saaransh Verma. "Electrodeposition of Li-Mg Alloys" 2021 – present.
34. Jessica Ganley. "3D Printing of Auxetic Polymers" 2021 – present.
33. Karla Molina. "Architected 3D-Printed Polymers." 2020 – present.
32. Puneet Kohli. "Mechanics of irradiated polymers for medical devices." 2020 – present.
31. Chiedu Nwaobi. "Biomechanics of sorghum." 2020 – present.
30. Bill Wang, High school student, "In-situ optical observation and stress

- measurements.” 2019 – 2020.
29. Michael Ecker-Randolph, REU student. “Manufactured defects for lightweight elastomers with high strength and toughness.” 2019.
 28. Temitayo Odunuga, REU student. “Stresses during electrochemical deposition of Li metal.” 2019.
 27. Kyriakos Avraam, visiting student from Cyprus. “Mechanical Testing of Ebeam and X-ray Sterilized Polymers for Medical Products.” 2019.
 26. Carl Reiser. “Highly stretchable and conductive electrode gels.” 2019 – 2020.
 25. Luke Perkins. “Mechanical Testing of Ebeam and X-ray Sterilized Polymers for Medical Products.” 2019.
 24. Edward Gaffney. “Mechanical Testing of Ebeam and X-ray Sterilized Polymers for Medical Products.” 2019 - 2020.
 23. Arjun Rao. “Mechanical Testing of Ebeam and X-ray Sterilized Polymers for Medical Products.” 2019.
 22. James Chin. “Effects of irradiation on mechanical properties of polymers.” 2019.
 21. Andrew Buske. “Effects of irradiation on mechanical properties of polymers.” 2019.
 20. Mark Olvera. “Effects of irradiation on mechanical properties of polymers.” 2019.
 19. Daniel Claybaugh, 2018 – 2020.
 18. Raquel Muyschondt, 2018 – present.
 17. Arber Shasivari, 2018 – 2019.
 16. Edwin Torres, 2018 – 2019.
 15. Maria Lydia Ioannides, visiting student from Cyprus, 2018
 14. Daniela Ojeda, REU student, 2018
 13. Russell Rowe, REU student, 2018
 12. Jonah Nouredine, 2018
 11. Paco Falcon, 2018
 10. Kylie Nielson, 2017 – 2018
 9. Aaron Garcia, 2017 – 2018
 8. Justin Coe, 2017 – 2018
 7. Scott McProuty, 2017 – 2018
 6. Brenda Cancino, 2017 – 2018
 5. Cole Fincher, 2016 – 2017
 4. Geoffrey Garner, 2016 – 2017
 3. Taiwo Odetola, 2017
 2. Garrett Swenson, REU student, 2017
 1. Valdemar Solis, 2017

Thesis Committees

30. Yuan Ji, Texas A&M Mechanical Engineering, Ph.D. (ongoing)
29. Kwang Noh, Texas A&M Materials Science and Engineering, Ph.D. (ongoing)
28. Jadha Gunawan, Texas A&M Mechanical Engineering, M.S. (ongoing)
27. Jaybelle Pranada, Texas A&M Materials Science and Engineering, M.S. (ongoing)
26. Devendra Dilip Badapurkar, Texas A&M Mechanical Engineering, M.S. (ongoing)
25. Yang Gang, Texas A&M Mechanical Engineering, Ph.D. (ongoing)

24. Ahmad Shahedi Shakil, Texas A&M Mechanical Engineering, Ph.D. (ongoing)
23. Jian Tan, Texas A&M Mechanical Engineering, Ph.D. (ongoing)
22. Kian Bashandeh, Texas A&M Mechanical Engineering, Ph.D. (ongoing)
21. Sumit Khatri, Texas A&M Aerospace Engineering, M.S. (2019)
20. Steven VandenBrook, Texas A&M Mechanical Engineering, M.S. (ongoing)
19. Xuhui Feng, Texas A&M Mechanical Engineering, Ph.D. (ongoing)
18. Mitchell Shockley, Texas A&M Mechanical Engineering, M.S. (2019)
17. Yu Liu, Texas A&M Material Science and Engineering, Ph.D. (2020)
16. Jamshid Kavosi, Texas A&M Material Science and Engineering, Ph.D. (2020)
15. Yuting Luo, Texas A&M Chemistry, Ph.D. (ongoing)
14. Lai Jiang, Texas A&M Materials Science and Engineering, Ph.D. (ongoing)
13. David Santos, Texas A&M Chemistry, Ph.D. (ongoing)
12. Ruyue Song, Texas A&M Mechanical Engineering, Ph.D. (2020)
11. Ana Rodriguez Atencio, Texas A&M Materials Science and Engineering, Ph.D. (2020).
10. Robert Rodi, Texas A&M Mechanical Engineering, M.S. (substitute) (2019)
9. Wei Deng, Texas A&M Mechanical Engineering, Ph.D. (2019)
8. Mohammadreza Soleymaniha, Texas A&M Mechanical Engineering, Ph.D. (2019)
7. Deep Barua, Texas A&M Mechanical Engineering, M.S. (substitute) (2019)
6. Navin Kumar Subramaniam, Texas A&M Mechanical Engineering, Ph.D. (2018)
5. Mohammad Muneer Humood, Texas A&M Mechanical Engineering, Ph.D. (2018)
4. Eric Coronado, Texas A&M Mechanical Engineering, M.S. (2017)
3. Xiaoyu Zheng, Texas A&M Mechanical Engineering, M.S. (2017)
2. Jonel Ortiz, Texas A&M Mechanical Engineering, M.S. (2017)
1. Michael Liu, Texas A&M Materials Science, M.S. (2017)

I hereby certify that the CV being submitted is current and correct as of the date of signature:

 Matt Pharr 5/13/2021