

CURRICULUM VITAE:

John A. Moore

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Academic Background

Ph.D. Mechanical Engineering, Northwestern University, 2015

Dissertation Title: A micromechanics-based method for multiscale fatigue prediction

Committee: Wing Kam Liu, Gregory Olson, and Jianmin Qu

M.S.E. (Civil Engineering) University of Washington, 2007

Thesis Title: Extension of the material point method for modeling interaction of distinct phases in porous continua

Committee: Peter Mackenzie-Helnwein, Pedro Arduino, and Gregory Miller

B.S. Aeronautical and Astronautical Engineering, University of Washington, 2005

Professional History

Assistant Professor, Marquette University, 2018 – present

Staff Computational Scientist/Engineer, Lawrence Livermore National Laboratory, 2017-2018

Postdoctoral Research Staff, Lawrence Livermore National Laboratory, 2015-2017

Structural Analysis Engineer, Aerojet (currently Aerojet Rocketdyne), 2009 – 2010

Structural Analysis Associate Engineer, Aerojet, 2007 – 2009

Structural Engineering Intern, D'Amato Conversano Inc. Engineers, 2006

Journal Publications

Please see an updated list of publications on Google Scholar:

<https://scholar.google.com/citations?user=c6mdEsIAAAAJ&hl=en>

Truman Miller Russell (MU-PhD), John P. Borg (MU-Faculty), **John A Moore**, Material Modeling of an Ultraviolet Sensitive Resin at High Pressures and Rates, Journal of the Mechanics and Physics of Solids, submitted, July 2024.

Jacob Rusch (MU-PhD), Dinc Erdeniz (UCincy-Faculty), **John A Moore**, A Multi-Fidelity and Bayesian Optimization Framework to Calibrate a Crystal Plasticity Finite Element Model for Nitinol, Computational Mechanics, submitted, August 2024.

20. V. Senthilkumaran (UAlberta-PhD), N. F. Beier (UAlberta-Postdoc) P. Shabaninezhad (MU-PhD), J. Stinehart (MU-Masters), S. Fourmaux (ALLS scientist), L. Zhou (MU-Faculty), **J. A. Moore**, and A. E. Hussein (UAlberta-Faculty), Laser-driven betatron x-rays for high-throughput imaging of additively manufactured materials, Review of Scientific Instruments 95, no. 12 (2024).

19. Parisa Shabani Nezhad (MU-PhD), **John A. Moore**, Dinc Erdeniz (UCincy-Faculty), Effect of Wire Size on the Functional and Structural Fatigue Behavior of Superelastic Nitinol, Materials Science and Engineering: A, Volume 895, March 2024, 146218.

18. **John A. Moore**, Caitlin Martinez (MU-undergrad), Ayushi Chandel (Brookfield Acad High School), NOCAL-FEA: A NonLOCAL Results Processor for Finite Element Analysis, Software Impacts, Volume 18, November 2023, 100595 (<https://doi.org/10.1016/j.simpa.2023.100595>).

17. **John A. Moore**, Caitlin Martinez (MU-undergrad), Ayushi Chandel (Brookfield Acad High School), A Nonconformal Nonlocal Approach to Calculating Statistical Spread in Fatigue Indicator Parameters for Polycrystals, Fatigue & Fracture of Engineering Materials & Structures 2023; 46:4801–4806, (<http://doi.org/10.1111/ffe.14158>).

16. **John A. Moore**, Jacob P. Rusch(MU-PhD), Parisa Shabani Nezhad(MU-PhD), Sivom Manchiraju (Ansys, Inc), Dinc Erdeniz (UCincy-Faculty), Effects of Martensitic Phase Transformation on Fatigue Indicator Parameters Determined by a Crystal Plasticity Model, International Journal of Fatigue 168 (2023): 107457.

15. **JA Moore**, N.R. Barton (LLNL), A porosity-based model of dynamic compaction in under-dense materials, International Journal of Solids and Structures 246 (2022): 111598.

14. Sayyad Qamar (Texas A&M-PhD), **JA Moore**, and N Barton (LLNL), A continuum damage approach to spallation and the role of microinertia, Journal of Applied Physics, 131.8 (2022): 085901.

13. **Moore, JA**. Frasca (MU-PhD), A. A Comparison of Gurson and Cocks-Ashby porosity kinetics and degradation functions, International Journal of Fracture, 229 (2021): 253–268.

12. **JA Moore**, S.F. Li (John Deere/LLNL), M. Rhee (LLNL), and N.R. Barton (LLNL). Modeling the effects of grain and porosity structure on copper spall response. Journal Dynamic Behavior of Materials 4(4) (2018): 464-480.

11. **Moore, JA**. A degradation function consistent with Cocks–Ashby porosity kinetics. International Journal of Fracture, 209, no. 1-2 (2018): 231-234.

10. **Moore, JA.**, Barton, N. R., Florando, J., Mulay, R., Kumar, M. Crystal plasticity modeling of β phase deformation in Ti-6Al-4V. *Modelling and Simulation in Materials Science and Engineering*, 25, no. 7 (2017): 075007.
9. **Moore JA**, Frankel D, Prasannavenkatesan R, Domel AG, Olson GB, Liu WK. A crystal plasticity-based study of the relationship between microstructure and ultra-high-cycle fatigue life in nickel titanium alloys. *International Journal of Fatigue*, 91 (2016): 183-194.
8. Mulay RP, **Moore JA**, Florando JN, Barton NR, Kumar M. Microstructure and mechanical properties of Ti-6Al-4V: Mill-annealed versus direct metal laser melted alloys. *Materials Science and Engineering: A*. 2016; 666:43-7.
7. Liu Z, **Moore JA**, Liu WK. An extended micromechanics method for probing interphase properties in polymer nanocomposites. *Journal of the Mechanics and Physics of Solids*, 666 (2016): 43-47.
6. Boyce BL, Kramer SL, Bosiljevac TR, Corona E, **Moore JA**, Elkhodary K, et al. The second Sandia fracture challenge: predictions of ductile failure under quasi-static and moderate-rate dynamic loading. *International Journal of Fracture*, 198(1-2) (2016):5-100.
5. Liu Z, **Moore JA**, Aldousari SM, Hedia HS, Asiri SA, Liu WK. A statistical descriptor based volume-integral micromechanics model of heterogeneous material with arbitrary inclusion shape. *Computational Mechanics*, 55(5) (2015):963-81.
4. **Moore JA**, Li Y, O'Connor DT, Stroberg W, Liu WK. Advancements in multiresolution analysis. *International Journal for Numerical Methods in Engineering*, 102(3-4) (2015):784-807.
3. **Moore JA**, Ma R, Domel AG, Liu WK. An efficient multiscale model of damping properties for filled elastomers with complex microstructures. *Composites Part B: Engineering*, 62 (2014):262-70.
2. Mackenzie-Helnwein P, Arduino P, Shin W, **Moore JA**, Miller GR. Modeling strategies for multiphase drag interactions using the material point method. *International Journal for Numerical Methods in Engineering*, 83(3) (2010):295-322.
1. McCarthy MP, Hernandez G, Mactutis A, **Moore JA**. Validation of an 8-14 μm cloud monitor using visual observations of Antarctic cloud cover. *Applied Optics*, 46(11) (2007): 2091-8.

Conference Proceedings

Amina E. Hussein (UAlberta-Faculty), Vigneshvar Senthilkumaran (UAlberta-PhD), Nick F. Beier (UAlberta-Postdoc), Stephan Reuter (Polytechnique Montréal-Faculty), Le Zhou (MU-Faculty), **John A. Moore**. Characterization of laser-plasma betatron x-rays at 2.5 Hz, 2024 Canadian Association of Physics (CAP) Congress, London, ON, Canada.

John A. Moore, Joseph T. Maestas (ARA), Sorin Bastea (LLNL), Michael Crochet (AFRL), Gerrit Sutherland (ARL), Robert J. Dorgan (AFRL), ALE-3D Hydrocode Simulations with kinetic CHEETAH of the Small-Scale Shock Reactivity Test, Moby Dick Test and Aardvark Test, Proceedings of the Joint Army-Navy-NASA-Air Force (JANNAF) meeting CS/APS/EPSS/ESHS/PIB. December 2023, Salt Lake City Utah.

Truman M. Russell (MU-MS), **John A. Moore**, and John P. Borg (MU-Faculty), Ultraviolet Sensitive Resin: Material Modeling with CTH and Dakota Optimization, Proceedings of the Conference on Shock Compression of Condensed Matter, Chicago, Il 2023.

Jack Borg(MU-PhD), Rafee Mahbub (MU-PhD), Truman Russell (MU-MS), **John A. Moore**, and John Borg (MU-Faculty), Material Models of PDMS and an Ultraviolet Sensitive Photopolymer, Proceedings of the Conference on Shock Compression of Condensed Matter, Chicago, Il 2023.

Sayyad Qamar (Texas A&M-PhD), **JA Moore**, and N Barton (LLNL) Expanding the envelope for spall modeling using porosity mechanics incorporating microinertia, Bulletin of the American Physical Society 67 Proceedings of the Conference on Shock Compression of Condensed Matter, Anaheim, CA 2022.

Alvaro R. Arce-Borkent (UAlberta-undergrad), Richard Tait (UAlberta-undergrad), Vigneshvar Senthilkumaran (UAlberta-PhD), Nick F. Beier (UAlberta-Postdoc), L. Zhou (MU-Faculty), **J Moore**, K. Steven Knudsen (UAlberta-Faculty), Amina E. Hussein (UAlberta-Faculty), Michael G Lipsett (UAlberta-Faculty), Design and development of a novel tensile testing apparatus for time-resolved betatron x-ray tomographic Imaging, 2022 Canadian Society for Mechanical Engineering International Congress, Edmonton Alberta CA, June 2022.

Conference Presentations (no Proceeding)

Anahita Alipanahi, Nicole Schilder, Madeline Janecek, Allison K. Murray, John A. Moore Dynamic Characterization and Optimization of TPMS Lattice Structures Under Random Vibrations, 2025 SEM Annual Conference and Exposition on Experimental Mechanics.

P. Shabani Nezhad, J.A. Moore, D. Erdeniz, Localized Deformation and Band Formation in Superelastic Nitinol Wires, PhotoMechanics – iDIC conference Clermont-Ferrand, October 2024.

John A. Moore, Parisa Shabani Nezhad, Jacob Rusch, Opemipo Adetan, Peter Kenesei, Jun-Sang Park, Dinc Erdeniz, A combined crystal plasticity, high energy diffraction microscopy, and micro-tomography study of fatigue in a nickel titanium alloy 16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics, July 2024 Vancouver BC.

John A. Moore, Jacob P. Rusch, Parisa Shabani Nezhad, Sivom Manchiraju, Ayushi Chandel Dinc Erdeniz, Fatigue Indicator Parameters: Effects of Phase Transformation and Nonlocality (Invited Talk), *TMS 2024 Annual Meeting & Exhibition*, March 2024, Orlando, FL.

John A. Moore, Joseph T. Maestas, Sorin Bastea, Michael Crochet, Gerrit Sutherland, Robert J. Dorgan, ALE-3D Hydrocode Simulations with kinetic CHEETAH of the Small-Scale Shock Reactivity Test, Moby Dick Test and Aardvark Test, Joint Army-Navy-NASA-Air Force (JANNAF) meeting CS/APS/EPSS/ESHS/PIB. December 2023, Salt Lake City Utah.

Jack Borg, Rafee Mahbub, Truman Russell, John Borg, John Moore, Material Models of PDMS and an Ultraviolet Sensitive Photopolymer, American Physical Society topical Group Shock Compression of Condensed Matter, June 2023, Chicago, IL.

John A. Moore, Jacob P. Rusch, Parisa Shabani Nezhad, Sivom Manchiraju, Dinc Erdeniz Effects of Martensitic Phase Transformation on Fatigue Indicator Parameters Determined by a Crystal Plasticity Model (Invited Talk), *17th US National Congress on Computational Mechanics*, July 2023, Albuquerque, NM.

Jacob Rusch, John A Moore, Multi-Fidelity Calibration of Nitinol Crystal Plasticity Model, *17th US National Congress on Computational Mechanics*, July 2023, Albuquerque NM.

Parisa Shabani Nezhad, John Moore, Dinc Erdeniz, Role of Non-Metallic Inclusions in the Fatigue Behavior of Superelastic Nitinol, *TMS 2023 Annual Meeting & Exhibition*, March 2023, San Diego, CA.

John A Moore. Student Design of a 10,000 ft Altitude Commercial Off-The-Shelf Rocket. *Wisconsin Space Grant Consortium Meeting*, August 2022, Waukesha, WI.

S Qamar, N Barton, J Moore, Expanding the envelope for spall modeling using porosity mechanics incorporating microinertia, *22nd Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter*, July 2022, Anaheim, CA.

V. Senthilkumaran, N. F. Beier, T. Richards, S. Knudsen, and A. E. Hussein, A. A-Borkent, M. Lipsett, S. Fourmaux, P. Shabaninezhad, J. Stinehart, L. Zhou and J. A. Moore, Imaging of defects in additively manufactured alloys using betatron X-rays, *49th International Conference on Plasma Science*, May 2022, Seattle, WA.

Parisa Shabani Nezhad, Jacob Rusch, John Moore, Dinc Erdeniz, Effect of Wire Size on the Fatigue Life of Superelastic Nitinol, *TMS 2022 Annual Meeting & Exhibition*, Anaheim CA.

V. Senthilkumaran, T. Richards, S. Knudsen, A. E. Hussein, A. A-Borkent and M. Lipsett, S. Fourmaux, F. Legare, J.-C. Kieffer, L. Zhou and, J. A. Moore, High-resolution betatron X-ray imaging of porosity evolution in additively manufactured alloys. *International Conference on Plasma Science*, September 2021 Virtual.

Parisa Shabani Nezhad, Jacob Rusch, John Moore, Dinc Erdeniz, Wire Size Effect on the Nucleation of Fatigue Cracks Near Non-Metallic Inclusions in Superelastic Nitinol, *Materials Science and Technology 2021: Technical Meeting and Exhibition*.

Jacob Rusch, John A Moore, Using finite element analysis and Bayesian machine learning to make predictions of crack nucleation in metals with non-metallic inclusions, *Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology* September 26-29, 2021, San Diego, CA.

Katarina Radmanovic, Jessica M. Fritz, Carolyn I. Albert, John A. Moore, Taly Gilat Schmidt, Sergei S. Tarima, Peter A. Smith, Gerald F. Harris, Effects of Saline Storage Time on Mechanical Properties in Healthy Pediatric Cortical Bone. *45th Meeting of the American Society of Biomechanics*, Virtual, August 2022.

Jacob Rusch, Sivom Manchiraju, JA Moore, Modeling of The Transformation Ratcheting of Nitinol Using Computational Crystal Plasticity, *16th US National Congress on Computational Mechanics*, Virtual, July 2021.

JA Moore, NR Barton, A Porosity Growth and Plasticity Model for Under-dense Material Subject to Extreme Loadings, *16th US National Congress on Computational Mechanics*, Virtual, July 2021.

Ian Morrissey, JA Moore, Modeling and Optimization of Super-Elastic Shape Memory Alloy Bending Dominated Lattice Structures for Kinetic Energy Absorption/Dissipation Using the Finite Element Method, Mach Conference, Virtual, April 7th, 2021.

NR Barton, JA Moore, SB Qamar, The Influence of Micro-inertia on Experimentally Observable Behaviors, *14th World Congress on Computational Mechanics*, Virtual, January 2021.

JA Moore. An implicit crystal mechanics and porosity model with strain-rate dependent porosity kinetics and damage, *14th World Congress on Computational Mechanics*, Virtual, January 2021.

Tamanna Tasnim, Somesh Roy, JA Moore. Cohesive zone modeling of interfaces under high impact velocity collisions. *International Mechanical Engineering Congress & Exposition 2020*, Virtual, Nov. 15-18, 2020.

M. Smoljan, M Ibrahim, JA Moore, A. Guentsch. Influence of canal preparation with progressively versus Minimally tapered instruments on the fracture resistance of mandibular molars: a finite element analysis study, *American Association of Endodontics (AAE20)*, Nashville TN, April 2020. (Canceled due to COVID-19, abstract presented in May 2020 issue of the Journal of Endodontics)

JA Moore, NR Barton. Incorporation of Microinertia into a Cocks-Ashby-kinetics-based Porosity Model, Mach Conference, Annapolis, Maryland April 5th, 2018.

NR Barton, JA Moore. A Cocks-Ashby based formulation for incorporating sub-scale variations in rate sensitivity into porosity modeling, *XIV International Conference on Computational Plasticity*, Barcelona Spain, September 2017.

JA Moore, NR Barton, JN Florando, RP Mulay, M Kumar. Microscale modeling of Ti-6Al-4V's response and failure, *Materials Science and Technology 2016: Technical Meeting and Exhibition*, Salt Lake City Utah, October 2016.

M Messner, JA Moore, NR Barton. Homogenized dynamics of lattice-structured meta-materials, *8th Multiscale Materials Modeling International Conference*, Dijon France, October 2016.

JA Moore, MA Bessa and WK Liu. A computational constitutive law for Multiscale Fatigue Predictions, *11th World Congress on Computational Mechanics*, Barcelona Spain, July 2014.

JA Moore, S Tang, WK Liu. Multiscale modeling of polymer/nanodiamond composites: property prediction, *11th US National Congress on Computational Mechanics*, Minneapolis, MN, July 2011.

P Mackenzie-Helnwein, P Arduino, JA Moore, WK. Shin, and GR Miller. Modeling interaction of phases in mixtures using a multi-field material point method," *9th US National Congress on Computational Mechanics*, San Francisco, July 2007.

Workshops and Other Presentation

JA Moore, WK Liu. A micromechanics-based method for multiscale fatigue prediction, *Steel Research Group 31st Annual Meeting*, Evanston, IL, March 2015.

JA Moore, WK Liu. Archetype-blending multiscale continuum method, *Steel Research Group 30th Annual Meeting*, Evanston, IL, March 2014.

JA Moore, WK Liu. Archetype-blending continuum theory for multiscale fatigue predictions, *Center for Surface Engineering and Tribology*, Evanston, IL, November 2013.

JA Moore, WK Liu. Computational fatigue prediction in titanium nickel superelastic alloys, *Steel Research Group 29th Annual Meeting*, Evanston, IL, March 2013.

JA Moore, KI Elkhodary, WK Liu. Application of archetype multiresolution theory to ceramic materials, *Society of Engineering Science 2011 Annual Technical Conference*, Evanston, IL, October 2011.

Funded Research

External Funding

Computational design of a characterization experiment for late time reaction of novel explosives, PI 100%, Amount Requested \$200,000 (\$50,000 every six months for two years for a possible

total of \$200,000) Funding Agency: Air Force Research Laboratory Regional Hub Network, 2024 - 2026, Status Funded.

Converting Eulerian Models of the Dynamic Behavior of Energetic Systems to Optimized Lagrangian Models (John A Moore, PI 100% effort), Agency: Applied Research Associates, Inc., Amount Funded \$107,600. Performance Dates: June 2023-June 2024, PI (100% effort) Status: Funded.

Investigation of failure dynamics in additively manufactured alloys using 3D betatron x-ray tomography, Sponsor/Agency: LaserNetUS, Amount Awarded TBD (for instruments), Performance Dates: 2024-2025, (John A Moore, collaborator 25% effort), Amina Hussein University of Alberta PI 50% effort, Le Zhou Marquette University collaborator 25% effort, Status: Funded.

Supplement: Using a Novel Multi-Fidelity Modeling Approach with Bayesian Machine Learning to Calibrate the Cyclic Properties of a Crystal Plasticity NiTi Model, Determining the Driving Force for Fatigue Crack Nucleation in a Superelastic Nickel Titanium Alloy. Sponsor/Agency: NSF: CMMI - Data Science Activities for the Civil, Mechanical and Manufacturing Innovation Communities. Amount Requested \$28,161. Performance Dates: June 2022-July 2024 (John A Moore, PI 100% effort) Status, funded.

MIRT. Amount Funded \$25000. Dates: August 2021, Sponsor/Agency: Deublin Company. \$25,000 Status: current (John A Moore, Key Participant, 10% effort), Phil Voglewede PI 80%, Allison Murray, Key Participant, 10% effort, all at Marquette University. Status, Complete.

Elastoplastic Thermo-Mechanical Modeling of Steel/SiC Shrink Fits, Sponsor/Agency: Deublin Company. Amount Funded \$ 8600. Performance Dates: August-Sept 2021, (John A. Moore, PI, 100% effort) Status: Complete.

REU Supplement: Determining the Driving Force for Fatigue Crack Nucleation in a Superelastic Nickel Titanium Alloy. Sponsor/Agency: NSF: CMMI. Amount Funded \$ 8000. Performance Dates: 2021-2022 Status: Complete (John A Moore, PI 100% effort). Dinc Erdeniz, University of Cincinnati, Co-I 0% effort.

High-resolution betatron X-ray imaging of porosity evolution in additively manufactured alloys, Sponsor/Agency: LaserNetUS, Amount Requested \$30,000 (for instruments), Performance Dates: 2021-2022, (John A Moore, collaborator 25% effort), Amina Hussein University of Alberta PI 50% effort, Le Zhou Marquette University collaborator 25% effort, Status: Complete.

REU Supplement: Determining the Driving Force for Fatigue Crack Nucleation in a Superelastic Nickel Titanium Alloy. Sponsor/Agency: NSF: CMMI. Amount Funded \$ 8000. Performance Dates: 2020-2022 Status: current (John A Moore PI 50% effort). Dinc Erdeniz, University of Cincinnati, Co-I 50% effort.

Determining the Driving Force for Fatigue Crack Nucleation in a Superelastic Nickel Titanium Alloy. Sponsor/Agency: NSF: CMMI. NSF Award Number 1934753, Amount Funded \$

448,025. Performance Dates: 2019-2024 Status: current (John A Moore PI 50% effort). Dinc Erdeniz, Marquette University, Co-I 50% effort.

Connecting Experiments and Simulations while Designing Functionality into the Dynamic Behavior of Surrogate Energetic Systems. Sponsor/Agency: AFOSR, AFOSR Grant: 06-01430-72331. Amount Funded: \$1,502,289 Performance Dates: 2018-2023 Status: current (John A Moore Co-I 12.5% effort). John Borg PI 50% Effort, Co-I's: Ronald Coutu, Simcha Singer, Somesh Roy, Allison Murray, all at Marquette University and 12.5 % effort.

Internal Funding

Pore Growth Measurements Using Micro-Computed Tomography (μ CT) and Tension Testing to Validate a New μ CT Technique (John A Moore PI 50% effort), Le Zhou Marquette Co-PI 50% effort, Agency: Marquette Faculty Scholar Development. Amount Requested (\$20,000), 2023, Awarded.

A Microstructure-Sensitive Model for Understanding the Dynamic Fracture Strength of Additive Manufactured Titanium. Sponsor/Agency: Marquette University: Regular Research Grant. Amount Rewarded \$3600. Performance Dates: 2021, Status: Complete (John A Moore PI, 100%)

Additively-Manufactured Motor with Integrated Cooling and Distributed Power Electronic. Sponsor/Agency: Marquette University: GHR Seed Grant. Amount Funded \$ 75,000. Performance Dates: 2019-2020 (John A Moore Co-I 25% effort), Ayman EL-Refaie PI 25% effort, Co-I's Nathan Weise Co-I 25% effort, Dinc Erdeniz Co-I 25% effort, all at Marquette University, Status: Complete

Bridging the Material Modeling Gap Between Research and Design. Sponsor/Agency: Marquette University: Summer Faculty Fellowship/Regular Research Grant. Amount Funded \$8,500. Performance Dates: 2019-2020, Status: Complete (John A Moore PI 100% effort).

Other Funding

Intercollegiate Rocket Engineering Competition, Wisconsin Space Grant Consortium. Amount Funded \$3,000 (John A Moore PI 100% effort) Date May 2022.

Other Proposals Submitted

Elements: A Unified Computational Crystal Plasticity Framework Connecting the Materials Research Community, PI (100%) Funding Agency National Science Foundation Cyberinfrastructure for Sustained Scientific Innovation, Amount Requested \$297,418, submitted Dec 2024.

Quantitative risk approach on determining SCC occurrence, growth rate, and management in pipeline steel considering uncertainties (Co-Investigator 20%), PI Qindan Huang (Marquette Civil Engineering 60%), Co-I Gabriel Langlois-Rahme (InferModel 20%). Amount Requested:

\$999,945, Funding Agency: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, submitted May 2024.

Elucidating the role of multi-scale features on high temperature creep in micro-architected structures (Co-Investigator, 50%) PI Le Zhou (Marquette), Amount Requested \$525,187, Funding Agency: NSF: CMMI MOMS, Submitted April 2024, Not awarded.

Accelerating Materials Evaluation to Enable Rotating Detonation Hydrogen Combustion Land Turbine (Co-Investigator, 20%) PI Dinc Erdeniz, Eric Payton, Ephraim Gutmark, Kishan Bellur, University of Cincinnati. Amount Requested (Total: \$ 999,496, MU \$28,104), Funding Agency: Department of Energy, Office of Fossil Energy and Carbon Management, University Turbine System Research, Submitted December 2023, Not awarded

Effects of At-Home Functional Strengthening on Mobility, Activity, Participation, and Fracture Risk in Youth with Osteogenesis Imperfecta, (Senior Personnel, Marquette PI, 10%), PI Jessica Fritz Medical College of Wisconsin, Amount Requested (Total:\$132,583, MU: \$16,490) Agency: National Institute of Health-Parent R01, Submitted 2023, Not Awarded.

Collaborative Research: DMREF: Design for Transformative Lifting Performance of Thin-Walled High-Conductivity Structural AM Alloys for Extreme Environments (PI 30% effort), Co-PI Dinc Erdeniz, Eric Payton University of Cincinnati, Zachary Cordero MIT, Natasha Vermaak Lehigh, Agency: National Science Foundation: Designing Materials to Revolutionize and Engineer our Future (DMREF). Total Amount Requested \$2,000,000 (Marquette \$331,373), Submitted March 2023, Not Awarded.

Fabrication and Residual Stress Minimization of Scalable Functionally Graded Alloy Systems with Bi-continuous Mesostructural Geometry for Propulsion Applications, Agency: NASA Space Technology Mission Directorate, Early Stage Innovation (Co-I 25% effort). Amount Requested \$ 650,000, (PI Darren, Pagan Penn), (Co-I Joseph Bartolai, Penn State Applied Research Lab), (Co-I Simon Miller, Penn State Applied Research Lab), June 2022, Status: Not awarded.

A Numerical Simulation Approach to Shape Charge Optimization via Liner Shape and Microstructure Control (White Paper). Agency: AFOSR,YIP, Dynamic Materials and Interactions. April, 2022. (PI 100% effort), Status: Not awarded.

A Toolbox for Uncertainty Quantification in Additively Manufactured Ti64 (White Paper), Sponsor/Agency: Airforce Research Laboratory, Program: Qualifying Additively Manufactured Airframe Structure (QAMAS). Amount Requested \$ 300,000 2021 (Co-I 33% effort), PI Allison Murray (34% effort), Co-I Le Zhou (33% effort) Status: Not Awarded.

Exploring Tailored Plasticity Response in Microstructurally Graded Engineering Alloys across Strain Rate Regimes, Sponsor/Agency: National Nuclear Security Administration (NNSA) Department of Energy, Amount Requested \$272,027 (Marquette Co-I 49%), PI Darren Pagan Penn State University, total for entire project \$763,038. Status: Not Awarded

Collaborative Research: DMREF: An Anisotropic, Nonlinear Design Approach to Improve Fatigue Resistance of Triply Periodic Minimal Surface Structures. Sponsor/Agency: NSF: DMREF. Amount Requested \$ 790,131, 2021 (PI 100% effort), Total for entire project \$1,718,909. Status: Not Awarded

CDS&E: Bridging the Material Modeling Gap Between Research and Design. Sponsor/Agency: NSF: CDS&E/CMML. Amount Requested \$324,163, 2020 (PI 66% effort), Status: Not awarded

A Microstructure-Sensitive Model for Understanding the Dynamic Fracture Strength of Additive Manufactured Titanium. Sponsor/Agency: Marquette University: Summer Faculty Fellowship Amount Requested \$5500 (PI 100% effort), Status: Not awarded

A microstructure-sensitive model for understanding the spall strength of additive manufactured Ti-6Al-4V (White Paper), Agency: ARO,YIP, Solid Mechanics. 2020. (PI 100% effort), Status: Not awarded.

Creep behavior of a selective laser melted nickel-based superalloy. Agency: NSF DMR. Amount Requested: \$445,436. 2019. (Co-I 45% effort), PI: Dinc Erdeniz, Marquette University, Status: Not awarded.

Fatigue Prediction for Additive Manufactured (AM) Metallic Components. Agency: DOD STTR Phase I. 2019. (Co-I 25% effort) PI: Abhinav Saboo, QuesTek Innovations LLC, Co-I: Greg Wagner, Northwestern University, Status: Not awarded.

Creep behavior of a selective laser melted nickel-based superalloy. Agency: NSF DMR. Amount Requested: \$463704. 2018. (Co-I 45% effort). PI: Dinc Erdeniz, Marquette University, Status: Not awarded.

Propagating microstructural variability to the structural system level in hypersonic vehicles using hybrid data-driven and mechanics-based framework. Agency: DARPA ,YIP. Amount Requested: Base: \$ 500,000, Option: \$ 400,799.85, Total: \$900,799.85. 2018. (PI 95% effort). Co-I Dinc Erdeniz, Marquette University, Status: Not awarded.

Graduate Students

Current Graduate Students

Anahita Alipanahi (Anna Alp) PhD Student, 2024- present. Advisor. Funding: TA

Truman Russell, Phd Student, 2024- present. Advisor. Funding AFRL Midwest Regional Network

Brenden Carty, Master's Student, 2025 – present Advisor. Funding Army Research Lab

Nzubechukwu (Solomon) Okolie, Master's student, 2025 – present. Funding TA

Former Graduate Students

D, PhD, 2024 Advisor. Funding: NSF: CMMI MOMS, Current Position: AngleLock

Truman Russell, Master's Degree 2024. Advisor. Funding: AFOSR/NSF.

Parisa Shabaninezhad, PhD 2023. Advisor. Funding: NSF: CMMI MOMS, Current Position: GE Healthcare

Ian Morrissey, Master's of Science 2022. Advisor. Funding: Dept. Mechanical Eng.

Tamanna Tasnim, Master's of Science, 2020. Co-Advisor with Somesh Roy. Funding: AFOSR. Current Position: Design Engineer, Milwaukee Tool

Committee Member or Other Supervision

- Abdellah Sabri (U. Cincy), Master's of Science 2024, Committee Member, Advisor: Dinc Erdeniz
- Katarina Radmanovic (Biomed. Eng.), PhD 2024, Committee Member, Advisor: Gerald Harris
- Maeve McDonald (Biomed. Eng.), PhD Candidate 2023 – present.
- Rafee Mahbub PhD 2024 Committee Member, Advisor: John Borg
- James Wolf (Biomed. Eng.), Master's of Science 2024. Committee Member, Advisor: Frank Pintar
- Devin Wozniak (Biomed. Eng.), Master's of Science 2024, Committee Member, Advisor: Brian Stemper
- Penn Rawn, Master's of Science 2023. Committee Member, Advisor: Le Zhou
- Jillian Stinehart, Master's of Science 2023. Committee Member, Advisor: Le Zhou
- Dylan Johnson, Master's of Science 2023. Committee Member, Advisor: Phil Voglewede
- Chloe David, Master's of Science, 2021. Committee Member, Advisor: Somesh Roy
- Christopher Johnson, PhD 2021. Committee Member, Advisor: John Borg
- Longhao Huang, PhD 2020 Committee Member, Advisor: John Borg
- Michael Smoljan (Dentistry), Master's Degree, 2020, Supervisor, Advisor: Mohamed Ibrahim
- Jessica Thayer, Master's of Science, 2020. Committee Member, Advisor: Phil Voglewede
- Nathaniel Helminiak, PhD, 2021. Committee Member, Advisor: John Borg
- Sebastian Konewko, Master's of Science, 2019. Committee Member, Advisor: John Borg
- Peter Sable, PhD, 2019. Committee Member, Advisor: John Borg

Undergraduate Research Students

Maddie Janecek, 2024 Funding: Marquette Faculty Scholar Development, OceanIt

Truman Russell, 2021. Funding: none (Master's Student Marquette)

Caitlin Martinez, 2021 - 2022 Funding: NSF CMMI MOMS REU (Master's Student U. Mich.)

Zach Hadzima, 2021. Funding: NSF CMMI MOMS REU (Blue Origin)

Adam Puchalski (Biomed.), 2021. Funding: NSF CMMI MOMS REU (PhD Student Clemson)

Andrew Frasca, 2020. Funding: none

Zach McMahon, 2020. Funding: none (Milwaukee Tool)

Ian Morrissey, 2019. Funding: none

Phillip Parisi, 2019. Funding: none (PhD student U. Rhode Island)

High School Research Students

Ayushi Chandel (Brookfield Academy, Brookfield WI) 2022 – 2023

- Co-author on 2023 “Software Impacts” and “Fracture of Engineering Materials & Structures” articles.
- Ayushi is a co-author of a TMS 2024 abstract
- Ayushi is currently attending Georgia Institute of Technology in Aerospace Engineering.

Teaching

| Course | Title | Position | University | Term | MOCES score |
|----------------|---|------------|----------------------|--------------------------|-------------|
| MEEN 3260 | Numerical Methods for Mechanical Systems (2 Sections) | Instructor | Marquette University | Fall 2023 | 5.7/6 |
| MEEN 4265/5265 | Intermediate Finite Element Methods | Instructor | Marquette University | Spring 2023 | 5.6/6 |
| MEEN 3260 | Numerical Methods for Mechanical Systems (3 Sections) | Instructor | Marquette University | Fall 2022 | 5.8/6 |
| MEEN 6366 | Computational Methods for Solids and Structures | Instructor | Marquette University | Spring 2022 | 5.7/6 |
| MEEN 3260 | Numerical Methods for Mechanical Systems (3 Sections) | Instructor | Marquette University | Fall 2021 | 5.6/6 |
| MEEN 4265/5265 | Intermediate Finite Element Methods | Instructor | Marquette University | Spring [†] 2021 | 5.3/6 |

| | | | | | |
|------------|--|------------------|-------------------------|------------------------|-------|
| MEEN 3260 | Numerical Methods for Mechanical Systems (3 Sections) | Instructor | Marquette University | Fall [†] 2020 | 5.2/6 |
| MEEN 6931 | Special Topic: Computational Methods for Solids and Structures | Instructor | Marquette University | Spring 2020 | * |
| MEEN 3260 | Numerical Methods for Mechanical Systems (2 Sections) | Instructor | Marquette University | Fall 2019 | 5.6/6 |
| MEEN 3260 | Numerical Methods for Mechanical Systems (2 Sections) | Instructor | Marquette University | Fall 2018 | 4.9/6 |
| CEE 426-II | Advanced Finite Element II | Joint Instructor | Northwestern University | Spring 2014 | N/A |
| CEE 426-II | Advanced Finite Element II | Joint Instructor | Northwestern University | Spring 2013 | N/A |

*MOCES not recorded due to COVID-19

[†] This course was taught in a hybrid modality (i.e., partially online partially in person) due to COVID19

Other Teaching

Instructor: MEEN 6995 Arbitrary Lagrange Eulerian Modeling, Marquette University, Fall 2025

Instructor: MEEN 6995 Computational Poroplasticity, Marquette University, Fall 2025

Instructor: MEEN 4995 Independent Study: Aerospace Structures and Materials, Marquette University, Fall 2025

Instructor: MEEN 6995 Computational Plasticity, Marquette University, Fall 2024

Instructor: MEEN 6995 Nonlinear Finite Element Analysis, Marquette University, Fall 2023

Instructor: MEEN 4995 Independent Study: Analysis of Spacecraft Structures, Marquette University, Fall 2023

Instructor: MEEN 6995 Computational Plasticity, Marquette University, Spring 2023

Joint Instructor: Vibrations Short Course for Industry-Deublin. With Allison Murray and Phil Voglewede. Three-part course taught over the summer of 2022 (2 parts at Deublin, 1 part at Marquette).

Instructor: MEEN 4995 Independent Study: Analysis of Spacecraft Structures, Marquette University, Fall 2021

Instructor: MEEN 4995 Independent Study: Bayesian Machine Learning for Computational Mechanics of Materials, Marquette University, Fall 2021

Instructor: MEEN 4995 Independent Study: Parallelization in Computational Fatigue Analysis, Marquette University, Fall 2021

Instructor: MEEN 6995 Continuum Mechanics, Marquette University, Spring 2020

Instructor: MEEN 4995 Independent Study: Finite Element Simulation of Spall Fracture, Marquette University, Spring 2020

Instructor: MEEN 4995 Independent Study: Finite Element Simulation of Hyperelastic Polymers, Marquette University, Spring 2020

Instructor: MEEN 6995 Independent Study: Shock Physics, Marquette University, Spring 2020

Instructor: MEEN 4995 Independent Study: Finite Element Modeling of Lattice Materials, Marquette University, Spring 2019

Teaching Assistant: CEE 327 Finite Element Methods in Mechanics, Northwestern University, Fall 2011

Teaching Assistant: CEE 220 Mechanics of Materials, University of Washington, Spring 2006

Committees/Service

Marquette Rocketry Adviser 2021 – present

- Wisconsin Space Grant Consortium's Collegiate Rocket Launch competition (CRL) 3rd Place 2024
- Wisconsin Space Grant Consortium's Collegiate Rocket Launch competition (CRL) winner 2023
- Wisconsin Space Grant Consortium's Collegiate Rocket Launch competition (CRL) winner 2022

ASME Student Chapter Adviser 2021 - present

NSF Panel Reviewer 2021

Member: Marquette University College of Engineering Mechanics Committee 2021-present

Member: Marquette University Mechanical Engineering Department Undergraduate Committee 2020 – 2021

Member: Marquette University Mechanical Engineering Department faculty search committee 2019 – 2020: Search for three tenure track lines (Hired: Dr. Allison Murray, Dr. Le Zhou)

Mini-symposium organizer. Advancements in Computational Poro-Plasticity and Ductile Fracture Modeling. 14th World Congress in Computational Mechanics. Co-Organizers: Justin Wilkerson, Texas A&M, Curt Bronkhorst, University of Wisconsin-Madison,

23 accepted abstracts, Virtual Conference January 11-15, 2021.

Member: Marquette University Mechanical Engineering Department Undergraduate Committee
2019 – 2020

Member: Marquette University Mechanical Engineering Department Graduate Committee
2018 – 2019

Marquette University Mechanical Engineering senior design mentor

- Klein tools Soft Close Tape Measure 2022- 2023 (Potential Patent Application)
- SAE Baja SAE Baja Coil-Over Shocks 2020-2021
- Loos & Co. Inc Seismic Tensioning Device 2019-2020
- SAE Baja Eagle 3 Gearbox 2018-2019

Journal reviewer

- International Journal of Plasticity (2024-present)
- Applied Composite Materials (2024-present)
- International Journal of Numerical Methods in Engineering (2024-present)
- Journal of Applied Physics (2022-present)
- Computer Modeling in Engineering and Sciences (2020-present)
- Journal of Materials Research (2020-present)
- Composite Interfaces (2020-present)
- Additive Manufacturing (2016-present)
- International Journal of Fatigue (2015-present)
- Computational Mechanics (2011-present)

Synergistic Activities

NSF Broadening Engineering Teaching with Theory Based Educational Resources (BETTER)
Community of Practice at Marquette, 6 weeks, Summer 2024.

Developing software for processing of nonlocal finite element analysis
(<https://github.com/johnallanmoore/NOCAL-FEA>), Fall 2022 – present.

Working with Dr. Dawei Liu in Marquette dentistry on designs for orthodontics. Fall 2023 – present.

Working with Dr. Michael Sevier of Milwaukee School of Engineering on strategies for better teaching of finite element analysis, Fall 2023.

Working with Jonny Kriefall of Milwaukee Tool to incorporate industry applications into numerical methods curriculum. First industry lectures started in Fall 2023.

Participated in Advanced Laser Light Source Laboratory (ALLS) beamtime between December 14th and 19th. LaserNetUS Cycle 3 Proposal entitled “High-resolution betatron X-ray imaging of porosity evolution in additively manufactured alloys”. Collaborated with staff scientist: Sylvain Fourmaux.

Attended and participated in Advanced Photon Source (APS) 1ID beamtime between July 15th and 18th 2022. APS General User Proposal GUP-75510 entitled "Determining the Crystallographic and Mechanical State of Superelastic Nitinol around an Inclusion". Collaborated with staff scientists: Peter Kenesei and Jun-Sang Park.

Client for Marquette University’s Digital Media Course (DGMD 3555 Corporate Media): Students produced three videos related to mechanical fatigue. Funding: NSF CMMI MOMS, Fall 2020.

Structural Reliability Partnership Participant – Focusing on challenge scenarios for the modeling and simulation community (2017-2018)

Contributor to the HEXRD software project which provides a collection of resources for analysis of x-ray diffraction data, especially high-energy x-ray diffraction (2016-2017)

Edited the Crystal Plasticity chapter of the second edition of “Nonlinear Finite Elements for Continua and Structures”, Wiley ISBN-13: 978-1118632703, 2014

Awards

Mechanical Engineering Department Teacher of the Year 2024-2025

Marquette University Certificate of Recognition for “Outstanding Work, Innovative Ideas and Commitment to External Partnerships”, 2023

United States Association for Computational Mechanics Travel Award, 2014

Predictive Science and Engineering Design Fellowship, Northwestern University, 2011-2012

Graduate School Conference Travel Grant, Northwestern University, 2011, 2014

Walter P. Murphy Fellowship, Northwestern University, 2010

Professional Society Membership

American Society of Mechanical Engineers

U.S. Association for Computational Mechanics

The Minerals, Metals, & Materials Society (TMS)

License

Engineer in Training: State of Washington, June 2009, Certification Number 29798

Website

<https://www.eng.mu.edu/cmml/>