

NEWELL MOSER

Curriculum Vitae

July 17, 2025

Work Contact Information

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EDUCATION

2019

Ph.D. in Mechanical Engineering

Northwestern University, Evanston, IL

Dissertation Advisors: Jian Cao, Ph.D., Kornel Ehmann, Ph.D.

Dissertation: *Deformation Mechanisms and Process Planning in Double-Sided Incremental Forming*

2013

B.S. in Mechanical Engineering

University of New Hampshire, Durham, NH

Valedictorian, Tau Beta Pi, Summa Cum Laude

PROFESSIONAL APPOINTMENTS

2021 – Present Research Scientist / Mechanical Engineer

National Institute of Standards and Technology, Boulder, CO

Material Measurement Laboratory, Applied Chemicals and Materials Division

2019 – 2021 National Research Council Postdoctoral Fellow

National Institute of Standards and Technology, Boulder, CO

Material Measurement Laboratory, Applied Chemicals and Materials Division

PROFESSIONAL INTERESTS

I have a passion for learning new things and applying what I learn to tackle challenging problems. This often requires teamwork, innovation, and perseverance. My background experience includes computational modeling, advanced manufacturing, material characterization, and engineering design.

RESEARCH EXPERIENCE

2019 – Present Research Scientist / Mechanical Engineer

National Institute of Standards and Technology, Boulder, CO

Measuring and modeling the mechanical performance of additively manufactured (AM) metal parts, with an emphasis on fracture and fatigue. Characterizing the distributions

in size and shape of micro-voids in metal-AM parts using X-ray computed tomography. Writing new Python scripts for post-processing and visualizing 3D image stacks. Mechanical testing of pipeline steels, as well as welded joints, in high-pressure hydrogen environments to measure fracture toughness and fatigue crack growth rates. Accelerated multi-scale thermal simulations, from atomistic to continuum length scales, using Green's function techniques for semiconductor applications. Regularly work with industry members and standards committees to promote U.S. innovation and industrial competitiveness.

2013 – 2019 Graduate Research Assistant

Northwestern University, Evanston, IL

Principal investigator to a variety of research projects that centered on advanced manufacturing, with a focus on robotic metal forming, specifically Double-Sided Incremental Forming (DSIF). Established new experimental procedures to investigate the mechanics of DSIF. Wrote a C++ software package for toolpath generation in DSIF that composed of over 100,000 lines of code and utilized OpenGL graphics. Verified and validated a high-fidelity finite element model of DSIF using both LS-DYNA and Abaqus Explicit/Standard. Programmed and validated user-material models that predicted material failure based on concepts from damage mechanics.

2011 – 2013 Undergraduate Research Assistant

University of New Hampshire, Durham, NH

Measured thermal histories during tensile testing of stainless steel specimens using an IR camera. Performed X-ray diffraction tests to measure the percent-volume of microconstituents, namely transformation-induced martensite and retained austenite.

2012 NSF Undergraduate Research Assistant

National Institute of Standards and Technology, Gaithersburg, MD

Designed experiments for a hydraulic biaxial testing machine using a novel cruciform specimen geometry. Performed Marciniak cup tests to characterize the yield stress of the sheet metal specimens made from transformation-induced plasticity (TRIP) steel.

HONORS

2023 NIST Bronze Medal (Group Award)

National Institute of Standards and Technology, Boulder, CO

The Bronze Medal Award is approved by the NIST Director, and it is the highest recognition awarded by NIST.

2022 MML Postdoctoral Fellow Accolade

National Institute of Standards and Technology, Boulder, CO

2019 NRC Postdoctoral Research Associateship Program

National Research Council; Two years of funding for postdoctoral research.

2017 Royal E. Cabell Terminal Year Fellowship

Northwestern University, Evanston, IL

- 2016** **Martin Outstanding Doctoral Fellowship**
Northwestern University, Evanston, IL
- 2015** **Graduate Mechanical Systems Innovation Scholarship**
University of Tokyo, Tokyo, Japan
- 2014** **NSF Graduate Research Fellowship Program**
National Science Foundation; Three years of funding during graduate school.
- 2013** **Walter P. Murphy Fellowship**
Northwestern University, Evanston, IL
- 2012** **Kenneth J. Higson Scholarship**
University of New Hampshire, Durham, NH
- 2011** **NSF Research Experiences for Undergraduates**
National Science Foundation
- 2010, 2011** **Raytheon Scholar**
The Raytheon Company
- 2010** **John B. and Martha M.W. Zocchi Scholarship**
University of New Hampshire, Durham, NH

AWARDED GRANTS

- 2024 – 2027** **Classification of Defects in Tomographic Reconstructions of Hyperscale Advanced Packages**
Co-PI (20 %)
U.S. Department of Commerce, CHIPS R&D Metrology Program
Awarded \$4.09M
- 2023 – 2027** **Causal Green's Function Simulations of Phonons for Multiscale/Multiphysics Modeling of Thermal Transport in Gate-All-Around Transistors**
Co-PI (50 %)
U.S. Department of Commerce, CHIPS R&D Metrology Program
Awarded \$1.11M

TEACHING EXPERIENCE

Assistant Instructor, Mechanics of Manufacturing Processes

Spring 2016, Fall 2016, Spring 2018

Department of Mechanical Engineering, Northwestern University, Evanston, IL

Graduate-level course. Taught 75 % of the lectures, co-designed the curriculum, created a new final project, managed online resources, and graded the assignments and exams.

NONACADEMIC EXPERIENCE

2024 – Present Laboratory Manager

National Institute of Standards and Technology, Boulder, CO
Responsible for lab safety training, chemical inventory, and maintenance of two X-ray computed tomography machines.

2014 – 2019 Laboratory Safety Designate

Northwestern University, Evanston, IL
Responsible for lab safety training and maintaining compliance to OSHA standards

2014 – 2018 Chair Member, Mechanical Engineering Graduate Student Society

Northwestern University, Evanston, IL
Coordinated networking events and assisted in planning the annual campus tour for prospective mechanical engineering graduate students

2012 – 2013 Co-Captain, Formula SAE Team

University of New Hampshire, Durham, NH
Intercollegiate competition to design and build a formula-style race car. Designed and welded the tubular steel frame of the car.

COMMUNITY/EDUCATIONAL OUTREACH

2014 – 2019 Mentor for Incoming Graduate Students

Northwestern University, Evanston, IL
Counseled first-year mechanical engineering graduate students to help them secure housing and choose graduate courses.

2013 – 2019 Laboratory Tour Guide

Northwestern University, Evanston, IL
Regularly volunteered to help the Society of Woman Engineers (SWE) and the National Society of Black Engineers (NSBE) provide students in middle and high school with opportunities to learn about STEM research.

2016 – 2017 Mentor for Middle School Students

Fifth Ward Middle School, Evanston, IL
Active member of a volunteer outreach program that enacts positive change through STEM exposure by carrying out science and engineering activities with 6th-8th graders

2014 – 2016 Research Project Advisor

Northwestern University, Evanston, IL
Devised projects and advised undergraduate research assistants and summer high-school interns that worked in the lab.

SERVICE TO PROFESSION

Journal Manuscript Reviewer

Reviewed or co-reviewed manuscripts for the following journals: *CIRP Annals*, *SME Manufacturing Letters*, *SME Journal of Manufacturing Processes*, *ASME Journal of Manufacturing Science and Engineering*, *Materials & Design*, *Engineering Fracture Mechanics*

PROFESSIONAL MEMBERSHIPS

2025 – Present Society of Manufacturing Engineers (SME)

2020 – Present The Minerals, Metals & Materials Society (TMS)

2010 – Present American Society of Mechanical Engineers (ASME)

CERTIFICATES AND TRAINING

2019 **Machine Learning**
Coursera, Offered by Stanford University
Credential ID: CD5VWHBB5FBT

2017 **Management for Scientists and Engineers**
Kellogg School of Management, Northwestern University, Evanston, IL
Certificate program taught by Kellogg faculty that equips promising post-candidacy doctoral students with the business and leadership skills

SELECT SKILLS

Software

Linux/Bash, Windows OS, Microsoft Office, LaTeX, Visual Studio, C/C#/C++, FORTRAN, Python, MATLAB, Mathematica, OpenCV, SolidWorks, CATIA, Siemens NX, OpenCASCADE, Altair Hypermesh, Abaqus FEA, LS-DYNA

Machine Shop

CNC Machining, Manual Mill, Manual Lathe, TIG/MIG Welding, NC Water Jet, NC Plasma Cutter

REFERENCES

Edward Garboczi, NIST Fellow (Retired)

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Applied Chemicals and Materials Division
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Kornel Ehmman, Professor of Mechanical Engineering

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PUBLICATIONS

Refereed Journal Articles

- [36] Moser, N. H., Landauer, A. K., & Kafka, O. L. (2025). IMPPY3D: Image Processing in Python for 3D Image Stacks. *Journal of Open Source Software*, 10(108), 7405. <https://doi.org/10.21105/joss.07405>
- [35] Malavé, V., Moser, N., Garboczi, E. J., McLinden, M. O., Widegren, J. A., & Suiter, C. L. (2025). Manipulation of meniscus rise for *in situ* multiphase nuclear magnetic resonance spectroscopy. *Physics of Fluids*, 37(4), 042114. <https://doi.org/10.1063/5.0261517>
- [34] Derimow, N., Benzing, J. T., Moser, N., Kafka, O. L., Joress, H., McDannald, A., Newton, D., Koepke, L., & Hrabe, N. (2024). *High pressure heat treatment development for laser powder bed fusion Ti-6Al-4V alloy: Observations and findings*. National Institute of Standards and Technology. <https://doi.org/10.6028/nist.ir.8551>
- [33] Kafka, O., Moser, N., Chiaramonti, A., Garboczi, E., Wilkerson, R., Rickman, D. (2025). Measurement of the three-dimensional shape and size distribution of 17 lunar regolith simulants: Simulant shape and size inter-comparison and simulant shape comparison with Apollo 11 and Apollo 14 lunar regolith. *Icarus*, 116542. <https://doi.org/10.1016/j.icarus.2025.116542>
- [32] Derimow, N., Benzing, J. T., Garcia, J., Levin, Z. S., Lu, P., Moser, N., Beamer, C., DelRio, F. W., & Hrabe, N. (2025). Precipitation hardening of laser powder bed fusion Ti-6Al-4V. *Materials Science and Engineering: A*, 921, 147549. <https://doi.org/10.1016/j.msea.2024.147549>

- [31] Derimow, N., Benzing, J. T., Joress, H., McDannald, A., Lu, P., DelRio, F. W., Moser, N., Connolly, M. J., Saville, A. I., Kafka, O. L., Beamer, C., Fishel, R., Sarker, S., Hadley, C., & Hrabe, N. (2024). Microstructure and mechanical properties of laser powder bed fusion Ti-6Al-4V after HIP treatments with varied temperatures and cooling rates. *Materials & Design*, 247, 113388. <https://doi.org/10.1016/j.matdes.2024.113388>
- [30] Moser, N., Buck, Z., Derimow, N., Martin, M. L., Lauria, D., Lucon, E., Bradley, P., & Connolly, M. (2024). Hydrogen Embrittlement Susceptibility and Fracture Toughness Measurements of Welded X65M Pipeline Steels. *Volume 4: Materials & Fabrication*, V004T06A008. <https://doi.org/10.1115/PVP2024-122545>
- [29] Derimow, N., Benzing, J. T., Newton, D., Beamer, C., Lu, P., DelRio, F. W., Moser, N., Kafka, O. L., Fishel, R., Koepke, L., Hadley, C., & Hrabe, N. (2024). Microstructural effects on the rotating bending fatigue behavior of Ti-6Al-4V produced via laser powder bed fusion with novel heat treatments. *International Journal of Fatigue*, 185, 108362. <https://doi.org/10.1016/j.ijfatigue.2024.108362>
- [28] Kafka, O. L., Landauer, A. K., Benzing, J. T., Moser, N. H., Mansfield, E., & Garboczi, E. J. (2024). A Technique for In-Situ Displacement and Strain Measurement with Laboratory-Scale X-Ray Computed Tomography. *Experimental Techniques*. <https://doi.org/10.1007/s40799-024-00715-y>
- [27] Johnson, W. L., Heyliger, P. R., Benzing, J. T., Kafka, O. L., Moser, N. H., Harris, D., Iten, J., & Hrabe, N. W. (2024). Evidence for contributions of lack-of-fusion defects and dislocations to acoustic nonlinearity and loss in additively manufactured aluminum. *NDT & E International*, 143, 103068. <https://doi.org/10.1016/j.ndteint.2024.103068>
- [26] Moser, N., Benzing, J., Kafka, O. L., Weaver, J., Derimow, N., Rentz, R., & Hrabe, N. (2024). AM Bench 2022 Macroscale Tensile Challenge at Different Orientations (CHAL-AMB2022-04-MaTTO) and Summary of Predictions. *Integrating Materials and Manufacturing Innovation*. <https://doi.org/10.1007/s40192-023-00333-3>
- [25] Landauer, A. K., Tsinas, Z., Kafka, O. L., Moser, N. H., Glover, J. L., & Forster, A. M. (2023). Unintended consequences: Assessing thermo-mechanical changes in vinyl nitrile foam due to micro-computed X-ray tomographic imaging. *Materials & Design*, 235, 112381. <https://doi.org/10.1016/j.matdes.2023.112381>
- [24] Webster, S., Moser, N., Fezzaa, K., Sun, T., Ehmann, K., Garboczi, E., & Cao, J. (2023). Pore formation driven by particle impact in laser powder-blown directed energy deposition. *PNAS Nexus*, 2(6), pgad178. <https://doi.org/10.1093/pnasnexus/pgad178>
- [23] Landauer, A. K., Kafka, O. L., Moser, N. H., Foster, I., Blaiszik, B., & Forster, A. M. (2023). A materials data framework and dataset for elastomeric foam impact mitigating materials. *Scientific Data*, 10(1), 356. <https://doi.org/10.1038/s41597-023-02092-4>
- [22] Kafka, O. L., Benzing, J., Moser, N., Liew, L.-A., Weaver, J., & Hrabe, N. (2023). Additive Manufacturing Benchmark 2022 Subcontinuum Mesoscale Tensile Challenge (CHAL-AMB2022-04-MeTT) and Summary of Predictions. *Integrating Materials and Manufacturing Innovation*, 12(3), 196–209. <https://doi.org/10.1007/s40192-023-00307-5>

- [21] Johnson, W. L., Benzing, J. T., Kafka, O. L., Moser, N. H., Harris, D., Iten, J. J., & Hrabe, N. W. (2023). Sensitivity of acoustic nonlinearity and loss to residual porosity in additively manufactured aluminum. *NDT & E International*, 135, 102801. <https://doi.org/10.1016/j.ndteint.2023.102801>
- [20] Watring, D. S., Benzing, J. T., Kafka, O. L., Liew, L.-A., Moser, N. H., Erickson, J., Hrabe, N., & Spear, A. D. (2022). Evaluation of a modified void descriptor function to uniquely characterize pore networks and predict fracture-related properties in additively manufactured metals. *Acta Materialia*, 223, 117464. <https://doi.org/10.1016/j.actamat.2021.117464>
- [19] Strutton, J. W., Moser, N. H., Garboczi, E. J., Jennings, A. R., Runnels, B., & McCollum, J. M. (2022). Interface History on Strain Field Evolution in Epoxy Resins. *ACS Applied Polymer Materials*, 4(2), 1535–1542. <https://doi.org/10.1021/acspam.1c01930>
- [18] Derimow, N., Hanson, K., Moser, N., Kafka, O. L., Benzing, J. T., & Hrabe, N. (2022). Surface globularization generated by standard PBF-EB Ti-6Al-4V processing achieves an improvement in fatigue performance. *International Journal of Fatigue*, 159, 106810. <https://doi.org/10.1016/j.ijfatigue.2022.106810>
- [17] Derimow, N., Benzing, J. T., Kafka, O. L., Moser, N., Pathare, P., Walker, M., DelRio, F. W., & Hrabe, N. (2022). Assessment of intra-build variations in tensile strength in electron beam powder-bed fusion Ti-6Al-4V part 2: Effects of powder mixing. *Materials Science and Engineering: A*, 848, 143353. <https://doi.org/10.1016/j.msea.2022.143353>
- [16] Derimow, N., Romero, A., Rubio, A., Terrazas, C., Moser, N., Kafka, O. L., Benzing, J. T., Medina, F., Wicker, R., & Hrabe, N. (2022). Assessment of intra-build variations in tensile strength in electron beam powder-bed fusion Ti-6Al-4V part 1: Effects of build height. *Materials Science and Engineering: A*, 849, 143354. <https://doi.org/10.1016/j.msea.2022.143354>
- [15] Balapour, M., Thway, T., Rao, R., Moser, N., Garboczi, E. J., Hsuan, Y. G., & Farnam, Y. (2022). A thermodynamics-guided framework to design lightweight aggregate from waste coal combustion fly ash. *Resources, Conservation and Recycling*, 178, 106050. <https://doi.org/10.1016/j.resconrec.2021.106050>
- [14] Balapour, M., Thway, T., Moser, N., Garboczi, E. J., Grace Hsuan, Y., & Farnam, Y. (2022). Engineering properties and pore structure of lightweight aggregates produced from off-spec fly ash. *Construction and Building Materials*, 348, 128645. <https://doi.org/10.1016/j.conbuildmat.2022.128645>
- [13] Afarani, H. T., Moser, N. H., Garboczi, E. J., Esfahani, E. N., & Biernacki, J. J. (2022). Print fidelity metrics for additive manufacturing of cement-based materials. *Additive Manufacturing*, 55, 102784. <https://doi.org/10.1016/j.addma.2022.102784>
- [12] Moser, N., Leem, D., Liao, S., Ehmann, K., & Cao, J. (2021). Advancing the Accuracy of Computational Models for Double-Sided Incremental Forming. In G. Daehn, J. Cao, B. Kinsey, E. Tekkaya, A. Vivek, & Y. Yoshida (Eds.), *Forming the Future* (pp. 271–281). Springer International Publishing. https://doi.org/10.1007/978-3-030-75381-8_23

- [11] Moser, N., Leem, D., Ehmann, K., & Cao, J. (2021). A high-fidelity simulation of double-sided incremental forming: Improving the accuracy by incorporating the effects of machine compliance. *Journal of Materials Processing Technology*, 295, 117152. <https://doi.org/10.1016/j.jmatprotec.2021.117152>
- [10] Ndip-Agbor, E., Cheng, P., Moser, N., Ehmann, K., & Cao, J. (2019). Prediction of rigid body motion in multi-pass single point incremental forming. *Journal of Materials Processing Technology*, 269, 117–127. <https://doi.org/10.1016/j.jmatprotec.2019.02.007>
- [9] Pritchett, D., Moser, N., Ehmann, K., Cao, J., & Huang, J. (2018). Quantifying discretization errors in electrophoretically-guided micro additive manufacturing. *Micromachines*, 9(9). <https://doi.org/10.3390/mi9090447>
- [8] Ren, H., Li, F., Moser, N., Leem, D., Li, T., Ehmann, K., & Cao, J. (2018). General contact force control algorithm in double-sided incremental forming. *CIRP Annals*, 67(1), 381–384. <https://doi.org/10.1016/j.cirp.2018.04.057>
- [7] Moser, N., Pritchett, D., Ren, H., Ehmann, K. F., & Cao, J. (2016). An efficient and general finite element model for double-sided incremental forming. *Journal of Manufacturing Science and Engineering*, 138(9). <https://doi.org/10.1115/1.4033483>
- [6] Moser, N., Zhang, Z., Ren, H., Zhang, H., Shi, Y., Ndip-Agbor, E., Lu, B., Chen, J., Ehmann, K. F., & Cao, J. (2016). Effective forming strategy for double-sided incremental forming considering in-plane curvature and tool direction. *CIRP Annals - Manufacturing Technology*, 65(1), 265–268. <https://doi.org/10.1016/j.cirp.2016.04.131>
- [5] Ndip-Agbor, E., Smith, J., Ren, H., Jiang, Z., Xu, J., Moser, N., Chen, W., Xia, Z. C., & Cao, J. (2016). Optimization of relative tool position in accumulative double sided incremental forming using finite element analysis and model bias correction. *International Journal of Material Forming*, 9(3), 371–382. <https://doi.org/10.1007/s12289-014-1209-4>
- [4] Ren, H., Moser, N., Zhang, Z., Ndip-Agbor, E., Smith, J., Ehmann, K. F., & Cao, J. (2015). Effects of tool positions in accumulated double-sided incremental forming on part geometry. *Journal of Manufacturing Science and Engineering*, 137(5), 1–8. <https://doi.org/10.1115/1.4030528>
- [3] Zhang, Z., Ren, H., Xu, R., Moser, N., Smith, J., Ndip-Agbor, E., Malhotra, R., Xia, Z. C., Ehmann, K. F., & Cao, J. (2015). A mixed double-sided incremental forming toolpath strategy for improved geometric accuracy. *Journal of Manufacturing Science and Engineering*, 137(5), 1–7. <https://doi.org/10.1115/1.4031092>
- [2] Lu, B., Fang, Y., Xu, D. K., Chen, J., Ou, H., Moser, N. H., & Cao, J. (2014). Mechanism investigation of friction-related effects in single point incremental forming using a developed oblique roller-ball tool. *International Journal of Machine Tools and Manufacture*, 85, 14–29. <https://doi.org/10.1016/j.ijmachtools.2014.04.007>
- [1] Moser, N. H., Gross, T. S., & Korkolis, Y. P. (2014). Martensite formation in conventional and isothermal tension of 304 austenitic stainless steel measured by X-ray diffraction. *Metallurgical*

and *Materials Transactions A: Physical Metallurgy and Materials Science*, 45(11), 4891–4896.
<https://doi.org/10.1007/s11661-014-2422-y>

Peer-Reviewed Conference Proceedings

- [12] Izumi, D., Nishihara, Y., Ishikawa, N., Moser, N., Buck, Z., Connolly, M., Slifka, A., & Stalheim, D. (2025) "Effect of Testing Conditions on Fracture Toughness of Linepipe Steel in Gaseous Hydrogen." *International Ocean and Polar Engineering Conference*, ISOPE-I-25-470. <https://onepetro.org/ISOPEIOPEC/proceedings-abstract/ISOPE25/ISOPE25/713099>
- [11] Buck, Z., Moser, N., Derimow, N., Martin, M., Lauria, D., Lucon, E., Stalheim, D., Bradley, P., & Connolly, M. (2024). Assessing girth weld quality of pipeline steels and their susceptibility to hydrogen embrittlement. *International Ocean and Polar Engineering Conference*, ISOPE-I-24-458. <https://onepetro.org/ISOPEIOPEC/proceedings-abstract/ISOPE24/All-ISOPE24/546178>
- [10] Leem, D., Moser, N., Ren, H., Mozaffar, M., Ehmann, K. F., & Cao, J. (2019). Improving the accuracy of double-sided incremental forming simulations by considering kinematic hardening and machine compliance. *18th International Conference on Sheet Metal, SHEMET 2019*, 29, 88–95. <https://doi.org/10.1016/j.promfg.2019.02.110>
- [9] Moser, N., Leem, D., Liao, S., Ehmann, K., & Cao, J. (2019). Improving the Accuracy of Finite Element Models in Double-Sided Incremental Forming by Quantifying the Effects of Mass Scaling on the Forming Mechanics. *NUMIFORM 2019: The 13th International Conference on Numerical Methods in Industrial Forming Processes*, 1–4.
- [8] Leem, D., Moser, N., Ehmann, K. F., & Cao, J. (2019). Double-Sided Incremental Forming of Periodic Structures with Free Edges. *NUMIFORM 2019: The 13th International Conference on Numerical Methods in Industrial Forming Processes*, 1–4.
- [7] Zhang, Z., Zhang, H., Shi, Y., Moser, N., Ren, H., Ehmann, K. F., & Cao, J. (2016). Springback Reduction by Annealing for Incremental Sheet Forming. *44th Proceedings of the North American Manufacturing Research Institution of SME*, 5, 696–706. <https://doi.org/10.1016/j.promfg.2016.08.057>
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- [5] Zhang, H., Zhang, Z., Ren, H., Moser, N., & Cao, J. (2016). Dieless Double-Sided Incremental Hole-Flanging with Different Toolpath Strategies. *ASME 2016 11th International Manufacturing Science and Engineering Conference, MSEC 2016*. <https://doi.org/10.1115/MSEC2016-8829>
- [4] Ren, H., Moser, N., & Cao, J. (2016). Simulation and analysis of double-sided incremental forming considering machine compliance. *NUMIFORM 2016: The 12th International Conference on Numerical Methods in Industrial Forming Processes*, 3.

- [3] Giovannini, M., Moser, N., & Ehmann, K. (2015). Experimental and analytical study of micro-serrations on surgical blades. *ASME 2015 13th International Conference on Nanochannels, Microchannels, and Minichannels*, 3. <https://doi.org/10.1115/IPACK2015-48046>
- [2] Giovannini, M., Moser, N., Wang, X., & Ehmann, K. (2015). Computational and experimental study of vibrational motions on tissue cutting for solid biopsy needles. *ASME 2015 International Manufacturing Science and Engineering Conference, MSEC 2015*, 2. <https://doi.org/10.1115/MSEC20159266>
- [1] Moser, N., Ndip-Agbor, E., Ren, H., Zhang, Z., Ehmann, K., & Cao, J. (2015). Challenges and process strategies concerning multi-pass double sided incremental forming. *Proceedings of ESAFORM 2015*, 651–653, 1122–1127. <https://doi.org/10.4028/www.scientific.net/KEM.651-653.1122>

Published Software and Data Sets

- [17] Benzing, J., Moser, N., Derimow, N., Kafka, O., Saville, A., & Allen, C. (2025). AMB2025-02 Macro-scale Quasi-Static Tensile Tests of PBF-L IN718 (1.0.0, p. 3 files, 68.7 MB) [data set]. National Institute of Standards and Technology. <https://doi.org/10.18434/MDS2-3735>
- [16] Benzing, J., Moser, N., Derimow, N., Kafka, O., Saville, A., Glaessgen, E., Newman, J. A., Yeratapally, S., Pribe, J., Weber, G., Chu, S.-H., Rogers, R., Allen, C., & Glaubitz, E. (2025). AMB2025-03 High-Cycle Rotating Bending Fatigue Tests of PBF-L Ti-6Al-4V (1.0.1, p. 390 files, 232.6 GB) [data set]. National Institute of Standards and Technology. <https://doi.org/10.18434/MDS2-3734>
- [15] Benzing, J., Moser, N., Derimow, N., Kafka, O., Saville, A., Glaessgen, E., Newman, J.A., Yeratapally, S., Pribe, J., Weber, G., Chu, S.H., Rogers, R., Allen, C., Glaubitz, E. (2025) AMB2025-03 High-Cycle Rotating Bending Fatigue Tests of PBF-L Ti-6Al-4V (1.1, p. 390 files, 374 GB) [data set] National Institute of Standards and Technology.
- [14] Benzing, J., Moser, N., Derimow, N., Kafka, O., Saville, A., Allen, C. (2025). AMB2025-02 Macro-scale Quasi-Static Tensile Tests of PBF-L IN718 (1.0, p. 3 files, 68.7 MB) [data set] National Institute of Standards and Technology. <https://doi.org/10.18434/mds2-3735>
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Manuscripts in Submission/Preparation

- [4] Tewary, V., Moser, N., Rawat, A., Garboczi, E. (2025). *Phonon Green's Function Method for Multiscale Modeling of Color Centers in Nanodiamonds*. Physics Letters A. In Review

- [3] Saville, A., Benzing, J., Zhang, F., Aroh, J., Weaver, J., Evans, R., Derimow, N., Webster, S., Hrabe, N., Allen, C., Moser, N., Martin, M., Holm, J., Seifert, T., Hirtler, M. (2025). *Priming Additively Manufactured Cobalt-free Maraging Steels for Improved Properties via Changes to As-Built Microstructure*. In Review
- [2] Buck, Z., Moser, N., Derimow, N., Lauria, D., Martin, M., Park, J.S., Stalheim, D., Connolly, M. (2025). *In Situ X-ray Diffraction on Fully-Reversed Strain-Life Measurements of X60 Steel in Hydrogen Gas*. In Review
- [1] Johnson, N., Kafka, O., Moser, N. (2025). *Accelerating In Situ X-ray Tomography Using Sparse Projections and Deep Learning*. In Preparation

PROFESSIONAL PRESENTATIONS

Conference Presentations

- [10] (2024). PVP2024-122545: Hydrogen Embrittlement Susceptibility and Fracture Toughness Measurements of Welded X65M Pipeline Steels. *ASME Pressure Vessels and Piping*, July 28-August 2, Bellevue, WA
- [9] (2023). Comparison of Hydrogen Performance of High-Frequency Induction Welds and Submerged Metal Arc Welds of Pipeline Steel. *ASME Pressure Vessels and Piping*, July 16-23, Atlanta, GA
- [8] (2022). Quantifying the Size, Shape, and Porosity of Metal Powder Particles using X-ray Computed Tomography (XCT). *Additive Manufacturing Benchmarks 2022*, August 14-18. Bethesda, MD
- [7] (2022). Characterizing Void Morphology in Single-Track Builds of Directed Energy Deposition using New Image Processing Techniques for X-ray Computed Tomography Data Sets. *TMS Annual Meeting*, February 27-March 3. Anaheim, CA
- [6] (2021). Advancing the Accuracy of Computational Models for Double-Sided Incremental Forming. *International Conference on the Technology of Plasticity*, July 25-30, Virtual
- [5] (2021). State-of-the-Art in Predicting Fatigue Life for Applications in Metal-Based Additive Manufacturing (AM). *TMS Annual Meeting*, March 15-18. Virtual
- [4] (2019). Improving the Accuracy of Finite Element Models in Double-Sided Incremental Forming by Quantifying the Effects of Mass Scaling on the Forming Mechanics. *NUMIFORM Conference*, June 23-27. Portsmouth, NH
- [3] (2016). An Investigation into the Mechanics of Double-Sided Incremental Forming using Finite Element Methods. *ESAFORM Conference*, April 27-29. Nantes, France

- [2] (2015). Japanese Energy Awareness Initiative. *Graduate Mechanical Systems Innovation Conference*, July 29-August 3. Tokyo, Japan
- [1] (2015). Challenges and Process Strategies Concerning Multi-Pass Double-Sided Incremental Forming. *ESAFORM Conference*, April 15-17. Graz, Austria

Invited Presentations, Lectures, and Departmental Talks

- [12] (2025). Applications of X-ray Computed Tomography in Additive Manufacturing. *ME 498 / ME 598: Laser 3D Printing*, [Lecture] March 10. University of Illinois, Urbana-Champaign, Champaign, IL
- [11] (2024). Special Topics: Motivation for Using Lagrangian Mechanics in Robotics. *ME 625: Introduction to Robotics*, [Lecture] November 26. New Jersey Institute of Technology
- [10] (2024). Nondestructive Testing for Additive Manufacturing: Acoustics and X-ray Computed Tomography. *ASPE-euspen Advancing Precision in Additive Manufacturing*, [Workshop/Conference] July 15. Colorado School of Mines, Golden, CO
- [9] (2024). Applications of X-ray Computed Tomography in Additive Manufacturing. *ME 498 / ME 598: Laser 3D Printing*, [Lecture] April 1. University of Illinois, Urbana-Champaign, Champaign, IL
- [8] (2023). Overview of Incremental Sheet Forming. *ME 625: Introduction to Robotics*, [Lecture] October 5. New Jersey Institute of Technology, Newark, NJ
- [7] (2023). Shape and Microstructural Characterization of Commercially Pure Titanium Feedstock Powders for Cold Spray Additive Manufacturing. *TMS Annual Meeting*, [Conference] March 19-23. San Diego, CA
- [6] (2022). AM Bench 2022 Macroscale Tensile Challenge at Different Orientations (CHAL-AMB2022-04-MaTTO), Part 2: Predictions and Trends. *Additive Manufacturing Benchmarks 2022*, [Conference] August 14-18. Bethesda, MD
- [5] (2022). Applications of X-ray Computed Tomography in Additive Manufacturing. *Lecture in ME 498/ME 598: Laser 3D Printing*, [Lecture] April 20. University of Illinois, Urbana-Champaign, Champaign, IL
- [4] (2022). Applications of X-ray Computed Tomography in Additive Manufacturing. *Mechanical and Aerospace Engineering Research Seminar Series*, [Seminar] March 31. University of Colorado, Colorado Springs, CO
- [3] (2020). Challenges and Strategies Related to the Simulation of Manufacturing Processes: A Case Study in Sheet Metal Forming. *Postdoc and Early-Career Association of Researchers Seminar*, [Seminar] January 24. National Institute of Standards and Technology, Boulder, CO
- [2] (2018). Challenges of Modeling Material Failure in Sheet Metal Forming. *Mechanical Engineering Graduate Student Society Research Talks*, [Seminar] January 26. Northwestern University, Evanston, IL

- [1] (2015). Introduction to Double-Sided Incremental Forming. *International Metal Decorators Association Annual Meeting*, [Conference] May 19-21. Bloomingdale, IL

Poster Presentations

- [6] (2025). Causal Green's Function Simulations of Phonons for Multiscale/Multiphysics Modeling of Thermal Transport in Gate-all-Around Transistors. *NIST Sigma Xi Post-Doctoral Poster Presentation*, April 30. National Institute of Standards and Technology, Boulder, CO
- [5] (2024). Causal Green's Function Simulations of Phonons for Multiscale/Multiphysics Modeling of Thermal Transport in Gate-All-Around Transistors. *NIST CHIPS Metrology Workshop: Failure Analysis and Reliability Testing*, February 22. National Institute of Standards and Technology, Boulder, CO
- [4] (2021). Predicting Fatigue Life in Metal-Based Additive Manufacturing using Damage Mechanics. *NIST Sigma Xi Post-Doctoral Poster Presentation*, March 31. Virtual
- [3] (2017). Dieless Incremental Sheet Forming. *I/UCRC for Metal Deformation Processes Planning Meeting*, March 14-15. Evanston, IL
- [2] (2017). Predicting Ductile Fracture in Double-Sided Incremental Forming. *The International Academy for Production Engineering STC-F Annual Meeting*. August 25. Lugano, Switzerland
- [1] (2014). An Analysis and Design Optimization of a Science Olympiad Problem: Bridge Building. *Altair Hyperworks Professional Conference*, December 5. Evanston, IL