Marko Knezevic

Department of Mechanical Engineering
University of New Hampshire
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EDUCATION:

Ph.D. in Materials Science and Engineering, Drexel University, Philadelphia, PA 2009
GPA: 3.91/4
Thesis Title: *"A New Spectral Framework for Crystal Plasticity Modeling of Cubic and Hexagonal Polycrystalline Metals."*
Advisor: Prof. Surya R. Kalidindi

BS/MS in Mechanical Engineering, University of Novi Sad, Serbia 2004
GPA: 9.80/10
Graduated with distinction and honor degree - the highest GPA and shortest time to graduation in the department's history.
Major: **Manufacturing Engineering** with thesis in **Metallurgy**
Thesis Title: *"Relationships between Mechanical Behavior of Graphite Inclusions and Metal Matrix in Ductile Iron during Tension and Compression."*

HONORS AND AWARDS:

- **2019 TMS-AIME Champion H. Mathewson Award**, TMS (2019).
- **Award for Excellence in Research**, College of Engineering and Physical Sciences, UNH (2018).
- **2017 NSF CAREER Award**, the US National Science Foundation (2017).
- **2016 MPMD Young Leaders Professional Development Award**, TMS (2016).
- **Air Armament Scholarship**, Air Force Research Laboratory at Eglin Air Force Base (2014).
- **Defense Programs Award of Excellence**, Los Alamos National Laboratory (2012).
- **Seaborg Institute Postdoctoral Fellowship**, Los Alamos National Laboratory (2012).
- **Graduate Student Excellence in Research Award**, Drexel University (2008).
- **Graduate Student Excellence in Teaching Award**, Drexel University (2008).
- **Dragomir Nicolitch Charitable Trust Scholarship**, Studenica Foundation (2007 and 2008).
- **The George Hill Jr. Fellowship**, Drexel University (2007).
- **Scholarship**, Serbian Government (2006 and 2007).
- **Conference Travel Awards**:
  - The American Ceramics Society for attending "ICOTOM 2008, Pittsburgh"
  - Drexel University office of graduate studies travel subsidy for "Plasticity 2008, Hawaii"
  - The Society of Engineering Science for "SES 2006, The Penn State University"
- **Trimo Research Award for Diploma Thesis**, International Competition in Diploma Thesis, Trebnje, Slovenia (2005).
- **Special Prize for Outstanding Senior Design Project**, College of Engineering, University of Novi Sad (2005).
- **Best Student Award**, awarded twice, University of Novi Sad (2003 and 2004).
- **Highest Academic Honors**, awarded three times, College of Engineering, University of Novi Sad (2001, 2003 and 2004).
- **Royal Norwegian Embassy Award for Academic Success**, Novi Sad (2002).
- **Talented Student Scholarship**, Awarding Fund of the University of Novi Sad (2002).
- **Award in Mechanics,** 41st National Competition of Mechanical Engineering Students, Serbia (2001).

ENTREPRENEURSHIP IN TECHNOLOGY:

Startup Business Plan: "***Microstructure Sensitive Design of Materials***".

- **Won business concept and business plan competition in 2007 and 2008** (over 60 plans)
- **Incubator Competition:** presented with a team of four the business plan to a panel of judges at the Entrepreneur Conference, Laurence A. Baiada Center, Philadelphia, 2008.
  Awarded with designated space in the Baiada Center Incubator, access to all of the programs and services offered by the Baiada Center, $6,000 cash to be used as seed funding for the business, $5,000 In-Kind support to be used to cultivate the start-up.

RESEARCH INTERESTS:

- Physics-Based Multi-Scale Constitutive Models, Crystal Plasticity, Continuum Elasto-Plasticity.
- Computational Materials Science, Computational Mechanics, Finite Elements Analysis.
- Localized Deformation and Fracture Behavior of Polycrystals, Analysis of Residual Stresses.
- Microstructure and Texture Quantification, Computational Methods for Microstructure-Property-Processing Linkages.
- Design and Manufacturing Processes.
- Mechanical Testing, Thermo-Mechanical Processing.
- Electron Microscopy, Orientation Imaging Microscopy, Diffraction.

EXPERIENCE:

❖ ***Associate Professor,*** University of New Hampshire, Durham, NH (2018 - present)

❖ ***Assistant Professor,*** University of New Hampshire, Durham, NH (2013 - 2018)

- **Funded projects (Total: $24,284,469; Portion of my share: $3,308,105)**:

  - *"GOALI/Collaborative Research: Strain Gadient Plasticity Modeling to Link Microstructural Non-Local Effects of Dislocation/Interface Interactions with Ductility and Springback,"*
    PI Marko Knezevic, Co-PI Raj Dasu, PI David T. Fullwood, Co-PI Michael Miles, **NSF**, $557,701 (10/19- 9/22) **[portion of my share is $257,846]**.
  - *"RII-Track 1: New Hampshire Center for Multiscale Modeling and Manufacturing of Biomaterials (NH Bio-Made),"*
    PI Brad Kinsey, …, **Co-I Marko Knezevic**, …, **NSF**, $20,000,000 (9/18- 8/23) **[portion of my share is $550,417]**.
  - *"GOALI/Collaborative Research: Immiscible Phase Interface-Driven Processing of Ultrafine-Laminated Structures for Lightweight and Strong Magnesium-Based Sheets,"*
    PI Marko Knezevic, PI Irene J. Beyerlein, Co-PI Raymond Decker, **NSF**, $509,835 (9/17- 8/20) **[portion of my share is $232,907]**.
  - *"CAREER: An Experimentally-Informed Multi-Level Framework for Modeling Fracture of Hexagonal Metals,"*
    PI Marko Knezevic, **NSF**, $524,000 (5/17-4/22)
  - *"Constitutive Modeling of Engineering Materials,"*
    PI Marko Knezevic, **DOE**, Los Alamos National Laboratory, $70,135 (6/16-9/17)
  - *"Microstructure and mechanical behavior studies to advance direct metal laser sintering of cobalt based superalloys,"*
    PI Marko Knezevic, Co-PI Igor Tsukrov, **New Hampshire Innovation Research Center and TURBOCAM, Inc.**, $149,899 (7/16-6/18)

- *"University of New Hampshire Planning Grant: I/UCRC for Metal Deformation Processes,"* PI Brad Kinsey, Co-PI Yannis Korkolis, **Co-PI Marko Knezevic** **NSF** $15,000 (4/16-3/17) **[portion of my share is $5,000]**.
- *"Physics-based models for manufacturing of advanced materials,"* **PI Marko Knezevic**, **DOD**, Army Research Laboratory, $764,789 (09/2015 – 10/2020).
- *"Manufacturing Interface Dominated Microstructures in Bulk Metal-Metal Composites for Ultra-high Strength and Formability,"* **PI Marko Knezevic**, Co-PI Siddhartha Pathak, **NSF**, $139,747 (6/15- 5/17).
- *"Measurement and Modeling of Elastic and Plastic Anisotropy of AHSS of Ferritic-Martensitic Steels,"* PI Yannis Korkolis, **Co-PI Marko Knezevic**, **Auto/Steel Partnership**, $90,710 (8/14-6/15) **[portion of my share is $22,678]**.
- *"Evaluation of Novel Additive Manufacturing Processes to Replace Forging and Casting,"* **PI Marko Knezevic**, Co-PI Igor Tsukrov, **New Hampshire Innovation Research Center and TURBOCAM, Inc.**, $149,910 (8/14-2/16)
- *"Microstructural characterization and testing of additively manufactured alloy 718,"* **PI Marko Knezevic**, **TURBOCAM ENERGY SOLUTIONS, LLC**, $14,914 (1/14-1/16)
- *"Materials Constitutive Model Development,"* **PI Marko Knezevic**, **DOE**, Los Alamos National Laboratory, $69,884 (5/14-9/15)
- *"Constitutive Modeling of Engineering Materials,"* **PI Marko Knezevic**, **DOE**, Los Alamos National Laboratory, $56,707 (5/13-8/14)
- *"MRI: Acquisition of analytical scanning electron microscope for engineering and earth science research,"* PI Todd Gross, **Co-PI Marko Knezevic**, Co-PI Brad Kinsey, Co-PI Yannis Korkolis, Co-PI Samuel Mukasa **NSF** $683,558 (9/13-8/15) **[portion of my share is $136,712]**.
- *"GOALI: Continuous-Bending-under-Tension (CBT) Studies to Enhance the Formability of Advanced Steels and Aluminum Alloys,"* PI Brad Kinsey, Co-PI Yannis Korkolis, **Co-PI Marko Knezevic**, Co-PI Cedric Xia **NSF** $487,680 (6/13-5/17) **[portion of my share is $162,560]**.

- **Teaching**
  - ME 643 Machine Design
    - Spring 2019/20
    - Spring 2018/19
    - Spring 2017/18
    - Spring 2016/17
    - Spring 2015/16
    - Spring 2014/15
    - Spring 2013/14
    - Spring 2012/13
  - ME 727/827 Advanced Mechanics of Solids
    - Fall 2018/19
  - ME 795/895 Fracture Mechanics
    - Fall 2019/20
    - Fall 2017/18

        - Fall 2015/16
    - ME 922 Continuum Mechanics
        - Fall 2017/18
        - Fall 2015/16
        - Fall 2014/15
    - ME 995 Computational Mechanics of Materials
        - Fall 2018/19
        - Fall 2016/17
        - Fall 2013/14

- **Graduate students**:
    - **Current Ph.D. students**
        - Nemanja Kljestan (CEPS fellowship 2019/20)
        - Vasilev, Evgenii (CEPS fellowship 2018/19)
        - Zhangxi Feng
        - Iftekhar A. Riyad
        - Adnan Eghtesad (CEPS fellowship 2016/17, DYF fellowship 2019/20)
        - Saeede Ghorbanpour (Summer TA fellowship 2017)
        - Daniel J. Savage (CEPS fellowship 2014/15, NSF fellowship 2015/16/17/18, DYF fellowship 2018/19)

    - **Alumni**
        3. *Milan Ardeljan (Seaborg institute fellowships 2014 and DYF fellowship 2016/17)*
        2. *Miroslav Zecevic (CEPS fellowship 2013/14, Seaborg institute fellowships 2016, and DYF fellowship 2017/18)*
        1. *Milovan Zecevic (DYF fellowship 2016/17)*

    - **Current MS students**
        - Shubhrodev Bhowmik
        - Nicholas Ferreri
        - William G. Feather
        - Russell Marki

    - **Alumni**
        3. *Timothy J. Barrett (Seaborg institute fellowships 2018)*
        2. *Camille M. Poulin*
        1. *Joseph M. Gabriel*

- **Post-docs**:
    - **Current**
        - NONE
    - **Alumni**
        1. *Mohammad Jahedi*

- **Visiting Scholars**
    - **Current**
        - NONE
    - **Alumni**
        1. *Mohammad Jahedi (Shiraz University, Shiraz, Iran)*

- ***Visiting Professor***, Los Alamos National Laboratory, Los Alamos, NM (summer 2013)
- ***Visiting Professor***, Los Alamos National Laboratory, Los Alamos, NM (summer 2014)
- ***Postdoctoral Research Associate****,* Los Alamos National Lab, Los Alamos, NM (2011 - 2013)
  Polycrystalline modeling and microstructure characterization
  - Implemented multi-scale constitutive laws based on dislocation densities within Visco-Plastic Self-Consistent (VPSC) crystal plasticity model for uranium, beryllium and zirconium.
  - Coupled the uranium VPSC model with the commercial finite-element software ABAQUS through a user material subroutine (UMAT).
  - Developed computationally efficient numerical methods and a high-performance implementation on graphical processing units (GPUs) for crystal plasticity.
- ***Principal Research Scientist****,* Scientific Forming Tech. Corp., Columbus, OH (2009 - 2011)
  Developer of the finite element based engineering software DEFORM™
  - Internal (SFTC) funded projects:
    - Implemented force movement control, floating movement control, spring loaded dies movement control, elastic stretch for metal forming equipment, and clamping jaws boundary conditions.
    - Developed infrastructure for the implementation of external user material subroutines (UMAT).
    - Enhanced user interfaces and multiple-operational simulation procedures for cogging and machining distortion specialized templates.
    - Developed pole figure and inverse pole figure texture visualization capabilities in the DEFORM post-processor.
  - Externally funded projects:
    - Navy STTR project*: "Integrated Thermo-Mechanical Processing, Microstructure, and Property Simulation System for Aluminum Alloys."* Implemented physics-based elasto-visco-plastic crystal plasticity micromechanical model for simulating microstructure evolution and anisotropic mechanical response during deformation processing in DEFORM. Developed a grain morphology evolution model.
    - Metals Affordability Initiative (MAI) project: *"3-D Modeling of Machining Distortions of Aerospace Components."* Analyzed machining induced surface residual stresses and heat-treating bulk residual stresses, and successfully modeled machining distortion of aircraft engine and airframe structural components due to presents of residual stresses using DEFORM. Prepared and held a workshop on modeling machining distortion.
    - Metals Affordability Initiative (MAI) project: *"Advanced Titanium Alloy Microstructure and Mechanical Property Modeling."* Developed infrustructure for integration of varius models for microstructure evolution and material property prediction for titanium alloys into the process modeling system DEFORM. Implemented an empirical phase transformation model for titanium Ti-6Al-4V alloy (model developed by Air Force Research Laboratory).
- ***PhD Student****,* Drexel University, Philadelphia, PA (2005 - 2009)
  - **Research**

Crystal plasticity modeling of cubic and hexagonal metals, crystal plasticity finite element models, continuum plasticity, and multi-scale modeling of materials

- Developed computationally efficient crystal plasticity framework for simulating texture evolution and anisotropic mechanical properties of cubic and hexagonal metals. The approach speeds up the computations by over 100 times relative to the numerical methods currently used in literature.
- Explained the role of micro-scale deformation mechanisms responsible for the unusually high strain hardening rates, yield asymmetry, and texture evolution in magnesium alloys.
- Developed a hypothesis for the physical origin of the observed difference in the morphology of the extension and contraction twins in magnesium alloys.

- Investigated the mechanical behavior, deformation mechanisms, microstructure evolution, and effects of texture on sheet formability in aluminum alloy Al5754.
- Developed a modeling framework for identifying the complete space of feasible anisotropic properties in polycrystalline microstructures.
- Built texture evolution networks for the design of deformation processes to achieve the optimized microstructure for target performances.
- Supervised the development of a materials design software (MSDPO) that considers material microstructure as a continues design variable for performance optimization.

o **Teaching**

- MATE 370 - Processing of Metallic Materials, Drexel University (Winter 2008)
- ENG220 - Introduction to Materials Science & Engineering, Drexel University (Fall 2007)
- MATE 610 - Mechanical Behavior of Solids, Drexel University (Fall 2005)
- Mentor and Trainer in "*Research Experience for Undergraduates*" program at Drexel University

❖ ***Research Assistant,*** University of Novi Sad, Serbia (2004- 2005)

- Investigated the structural transformations and mechanical behavior of ductile cast iron.
- Designed sets of dies for metal forming; designed metal cutting tools; performed technological processes design and optimization in machining, metal forming, welding, and casting.
- Used computer-aided design (CAD) and computer-aided manufacturing (CAM) software tools for design of components and programming of computer numerical control (CNC) machine tools.

SEMINARS:

19. Colorado School of Mines, Golden, CO, December 12, 2016.
18. University of Nevada, Reno, NV, April 29, 2016.
17. University of Virginia, Charlottesville, VA, September 29, 2014.
16. U.S. Army Research Laboratory, Aberdeen, MD, August 17, 2014.
15. Los Alamos National Laboratory, Los Alamos, NM, July 17, 2014.
14. DOE HQ, Advanced Manufacturing Office, Washington DC, January 10, 2014.
13. Pratt & Whitney, East Hartford, CT, December 12, 2013.
12. Industrial Advisory Board Meeting, UNH, Durham, NH, October 11, 2013
11. University of Florida, Shalimar, FL, August 30, 2013.
10. Turbocam, Barrington, NH, August 7, 2013.
9. Los Alamos National Laboratory, Los Alamos, NM, July 25, 2013.
8. HC Starck, Newton, MA, May 7, 2013.
7. Missouri University of Science and Technology, Rolla, MO, May 3, 2012.
6. GE Aviation, Cincinnati, OH, April 20, 2012.
5. University of New Hampshire, Durham, NH, March 26, 2012.
4. Los Alamos National Laboratory, Los Alamos, NM, December 9, 2011.
3. Scientific Forming Technologies Corporation, Columbus, OH, November 2, 2010.
2. Los Alamos National Laboratory, Los Alamos, NM, October 18, 2010.
1. Scientific Forming Technologies Corporation, Columbus, OH, September 26, 2008.

INVITED TALKS:

26. "Experimental and modeling studies into the role of cyclic bending during stretching of dual-phase steel sheets,"
International Conference on Plasticity, Damage, and Fracture, Barcelo Maya Grand Resort, Rivera Maya, Mexico, January 3 – 9, 2020.

25. *"Modelling recrystallization textures driven by intragranular fluctuations implemented in the viscoplastic self-consistent formulation"*
    7th International Conference on Recrystallization and Grain Growth, Ghent, Belgium, August 4-9, 2019.

24. *"Deformation behavior and strength of bulk Zr/Nb nanolayered composites"*
    TMS 2019 148th Annual Meeting & Exhibition, Phoenix, AZ, March 10-14, 2019.

23. *"Progress in VPSC and EPSC modeling of polycrystals at the University of New Hampshire"*
    A workshop honoring the work and retirement of Carlos Tomé, Santa Fe, NM, September 20-21, 2018.

22. *"Modeling intragranular misorientation, grain fragmentation, and associated effects on mechanical fields and texture evolution in polycrystals using the viscoplastic self-consistent framework,"*
    13th World Congress in Computational Mechanics, New York City, NY, July 22 - 27, 2018.

21. *"Accumulative roll bonding of Mg/Nb ultrafine-laminated structures,"*
    TMS 2018 147th Annual Meeting & Exhibition, Phoenix, AZ, March 11-15, 2018.

20. *"Tensile, compressive, large strain cyclic, and fatigue behavior of direct metal laser sintered Inconel 718: Experiments and crystal plasticity modeling,"*
    International Symposium on Plasticity and Its Current Applications, San Juan, PR, January 3 – 9, 2018.

19. *"Spectral database constitutive representation within finite element and spectral micromechanical solvers for computationally efficient crystal plasticity modelling,"*
    The 18th International Conference on the Textures of Materials (ICOTOM 18), St. George, UT, November 5-10, 2017.

18. *"Transitioning rate sensitivities across multiple length scales in crystal plasticity,"*
    24th International Congress of Theoretical and Applied Mechanics (ICTAM), Montreal, Canada, August 21-26, 2016.

17. *"An accurate description of rate-sensitive flow of polycrystals across multiple-scales,"*
    International Union of Theoretical and Applied Mechanics (IUTAM) Symposium: Integrated Computational Structure-Material Modeling of Deformation and Failure under Extreme Conditions, Baltimore, MD, June 20-22, 2016.

16. *"Predicting cyclic deformation of AA6022-T4 and DP590 using polycrystal plasticity,"*
    International Symposium on Plasticity and Its Current Applications, Kona, Hawaii, January 3-9, 2016.

15. *"Modeling high strain-rate plastic deformation and ductile damage using crystal plasticity finite element models,"*
    Hopkins Extreme Materials Institute Mach Conference, Annapolis, MD, April 8-10, 2015.

14. *"Shear banding in two-phase polycrystalline hcp/bcc composites,"*
    International Symposium on Plasticity and Its Current Applications, Montego Bay, Jamaica January 4-9, 2015.

13. *"A strain-rate and temperature dependent constitutive model for BCC metals incorporating non-Schmid effects,"*
    International Symposium on Plasticity and Its Current Applications, Montego Bay, Jamaica January 4-9, 2015.

12. *"Evolution of microstructure and strain localizations in two-phase polycrystalline hcp/bcc composites,"*

The Center for Integrated Nanotechnologies user meeting, Santa Fe, NM, September 22-23, 2014.

11. *"A dislocation density based crystal plasticity finite element model: application to a two-phase polycrystalline HCP/BCC composites,"*
    17th U.S. National Congress on Theoretical and Applied Mechanics, Michigan State University, East Lansing, MI, June 15-20, 2014.

10. *"Towards computationally tractable simulations of metal forming processes with evolving microstructures,"*
    Manufacturing Science and Engineering Conference, Detroit, MI, June 9 - 13, 2014.

9. *"Identification of deformation mechanisms by crystal plasticity models with hardening laws based on dislocation density,"*
    TMS 2014 143rd Annual Meeting & Exhibition, San Diego, CA, February 16-20, 2014.

8. *"A polycrystal plasticity model for predicting mechanical response and texture evolution in hexagonal metals during strain-path changes,"*
    THERMEC 2013, Las Vegas, NV, USA, December 2-6, 2013.

7. *"Predicting deformation behavior of α-uranium using crystal plasticity in finite elements,"*
    49th Annual Technical Meeting Society of Engineering Science, Atlanta, GA, Oct 10-12, 2012.

6. *" Finite element implementation of a self-consistent polycrystal plasticity model: application to α-uranium,"*
    TMS 2012 141st Annual Meeting & Exhibition, Orlando, FL, March 11-15, 2012.

5. *"Modeling anisotropic stress-strain response and texture evolution of α-uranium,"*
    International Symposium on Plasticity and Its Current Applications, San Juan, PR, January 3 – 8, 2012.

4. *"Anisotropic stress-strain response and microstructure evolution in AZ31,"*
    International Symposium on Plasticity and Its Current Applications, St. Thomas, USVI, January 3 – 8, 2009.

3. *"A novel spectral approach for the design of deformation processing operations to achieve desired textures in polycrystalline FCC metals,"*
    The 15th International Conference on the Textures of Materials (ICOTOM 15), Pittsburgh, PA, June 1 – 6, 2008,

2. *"Spectral methods for crystal plasticity and closures involving plastic properties of FCC metals,"*
    International Symposium on Plasticity and Its Current Applications, Kona, Hawaii, January 3 – 8, 2008.

1. *"Atlas of first-order closures for anisotropic elastic-plastic properties of cubic materials,"*

    The First Annual Drexel Engineering Research Symposium, April, 2007.

CONTRIBUTED CONFERENCE PRESENTATIONS:

21. *"A comparative study between elasto-plastic self-consistent crystal plasticity and anisotropic yield function with distortional hardening formulations for sheet metal forming,"*
    NUMIFORM 2019: The 13th International Conference on Numerical Methods in Industrial Forming Processes, Portsmouth, NH, June 23-27, 2019.

20. *"Effect of hot working on fatigue of WE43 rare earth magnesium alloy,"*
    TMS 2019 148th Annual Meeting & Exhibition, Phoenix, AZ, March 10-14, 2019.

19. *"A Crystal Plasticity Model Incorporating the Effects of Precipitates in Superalloys: Application to Tensile, Compressive, and Cyclic Deformation of Additively Manufactured Inconel 718,"*
    9th International Symposium on Superalloy 718 & Derivatives: Energy, Aerospace, and Industrial Applications, Pittsburgh, PA, June 3-6, 2018.

18. *"Mechanical fields due to double twinning in magnesium alloy AZ31 as revealed by explicit modeling of twin lamellae using a crystal plasticity finite element model,"*
    TMS 2018 147th Annual Meeting & Exhibition, Phoenix, AZ, March 11-15, 2018.

17. *"Deformation behavior and strength of bulk Zr/Nb nanolayered composites,"*
    The 18th International Conference on the Textures of Materials (ICOTOM 18), St. George, UT, November 5-10, 2017.

16. *"Low cycle fatigue behavior of direct metal laser sintered Inconel alloy 718: Experiments and crystal plasticity modeling,"*
    TMS 2017 146th Annual Meeting & Exhibition, San Diego, CA, February 26 - March 2, 2017.

15. *"Predicting Texture Evolution using Coupled Polycrystal Plasticity and Recrystallization Models,"*
    6th International Conference on Recrystallization and Grain Growth, Pittsburgh, PA, July 17-21, 2016.

14. *"Spectral database solutions to elasto-viscoplasticity within finite elements,"*
    TMS 2016 145th Annual Meeting & Exhibition, Nashville, TN, February 14-18, 2016.

13. *"A high-performance computational framework for fast crystal plasticity finite element simulations,"*
    TMS 2015 144th Annual Meeting & Exhibition, Orlando, FL, March 15-19, 2015.

12. *"A strain-rate and temperature dependent constitutive model for tantalum-tungsten alloys,"*
    TMS 2015 144th Annual Meeting & Exhibition, Orlando, FL, March 15-19, 2015.

11. *"Modeling bending of α-titanium with embedded crystal plasticity and analytical yield surface formulations in implicit finite elements,"*
    TMS 2013 142nd Annual Meeting & Exhibition, San Antonio, TX, March 3-7, 2013.

10. *"Integration of self-consistent polycrystal plasticity with dislocation density based hardening laws within an implicit finite element framework,"*
    TMS 2013 142nd Annual Meeting & Exhibition, San Antonio, TX, March 3-7, 2013.

9. *"Three orders of magnitude improved efficiency of crystal plasticity models using spectral methods on high-performance GPU platforms,"*
    International Workshop on Computational Mechanics of Materials, Baltimore, MD, September 24 - 26, 2012

8. *"Modeling Machining Distortion using the Finite Element Method: Application to Engine Disk,"*
    40th North American Manufacturing Research Conference, Notre Dame, IN, June 4-8, 2012.

7. *"Technical development: Polycrystal plasticity modeling in DEFORM,"*
    DEFORM User's Group Meetings, Columbus, OH, November, 2010.

6. *"Technical development: Cogging template enhancements,"*
    DEFORM User's Group Meetings, Columbus, OH, May, 2010.

5. *"Technical development: Implementation of force, spring, and rigid floating objects movement control,"*
    DEFORM User's Group Meetings, Columbus, OH, November, 2009.

4. *"Technical development: Modeling texture in DEFORM,"*

DEFORM User's Group Meetings, Columbus, OH, May, 2009.

3. *"Application of spectral methods for anisotropy design of Ti-Nb polycrystals for biomedical applications based on ab initio elastic single crystal constants and fast Fourier homogenization,"* Materials Research Society (MRS) Fall Meeting, Boston, MA, December 1 - 5, 2008.

2. *"Delineation of first-order closures for plastic properties requiring explicit consideration of strain hardening and crystallographic texture evolution",* TMS 2007 136th Annual Meeting & Exhibition, Orlando, FL, February 25-March 1, 2007.

1. *"Invertible microstructure-property-processing linkages using spectral methods,"* 43rd Annual Technical Meeting Society of Engineering Science, University Park, PA, 2006.

WORKSHOPS:

14. *"Microstructure & Property Relationship of Polycrystalline Materials: Characterization and Modelling,"* A workshop honoring the work and retirement of Carlos Tomé, Santa Fe, NM, September 20-21, 2018.

13. *"Core Knowledge and Skills for Effective Use of Advanced Computation and Data-Enabled Research in Materials and Manufacturing,"* TMS 2018 Annual Meeting & Exhibition, Phoenix, AZ, March 11, 2018.

12. *"I/UCRC Metal Deformation Center Planning Meeting,"* Northwestern University, Evanston, IL, March 14-15, 2017.

11. *"Sheet Metal Forming Roadmap Workshop,"* University of New Hampshire, Durham, NH, October 27-28, 2016.

10. *"Pathways to Tenure,"* University of New Hampshire, Durham, NH, September 25, 2015.

9. *"NSF CAREER Proposal Writing Workshop,"* Northeastern University, Boston, MA, April 27-28, 2015.

10. *"Faculty Development Needs for Advanced Manufacturing in the USA,"* National Science Foundation, Arlington, VA, January 9-10, 2014.

5. *"Advanced Manufacturing Workshop,"* National Science Foundation, Arlington, VA, August 12-13, 2013.

6. *"Damage evolution in structure materials at the mesoscale: models and experiments,"* Los Alamos National Laboratory, Los Alamos, NM, July 17-18, 2012.

5. *"Methods for 3D microstructural studies,"* Carnegie Mellon University, Pittsburgh, PA, July 13-14, 2012.

4. *"Complex dynamics of dislocations, defects and interfaces,"* Los Alamos National Laboratory, Los Alamos, NM, November 14-16, 2011.

3. *"Modeling machining distortion,"* Scientific Forming Technologies Corporation, Columbus, OH, November 2, 2010.

2. *"Crystal plasticity workshop,"* Rolls-Royce Corporation North America, Indianapolis, IN, January 11-12, 2010.

1. *"Phase field models for the prediction of microstructure evolution in aerospace alloys,"* Ohio State University, Columbus, OH, July 25-28, 2005.

PROFESSIONAL SERVICE:

- Referee for: Acta Materialia, Scripta Materialia, Materials Science & Engineering A, International Journal of Plasticity, Journal of the Mechanics and Physics of Solids, Mechanics of Materials, Computational Materials Science, International Journal of Mechanical Sciences, Computer Methods in Applied Mechanics and Engineering, Materials Characterization, Metallurgical and Materials Transactions A, Journal of Manufacturing Science and Engineering, Journal of Manufacturing Processes, Journal of Engineering Materials and Technology, Structure Analysis and Characterization, Materials, Scientific Reports, Modelling and Simulation in Materials Science and Engineering, Advances in Engineering Software, JOM, Journal of Materials Engineering and Performance, Advanced Engineering Materials, Materials Research Letters, Philosophical Magazine Letters, Meccanica, Proceedings of the Royal Society A, Computational Mechanics, International Journal for Numerical Methods in Engineering, Journal of Alloys and Compounds, Journal of Materials Science, Computer Physics Communications, Computers & Structures, Steel Research International, International Journal of Material Forming, International Journal for Multiscale Computational Engineering.
- Member of: The Minerals Metals and Materials Society (TMS), The Shaping and Forming Committee of the TMS Materials Processing and Manufacturing Technical Division, American Association of University Professors (AAUP).
- Proposal panelist, NSF-CMMI (2012) Reviewed 10 proposals, NSF-CMMI (2013) Reviewed 9 proposals, NSF-CMMI (2015) Reviewed 11 proposals, NSF-CMMI (2015) Reviewed 8 proposals, NSF-CMMI (2017) Reviewed 8 proposals, NSF-DMR (2018) Reviewed 1 proposal, DOE (2018) Reviewed 1 proposal, ARO (2018) Reviewed 1 proposal, NSF-CMMI (2018) Reviewed 6 proposals.
- Sessions Chair at: 22nd International Workshop on Computational Mechanics of Materials (2012), 49rd Annual Technical Meeting Society of Engineering Science (2012), TMS Annual Meeting (2014), Manufacturing Science and Engineering Conference (2014), TMS Annual Meeting (2015), 24th International Congress of Theoretical and Applied Mechanics (2016), ICOTOM18 (2017).
- Symposium co-organizer at: TMS Annual Meeting (2014), TMS Annual Meeting (2015), TMS Annual Meeting (2016), TMS Annual Meeting (2017), TMS Annual Meeting (2018), TMS Annual Meeting (2019), TMS Annual Meeting (2020).
- Co-organizer: NUMIFORM conference (2019).

LIST OF PUBLICATIONS:

❖ **Book Chapters**

5. *"Effect of Hot Working on the High Cycle Fatigue Behavior of WE43 Rare Earth Magnesium Alloy,"*
   S. Ghorbanpour, B. A. McWilliams, and **M. Knezevic**,
   Magnesium Technology 2019, the Minerals, Metals & Materials Series, Springer
   ISBN: 978-3-030-05788-6 (2019) 219-225.

4. *"Mesoscale, microstructure-sensitive modeling for interface-dominated, nanostructured materials,"*
   I. J. Beyerlein and **M. Knezevic**,
   Handbook of Materials Modeling: Methods: Theory and Modeling,
   Springer, Cham, ISBN: 978-3-319-42913-7 (2018) 1-42.

3. *"Formability of magnesium alloy AZ31B from room temperature to 125 °C under biaxial tension,"*
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