Frederic Sansoz, Ph.D., ASME Fellow

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RESEARCH INTERESTS

Atomistic and Multiscale Modeling in Materials Science
In situ Mechanics and Electron Microscopy
Plasticity of Nanostructured Metals and Alloys
Microstructure and Properties of Interfaces
Materials Behavior in Extreme Environments

EDUCATION

Ecole Nationale Supérieure des Mines de Paris (MINES Paris), France
Ph.D. in Materials Science and Engineering with Honors, 2000
Dissertation: "Growth of Short Fatigue Cracks under Stress Concentrations in a Nickel-based Superalloy"
Advisor: Prof. Andre Pineau

Ecole Nationale Supérieure de Mécanique et Aérotechnique (ISAE-ENSMA), Poitiers, France
M.S. in Materials Science and Engineering, 1996
Thesis: "Phase Transformations by Laser Shock in FeNi Alloys"

Ecole Nationale Supérieure de Mécanique et Aérotechnique (ISAE-ENSMA), Poitiers, France
Engineer Diploma in Mechanical and Aerospace Engineering, 1996

APPOINTMENTS

2015-present	Professor and Graduate Program Director Department of Mechanical Engineering, University of Vermont Materials Science Graduate Program, University of Vermont Director of the Laboratory for Advanced Nanoscale Mechanics and Microstructures
2019-2020	Acting Chair, Department of Mechanical Engineering, University of Vermont
2013-2014	Head, Mechanical Engineering Program, School of Engineering, University of Vermont
2010-2015	Associate Professor, School of Engineering, University of Vermont
2004-2010	Assistant Professor, School of Engineering, University of Vermont
2002-2003	Postdoctoral Fellow, Dept. of Mechanical Engineering, The Johns Hopkins University
2001-2002	Postdoctoral Fellow, Dept. of Mechanical Engineering and Appl. Mech., Univ. of Rhode Island
2000-2001	Military Service, Overseas Research Fellow, SNECMA/ French Ministry of Foreign Affairs
1996-2000	Graduate Research Assistant, Centre des Matériaux, Ecole des Mines de Paris, Evry, France
1996	Graduate Research Assistant, Dept. of Physics and Mechanics of Materials, ENSMA, France
1995	Student Intern, Metallurgy Group, CEA Paris-Saclay Nuclear Research Center, France

HONORS AND AWARDS

2019	Fellow of the American Society of Mechanical Engineers
2017	CEMS Faculty Award for Excellence in Research
2011	Named "World's Nanotechnology Thought Leader" by AzoNano.com
2009	CEMS Milt Silveira Junior Faculty Award
2008	National Science Foundation CAREER Award
2007	TMS Early Career Faculty Award – Honorable mention
2005-18	Four times nominee for Best Poster Award at Materials Research Society Meetings

ACADEMIC LEADERSHIP

- **2 years of experience as interim department chair in mechanical engineering (2014, 2019-20):**
  - Experienced in many aspects of departmental academic leadership: Student admission & advising, course scheduling, conflict resolution, research expenditure oversight, budgeting, hiring, staff supervision, faculty evaluation, reappointment and promotion, bylaws, program accreditation, and Board of Advisors coordination.
  - Created an effective and inclusive course assessment plan for the department involving faculty, students, and external industrial advisors for an incoming ABET re-accreditation. This effort was by the successful re-accreditation for 6 years of our BS mechanical engineering degree with a perfect score and no deficiency in 2021.
  - Led a department consisting of 360 undergraduate students, 45 graduate students, and 15 faculty with 1 administrative assistant.
  - Worked with senior administration, faculty, staff, and students to find synergistic and positive solutions to any arising problems. Notably, I have successfully brought back the faculty and staff from exceptional challenges, specifically, the pandemic and two active faculty unexpectedly passing away in the same year.
  - Hired a new tenure-track faculty, despite a university-wide hiring freeze, through successful negotiation efforts with the Dean and President.
  - Chaired a tenure-track search committee resulting in the hiring of a new diversity colleague that I am still currently mentoring.
  - Enabled BS in Mechanical Engineering to rank among the 5 largest undergraduate degrees at the University of Vermont for student enrollment.

- **14 years of experience as graduate program director in mechanical engineering (2011-now):**
  - Significantly experienced in many aspects of graduate program (MS and PhD) administration: Graduate student admission & advising, program marketing, teaching assistant assignments, conflict resolution, degree requirements, assessments of student outcomes, and alumni outreach.
  - Moved the UVM doctoral program in mechanical engineering from unranked until 2015 to one standing 89th nationally in the Top 49% of the U.S. News and World Report 2023 graduate school rankings in mechanical engineering in the United States, exceeding larger programs in New England and other EPSCoR states.
  - Spearheaded the first accelerated MS program in mechanical engineering to become a top ranked accelerated MS programs at UVM in total enrollment since 2018.
  - Led a 10-year graduate program review and self-study writing addressing the goals, contributions to the University mission, quality, effectiveness, demand, societal needs, and quality control mechanisms of the mechanical engineering graduate program in 2022.
  - Designed graduate program website and social media.
  - Mentored junior faculty to achieve effective graduate student advising.
  - Helped the preparation of ME graduate students who have won major awards at UVM and nationally from professional societies and have earned competitive international fellowships.
  - Worked with local engineering firms to enable their employees as part-time students into our MS program.
  - Promoted collaborative research teams to emerge across different departments and units to supervise ME graduate students.
  - Grew the organization of a weekly Mechanical Engineering Public Seminar Series for graduate students.
  - Fostered an increase of diversity among graduate students and faculty in mechanical engineering.

FEDERALLY FUNDED RESEARCH AWARDS ($3.7 million as PI, $1.5 million as co-PI)

1. Title: "Segregation and Localized Deformation in Ultrafine-Grained Alloys"
   Source: **U.S. Department of Energy/Basic Energy Sciences**
   Role: **PI**, 100% effort
   Amount awarded: **$100,000**
   Project duration: 08/15/25-08/14/26

2. Title: "Segregation and Shear Localization in Nanocrystalline Alloys"
   Source: **U.S. Department of Energy/Basic Energy Sciences**
   Role: **PI**, 100% effort
   Amount awarded: **$638,000**
   Project duration: 08/15/22-08/14/25

3. Title: "Role of Heterogeneous Segregation on Shear Localization Mechanisms in Nanocrystalline Alloys"
   Source: **U.S. Department of Energy/Basic Energy Sciences**
   Role: **PI**, 100% effort
   Amount awarded: **$584,936**
   Project duration: 08/15/19-08/14/22

4. Title: "MRI: Acquisition of a Variable-Pressure, Field-Emission Scanning Electron Microscope for Materials Research and Education"
   Source: **National Science Foundation - MRI**
   Role: **co-PI**, 20% effort
   Amount awarded: **$480,000**
   Project duration: 10/01/18-09/30/21

5. Title: "Strengthening Nanotwinned Metals Beyond the Hall-Petch Limit"
   Source: **U.S. Department of Energy/Basic Energy Sciences**
   Role: **PI**, 100% effort
   Amount awarded: **$586,000**
   Project duration: 08/15/16-08/14/19

6. Title: "Role of Defects and Stacking-Fault Energy in Deformation and Fracture of Nanotwinned Metals"
   Source: **National Science Foundation** – Division of Materials Research
   Role: **PI**, 100% effort
   Amount awarded: **$285,000**
   Project duration: 09/01/14-08/31/17

7. Title: "Flexible Thermal Protection Systems: Materials Characterization and Performance in Hypersonic Atmospheric Entry"
   Source: **NASA EPSCoR Faculty Research Team Competition**
   Role: **PI**, 30% effort (Co-PI's: D. Fletcher, Y. Dubief, D. Huston, T. Tan)
   Award: **$749,999** (+ additional **$376,966** in University of Vermont matching fund)
   Project duration: 08/01/14-07/31/17

8. Title: "Undergraduate Research in Complex Materials"
   Source: **National Science Foundation** – Division of Materials Research
   Program: **Research Experience for Undergraduates (REU) Program**
   Role: **co-I/Faculty Mentor** (PI: Dennis Clougherty, co-PI: Madalina Furis); 10% effort
   Award: **$286,000**
   Project duration: 03/01/11-02/28/14

9. Title: "CAREER: Microstructure and Size Effects on Metal Plasticity at Limited Length Scale"
   Source: **National Science Foundation** – Division of Materials Research – Metals Program
   Program: **National Science Foundation CAREER award**
   Role: **PI**, 100% effort
   Award: **$400,000**
   Project duration: 04/01/08-03/31/14

10. Title: "Investigation of Critical Aerothermodynamic Phenomena for Hypersonic Vehicles"
    Source: **NASA** Experimental Program to Stimulate Competitive Research (EPSCoR)
    Program: Faculty Research Team Competition
    Role: **Co-I** (PD/PI: Douglas Fletcher; other Co-Is: Y. Dubief, D. Huston, D. Hitt); **20% effort**
    Award: **$750,000** (+ $761,028 from in-kind UVM matching funds);
    Project duration: 09/01/07-08/31/10

OTHER FUNDED RESEARCH GRANTS ($375,000 in total)

1. Title: "Development of Printed Ultrahigh Temperature Nb-Si-X Refractory Alloys "
   Source: VT NASA EPSCoR Small-scale faculty grant
   Role: **PI**; **100% effort**
   Amount awarded: **$30,000**; Project duration: 06/01/2025 to 05/31/2026
2. Title: "Microstructural Design of a High-Entropy Refractory Alloy for Ultrahigh Temperature Structural Applications"
   Source: Vermont Space Grant Consortium Graduate Research Assistantship (Student: Chris Kombo)
   Role: **Faculty Mentor**; Amount awarded: **$35,880**; Project duration: 07/01/2025-06/30/2026
3. Title: " Heat Conduction in Flexible 2-D Woven Ceramic Fibers for Extreme Atmospheric-entry Environments "
   Source: VT NASA EPSCoR Small-scale grant
   Role: **PI**; **100% effort**
   Amount awarded: **$16,250**; Project duration: 10/01/19-09/30/20
4. Title: " Heat Conduction in Flexible 2-D Woven Ceramic Fibers for Extreme Atmospheric-entry Environments "
   Source: VT NASA EPSCoR Small-scale grant
   Role: **PI**; **100% effort**
   Amount awarded: **$24,983**; Project duration: 08/01/18-07/30/19
5. Title: "Thermoelectric Performance of Stretchable Nanowire-based Composite Materials"
   Source: NASA/Vermont Space Grant Consortium - Graduate Research Assistantship
   Role: **Faculty mentor** Amount awarded: **$25,000**; Project duration: 08/01/16-07/31/17
6. Title: "Thermoelectric Performance of Stretchable Nanowire-based Composite Materials"
   Source: NASA/Vermont Space Grant Consortium - Graduate Research Assistantship
   Role: **Faculty mentor** Amount awarded: **$27,500**; Project duration: 09/01/15-06/30/16
7. Title: " Performance of Flexible Thermoelectric Nanowire Composites under Reversible Deformation"
   Program: UVM Summer Award for Undergraduate Research
   Role: **Faculty Mentor** Award: **$5,000**; Period: 06/01/2014-08/31-2014
8. Title: "Flexible Thermal Protection Systems: Materials Characterization and Performance in Hypersonic Atmospheric Entry"
   Source: VT NASA EPSCoR Small-scale grant
   Role: **PI** (with Douglas Fletcher as co-PI); **66% effort**
   Amount awarded: **$25,000**; Project duration: 05/01/13-04/30/14
9. Title: "Study of Thermal Transport in High-ZT Nanoengineered Thermoelectrics"
   Source: NASA/Vermont Space Grant Consortium - Graduate Research Assistantship
   Role: **Faculty mentor** Amount awarded: **$27,500**; Project duration: 09/01/12-08/30/13
10. Title: "*In-situ* mechanical characterization of microparticles by atomic force microscopy"
    Source: NASA/Vermont Space Grant Consortium - Graduate Research Assistantship
    Role: **Faculty mentor**; Award: **$27,000**; Project duration: 07/01/10-06/30/11
11. Title: "Atomistic simulation study of indentation of nickel nanowires"
    Source: University of Vermont – Vermont Space Grant Consortium
    Program: Undergraduate Research Endeavor Competitive Award (URECA!)
    Role: **Faculty Mentor**
    Amount awarded: **$3,000**; Project duration: 07/01/10-06/30/11
12. Title: "Determination of mechanical properties by indentation of nanoscale metallic wires using atomic force microscopy"
    Source: University of Vermont – Vermont Space Grant Consortium
    Program: Undergraduate Research Endeavor Competitive Award (URECA!)
    Role: **Faculty Mentor**
    Amount awarded: **$3,000**; Project duration: 05/01/09-04/30/10
13. Title: "Self-healing H2 Storage"
    Source: Vermont EPSCOR Innovation Fund
    Role: **Co-PI** (PI: Dryver Huston); **33% effort.**
    Amount awarded: **$5,000;** Project duration: 03/01/08-09/31/08
14. Title: "Determination of atomic force microscope cantilever spring constants via finite element modeling for nanomechanical analysis"

Source: University of Vermont Undergraduate Research Endeavor Competitive Award (URECA)
Role: **Faculty Mentor**; Amount awarded: **$3,000**; Project duration: 01/01/07-09/30/07

15. Title: "Computer Simulation of Thermal Phenomena and Energy Conversion in Molecular Scale Devices"
Source: Vermont Space Grant Consortium Graduate Research Assistantship
Role: **Faculty Mentor**; Amount awarded: **$20,000**; Project duration: 09/01/06-08/31/07

16. Title: " Computation in Mechanical Engineering and the Physical Sciences: Calculation and simulation from the mesoscale to the nanoscale"
Source: Vermont Advanced Computing Center Planning Proposal
Role: **Co-PI** (PI: Kelvin Chu); Amount awarded: **$5,000**; Project duration: 01/01/06-12/31/06

17. Title: "Acquisition of a metal sputtering system"
Source: NSF - Vermont EPSCOR Polymer/Composites Group Fund – Small equipment grant
Role: **PI**; Amount awarded: **$8,445;** Project duration: 02/01/06-12/31/06

18. Title: "Enabling *In-Situ* AFM-Based Indentation"
Source: College of Engineering and Mathematical Sciences - Outwater Funding Award
Role: **PI**; Amount awarded: **$6,900**; Project duration: 02/01/06-12/31/06

19. Title: " Enabling Advanced AFM Probe Positioning For Nanomaterials and Nanofluidics Research"
Source: National Science Foundation – Vermont EPSCOR Small Equipment Acquisition
Role: **PI**; Amount awarded: **$16,125**; Project duration: 10/01/05-3/31/06

20. Title: " Mechanosensing in Nanopores: A Massively Parallel Molecular Dynamics Study"
Source: Vermont Space Grant Consortium Graduate Research Assistantship
Role: **Faculty Mentor**; Amount awarded: **$19,000**; Project duration: 09/01/05-08/31/06

21. Title: "Nanoporous Polymeric Membranes: Molecular Templating and Testing"
Source: University of Vermont Undergraduate Research Endeavor Competitive Award (URECA)
Role: **Faculty Mentor**; Amount awarded: **$3,000**; Project duration: 01/01/05-09/30/05

22. Title: "Advanced Materials Initiatives using Scanning Electron Microscopy in Engineering Research"
Source: National Science Foundation – Vermont EPSCOR Small Equipment Acquisition
Role: **PI**; Amount awarded: **$18,000**; Project duration: 03/31/04-3/31/05

23. Title: "Enabling Technology for High Speed Computing"
Source: National Science Foundation – Vermont EPSCOR Small Equipment Acquisition
Role: **co-PI** (PI: Prof. Georges Pinder)
Amount awarded: **$20,000**; Project duration: 03/31/04-3/31/05

SUPERCOMPUTING RESEARCH CENTER AWARDS

1. Allocation: NSF - Extreme Science and Engineering Discovery Environment (XSEDE)
2.8 Million CPU·hours on different NSF supercomputers; Allocation duration: 2013 – 2021

2. Allocation: National Energy Research Scientific Computing Center (NERSC)
9 Million CPU·hours on Cori (2016 – 2021) and **10,000 Node·hours on Perlmutter** (2022-present)

RESEARCH PUBLICATION

5 Most Cited Journal Articles:

1. Y.M. Wang, F. Sansoz, T.B. LaGrange, R.T. Ott, T.W. Barbee Jr, A.V. Hamza. Defective Twin Boundaries in Nanotwinned Metals, **Nature Materials** 12, 697 - 702 (2013), Google Scholar Citations: 356
2. J. Wang, F. Sansoz, J. Huang, Y. Liu, S. Sun, Z. Zhang, S.X. Mao. Near Ideal Theoretical Strength in Gold Nanowires containing Angstrom Scale Twins, **Nature Communications** 4, 1742 (2013), Google Scholar Citations: 308
3. F. Sansoz and J.F. Molinari. Mechanical Behavior of Sigma Tilt Grain Boundaries in Nanoscale Cu and Al: A Quasicontinuum Study, **Acta Materialia** 53, 7, 1931-1944 (2005), Google Scholar Citations: 272
4. K. A. Afanasyev and F. Sansoz, Strengthening in Gold Nanopillars with Nanoscale Twins, **Nano Letters** 7, 2056-2062 (2007), Google Scholar Citations: 239
5. C. Deng and F. Sansoz. Fundamental Differences in the Plasticity of Periodically Twinned Nanowires in Au, Ag, Al, Cu, Pb and Ni, **Acta Materialia**, 57, 6090-6101 (2009) **2010 Acta Materialia Student Award Winner**, Google Scholar Citations: 174

Other Published Journal Articles:

6. P. Nikitin, M. Guinel de France, F. Sansoz. Solid solutions limited by grain-boundary solute clustering in ultrafine-grained alloys. **Scripta Materialia** 272, 117073 (2026)
7. P. Nikitin, M. Guinel de France, F. Sansoz. The physical origin of heterogeneous solute clustering and nanoprecipitation at grain boundaries in ultrafine-grained immiscible alloys. **Scripta Materialia** 270, 116939 (2026)
8. P. Nikitin and F. Sansoz. Size-dependent attraction of Cu solutes to clusters formed at Ag grain boundaries. **Physical Review Materials** 9 (9), 093603 (2025)
9. T. Nenninger and F. Sansoz. Solute clustering in polycrystals: Unveiling the interplay of grain boundary junction and long-range solute attraction effects. **Acta Materialia** 290, 120946 (2025)
10. M. Martell, N.F. Mendez, S. Kumar, A.J. Müller, G. Hurd, V. Sebastián, D. Punihaole, R. Mustafa, L. Aheran, B. Benicewicz, R. Ly, H. Lin, F. Sansoz, L.S. Schadler. Effects of crystallization on micro-mechanical behavior of polyethylene nanocomposites using Raman spectroscopy. **Nanocomposites** 11 (1), 68-78 (2025)
11. N.F. Mendez, M. Martell, M. Król, V. Pai, I.C. Huang, J. Ruokolainen, F. Sansoz, A.J. Muller, L. Schadler, S.K. Kumar. Properties of Zone-Annealed Miscible Polymer Blends, **Macromolecules** 58 (3), 1289-1297 (2025)
12. L. Capaldi and F. Sansoz. High-temperature Active Oxidation of Nanocrystalline Silicon-Carbide: A Reactive Force-Field Molecular Dynamics Study. **Acta Materialia**, 258, 119229 (2023).
13. T. Nenninger and F. Sansoz. Local atomic environment analysis of short and long-range solute-solute interactions in a symmetric tilt grain boundary. **Scripta Materialia**, 222, 115045 (2023)
14. E. A. Picard and F. Sansoz. Ni Solute Segregation and Associated Plastic Deformation Mechanisms into Random FCC Ag, BCC Nb and HCP Zr Polycrystals. **Acta Materialia**, 240, 118367 (2022)
15. F. Sansoz and X. Ke. Hall-Petch Strengthening Limit through Partially Active Segregation in Nanocrystalline Ag-Cu Alloys. **Acta Materialia**, 225, 117560 (2022)
16. Z. Liu, J.M. Meyers, J. Schindler, F. Sansoz, T. Tan, D.G. Fletcher. In situ tensile behavior of Hi-Nicalon silicon carbide fibers exposed to high-temperature argon plasma, **Journal of the American Ceramic Society** 105 (1), 525-537 (2022)
17. Q. Zhu, Z. Pan, Z. Zhao, G. Cao, L. Luo, C. Ni, H. Wei, Z. Zhang, F. Sansoz and J. Wang. Defect-driven selective metal oxidation at atomic scale, **Nature Communications** 12 (1), 1-8 (2021)
18. Q. Zhu, L. Kong, H. Lu, Q. Huang, Y. Chen, Y. Liu, W. Yang, Z. Zhang, F. Sansoz, H. Zhou, J. Wang. Revealing extreme twin-boundary shear deformability in metallic nanocrystals, **Science Advances** 7, eabe4758 (2021)
19. Q. Fang and F. Sansoz. Columnar grain-driven plasticity and cracking in nanotwinned FCC metals, **Acta Materialia** 212, 116925 (2021)

20. R. Penide-Fernandez and F. Sansoz. Microscale Knudsen Effect over the Transverse Thermal Conductivity of Woven Ceramic Fabrics Under Compression, **International Journal of Heat and Mass Transfer** 171, 121085 (2021)
21. Z. Pan and F. Sansoz. Heterogeneous Solute Segregation Suppresses Strain Localization in Nanocrystalline Ag-Ni Alloys, **Acta Materialia**, 200, 91-100 (2020)
22. X. Ke, J. Ye, Z. Pan, J. Geng, M.F. Besser, D. Qu, A. Caro, J. Marian, R.T. Ott, Y.M. Wang, F. Sansoz. Ideal Maximum Strengths and Defect-induced Softening in Nanocrystalline-Nanotwinned Metals, **Nature Materials** 18, 1207–1214 (2019)
23. R. Penide-Fernandez and F. Sansoz. Anisotropic Thermal Conductivity Under Compression in Two-dimensional Woven Ceramic Fibers for Flexible Thermal Protection Systems, **International Journal of Heat and Mass Transfer**, 145, 118721 (2019)
24. X. Zhou, W. Bu, S. Song, F. Sansoz, X. Huang. Multiscale Modeling of Interfacial Mechanical Behaviours of SiC/Mg Nanocomposites, **Materials & Design** 182, 108093 (2019)
25. J. Wang, G. Cao, Z. Zhang, F. Sansoz. Size-dependent Dislocation-twin Interactions, **Nanoscale** 11, 12672-12679 (2019)
26. Z. Pan, V. Borovikov, M.I. Mendelev and F. Sansoz. Development of a Semi-empirical Potential for Simulation of Ni Solute Segregation into Grain Boundaries in Ag, **Modelling and Simulation in Materials Science and Engineering**, 26, 075004 (2018)
27. X. Zhou, X. Liu, F. Sansoz, M. Shen. Molecular Dynamics Simulation on Temperature and Strain rate-dependent Tensile Response and Failure Behavior of Ni-coated CNT/Mg Composites, **Applied Physics A** 124 (7), 506 (2018)
28. L. Zhong, F. Sansoz, Y. He, C. Wang, Z. Zhang, S.X. Mao. Slip-activated surface creep with room-temperature super-elongation in metallic nanocrystals, **Nature Materials** 16, 439-445 (2017)
29. X. Ke and F. Sansoz. Segregation-affected Yielding and Stability in Nanotwinned Silver by Microalloying, **Physical Review Materials** 1, 063604 (2017)
30. Q. Fang and F. Sansoz. Influence of Intrinsic Kink-like Defects on Screw Dislocation - Coherent Twin Boundary Interactions in Copper, **Acta Materialia** 123, 383-393 (2017)
31. C. Deng and F. Sansoz. A New Form of Pseudo-elasticity in Small-scale Nanotwinned Gold, **Extreme Mechanics Letters,** 8, 201-207 (2016)
32. A. Porter, C. Tran, F. Sansoz. Intrinsic Nanotwin Effect on Thermal Boundary Conductance in Bulk and Single-Nanowire Twinning Superlattices, **Physical Review B**, 93, 195431 (2016)
33. F. Sansoz, K. Lu, T. Zhu and A. Misra. Strengthening and Plasticity in Nanotwinned Metals, **MRS Bulletin** April 2016, 41, 292-297 (2016)
34. W. Owens, D. Merkel, F. Sansoz, D. Fletcher. Fracture Behavior of Woven Silicon Carbide Fibers Exposed to High-Temperature Nitrogen and Oxygen Plasmas, **J. of the American Ceramic Society**, 98, 12, 4003-4009 (2015)
35. J. Wang, F. Sansoz, G. Xu, G. Han and S.X. Mao. Strong Hall–Petch Type Behavior in the Elastic Strain Limit of Nanotwinned Gold Nanowires, **Nano Letters,** 15, 3865-3870 (2015)
36. J. Gu and F. Sansoz. Superplastic Deformation and Energy Dissipation Mechanism in Surface-Bonded Cone-Stacked Carbon Nanofibers, **Computational Materials Science**, 99, 190-194 (2015)
37. V. Péron-Lührs, F. Sansoz, A. Jerusalem and L. Noels. Multiscale Computational Modeling of Deformation Mechanics and Intergranular Fracture in Nanocrystalline Copper, **Computational Materials Science**, 90, 253-264 (2014)
38. M. H. Lee, B. S. Kim, D. H. Kim, R. T. Ott, F. Sansoz and J. Eckert. Effect of Geometrical Constraint Condition on the Formation of Nanoscale Twins in the Ni-based Metallic Glass Composite, **Philosophical Magazine Letters**, 94:6, 351-360 (2014)
39. E.L. Wood, T. Avant, G.S Kim, S.K. Lee, Z. Burchman, J.M. Hughes, and F. Sansoz. Size Effects in Bimetallic Nickel-Gold Nanowires: Insight from Atomic Force Microscopy Nanoindentation, **Acta Materialia**, 66, 32-34 (2014)
40. V. Péron-Lührs, F. Sansoz, and L. Noels. Quasicontinuum Study of the Shear Behavior of Defective Tilt Grain Boundaries in C, **Acta Materialia**, 64, 419-428 (2014)

41. J. Gu and F. Sansoz. Role of Cone Angle on the Mechanical Behavior of Cup-stacked Carbon Nanofibers Studied by Atomistic Simulations, **Carbon**, 66, 523-529 (2014)
42. V. Péron-Lührs, A. Jérusalem, F. Sansoz, L. Stainier, and L. Noels. A Two-scale Model Predicting the Mechanical Behavior of Nanocrystalline Solids, **J. Mechanics and Physics of Solids**, 61, 1895-1914 (2013)
43. J. Gu and F. Sansoz. An Atomistic Simulation Study of the Mechanisms and Kinetics of Surface Bond Strengthening in Thermally Treated Cone-stacked Carbon Nanofibers, **Carbon**, 56, 351-357 (2013)
44. (Invited Feature Article) E. L. Wood and F. Sansoz. Growth and Properties of Coherent Twinning Superlattice Nanowires, **Nanoscale**, 4, 5268 (2012)
45. F. Sansoz. Surface Faceting Dependence of Thermal Transport in Silicon Nanowires, **Nano Letters**, 11 (12), 5378–5382 (2011)
46. F. Sansoz and K.D. Stevenson. Relationship between Hardness and Dislocation Processes in a Nanocrystalline Metal at the Atomic Scale, **Physical Review B**, 83, 224101 (2011)
47. F. Sansoz. Atomistic Processes Controlling Flow Stress Scaling during Compression of Nanoscale Face-centered-cubic Crystals, **Acta Materialia**, 59, 3364-3372 (2011)
48. F. Sansoz and T. Gang. A Force-Matching Method for Quantitative Hardness Measurements by Atomic Force Microscopy with Diamond-tipped Sapphire Cantilevers, **Ultramicroscopy**, 111, 11-19 (2010)
49. F. Sansoz and V. Dupont. Nanoindentation and Plasticity in Nanocrystalline Ni Nanowires: A Case Study in Size Effect Mitigation, **Scripta Materialia**, 63, 1136-1139 (2010)
50. C. Deng and F. Sansoz. Repulsive Force of Twin Boundary on Curved Dislocations and Its Role on the Yielding of Twinned Nanowires, **Scripta Materialia**, 63, 50-53 (2010)
51. C. Deng and F. Sansoz. Effects of Twin and Surface Facet on Strain-rate Sensitivity of Gold Nanowires at Different Temperatures, **Physical Review B**, 81, 155430 (2010)
52. C. Deng and F. Sansoz. Near-Ideal Strength in Gold Nanowires Achieved through Microstructural Design, **ACS Nano**, 3, 3001-3008 (2009)
53. C. Deng and F. Sansoz. Size-Dependent Yield Stress in Twinned Gold Nanowires Mediated by Site-Specific Surface Dislocation Emission, **Applied Physics Letters**, 95, 091914 (2009)
54. C. Deng and F. Sansoz. Enabling Ultrahigh Plastic Flow and Work Hardening in Twinned Gold Nanowires, **Nano Letters**, 9 (4), 1517-1522 (2009)
55. V. Dupont and F. Sansoz. Molecular Dynamics Study of Crystal Plasticity during Nanoindentation in Ni Nanowires, **Journal of Materials Research**, 24 (3), 948-956 (2009)
56. D.L. Languerand, H. Zhang, K.T. Ramesh, N.S. Murthy, and F. Sansoz. Inelastic Behavior and Fracture of High Modulus Polymeric Fiber Bundles at High-Strain Rates, **Materials Sci. and Eng. A**, 500, 216-224 (2009)
57. V. Dupont and F. Sansoz. Quasicontinuum Study of Incipient Plasticity under Nanoscale Contact in Nanocrystalline Aluminum, **Acta Materialia**, 56, 6013-6026 (2008)
58. (invited review paper) F. Sansoz, H. Huang and D.H. Warner. An Atomistic Perspective on Twinning Phenomena in Nano-enhanced FCC Metals, **JOM**, 9, 79-84 (2008)
59. F. Sansoz and C. Deng. Comment on "Deformation mechanisms of face-centered-cubic metal nanowires with twin boundaries" Appl. Phys. Lett. 90, 151909 (2007), **Applied Physics Letters**, 93, 086101 (2008)
60. F. Sansoz, K.D. Stevenson, R. Govinthasamy, and N. S. Murthy. Making the Surface of Nanocrystalline Ni on an Si Substrate Ultrasmooth by Direct Electrodepositio, **Scripta Materialia**, 59, 103-106 (2008)
61. F. Bedoui, F. Sansoz and S. Murthy. Incidence of Nanoscale Heterogeneity on the Nanoindentation of a Semicrystalline Polymer: Experiments and Modeling, **Acta Materialia**, 56, 10, 2296-2306 (2008)
62. R.L. Headrick, S. Wo, F. Sansoz, J.E. Anthony. Anisotropic Mobility in Large Grain Size Solution Processed Organic Semiconductor Thin Films, **Applied Physics Letters**, 92, 063302 (2008)
63. F. Sansoz and V. Dupont. Atomic Mechanism of Shear Localization during Indentation of a Nanostructured Metal, **Materials Science and Engineering C**, 27, 1509-1513 (2007)
64. F. Sansoz and J.F. Molinari. Size and Microstructure Effects on the Mechanical Behavior of FCC Bicrystals by Quasicontinuum Method, **Thin Solid Films**, 515/6, 3158-3163 (2007)

65. R.T. Ott, F. Sansoz, T. Jiao, D. Warner, C. Fan, J.F. Molinari, K.T. Ramesh, and T.C. Hufnagel. Yield Criteria and Strain-Rate Behavior of $Zr_{57.4}$-$Cu_{16.4}$-$Ni_{8.2}$-Ta_8-Al_{10} Metallic-Glass-Matrix Composites, **Metallurgical and Materials Transactions A**, 37A, 3251 (2006)

66. F. Sansoz and V. Dupont. Grain Growth Behavior at Absolute Zero during Nanocrystalline Metal Indentation, **Applied Physics Letters**, 89, 111901 (2006)

67. D. Warner, F. Sansoz, and J.F. Molinari. An Atomistic-Based Continuum Investigation of Plastic Deformation in Nanocrystalline Copper, **International Journal of Plasticity**, 22, 754-774 (2006)

68. R.T. Ott, F. Sansoz, J.F. Molinari, J. Almer, K.T. Ramesh, and T.C. Hufnagel. Micromechanics of Deformation of Metallic-Glass-Matrix Composites from in-situ Synchrotron Strain Measurements and Finite Element Modeling, **Acta Materialia**, 53, 7, 1883-1893 (2005)

69. F. Sansoz, M. Almesallmy and H. Ghonem. Ductility Exhaustion Mechanisms in Thermally Exposed Thin Sheets of a Near-β Titanium Alloy, **Metallurgical and Materials Transactions A**, 35A, 10, 3113-3127 (2004)

70. F. Sansoz and J.F. Molinari. Incidence of Atomic Shuffling on the Shear and Decohesion Behavior of a Symmetric Tilt Grain Boundary in Copper, **Scripta Materialia**, 50, 10, 1283-1288 (2004)

71. F. Sansoz and H. Ghonem. Fatigue Crack Growth Mechanisms in Ti6242 Lamellar Microstructures: Influence of Loading Frequency and Temperature, **Metallurgical and Materials Transaction A**, 34A, 11, 2565-2577 (2003)

72. F. Sansoz and H. Ghonem. Effects of Loading Frequency on Fatigue Crack Growth Mechanisms in alpha/beta Ti Microstructures with Large Colony Size, **Materials Science and Engineering A**, 356, 1-2, 81-92 (2003)

73. F. Sansoz, B. Brethes and A. Pineau. Propagation of Short Fatigue Cracks from Notches in a Ni base Superalloy: Experiments and Modelling, **Fatigue and Fracture of Eng. Mater. and Structures**, 25, 1, 41-53 (2002)

Invited Book Chapters

74. F. Sansoz, Chapter 15: Surface and Interface Effects on Thermoelectric Behavior in Crystalline Nanowires, **Thermoelectrics and its Energy Harvesting: Materials, Preparation, and Characterization in Thermoelectrics**, D. M. Rowe (Ed.), CRC Press (2012)

75. V. Dupont and F. Sansoz, Multiscale Modeling of Contact-induced Plasticity in Nanocrystalline Metals, **Trends in Computational Nanomechanics: Transcending Time and Space**, T. Dumitrica (Volume Ed.), Springer Series: Challenges and Advances in Computational Chemistry and Physics. Vol. 9 (2010)

Refereed Conference Proceedings

76. V. Péron-Lührs, A. Jérusalem, F. Sansoz, L. Stainier and L. Noels, A two-scale model predicting the mechanical sliding and opening behavior of grain boundaries in nanocrystalline solids, **Proceedings of the 5th International Conference on Advanced Computational Methods in Engineering** (ACOMEN2011)

77. (invited paper) F. Sansoz and C. Deng, Size-dependent Plasticity in Twinned Metal Nanowires, **Proceedings of the International Conference on Fracture (ICF) 12**, Ottawa, Canada (2009)

78. J. Gu and F. Sansoz, Mechanical Properties in Individual Carbon Nanofibers at High Temperature and High Pressure by Molecular Dynamics Simulations, **Mater. Res. Soc. Symp. Proceeding** 1137E, 1137-EE10-05 (2009)

79. C. Deng and F. Sansoz, Uniaxial Compression Behavior of Bulk Nano-twinned Gold from Molecular Dynamics Simulation, **Mater. Res. Soc. Symp. Proceeding** 1049, 1049-AA08-05 (2007)

80. J. Frolik, F. Sansoz, D. Rizzo, A. Sadek, A Multidisciplinary Curricular Effort Incorporating Wireless Sensors, **Proc. of the 2007 ASEE Annual Conference & Exposition** (2007). Education Paper

81. N.S. Murthy, F. Bedoui, F. Sansoz and D.T. Grubb, Recent Observations on the Structure and their Influence on Properties in Semicrystalline Polymers, **Proc. of The Macro2006 Conference – Polymer for Advanced Technologies**, (2006)

82. V. Dupont and F. Sansoz, Grain Boundary Structure Evolution in Nanocrystalline Al by Nanoindentation Simulations, in *Amorphous and Nanocrystalline Metals for Structural Applications*, edited by E. Ma, C. A. Schuh, Y. Li, M. K. Miller, **Mater. Res. Soc. Symposium Proceeding** 903E, 0903-Z06-05.1 (2005)

83. D.H. Warner, F. Sansoz and J.F. Molinari, Modeling of Deformation in Nanocrystalline Copper Using An Atomistic-Based Continuum Approach, **Mater. Res. Soc. Symposium Proceeding** 791, Q5.31.1-Q5.31.6 (2004)

84. R.T. Ott, F. Sansoz, J.F. Molinari, J. Almer, C. Fan and T.C. Hufnagel, Synchrotron Strain Measurements for in-situ Formed Metallic Glass Matrix Composite, **Mater. Res. Soc. Symposium Proceeding** 806, MM8.12.1-MM8.12.6 (2004)

85. F. Sansoz and H. Ghonem, Fatigue Crack Growth Mechanisms in Fully Lamellar Ti6242 Alloy at 520°C, in **Proc. of The Camp2002 High Temperature Fatigue Conference**, G. Ballias, H.J. Maier, O. Hahn, K. Herrmann, F. Vollertsen, eds., Paderborn, Germany, pp. 155-168 (2002)

86. F. Sansoz, B. Brethes and A. Pineau, Growth of Short Fatigue Cracks from Stress Concentrations in N18 Superalloy", **Proc. Of The 9th International Spring Meeting Of SF2M on Temperature-Fatigue Interaction**, Paris, France, 2001, pp. 341-350

87. F. Sansoz, B. Brethes and A. Pineau, Propagation des petites fissures de fatigue dans les zones de concentration de contraintes dans un superalliage base Ni, **J. Phys. IV**, 10, Pr4, 235-240 (2000)

88. F. Sansoz, B. Brethes and A. Pineau, Short Fatigue Crack Propagation from Notches in N18 Ni based Superalloy, **Proc. of The European Conference on Fracture 12**. M.W. Brown, E.R. de Los Rios, K.J. Miller, 1, 61-66 (1998)

Non-Refereed Conference Papers

89. F. Sansoz and V. Dupont, Deformation of Nanocrystalline Metals under Nanoscale Contact, **Proceedings of the NSTI Nanotech 2006 Conference**, Boston, MA (2006)

90. C. Sarrazin-Baudoux, F. Sansoz, and H. Ghonem, Influence of Environment, Loading Frequency and Temperature on Fatigue Crack Growth Mechanisms in Titanium Lamellar Microstructures, **Proc. of the 11th International Conference On Fracture (ICF11)**, Turin, Italy (2005)

Other Invited Publications

91. F. Sansoz, Nanoscale Crystal Plasticity: Rising to the Surface, Invited online *article for* **AZoNano.com's Nanotechnology Thought Leaders Series**, December 2010

92. F. Sansoz, "Calculation of crack closure by a node release method", Gazette Zebulon, no. 13 (December 1998)

PRESENTATIONS

Invited Presentations and Seminars

1. Frederic Sansoz (invited speaker). Hardening and Improving Tensile Ductility in Nanocrystalline Ag by Intercalation of Spinodal Ni-rich Nanolayers. Symposium: Atomistic Simulations Linked to Experiments to Understand Mechanical Behavior: A MPMD Symposium in Honor of Professor Diana Farkas. **2025 TMS Annual Meeting**, Las Vegas, NV (Mar. 2025)

2. Frederic Sansoz (invited seminar). Pushing the Limits of Strength and Plasticity in Nanostructured Metals and Alloys, Department of Metallurgical and Materials Science, **Colorado School of Mines** (February 2024)

3. Frederic Sansoz (invited speaker) and Pavel Nikitin. Local Solute Clustering and Partially Active Segregation at Grain Boundaries in Nanocrystalline Sterling Silver Alloys. Symposium Local Ordering in Materials and Its Impacts on Mechanical Behaviors, Radiation Damage, and Corrosion. **2024 TMS Annual Meeting**, Orlando, FL (Mar. 2024)

4. Frederic Sansoz (invited keynote speaker), Grain-boundary Solute Segregation and Strain Localization Mechanisms in Nanocrystalline Alloys, **2023 International Conference on Plasticity, Damage and Fracture**, Punta Cana, Dominican Republic (January 2023). Symposium: Interfaces and their Roles in Plasticity, Damage, and Fracture.

5. Frederic Sansoz (invited speaker), Small-scale Mechanics of Super-strong Silver Nanostructures, **2018 Materials Science & Technology conference**, Columbus, Ohio (October 2018). Symposium: Small-scale Properties of Materials and Length-scale Phenomena.

6. Frederic Sansoz (invited speaker), Small-scale Mechanics of Super-strong Silver Nanostructures, **2018 European MRS Spring Meeting**, Strasbourg, France (April 2018). Symposium AA— Strength, plasticity, fracture and fatigue behaviour controlled by interfaces and grain boundaries.

7. F. Sansoz, Small-scale Mechanics of Super-strong Silver Nanostructures, **Materials Science and Engineering Department Seminar**, **University of Connecticut**, seminar speaker (April 2018)
8. Frederic Sansoz (invited speaker), Exploring the Limit of Strength in Nanocrystalline-Nanotwinned Silver, **2018 MRS Spring Meeting**, Phoenix, AZ (April 2018). Symposium NM10—Nano-Metallic Materials by Design
9. Frederic Sansoz (invited speaker), Xing Ke, Qiongjiali Fang, Intrinsic Twin Boundary Defects and Strength in Nanotwinned Ag and Ag-Cu Alloys, Symposium: Interface-Mediated Properties of Nanostructured Materials. **2017 TMS Annual Meeting**, San Diego, CA (February 2017)
10. F. Sansoz, Small-scale Mechanics of Nanoscale Metals, **Jones Seminar**, **Dartmouth College**, seminar speaker (January 2017)
11. F. Sansoz, Enabling Superplastic Extensibility in Silver Nanocrystals at Room Temperature, **University of Vermont's ANGEL Symposium** (October 2016)
12. F. Sansoz, Plasticity and Heat Transport in Nanowires Strengthened by Nanoscale Twins, **2016 Society of Engineering Science (SES) Annual Meeting**, Symposium E-2: Mechanics of One-dimensional Nanomaterials: Experiment and Modeling, Invited speaker (October 2016)
13. F. Sansoz, Role of Intrinsic Defects in Plasticity of Nanotwinned Metals, **University of Vermont's Advanced Materials for Energy and Biomedical Applications Symposium** (December 2015)
14. F. Sansoz, Role of Intrinsic Defects in Plasticity of Nanotwinned Metals, Symposium U - Microstructure Evolution and Mechanical Properties in Interface-dominated Metallic Materials, **2015 MRS Fall Meeting**, Boston, MA, invited speaker (December 2015)
15. F. Sansoz, From Bimetallic Nanowires to Nanotwinned Metals: Controlling Nanoscale Plasticity with the Stacking-fault Energy, Symposium RR: Scaling Effects in Plasticity-Synergy between Simulations and Experiments, **2014 MRS Fall Meeting**, Boston, MA, invited speaker (December 2014)
16. F. Sansoz, Nanotwinned Materials: Weird Kinks and Strength at the Nanoscale, **The George Washington University**, Department of Civil and Environmental Engineering Seminar, Washington, DC, invited seminar (November 2014)
17. F. Sansoz, Plasticity and Heat Conduction in Nanotwinned Materials by Atomistic Simulation, **The University of Houston**, Mechanical Engineering Department Seminar, Houston, TX, invited seminar (October 2014)
18. F. Sansoz, Nanotwinned Materials: Weird Kinks and Strength at the Nanoscale, **Engineering Leadership Seminar Series - Northeastern University**, Department of Mechanical & Industrial Engineering, Boston, MA, invited seminar (September 2014)
19. F. Sansoz, From Defective Twin Boundaries to Angstrom-scaled Twins: Understanding the Plasticity and Fracture of Nanotwinned Metals, Symposium: Mechanical Behavior at the Nanoscale II, **2014 TMS Annual Meeting**, San Diego, CA, invited speaker (February 2014)
20. F. Sansoz, Nanotwinned Materials: Weird Kinks and Strong Gold at the Nanoscale, **Mechanical Engineering Department Seminar - Johns Hopkins University**, Baltimore, MD, invited seminar (September 2013)
21. F. Sansoz, Nanoscale Crystal Plasticity from Atomistic Simulations, Department of Mechanical Engineering, **Université de Paris-Est**, Paris, France, invited seminar (April 2011)
22. F. Sansoz and C. Deng, Size-Dependent Plasticity in Twinned Metal Nanowires, **2010 US National Congress on Theoretical and Applied Mechanics** (USNCTAM 2010), State College, PA, invited talk (June 2010)
23. F. Sansoz and C. Deng, Influences of Surface Facets and Microstructure on Plasticity in Gold Nanowires, **2010 European Conference on Computational Mechanics**, Paris, France, invited talk (May 2010)
24. F. Sansoz, Size-dependent Strength and Fracture of Twinned Metal Nanowires through Surface Engineering and Microstructural Design, **DFG-NSF Joint Research Conference on Sustainable Use of Nanomaterials for Engineering Solutions**, New York City, NY, invited poster presentation (October 2009)
25. F. Sansoz and C. Deng, Size-Dependent Plasticity in Twinned Metal Nanowires, **12th International Conference on Fracture (ICF12) - Symposium: Atomistic Plastic Deformation and Fracture**, invited Keynote Lecture (July 2009)
26. F. Sansoz, Nanoscale Plasticity from Atomistic Simulations, Materials Science and Engineering Seminar Series, **Texas A&M University**, College Station, TX, invited seminar (Nov. 2008)

27. F. Sansoz, Nanocrystalline Metal Indentation, Center for Nanomaterials Research, **Dartmouth College**, Hanover, NH, invited seminar (May 2006)
28. F. Sansoz, Deformation at the Nanometer Length Scale: Why Should We Be Interested in Crystalline Interfaces?, Mechanical and Aerospace Engineering Department Seminar, **Clarkson University**, Potsdam, NY, invited seminar (April 2005)
29. F. Sansoz, Why is Nanomechanics so Important to Polymer and Composites Research?, Vermont EPSCoR Annual Meeting, **University of Vermont**, Burlington, VT, invited seminar (February 2005)
30. F. Sansoz, Why Should We Be Interested in the Atomic Structure of Interfaces? Department of Mechanical Engineering, **University of Vermont**, Burlington, VT, invited seminar (May 2003)

Oral Presentations

31. Frederic Sansoz (speaker) and Pavel Nikitin. Segregation-dependent Transition from Strengthening to Softening in Dislocation Nucleation in Ultrafine-grained Ag-Cu Alloys. Symposium SF10-Dislocation Behavior in Crystalline Materials—90 Years of Dislocation Theory and Application. **2025 MRS Fall Meeting**, Boston, MA (November 2025)
32. Pavel Nikitin and Frederic Sansoz (speaker). Partially Active Grain-Boundary Segregation and Maximum Tensile Strengths in Nanocrystalline Silver-Copper Alloys. Symposium: Mechanical Behavior Related to Interface Physics IV. **2025 TMS Annual Meeting**, Las Vegas, NV (Mar. 2025)
33. Frederic Sansoz (speaker) and Tara Nenninger. The Interplay of Triple Junction and Long-Range Solute Attraction Effects on Grain-boundary Solute Clustering in Polycrystals. MMM11 – **The 11th International Conference on Multiscale Materials Modeling** – Symposium I. Multiscale and coarse-grained models of surfaces and interfaces – Prague (Sept. 22-27, 2024)
34. Pavel Nikitin (speaker) and Frederic Sansoz. Maximizing Tensile Properties through Partially Active Grain Boundary Segregation in Nanocrystalline Sterling Silver Alloys. Symposium: Accelerating Discovery for Mechanical Behavior of Materials 2024 **TMS Specialty Congress 2024**, Cleveland, OH (June 2024)
35. Frederic Sansoz (speaker) and Luc Capaldi. High-Temperature Oxygen Plasma Experiment and Atomistic Simulations of Active Oxidation in Nanocrystalline SiC Woven Fibers. Symposium Simulations/Experiments Integration for Next Generation Hypersonic Materials. **2024 TMS Annual Meeting**, Orlando, FL (Mar. 2024)
36. Frederic Sansoz (speaker) and Luc Capaldi. Active Oxidation in Nanocrystalline SiC Woven Fibers: Atomistic Simulation and High-Temperature Oxygen Plasma Experiment. Symposium SF08-Design and Behavior of Architectured Materials for Extreme Environments. **2023 MRS Fall Meeting**, Boston, MA (November 2023)
37. Frederic Sansoz (speaker). Grain-Boundary Solute Segregation and Associated Shear Localization Mechanisms in Random FCC Ag, BCC Nb and HCP Zr Polycrystals. Symposium SF04: Integrated Experimental and Modeling Approaches for Understanding Interfacial Effects at Different Physical Scales in Crystalline Materials. **2022 MRS Fall Meeting**, Boston, MA (December 2022)
38. Frederic Sansoz (speaker). Pushing the Limits of Strength and Plasticity in Nanostructured Metals by using Atomistic simulations. **Mechanical Engineering Seminar Series. University of Vermont** (Nov. 2022).
39. Frederic Sansoz (speaker), Eve-Audrey Picard and Tara Nenninger. Atomic-scale Analysis of Heterogeneous Nickel Solute Segregation into Random Grain Boundaries and Polycrystals. Symposium 10 - Interface-driven Phenomena in Materials: Thermodynamics, Kinetics, and Chemistry. **MMM10 – The 10th International Conference on Multiscale Materials Modeling**, Baltimore, MD (October 2022)
40. Frederic Sansoz (speaker), Tara Nenninger and Eve-Audrey Picard. Atomistic Simulation Study of Grain-boundary Solute Clustering and Associated Strain Localization Mechanisms in Polycrystals. Symposium Grain Boundaries and Interfaces. **2022 TMS Annual Meeting**, Anaheim, CA (March 2022)
41. Frederic Sansoz (speaker) and Ryan Pringle. Dynamic Recrystallization-induced Strengthening in Amorphous-Nanocrystalline Silver-Nickel Nanolaminates. Symposium: Mechanical Behavior at the Nanoscale VI. **2022 TMS Annual Meeting**, Anaheim, CA (February 2022)
42. Frederic Sansoz, Defect-induced Hall-Petch Softening in Nanocrystalline-Nanotwinned Metals, **2020 MRS Fall Meeting**, Boston, MA (Dec. 2020). Symposium SF08—Defect-Dominated Plasticity and Chemistry in Metals and Alloys
43. Rodrigo Penide-Fernandez (speaker) and Frederic Sansoz, "Computational and Experimental Study of Heat Transfer through Flexible Ceramic-fiber Thermal Protection Systems", **2019 MS&T conference**, Portland, Orgeon (October 2019). Symposium: Thermal Protection Materials and Systems

44. Rodrigo Penide-Fernandez (speaker) and Frederic Sansoz. Anisotropic Thermal Conductivity in Flexible Woven Ceramic Fibers for Hypersonic Atmospheric Entry. Symposium: Advanced MAX/MXene Phases and UHTC Materials for Extreme and High Temperature Environment; Track B: Ultra-high-temperature ceramics (UHTCs). **43rd International Conference of Advance Ceramics and Composites**, Daytona Beach, FL (Jan. 2019).

45. Xing Ke (speaker) and Frederic Sansoz, "Mechanical Properties of Nanocrystalline-Nanotwinned Silver Strengthened by Copper Impurity Segregation. **2018 MS&T conference**, Columbus, Ohio (October 2018). Symposium "Deformation and Transitions at Grain Boundaries VI".

46. Rodrigo Penide-Fernandez (speaker) and Frederic Sansoz, "Anisotropic Heat Conduction in Flexible 2-D Woven Ceramic Fibers for Extreme Atmospheric Entry Environments", **2018 MS&T conference**, Columbus, Ohio (October 2018). Symposium: Thermal Protection Materials and Systems

47. Zhiliang Pan (speaker), Xing Ke, Qiongjiali Fang, Frederic Sansoz: Segregation-mediated Strengthening Mechanisms in Nanotwinned Metals, **18th International Conference on the Strength of Materials (ICSMA 18)**. The Ohio State University, Columbus, Ohio (July 2018)

48. M.I. Mendelev (speaker), V. Borovikov, Z. Pan, F. Sansoz. Development of a Semi-empirical Potential For Simulation of Ni Solutes Segregated in Ag Grain Boundaries, **2018 TMS Annual Meeting**, Phoenix (Mar. 2018)

49. F. Sansoz (speaker), Li Zhong and Scott X. Mao: Small-scale Mechanics of Super-Strong and Stretchy Silver Nanowires, in Symposium TC6—Mechanical Behavior at the Micro and Nanoscale—Bridging Between Computer Simulations and Experiments, **2017 MRS Fall Meeting**, Boston, MA (November 2017)

50. Q. Fang (speaker) and F. Sansoz: Influence of intrinsic kink-like defects on screw dislocation - coherent twin boundary interactions, Symposium S: Mechanical Behavior at the Nanoscale, **2015 MRS Fall Meeting**, Boston, MA, invited speaker (December 2015)

51. F. Sansoz (speaker), A. Porter and S. Kessler: Anomalous Heat Conduction in Silicon Materials Containing Nanoscale Twins, in Symposium CC: Advanced Materials and Devices for Thermoelectric Energy Conversion, **2014 MRS Fall Meeting**, Boston, MA (December 2014)

52. F. Sansoz (speaker): Ductile-to-Brittle Transition in Gold Nanowires with Angstrom-Scaled Twins, in Symposium JJ: Materials Fundamentals of Fatigue and Fracture, **2013 MRS Fall Meeting**, Boston, MA (December 2013)

53. F. Sansoz (speaker): Nanotwinned Materials: Weird Kinks and Strong Gold at the Nanoscale, in symposium Structure-Property Relationships in Low-dimensional Metallic Nanostructures, **Materials Science & Technology (MS&T) 2013 conference**, Montreal, Quebec, Canada (October 2013)

54. F. Sansoz (speaker): Effects of Surface Faceting and Twinning on Thermal Transport Characteristics of Silicon Nanowires, in Symposium: Energy Nanomaterials, **2012 TMS Annual Meeting**, Orlando, FL (March 2012)

55. F. Sansoz (speaker): Effects of Size and Microstructure in Compression of Nanoscale Metallic Pillars by Molecular Dynamics Simulation, in Symposium: Mechanical Behavior at Nanoscale I, **2012 TMS Annual Meeting**, Orlando, FL (March 2012)

56. F. Sansoz (speaker): Effects of Surface Faceting and Twinning on Thermal Transport Characteristics of Silicon Nanowires, in Symposium W: Phonons in Nanomaterials—Theory, Experiments, and Applications, **2011 MRS Fall Meeting**, Boston, MA (December 2011)

57. J. Gu (speaker) and F. Sansoz: Atomistic Simulation Study of Mechanical Properties in Cone-stacked Carbon Nanofibers under Uniform Deformation, **2010 MS&T conference**, in Symposium Mechanical Behavior of Low Dimensional, Houston, TX (October 2010)

58. F. Sansoz (speaker) and T. Gang: Fundamental Mechanisms at the Very Onset of Plasticity in Nanocrystalline Ni Coatings under Nanoindentation, **2010 MS&T conference**, in Symposium Mechanical Behavior of Low Dimensional, Houston, TX (October 2010)

59. V. Péron-Lührs (speaker), F. Sansoz, L. Noels: Calibration of direct numerical simulation based on quasicontinuum model of grain boundary sliding, **9th World Congress on Computational Mechanics**, Sydney, Australia (July 2010)

60. F. Sansoz (speaker), V. Dupont, T. Gang and K. D. Stevenson: Local Plasticity during Nanoindentation of Nanocrystalline FCC Metals using Quasicontinuum Simulation and Nanomechanical Experiment, in Symposium HH: Multiscale Polycrystal Mechanics of Complex Microstructures, **2009 MRS Fall Meeting**, Boston, MA (December 2009)

61. F. Sansoz (speaker): Size Effects on the Yielding and Plasticity of Nanotwinned Gold: From Bulk to Nanowires, in Symposium GG: Plasticity in Confined Volumes, **2009 MRS Fall Meeting**, Boston, MA (December 2009)
62. C. Deng (speaker) and F. Sansoz: Yielding and Plasticity of Periodically-twinned Nanowires in FCC Metals from Molecular Dynamics Simulations, in Symposium FF: Mechanical Behavior of Nanomaterials--Experiments and Modeling, **2009 MRS Fall Meeting**, Boston, MA (December 2009)
63. C. Deng (speaker) and F. Sansoz: Nanoscale plasticity and size effects in twinned gold nanowires from molecular dynamics simulations" in Symposium: Recent Advances in Computational Study of Nanostructures, **10th US National Congress on Computational Mechanics**, Columbus, OH (July 2009)
64. C. Deng (speaker) and F. Sansoz: Size-Dependence of Yield Stress in Twinned Gold Nanowires under Uniaxial Tension, **TMS 2009 Annual Meeting& Exhibition**, San Francisco, CA (Feb. 2009)
65. F. Sansoz (speaker) and C. Deng: Strengthening Mechanisms in Nanotwinned Gold: From Bulk to Nanowires, **PLASTICITY 2009** – Symposium "Plasticity and Fracture of Nano-Materials", St Thomas, US Virgin Islands (Jan. 2009)
66. F. Sansoz (speaker), C. Deng and K. Afanasyev: Atomistic Simulations of Strengthening Mechanisms in Nanotwinned Gold: From Bulk to Nanowires, **American Society of Mechanical Engineers IMECE**, track 12-12: Modeling and Experiments in Nanomechanics and Nanomaterials, Boston, MA (November 2008)
67. F. Sansoz (speaker), and V. Dupont: Quasicontinuum and Molecular Dynamics Simulations of Contact Plasticity in Nanocrystalline Metals, **American Society of Mechanical Engineers IMECE**, track 13-3: Recent Advances in Computational Study of Nanostructures, Boston, MA (November 2008)
68. C. Deng (speaker) and F. Sansoz: Molecular Dynamics Simulations of Size Effects on Yielding Phenomena in Twinned and Single Crystal Au Nanowires, **American Society of Mechanical Engineers IMECE**, track 13-3: Recent Advances in Computational Study of Nanostructures (November 2008)
69. F. Sansoz (speaker), C. Deng and K.A. Afanasyev: Size-dependent strengthening in bulk and nano-sized gold with nanoscale growth twins, in Symposium U: Mechanics of Nanoscale Materials, **2008 MRS Spring Meeting**, San Francisco, CA (March 2008)
70. R.L. Headrick (speaker), S. Wo, F. Sansoz, J.E. Anthony: Control of Grain Structure and Interface Structure in Solvent Deposited Organic Semiconductor Thin Films. **3rd Annual Organic Microelectronics Workshop**, Seattle, Washington (July 2007)
71. J. Frolik (speaker), F. Sansoz, D. Rizzo, A. Sadek: A Multidisciplinary Curricular Effort Incorporating Wireless Sensors, **2007 American Society of Engineering Education (ASEE) Annual Conference & Exposition**, Honolulu, Hawaii (June 2007)
72. F. Sansoz (speaker) and V. Dupont: Atomic mechanism of stress-assisted grain coarsening during indentation of a nanostructured metal, Symposium on Mechanical Behavior of Nanostructured Materials, in Honor of Carl Koch, **TMS 2007 Annual Meeting& Exhibition**, Orlando, FL (Feb. 2007)
73. F. Sansoz (speaker) and K. Afanasyev: Effects of Twin boundaries on the Slip Activity of Nanosized FCC Metallic Pillars, Symposium on Plasticity from the Atomic Scale to Constitutive Laws, **TMS 2007 Annual Meeting& Exhibition**, Orlando, FL (Feb. 2007)
74. V. Dupont (speaker) and F. Sansoz: Contact-Induced Shear Localization in Nanocrystalline Al by Atomistic Simulation, Symposium on Plasticity from the Atomic Scale to Constitutive Laws, **TMS 2007 Annual Meeting& Exhibition**, Orlando, FL (Feb. 2007)
75. N.S. Murthy (speaker), F. Bedoui, F. Sansoz and D.T. Grubb: Recent Observations on the Structure and their Influence on Properties in Semicrystalline Polymers, **MACRO2006 – Polymer for Advanced Technologies**, Pune, India (December 2006)
76. F. Sansoz (speaker) and V. Dupont: An atomistic model of grain coarsening during nanocrystalline metal indentation, in Symposium EE: Size Effects in the Deformation of Materials -- Experiments and Modeling, **2006 MRS Fall Meeting**, Boston, MA (December 2006)
77. F. Sansoz (speaker), V. Dupont and K.D. Stevenson: AFM Contact Studies of Metallic Nanostructures: Direct Insight from Atomistic Simulations, in Symposium A: Trends in Nanoscience - From Materials to Applications, **E-MRS 2006 Spring Meeting**, Nice, France (June 2006)
78. K. Stevenson (speaker) and F. Sansoz, AFM Characterization and Surface Modification of Nanocrystalline Ni Films, **TMS 2006 Annual Meeting**, San Antonio, TX (March 2006)

79. V. Dupont (speaker) and F. Sansoz, Atomistic Simulation of Metal Surface Indentation Including Interface Friction and Surface Energy, **TMS 2006 Annual Meeting**, San Antonio, TX (March 2006)

80. F. Sansoz (speaker) and H. Ghonem, Investigation of Ductility Loss in a Thermally Exposed Near-Beta Ti Alloy, **TMS 2006 Annual Meeting**, San Antonio, TX (March 2006)

81. V. Dupont and F. Sansoz (speaker): Grain Boundary Structure Evolution in Nanocrystalline Al by Nanoindentation Simulations, **2005 MRS Fall Meeting** - Symposium Z - Amorphous and Nanocrystalline Metals for Structural Applications, Boston, MA (December 2005)

82. V. Dupont (speaker) and F. Sansoz: Nanoindentation of Single Crystals: Effects of Interface Friction and Adhesion Energy, **2005 MRS Fall Meeting** - Symposium AA - Micro- and Nanomechanics of Structural Material, Boston, MA (December 2005)

83. T.C. Hufnagel (speaker), R.T. Ott, F. Sansoz, J.F. Molinari, K.T. Ramesh, J. Almer: Micromechanics of Deformation in Metallic-Glass-Matrix Composites, **4th International Conference on Bulk Metallic Glasses** (BMG IV), Gatlinburg, TN (May 2005)

84. F. Sansoz, Mechanical Engineering Department Seminar, **University of Vermont** (April 2005)

85. F. Sansoz (speaker) and R.E. Miller: Concurrent Multiscale Modeling of Contact and Friction with Multiple Asperities, **2005 MRS Spring Meeting**, Symposium EE: Linking Length Scales in the Mechanical Behavior of Materials, San Francisco, CA (March 2005)

86. H. Ghonem (speaker), C. Sarrazin-Baudoux, and F. Sansoz: Influence of Environment, Loading Frequency and Temperature on Fatigue Crack Growth Mechanisms in Titanium Lamellar Microstructures, **11th International Conference on Fracture** (ICF11), Turin, Italy (March 2005)

87. F. Sansoz (speaker) and E. Buchovecky: Contact-Induced Plasticity of Rough Surfaces Under Nanoindentation, **2005 TMS Annual Meeting & Exhibition**, San Francisco, CA (February 2005)

88. F. Sansoz (speaker) and J.F. Molinari: Investigation of Size Effects in the Mechanical Behavior of FCC Bicrystals by Quasicontinuum Method, **2005 TMS Annual Meeting & Exhibition**, San Francisco, CA (February 2005)

89. R.T. Ott (speaker), F. Sansoz, J.F. Molinari, J. Almer, T.C. Hufnagel: Micromechanics and Macroscopic Mechanical Behavior of In Situ Formed Metallic Glass Matrix Composites, **2005 TMS Annual Meeting & Exhibition**, San Francisco, CA (February 2005)

90. D. Warren, F. Sansoz, and J.F.Molinari (speaker): A Continuum Mechanics Model For Grain Boundary Sliding In Nanocrystalline Materials, **International Conference on Experimental Mechanics** (ICEM12), Bari, Italy (August 2004)

91. D. Warner (speaker), F. Sansoz and J.F. Molinari: Deformation of Polycrystals with Micro to Nanoscale Grain Size using Atomistic-based Continuum Modeling, in **2003 ASME International Mechanical Engineering Congress**, Washington, DC, (November 2003)

92. F. Sansoz (speaker), M. Shazly and H. Ghonem: Time-Dependent Damage Mechanisms at Elevated Temperature in Fully Lamellar Ti6242 Alloy, **9th SF2M Spring Meeting on Temperature-Fatigue Interaction**, Paris, France (2001)

93. F. Sansoz (speaker), B. Brethes and A. Pineau: Propagation des petites fissures de fatigue dans les zones de concentration de contraintes dans un superalliage base Ni, **42e Colloque de métallurgie de l'INSTN: Matériaux pour les machines thermiques**, CEA Saclay, France (2000)

94. F. Sansoz (speaker) and S. Ponnelle: Fatigue Crack Propagation at High Temperature in Ni base Superalloys for HP Turbine Disks, **SF2M Workshop on High Temperature**, Paris, France (1999)

95. F. Sansoz (speaker), B. Brethes and A. Pineau: Short Fatigue Crack Propagation from Notches in N18 Ni based Superalloy, **European Conference on Fracture (ECF) 12**, Sheffield, UK (1998)

96. F. Sansoz (speaker), Seminar of the Centre des Matériaux, **Ecole des Mines de Paris**, Evry, France (1998)

Poster Presentations

1. P. Nikitin, T. Nenninger, F. Sansoz, "Grain-boundary Segregation and Shear Localization in Nanocrystalline Alloys", **2024 Department of Energy Principal Investigator Meeting**, Mechanical Behavior and Radiation Program (Sept. 2024)
2. F. Sansoz, "Grain-boundary Segregation and Shear Localization in Nanocrystalline Alloys", **2022 Department of Energy Principal Investigator Meeting**, Mechanical Behavior and Radiation Program (November 2022)
3. X. Ke and F. Sansoz: Copper Segregation Affected Yielding in Nanotwinned Silver, **2017 MRS Fall Meeting**, in Symposium PM3—Interfaces and Interface Engineering in Inorganic Materials, Boston, MA (November 2017). **Nominee for best poster award**
4. Q. Fang and F. Sansoz, Atomistic mechanisms of dislocation nucleation and interactions with perfect and imperfect twin boundaries, **2016 Dislocation Conference**, Purdue University, IA (September 2016)
5. A. Porter and F. Sansoz: Role of Twin Boundaries on Thermal Conductivity in Silicon Nanowires, in Symposium BB: Thermoelectric Materials–From Basic Science to Applications, **2013 MRS Fall Meeting**, Boston, MA (December 2013)
6. D. Merkel and F. Sansoz: Flexible Thermoelectric Materials using InSb Nanowire Networks, in Symposium BB: Thermoelectric Materials–From Basic Science to Applications, **2013 MRS Fall Meeting**, Boston, MA (December 2013)
7. F. Sansoz: Atomistic Simulation Study of Size Effects in Compression of Nanoscale Cu Pillars Containing Complex Dislocation Networks, in Symposium SS: Properties and Processes at the Nanoscale—Nanomechanics of Material Behavior, **2011 MRS Fall Meeting**, Boston, MA (December 2011)
8. F. Sansoz: Size-dependent Strength and Fracture of Twinned Metal Nanowires through Surface Engineering and Microstructural Design, **DFG-NSF Joint Research Conference on Sustainable Use of Nanomaterials**, New York City, NY, (October 2009)
9. J. Gu and F. Sansoz: Mechanical Properties in Individual Carbon Nanofibers at High Temperature and High Pressure by Molecular Dynamics Simulations, **2008 MRS Fall Meeting**, in Symposium EE: Nano- and Microscale Materials--Mechanical Properties and Behavior under Extreme Environments, Boston, MA (December 2008)
10. C. Deng, K. A. Afanasyev and F. Sansoz: Gold nanopillar compression: Strengthening mechanisms with nanoscale growth twins, **2007 MRS Fall Meeting**, in Symposium AA: Fundamentals of Nanoindentation and Nanotribology IV, Boston, MA (December 2007). **Nominee for best poster award**
11. K. Afanasyev and F. Sansoz: Atomic mechanisms of plasticity in twin-dominated metal nanopillars, **2006 MRS Fall Meeting**, in Symposium EE: Size Effects in the Deformation of Materials -- Experiments and Modeling, Boston, MA (December 2006). **Nominee for best poster award**
12. V. Dupont and F. Sansoz: Deformation of Nanocrystalline Metals under Nanoscale Contact, **NSTI Nanotech 2006**, Boston, MA (May 2006)
13. F. Sansoz and J.F. Molinari: The Relation between Sliding and Structure at Grain Boundaries in Nanoscale FCC Bicrystals, **2005 MRS Spring Meeting**, Symposium BB: Mechanical Properties of Nanostructured Materials: Experiments and Modeling, San Francisco, CA (March 2005). **Nominee for best poster award**
14. C.V. Wolf, G. Gary and F. Sansoz: Bio-Transport in Nanoporous Synthetic Membranes: Synthesis, Testing, and Molecular Modeling, **Vermont EPSCoR Annual Meeting**, University of Vermont, Burlington, VT (February 2005)
15. D. L. Languerand, N.S. Murthy, and F. Sansoz: Multiscale Investigation of Mechanical Properties in High-Strength Polymeric Fibers, **Vermont EPSCoR Annual Meeting**, University of Vermont (February 2005)
16. K.D. Stevenson and F. Sansoz: Electrodeposition of Nanocrystalline Ni Thin Films for MEMS Technology, **Vermont EPSCoR Annual Meeting**, University of Vermont, Burlington, VT (February 2005)
17. F. Sansoz and J.F. Molinari: Mechanical Behavior of Tilt Grain Boundaries in FCC Metals from Quasicontinuum Simulations, **Gordon Research Conference on Physical Metallurgy**, Plymouth, NH (July 2004)
18. C. Sarrazin-Baudoux, F. Sansoz and H. Ghonem: Microstructure-Environment Interactions in Fatigue Crack Growth Mechanisms of Alpha/Beta Titanium Alloys at High Temperature, **Euromat 2003**, Lausanne, Switzerland (2003)

19. D.H. Warner, F. Sansoz and J.F. Molinari: Modeling of Deformation in Nanocrystalline Copper using an Atomistic-Based Continuum Approach, **2003 MRS Fall Meeting**, Symposium Q: Mechanical Properties of Nanostructured Materials and Nanocomposites, Boston, MA (2003)
20. R.T. Ott, F. Sansoz, J.F. Molinari, J. Almer, C. Fan and T.C. Hufnagel: Synchrotron Strain Measurements for in-situ Formed Metallic Glass Matrix Composite, **2003 MRS Fall Meeting**, Symposium MM: Amorphous and Nanocrystalline Metals, Boston, MA (Dec. 2003)
21. F. Sansoz, B. Brethes and A. Pineau: Growth of Short Fatigue Cracks from Stress Concentrations in N18 Superalloy, **9th SF2M Spring Meeting on Temperature-Fatigue Interaction**, Paris, France (2001)
22. F. Sansoz: The Propagation of Short Fatigue Cracks from Notches in a Ni based Superalloy, **Junior Euromat 98**, Swiss Federal Institute of Technology, Lausanne, Switzerland (1998)

MENTORED STUDENTS AND SCHOLARS

Graduate Students (current & past)

Ph.D. Students:

1. Tara Nenninger, Ph.D. Mechanical Engineering student (present). Research: Predicting grain-boundary solute interactions from the atomic environment in grain boundaries and polycrystals.
2. Khaoula Chougag, Graduate Research Assistant (Sept. 2021 – July 2022). Research: In-situ tensile characterization of shear band localization mechanisms in nanocrystalline metals and alloys.
3. Dr. Qiongjiali (Lily) Fang, Ph.D. Mechanical Engineering 2020. Research: Understanding Grain Boundary and Stress Concentration Effects on Strengthening Mechanisms in Nanotwinned Metals
4. Dr. Rodrigo Penide-Fernandez, Ph.D. Mechanical Engineering 2020. Research: Multiscale Modeling of Heat-transfer in two-dimensional woven fiber ceramic materials for flexible thermal protection systems
5. Dr. Xing Ke, Ph.D. Materials Science 2018, Research: Atomistic Simulation Studies of Grain-Boundary Segregation and Strengthening Mechanisms in Nanocrystalline Nanotwinned Silver-Copper Alloys
6. Dr. Erin Wood, Ph.D. Mechanical Engineering 2014. An Atomic Force Microscopy Nanoindentation Study of Size Effects in Face-Centered Cubic Metal and Bimetallic Nanowires. Now NRC Postdoctoral Fellow at the National Institute of Standards and Technology (NIST), Gaithersburg, MD.
7. Dr. Jingjun (Jessie) Gu, Ph.D. Mechanical Engineering 2013. Elucidating the Complex Role of Microstructure on Mechanical Properties in Carbon Nanofibers by Atomistic Simulations. Now lecturer at Miami University.
8. Dr. Chuang Deng, Ph.D. Materials Science, 2009. Yielding and Plasticity in Twinned FCC Metal Nanowires Studied by Atomistic Simulations. Now Assistant Professor in Mechanical Engineering at Univ. of Manitoba, Canada.
9. Dr. Virginie Rollin (Dupont), Ph.D. Mechanical Engineering, 2008. Multiscale Modeling of Contact Plasticity and Nanoindentation in Nanostructured FCC Metals. Now Assistant Professor in Aerospace Engineering at Embry Riddle Aeronautical University, Daytona Beach, Florida.

M.S. Students:

10. JJ White, M.S. Mechanical Engineering student (present). Atomic-scale deformation mechanisms in nanoparticle-embedded copper films.
11. Luke Randall, M.S. Mechanical Engineering student (present). Microstructure and oxidation behavior of printed niobium alloys.
12. Christopher Kombo, M.S. Mechanical Engineering student (present). Microstructures and mechanical behavior in refractory high-entropy alloys.
13. Akiva Gopalkrishnan, M.S. Mechanical Engineering 2021. Finite-element modeling of random nanowire networks.
14. Jacob Williams, M.S. Mechanical Engineering 2021. Peridynamics simulation study of repeated projectile impact on a steel plate.
15. Tara Nenninger, M.S. Mechanical Engineering 2021. Atomic-scale analysis of solute segregation energy into grain boundaries and polycrystals.

16. Ryan Pringle, M.S. Mechanical Engineering 2021. Strengthening mechanisms in nanocrystalline Ag-Ni nanolayers.
17. Eve-Audrey Picard, M.S. Mechanical Engineering 2021. Ni solute segregation and mechanical behavior in nanocrystalline FCC, BCC and HCP alloys
18. Cory Arcovitch, M.S. Mechanical Engineering 2017. Research: Design and performance of stretchable InSb nanowire-based nanocomposites for energy harvesting
19. Qiongjiali (Lily) Fang, M.S. Mechanical Engineering 2015. The interaction mechanisms of a screw dislocation with a defective coherent twin boundary in copper
20. Daniel Merkel, M.S. Mechanical Engineering 2014. Fabrication and Testing of Flexible Indium Antimonide Nanowire Networks.
21. Aaron Porter, M.S. Mechanical Engineering 2013. Atomistic Simulation Study of Thermal Transport in Nanotwinned Silicon. Now engineer at Global Foundries.
22. Shiqi Zhang, Graduate Teaching Assistant. Now graduate student at Arizona State University.
23. Evan Malina, M.S. Mechanical Engineering 2011. Mechanical Behavior of Atomically-thin Graphene Sheets using Atomic Force Microscopy Nanoindentation. Now structural engineer at Boeing.
24. Konstantin Afanasyev, M.S. Physics, 2007. Atomistic Simulations of Twin Boundary Effects on Deformation in Gold Nanobeams and Nanopillars. Now at engineer for GE Health Care.
25. Dulcie Languerand, M.S. Mechanical Engineering, 2007. Multiscale Investigations of Deformation in High-Strength Polymeric Fibers. (co-advised with Prof. Sanjeeva Murthy, Physics Department, UVM)
26. Carl Wolf, Graduate Research Assistant, 2004-2006. Multiscale Modeling of Thermal Transport in Molecular Systems. Now Assistant Professor at Vermont Technical College, Randolph, VT.
27. Kevin Stevenson, M.S. Mechanical Engineering, 2006. Electrochemical Synthesis and Mechanical Properties of Ni Nanostructures. Now Structural Engineer for Concept2, Morrisville, VT.
28. Eric Buchovecky, Graduate Research Assistant (Jan 04-to Aug. 04). Quasicontinuum Simulations of Single Crystal Nanoindentation.
29. Jose Arteiro, M.S. Mechanical Engineering 2002 (University of Rhode Island, co-advised with Prof. Hamouda Ghonem). Effects of Heat Treatment on Microstructure and Fatigue Crack Growth in Near-alpha Titanium Alloy IMI 834 at Elevated Temperature.

Visiting Scholars/Postdoctoral Research Associates (current & past)

1. Dr. Pavel Nikitin, Postdoctoral Research associate, Research: Solute segregation, plasticity and fracture in sputter-deposited ultrafine-grained Ag-Cu alloys, May 2023 – April 2026.
2. Dr. Rodrigo Penide-Fernandez, Postdoctoral Research associate, Research: Strain localization studies in nanocrystalline metals using in-situ tensile testing, September 2020 – August 2021.
3. Dr. Zhiliang Pan, Postdoctoral Fellow, Research: Ab-initio and molecular dynamics simulation study of nanotwinned Ag-Ni alloys, October 2016 – October 2019.
4. Dr. Xia Zhou, Visiting Professor, Director of Biomechanics and Nanomechanics Laboratory at Dalian University, China. January 2015 – July 2015. Research: Atomistic Simulation of Mg-based Nanocomposites
5. Dr. Vincent Peron-Luhrs, Visiting graduate student from University of Liege, Belgium, September 2009. Research: Quasicontinuum Modeling and Simulation of Sigma Tilt Grain Boundaries in Metals.
6. Dr. Fahmi Bedoui, Postdoctoral researcher, July 06-Dec. 06 (in collaboration with UVM Physics Department). Research: AFM-Based Nanoindentation of Micro- and Nano-structured Polymers.

Undergraduate Research Assistants (current & past)

7. Emmett Cline Lucey (present), Honors Thesis, Research: Tensile properties of sputter-deposited Ag-Ni films.
8. Ethan Rubin, 2023, Honors Thesis, Research: Size effects in the mechanical behavior of additively manufactured 316L steels.
9. Luc Capaldi, 2020-2022, NASA ESPCoR REU, Research: ReaxFF atomistic simulation study of oxidation in SiC
10. Eve-Audrey Picard, Barrett Scholar, 2019. Deposition of metallic nanocomposites for wind turbines.

11. Isabella Barbera, Barrett Scholar, 2017 – 2018. Fabrication of stretchable Ag nanowire elastomer composites
12. Ena Ibrisimovic, REU and Barrett Scholar, 2016 – 2017. Ice-templated Electrodeposition of Ag and Cu Nanowires.
13. Rodrigo Penide Fernandez, International Student Exchange Program (2015) - Senior Thesis: Modeling of 3-D Woven SiC Fabrics for Flexible Thermal Protection Systems.
14. Cory Arcovitch, Honors Thesis in Mechanical Engineering (2015). Thesis title: Performance of Flexible Thermoelectric Nanowire Composites under Reversible Deformation.
15. Samuel Kessler, Honors Thesis in Mechanical Engineering 2013. Thesis title: Thermal Conductivity Simulations in Heterostructure Nanowires.
16. Chan Tran, Summer 2013 REU student, Physics and Computer Science at Siena College.
17. Khrystyna Dilai, Summer 2012 REU student, Chemical Engineering student at Clarkson University.
18. Jake Brutman, UVM Chemistry Department. Now graduate student at Univ. of Minnesota.
19. Trevor Avant, Honors College Thesis. UVM Mechanical Engineering. Thesis title: Mechanics of Indentation in Nanowires from Atomistic Simulations.
20. Evan Malina, Undergraduate Research Endeavor Competitive Award (URECA) (Spring 09-Fall 09). Determination of Mechanical Properties by Indentation in Nanoscale Metallic Wires using AFM
21. Zach Burchman, Honors College Senior Thesis (Fall 07-Spring 08). Growth, Structure and Mechanical Properties of Single Crystal and Polycrystalline Nickel Nanowires
22. Travis Gang, (1) Undergraduate Research Endeavor Competitive Award (URECA) (Spring 07-Fall 07). Determination of atomic force microscope cantilever spring constants via finite element modeling for nanomechanical analysis; (2) Helix Summer Intern (Summer 07) Effects of Surface Morphology on Elastic and Plastic Properties in Nanocrystalline Ni Electrodeposits.
23. Grant Gary, Undergraduate Research Endeavor Competitive Award (URECA) (Spring 05-Spring 06). Synthesis of Ni Nanowires by Template-Assisted Electrodeposition.
24. Virginie Rollin (Dupont), Senior thesis, Ecole Superieure de Mechanics and Aerotechnique (ENSMA), Atomistic Studies of Plasticity in Nanomaterials.
25. John B. Marking, ME Undergraduate Research Assistant (Summer 04). Fabrication of ultra sharp scanning tunneling tips.

TEACHING

University of Vermont:

ME350/6550 – Multiscale Modeling. Credits: 3. Level: Graduate
Student enrollment: 10 (Spring 07), 10 (Spring 2017), 16 (Fall 2020), 21 (Fall 2023), 13 (Fall 2025).

ME259/5520 – Computational Solid Mechanics. Credits: 3. Level: Graduate/senior
Student enrollment: 23 (Fall 12), 14 (Spring 14), 29 (Spring 15), 29 (Spring 16), 27 (Spring 17), 14 (Spring 18), 15 (Spring 2019), 24 (Spring 2022), 14 Spring (2023).

ME255/5120 – Advanced Engineering Materials. Credits: 3. Level: Graduate/senior elective
Student enrollment: 27 (Fall 08), 23 (Fall 09), 32 (Fall 14), 36 (Spring 2021), 32 (Fall 2022), 28 (Spring 2025).

ME252/5110/6110 – Mechanical Behavior of Materials. Credits: 3. Level: Graduate/senior elective
Student enrollment: 11 (Fall 04), 16 (Fall 05), 10 (Fall 06), 14 (Spring 08), 11 (Spring 09), 12 (Spring 10), 14 (Spring 12), 26 (Fall 13), 27 (Fall 15), 6 (Spring 18), 14 (Spring 2019), 23 (Spring 2020), 14 (Spring 2022), 17 (Spring 2024), 9 (Spring 2026).

ME124/2111 – Materials and Mechanics Laboratory. Credits: 2. Level: Junior
Student Enrollment: 40 (Spring 06), 34 (Spring 07), 40 (Spring 08), 66 (Spring 09), 90 (Spring 2010), 88 (Spring 2015), 36 (Fall 2019), 47 (Spring 2020), 48 (Fall 2022), 24 (Spring 2023).

ME101/2110 – Materials Engineering. Credits: 3. Level: Junior
Student enrollment: 39 (Fall 05), 41 (Fall 06), 44 (Fall 07), 39 (Fall 11), 30 (Spring 13), 49 (Fall 13), 50 (Fall 14), 55 (Fall 2015), 56 (Fall 2016), 47 (Fall 2018), 55 (Fall 2019), 61 (Fall 2020), 47 (Fall 2021), 49 (Fall 2023), 62 (Fall 2025).

ME014/1140 – Mechanics of Solids. Credits: 3. Level: Sophomore;
Student enrollment: 36 (Spring 04), 38 (Spring 05), 42 (Spring 06), 39 (Spring 12), 59 (Spring 13).

Other Teaching Experience:

- **Ecole des Mines, Paris**, Centre des Materiaux P.M. Fourt (1998-1999): Undergraduate and MS students advising for research projects in the Mechanics and Materials Master program.
- **University of Evry,** Department of Engineering (1997-1999): Graduate teaching assistant. Lecture and grading. Atom Diffusion and Mechanics of Materials.

PROFESSIONAL ACTIVITIES

Professional Memberships

American Society of Mechanical Engineers (ASME), Fellow
Materials Research Society (MRS), member
The Minerals, Metals and Materials Society (TMS), member
American Society for Metals (ASM) International, member
Société Française de Métallurgie et Matériaux (SF2M), member

Industrial Consulting:

Beta Technologies, Williston, VT
Flex-a-Seal, Williston, VT
Superior Technical Ceramics, Saint Alban, VT

Professional Service

Book Reviews: Oxford University Press, Cambridge University Press.

Reviewer for 57 Referred Journals:

ACS Applied Nano Materials
ACS Nano
Acta Materialia
Applied Physics Letters
ASME Journal of Applied Mechanics
ASME Journal of Tribology
Carbon
Computational Materials Science
Current Nanoscience
Electrochemica Acta
Experimental Mechanics
Extreme Mechanics Letters
International Journal of Plasticity
Int. Journal of Smart and Nano Materials
ISRN Nanomaterials
Journal of Alloys and Compounds
Journal of Applied Physics
Journal of Applied Crystallography
Journal of the Electrochemical Society
Journal of the European Ceramic Society
Journal of Materials Research
Journal of Materials Science
Journal of the Mechanics and Physics of Solids
JOM
Materialia
Materials Research Letters
Materials Science and Engineering A
Mechanics of Materials
Metals
MRS Bulletin
Multiscale Modeling in Materials and Structures
Modeling and Simulation in Materials Sci. and Engng.
Nanoscale
Nanotechnology
Nano Letters
Nature
Nature Communications
Nature Materials
Nature Materials Reviews
Physical Review B & E
Physical Review Letters
Philosophical Magazine
Surface and Coatings Technology
Surface and Interfaces
Surface Science
Semiconductor Science & Technology

Journal of Nanoscience Letters
Journal of Physical Chemistry
Journal of Physics: Cond. Matter Physics
Journal of Physics D: Applied Physics
Journal of Virtual Experiments (JOVE)
Journal of Micromechanics and Microengineering
Scripta Materialia
Scientific Reports (Nature)
The Open Electrochemistry Journal
Transactions of Nonferrous Metals Society of China
Tribology Transactions

Reviewer for Funding Agencies:

ACS – Petroleum Research Fund
Air Force Office of Scientific Research
Center for the Advancement of Science in Space (CASIS)
Quebec Research Foundation for Nature and Technologies
Samsung Electronics
US Department of Energy – Basic Energy Sciences & Fusion Energy Sciences
US National Science Foundation – CMMI & DMR Divisions
Vermont EPSCoR

Proposal Review Panels:

Spring 2025: US National Science Foundation - Division of Materials Research
Spring 2025: US National Science Foundation - Division of Engineering
Fall 2024: US Department of Energy – Fusion Materials Program
Spring 2023: US National Science Foundation - Division of Engineering
Spring 2019: US National Science Foundation - Division of Engineering
Spring 2016: US National Science Foundation - Division of Engineering
Spring 2016: US National Science Foundation - Division of Materials Research
Fall 2014: US National Science Foundation - Division of Materials Research
Spring 2014: US National Science Foundation - Division of Engineering
Spring 2013: US National Science Foundation - Division of Materials Research
Spring 2013: Center for the Advancement of Science in Space (CASIS)
Spring 2012: US National Science Foundation - Division of Materials Research
Spring 2009: US National Science Foundation - Division of Materials Research

Conference Symposium Organization:

Lead-organizer (with G. Cross, J. Lou and D. Kiener), Symposium S – Mechanical Behavior at the Nanoscale, 2015 MRS Fall Meeting, Boston, MA.

Co-organizer (with X. Zhang, H. Wang, N. Li and X. Li), Symposium "Mechanical Behavior of Nanostructured Materials", 2015 Society of Engineering Science (SES) Annual Meeting, College Station, TX.

Lead-organizer (with J. Lou, R. Miller and Y.M. Wang), Symposium "Structure-Property Relationships in Low-dimensional Metallic Nanostructures", Materials Science & Technology 2013, Montreal, QC.

Co-organizer (with J. Lou, X. Zhang, J. Huang, C. Eberl and V. Tomar), Symposium "Mechanical Behavior of Low Dimensional Materials", Materials Science & Technology 2010, Houston, TX.

Service for the University of Vermont:

2011 -present	Graduate Program Director, Mechanical Engineering
2019 – 2020	Acting Chair, Department of Mechanical Engineering
2013 – 2014	Program Head, Mechanical Engineering program, School of Engineering
2016 – 2023	Executive Committee Member, UVM Materials Science Graduate Program
2014 – 2023	Faculty Mentor, University of Vermont MRS Student Chapter

Regular Faculty Committees:

Mar. 14 – May 15	Honors College Representative for the College of Engineering & Mathematical Sciences
Fall 06 – Fall 10	Member, Materials Science Program Steering Committee
Fall 06 – Fall 10	Member, College of Engineering & Mathematical Sci. Faculty Advisory Council
Fall 09 – Fall 10	Chair, Mechanical Engineering Laboratory Planning Committee
Spring 07 – Fall 07	Point Person, Multiscale System Focus Group, School of Engineering

Fall 05 - Spring 06	Chair, Mechanical Engineering Curriculum Committee
Fall 04 - Spring 05	Information Technology Committee, Mechanical Eng. Representative
Spring 04 - Present	UVM Graduate Faculty

Faculty/Staff Searches:

Fall 25 – Spring 25	Committee Member, Department Chair Search in Mechanical Engineering
Fall 22 – Spring 23	Committee Member, Tenure-Faculty Faculty Search in Mechanical Engineering
Fall 18 – Spring 19	Chairperson, Computational Mechanics Tenure-Track Faculty Search
Fall 16	Chairperson, Coordinator for Graduate Programs in CEMS (staff) Search
Fall 14 – Spring 15	Committee Member, Lecturer Search in Mechanical Engineering
Fall 13 – Spring 14	Chairperson, Tenure-track Faculty Search in Mechanical Engineering
Fall 12 - Spring 13	Chairperson, Tenure-track Faculty Search in Mechanical Engineering
Summer 10	Chairperson, Lecturer Search in Mechanical Engineering
Summer 09	Committee Member, Lecturer Search in Mechanical Engineering
Fall 08 – Spring 09	Committee Member, School of Engineering Director Search
Fall 08 – Spring 09	Committee Member, Faculty Search in Condensed Matter Physics
Fall 07 – Spring 08	Committee Member, Bioengineering Faculty Search
Summer 07	Committee Member, Electrical Engineering Laboratory Technician Search
Fall 06 – Spring 07	Committee Member, Tenure-Faculty Faculty Search in Mechanical Engineering
Spring 05	Committee Member, Tenure-Faculty Faculty Search in Mechanical Engineering

Graduate Student Doctoral Thesis Defense Committees:

Spring 2026	Member, Vighnesh Pai (Mechanical Engineering), Thesis proposal
Fall 2025	Member, Sourena Azidhak (Mechanical Engineering), Thesis proposal
Spring 2025	Member, Andrew Lewis (Materials Science), Doctoral Defense
Spring 2024	Chairperson, Subhadra Thapa (Materials Science), Doctoral Defense
Spring 2024	Chairperson, Atoosa Para (Computer Science), Doctoral Defense
Spring 2023	Member, Ajibade Saheed (Materials Science), Thesis proposal
Spring 2021	Member, Dan Orfeo (Mechanical Engineering), Doctoral defense
Fall 2020	Member, Zhuang Liu (Mechanical Engineering), Doctoral defense
Spring 2020	Chairperson, Brandon Ackley (Chemistry), Doctoral defense
Summer 2019	Member, Jason Pearl (Mechanical Engineering), Doctoral Defense
Spring 2019	Chairperson, Saleh Alghamdi (Civil and Environmental Engineering), Doctoral Defense
Fall 2018	Member, Yujie Li (Civil and Environmental Engineering), Doctoral defense
Fall 2015	Member, Nestor Polanco (Civil and Environmental Engineering), Thesis proposal
Spring 2015	Member, Walt Owens (Mechanical Engineering), Doctoral defense
Spring 2014	Member, Vincent Peron-Luhrs (Univ. of Liege, Mechanics), Doctoral defense
Spring 2013	Member, Ishviene Cour (Materials Science), Doctoral defense
Fall 2011	Chairperson, Adam Richardson (Chemistry), Doctoral defense
Fall 2009	Member, Wenjie Wang (Materials Science), Doctoral defense
Fall 2009	Member, Lan Zhou (Materials Science), Thesis proposal
Fall 2009	Member, Ana Barbir (Mechanical Engineering), Thesis proposal
Summer 2009	Member, Songtao Wo (Materials Science), Thesis proposal
Summer 2009	Member, Art Michalek (Mechanical Engineering), Doctoral defense
Spring 2009	Member, Sredhar Manchu (Mechanical Engineering), Thesis proposal
Fall 2004	Member, Matt McGarry (Mechanical Engineering), Doctoral defense

Graduate Student M.S. Thesis Defense Committees:

Fall 2023	Member, Mason Martell (Mechanical Engineering), M.S. defense
Summer 2023	Member, Kevin Zuniga Cuellar (Mechanical Engineering), M.S. defense
Summer 2020	Member, TJ Heffernan (Mechanical Engineering), M.S. defense
Spring 2018	Member, Taylor Ducharme (Mechanical Engineering), M.S. proposal
Spring 2017	Chairperson, John Gilbert (Geology), M.S. defense
Spring 2015	Chairperson, Brian Ribbans (Civil Engineering), M.S. defense
Summer 2014	Member, Max Graves (Materials Science), M.S. defense
Summer 2014	Chairperson, Peter Hornish (Physics), M.S. defense
Summer 2014	Member, Meredith Koch (Mechanical Engineering), M.S. defense
Summer 2013	Chairperson, Patrick Dyess (Geology), M.S. defense
Fall 2012	Chairperson, Yijian Zheng (Biomedical Engineering), M.S. defense
Spring 2009	Chairperson, Shay Romine (Geology), M.S. proposal
Spring 2008	Chairperson, Christopher Massa (Bioengineering), M.S. defense