

# Jeffrey W. Kysar

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## Work Address:

Department of Mechanical Engineering  
Columbia University  
New York, NY 10027

## Home Address:

Apartment 17-D  
560 Riverside Drive  
New York, NY 10027

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## Education

### Harvard University, Division of Engineering and Applied Science

- Ph.D. Engineering Sciences ..... 1998
  - Advisor: James R. Rice
  - Dissertation title: Experimental and Continuum Plasticity Aspects of the Brittleness and Ductility of Bicrystal Interfacial Fracture
- S.M. Engineering Sciences ..... 1993

### University of Canterbury, Christchurch, New Zealand

- Rotary Foundation Ambassadorial Scholar ..... 1988

### Kansas State University

- M.S. Mechanical Engineering ..... 1992
  - Advisor: Daniel V. Swenson
  - Thesis title: A Validated Finite Element Model of A Livestock Trailer
- B.S. Mechanical Engineering, *magna cum laude* ..... 1987

## Professional Experience

### Columbia University

- Professor of Mechanical Engineering and of Otolaryngology Head & Neck Surgery ..... 01/17
- Chair, Department of the Department Mechanical Engineering ..... 07/14
- Professor of Mechanical Engineering ..... 07/11–12/16
- Visiting Associate Professor, École Nationale Supérieure des Mines de Paris ..... 06/10–07/10
- Associate Professor, Department of Mechanical Engineering ..... 07/08–06/11
- Associate Professor ( untenured ), Department of Mechanical Engineering ..... 01/06–06/08
- Assistant Professor, Department of Mechanical Engineering ..... 07/01–12/05

### Brown University

- Adjunct Assistant Professor, Division of Engineering ..... 09/99 12/99
- Research Associate, Division of Engineering ..... 09/98–08/01

### Harvard University

- Teaching Fellow (Quarter-time for three semesters) ..... 09/93–05/96
- Research Assistant, Division of Engineering and Applied Science ..... 06/93–09/98
- Graduate Fellowship, Division of Engineering and Applied Science ..... 09/92 05/93

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## Prior Experience

- Engineer and farmer in family business.....09/91 08/92
- Research Assistant, Department of Mechanical Engineering, Kansas State University ..... 06/90 05/91
- Teaching Assistant, Department of Mechanical Engineering, Kansas State University ..... 08/89 05/90
- NASA-USRA Summer Fellow, Marshall Space Flight Center ..... 05/89–08/89
- Rotary Foundation Ambassadorial Scholar, Christchurch, New Zealand.....02/88–03/89
- Research Assistant, Department of Physics, Kansas State University ..... 06/87–02/88

## Consulting Activities

- Sandia National Laboratory ..... 2008–2012
- State University of New York (SUNY), Stony Brook..... 2004–2005
- The Gillette Company ..... 1998–1999

## Honors and Awards

### Columbia University

- Plenary Lecturer at Symposium Jean Mandel, École Polytechnique, Palaiseau, France ..... 2015
- William E. Hitzelberger Memorial Lectureship from The American Neurotology Society ..... 2015
- Columbia University Medical School Student Research Day Award for poster “Microperforation Mediated Enhancement of Diffusion Across Round Window Membrane of the Inner Ear” ..... 2014
- Best Poster Award, Joint National Synchrotron Light Source and Center for Functional Nanomaterials Users’ Meeting at Brookhaven National Laboratory ..... 2012
- International Journal of Plasticity Young Researcher Award ..... 2012
- Hot Paper in Chemistry as reported by Science Watch during March-June 2010 as “the most-cited chemistry report published in the last two years, excluding reviews” ..... 2010
- Séminaire de la *Fédération Francilienne en Mécanique des Matériaux*, Paris ..... 2010
- Invited Speaker at Ph.D. Convocation at Columbia University ..... 2008
- Presidential Early Career Award for Scientists and Engineers (PECASE) presented at the White House..... 2006
- Department of Energy Early Career Scientist and Engineer Award ..... 2006
- Frontiers of Engineering Program at National Academy of Engineering ..... 2003
- NSF Faculty Early Career Development (CAREER) Award ..... 2001

### Harvard University

- Outstanding Paper Award, Northeast Graduate Student Symposium on Mechanics ..... 1995
- Certificate of Distinction in Teaching (Bok Center for Teaching and Learning) ..... 1995
- Courtlandt S. Gross Fellow ..... 1994

### University of Canterbury, Christchurch, New Zealand

- Rotary Foundation Ambassadorial Scholar ..... 1988

### Kansas State University

- NASA-USRA Summer Fellow ..... 1989
- Phi Kappa Phi ..... 1986
- Boeing Scholarship.....1986
- State of Kansas Scholar.....1986
- Tau Beta Pi ..... 1985
- Golden Key Honor Society.....1985
- Pi Tau Sigma ..... 1985

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## Professional Societies

- American Academy of Mechanics (AAM)
- American Heart Association (AHA)
- American Association for the Advancement of Science (AAAS)
- American Chemical Society (ACS)
- American Society of Mechanical Engineers (ASME)
- Association for Research in Otolaryngology (ARO)
- Materials Research Society (MRS)
- Society for Experimental Mechanics (SEM)

## Funding from External Sources

\$8,535,878 Total external funding with Kysar as Principal Investigator or Co-Principal Investigator.

- New York Metropolitan Transit Authority (NYMTA CU17-1525 and PANYNJ CU17-2895)
  - Fire Effects on Main Cable of Suspension Bridges
  - Start Date: May 15, 2017, Project Duration: 24 Months
  - Award Amount: \$999,875
  - Raimondo Betti is PI and Kysar is co-PI
- National Institutes of Health (NIH-NIDCD-R01DC014547)
  - Intracochlear Delivery of Therapeutics Across RWM via Microneedle Array
  - Start Date: August 10, 2015, Project Duration: 60 Months
  - Award Amount: \$2,144,187
  - Research Supplement to Promote Diversity in Health-Related Research: \$53,182
  - Kysar and Anil Lalwani are co-PIs
- Columbia-Coulter Translational Research Partnership (PT-0052)
  - Single Needle Perforation of the Human Round Window Membrane to Facilitate Cochlear Implantation
  - Start Date: November 1, 2014, Project Duration: 12 Months
  - Award Amount: \$160,000
  - Kysar and Anil Lalwani are co-PIs
- National Science Foundation (NSF DMR-1427812)
  - MRI: Development of and Broad-Based Materials Research with the Next Generation Nanomechanical Testing Laboratory
  - Start Date: August 15, 2014, Project Duration: 60 Months.
  - Award Amount: \$1,587,763
  - Pharr is PI, Herbert and Oliver are co-PIs, Kysar is Senior Personnel
- National Science Foundation (NSF CMMI-1363093)
  - GOALI/Collaborative Research: Improving the Performance of Electrical Connectors Using Extremely Thin Sheets of Graphene Sandwiched Between Metal Layers
  - Start Date: August 1, 2014, Project Duration: 36 Months with 12 month No Cost Extension.
  - Award Amount: \$245,781
  - Kysar is PI, Terrell is co-PI
- National Science Foundation (NSF CMMI-1437450)
  - Strength and Reliability of Large Area CVD Graphene
  - Start Date: July 15, 2014, Project Duration: 36 Months with 12 month No Cost Extension.
  - Award Amount: \$398,101
  - Kysar and Hone are co-PIs

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- American Otological Society Research Fund (AOS CU14-0751)
    - Development of RWM Microneedle Array for Intracochlear Drug Delivery
    - Start Date: July 1, 2014, Project Duration: 24 months
    - Award Amount: \$110,000
    - Kysar and Lalwani are co-PIs
  - Moxtek, Inc.
    - Moxtek funded summer project for 2014
    - Start Date: June 1, 2014, Project Duration: 3 months
    - Award Amount: \$11,500
    - Kysar and Hone are co-PIs
  - National Science Foundation (NSF DMR-1310503)
    - Probability Density Function of Dislocation Free Path Length: Experimental Determination through GND Measurements
    - Start Date: September 1, 2013, Project Duration: 36 Months
    - Award Amount: \$370,254
    - Kysar is sole PI
  - Columbia-Coulter Translational Research Partnership (PT-0052)
    - Intracochlear Drug Delivery Device
    - Start Date: July 1, 2013, Project Duration: 12 Months
    - Award Amount: \$100,000
    - Kysar and Lalwani are co-PIs
  - National Science Foundation (NSF CMMI-0927891)
    - Monoatomically Thin Films: Nonlinear Mechanical Response and Mechanical-Electrical Coupling
    - Start Date: August 1, 2009, Project Duration: 36 Months
    - Award Amount: \$350,292
    - Kysar is PI, with Co-PIs Hone and Marianetti
  - Air Force Office of Scientific Research (AFOSR FA9550-09-1-0453)
    - DURIP: Equipment Acquisition for the Study of Mechanical Behavior of Materials under High Temperatures and Extreme Conditions
    - Start Date: June 1, 2009, Project Duration: 12 Months
    - Award Amount: \$ 332,524
    - Kysar is sole PI
  - Air Force Office of Scientific Research (AFOSR FA9550-09-1-0048)
    - Plasticity in High Temperature Materials: Tantalum and Monazite
    - Start Date: February 15, 2009, Project Duration: 58 Months.
    - Award Amount: \$1,210,838
    - Kysar is sole PI.
  - National Science Foundation (NSF CMMI-0826093)
    - Nanoporous Metals Incorporated into MEMS and NEMS Devices for Enhanced Functionality
    - Start Date: July 15, 2008, Project Duration: 36 Months.
    - Award Amount: \$279,978
    - Kysar is sole PI.
  - Department of Energy (LLNL Purchase Requests B571059, BS85562, B587550, B595720, B598431)
    - Presidential Early Career Award for Scientists and Engineers (PECASE)
    - PECASE: Multiscale Investigations into Plasticity in Metals under Dynamic Loading Conditions
    - Start Date: May 1, 2008, Project Duration: 60 Months.

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- Award Amount: \$250,000
  - Kysar is sole PI.
  - National Science Foundation (NSF DMR-0706058)
    - Experimental Characterization of Gold Single Crystals and Bicrystals at the Nanoscale with Emphasis on Interaction Between Dislocations and Grain Boundaries
    - Start Date: July 1, 2007, Project Duration: 48 Months.
    - Award Amount: \$400,000
    - Kysar is sole PI.
  - National Science Foundation (NSF DMR-0213574)
    - Materials Research Science and Engineering Center: Center for Nanostructured Materials
    - Start Date: September 1, 2002, Project Duration: 72 Months.
    - Award Amount: \$6,681,825
    - Herman is PI. Kysar is one of 13 senior investigators, effective as of March 1, 2007 and receives partial support (\$40,000 per year) for one postdoctoral scientist.
  - National Science Foundation (NSF DMR-0650555)
    - SGER: Detailed Interaction of Dislocations and Grain Boundaries in Nanoscale Gold Bicrystals
    - Start Date: December 15, 2006, Project Duration: 12 Months.
    - Award Amount: \$89,619
    - Kysar is sole PI.
  - Air Force Office of Scientific Research (AFOSR FA9550-06-1-0214)
    - Combined Experimental Study of Plastic Deformation for the Development of Multi-Length Scale Constitutive Models
    - Start Date: March 15, 2006, Project Duration: 36 Months.
    - Award Amount: \$322,247
    - Kysar is sole PI.
  - National Science Foundation (NSF DMII-0500239 and DMII-0549629)
    - Effects of Heterogeneity, Anisotropy and Length Scale in Microscale Deformation Processes
    - Start Date: July 1, 2005, Project Duration: 36 Months.
    - Award Amount: \$333,256
    - Kysar is PI, with co-PI Yao.
  - National Science Foundation (NSF CMS-0134226)
    - CAREER: Multi-Scale Experiments of Fracture in Elastic-Plastic Materials
    - Start Date: July 1, 2002, Project Duration: 60 Months.
    - Award Amount: \$374,244
    - Kysar is sole PI.

## Funding from Internal Sources

- Translational Fellows Program, Columbia University
  - A Surgical Tool For Creating Perforations in RWM for Treatment of Ear Disorders
  - Provides partial salary support for Postdoctoral Research Scientist
  - Start Date: April 1, 2019, Project Duration: 12 Months.
  - Award Amount: \$16,991
  - Kysar and Lalwani are co-PIs.
- SEAS Research Equipment Assistance Program (REAP), Columbia University
  - Purchase of a Replacement DCM II Indenter Head and Purchase of Express Test Control Software for Agilent G-200 Nanoindenter

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- Start Date: July 1, 2017, Project Duration: 12 Months.
  - Award Amount: \$40,000
  - Kysar is PI.
  - Translational Fellows Program, Columbia University
    - A Surgical Tool For Creating Perforations in RWM for Treatment of Ear Disorders
    - Provides partial salary support for Associate Research Scientist
    - Start Date: April 1, 2015, Project Duration: 12 Months.
    - Award Amount: \$14,441
    - Kysar and Lalwani are co-PIs.
  - Academic Quality Fund, Columbia University
    - Nanomechanics Research Center
    - Start Date: October 1, 2004, Project Duration: 24 Months.
    - Award Amount: \$279,632
    - Kysar and Chen are co-PIs.
  - Seed Money from NSF-funded MRSEC at Columbia University
    - Metal Nanocomposite Thin Films: Synthesis and Characterization
    - Start Date: October 1, 2004, Project Duration: 24 Months.
    - Award Amount: \$50,000
    - Kysar and Chen are co-PIs.
  - Seed Money from NSF-funded MRSEC at Columbia University
    - Mechanical Constitutive Relationships Appropriate for Nanoparticle Thin Films
    - Start Date: October 1, 2006, Project Duration: 12 Months.
    - Award Amount: \$25,000
    - Kysar is sole PI.
  - Funds toward purchase of MTS G200 Nanoindenter
    - SEAS Dean's Office: \$40,000
    - NSF-funded MRSEC: \$37,800
    - Kysar contribution: \$56,595
    - Purchase Date: May 24, 2007
    - Kysar is sole recipient.
  - Sponsor of Research Experience for Teachers (RET) participant
    - NSF-funded program through PI Jay Dubner
    - Jonathan M. Peter (High school physics and chemistry teacher)
      - ▷ New Explorations Into Science, Technology and Math (NEST+M) High School
      - ▷ Participated in research in Kysar's lab during summers of 2006 and 2007.
    - Award Amount: \$2,000
    - Kysar is sole recipient.

## Ph.D. Graduate Students Advised

- Hongqiang Chen, Ph.D..... January 2003 to May 2004
  - Dissertation Title: Microscale laser shock peening: experiment, modeling and spatially resolved material characterization
  - Co-advisor with Y. L. Yao
  - Lead Engineer - Laser & Metrology Systems Lab at General Electric Global Research Center
- Yong X. Gan, Ph.D.....September 2002 to May 2005

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- Dissertation Title: High Strain Gradient Deformation States in Elastic-Plastic Single Crystals: Theory, Simulations, and Experiments
  - Associate Professor, Department of Mechanical Engineering, California State Polytechnic University
  - Youneng Wang, Ph.D. .... June 2004 to May 2005
    - Dissertation Title: Microscale Laser Shock Induced Deformation: Anisotropy and Length Scale Effect
    - Co-advisor with Y. L. Yao
    - Research Scientist at Michelin Research
  - Yuki Saito, Ph.D. .... January 2004 to August 2007
    - Dissertation Title: Investigations into Strain Gradient Plasticity
    - Director of Business Development, Next-Generation Space System Technology Research Association (NESTRA)
  - Xiaoding Wei, Ph.D. .... June 2004 to May 2009
    - Dissertation Title: Mechanical Properties of nanoscale and atomic scale materials: Nanocrystalline copper and graphene
    - Assistant Professor, Department of Mechanics and Engineering Science, Peking University
  - Sinisa Vukelić, Ph.D. .... June 2005 to June 2009
    - Dissertation Title: Laser induced deformation and structural modification of crystalline and amorphous materials
    - Co-advisor with Y. L. Yao
    - Lecturer in Mechanical Engineering, Columbia University
  - Muin Öztop, Ph.D. .... June 2007 to September 2011
    - Dissertation Title: Multi-scale experimental analysis in plasticity: Linking dislocation structures to continuum deformation fields
    - Associate at The Boston Consulting Group
  - Oya Okman, Ph.D. .... September 2006 to July 2012
    - Dissertation Title: Fabrication and Applications of Nanoporous Gold
    - Senior Engineer, Becton Dickinson R&D Department
  - Mehmet Yilmaz, Ph.D. .... October 2007 to January 2013
    - Dissertation Title: Batch-compatible Integration of Nanowires with Uniaxial Micro Tensile Testing Platforms
    - Post-doctoral Researcher at Bilkent University's National Nanotechnology Research Center in Turkey
  - Ryan Cooper, Ph.D. .... September 2008 to December 2013
    - Dissertation Title: Micro and Nanofilm Mechanics
    - Assistant Professor In Residence, Department of Mechanical Engineering, University of Connecticut
  - Abdulhamit Sarac, Ph.D. .... September 2009 to May 2014
    - Dissertation Title: Net Burgers Density Vector Fields in Crystal Plasticity: Characteristic Length Scales and Constitutive Validation
    - Mechanical Engineer at The Scientific and Research Council of Turkey
  - Nastaran Ghazi, Ph.D. .... September 2008 to August 2014
    - Investigation of Plastic Strain Recovery and Creep in Thin Film Nanocrystalline Metals
    - Postdoctoral Research at Rutgers University
  - Christopher DiMarco, Ph.D. Candidate .... June 2013 to present
  - Shruti Rastogi, Ph.D. Candidate .... September 2015 to present
  - Richard Leechung Li, Ph.D. Candidate .... September 2015 to present
  - Aykut Aksit, Ph.D. Candidate .... September 2016 to present
  - Wenbin Wang, Ph.D. Candidate .... September 2016 to present

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## Ph.D. Dissertation Committees

(N.B. Students from Columbia University unless otherwise indicated.)

- 2004-2005
  - R. Krishnan, H. Chen, M. Shilov, B. Turk, M.-H. Wu, S. Oh, M. Nagashima, I. Perez-Luna, J. Lou (Princeton University)
- 2005-2006
  - S. Park, S. Yang, M. Zheng, R. Verastegui, J. Choi, M. Wu, G. Vunni, Y. Wang
- 2006-2007
  - M. Likhitpanichkul, Y. Fan, A. Rambalacos, M. Wu, M.-H. Wu, L. Brant, Z. Zong (Princeton University), K. Q. Chen
- 2007-2008
  - Q. R. Marksteiner
- 2008-2009
  - C. Canal Guterl, A. J. Birnbaum, N. Wilson
- 2009-2010
  - R. Bose, M. Huang, M. Caligaris, W. Wei
- 2010-2011
  - S. Ghassemi, Z. Liu, A. Mathur
- 2011-2012
  - O. Gaathon, S. Kuznetsov, P. Biswas (Indian Institute of Science, Bangalore), A. Montoya, A. Sahin
- 2012-2013
  - X. Liu, C. Chen, Y. Shi, S.-T. Hsu, M. Lan, D. Hochstein, D. Eroglu, N. Gu, E. Sandoz-Rosado
- 2013-2014
  - K. Sasihithlu, C. McAuliffe, P. Kongsuwan
- 2014-2015
  - Y. Zheng, J. P. Kyle, S. R. Oungo, S. Y. Wang, M. Marko
- 2015-2016
  - Y. Li, Y. Gao, Z. Yuan, S. Liu, D. Chenet, M. Fernandez, J.-H. Park
- 2016-2017
  - O. Ajayi, M. Arriaga, M. Misra, C. Ling (École Nationale Supérieure des Mines de Paris), Y. Wang, M. Kornbluth, W. Yang, A. Brügger
- 2017-2018
  - M. Mobasher, G. Arefe, D. Fafalis, D. Bian, A. Cui, A. Dadgar, J. Kang, J. C. Hou
- 2018-2019
  - J. F. McMillan

## M.S. and Professional Degree Students Advised

- Kelly (Horton) Kessler, M.S. .... September 2001 to May 2002
- John Culkowski, M.S. .... September 2003 to May 2004
- James B. Carleton, M.S. .... September 2004 to July 2005
- Varun Hemraj, M.S. .... September 2004 to December 2005
- Emine Eda Kuran, M.S. .... September 2008 to December 2009
- Jasmine Bridges, M.S. .... September 2009 to May 2010
- Sibylle Delaporte, M.S. .... September 2008 to May 2010
- Arora Shruti, M.S. .... January 2010 to December 2010
- Donald Boone, Professional Degree .... June 2011 to May 2012
- Jaewon Moon, M.S. .... April 2013 to May 2014
- Kwadwo Adu Twum, M.S. .... September 2014 to December 2015
- Arnuparp (Nu) Santimetneedol, M.S. .... January 2016 to December 2016
- Zihan Wang, M.S. .... September 2016 to December 2016
- Ashwini Karmarkar, M.S. .... June 2017 to December 2017



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- Maria Lynette Nadal, M.S. .... September 2018 to May 2019
  - Chaoqun Zhao, M.S. .... September 2018 to present

## Visiting M.S. and Ph.D. Students Hosted in Laboratory

- Christopher Nellemann (DTU), Salim A. El-Naaman (DTU)

## Undergraduate Students, High School Students and Teachers in Laboratory

(N.B. REU and RET refer, respectively, to NSF-funded Research Experience for Undergraduates program and Research Experience for Teachers program.)

- Marilyn Nourse (Brown University), Luis Romero, Calder Hughes, Jack Barnett, Timothy Lee, Kerstin Perez (REU), Jean Chang (REU), Sarah Lowenthal, Mark Backman, Lindsay Kuhn, Sophie Bourgoin (École Polytechnique, Paris), Salka Keller (REU), Milton Jones (REU), Carlos Maturana, Jonathan Peter (RET from New York City public high school), Timothy Morse (REU), Benjamin Dickman, Gilberto Mendez Arzuza, Allan Fong, Lauren Stolar, Sahar Hasan, Kevin Chan (REU), Hichem Smaoui (École Polytechnique, Paris), Benoit Carrier (École Polytechnique, Paris), James Magargee (REU), Mark Lombardi, Adam Steege, Nicholas Mathis (École Polytechnique, Paris), Darren Pagan, Gerald Brantner, David Zhang, Ilana Foni (Brown University), Alexandra Hammerberg, Katherine Adams, Thomas Cahuzac, Laëtitia Dubois (École Polytechnique, Paris), Pierre Turquet de Beauregard (ENSTA, ParisTech), Christopher DiMarco, Michael Carroll, Joseph Barstad, Tizian Bucher, Kyle Doyle, Henry Loughlin, Katie Fisher, Laurent Guin (École Polytechnique, Paris), Sydney Sherman, Christine Capper, Sylvain Quennehen (École Polytechnique, Paris), Néhémie Guillomâitre, Alexander Timaramiebi Taf Vera, Emanuil Yanev, James Palladino, Breanna Johnson, Camille Guérin (ENSTA-ParisTech), Chengke Fan

## Senior Visitors

- Vivek Shenoy ..... January 2011 to June 2011
  - Professor, Brown University
- Dongyun Lee ..... February 2018 to January 2019
  - Associate Professor, Pusan National University, Republic of Korea

## Postdoctoral Researchers

- Dongyun Lee ..... September 2004 to February 2007
  - Current Position: Professor, Pusan National University, Republic of Korea
- Benjamin Fragneaud ..... June 2007 to November 2009
  - Current Position: Professor of Physics at Universidade Federal de Juiz de Fora, Brazil
- Muin Öztop ..... October 2011 to December 2011
  - Current Position: The Boston Consulting Group, Istanbul, Turkey
- Carl Dahlberg (Swedish-American Foundation Fellow) ..... February 2012 to June 2013
  - Current Position: Researcher and Lecturer at Swedish Royal Institute of Technology
- Kim Lau Nielsen (Visiting Scientist from Technical University of Denmark) ... March 2013 to May 2013
  - Current Position: Associate Professor at Technical University of Denmark

- Hirobumi Watanabe (Associate Research Scientist) ..... July 2013 to June 2017
  - Neural interface engineer at Kernel
- Thomas Rousseau ..... October 2016 to September 2017
  - Chef de Projet Recherche et Développement at FILAB SAS in Dijon, France
- Miguel Torre do Vale Arriaga e Cunha ..... January 2017 to December 2018
  - Postdoctoral Fellow at Technische Universität Wien
- Dimitrios Fafalis ..... November 2017 to present

## Medical Students and Medical Residents in Research Group

- Zhen Jason Qian (NIH Summer Fellow, CU College of Physicians & Surgeons) ..... 06/13–08/13
- Catherine Kelso (Dean’s Research Fellow, CU College of Physicians & Surgeons) ..... 07/13 06/14
- James Stevens (Dean’s Research Fellow, CU College of Physicians & Surgeons) ..... 05/14 04/15
- Charlotte PrevotEAU (Medical Resident from Hôpital Charles-Nicolle, France) ..... 11/16 10/17
- Daniel Arteaga (CU College of Physicians & Surgeons) ..... 07/17–06/18
- Michelle Yu (Dean’s Research Fellow, CU College of Physicians & Surgeons) ..... 01/18–04/19
- Harry Chiang (CU College of Physicians & Surgeons) ..... 04/18–04/19
- Betsy Szeto (Dean’s Research Fellow, CU College of Physicians & Surgeons) ..... 03/19–present
- Christopher Valentini ..... 05/19–present

## University Service

- **Columbia University**
  - Faculty Advisor to Naval ROTC ..... 2016–present
  - University Senate Committee on Campus Planning and Physical Development ..... 2016–2017
  - University Judicial Board Member ..... 2015–present
  - Chair of ROTC Advisory Committee to Provost ..... 2011–2016
  - University Senate Budget Review Committee ..... 2013–2016
  - Task Force on Fringe Benefits ..... 2010–2011
  - University Senate Education Committee ..... 2009 2014
  - University Senate ..... 2009 2017
  - Undergraduate Recruiting
    - ▷ Columbia Engineering Invitationals ..... 2010, 2012–2013
    - ▷ Multicultural Recruitment Committee Open House ..... 2010
- **School of Engineering and Applied Science, Columbia University**
  - Executive Committee ..... 2014–present
  - Nominating Committee ..... 2008–2017
  - Engineering Library Space Committee ..... 2002–2003
- **Department of Mechanical Engineering**
  - Scribe at faculty meetings ..... 2001–2003
  - Colloquium Organizer ..... 2002–2003
  - Undergraduate Committee
    - ▷ Member ..... 2001–2005
    - ▷ Chair ..... 2011–2014
  - Laboratory Committee
    - ▷ Member ..... 2001–2003, 2005–2014
    - ▷ Chair ..... 2004 2005
  - Graduate Committee
    - ▷ Member ..... 2003–2005, 2010–2011

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- ▷ Chair ..... 2006–2009
  - Executive Committee
    - ▷ Member ..... 2008–2014
    - ▷ Chair ..... 2014–present
  - ABET Committee Member ..... 2006–2007
    - ▷ Conduct annual surveys ..... 2006–2010
  - Departmental liaison with Center for Career Education ..... 2005 2008
  - Pi Tau Sigma faculty sponsor ..... 2005 2014
  - Strategic Planning Committee
    - ▷ Chair ..... 2009–2010
  - Department Chair ..... 2014–present

## Symposium and Conference Organization

- Organizing or Scientific Committees for Conferences
  - 15th ASCE Engineering Mechanics Division Conference, New York City ..... 2002
  - North American Manufacturing Research Conference (NAMRC 33), New York City ..... 2005
  - Fourth Biot Conference, New York City ..... 2009
  - International Symposium on Plasticity, Nassau, Bahamas ..... 2013
  - International Symposium on Plasticity, Freeport, Bahamas ..... 2014
  - International Workshop on Computational Mechanics of Materials, Madrid, Spain ..... 2014
  - International Symposium on Plasticity, Montego Bay, Jamaica ..... 2015
  - International Symposium on Plasticity, Kona, Hawaii ..... 2016
  - Mach 2016 Scientific Committee, Annapolis, MD ..... 2016
  - Mach 2017 Scientific Committee, Annapolis, MD ..... 2017
  - International Symposium on Plasticity, Puerto Vallarta, Mexico ..... 2017
- Symposia Organization
  - Organized symposia at American Society of Mechanical Engineers (ASME) annual International Mechanical Engineering Congress and Exposition (IMECE) ..... 2002–present
  - Organized symposia at summer meeting with involvement of Applied Mechanics Division and/or Materials Division of American Society of Mechanical Engineers ..... 2003–2005

## Editorial Responsibilities

- Editorial Board Member of *International Journal of Solids and Structures* ..... 2013–present
- Regional Editor of *International Journal of Fracture* ..... 2013–present
- Editorial Advisory Board of *International Journal of Plasticity* ..... 2007–present
- Associate Editor of *ASME Journal of Engineering Materials and Technology* ..... 2010–2013
- Associate Technical Editor of *Experimental Mechanics* ..... 2007–2013
- Editorial Advisory Board of *The Open Mechanical Engineering Journal* ..... 2007–2009

## Reviewer for Journals and Proceedings

- Acta Materialia
- Applied Surface Science
- Computational Materials Science
- Engineering Fracture Mechanics
- European Journal of Mechanics A/Solids
- Experimental Mechanics
- International Journal of Fracture
- International Journal of Mechanical Sciences

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- International Journal of Plasticity
  - International Journal of Solids and Structures
  - Journal of Applied Mechanics
  - Journal of Applied Physics
  - Journal of Engineering Materials and Technology
  - Journal of Engineering Mechanics
  - Journal of Materials Science
  - Journal of Mechanics of Materials and Structures
  - Journal of Physics D: Applied Physics
  - Journal of Strain Analysis for Engineering Design
  - Journal of Materials Science
  - Journal of the American Chemical Society
  - Journal of the Mechanics and Physics of Solids
  - Materials Characterization
  - Materials Chemistry and Physics
  - Materials Science & Engineering A
  - Materials Research Society Symposium Proceedings
  - Mathematics and Mechanics of Solids
  - Mechanics of Materials
  - Mechanics Research Communications
  - Metallurgical and Materials Transactions A
  - Modelling and Simulation in Materials Science and Engineering
  - Nano Letters
  - Nanotechnology
  - Nature Scientific Reports
  - Philosophical Magazine
  - Physica Status Solidi
  - Proceedings of the National Academy of Sciences
  - Science
  - Scripta Materialia
  - The Open Mechanical Engineering Journal
  - Thin Solid Films
  - Ultramicroscopy

## Proposal or Panel Reviewer

- ACS Petroleum Research Fund
- Columbia University RISE
- Deutsche Forschungsgemeinschaft (DFG)
- DOD Army Research Office
- DOE AFCI (Advanced Fuel Cycle Initiative)
- DOE BES (Basic Energy Sciences)
- DOE NEUP (Nuclear Energy University Program)
- European Research Council (ERC)
- Kentucky Science and Engineering Foundation (R&D Excellence Program)
- NSF CMMI Mechanics of Materials
- NSF CMMI Mechanics of Materials and Structures
- NSF CMMI (CAREER Award Review Panel)
- NSF DMR Metals
- NSF DMR Metals (CAREER Award Review Panel)
- NSF GRFP (Graduate Research Fellowship Program)
- NSF MWN (Materials World Network)
- NSF OISE (Cooperative Activities Program)

- Oak Ridge National Laboratory Proposal Review Committee (PRC) for the SHaRE User Facility
- U.S. Civilian Research and Development Foundation (CRDF)
- Vanderbilt University (IDGP)

## Program Reviewer

- DOE-sponsored Predictive Science Academic Alliance Program (PSAAP) at Caltech
  - Member of Review Team ..... 2008
  - Chair of Review Team ..... 2009–2011

## Technical Committee Memberships

- American Society of Mechanical Engineers (ASME)
  - Fracture Mechanics Technical Committee
  - Experimental Mechanics Technical Committee
- Society for Experimental Mechanics
  - MEMS & Nanotechnology
  - Fracture & Fatigue

## Teaching Experience

- Columbia University, Department of Mechanical Engineering

Semester	Course Number	Course Title	Number Students
Spring 2002	MECE E3018	Mechanical Engineering Laboratory Introduction	28
Spring 2003	MECE E3018	Mechanical Engineering Laboratory Introduction	23
Fall 2003	MECE E3401	Mechanics of Machines	22
Fall 2003	MECE E1001	Mechanical Engineering: Micromachines to Jumbo Jets	39
Spring 2004	MECE E3018	Mechanical Engineering Laboratory I	45
Fall 2004	MECE E3401	Mechanics of Machines	31
Fall 2004	MECE E1001	Mechanical Engineering: Micromachines to Jumbo Jets	51
Spring 2005	MECE E3018	Mechanical Engineering Laboratory I	48
Fall 2005	MECE E1001	Mechanical Engineering: Micromachines to Jumbo Jets	31
Spring 2006	MECE E6423	Elasticity II	7
Fall 2006	MECE E3018	Mechanical Engineering Laboratory I	42

Semester	Course Number	Course Title	Number Students
Fall 2006	MECE E1001	Mechanical Engineering: Micromachines to Jumbo Jets	43
Fall 2007	MECE E3018	Mechanical Engineering Laboratory I	48
Fall 2007	MECE E1001	Mechanical Engineering: Micromachines to Jumbo Jets	34
Spring 2008	MECE E6423	Elasticity II	10
Fall 2008	MECE E3018	Mechanical Engineering Laboratory I	48
Spring 2009	MECE E8990	Small Scale Mechanical Behavior	12
Fall 2009	MECE E3018	Mechanical Engineering Laboratory I	45
Spring 2010	MECE E8990	Small Scale Mechanical Behavior	7
Spring 2011	MECE E6423	Elasticity II	12
Fall 2011	MECE E3018	Mechanical Engineering Laboratory I	62
Spring 2012	MECE E8990	Small Scale Mechanical Behavior	5
Fall 2012	MECE E3018	Mechanical Engineering Laboratory I	59
Spring 2013	MEEM E6432	Small Scale Mechanical Behavior	13
Fall 2013	MECE E3018	Mechanical Engineering Laboratory I	57
Spring 2014	MECE E6423	Elasticity II	12
Fall 2014	MECE E3018	Mechanical Engineering Laboratory I	56
Fall 2015	MECE E3018	Mechanical Engineering Laboratory I	67
Spring 2016	MEEM E6432	Small Scale Mechanical Behavior	8
Fall 2016	MECE E3018	Mechanical Engineering Laboratory I	55
Fall 2017	MECE E3018	Mechanical Engineering Laboratory I	60
Fall 2018	MECE E3018	Mechanical Engineering Laboratory I	59

- Brown University, Division of Engineering
  - Introduction to Mechanics and Engineering (EN3) ..... 1999
- Harvard University, Division of Engineering and Applied Sciences

- Teaching Fellow for The Architecture of Condensed Matter (Science A-33) ..... 1997
  - ▷ Professor F. A. Spaepen
- Teaching Fellow for Introduction to Materials Engineering (ES 190) ..... 1995
  - ▷ Professor A. G. Evans
  - ▷ Received Bok Center Certificate of Distinction in Teaching
- Teaching Fellow for Solid Mechanics I (ES 240) ..... 1993
  - ▷ Professor J. R. Rice
- Kansas State University, Department of Mechanical Engineering
  - Teaching Assistant in NASA-USRA interdisciplinary senior design course ..... 1989-1990
  - Teaching Assistant in Production Processes Laboratory course ..... 1985-1987

## Peer Reviewed Archival Journal Publications

- [1] S. D. Mesarovic and J. W. Kysar, “Continuum aspects of directionally dependent cracking of an interface between copper and alumina crystals”, *Mechanics of Materials* **23**, 271–286 (1996).
- [2] J. W. Kysar, “Effects of strain field on light in crack opening interferometry”, *International Journal of Solids and Structures* **35**, 33–49 (1998).
- [3] J. W. Kysar, “Directional dependence of fracture in copper/sapphire bicrystal”, *Acta Materialia* **48**, 3509–3524 (2000).
- [4] J. W. Kysar, “Continuum simulations of directional dependence of crack growth along a copper/sapphire bicrystal interface. Part I: Experiments and crystal plasticity background”, *Journal of the Mechanics and Physics of Solids* **49**, 1099–1128 (2001).
- [5] J. W. Kysar, “Continuum simulations of directional dependence of crack growth along a copper/sapphire bicrystal interface. Part II: Crack tip stress/deformation analysis”, *Journal of the Mechanics and Physics of Solids* **49**, 1129–1153 (2001).
- [6] J. W. Kysar, “Crack-opening interferometry at interface of transparent materials and metals”, *Experimental Mechanics* **41**, 52–57 (2001).
- [7] J. W. Kysar, “Path of light in near crack tip region in anisotropic medium and under mixed-mode loading”, *International Journal of Solids and Structures* **38**, 5963–5973 (2001).
- [8] J. W. Kysar and C. L. Briant, “Crack tip deformation fields in ductile single crystals”, *Acta Materialia* **50**, 2367–2380 (2002).
- [9] J. W. Kysar, “Energy dissipation mechanisms in ductile fracture”, *Journal of the Mechanics and Physics of Solids* **51**, 795–824 (2003).
- [10] H. Chen, Y. L. Yao, and J. W. Kysar, “Spatially resolved characterization of residual stress induced by micro scale laser shock peening”, *Journal of Manufacturing Science and Engineering* **126**, 226–236 (2004).
- [11] H. Chen, J. W. Kysar, and Y. L. Yao, “Characterization of plastic deformation induced by microscale laser shock peening”, *Journal of Applied Mechanics* **71**, 713–723 (2004).
- [12] H. Chen, Y. Wang, J. W. Kysar, and Y. L. Yao, “Advances in microscale laser shock peening”, *Tsinghua Science and Technology* **9**, 506–518 (2004).
- [13] H. Chen, Y. Wang, J. W. Kysar, and Y. L. Yao, “Systematical characterization of material response to microscale laser shock peening”, *Journal of Manufacturing Science and Engineering* **126**, 740–749 (2004).
- [14] H. Chen, Y. L. Yao, J. W. Kysar, I. C. Noyan, and Y. Wang, “Fourier analysis of x-ray micro-diffraction profiles to characterize laser shock peened metals”, *International Journal of Solids and Structures* **42**, 3471–3485 (2005).
- [15] J. W. Kysar, Y. X. Gan, and G. Mendez-Arzuza, “Cylindrical void in a rigid-ideally plastic single crystal. Part I: Anisotropic slip line theory solution for face-centered cubic crystals”, *International Journal of Plasticity* **21**, 1481–1520 (2005).

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- [16] Y. Gan, D. Lee, X. Chen, and J. W. Kysar, "Structure and properties of electrocodeposited Cu-Al<sub>2</sub>O<sub>3</sub> nanocomposite thin films", *Journal of Engineering Materials and Technology* **127**, 451–456 (2005).
- [17] G. Cao, X. Chen, and J. W. Kysar, "Strain sensing of carbon nanotubes: Numerical analysis of the vibrational frequency of deformed single-wall carbon nanotubes", *Physical Review B* **72**, 195412 (2005).
- [18] G. Cao, X. Chen, and J. W. Kysar, "Apparent thermal contraction of single-walled carbon nanotubes", *Physical Review B* **72**, 235404 (2005).
- [19] Y. X. Gan, J. W. Kysar, and T. L. Morse, "Cylindrical void in a rigid-ideally plastic single crystal II: Experiments and simulations", *International Journal of Plasticity* **22**, 39–72 (2006).
- [20] S. Banerjee, S. Jia, D. I. Kim, R. D. Robinson, J. W. Kysar, J. Bevk, and I. P. Herman, "Raman microprobe analysis of elastic strain and fracture in electrophoretically deposited CdSe nanocrystal films", *Nano Letters* **6**, 175–180 (2006).
- [21] G. Cao, X. Chen, and J. W. Kysar, "Thermal vibration and apparent thermal contraction of single-walled carbon nanotubes", *Journal of the Mechanics and Physics of Solids* **54**, 1206–1236 (2006).
- [22] D. Lee, M. Zhao, X. Wei, X. Chen, S. C. Jun, J. Hone, E. G. Herbert, W. C. Oliver, and J. W. Kysar, "Observation of plastic deformation in freestanding single crystal Au nanowires", *Applied Physics Letters* **89**, 111916 (2006).
- [23] G. Cao, X. Chen, and J. W. Kysar, "Numerical analysis of the radial breathing mode of armchair and zigzag single-walled carbon nanotubes under deformation", *Journal of Applied Physics* **100**, 124305 (2006).
- [24] D. Lee, X. Wei, M. Zhao, X. Chen, S. C. Jun, J. Hone, and J. W. Kysar, "Plastic deformation in nanoscale gold single crystals and open-celled nanoporous gold", *Modelling and Simulation in Materials Science and Engineering* **15**, S181–S192 (2007).
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- [27] D. Lee, X. Wei, X. Chen, M. Zhao, S. C. Jun, J. Hone, E. G. Herbert, W. C. Oliver, and J. W. Kysar, "Microfabrication and mechanical properties of nanoporous gold at the nanoscale", *Scripta Materialia* **56**, 437–440 (2007).
- [28] H. Chen, Y. Wang, J. W. Kysar, and Y. L. Yao, "Study of anisotropic character induced by microscale laser shock peening on a single crystal aluminum", *Journal of Applied Physics* **101**, 024904 (2007).
- [29] Y. X. Gan and J. W. Kysar, "Cylindrical void in a rigid-ideally plastic single crystal III: Hexagonal close-packed crystal", *International Journal of Plasticity* **23**, 592–619 (2007).
- [30] G. Cao, X. Chen, J. W. Kysar, D. Lee, and Y. X. Gan, "The mean free path of dislocations in nanoparticle and nanorod reinforced metal composites and implication for strengthening mechanisms", *Mechanics Research Communications* **34**, 275–282 (2007).
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- [32] Y. Wang, H. Chen, J. W. Kysar, and Y. L. Yao, "Response of thin films and substrate to micro-scale laser shock peening", *Journal of Manufacturing Science and Engineering* **129**, 485–496 (2007).
- [33] J. W. Kysar, Y. X. Gan, T. L. Morse, X. Chen, and M. E. Jones, "High strain gradient plasticity associated with wedge indentation into face-centered cubic single crystals: Geometrically necessary dislocation densities", *Journal of the Mechanics and Physics of Solids* **55**, 1554–1573 (2007).
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- [37] U. Borg, C. F. Niordson, and J. W. Kysar, “Size effects on void growth in single crystals with distributed voids”, *International Journal of Plasticity* **24**, 688–701 (2008).
- [38] Y. Wang, Y. Fan, J. W. Kysar, S. Vukelić, and Y. L. Yao, “Microscale laser peen forming of single crystal”, *Journal of Applied Physics* **103**, 063525 (2008).
- [39] C. Lee, X. Wei, J. W. Kysar, and J. Hone, “Measurement of the elastic properties and intrinsic strength of monolayer graphene”, *Science* **321**, 385–388 (2008).
- [40] J. W. Kysar, “Direct comparison between experiments and computations at the atomic length scale: A case study of graphene”, *Scientific Modeling and Simulation* **15**, 143–157 (2008).
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- [231] J. W. Kysar and D. M. Kalfa, "Polymeric Heart Valves: Past, Present and Future", 2nd Columbia Pediatric Heart Valve Symposium: From Bench to Bedside, Columbia University Medical Center, New York, NY, May 2019.
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- [297] M. S. Öztöp, J. W. Kysar, B. L. Adams, and J. Kacher, "Poster presentation: Lower bound geometrically necessary dislocation (GND) densities with high resolution EBSD measurements", Materials Research Society, Symposium GG, Fall Meeting, Boston, MA, Nov. 2009.
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