Julie Chen
Vice Chancellor for Research, Innovation, and Economic
Development University of Massachusetts Lowell
Lowell, MA 01854

EDUCATION

1988-1991	Ph.D.	Massachusetts Institute of Technology, Cambridge, MA Department of Mechanical Engineering
1986-1988	M.S.	Massachusetts Institute of Technology, Cambridge, MA Department of Mechanical Engineering
1982-1986	B.S.	Massachusetts Institute of Technology, Cambridge, MA Department of Mechanical Engineering

ADMINISTRATIVE and PROFESSIONAL EXPERIENCE

2016-present **Vice Chancellor for Research & Innovation**
University of Massachusetts Lowell (Lowell, MA)
Chief Research Officer role, elevated to an executive cabinet-level position in 2016. Additional responsibility of Economic Development added in 2018. Primary focus on external relationships and strategic leadership. Led research growth to $95million annually in FY21 (a 58% increase over the past decade).

2009-2016 **Vice Provost for Research (***interim, July 2009-June 2010***)**
University of Massachusetts Lowell (Lowell, MA)
Became the first permanent VPR for the University. Primary focus on building the internal VPR structure and support of research development.

2004-present **Professor of Mechanical Engineering**
1997-2003 **Associate Professor of Mechanical Engineering (tenured, 2001)**
University of Massachusetts Lowell (Lowell, MA)

2008-2014 **ASME Congress Steering Committee (executive committee, including leadership role as 2010 ASME IMECE Technical Program Chair).** The annual International Mechanical Engineering Congress and Exhibition is the premier global conference for mechanical engineering, convening over 3500 engineers, educators, and leaders from academia, industry, and government. The Technical Program Chair is responsible for all major aspects of programming, budget decisions, and application of policy.

2005-2010 **Co-Director, UML Nanomanufacturing Center**
(lead for state-funded $5M Nanomanufacturing Center of Excellence)
University of Massachusetts Lowell (Lowell, MA)

2002-2004 **Program Director, NanoManufacturing (2003-2004) and Materials Processing & Manufacturing (2002-2003)**
Division of Design, Manufacture, and Industrial Innovation
Directorate for Engineering, National Science Foundation (Arlington, VA)

	Responsible for a direct $5-10M budget, and represented Engineering and NSF on multiple cross-agency initiatives and workshops (e.g., with Dept of Energy, NIH), resulting in tens of millions in grants. Led both program-specific and cross-cutting panels for proposal review and input on emerging technology trends.
1997-2016	Co-Director, Advanced Composite Materials and Textile Research Lab *University of Massachusetts Lowell (Lowell, MA)*
2001	Visiting Researcher, Ecole Nationale Superieure d'Arts & Metiers (ENSAM-Paris) and ESEM, University of Orleans (France)
1994	NASA/ASEE Summer Faculty Fellow, Polymers and Composites Branch *Materials Division, Langley Research Center (Hampton, VA)*
1991-1997	Assistant Professor of Aerospace and Mechanical Engineering *Boston University (Boston, MA)*
1986-1991	Graduate Research Assistant, Fibers & Polymers Laboratory *M.I.T. (Cambridge, MA)*
1986-1991	Assistant Field Hockey Coach, M.I.T. (Cambridge, MA)
1984-1986	Undergraduate Research Assistant Resource Extraction Laboratory, M.I.T. (Cambridge, MA) (1985-86) Orthopedics Laboratory, Massachusetts General Hospital (Boston, MA) (1984)
1983, 1984	Summer Engineering Intern *Xerox Corporation (Webster, NY)*

Board Service

Massachusetts Technology Collaborative (Executive Committee)

Massachusetts Life Sciences Center (President Meehan designee)

Massachusetts Cybersecurity Strategy Council (Chancellor Moloney designee)

Massachusetts Military Asset and Security Strategy Task Force

Massachusetts Advanced Manufacturing Collaborative

Physical Sciences, Inc. (2016-2018, stepped down due to time conflict with VCRI responsibilities)

HIGHLIGHTS from my UMASS LOWELL EXECUTIVE CABINET ACCOMPLISHMENTS

- **Strategic Plan Implementation —** Assisted the Chancellor along with other Executive Cabinet members to develop and implement strategies to achieve the goals outlined in the 2020 Strategic Plan. Under the chancellor's leadership, we met or exceeded goals ranging from increased enrollment, academic quality and degree completion, diversity, research and external funding, philanthropic and reputational achievements as well as sustainability and financial stability.
- **Student Enrollment –** With student enrollment up 5.2% since 2015 and the diversity of the 2020 incoming class up to 40% compared to 26% in 2010, worked with colleagues in creating expanded classroom,

laboratory and experiential learning opportunities. Established the Immersive Scholars program that provided research, international, and other experiential learning opportunities for rising sophomores – resulting in recruitment, retention, and student success. Established partnerships with entities supporting K-12 such as Project Lead The Way and Mass STEM Hub to diversify the pipeline.

- **Diversity, Equity, and Inclusion —** Serve as co-chair of the steering committee for the university's Council on Social Justice and Inclusion, leading efforts to continue to strengthen the university's open and welcoming culture and ensure opportunities for success and belonging for all groups. Since 2010, student diversity has increased more than 97% and diversity among employees is up 100%. Work with the Executive Cabinet to implement Strategic Plan 2020 subcommittee recommendations around diversity, equity and inclusion and to finalize a Diversity Action Plan consistent with our aspirations.

- **Growth of the University Physical Footprint —** Serve on the "Space Committee" that has responsibility for strategy and oversight for physical infrastructure. Working with finance, facilities and academic affairs, contribute to the modernization of university buildings, classrooms and labs for faculty, staff, and students. Achieved unique solutions that integrated our corporate, government and non-profit partners for the benefit of all. Some 2 million square feet has been added during the last decade. Given the combination of new buildings and buildings sorely in need of renovation, many creative solutions were generated to align moves and projects with funding availability, while over time, achieving reasonable equity in space quality.

- **Pandemic Response —** Established protocols and polices around remote learning and university community access in Spring 2020 followed by the gradual build-up of on-campus instruction, access, and student housing during the next three semesters. Served on the Massachusetts Manufacturing Emergency Response Team (only UMass Lowell, MIT, and WPI were university representatives). For testing, represented the University in system meetings and led the organization of surveillance testing with the Broad Institute. In parallel, augmented our options by establishing a COVID-19 PCR testing lab with UMass Lowell faculty and students. Explored wastewater testing, but determined the sampling options would not lead to actionable information. As a close partner with the Commonwealth, conducted Personal Protective Equipment testing during the pandemic and coordinated the support of faculty research efforts around multiple aspects of detecting and preventing the spread of COVID-19 and health communication.

- **Finance –** Increased and diversified revenue streams, including increasing research and development funding by more than 50% between 2012 and 2021 to a total of $95 million. As part of the Executive Cabinet, developed and implemented strategies to address budget challenges due to COVID-19, as well as utilization of federal funds in the recovery.

- **Advancement –** Engaged donors, corporate partners and alumni as part of the university's $165M Our Legacy, Our Place Campaign. Led efforts for federal, state, and industry support for major capital projects and R&D infrastructure, including the vision for the Saab Emerging Technologies & Innovation Center, and the 110 Canal Innovation Center.

HIGHLIGHTS from my VICE CHANCELLOR and VICE PROVOST for RESEARCH ACCOMPLISHMENTS

Developed Strong, Strategic, and Innovative Relationships with Government, Industry, and Academia

- **HEROES Initiative with the Natick Soldier RD&E Center** – Working with key faculty and NSRDEC partners (e.g., Nagarajan, Samuelson, Drew), leveraged shared research space vacated by the Nanomanufacturing Center move to the Saab ETIC to create a strategic co-location relationship with NSRDEC. The initiative has led to more than $25M in new R&D funding and over $1M in direct ORISE funding to UMass Lowell postdocs

and students in the past five years. Over 30 faculty in engineering, sciences, business, health sciences, and FAHSS are benefitting directly from HEROES, and the success has been leveraged for future opportunities (see Fabric Discovery Center). With combined business and technology teams, a mini-"Shark Tank" event, and partnering with companies, new discoveries are moving towards application.

- **Printed Electronics Research Collaborative (PERC) and Raytheon-UMass Lowell Research Institute (RURI)** – Brought together key pieces, including: (i) new state R&D matching fund (worked to obtain one of the first two awards, $4M from the MA Technology Collaborative); (ii) key faculty (e.g., Armiento, Akyurtlu, McCarroll) and university connections with Raytheon (established an agreement leading to ~$10M in facilities use fees and sponsored research); and (iii) new research space in the Saab ETIC that made possible the innovative concept of co-location of industry and university researchers. PERC/RURI and the Nanomanufacturing Center both provide foundations for future opportunities with the national Flexible Hybrid Electronics Manufacturing Innovation Institute and future federal R&D centers. In 2019, UMass Lowell became the 2nd highest academic source of new hires for Raytheon in the US.
- **Fabric Discovery Center** – Led UMass Lowell team of faculty and technical program managers (e.g., Nagarajan, Yanco, Mead) in successfully pursuing $10M in state funding to build out and equip the 1st and 2nd floors of 110 Canal. This Center is touted nationally as the first to integrate 3 Manufacturing USA Institutes (AFFOA, NextFlex, and ARM) to address smart textiles, flexible electronics, and robotics. The Center includes a pilot manufacturing and test facility that will benefit faculty and industry/govt partners in fields such as materials, medical textiles, wearable electronics, sports apparel, fashion design, sustainability, etc.
- **NERVE (Robotics) Center** – Supported establishment of the New England Robotics Validation and Experimentation Center to leverage existing faculty expertise (e.g., Yanco) and provide unique capabilities leading to competitiveness for larger and longer-term funding. NERVE became a key component of the Fabric Discovery Center and was one of only two universities awarded the NASA "Valkyrie" humanoid robot for R&D (the other was MIT). New hires in Physical Therapy are teaming with NERVE to expand new research in rehabilitation, human performance augmentation, and related themes. NERVE is also a key member of the new NSF AI center with Georgia Tech, Carnegie-Mellon, and others.
- **110 Canal Innovation Center –** Integrated the 4 floors (M2D2 – medical device and biotech incubator; iHub – technology incubator; FDC and NERVE) to create a vibrant, interdisciplinary platform that can support activities from basic research to applied research to startups and commercialization. This vision serves as a microcosm of what we envision for East Campus and is often used to showcase the University's innovation.
- **Massachusetts Life Sciences Center** – Secured $10M in funds for the NanoFabrication Lab (clean room) and 3rd floor build-out of the Saab ETIC from the MLSC, to expand our capabilities in nanomedicine and pharmaceutical sciences. This first major grant helped initiate our Core Research Facilities structure. Supported other capital grants to the University for equipment for the Core Research Facilities.
- **Massachusetts Clean Energy Center** – Supported Center for Wind Energy (and the NSF WindSTAR IUCRC) in obtaining MassCEC funds for partnering with the Wind Technology Testing Center (unique national facility in Charlestown, MA) and educational efforts. Established a partnership with Greentown Labs, the largest cleantech incubator in North America. Secured a $1.2M grant to move the expertise and equipment from the Fraunhofer Center for Sustainable Energy and build out a new lab to maintain this capability in the Commonwealth.
- **Rist Institute for Sustainability and Energy** – Supported initial major Office of Naval Research program on energy resilience with Stony Brook ($10M) and partnership with Avangrid/Central Maine Power ($5M). Helped with the vision of combining the Energy research, Climate Change Initiative, and Office of Sustainability under one umbrella.

- **UML Applied Research Center (UMLARC) and NEXUS** – Established a 501c3 non-profit organization to enable the participation and contribution of R&D and educational efforts in a more applied setting. Utilized this structure to establish the NEXUS, with $1.5M in support from the MassTech Collaborative and MassDevelopment for the build out. The NEXUS represents a new mechanism to bring together representatives from the Army, Air Force, Navy, Marines, Special Operations, National Guard, Reserves, etc. to communicate needs, and to facilitate teaming amongst the academics, startups, small businesses, non-profits, and primes to solve these challenges. The goals also include educating the young leaders (e.g., ROTC, H4D) and current military/civilian staff in new areas such as digital engineering, AI, cybersecurity, and entrepreneurial thinking. In recognition of my contributions towards creating this NEXUS vision and communicating it to national leaders – e.g., Deputy Secretary of Defense Kathleen Hicks (with Senators Warren and Markey), Chief of Staff of the Army General James McConville, Army Futures Command Lt General James Richardson and Lt General Thomas Todd -- I was recognized with the 4th highest civilian award by the Army.

Facilitating and Expanding Research and Research Funding

- **Research Awards and Expenditures continue to increase –** Annual research expenditures have increased by 58% from FY12-FY21, reaching $95M this past year. Many of these increases are the result of the foundations established in the strategic partnerships described above and the internal programs below.
- **Success with UMass President's Office funding (S&T, Creative Economy, Technology Development Fund) –** Through active advising, the Lowell campus has had more than its proportional share of success in the UMass system funding programs. For example, in the first half of the last decade, 20 of the 56 Creative Economy awards and 12 of 33 CVIP Technology Development Fund awards have gone to UMass Lowell faculty. UMass Lowell S&T awardees (e.g., Wind Energy, Biopharmaceutical Manufacturing, NERVE, HEROES) have leveraged their S&T funds for significant federal funding. Unfortunately, the S&T and CE programs were eliminated due to budget constraints.
- **Opportunities to foster collaboration and celebrate research –** Both the faculty research symposium and the student research symposium have expanded greatly over the last decade, each with over a hundred participants annually. The symposia continue to evolve and improve, with for example, the addition of faculty lightning talks, alumni judging of student posters, 3-min student videos, and broad representation of all disciplines.
- **Enlightened Bites and Research Development --** Created programs such as the CAREER proposal development workshop and a regular seminar series (Enlightened Bites) to provide information on everything from funding opportunities to technology commercialization to BuyWays to international programs. These have been especially beneficial for new faculty.
- **Centers and Institutes –** The Centers and Institutes structure has evolved to encourage fewer but more substantial centers. The vision is that University Research Centers and Engagement Centers have a role to foster community that will lead to greater opportunities for faculty, staff, and students and greater visibility for the University. Larger, multi-disciplinary centers with critical mass will be more sustainable and more visible nationally by pooling administrative resources, hosting prestigious visitors and events, sharing information on opportunities, and attracting stronger faculty and student applicants.

Strengthening Research Infrastructure

- **Core Research Facilities (CRF) –** Recognizing the challenge of rapidly increasing costs of purchasing and maintaining advanced research instrumentation, established the core research facilities to increase

utilization by faculty and by outside users to offset costs. Cores included capabilities in materials characterization, microfabrication, thermal and mechanical properties, gene sequencing, imaging, and more. **Revenues continue to grow, exceeding $2M in FY21, a 58% increase over the previous year.** Faculty and student use remains the majority at 58% of orders, while only representing 33% of the revenues due to reduced charges for internal users. Industry users represent 130 accounts and 287 separate users. The CRF structure provides professional technical management of the instruments to assist with training, reduce maintenance downtime and cost, and foster connections between internal and external users with common interests. New CRFs are planned, depending on the evaluation of the business case (e.g., faculty need, external users).

- **Startup packages -** Availability of major research instruments to the University community has been an emphasis in startup negotiations with new faculty. Access to the CRFs has reduced the need for purchasing new equipment for individual faculty labs. Major new research instruments requested as part of startup packages or through federal programs are assessed for potential use by other faculty and when possible included in CRFs to provide increased use, management, and maintenance.
- **Shared labs –** The hiring of new, research-active faculty that are typically replacing faculty with limited or no research activity has been a challenge for existing facilities. As renovations are proposed, there is an emphasis on creating more shared labs. Larger labs shared by roughly 2-5 faculty have been used to reduce per square foot costs, encourage collaboration and interaction of students, foster sharing of equipment, and allow for more gradual future expansion and contraction of research groups. Examples have been the new shared labs in Perry, Falmouth, Pinanski, and Riverview.
- **Technical Program Managers (TPM) –** Even with the difficult and very competitive funding climate, our faculty have been productive in securing grants. To increase research funding to the next level, we need to add staff who can have a multiplying effect on faculty efforts. Technical Program Managers who have experience in industry and/or with federal grants can assist in proposal development, representing us at meetings, and following up on contracts and reporting. We have seed funded TPMs to assist major centers/groups of faculty. These TPMs have already been extremely productive and beneficial to the faculty groups across multiple colleges.

Research Administration and Compliance

- **Responding to increasingly complex and strict federal regulations –** As the federal government continues to expand the regulatory environment and increase attention on a wide range of compliance and proposal submission requirements, the Office of Institutional Compliance (now the Office of Research Integrity) and the Office of Research Administration have developed new processes to meet these mandated requirements. In addition, the greater range of research undertaken at the University has added complexity. This includes export control, conflict of interest, human subjects research, and biosafety on the compliance side. For research administration, this has led to a need for tighter review and negotiation of contracts and for internal deadlines to ensure review of proposal requirements. .
- **Responding to scale-up challenges –** We will be implementing a new electronics research administration system (Kuali) to address the higher activity levels in a more efficient and effective way as we continue to grow. We have utilized external experts such as Huron and Hanover to provide benchmarking and strategic advice on our growth to R1. One part of the solution is moving from a fully centralized structure to a hybrid structure that includes more college, departmental, and center research administration staff.

Technology Transfer and Economic Development

- **New Ventures Development –** As part of the increased opportunity for faculty startups, a new position of New Ventures Development Director was created several years ago. NVD has successfully built up several new programs. For example, UML has received more than 8 NSF I-Corps grants that help faculty inventions move towards market viability and train graduate students and postdocs on technology commercialization. NVD has also supported a NSF Partnership for Innovation grant on technology development, and several SBIR/STTR proposals. Most notably, NVD has created the River Hawk Venture Fund, garnering the support of alumni to provide funding for startup companies with connections to the University community.
- **Technology Commercialization –** We have been successful with several patents, but the largest is the successful acquisition of Anterios, a startup based on UML technology. The acquisition resulted in >$1M to the University. The Office of Technology Commercialization and NVD are working closely with the Manning School of Business to increase the number and competitiveness of university inventions moving towards commercialization.

Diversity

- **Diversity in STEM –** An area of concern for the University is the current imbalance in female and male students because of the growing enrollments in STEM and business majors. To address this imbalance in the long term, for the University and the nation, the diversity in these fields needs to increase. I have been a core member of the team that was awarded a ~$3.5M NSF ADVANCE Institutional Transformation grant on WAVES (Women Academics Valued and Engaged in STEM). An earlier NSF ADVANCE submission was awarded $750K to create a metric for subtle gender bias.
- **National leadership in STEM diversity –** Based on our partnership with Queen's University Belfast, we learned of the UK Athena SWAN program, a national higher education rating system for improving the environment for women in STEM. We worked with AAAS, the White House OSTP, and NSF to develop a national rating system for diversity in STEM. This SEA (STEM Equity Achievement) Change award was formally initiated in 2019 by AAAS, with UMass Lowell one of the first three recipients. Based partly on my work in STEM diversity and my own research in fibers and composites, I was awarded an honorary degree by Queens University Belfast.

Professional Awards and Honors

2021	Department of the Army, Public Service Commendation Medal (4th highest civilian honor)
2019	Honorary Degree, Queens University Belfast (June 2019)
2018	Museum of Science, Boston, Women in Science and Engineering Speaker Series
2016	Massachusetts Commission on the Status of Women, Unsung Heroines of Massachusetts
2012	Lowell Sun Salute to Women Honoree
2008	Invited testimony, US House of Representatives, Committee on Science and Technology, Subcommittee on Research and Science Education, "The Transfer of National Nanotechnology Initiative Research Outcomes for Commercial and Public Benefit", March 11, 2008
2008	Invited Participant, NSF workshop on Grand Challenges in Bio and Nanomanufacturing
2005	National Academy of Engineering, German-American Frontiers of Engineering Program
2002	Invited Participant, US-Italy Workshop on Nanomaterials, Washington, DC (March)
2002	Invited Participant, NSF-EC Wksp on Nanomanufacturing and Processing, San Juan, PR (Jan)
2002	National Academy of Engineering, Frontiers of Engineering Program (goal is to bring together outstanding leaders from industry, academia, and government labs; participation limited to 100 engineers, age 30-45.

2001 International Advisory Board, International Journal of Forming Processes
2001 Editorial Advisory Board, Journal of Composite Materials
1999 International Advisory Committee, Polymer Composites '99, International Symposium on Polymer Composites Science and Technology, Society of Plastics Engineers
1998 Invited Participant, First Korea-US Seminar on Composite Materials
1998 International Conference on Composites Engineering (ICCE/5) Distinguished Lecture

Teaching Awards

2009 UML Student Government Association Exceeding Excellence in Teaching Award
2008 UMass Lowell Mechanical Engineering Departmental Teaching Award
2000 UML Engineering Student Council Outstanding Teacher Award
1999 UMass-Lowell Mechanical Engineering Departmental Teaching Award
1994 Boston University Engineering Professor of the Year

Academic Honors

- Tau Beta Pi, *Engineering Honor Society*
- Pi Tau Sigma, *Mechanical Engineering Honor Society*
- Sigma Xi, *Scientific Research Society*
- MIT Senior Scholar-Athlete (1986), *top student-athlete in the senior class*
- GTE Academic All-American, First Team (1986), *recognized nationally as an outstanding student-athlete in both field hockey and softball*
- Xerox Corporation Scholarship(1984), *undergraduate engineering scholarship*
- Digital Equipment Corporation Scholarship(1983), *undergraduate engineering scholarship*
- Presidential Scholar(1982), *one of two students selected from each state*

PROFESSIONAL ACTIVITIES

Membership on Editorial and Peer Review Boards

Member of **National Science Foundation** Proposal Review Panel for

- Civil, Mechanical and Manufacturing Innovation – Division review panel (Committee of Visitors, 2012)
- Engineering Education and Centers – Division review panel (Committee of Visitors)
- Nanoscale Science and Engineering Centers – Center review panels
- Engineering Research Centers -- Center review panels
- Civil, Mechanical, and Manufacturing Innovation (CMMI, merged division of DMII and CMS) – Committee of Visitors, Chair; panel reviewer
- Design, Manufacture, and Industrial Innovation (DMII)
- Civil and Mechanical Systems (CMS)
- Chemical, Bioengineering, Environment, and Transport
- Research Experiences for Undergraduates
- Instrumentation and Laboratory Improvement, Course and Curriculum Development
- Small Business Innovation Research Grants

Member of Review Panels for:

- NRC/National Academies – 21st Century Truck Partnership
- NRC/National Academies – Review of NIST Manufacturing-related Programs
- NRC/National Academies – DOD Study: Benchmarking the Technology and Application of Lightweighting

- National Academies Army Research Laboratory Technical Assessment Board (ARL) – Air and Ground Vehicle Technology
- Department of Energy – Nanomanufacturing for Energy Efficiency
- Air Force Office of Scientific Research (**AFOSR**) - Mechanics of Materials and Structural Mechanics
- National Institute of Health (**NIH**) – Rehabilitation Medicine SBIR/STTR

Journal Reviewer for:

- Journal of Composite Materials (**Editorial Advisory Board**)
- International Journal of Forming Processes (**International Advisory Committee**)
- Composites Manufacturing (Composites Part A, Applied Science and Manufacturing)
- Composites, Part B, Engineering
- Journal of Nanoparticle Research
- Polymer Composites
- Polymer Engineering and Science
- Journal of Applied Mechanics
- Textile Research Journal
- TAPPI Journal

Membership in Professional Societies:

American Society for Mechanical Engineers (ASME)

- Technical Program Chair (ASME-IMECE ’10)
- Congress Steering Committee (2008-2014)
- Symposium Co-Organizer (ASME-IMECE ’03, Design and Manufacturing of Composites)
- Symposium Co-Organizer (ASME-IMECE ’02, Design and Manufacturing of Composites)
- Symposium Co-Organizer (ASME-IMECE '96, Design and Manufacturing of Composites)
- Materials Division, Composites Committee Vice-Chair (2004-2005)
- Materials Division, Composites Committee Chair (2005-2006)
- Materials Division, Executive Committee, Secretary/Treasurer (2008-2010)
- Materials Division, Executive Committee, Vice-Chair (2011), Chair (2012)

American Society for Composites (ASC)

- Co-Organizer, International Symposium on Affordable Composites Manufacturing, 2000
- Polymer Matrix Composites Committee Member

European Scientific Association for Material Forming (ESAFORM)

- Mini-Symposium Organizer (ESAFORM 2002)
- Session Chair

The Fiber Society

- elected Governing Council Member, 1999-2002
- Student Award Committee Chair, 1999
- Student Award Committee, 1997-1999

American Society for Engineering Education (ASEE)
Society for Advancement of Materials and Process Engineering (SAMPE)
American Institute for Aeronautics and Astronautics (AIAA) (1991-1995)
Technical Association of the Pulp and Paper Industry (TAPPI) (1989-1992)
International Nonwovens and Disposables Association (INDA) (1989-1991)

RESEARCH

1. **Grants and Contracts (representative examples below):** Principal Investigator on grants totaling over $10M, co-PI on an additional $15M in grants (full listing available upon request). Primary contributor to over $50M in state and federal funding to UMass Lowell. Funding received from federal agencies (NSF, DOD), state agencies, and private companies.

Institutional Grants and Contracts (examples)

- Fabric Discovery Center (1st in the US integration of AFFOA, NextFlex, and ARM) (with Ram Nagarajan, Joey Mead, Holly Yanco, and others), Massachusetts Manufacturing Innovation Initiative (M2I2), $10M
- Printed Electronics Research Center ($4M) and Raytheon UMass Lowell Research Institute ($10M) (with Craig Armiento, Alkim Akyurtlu, et al.)
- Avangrid/Central Maine Power ($5M) (with Chris Niezrecki)
- HEROES ($25M+) (with Ram Nagarajan)
- ONR Energy Resilience with Stony Brook ($10M+) (with Chris Niezrecki)
- Mass Clean Energy Center – Fraunhofer ($1.2M)
- Nano-Bio Labs in Saab ETIC (with multiple faculty and staff), Massachusetts Life Sciences Center, $10M (2017-2018)

Research Grants and Contracts (examples)

- **EDA-Massachusetts Manufacturing Emergency Response Team (MERT 2.0) (PI,** with MIT, WPI, MassTech, MassMEP, MassRobotics, FORGE, AFFOA), $3.4M ($4.3M total project) (2021-2023)
- **ADVANCE-Institutional Transformation: Making WAVES – Women Academics Valued and Engaged in STEM (co-PI,** with Moloney, Bond, Sobkowicz-Kline, Ruths, Haynes-Baratz, et al.), NSF, $3.5M (2016-2021)
- **Creating a National Higher Education Rating System for STEM Equality Achievement (SEA)**: *The SEA Change Workshop -- expanding Diverse Talent in STEM to Strengthen the Nation* (co-PI, with Rayman, Wong, Malcolm), NSF, $44,614 (2016-2018)
- **Collaborative Research: Institutional Networks and Continuous Learning to Undo Effects of Micro-Inequities on Women (PI,** with Tran, Ho, Bond, Rayman, et al. UMass Medical), NSF, $390,910 (2012-2015)
- **Effect of Manufacturing-Induced Defects on Reliability of Composite Wind Turbine Blades (PI,** with Niezrecki, Sherwood, Avitabile), Department of Energy, $497,321 (2009-2012)
- **Collaborative Research: Microscale Joining Using Nanoheater Structures (co-PI**, with Z.Gu, Northeastern, Tufts)**,** National Science Foundation, $242,956 (9/10-8/13)
- **Manufacture of Semi-Permeable Coatings on Textiles** (**co-PI**, with Dr. Jun Lee)
  EIC Labs (ARMY SBIR PHASE II), $134,569 (5/09-4/11)
- **Industrial Safety of Nanoheaters (PI,** with Z. Gu, et al.**)**
  National Science Foundation, $589,776 (collaborative with Northeastern, Tufts) (9/07-8/09)
- **Nanomanufacturing of Multifunctional Sensors** (**co-PI**, with Professors Joey Mead and Carol Barry, multiple faculty), Army Research Lab/WMRD, $9,000,000 (9/07-8/11)

- **Linking Process-Induced Properties to Thermoplastic-Matrix Woven-Fabric Composites Performance** (**Co-PI**, with Jim Sherwood (PI) and Larissa Gorbatikh), National Science Foundation, $360,000 (9/05-8/09)
- **Nanomanufacturing Center of Excellence** (**PI**, with Carol Barry and Joey Mead, multiple faculty), Massachusetts Technology Collaborative, $4,955,120 (7/05-6/10)
- **MRI: Acquisition of a 3D Scanning Laser Vibrometer** (**co-PI**, with Professors Niezrecki (PI), Avitabile, Sherwood, and Kurup) National Science Foundation, $491,575 (7/07-6/08)
- **Deformation Measurement and Modeling of Parachute Fabric Using Imaging and Smart Material Sensors** (**co-PI**, with Professors Niezrecki (PI) and Niemi), Natick Soldier Center, $103,128 (3/06-5/07)
- **US-Japan Young Researchers Exchange Program in Nanomanufacturing and Nanotechnology (PI),** National Science Foundation, $69,837 (3/06-2/07)
- **Multifunctional Composites** (**PI**, with Professors Avitabile and Sherwood)
  NASA SBIR Phase II through EIC Laboratories, $136,268 (2004-2006).

Note that as a Program Director at NSF (2002-2004), I was not allowed to be a PI or co-PI on any federal grants. My students, however, were active in several new grants from NSF, Kazak Composites, Aerogel Composites, Triton Systems, etc. (in most cases with Professor James Sherwood as PI)

- **Interface Effects in High Volume Nanoscale Processing of Polymers** (co-PI with J. Mead (PI) and C. Barry), NSF, $388,893 (4/02-3/05)
- **Intelligent Material and Process Design for Stamping of Structural Composites, (PI,** with Northwestern/J. Cao), $322,025, (4/99-3/02)
- **Substrate-Coating Interaction in Coated Fabrics (PI,** with UC-Davis and UMass Dartmouth), National Textile Center), $280,000 (5/00-4/03)

2. Academic & Professional Publications

- **Refereed Journal Publications and Refereed Conference Papers:** Over 45 refereed publications and over 40 additional conference publications in composites, materials, and manufacturing (representative examples below – most with students as first author, full list available upon request).

1. Goldberg, M., Manzi, A., Aydin, E., Singh, G., Khoshkenar, P., Birdi, A., LaPorte, B., Krauskopf, A., Powell, G., **Chen, J.**, and Langer, R., "Development of Nanoparticle-embedded Chitosan Sponge for Topical and Local Administration of Chemotherapeutic Agents," *J. Nanotechnology in Engineering and Medicine*, 5(4), 2014.
2. LeBlanc, B., Niezrecki, C., Avitabile, P., **Chen, J.**, Sherwood, J. A. Damage detection and full surface characterization of a wind turbine blade using three-dimensional digital image correlation. *Structural Health Monitoring, 12*(5-6), 430-439, 2013.
3. Gu, Z., Cui, Q., **Chen, J.,** Buckley, J., Ando, T., Erdeniz, D., Wong, P., Hadjiafxenti, A., Epaminonda, P., Gunduz, I. E., Rebholz, C., Doumanidis, Charalabos C., "Fabrication, characterization and applications of novel nanoheater structures". *Surface & Coatings Technology*. Vol. 215, p.493-502, 2013.
4. Fetfatsidis, K.A., Gamache, L.M., Gorczyca, J.L., Sherwood, J.A., Jauffrès, D., **Chen, J.**,"Design of an apparatus for measuring tool/fabric and fabric/fabric friction of woven-fabric composites during the thermostamping process". *International Journal of Material Forming, 6 (1), pp. 1-11,* 2013.

5. Clay, M., Cui, Q., Sha, Y., Chen, J., Rondinone, A.J., Wu, Z., **Chen, J.,** Gu, Z**.** (2012) Galvanic synthesis of bi-modal porous metal nanostructures using aluminum nanoparticle templates. *Materials Letters, 88, pp. 143-147,* 2012.

6. Favini, E., Agnihotra, S., Surwade, S.P., Niezrecki, C., Willis, D., **Chen, J.,** Favini, E., Agnihotra, S., Surwade, S.P., Desabrais, K., Charette, C., Manohar, S.K. (2012) Sensing performance of electrically conductive fabrics and suspension lines for parachute systems. *Journal of Intelligent Material Systems and Structures, 23 (17), pp. 1969-1986,* 2012.

7. Wu,N.; Zou,X.; Tian,Y.; Fitek,J.; Maffeo,M.; Niezrecki,C.; **Chen,J.**; Wang,X., "An ultra-fast fiber optic pressure sensor for blast event measurements". *Measurement Science and Technology*, 23(5), 2012.

8. Sargent,J, Chen,J, Sherwood,JA, Cao,J, Boisse,P, Willem,A, Vanclooster,K, Lomov,SV, Khan,M, Mabrouki,T, Fetfasidis,K, and Jauffres,D, "Benchmark Study of Finite Element Models for Simulating Thermostamping of Woven-Fabric Reinforced Composites," *Intl J. Matl Forming*, v.3, 683-686, 2010.

9. Cui,Q., Jogdand,H., Chen,J., and Gu, Z. "Structure and Ignition Properties of Nanoheaters Formed by Bimetallic Al-Ni Reactive Nanostructures", *Mater Res. Soc. Symp. Proc.*, 2009, *1148*, 1148-PP09-14

10. Cao, J., Akkerman, R., Boisse, P., Chen, J., and H.S. Cheng, E.F. de Graaf, J.L. Gorczyca, P. Harrison, G. Hivet, J. Launay, W. Lee, L. Liu, S.V. Lomov,A. Long,E. de Luycker,F. Morestin,J. Padvoiskis,X.Q. Peng,J. Sherwood,Tz. Stoilova,X.M. Tao,I. Verpoest,A. Willems,J. Wiggers,T.X. Yu,B. Zhu (benchmark paper), "Characterization of mechanical behavior of woven fabrics: Experimental methods and benchmark results," *Composites Part A*, 2008.

11. Gorczyca, J., Sherwood, J. and Chen, J., "Development of a Friction Model for Use in the Thermostamping of Commingled Glass-PP Woven Fabrics," *Comp Part A*, 38, p. 393-406, 2007.

12. Farboodmanesh S., Chen J., Mead J. and White K., "Effect of Fabric Construction on Mechanical Behavior of Rubber Reinforced Fabric", *Rubber Chemistry and Technology*, Vol. 79(2) Pages 119-216, 2006

13. Liu, L., Chen, J., Li, X., and Sherwood, J.A., "Two-dimensional Macro-Mechanics Shear Models of Woven Fabrics," *Composites Part A,* 36, pp.105-114, 2005.

14. Liu, L., Chen, J., Gorczyca, J.L., and Sherwood, J.A., "Modeling of Friction and Shear in Thermostamping of Composites – Part II," *J. Composite Matls*, 38(21), pp.1931-1947, 2004.

15. Gorczyca, J., Sherwood, J., Lu, L. and Chen, J., 2004, "Friction and Shear in Thermostamping of Composites - Part I", *Journal of Composite Materials*, Vol. 38, p. 1911-1929, 2004.

- **Books and Chapters**

1. Farboodmanesh, S., Chen, J., Tao, Z., Mead, J., and Zhang, H., "Base Fabrics and Their Interactions in Coated Fabrics" in Smart Textile Coatings and Laminates, ed. W.C. Smith, Woodhead Publishing, 2010.

2. Chen, J. and Sellers, K., "Overview of Manufacturing Processes," in Nanotechnology and the Environment, ed. K. Sellers, Taylor and Francis, 2008.

3. Gorczyca-Cole, J.L., Chen, J., and Cao, J. "Benchmarking of composite forming modeling techniques," in Composites Forming Technologies, ed. A.C. Long, The Textile Institute, CRC Press, Woodhead Publishing, 2007.

4. Barry, C., Chen, J., Mead, J., and Schmidt, D., "Multiscale Processing of Polymers and Nanocomposites," in Materials Processing Handbook, ed. J. Groza, CRC Press, 2007.

5. Schmidt, D., Mead, J., Barry, C., and Chen, J., "Nanomanufacturing with Polymers", in Handbook of Plastics Technologies, ed. C.A. Harper, McGraw-Hill, 2006.
6. Barry, C., Chen, J., and Mead, J., "Nanomanufacturing Processes using Polymeric Materials," in Nanomanufacturing Handbook, ed. A. Busnaina, CRC Press, 2006.
7. Bunyan, N., Chen, J., Chen, I., and Farboodmanesh, S., "Electrostatic Effects on Electrospun Fiber Deposition and Alignment," in Polymeric Nanofibers, ed. D. Reneker, Amer Chemical Society, 2006.
8. Chen, J. , "Overview of US Academic Research," in Nanotechnology: Science, Innovation, and Opportunity, ed. L.E. Foster, Prentice-Hall, 2005.

- **Patents**

1. C.C. Doumanidis, J. Chen, T. Ando and C. Rebholz, "Nanoheater Elements, Systems and Methods of thereof", PCT Application No. US/2007/017524 (filed on August 7, 2007);US Provisional Patent Application (filed August 7, 2006), University of Massachusetts, Lowell, *USA*.
2. Z. Gu, Q. Cui, and J. Chen, **"**Methods for the Preparation of Nickel Nano-shell Particles and Aluminum-Nickel Core-shell Nanoparticles and Their Applications", Provisional Patent filed, Spring 2009 (*CVIP Technology Development Fund award*)
3. R. Nagarajan, S. Balasubramaniam, J. Chen, and J. Mead, "Novel Low Temperature Processable Metallic Inks", Provisional Patent filed Spring 2009. (*CVIP Technology Development Fund award*)

INSTRUCTION RELATED ACTIVITY

1. Teaching

a. Undergraduate Courses:

22.212	Mechanics of Materials (sophomore)
22.296	Mechanical Behavior of Materials (sophomore)
22.311	Applied Strength of Materials (junior)
22.423	Senior Capstone Design (seniors)
49.110	Future of Work (team taught)

b. Graduate Courses:

22.478/578	Advanced Materials
22.596	Composite Materials
22.697	Structural Applications of Composite
22.519	Mechanical Behavior of Materials – New Materials

c. Courses Taught at Boston University:

Mechanics and Design of Advanced Composite Materials (graduate)
Plates and Shells (graduate)

Mechanics of Materials
Engineering Mechanics -- Statics and Dynamics
Engineering Mathematics
Polymer Processing -- directed study

1996 ASME Fundamentals of Engineering Review – created review materials and videotaped section on "Statics" for a series of review videotapes for the Fundamentals of Engineering exam. Passing the exam is the first requirement for becoming a registered Professional Engineer.

2. Other Activity and Accomplishments Related to the Instructional Function

a. Graduate Students

1. Primary thesis advisor:

2016	Wei, Siqi	Electrospinning of inorganic and composite nanofiber films (PhD) [FLIR]
2015	Goldberg, Manijeh	Chitosan Sponge Embedded with Nanoparticles for Topical Mucosal Delivery (PhD, BMEBT) [Privo Technologies]
2010	Buckley (Pelealuw), Jacqueline	Thermal modeling and characterization of composite nanoheaters (MS) [GE]
2010	Fitek, John	Dynamic response of composites (MS) [Natick Soldier Systems Ctr]
2010	Patel, Shardul	Microchannel flow (project) (MS) [Varian Semiconductor]
2008	Farboodmanesh, Samira	Patterned electrospun nanofibers for tissue scaffolds (PhD) [Millipore]
2008	Jogdand, Harshawardhan	Thermal and microstructural characterization of nanoheaters (MS) [Hypertherm]
2005	Liu, Lu	Formability of structural thermoplastic textile composites (D.Eng) [Spaulding Composites]
2003	Bunyan, Navin	Control of deposition and orientation of electrospun fibers (MS) [HP]
2003	Farboodmanesh, Samira	Substrate-coating interactions in shear of coated fabrics (MS) [UML PhD program]
2002	Chow, Samuel	Frictional interaction between blank holder and fabric in stamping of woven thermoplastic composites (MS) [Intrinsic Therapeutics]
2002	Lussier, Darin	Thermal effects in stamping of thermoplastic composites (MS) [Pratt&Whitney]
2001	Bulusu, Anuradha	Modeling of architecture and deformation of dry woven fabrics during shear (MS) [Univ of Texas, Arlington, PhD program]
2001	DaSilva, Robert	Characterization and model development of non-embedded linear braided textile structures (MS) [Pratt&Whitney]
2000	King, Michael	Fatigue behavior of tapered sandwich composites (MS) [Kazak Composites]
1999	Hong, Eugene	Energy absorption of composite sandwich structures during low-velocity impact (MS) [Quality Engineering Associates)

1998	Krauss, Gordon G.	Ultrasonic NDE of bonded composite structures (PhD, ME, Boston Univ) [Ford Motor Co.]
1997	McBride, Timothy M.	The large deformation behavior of woven fabric and microstructural evolution in formed textile composites (PhD, ME, Boston Univ) [Texas Instruments]

2. Thesis committee member:

2021	White, Kari	Characterization of Temperature-Dependent Material Properties of Thermoplastic Lamina for the Finite Element Modeling of Composite Thermoforming (PhD)
2011	White, Kari	Composite sandwich panel attachment failure (MSME)
2007	Gravelle, Nathan	Critical Comparison of Steel and Composite Beams in a Side Impact using Finite Element and Experimental Analysis (MSME)
2007	Gamache, Lisa	Design of a Self-Contained Test Apparatus for the Characterization of Fabric Friction during the Thermostamping Process (MSME)
2005	Li, Xiang	Material characteristics of woven-fabric composites and finite element analysis of the thermostamping process (D.Eng ME)
2004	Gorczyca, Jennifer	A study of the frictional behavior of a plain-weave fabric during the thermostamping process (D.Eng, ME)
2005	Tao, Zhenhong	Failure studies on rubber and rubber composites (D.Eng. PL)
2005	Wei, Ming	Phase morphology control in electrospun nanofibers from the electrospinning of polymer blends (D.Eng, PL)
2002	Suwapaet, Nuchida	Design for Reliability,: Remote Communication System Using Solar Power (MSME)
2001	Buso, Patricia	Finite Element Modeling of Co-Mingled Glass/Thermoplastic Fabrics for Low-Cost/High-Volume Composites Manufacturing (MSME)
2001	Shetty, Malar Rohith	(co-advisor with Prof Steve McCarthy) [Nypro]
2000	Gorczyca, Jennifer	Applications of CAE and the Finite Element Method for Automobile Door Design (MSME)
1999	Palmer, Chris	Tactile pressure sensors technology applications to geotechnical engineering
1997	Rocca, Derek	Application of state variable modeling and nonlinear finite element analysis to the impact of steel projectiles into thin polycarbonate lenses

4. Undergraduate Research

2008-2009	Rondeau, Nichole	Nanoheaters
2008-2009	Radik, Zeke	Nanoheaters
2008	Phamduy, Paul	Nanoheaters
2008-2009	Winchester, David	Composite forming
2007-2008	Pelealuw, Jacqueline	Electrospinning (BS/MS student in Composites)
2007-2008	Cloutier, David	Nanoheaters (BS/MS student in Vibrations)
2005-2007	Mooskian, John	Electrospinning (Portsmouth Naval Yard)
2005-2007	Cushman, Jamie	Braiding of blood vessels (GE)

2001-2002	Stevens, Kari	Shear behavior in coated fabrics (BS/MS student)
2002-2003	Morand, Chris	Automated, mechanized loom (Mentis Sciences)
2000-2001	Paquin, Brad	Composite impact and fracture (
2000-2001	Wong, Siak Keong	Mechanical properties of coated fabrics
2000-2001	Seaver, Marc	Thermal conductivity
1999-2000	Creamer, Clayton	Creep and fatigue of composites
1999-2001	Seo, Min-Chul	Impact response of a polymer compound
1999	Griffiss, Bobby	Design of a temperature control chamber
1998-1999	Lussier, Darin	Stress analysis of complex structures using photostress techniques (Francis Scholar, BS/MS student)
1998-1999	Chow, Samuel	Thermoplastic stamping (Francis Scholar, BS/MS student)

b. Graduate Students at Boston University:

1. Master of Science Degree: (employer after graduation listed in parentheses)

1997	Pratibha Sinha (Parametric Technology)	Finite element simulation of wrinkling during in-plane shearing of woven fabrics
1997	Mayur A. Tilak (Silicon Valley Group)	Analysis of a material model for finite element modeling of shear deformation in fabrics
1997	Paul R. Viens (Dynamics Research Corp)	An optimization tool for the packing of folding space structures
1995	Andreas G. Prodromou (PhD, Univ of Leuven, Belgium)	Geometric effects on conformance of textile composite preforms
1994	Richard A. Moro (Draper Labs)	A systematic approach to design for assembly:feature based design and tolerancing
1992	Stacey D. Chinn (GE, UChicago Business)	The effect of previous drying on recycled paper fibers

SERVICE ACTIVITIES EXAMPLES (note: service to professional community listed in Professional Activities section)

University:

- Strategic Planning 2020
  - Co-Chair, Committee on Innovative Research
  - Member, Committee on Facilities Renewal and Master Planning
  - Member, Committee on Economic Development, Entrepreneurship, and Corporate Relations

- Search Committees
  - Co-Chair, Provost Search (2015-16)
  - Committee Member, Chancellor Search (2015)
  - Co-Chair, Dean of Manning School of Business Search (2014-15)
  - Co-Chair, Dean of Engineering Search (2012-13)
  - Co-Chair, Provost Search (2007-8)
  - Committee Member, Chancellor Search (2006-7)

- Tau Beta Pi, Engineering Honor Society, Faculty Advisor (1997-2001)
  Guided undergraduates in organizing initiation ceremony and coordinating society administrative matters. This student organization is in the process of strengthening its visibility and its service to

the community. Kari Stevens, the 2001-2 president of the UML chapter, was awarded one of the National Tau Beta Pi Scholarships.

- Task Force Co-Chair, Campus Climate, Council on Diversity and Pluralism (1997-2001)
  Guided graduate students in organizing a Public Speaking/Toastmasters Club to improve skills in technical presentations, teaching assistant roles, and professional interaction.
  Co-organized TA Workshop (Sept 2001) to provide graduate students with an introduction to the classroom – cultural issues, teaching/learning styles, stress/time management, grading, etc.

Department:

- Department Seminar Coordinator (established, Spring 2000)
  Responsible for identifying and inviting external and internal experts to present seminars on important research areas, as well as on their experiences as engineers.

- Department Graduate Admissions Committee (1997-2002)
  Responsible for evaluation of incoming applications to the graduate program and identification of candidates for research and teaching assistantships.

- Undergraduate Advisor (1997-2009)
  Advise over 20 undergraduate students with regard to course registration and other administrative matters. Routinely encourage students to take part in either research at the university or engineering positions at local companies.

- Co-Director of the Advanced Composite Materials and Textile Research Lab (ACMTRL)
  ACMTRL (co-Director, with Jim Sherwood) has grown to include over a half dozen faculty and over a dozen graduate RAs and numerous undergraduates on a regular basis. Through existing resources, industry donations, and research funding, we have built up the laboratory's instrumentation and equipment for materials fabrication, characterization, and testing. The laboratory also has strong capabilities in computer analysis and modeling. ACMTRL has played a leadership role in major national research opportunities, including 2 Manufacturing Innovation Institute competitions and the NIST composites roadmapping grant.