Dr. Cheryl Xu

Professor
Department of Mechanical and Aerospace Engineering
North Carolina State University
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1. Education Background:

2006	Ph.D.	Mechanical Engineering Purdue University, West Lafayette, IN
2001	M.S.	Mechanical Manufacturing and Automation Beijing University of Aeronautics and Astronautics, China
1998	B.S.	Electromechanical Engineering Qingdao University, China

2. Professional Experience:

08/2022 – Present	Professor Mechanical & Aerospace Engineering, North Carolina State University (NCSU)
08/2018 – 08/2022	Associate Professor Mechanical & Aerospace Engineering, North Carolina State University (NCSU)
01/2014 – 08/2018	Associate Professor Mechanical Engineering, Florida State University (FSU)
05/2013 – 12/2013	Associate Professor Mechanical & Aerospace Engineering, University of Central Florida (UCF)
08/2007 – 04/2013	Assistant Professor Mechanical & Aerospace Engineering, University of Central Florida (UCF)
2006–2007	Postdoctoral Research Associate Mechanical Engineering, Purdue University

3. Scholarly Activities:

Type	Number
Ph.D. completed as Chair	8
M.S. completed as Chair	7
Book	1
Book Chapter	7
Referred Journal Article	77
Patent applications	9 (issued) + 6 (pending) + 2 (disclosure)

4. Membership in Professional Organizations:

- Fellow, American Society of Mechanical Engineers (ASME), 2020
- Fellow, International Association of Advanced Materials (IAAM), 2021
- Member, The American Ceramic Society (ACerS)
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, Society of Manufacturing Engineers (SME)

5. Honors and Awards:

– 2023, Summer Faculty Fellowship, Naval Research Laboratory (NRL)
– 2021, Defense University Research Instrumentation Program (DURIP), Air Force
– 2021, **Fellow**, International Association of Advanced Materials (IAAM)

– 2021, Chancellor's Innovation Fund (CIF) Award, NCSU
– 2020, **Fellow**, American Society of Mechanical Engineers (ASME)
– 2020, Summer Faculty Fellowship, Naval Research Laboratory (NRL)
– 2016; 2018, Summer Faculty Fellowship, Air Force Research Laboratory (AFRL)
– 2017, College, Research Excellence Award, Florida State University (FSU)
– 2016; 2017, University, Grant Assistant Program (GAP) Award, Florida State University (FSU)
– 2015, IEEE Education Society, Mac E. VanValkenburg Teaching Award
– 2013, University, Research Incentive Award, University of Central Florida (UCF)
– 2013, College, Distinguished Researcher Award, University of Central Florida (UCF)
– 2013, College, Deans Research Professorship Award (DRPA), University of Central Florida (UCF)
– 2012, University, Teaching Incentive Award, University of Central Florida (UCF)
– 2011, Office of Naval Research Young Investigator (ONR YIP) Award
– 2011, Society of Manufacturing Engineers (SME), Outstanding Young Manufacturing Engineer Award
– 2010, Department, Excellence in Research Award, University of Central Florida (UCF)
– 2008, Oak Ridge Associated Universities Visiting Industrial Scholar Program Award
– 2006-2007, Bilsland Dissertation Fellowship, Purdue University
– 2006, Chroafas Best Dissertation Award in Mechanical Engineering, Purdue University

6. Professional Service on-campus:

– University, Standing Committee, Group Insurance and Benefits (2022-2025)
– Department Education and Technology Fee (ETF) Planning and Laboratory Committee (2018-present)
– Department, Faculty Search Committee (2020-2021, 2022-present)
– Department, Peer Teaching Evaluation Committee (2021-present)
– Department, Mentoring Committee (2022-present)

7. Professional Service off-campus:

Editor-in-Chief	**Nature** portfolio: *npj* Advanced Manufacturing
Advisory Board	American Carbon Society (2023-2029)
Associate Editor	ASME Transactions, J. of Manufacturing Science and Engineering (2021-present)
Associate Editor	ASME Transactions, J. of Micro- and Nano- Manufacturing (2015-2019)
Associate Editor	International J. of Nanomanufacturing (2008-2010)
Society Committee	American Society of Mechanical Engineers (ASME), Manufacturing Science and Engineering, Diversity & Inclusion Committee (2022-present)
Society Committee	The American Ceramic Society, Diversity & Inclusion Committee (2022-present)
Society Committee	IEEE Education Society, Membership Committee (2014-present)
Editorial Board	J. of Aviation and Aerospace Perspectives (2010-2013)
Editorial Board	International J. of Computational Materials Sci. and Surface Engi. (2007-2010)

Conference Chair

2015, NSF 1st National Wireless Research Collaboration Workshop

Invited Speaker

2016, Ceramic Expo, Cleveland

2016, International Conf. on High Temperature Ceramic Matrix Composites, Canada

Executive Committee

2012-2014, ASME International Symposium on Flexible Automation

Technical Committee

2018-present, IEEE Manufacturing Automation and Robotic Control (MARC)

Conference Organizing Committee

2015-present, IEEE International Conference on Electro/Information Technology (EIT)

2014, ASME Dynamic Systems and Control Conference

2010-2013, SPIE Conference, Smart Structures/NDE, Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems
2006-2009, Inter. Conf. on Cybernetics and Information Technologies, Systems & Applications

Panel Moderator
2019, Energy Conversion and Conservation Division, ASEE, Tampa

Symposium organizer
2014, ASME Dynamic Systems and Control Conference, Advanced Manufacturing track
2009, 2014, ASME International Manufacturing Science and Engineering Conference
2010, Sensor Technology, 3rd International Congress on Ceramics, Osaka, Japan

I. TEACHING AND MENTORING

A. Courses Taught

(at NCSU)

MAE410:	Modern Manufacturing Processes
MAE208:	Engineering Dynamics
MAE315:	Vibration: Dynamics of Machines
MAE534:	Mechatronics

(at FSU)

EML4930/5930 (Senior/Graduate):	Design and Modeling for Manufacturing Processes
EML4930/5930 (Senior/Graduate):	Manufacturing Process Control
EML4312/5311 (Senior/Graduate):	Design and Analysis of Control Systems
EML4316/5317 (Senior/Graduate):	Advanced Control Systems

(at UCF)

EGN3321 (Junior):	Engineering Analysis: Dynamics
EML4312 (Senior):	Feedback Controls
EML5311 (Graduate):	System Control
EAS4407/5407 (Senior/Graduate):	Mechatronic Systems
EML4937/5937 (Senior/Graduate):	Design for Manufacturing
EML6808 (Graduate):	Analysis and Control for Robot Manipulators
EML6938 (Graduate):	Intelligent Systems: Modeling, Optimization and Control

B. Doctoral and Masters Theses completed and in-progress

PhDs completed as Chair (total = 8)

Name	Degree	Graduation	Chairman
Ajayi, T.	Ph.D.	2021	Xu, C.
Chowdhury, A.	Ph.D.	2020	Xu, C.
Ju, L.	Ph.D.	2018	Xu, C. (co-Chair: Hellstrom, E.)
Zhao, R.	Ph.D.	2014	Xu, C.
Liu, J.	Ph.D.	2012	Xu, C.
Idahosa, U.	Ph.D.	2010	Xu, C. (Chair: Basu, S.)
Tang, Y.	Ph.D.	2009	Xu, C.
Allen, R.	Ph.D.	2009	Xu, C.

Student:	Ajayi, T.
Degree:	Doctor of Philosophy
Thesis:	Tunable Multi-functional Properties of Polymer Derived Silicon Carbon Nitride (SiCN) Ceramic Composites for Advanced Aerospace Applications
Status:	Works at Lam Research in CA

Student: Chowdhury, A.
Degree: Doctor of Philosophy
Thesis: Study on the Electrical and Dielectric Properties of Polymer Derived SiC Ceramics Pyrolyzed at High Temperatures
Status: Works as an Application Development Engineering at KLA-Tencor, Milpitas, CA

Student: Ju, L.
Degree: Doctor of Philosophy
Thesis: Hybrid Multifunctional Composite Material by co-curing Lay-up Process for Enhanced Surface Durability
Status: Currently a faculty member overseas

Student: Zhao, R.
Degree: Doctor of Philosophy
Thesis: Modeling and Contour Control of Multi-axis Linear Driven Machine Tools
Status: Currently works in Google LLC

Student: Liu, J.
Degree: Doctor of Philosophy
Thesis: Experimental Study and Modeling of Mechanical Micro-machining of Particle Reinforced Heterogeneous Materials
Status: Currently works in Alcon

Student: Idahosa, U.
Degree: Doctor of Philosophy
Thesis: Combustion Dynamics and Fluid Mechanics in Acoustically Perturbed Non-Premixed Swirl-Stabilized Flames
Status: Currently works in GE Global Research Center, Niskayuna, NY

Student: Tang, Y.
Degree: Doctor of Philosophy
Thesis: Integrated Servomechanism and Process Control for Machining Processes
Status: Currently a Professor at Embry-Riddle Aeronautical University (Daytona Beach, FL).

Student: Allen, R.
Degree: Doctor of Philosophy
Thesis: Robust Estimation and Adaptive Guidance for Multiple UAVs' Cooperation
Status: Currently works at LoneStar, Inc.

PhDs in-progress as Chair

Name	Degree	Expected Graduation	Chairman
Stephen Kimball	Ph.D.	2024	Xu, C.
Luke Joyce	Ph.D.	2025	Xu, C.
Nick Maier	Ph.D.	2025	Xu, C.

PhDs as Committee Member

Name	Degree	Graduation	Chairman
Waliur Rahman	Ph.D.	in progress	Kara Peters
Will Chen	Ph.D.	in progress	Hao Su
Israel Dominguez	Ph.D.	in progress	Hao Su
Emmanuel Amoako	Ph.D.	in progress	Tim Horn

Auston Gray	Ph.D.	in progress	Yuan, F.
Zubin Chacko	Ph.D.	in progress	Rabiei, A.
Walter Onuorah	Ph.D.	in progress	Ware, H.
Sarka, S.	Ph.D.	in progress	Rabiei, A.
Walaa Enab	Ph.D.	in progress	Philip Bradford (College of Textiles)
Kim, J.	Ph.D.	2022	Peters, K.
Yeng, Saanchi	Ph.D.	2022	Stefanski, L. (Statistics)
Xu, Steven	Ph.D.	2022	Reich, B.; Yang, S. (Statistics)
Lyathakula, K.	Ph.D.	2021	Yuan, F.
Lall, A.	Ph.D.	2021	Rabiei, A.
Hu, H.	Ph.D.	2020	Zheng, X. & Hammond, R. (Economics, Mgmt)
Hosani, M. Y. A.	Ph.D.	2013	Qu, Z.
Shao, G.	Ph.D.	2013	An, L.
Huang, K.	Ph.D.	2012	Sohn, Y.
Chen, Y.	Ph.D.	2011	An, L.
Li, C.	Ph.D.	2011	An, L.
Plaisted, C.E.	Ph.D.	2007	Leonessa, A.

Masters thesis completed as Chair (total = 7)

Name	Degree	Graduation	Chairman
Morales, J.	M.S.	2021	Xu, C.
Mehta, S.	M.S.	2020	Xu, C.
Ajayi, T.	M.S.	2018	Xu, C. (Co-Chair: Okoli, O.)
Odewale, V.	M.S.	2016	Xu, C.
Hernandez, M.	M.S.	2012	Xu, C.
Deane, E.	M.S.	2011	Xu, C.
Knipe, K.	M.S.	2010	Xu, C.

Student: Morales, J.
Degree: Master of Science
Thesis: Manufacturing Boron Nitride Nanotube (BNNT) Reinforced Polymer Derived Ceramic (PDC) Composites for Space Applications
Status: Currently works at Oak Ridge National Lab

Student: Mehta, S.
Degree: Master of Science
Thesis: Additive Manufacturing Ultra-High Temperature Ceramic (UHTC) Composites Using Electron Beam Melting Process
Status: Currently works at Endera Motors on the commercial Electric Vehicle Segment

Student: Ajayi, T.
Degree: Master of Science
Thesis: Boron Nitride Nanotubes (BNNTs) Reinforced-Polymer Derived Ceramic (PDC) Nanocomposites for Mechanical and Thermal Applications (co-advisor: Okoli, O.)
Status: Stayed and graduated with his Ph.D degree in my group

Student: Odewale, V.
Degree: Master of Science
Thesis: Additive Manufacturing of Freeform Ceramic Material using Polymer-Derived Ceramics (PDC)
Status: Currently a faculty member overseas

Student: Hernandez, M. (***Minority***)
Degree: Master of Science
Thesis: Process Optimization Towards the Development of an Automated CNC Monitoring System for a Simultaneous Turning and Boring Operation
Status: Currently works at Honda Motor Co., Inc.

Student: Deane, E. (***Minority***)
Degree: Master of Science
Thesis: Multi-sensor Optimization of the Simultaneous Turning and Boring Operation
Status: Currently works at Siemens Corporation

Student: Knipe, K.
Degree: Master of Science
Thesis: Structural Analysis and Active Vibration Control of Tetraform Space Frame for use in Micro-scale Machining
Status: Pursued his Ph.D degree at UCF after I left

Masters thesis as Committee Member

Name	Degree	Graduation	Chairman
Jimenez, L.	M.S.	in progress	Buckner, G.
Carbiener, C.	M.S.	2017	Clark, J.
Pascioni, K.	M.S.	2017	Cattafesta, L.
McKee, J.	M.S.	2013	Gou, J.
Mutter, N.	M.S.	2012	Gordon, A.
Torrance, M.	M.S.	2012	Kapat, J.

Masters non-thesis supervised

Parth Tulapurkar	non-thesis M.S.	2024
Soham Deshpande	non-thesis M.S. (ECE)	2023
Shravya Pillarisetti	non-thesis M.S. (ECE)	2022
Michael DiGruccio	non-thesis M.S.	2022
James Stanley	non-thesis M.S.	2022
Dongre, S.	non-thesis M.S. (ECE)	2021
Zhao, S.	non-thesis M.S.	2021
Chen, R.	non-thesis M.S. (ECE)	2021
Weiden, C.	non-thesis M.S.	2021
Kulkarni, A.	non-thesis M.S.	2021
Pasagada, K.	non-thesis M.S.	2021
Daniel, J.	non-thesis M.S.	2018
Bazyler, B.	non-thesis M.S.	2018
Sun, X.	non-thesis M.S.	2016
Giesecke, D.	non-thesis M.S.	2012
Li, J.	non-thesis M.S.	2012
Joslin,, A.	non-thesis M.S.	2010
Barnes, G.	non-thesis M.S.	2009

C. Mentoring Activities

Supervised Post-Doctoral Scholars

Name	Duration
Jiwan Ghimire	2023-Present

Shalini Rajpoot (***Female***)	2023-Present
Ni, Y. (***Female***)	2020-2023
Jia, Y.	2018-2020
Wang, K.	2016-2017
Yang, J.	2012-2016
Ji, Y.	2010-2011

Supervised Exchange Students

Name	Duration
Hu, X.	2012
Li, P.	2012-2013
Deng, J. (***Female***)	2012-2013
Pang, T.	2011

Served in Honor-In-Major (HIM) Undergraduate Thesis Chair

Name	Degree	Graduation	Chairman
Concoliver-Zack, J.	HIM UG	2016	Xu, C. (Co-Chair: Okoli, O.)

Served in Honor-In-Major (HIM) Undergraduate Thesis Committee

Name	Degree	Graduation	Chairman
Burkett, M.	HIM UG	2015	Zeng, C.
Hodges, J.	HIM UG	2012	Kapat, J.
Wright, D.	HIM UG	2010	Chew, L.
Robinson, J.	HIM UG	2009	Ham, C.

Supervised Undergraduate Research Activities

Andrew Bauer, Fall 2022 - present
Jason Solomon, Fall 2022 - present
Michael Reid, Summer 2022 - present
Weslee Tucker, Spring 2023 - present
Karthik Kannan, Spring 2023 - present
Alex Forsgard, Spring 2023 - present
Jacob Kennedy, Spring 2023
Caitlyn Morton, Spring 2023
Michael DiGruccio, Spring 2022.
Luke Joyce, Fall 2021 - Spring 2022.
Taylor Kenion, Spring 2021 - Spring 2022.
Harwood, H., (***Female***), Fall 2021.
Guynn, M., (***Female***), Fall 2021.
Lawson, A, Spring 2021.
Mueller, B., Fall 2020.
Choi, J., Fall 2020-Spring 2021.
Mark Roberts, Spring 2021.
Pratt, W., Fall 2019-Spring 2020.
Justin, D., 2016-2017.
Macdonald, J., 2016.
Rubin, S., 2016.
Fajardo, T., 2016.
Hood, S., (***Female***), 2016.
Morales, J., 2016.
Simal, B., (***Female***), 2014-2015.

Htchinson, J., 2015.
Duckett, M., 2015.
Swain, M., 2014.
Albarracin, B., 2013.
Spags, A., 2012-2013.
Harris, K., 2012-2013.
Zuanetti, B., 2012-2013.
Mayhew, D., 2012-2013.
Gilmore, J., 2011-2012.
Carreiro, J., 2011-2012.
Meanor, M., 2010-2011.
Giesecke, D., 2010-2011.
Hernandez, M., (***Minority***), 2010.
Walls, K., 2010.
Deane, E., (***Minority***), 2009-2010.
Coy, L., (***Female***), 2009.
Mak, A., 2008-2009.
Collins, S., (***Minority***), 2008-2010.
Clapp, R., 2008.
Joseph, L., (***Minority***), 2008.

II. Research Funding

Xu, C. (2023-2024). *Highly-Transparent Armor Material (SiAlON/SiON) by Hot Isostatic Sintering and Polymer-Derived Ceramic (PDC) Route.* Funded by the Office of Naval Research (ONR). Total award $150,000. Single PI.

Xu, C., Fang, T. (2023-2024). *A Self-Healing UHTC-reinforced Composite using Selective Laser-induced Reaction Sintering (SLRS) Process for Extended Thermal Stability.* Funded by the Center for Additive Manufacture of Advanced Ceramics (CAMAC). Total award $45,000. Xu is the PI.

Xu, C. (2023). *I-Corps: Radar Absorbing Materials (RAM) for High-temperature Harsh Environment Applications,* Funded by National Science Foundation (NSF). Total award $50,000. Single PI.

Xu, C., Adams, J. (2023-2024). *Electromagnetic Interference (EMI) Absorbers based on Ultra-High Temperature Ceramics (UHTCs) Reinforced Ceramic Composites,* Funded by the Center for Dielectrics and Piezoelectrics (CDP). Total award $25,000. PI.

Xu, C. (2022). *Hypersonic Seeker Window Attachment for Hypersonic Flight Systems,* Funded by Missile Defense Agency (MDA), sub-contracted from Materials Research & Design (MR&D). Total award $50,000. Single PI.

Xu, C. (2022-2024). *Accelerating Delivery of a Secure Hypersonic Network (Phase II Option).* Funded by Air Force Research Lab (AFRL), sub-contracted from Nahsai, LLC. Total award $420,000. Single PI.

Xu, C. (2022-2025). *Characterization of Materials' Electromagnetic (EM) Property at High Temperature and Metamaterial Design Enabling Electromagnetic (EM) Transparency.* Funded by Army Research Lab (ARL). Total award $225,000. Single PI.

Xu, C. (2022-2023). *Electron Beam Sintering Processing of Resilient Ultra-High Temperature Ceramics (UHTCs) Coatings on C/C Substrates for Extreme Conditions.* Funded by Naval Surface Warfare Center (NSWC). Total award $210,000. Single PI.

Xu, C. (2022). *Wireless Temperature Sensor for Steel Production Process.* Funded by RHI-Magnesita. Total award $115,000. Single PI.

Xu, C. (2022). *Electromagnetic (EM) Transparency Radome Material Made of Boron Nitride Nanotubes (BNNT) Reinforced Ceramic Composites.* Funded by Navy Sea Systems Command, sub-contracted from BNNT, LLC. Total award $80,000. Single PI.

Xu, C. (2022). *Multifunctional Ceramic Matrix Composites (CMC) Made with Three-Dimensionally(3D) Reinforced High Volume Fractions of Boron Nitride Nanotubes (BNNT).* Funded by National Aeronautics and Space Administration (NASA), sub-contracted from BNNT, LLC. Total award $49,000. Single PI.

Xu, C., Fang, T. (2022-2023). *3D Printing of Ultra-High Temperature Ceramics (UHTCs) using Selective Laser-induced Reaction Sintering (SLRS) Process.* Funded by the Center for Additive Manufacture of Advanced Ceramics (CAMAC). Total award $41,085. Xu is the PI.

Xu, C. (2021). *Electromagnetic Property Measurement Apparatus of Ceramic Materials at High-Temperature Environments.* Funded by the US Air Force Office of Scientific Research (AFOSR) Defense University Research Instrumentation Program (DURIP). Total award $394,707. Single PI.

Xu, C. (2021). *Wide-band Tunable Radar Absorbing Material (RAM) for Stealth Applications.* Funded by NCSU Chancellors Innovation Fund (CIF). Total award $50,000. Single PI.

Mullany, B., Xu, C., Williams, W., El-Ghannam, A., Schmid, S., (2021). *A Center for Additive Manufacture of Advanced Ceramics (CAMAC).* Funded by UNC Research Opportunities Initiative (ROI) award. Total: $1,250,000 Xu is a co-PI.

Xu, C. (2020-2023). *Effect of Pyrolysis Temperature and Dopant on the Frequency-Dependent and Temperature-Dependent Electromagnetic Properties for Ultra-High Temperature Ceramics (UHTCs) Reinforced Ceramic Composites.* Funded by the US Air Force Office of Scientific Research (AFOSR). Total award $553,100. Single PI.

Xu, C. (2020). *Accelerating Delivery of a Secure Hypersonic Sensor Network (Phase II).* Funded by Air Force Research Lab (AFRL), sub-contracted from Nahsai, LLC. Total award $150,000. Single PI.

Rabiei, A., Harrysson, O.L., Ngaile, G.E., Xu, C., Horn, T.J., (2020). *MRI: Acquisition of a Large High-Temperature Vacuum Press for Advanced Materials Research, Manufacturing and Training at NC State University.* Funded by NSF Major Research Instrumentation (MRI) Program. Total: $914,500 (Award from NSF $640,150; Cost-share: $274,350. Xu is a co-PI.

Xu, C. (2020). *Accelerating Delivery of a Secure Hypersonic Sensor Network (Phase I).* Funded by Air Force Research Lab (AFRL), sub-contracted from Nahsai, LLC. Total award $15,528. Single PI.

Liu, J. and Xu, C. (2019). *Enabling Anisotropic Thermal Conductivity Measurement at High Temperatures (up to 1400 degree C).* Funded by NCSU Research and Graduate Studies – FRPD Individual Program. Total award $10,000. Xu is the co-PI.

Xu, C. (2018-2019). *A Hybrid Multifunctional Composite Material by Co-Curing Lay-up Process for Enhanced Thermal/Chemical Stability and Surface Durability*. Funded by the Office of Naval Research (ONR). Total award $230,825. Single PI.

Xu, C. (2019). *Manufacturing Hybrid Multifunctional Composite Skin Materials via Standard Prepreg Lay-up Process.* Sub-contracted from KAI, LLC (Funded from ONR STTR). Total award $75,000. Single PI.

Xu, C. (2018). *Evaluate Readability Range and Accuracy of Wireless Temperature Sensor.* Saint-Gobain. Total award $4,127. Single PI.

Xu, C. (2018). *Dielectric Measurement of Ceramic Materials at High Temperature.* Funded by the Johns Hopkins University Applied Physics Laboratory (JHU/APL). Total award $50,000. Single PI.

Soto, R. and Xu, C. (2018). *Wireless High Temperature Sensor for Real Time Monitoring of Power Generation Turbine Engines.* Funded by National Science Foundation (NSF) STTR. Total award $225,000. Xu is the co-PI.

Xu, C. (2017–2018). *Electromagnetic Properties of Conductive Ceramic Composites Made of Ultra-High-Temperature and Polymer-Derived Ceramics*. Funded by Air Force Office of Scientific Research (AFOSR). Total award $109,920. Single PI.

Xu, C. (2017–2019). *A Hybrid Multifunctional Composite Material by Co-Curing Lay-up Process for Enhanced Thermal/Chemical Stability and Surface Durability*. Funded by Office of Naval Research (ONR). Total award $265,577. Single PI.

Xu, C. (2017–2018). *Effect of Pyrolysis Temperature on Electrical Properties of Polymer-Derived SiC*

Ceramics. Funded by Army Research Office (ARO). Total award $60,000. Single PI.

Xu, C. (2017–2018). *In-situ Wireless Temperature Sensor in Ultra-high Temperature and Harsh Environment*. Funded by FSU Grant Assistance Program (GAP) Award. Total award $34,000. Single PI.

Xu, C. (2017–2018). *Additive Manufacturing of A Ceramic Pressure Sensor for Embedded and Wireless Monitoring of Munitions*. Funded by Air Force Research Laboratory (AFRL). Total award $25,000. Single PI.

Xu, C. (2017). *Material Processing and Electrical Property Characterization of Ceramic Materials in High Temperature*. Funded by NASA Glenn. Total award $5,000. Single PI.

Xu, C. (2016–2017). *High-Temperature Furnace Apparatus for Electrical Property Characterization of Ceramic Materials*. Funded by Department of Defense (DOD) Historically Black Colleges and Universities/Minority Institutions (HBCU/MI) Equipment/Instrument. Total award $431,884. Single PI.

Xu, C. (2016–2017). *In-situ Temperature and Strain Sensor in Ultra-High Temperature and Harsh Environment*. Funded by FSU Grant Assistance Program (GAP) Award. Total award $22,000. Single PI.

Xu, C. (2014–2016). *Multifunctional Ceramic Nanocomposites Reinforced with a High Volume Fraction of Well-Dispersed and Well-Aligned Carbon Nanotubes*. Funded by Office of Naval Research (ONR). Total award $305,316. Single PI.

Mousavinezhad, S., Xu, C., Chiu, S., Zydek, D. and Welch, T. (2013–2015). *1st Annual National Wireless Research Collaboration Symposium*. Funded by National Science Foundation (NSF). Total award $99,335. Xu is a co-PI.

Xu, C. (2012–2013). *Dispersion and Alignment System for Carbons Nanotubes for Polymer-Derived Ceramic Composite*. Funded by Defense University Research Instrumentation Program (DURIP). Total award $133,416. Single PI.

Xu, C. (2011–2014). *Multifunctional Ceramic Nanocomposites Reinforced with a High Volume Fraction of Well-Dispersed and Well-Aligned Carbon Nanotubes*. Funded by Office of Naval Research (ONR). Total award $204,598. Single PI.

Xu, C. (2012). *Adaptive On-line Controller Design and System Integration for CNC Simultaneous OD Turning and ID Boring Operations*. Funded by General Dynamics. Total award $203,927. Single PI.

Xu, C. (2010–2011). *Response Surface Design and Process Optimization for CNC simultaneous OD turning and ID boring operations*. Funded by General Dynamics. Total award $295,155. Single PI.

Xu, C. (2012). *Adaptive On-line Controller Design and System Integration for CNC Simultaneous OD Turning and ID Boring Operations*. Funded by Florida High Tech Corridor. Total award $41,105. Single PI.

Xu, C. (2010–2011). *Response Surface Design and Process Optimization for CNC simultaneous OD turning and ID boring operations*. Funded by Florida High Tech Corridor. Total award $98,385. Single PI.

Xu, C. (2010). *A Contactless Polymer Derived Ceramic Temperature Sensing System for Turbine Applications*. Funded by Florida State - Florida Center for Advanced Aero-Propulsion (FCAAP). Total award $25,000. Single PI.

Gong, X., An, L. and Xu, C., (2010–2012). *On-line, In-situ Monitoring Combustion Turbine using Wireless Passive Ceramic Sensors*. Funded by Department of Energy (DOE) and UCF. Total award $1,014,000. Xu is a co-PI.

An, L. and Xu, C. and (2009–2014). *Micromachinable Polymer-Derived Ceramic Ultra-High Temperature Sensors*. Funded by National Science Foundation (NSF). Total award $325,630. Xu was the former PI and was switched to the co-PI because of changing school.

Kapat, J. and Xu, C. (2009). *Detailed Study of Flow Interaction and its Impact on Aerodynamic Performance and Heat Transfer in Turbomachinery Passages*. Funded by Florida State -

Florida Center for Advanced Aero-Propulsion (FCAAP). Total award $128,750. Xu is the co-PI.

Xu, C. (2009–2010). *Multivariate Factor Analysis for CNC Turning Operations*. Funded by General Dynamics. Total award $360,324. Single PI.

Xu, C. (2009–2010). *Multivariate Factor Analysis for CNC Turning Operations*. Funded by Florida High Tech Corridor. Total award $120,108. Single PI.

Xu, C. (2009). *Intelligently Controlled High-Temperature Shape Memory Alloy Actuators*. Funded by Florida State - Florida Center for Advanced Aero-Propulsion (FCAAP). Total award $53,000. Single PI.

Sohn, Y., Kapat, J. and Xu, C. (2008–2010). *Phase-Field Modeling and Experimentation of Thermotransport in U-alloys for Transmutation in Fast Reactors*. Funded by Idaho National Laboratory from Department of Energy (DOE). Total award $180,000. Xu is a co-PI.

Basu, S. and Xu, C. (2008–2009). *Integrated Advance Gas Turbine Monitoring*. Funded by GT Analysis, Inc. Total award $72,946. Xu is the co-PI.

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[41] **(Best paper in session)** Xu, C. and Shin, Y. C., 2006, "A Hierarchical Self-tuning Fuzzy Controller for General Nonlinear Systems with Stability Analysis", The 3rd International Conference on Cybernetics and Information Technologies Systems and Applications, Orlando, FL.

Referred Conference Presentations

[1] Xu, C., (2022). *Dielectric Property Characterization of two Commercial BN and two Synthesized BNNT/SiCN Plates from Room Temperature to 1000 ℃*, 18th DoD Electromagnetic Windows Symposium, Neward, Delaware.
[2] (**Invited Lecture**) Xu, C., (2021). *Wide-Band Tunable Electromagnetic (EM) Absorbing Ceramic Composites*, Prof. Joseph H. Koo Web Symposium on Polymer Nanocomposites, Advanced Materials Web Congress 2021, Nov. 16-18, Sweden.
[3] Xu, C., (2021). *Electromagnetic Properties of Ceramic Composites Made of Ultra-High-Temperature and Polymer-Derived Ceramics*, AFOSR Aerospace Composite Materials Program Annual Review.
[4] Xu, C., (2021). *Next-Generation Radar Absorbing Material (RAM) for Stealth Applications*, NCSU Chancellor's Innovation Fund (CIF) Award Presentation.
[5] Xu, C., (2021). *Technology Overview and Market Review on High-Temperature Sensor System for Extreme Environment Applications*, Technical Advisory Committee Presentation for RHI Magnesita.
[6] Xu, C., (2021). *Radar Absorbing Material (RAM) for Aerospace Applications*, Functional & Computational Materials, Advanced Materials Lecture Series.
[7] Wang, S., Zargar, S. A., Xu, C. and Yuan, F-G., (2019). *An Efficient Augmented Reality (AR) System for Enhanced Visual Inspection*, The 12th International Workshop on Structural Health Monitoring, Stanford, CA.
[8] Ajayi, T., Nickerson, B., Xu, C. (2019). *Carbon Nanotube (CNTs) Reinforced Ceramic Thin Films as Thermal/Environmental Barrier Coatings (T/EBCs) for Aerospace Applications*, Sandphobic Thermal/Environmental Barrier Coatings Symposium, Materials Science & Technology, Portland, OR.
[9] Xu, C., Ajayi, T., Nickerson, B. (2018). *A Hybrid Ceramic-Polymer Composite Fabricated by Co-*

Curing Lay-Up Process for Erosion Resistance, The Composites and Advanced Materials Expo (CAMX), Dallas, TX.

[10] Xu, C., Daniel, J. (2018). *Wireless Temperature Sensor for High-Temperature Environments (up to 1000C) using RF Techniques with 0.5 meter Sensing Distance*, 41th Annual Conference on Composites, Materials, and Structures, Cocoa Beach, FL.

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[12] Xu, C. and Peebles, J. (2017). *Non-Destructive Testing of Composite Materials at High Temperature (2000°C)*, Material Measurements Working Group, Dayton, OH.

[13] Xu, C. and Daniel, J. (2017). *Wireless Temperature Measurement Based on Radio Frequency (RF) Technology*, 40th Annual Conference on Composites, Materials, and Structures, Cocoa Beach, FL.

[14] Xu, C. (2015). *Ceramic Matrix Composites (CMCs) with High Volume Fractions of Reinforcements (up to 60 Vol.%) and Ensuring 3-Dimensional Bonding Strength*. Workshop on Carbon Fiber and their Composites, Oak Ridge, TN.

[15] Yang, J., Xu, C., Ju, L., Downes, R., Hao, A., Liang, R. (2015). *Flexible Ceramic Matrix Composite with High Strength and Conductive by Aligned CNTs*. 39th International Conference and Expo on Advanced Ceramics and Composites, Daytona, FL.

[16] Xu, C., Yang, J., Ju. L., Jiang, Z. and Wang, H. (2015). *Effective Nano-Infiltration to Make Fully-Densed Ceramic Composites with A High Volume Fraction of Reinforcements*. 39th International Conference and Expo on Advanced Ceramics and Composites, Daytona, FL.

[17] Xu, C. (2015). *Flexible Ceramic Thin Film with High Conductivity*, Defense Manufacturing Conference, Phoenix, AZ.

[18] Yang, J. and Xu, C. (2014). *Optimization of Carbon Nanofibers Alignment Induced by Shear Force*. 38th International Conference and Exposition on Advanced Ceramics and Composites, Daytona, FL.

[19] Shao, G., Freese, D., Xu, C. and An, L. (2013). *Polymer Derived Ceramic Sensors for Ultra-High Temperature Application*. 37th International Conference and Exposition on Advanced Ceramics and Composites, Combustion Institute, Daytona, FL.

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[21] Shao, G., Xu, C. and An, L. (2010). *Carbon Nanofiber Reinforced Polymer Derived Ceramic Nanocomposites*. Materials Science & Technology (MS&T'10), Houston, TX.

[22] Xu, C., Knipe, K. and Jackson, M. (2008). *Finite Element Modeling and Vibration Control of a Tetraform Space Frame for Micro-Machining Processes*. 6th International Workshop on Microfactories, Evanston, IL.

[23] Xu, C., Tang, Y. and Jackson, M. (2008). *Adaptive Control of Cutting Force to Compensate Tool Deflection during Micro-Milling Processes*. 6th International Workshop on Microfactories, Evanston IL.

[24] Xu, C. (2007). *Intelligent Control System for Manufacturing Processes*. North American Manufacturing Research Conference (NAMRC), Ann Arbor, MI.

[25] Jin, L., Xu, C. and Fricker, J. D. (2008). Comparison of Annual Average Daily Traffic Estimates: Traditional Factor, Statistical, Artificial Neural Network, and Fuzzy Basis Neural Network Approach, *TRB Meeting, National Research Council*, Washington D.C.

[26] Tang, Y., Xu, C. and Jackson, M. J. (2008). Adaptive Control of Cutting Force to Compensate Tool Deflection during Micro-Milling Processes, *The 6th International Workshop on Microfactories*, Evanston, IL.

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[28] Allen R. and Xu, C. (2008). Cooperative Navigation: Adaptive Robust Estimator/Tracker for UAV Weaponization, *The Institute of Navigation – Guidance, Navigation, and Control Challenges for Miniature Autonomous Systems Workshop*, Fort Walton Beach, FL.

[29] Xu, C. (2007). Intelligent Control System for Manufacturing Processes, *NAMRC 35 – North American Manufacturing Research Conference, SME NIST-ATP Technology Dissemination Workshop on Intelligent Optimization and Control of Grinding Processes*, Ann Arbor, MI.

Representative Invited Presentations

[1] Xu, C., (2018). *Ceramic Composite Enabling EM Absorbing for High-Temperature Application*, AFOSR Project Peer Review, Dayton, OH.

[2] Xu, C. (2018). *Multifunctional Ceramic Materials for Extreme Environment Applications*, U.S. Army Research Laboratory, Aberdeen Proving Ground (APG), Maryland.

[3] Xu, C., Ajayi, T. and Morales, J. (2017). *Thermal and Oxidation Stability of BNNT and BNNT Composites*. Presentation at NASA Langley.

[4] Xu, C. (2016). *Strong and Flexible Ceramic Composites with High In-Plane Thermal Conductivity for Hypersonic Applications*. Presentation at Air Force Research Lab (AFRL) at Eglin, FL.

[5] Xu, C. and Yang, J. (2016). *Three-Dimensional Multi-Reinforced Ceramic Composites with Enhanced Through-Thickness Thermal Conductivity.* 9th International Conference on High-Temperature Ceramic Matrix Composites (HTCMC-9), Toronto, Canada.

[6] Xu, C. (2016). *High Conductive Ceramic Thin Film with Unique Mechanical Property*. Presentation at Ceramic Expo, Cleveland, OH.

[7] Xu, C. (2015). *Flexible Ceramic Composites with High In-Plane Thermal Conductivity*. Presentation at Air Force Research Lab (AFRL) at Eglin, FL.

[8] Xu, C. (2008). "Intelligent Modeling and Control System for Micro-Machining Processes", *Invited Presentation*, March 26, Microlution, Inc., Chicago, IL.

[9] Xu, C. (2008). "Intelligent Data-based Multivariable Modeling and Control Systems with Various Applications", *Invited Presentation*, Aug. 12, University of California at Berkeley, Berkeley, CA.

Professional Participation and Training

[1]. NSF Industry-Academia Collaboration in Advanced Manufacturing Virtual Workshop, Organized by Dr. Hitomi Yamaguchi Greenslet, Dr. Sangkee Min, Dr. Brigid Mullany, May 19-21, 2021.

[2]. KEEN Integrating Curriculum with Entrepreneurial Mindset 1.0 (ICE) workshop, Integrating Curriculum with EM Workshop, August 2-5, 2021.

[3]. NSF 2022 Panel Fellow Cohort for CMMI's Game Changer Academies (CGCA) for Advancing Research Innovation, Fall 2021 – Spring 2022.

IV. TECHNOLOGICAL AND MANAGERIAL INNOVATION

A. Patent Issued

[1] Xu, C. *Nanoparticle-Reinforced Composites and Methods of Manufacture and Use*. U.S. Patent No.: 10,214,801.

[2] Xu, C. *Ceramic Composite Materials and Methods*. U.S. Patent No.: 10,214,455 B2.

[3] Xu, C. *Ceramic Composite Materials and Methods*. U.S. Patent No.: 10,927,045 B2.

[4] Xu, C., *Methods for Aligning Fibers with An Electrical Field And Composite Materials*. U.S. Patent No.: 10,252,475.

[5] Xu, C. and Schrand, A., *Polymeric Ceramic Precursors, Apparatuses, Systems, and Methods*. U.S. Patent No.: 10,384,393.

[6] Xu, C., Schrand, A., Soto, R., *Temperature and Pressure Sensors and Methods*. U.S. Patent No.: 10,845,211 B2.

[7] Xu, C. *Three-Dimensional Multi-Reinforced Composites and Methods of Manufacture and Use*

Thereof. U.S. Patent No.: 10,836,135.
[8] Xu, C. and Daniel, J., *Wireless Temperature Sensors and Methods*. U.S. Patent No. 10,969,282 B2.
[9] Xu, C. and MacDonald, J., *Metamaterials, Radomes including Metamaterials, and Methods*. U.S. Patent No.: 11,011,834.

B. Patent Applications

[1] NCSU-20092-01. *Ceramic Composites and Methods of Making and Using the Same*. U.S. Utility Patent Application: US 2022/0119316 A1.
[2] NCSU-2020-096-02. *Polymer-Derived Ceramic Reinforced with Boron Nitride*. Patent Application: 17/658,141.
[3] Xu, C. and Schrand, A., *Temperature and Pressure Sensors and Methods*. International Patent Application. Publication No. WO 2018/182815 A1.
[4] Xu, C. *Ceramic Composite Materials, Articles and Methods*. U.S. Application No. 16/279,684.
[5] Xu, C. and MacDonald, J., *Metamaterials, Radomes including Metamaterials, and Methods*. U.S. Application No. 16/017,206.
[6] Xu, C. and Nickerson, W., *Hybrid Multifunctional Composite Material and Method of Making the Same*. U.S. Application No. 16/778,088.

C. Patent Disclosures

[1] NCSU-20093. *Aligned Carbon Nanotube/Carbon (CNT/C) Composites with Exceptionally High Electrical Conductivity at Elevated Temperature*. Submitted on 11/12/2019.
[2] NCSU-20223. *Additive Manufacturing of Complex Geometries of UHTC-Based Ceramics using Electron Beam Melting (EBM) Process*. Submitted on 04/10/2020.