

Areas of expertise and interests

Computational Mechanics, Integrated Computational Materials Engineering (ICME), Process Modeling, Material characterization, Multiscale analysis, Composites manufacturing, Finite Element Analysis (FEA), Higher-order FEA, Molecular Dynamics, Additive Manufacturing, Virtual testing, Renewable Energies, Energy-efficient and advanced structures.

Education

- 2014 **Ph.D. in Aerospace Engineering**, *University of Michigan, US/Turin Polytechnic Institute, IT.*
- 2010 **M.S. in Aerospace Engineering**, *Turin Polytechnic Institute, Torino, Italy.*
- 2008 **B.S. in Aerospace Engineering**, *Turin Polytechnic Institute, Torino, Italy.*

Professional Appointments

- 01/2024–Present **Associate Professor**, *Department of Civil Engineering and Engineering Mechanics, Columbia University, New York (NY).*
- 01/2024–Present **Assistant Editor**, *Composites Part A: Applied Science and Manufacturing Journal, Elsevier.*
- 07/2022–12/2023 **Associate Professor**, *Mechanical Engineering Department, University of Massachusetts Lowell, Lowell (MA).*
- 09/2016–06/2022 **Assistant Professor**, *Mechanical Engineering Department, University of Massachusetts Lowell, Lowell (MA).*
- Summer 2019 **Visiting Professor**, *NASA Glenn Research Center, Cleveland, OH (US).*
- 01/2015–08/2016 **Postdoctoral Research Associate**, *William E. Boeing Department of Aeronautics and Astronautics, University of Washington, Seattle (WA).*
- 04/2013–12/2014 **Postdoctoral Research Associate**, *Aerospace Engineering Department, University of Michigan, Ann Arbor (MI).*
- 11/2010–12/2010 **Intern**, *Advanced Materials, Centre de Recherche Public Henri Tudor, Esch-sur-Alzette (Luxembourg).*
- 02/2008–06/2008 **Intern**, *Advanced Materials Department, Thales Alenia Space, Torino (Italy).*

Awards and Achievements

- NSF CAREER Award, 2022.
- AIAA SciTech ICME Award, 2022.
- 2021 ASC/DEStech Young Composites Researcher Award, 2021.
- UMass Lowell Award for Faculty Mentoring Faculty, 2020.
- AIAA SciTech ICME Award, 2020.
- AFOSR YIP Award, 2020.
- University of Massachusetts Lowell Teaching Excellence Award, 2017.
- Top three “Aldo Muggia Best Thesis Award”, 2012.
- Italian Engineering Licence (Aerospace Engineering). December 2011.
- Student Ambassador at G8 University Summit in Turin. May 2009.

Research Grant

- "Advanced Manufacturing, Materials, and Sustainability of Modular Wind Blades". DOE, **\$3,000,000**, 2024-2027 (PI, 60%).
- "CAREER: Curing-Induced Microcracking in Thermoset Composites". NSF, **\$568,263**, 2022-2027 (PI, 100%).
- "Residual Stress Modeling in Fused Filament Fabrication". NSF I/UCRC SHAP3D, **\$60,000**, 2022-2023 (PI, 100%).
- "Institute for Ultra-Strong Composites by Computational Design (US-COMP)". NASA, **\$160,000**, 2022-2023 (Co-PI, 100%; PI: Odegard G.M.).
- "YIP: Physics-based Process Modeling for High-Temperature and High-Strength Composites". Air Force Office of Scientific Research, **\$450,000**, 2020-2023 (PI, 100%).
- "ICME Optimization of Advanced Composite Components of the Aurora D8 Aircraft". NASA, **\$937,000**, 2021-2023 (PI, 55%, subcontracts to Aurora Flight Sciences, Michigan Technological University, and Collier Aerospace).
- "QRM: Integrated Computational Materials Engineering approach for Polymer Matrix Composites microstructural quantification and virtual reconstruction". National Science Foundation **\$460,863**, 2017-2021 (PI, 55%).
- "REU: QRM: Integrated Computational Materials Engineering approach for Polymer Matrix Composites microstructural quantification and virtual reconstruction". National Science Foundation **\$16,000**, 2017-2021 (PI, 90%).
- "Multiscale Modeling of Advanced Fiber-reinforced Thermoset Composites During Curing". NASA **\$180,000**, 2019-2021 (PI, 95%).
- "Phase II IUCRC: Center for Wind Energy Science, Technology and Research (WindSTAR)". National Science Foundation **\$582,050**, 2020-2025 (Co-PI, 15%; PI: Niezrecki C.).
- "Mechanical Properties Enhancement Prediction for Matrix Materials". I/UCRC for Wind Energy, Science, Technology, and Research (WindSTAR), National Science Foundation - I/UCRS **\$185,000**, 2016-2020 (PI, 95%).
- "Structural Wind Blade Repair Optimization". I/UCRC for Wind Energy, Science, Technology, and Research (WindSTAR), National Science Foundation - I/UCRS **\$180,851**, 2018-2021 (PI, 95%).
- "Experimental and Computational Modeling of Textile Composites for Prediction of Damage Initiation and Growth, Air Force Research Laboratory" **\$255,000**, 2019-2021 (Co-PI, 25%; PI: Stapleton S.E.).
- "Smart Textile with Embedded and Printed Sensors (STEPS)", Boeing/NextFlex **\$537,000**, 2018-2021 (Co-PI, 36%; PI: Wang X.).
- "Characterization of Novel Thermoresponsive Fibers for Lightweight Smart Thermal Insulation", CCDC Soldier Center **\$197,780**, 2019-2020 (Co-PI, 36%, PI: Sun H.).
- "Residual Stresses in Thick Paste Adhesive". I/UCRC for Wind Energy, Science, Technology, and Research (WindSTAR), National Science Foundation - I/UCRS **\$71,008**, 2016-2021 (Co-PI, 50%; PI: Stapleton S.E.).
- "Finite Element Analysis of 3D Woven Composites", UDRI/NASA **\$25,000**, 2016 (PI, 100%).

Invited Seminars and Workshops

- 1 **Computational Simulations of C-C Composites** *9th Annual US-Australia-Japan Composites Workshop*, Melbourne (Australia). March 2024.
- 2 **Diseño Sostenible de Estructuras y Productos Aeronáuticos Utilizando Multifísica y Algoritmos de Optimización** *UTEC Universidad de Ingeniería y Tecnología*, Lima (Peru). December 2023.
- 3 **Multiscale Computationally-Driven Design & Manufacturing of Composites** *Pontificia Universidad Católica de Chile*, Santiago de Chile (Chile). November 2023.
- 4 **Process modeling of polymer-derived composites** *Ceramic Materials in Extreme Environments: New Processing Tools and Data-Driven Approaches Workshop - American Ceramic Society*, (Online). March 2023.
- 5 **Composites 2.0: Multiscale Computationally-Driven Manufacturing** *UCLA*, (CA). February 2023.
- 6 **Digital Workforce Development - Best Practices** *Invited Panelist AIAA 2023*, (MD). January 2023.
- 7 **Process Modeling for ICME of Composites** *HOLSIP 22*, (UT). January 2023.
- 8 **Multiscale Process Modeling for Advanced Composites** *Georgia Institute of Technology*, (GA). January 2023.
- 9 **Multiscale Computationally-Driven Design and Manufacturing of Composites: Fundamentals & Implementation of ICME** *Georgia Institute of Technology*, (GA). October 2023.
- 10 **Energy Efficient Structures: Smart Design through ICME** *Columbia University*, (NY). September 2023.
- 11 **Digital Engineering of the Next Generation of High-Performance Aerospace Composites** *Virginia Commonwealth University*, (VA). March 2022.
- 12 **Composites 2.0: Multiscale Computationally-Driven Manufacturing** *New York University*, (NY). October 2021.
- 13 **Process Modeling of Polymer Matrix Composites** *NASA Langley*, (VA). Online - June 2021
- 14 **ICME Optimization of Advanced Composite Components of the Aurora D8 Aircraft**, *NASA* (OH). Online - June 2021.
- 15 **Physics-Based Process Modeling for High-Temperature and High-Strength Composites**, "Hypersonic Materials Current and Future Needs", *AFOSR/Joint Hypersonics Transition Office (JHTO)*. Online - April 2021.
- 16 **Physics-Based Process Modeling for High-Temperature and High-Strength Composites**, *AFRL*. Online - May 2021.
- 17 **Computational Modeling for Enhanced Performance of Composites** *Lehigh University*, (PA). October 2019.
- 18 **Composites for Aerospace Applications** *SWE UML*, Lowell (MA). September 2019.
- 19 **Multiscale Modeling and Prediction of Residual Stresses in Thermosetting Polymer Matrix Composites** *Air Force Research Laboratory*, Dayton (OH). July 2019.
- 20 **Multiscale Process Modeling of Thermosetting Polymer Matrix Composites within ICME**. *NASA Glenn Research Center*, Cleveland (OH). June 2019.

- 21 **Virtual Reconstruction of Polymer Matrix Composites within an ICME Approach.** *NASA Langley Research Center.*, Hampton (VA). March 2019.
- 22 **Multi-scale Analysis of Thermoset Composites, from Virtual Manufacturing to In-service Performance.** *Michigan Technological University*, Houghton (MI). February 2019.
- 23 **Multi-scale Analysis of Thermoset Composites.** *University of Texas Arlington*, Arlington (TX). February 2019
- 24 **Effective use of Advanced Computation and Data, NSF Workshop.** *The Minerals, Metals & Materials Society Workshop*, Phoenix Convention Center, Phoenix (AZ). March 2018.
- 25 **Integrated Computational Materials Engineering (ICME) for Advanced Composites.** *Lowell Center for Space Science and Technology*, Lowell (MA). February 2018.
- 26 **Virtual modeling of Polymer Matrix Composites (PMCs).** *Politecnico di Torino FULL-COMP Workshop*, Torino (Italy), May 2017.
- 27 **Polymer Matrix Composites (PMCs): From Virtual Manufacturing to Progressive Failure Analysis.** *University of Massachusetts*, Lowell, MA. February 2016.
- 28 **Micromechanical Modeling of Virtually Cured Polymer Matrix Composite Structures (PMCs).** *NASA Glenn Research Center*, Cleveland, OH. November 2015.

Professional Activities

- American Society for Composites Conference Chair, Boston 2023.
- AIAA SciTech 2021-2023 Materials TC Deputy Rep, AIAA SciTech 2023 Materials TC Deputy
- Editorial Board Member of the Journal of Mechanics of Advanced Materials and Structures (MAMS), since April 2023.
- Editorial Board Member of the International for Multiscale Computational Engineering, since September 2017.
- Member of American Institute of Aeronautics and Astronautics (AIAA) Materials Technical Committee, since January 2017.
- Session Organizer and Session Chair for the American Society for Composites (ASC), SciTech AIAA, American Society of Mechanical Engineers (ASME) and International Conference on Mechanics of Advanced Materials and Structures (ICMAMS), ASME Aerospace Structures, Structural Dynamics, and Materials Conference (SSDM), International Conference on Advanced Topics in Mechanics of Materials (AtoMech).
- AIAA SciTech Student Paper Competition MTC Rep 2020 and 2021.
- Technical Reviewer for National Agencies:
National Aeronautics and Space Administration (NASA), the National Science Foundation (NSF), Air Force Office of Scientific Research (AFOSR), European Research Council (ERC).
- Technical Reviewer for International Conferences:
the American Society for Composites (ASC); the American Institute of Aeronautics and Astronautics SciTech; the International Mechanical Engineering Congress and Exposition (IMECE), ICMAMS, ASME Aerospace Structures, Structural Dynamics, and Materials (SSDM).

- Technical Reviewer for International Journals:
International Journal of Mechanical Sciences; the AIAA Journal; Journal of Reinforced Plastics and Composites; Composites Part A, Composites Part B; Composites Structures; Journal of Sandwich Structures and Materials; Mechanics of Advanced Materials and Structures; Journal of Composite Materials; Journal of Thermoplastic Composite Materials; International Journal of Damage Mechanics; Journal of Manufacturing Processes; Mechanics and Materials; Additive Manufacturing.

Past Projects Participation

- "Integrated Computational Methods for Composite Material"(ICM2). Project funded by the Air Force Research Laboratory (AFRL). Cooperation with GE Aviation and Lockheed Martin Aeronautics.
- Structural analysis of the "Team Italia" Lunar Lander and Rover for the "Google Lunar X PRIZE" competition. Project funded by the Italian Space Agency (ASI). Cooperation with Thales Alenia Space and Carlo Gavazzi Space.

Teaching Experience

- Assistant Professor. "Introduction to Aerospace" (MECH.2080), since Fall 2018. Undergraduate class. Department of Mechanical Engineering. University of Massachusetts Lowell.
- Assistant Professor. "Mechanics of composites" (MECH.5960), since Spring 2017, Graduate class. Department of Mechanical Engineering. University of Massachusetts Lowell.
- Assistant Professor. "Applied strength of materials" (MECH.3910), since Fall 2016, Undergraduate class. Department of Mechanical Engineering. University of Massachusetts Lowell.
- Assistant Professor. "Directed studies in ME" (MECH 4990), since Spring 2017, Undergraduate class, Department of Mechanical Engineering. University of Massachusetts Lowell.

Table 1: Courses Taught at UMass Lowell, 2016 to Present

Sem.	MECH 2080	MECH 3110	MECH 5960	Directed Studies	Total Cr- Hr
S21			26		78
F20**	22	82			268
S20			25		75
F19**	21	74		2	249
S19			22	1	69
F18	22	54		1	187
S18			26		78
F17		72			216
S17			27	1	84
F16		68			204

** Taught 2 sections

- Research Assistant. Graduate Space Structures class. Academic years 2011-2012 and 2012-2013. Department of Mechanical and Aerospace Engineering. Politecnico di Torino (Italy).
- Substitute Lecturer. Undergraduate Finite Element Structural Analysis class (AA 430). Fall 2015. Department of Aeronautics and Astronautics. University of Washington.
- Substitute Lecturer. Undergraduate Engineering Statics class (AA 210). Winter 2016. Department of Aeronautics and Astronautics. University of Washington.

Academic Service

- University of Massachusetts Lowell Faculty Senator, Fall 2018-2021.
- University of Massachusetts Lowell College Computing Committee, Fall 2017-present.
- University of Massachusetts Lowell Academic scholarship reviewer and chair, Spring 2018-2021.
- University of Massachusetts Lowell SEED reviewer, Spring 2018.
- University of Massachusetts Lowell Open House.

Languages

Italian	Native speaker
English	Fluent in speech, writing and reading PET with MERIT certificate (ESOL Examinations University of Cambridge)
Spanish	Fluent in speech, writing and reading DELE Nivel Inicial certificate (Cervantes Institute University of Salamanca)

Trainees

Current Ph.D. Students

Sebastian Abreu, Ph.D. Student
Juan Pablo Viaux, Ph.D. Student
Kalima Bukenia, Ph.D. Student
Michael Olaya, Ph.D. Student
Evgenia Plaka, Ph.D. Student

Current Postdocs

Manish Nagaraj, Postdoc
Sagar Shah, Postdoc

Past Trainees

Evgenia Plaka, M.S. (M.S. Thesis: Optimization of the D8 Double Bubble Composite Y-Joint, Current position: Ph.D. Student at the University of Massachusetts Lowell)

Francesco Calleri, M.S. (M.S. Thesis: Failure Analysis of Cross-ply Laminates, Current position: Structural Engineer at Leonardo)

Aurelio DeSimone, M.S. (M.S. Thesis: Microscale analysis of Fiber Reinforced Composite Materials, Current position: Logistic engineer at Lamborghini)

Joseph McDonald, M.S. (M.S. Thesis: Composites for Wind Turbine Blade Repair, Current position: Research Scientist at Toray Composites)

Sagar Patil, Ph.D. (Thesis: Molecular Modeling of High-performance Polymers, Current position: Postdoctoral Researcher at Michigan Technological Institute)

Michele Magonetti, M.S. (M.S. Thesis: Micromechanics analysis of fiber-reinforced composites, Current position: Project manager at Leonardo)

Sagar Shah, Ph.D. (Thesis: Transverse Property Prediction of Thermoset Polymer Matrix Composites, Current Position: Postdoctoral Researcher at the University of Massachusetts Lowell)

Andrew Burke, Postdoc (Current Position: Principal Engineer at Physical Sciences)

Daniele Guarnera, Ph.D. (Thesis: Refined one-dimensional models applied to biostructures and fluids, Current position: Postdoctoral Researcher at Istituto di Biorobotica Scuola Superiore Sant'Anna, Italy)

Francesco Deleo, Ph.D. (Thesis: Continuum Damage Progressive Failure Modeling for Crashworthiness and Static Analyses of Laminated Composites, Current position: Natrium Core Design and Methods Senior Manager at Terrapower, Affiliate Assistant Professor at the University of Washington, Aeronautics and Astronautics Department)

Reese George, M.S. (M.S. Thesis: Investigating Fused Filament Fabrication (FFF) Processing Parameters)

Journal Publications

Autorship convention: Usually, the first manuscript's author is the trainee that mainly contributed to the manuscript, other students that contributed to the project and edited the paper, collaborators in the project follow, the principal investigator that directed the work, and the manuscript is the last author. When a doctoral student in Italy, the convention was to list the principal investigator as a first author until the candidate's defense.

- J1 Kashmari K., Al Mahmud H., Patil S.U., Pisani W.A., Deshpande P., Maiaru M., Odegard M.G. (2023). **Multiscale Process Modeling of Semicrystalline PEEK for Tailored Thermomechanical Properties** *ASC Applied Engineering Materials, Vol 1 (11), pp3167–3177*
- J2 Shah, S., Olaya, M.N., Plaka, E., McDonald J., Hansen C.J., Maiaru M., (2023). **Effect of Moisture Absorption on Curing of Wind Blades during Repair** *Composites Part A* <https://doi.org/10.1016/j.compositesa.2023.107706>.
- J3 Nagaraj, M., Maiaru M., (2023). **A Novel Higher-Order Finite Element Framework For the Process Modeling of Material Extrusion Additive Manufacturing** *Additive Manufacturing, Vol 76*, <https://doi.org/10.1016/j.addma.2023.103759>.
- J4 Shah, S., Maiaru M. (2023). **Verification and Validation of a Rapid Design Tool for the Analysis of the Composite Y-Joint of the D8 Double-Bubble Aircraft** *International Journal for Multiscale Computational Engineering, Vol 21 (6), pp35–47*, 10.1615/IntJMultCompEng.2023047801.
- J5 Patil S., Krieg A., Odegard L., Yadav U., King J., Maiaru M., Odegard O. (2023). **Simple and Convenient Mapping of Molecular Dynamics Mechanical Property Predictions for Strain Rate, Temperature, and Degree of Cure** *Soft Matter*, <https://doi.org/10.1039/D3SM00697B>.
- J6 Shah, S., Maiaru, M. (2023). **Analytical Model for Composite Transverse Strength based on Computational Micromechanics**. *International Journal for Multiscale Computational Engineering. Vol 21 (6), pp 77–97* 10.1615/IntJMultCompEng.2023048428
- J7 Fisher O.J.P., Matlik J.F., Schindel W.D., French M.O., Kabir M.H., Ganguli J.S., Hardwick M., Arnold S.M., Byar A.D., Lewe J., Mahadevan S., Duncan S., Dong J.J., Kinard D.A., Maiaru M., (2022). **Digital Twin: Reference Model, Realizations, and Recommendations** *INSIGHT, Vol. 25, no. 1 pp. 50–55*.
- J8 Odegard G.M., Patil S.U., Gaikwad P.S., Deshpande P., Krieg A.S., Shah, S.P., Reyes A., Dickens T., King J.A., Maiaru M. (2022). **Accurate Predictions of Thermoset Resin Glass Transition Temperatures from All-Atom Molecular Dynamics Simulation** *Soft Matter, Vol. 18, no. 11, pp.7550–7558*.
- J9 Nagaraj, M. H., Maiaru M. (2023). **Progressive Damage Analysis of Steel-reinforced Concrete Beams using Higher-order 1D Finite Elements** *International Journal for Multiscale Computational Engineering, Vol 21 (4), pp57–65*.

- J10 Patil S.U., Shah, S., Olaya, M.N., Desphande P.P, Maiaru M., Odegard, G.M. (2021). **Reactive Molecular Dynamics Simulation of Epoxy for the Full Crosslinking Process** *ACS Applied Polymer Materials*, Vol. 3, no. 11, pp. 5788–5797.
- J11 Gaikwad, P.S, Krieg, A.S., Desphande P.P, Patil, S.U., King, J.A., Maiaru M., Odegard, G.M. (2021). **Understanding the Origin of the Low Cure-Shrinkage of Polybenzoxazine Resin by Computational Simulation** *ACS Applied Polymer Materials*, Vol. 3, no.12, pp 6407–6425.
- J12 Guarnera, G., Carrera E., Hansen C.J., Maiaru M. (2021). **Mechanical Characterization of 3D Printed Mimic of Human Artery Affected by Atherosclerotic** *Biomechanics and modeling in mechanobiology*, doi: 10.1007/s10237-021-01487-9.
- J13 Schey M., Beke T., Appel L., Zabler S., Shah, S., Hu J., Liu F., Maiaru M., Stapleton S. (2021). **Identification and quantification of 3D fiber clusters in fiber reinforced composite materials** *The Journal of The Minerals, Metals & Materials Society*, <https://doi.org/10.1007/s11837-021-04703-0>.
- J14 Bukenya, K., Olaya, M.N., Shah, S., Pineda E. J., Ricks, T. M., Maiaru, M. (2021). **Residual Stresses Induced Due to Curing of the Bulk Matrix in a Simplified Three-Dimensional (3D) Woven Repeating Unit Cell.**, *NASA Technical Reports Server (NTRS)*, <https://ntrs.nasa.gov/citations/20205009287>.
- J15 Shah, S., Maiaru M., (2021). **Effect of Manufacturing on the Transverse Response of Polymer Matrix Composites.** *Polymers*, doi: 10.3390/polym13152491.
- J16 Patil, S., Shah, S., Deshpande, P., Olaya, M., Maiaru, M., Odegard, G. (2021). **Reactive Molecular Dynamics Simulation of Epoxy for the Full Cross-Linking Process.**, *Applied Polymer Materials*, <https://doi.org/10.1021/acsapm.1c01024>.
- J17 Odegard, G., Patil, S., Deshpande, P., Kanhaiya, K., Winetrout, J., Heinz, H., Shah, S., Maiaru, M. (2021). **Molecular Dynamics Modeling of Epoxy Resins using a Reactive Interface Force Field**, *Macromolecules*,10.1021/acsapm.1c01024.
- J18 Shah, S., Patil S., Hansen C., Odegard G., Maiaru M., (2021). **Process Modeling and Characterization of Thermoset Composites for Residual Stress Prediction.** *Mechanics of Advanced Materials and Structures*, <https://doi.org/10.1080/15376494.2021.2017527>.
- J19 Lux P., Cassano A.G., Johnson S.B., Maiaru M., Stapleton S.E. (2020). **Adhesive Curing Cycle Time Optimization in Wind Turbine Blade Manufacturing** *Renewable Energy*, vol. 162, <https://doi.org/10.1016/j.renene.2020.08.043>.
- J20 Cassano A.G., Dev S., Maiaru M., Hansen C.J., Stapleton S.E. (2020). **Cure Simulations of Thick Adhesive Bondlines for Wind Energy Applications** *Journal of Applied Polymer Science*, <https://doi.org/10.1002/app.49989>.
- J21 Olaya, M., Shah, S., Maiaru, M. (In submission). **Time-independent Characterization of Curing Thermosets through Off-stoichiometry Proxies.**
- J22 Nagaraj, M., Schey M., Stapleton S., Maiaru M. (In submission). **Mechanical and Statistical Convergence of Virtually Reconstructed Microstructures.**, *Composites Part A: Applied Science and Manufacturing*.
- J23 Maiaru M., D'Mello R.J., Waas A. M. (2018). **Characterization of Intralaminar Strengths of Virtually Cured Polymer Matrix Composites** *Composites Part B: Engineering.*, vol. 149, 10.1016/j.compositesb.2018.02.018.

- J24 Maiaru M., Petrolo M., Carrera E. (2016). **Evaluation of Energy and Failure Parameters in Composite Structures via a Component-Wise approach.** *Composites Part B: Engineering*, vol. 108, pp.53-64.
- J25 D'Mello R.J., Maiaru M., Waas A. M. (2016). **Virtual Manufacturing of Composite Aerostructures.** *The Aeronautical Journal*, vol. 120, issue 1223 (150th anniversary of the Royal Aeronautical Society), pp. 61-81.
- J26 D'Mello R.J., Maiaru M., Waas A. M. (2015). **Effect of the Curing Process on the Transverse Tensile Strength of Fiber-Reinforced Polymer Matrix Lamina Using Micromechanics Computations.** *Integrating Materials and Manufacturing Innovation*, vol. 4:7. doi:10.1186/s40192-015-0035-y.
- J27 Carrera E., Maiaru M., Petrolo M., Giunta G. (2013). **A Refined 1D Element for the Structural Analysis of Single and Multiple Fiber/Matrix Cells.** *Composite Structures*, vol. 96, pp. 455-468. - ISSN 0263-8223.
- J28 Carrera E., Maiaru M., Petrolo M. (2012). **Component-Wise Analysis of Laminated Anisotropic Composites.** *International Journal of Solids and Structures*, vol. 49, pp. 1839-1851. - ISSN 0020-7683.
- J29 Bukenya, K., Shah, S., Sabato A., Maiaru M. (2023). **Digital Image Correlation for Shrinkage Characterization during Curing.** [10.26434/chemrxiv-2023-6xg1g](https://doi.org/10.26434/chemrxiv-2023-6xg1g).
- J30 Nagaraj M.H., Maiaru M. (2023). **Curing-Induced Residual Stress and Strain in Thermoset Composites** [10.26434/chemrxiv-2023-qg7zx](https://doi.org/10.26434/chemrxiv-2023-qg7zx).
- J31 Deshpande P., Olaya M.N., Krieg A., Patil S.U., Shah S., King J., Odegard G.M., Maiaru M. (2023). **Curing-Induced Residual Stress and Strain in Thermoset Composites** [10.26434/chemrxiv-2023-sc4mx](https://doi.org/10.26434/chemrxiv-2023-sc4mx)

Conference Proceedings

- P1 Hearley B.L., Arnold S., Maiaru M. (2023). **Automation of the ICME Workflow Incorporating Material Digital Twins at Different Length Scales Within a Robust Information Management System**, 7th World Congress on Integrated Computational Materials Engineering.
- P2 Nagaraj M., Maiaru M. (2024). **Process modeling of the Fused Filament Fabrication of semi-crystalline thermoplastics**, AIAA SCITECH 2024 Forum, <https://doi.org/10.2514/6.2024-1793>.
- P3 Olaya, M.N., Maiaru M. (2023). **Homogenization methods for multiscale process modeling through full factorial design**, 38th ASC Technical Conference, American Society for Composites.
- P4 Shah S., Maiaru M. (2023). **Analytical Model for Transverse Tensile Strength Prediction of Thermoset Composites**, 38th ASC Technical Conference, American Society for Composites.
- P5 Bukenya, K., Sabato A., Maiaru M. (2023). **Cure Shrinkage Characterization of a Thermosetting Resin with Three-dimensional Digital Image Correlation (3D-DIC)**, 38th ASC Technical Conference, American Society for Composites.
- P6 Nagaraj M., Hansen C., Maiaru M. (2023). **Prediction of Distortion and Residual Stress Evolution in the Fused Filament Fabrication Process Using Higher-order Finite Elements**, 38th ASC Technical Conference, American Society for Composites.

- P7 Wavrunek T., Patil S., Bamane S., Kemppainen J., Maiaru M., Odegard G. (2023). **Thermo-mechanical Property Prediction of a Bismaleimide Resin Using Molecular Dynamics**, 38th ASC Technical Conference, American Society for Composites.
- P8 Patil S., Odegard G., Maiaru M. (2023). **Thermo-mechanical Property Prediction at the Nano-scale for Process Modeling of the Aurora D8 Aircram Y-joint**, 38th ASC Technical Conference, American Society for Composites.
- P9 Bukenya, K., Olaya, M.N. N., Pineda E. J., Maiaru M. (2022). **Process Modeling of Woven Textiles**, AIAA SciTech 2022 Forum, American Institute of Aeronautics and Astronautics (Awarded Best Paper - Student Paper Competition).
- P10 Plaka, E., Jones S.P, Bednarczyk B.A., Pineda E.J., Maiaru M. (2022). **Application of a Rapid Design Tool to a 3D Woven Structural Joint**, AIAA SciTech 2022 Forum, American Institute of Aeronautics and Astronautics.
- P11 Olaya, M.N., Odegard, O.M., Maiaru M. (2022). **A multi-scale approach for process modeling of polymer matrix composites**, AIAA SciTech 2022 Forum, American Institute of Aeronautics and Astronautics.
- P12 Shah, S., Maiaru M. (2022). **A Novel Closed-form Solution for Transverse Tensile Strength of Polymer Composites based on Virtual Testing**, AIAA SciTech 2022 Forum, American Institute of Aeronautics and Astronautics.
- P13 Shah, S., Maiaru M. (2022). **Transverse Tensile Strength Prediction of Thermosetting Composites**, A37th American Society for Composites Conference, Tucson, AZ, September 19-21, 2022.
- P14 Plaka, E., Bednarczyk B., Maiaru M. (2022). **Design of Adhesively Bonded Composite Joints Using a Rapid Design Tool**, A37th American Society for Composites Conference, Tucson, AZ, September 19-21, 2022.
- P15 Nagaraj, M.H., Maiaru M. (2022). **Micro-Scale Process Modeling and Evaluation of Curing-Induced Residual Stresses in Fiber Reinforced Polymers Using Higher-Order FE Models**, A37th American Society for Composites Conference, Tucson, AZ, September 19-21, 2022.
- P16 Kashmari, K., P. Deshpande, S. Patil, M. Maiaru, Odegard G.M., (2022). **A Multiscale Approach to Investigate the Effect of Temperature and Crystallinity on the Development of Residual Stresses in Semicrystalline PEEK**, A37th American Society for Composites Conference, Tucson, AZ, September 19-21, 2022.
- P17 Patil, S.U., Olaya, M.N., Deshpande, P. Maiaru, M, Odegard, G.M. (2022). **Influence of stoichiometry on thermo-mechanical properties of DGEBF/DETDA epoxy**, 37th AIAA SciTech Forum, San Diego, CA, January 2022.
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