

Call for Papers

The AIAA Materials Technical Committee, the Structures Technical Committee and the Multidisciplinary Design Optimization Technical Committee are sponsoring a Joint Session on

AI/ML for Materials, Structures and Optimization

AIAA SciTech 2027

January 11-15, 2027,

Orlando, FL

The AIAA Structures and Materials Technical Committees solicit papers showcasing recent research, technological advancements, and systems-level perspectives in **Artificial Intelligence and Machine Learning** applied to aerospace materials and structures. As AI/ML technologies mature, the focus is shifting from exploration to deployment in safety-critical applications. We seek contributions that demonstrate how these tools revolutionize the development, analysis, manufacturing, and certification of aerospace structures. **Key topics of interest include, but are not limited to:** *Physics-Informed Machine Learning (PINNs), Generative AI for Design and Discovery, Certification, Verification & Validation (V&V), Data-Efficient Learning, Digital Twins and Structural Health Monitoring (SHM) with real-time AI integration for predictive maintenance, anomaly detection, and dynamic life-cycle management of aircraft and spacecraft structures, and AI in Manufacturing.* Applications across all classes of aerostructures—including commercial aircraft, military platforms, launch vehicles, and spacecraft—are welcome.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/call-for-content/call-for-papers>

Make sure to select the “AI/ML for Materials and Structures” topic option under “Materials”, “Structures” or “Multidisciplinary Design Optimization” technical discipline when prompted during submission.

For more information, contact one of the following organizers:

Ibrahim Guven	Virginia Commonwealth University	iguven@vcu.edu
August Noevere	Collier Aerospace	August.Noevere@CollierAerospace.com
Saha, Sourav	Virginia Polytechnic Institute and State University	souravsaha@vt.edu
Suraj Ravindran	University of Minnesota	sravi@umn.edu

Call for Papers

The AIAA Materials Technical Committee is soliciting abstracts for a Special Session on

Materials for Additive Manufacturing

AIAA SciTech 2027

January 11-15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee solicits papers with recent research, technological advancements, and systems-level perspectives on **Additive Manufacturing** within the AIAA SciTech conference. These sessions will examine advances in Additive Manufacturing, also sometimes known as 3D Printing. Any materials-related aspect of additive manufacturing that is relevant to aerospace is acceptable for papers, including but not limited to

- Metals and Alloys: Steel, Titanium and Aluminum based alloys, Superalloys, high entropy alloys etc.
- AM for material and component design: multi-material printing, spatially and functionally gradient designs, etc.
- Computational modeling of AM processes and resulting material properties
- Constitutive models for Additively Manufactured materials
- Multi-scale structural analysis modeling for Additively Manufactured materials
- Design of structures to enable efficient additive manufacturing
- Additive Manufacturing for polymers and composites
- Additive Manufacturing for ceramics and refractory materials
- Additive Manufacturing for tooling
- Process monitoring and control methods
- In-space additive manufacturing
- Testing and inspection
- AI-driven processes
- Additive repair
- New or novel Additive Manufacturing process development
- Materials discipline capabilities for certification

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts will be evaluated by qualified individuals from these sectors.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at: <https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Materials for Additive Manufacturing” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Materials Technical Committees is soliciting abstracts for a Special Session on

Fatigue and Fracture

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee solicits papers with recent research, technological advancements, and systems-level perspectives on **Fatigue and Fracture** mechanics research, development, and application within the AIAA SciTech conference. It is the intention to examine advances including underlying theoretical principles, fundamental improvements to the state of the art in experimental, computational, and/or modeling practices, verification, validation, and uncertainty quantification, standard and nonstandard testing, and additional relevant topics as proposed.

- Durability and damage tolerance
- Progressive failure analysis
- Material behavior including composites, metals, ceramics, and polymers
- Environmental influences
- Computational and analytical modeling
- Experimental mechanics
- Testing and characterization procedures
- Sustainment and life extension
- Verification and validation
- Post-impact performance
- No-growth and slow-growth design criteria
- Application of artificial intelligence and machine learning

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts will be evaluated by qualified individuals from these sectors.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/call-for-content/call-for-papers>

Make sure to select the “Fatigue and Fracture” topic option under “Materials” technical discipline when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Materials Technical Committees is soliciting abstracts for a Special Session on

Materials for Extreme Environments

AIAA SciTech 2027
January 11-15, 2027 Orlando, FL

The American Institute of Aeronautics and Astronautics (AIAA) Materials Technical Committee solicits papers with recent research and technological advancements on **Materials for Extreme Environments** at the AIAA SciTech 2027 conference. Materials used for high-speed atmospheric, atmospheric reentry, Earth orbit, lunar surface, or planetary science applications all experience extreme environments including temperature extremes, solar and ionizing radiation, atomic oxygen, and abrasive regolith dust.

Topics of interest include, but are not limited to, materials science research on:

- Hypersonic applications
- Emerging entry, descent, and recovery systems
- Development of thermal and environmental barrier coatings
- In-Space Servicing, Assembly, and Manufacturing (ISAM) applications
- Assessment and prevention of materials degradation due to space environment hazards such as ionizing radiation, atomic oxygen, spacecraft charging, and micrometeoroids
- Materials for dust and regolith mitigation and lunar surface hazards
- In-situ Resource Utilization (ISRU)

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed. Multiple sessions may be arranged to cluster papers with related topics.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at: <https://www.aiaa.org/SciTech/call-for-content/call-for-papers>

Make sure to select the “Materials for Extreme Environments” topic option under “Materials” technical discipline when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Materials Technical Committee is sponsoring a special session on

Microstructure Characterization and Modeling

AIAA SciTech 2027

January 11–15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee (MTC) is pleased to announce a call for papers to be presented in special sessions on **Microstructure Characterization and Modeling** within the AIAA SciTech Forum. These sessions will examine advances in experimental and computational characterization, testing, design, modeling, simulation, analysis, validation, and optimization of material microstructures. Any materials-related aspect of microstructures relevant to aerospace is acceptable for papers, including but not limited to:

- Modeling and experimentation of predictive relationships between the synthesis/processing parameters, material composition, microstructure (including manufacturing defects, damage, and other physical features), and material degradation, failure, and properties
- Mechanical, thermal, ablation, and multifunctional behavior of microstructures and effects across length scales
- Computational and analytical modeling, simulation, verification, and validation
- Testing and characterization procedures (including micro-computed tomography)
- Design, optimization, and innovative and/or end-user-tailored applications
- Manufacturing and inspection procedures
- Effects of life-cycle, recycling, and/or environment on microstructural evolution

Material architectures with microstructures of interest may include but are not limited to composites, metals and alloys, polymers, ceramics, refractory materials, functionally graded materials, multi-scale hierarchical materials, metamaterials, and interfaces.

To this end, the MTC is soliciting papers with recent research, technological advancements, and systems-level perspectives in the above areas. The MTC welcomes submissions from government, industry, academic, and small businesses.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Microstructure Characterization and Modeling” topic option under “Materials” when prompted during submission.

Please notify us if you are planning to submit an abstract, so that we can ensure that it is included in these sessions. For more information contact one of the following organizers:

Samantha Bernstein	The University of Texas at Austin	samantha.bernstein@utexas.edu
Dr. Joseph H. Koo	The University of Texas at Austin	jkoo@mail.utexas.edu
Dr. Reed Kopp	ATA Engineering, Inc.	reed.kopp@ata-e.com
Dr. Evan Pineda	NASA Glenn Research Center	evan.j.pineda@nasa.gov

Call for Papers

The AIAA Materials Technical Committee is soliciting abstracts for a Special Session on

Multifunctional Materials for Aerospace

AIAA SciTech 2027

January 11-15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committees solicit papers with recent research, technological advancements, and systems-level perspectives on **Multifunctional Materials for Aerospace** within the AIAA SciTech conference. It is the intention to examine advances including:

- Area of interest 1: Multifunctional nano-composite materials and applications
- Area of interest 2: Piezoelectric/pyroelectric materials and applications
- Area of interest 3: Piezoresistive/piezoresistance materials and applications
- Area of interest 4: Photo sensitive materials and applications
- Area of interest 5: Temperature sensitive materials and applications
- Area of interest 6: Electroactive/Magneto-active materials and applications
- Area of interest 7: Shape memory materials and applications
- Area of interest 8: Dielectric materials and applications
- Area of interest 9: Self-healing materials and Structures
- Area of interest 10: Any new functional/multifunctional material discoveries

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Multifunctional Materials for Aerospace” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

Richard Li
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Call for Papers

The AIAA Materials Technical Committee is sponsoring a special session on

Multiscale Modeling

AIAA SciTech 2027
January 11-15, 2027
Hyatt Regency Orlando
Orlando, FL

The American Institute of Aeronautics and Astronautics (AIAA) Structures and Materials Technical Committees solicit papers with recent research and technological advancements on **Multiscale Modeling** at the AIAA SciTech 2026 conference. Multiscale modeling approaches are crucial for understanding and predicting material behavior across different length and time scales, enabling more efficient design and optimization of aerospace systems.

Topics of interest include, but are not limited to:

- Atomic to continuum scale bridging
- Molecular dynamics simulations
- Mesoscale modeling techniques
- Microstructure-property relationships
- Concurrent multiscale methods
- Machine learning in multiscale modeling
- Uncertainty quantification
- Experimental validation techniques
- High-performance computing applications
- Process-structure-property modeling
- Multiphysics coupling strategies
- Damage and failure prediction
- Novel numerical methods

The committee welcomes submissions from government, industry, academia, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**
Author notification of paper acceptance on or about **August 24, 2026**
Final manuscript due on or about **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:
<https://www.aiaa.org/SciTech/call-for-content/call-for-papers>

Make sure to select the "Multiscale Modeling" topic option under "Materials" when prompted during submission.

For more information, contact one of the following organizers:

Marianna Maiaru
Samit Roy
Gary Seidel

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Call for Papers

The AIAA Materials Technical Committees is soliciting abstracts for a Special Session on

Nanostructured Materials

AIAA SciTech 2027

January 11-15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee solicit papers with recent research, technological advancements, and systems-level perspectives on **Nanostructured Materials** to be presented in special sessions within the AIAA SciTech conference. It is the intention to examine advances including (and not limited to):

- Hierarchical methods development including molecular simulations
- Process-structure-property relationships
- Performance analysis
- Experimental techniques and characterization
- Multifunctional properties and approaches
- Synthesis and processing of nanostructured materials including additive manufacturing

The committee welcomes submissions from government, industry, academia, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Nanostructured Materials” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

Name	Affiliation	Email
Dr. Yumeng Li	University of Illinois at Urbana Champaign	Yumengl@illinois.edu
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Dr. Brian L. Wardle	Massachusetts Institute of Technology	wardle@mit.edu
Dr. Jingyao Dai	University of Oklahoma	jydai@ou.edu

Call for Papers

The AIAA Materials Technical Committee is soliciting abstracts for a Special Session on

Testing and Characterization of Materials

AIAA SciTech 2027

January 11–15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee is very pleased to announce a call for papers to be presented in special sessions on **Testing and Characterization of Materials** within the AIAA SciTech conference. These sessions will examine advances in testing and characterization of materials to be utilized in any aircraft, aerospace, spacecraft, hypersonic, or other vehicle or structure. Any aspect of this broad area relevant to aerospace is acceptable for papers, including:

- Testing and characterization programs, results, or material selection efforts
- Unique challenges in testing and characterization
- Overview or survey papers addressing available databases or consortiums
- New or novel instrumentation/testing methods or applications for new material types
- Extreme environment materials testing or characterization, including high-temperature (>1000 °C), corrosion, and erosion environments
- Analog or performance testing of materials, even in structural configurations
- AI/ML-guided testing and characterization, including design of experiments
- In situ characterization during material stimulation (testing or processing conditions)

To this end, the Materials Technical Committee is soliciting papers with recent research, technological advancements, and systems level perspectives in the above areas. The committee welcomes submissions from government, industry, academic, and small businesses.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Testing and Characterization of Materials” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

Dr. Jingyao Dai	University of Oklahoma	jydai@ou.edu
Dr. Reed Kopp	ATA Engineering, Inc.	reed.kopp@ata-e.com
Dr. Sourav Saha	Virginia Polytechnic Institute	souravsaha@vt.edu
Dr. Solver Thorsson	Exponent	sthorsson@exponent.com
Dr. Tian-Bing Xu	Old Dominion University	txxu@odu.edu
Dr. Namiko Yamamoto	Penn State	nuy12@psu.edu

Call for Papers

The AIAA Materials Technical Committees is soliciting abstracts for a Special Session on

Thermoplastic Composites

AIAA SciTech 2027

January 12-16, 2027

Orlando, FL

The American Institute of Aeronautics and Astronautics (AIAA) Structures and Materials Technical Committees solicit papers with recent research and technological advancements on Thermoplastic Composites at the AIAA SciTech 2027 conference. Thermoplastic composites offer potential performance, cost, and manufacturing rate benefits to aircraft structures, but several challenges remain. Topics of interest include, but are not limited to:

- Materials
- Structures
- Design
- Manufacturing
- Degradation
- Modeling
- Testing
- Joining
- Painting
- Repair

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Thermoplastic Composites” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Materials Technical Committee is soliciting abstracts for a Special Session on

Materials for High-Rate Manufacturing

AIAA SciTech 2027

January 11-15, 2027

Orlando, FL

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committees solicit papers with recent research, technological advancements, and systems-level perspectives on **Materials for High-Rate Manufacturing** within the AIAA SciTech conference. It is the intention to examine advances including but not limited to:

- Area of interest 1: Thermoplastic materials/composites
- Area of interest 2: Large additive manufacturing
- Area of interest 3: Fast-curing and next generation thermosets such as snap cure resins
- Area of interest 4: Accelerated resin transfer molding (RTM) materials & processes
- Area of interest 5: Compression molding of composites

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Materials for High-Rate Manufacturing” topic option under “Materials” when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Materials Technical Committee is soliciting abstracts for a Special Session on

Bio-Inspired Materials and Structures

The AIAA (American Institute of Aeronautics and Astronautics) Materials Technical Committee solicits papers with recent research, technological advancements, and systems-level perspectives on bio-inspired materials design, biomimetic structures, and nature-derived engineering solutions within the AIAA SciTech conference. It is the intention to examine advances including underlying theoretical principles, fundamental improvements to the state of the art in experimental, computational, and/or modeling practices, biological-to-engineering translation methodologies, multifunctional design approaches, and additional relevant topics as proposed.

Topics of Interest:

- Biological investigation and characterization of natural structures
- Biomimetic design principles and translation methodologies
- Hierarchical and multifunctional materials
- Bio-inspired thermal management systems
- Nature-inspired radiation shielding, damage tolerant, and protective structures
- Trabecular bone and skeletal architecture-inspired designs
- Plant-based structural concepts (xylem, cellular architecture)
- Additive manufacturing of bio-inspired geometries
- Computational modeling of biological and biomimetic structures
- Experimental validation and characterization
- Multi-physics simulation of bio-inspired systems
- Applications in aerospace, energy, and biomedical systems
- Lightweight structural optimization using biological principles
- Water transport and fluid management systems inspired by nature
- Integration of imaging, morphometric analysis, and CAD translation

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts will be evaluated by qualified individuals from these sectors.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/call-for-content/call-for-papers>

Make sure to select the "Bio-Inspired Materials and Structures" topic option under "Materials" technical discipline when prompted during submission.

For more information, contact one of the following organizers:

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Call for Papers

The AIAA Non-Deterministic Approaches and Materials Technical Committee
are sponsoring a Joint Session on

Uncertainty Quantification for Advanced Manufacturing and Composite Material Characterization

AIAA SciTech 2027

January 11-15, 2027

Orlando, FL

The AIAA Non-Deterministic Approaches (NDA) and the Materials (MAT) Technical Committee are soliciting papers with recent research, methodological advances, and industrial applications related to **Uncertainty Quantification (UQ) for AM and Composite Material Characterization**.

Authors are invited to submit papers that integrate modeling and experimentation for material microstructure characterization and property evaluation from data with focus on verification, validation, and uncertainty quantification. Topics of interest include characterization of material uncertainty in advanced manufacturing and composite manufacturing processes, probabilistic model calibration and validation, uncertainty propagation through multi-scale materials models, and risk analysis arising from material variability.

The committee welcomes submissions from government, industry, academic, and small businesses. All abstracts are peer-reviewed.

Extended abstracts of no less than 1,000 words are due **May 21, 2026**

Author notification of paper acceptance on or about **August 24, 2026**

Final manuscript due **December 1, 2026**

Detailed deadline information, abstract preparation instructions, and policies can be found at:

<https://www.aiaa.org/SciTech/presentations-papers/call-for-papers>

Make sure to select the “Uncertainty Quantification for Advanced Manufacturing and Composite Material Characterization” topic option under “Materials” or “Non-Deterministic Approaches” when prompted during submission.

For more information, contact one of the following organizers:

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