NAISE Advanced Metal Manufacturing Workshop
Characterization, AI and Critical Applications

Information Booklet

March 12, 2026

VENUE
Northwestern, Evanston Campus
NAISE HQ, Hogan Building, Suite 1-160
2205 Tech Drive, Evanston, IL, 60608
https://maps.northwestern.edu/facility/88

PARKING
Northwestern North Parking Garage*
2311 N. campus Drive, Evanston, IL, 60208
https://maps.northwestern.edu/facility/646
**once at event, please ask for a validation ticket*

NAISE CONTACTS

Technical:
Begum Gulsoy – Director of Research
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Logistics:
Iustitia Ko – Program Assistant
iustitia.ko@northwestern.edu

BRIEF

NAISE Advanced Metal Manufacturing Workshop

Characterization, Artificial Intelligence and Critical Applications

March 12, 2026 @ NAISE / Northwestern – Evanston Campus

SCOPE

The NAISE Workshop on *Advanced Metal Manufacturing: Characterization, Artificial Intelligence, and Critical Applications* aims to foster collaboration between Northwestern University and Argonne National Laboratory while addressing urgent research and development needs in metal manufacturing. Advanced metallic components are foundational to technologies in energy, defense, and national security, yet current manufacturing capabilities face increasing challenges related to supply chain resilience, materials qualification, process control, and scalability. Recent disruptions and evolving performance requirements underscore the need for coordinated advances in materials design, manufacturing science, and data-driven innovation. This workshop seeks to identify shared challenges, define high-impact research directions, and catalyze collaborative efforts that advance next-generation metal manufacturing for critical national needs.

The workshop will focus on the following interconnected themes:

- **Advanced alloy and manufacturing process development for critical applications**: Emphasizing materials and processing strategies tailored for energy and national security, with the goal of strengthening domestic manufacturing capabilities, mitigating supply chain vulnerabilities, and enabling efficient qualification of high-performance components.

- **Integration of artificial intelligence across the metal manufacturing lifecycle**: Embedding AI into education and workforce development, process monitoring and control, material-process-product co-design, and qualification and certification to accelerate innovation, in alignment with national initiatives such as *GENESIS* that apply AI to advance scientific discovery and manufacturing.

- **High-throughput and high-resolution characterization of metallic materials and manufacturing processes**: Leveraging advanced experimental capabilities to achieve in-depth understanding of process-structure-property relationships, establish high-fidelity datasets, and provide reliable ground truth for physics-informed and data-driven model development.

FINAL AGENDA

NAISE Advanced Metal Manufacturing Workshop

Characterization, Artificial Intelligence and Critical Applications

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All Times CST

08:40AM – 09:00AM Breakfast & Registration

09:00AM – 09:05AM **NAISE Welcome**
Neelesh Patankar & Begum Gulsoy, *Northwestern*

09:05AM – 09:15AM **Workshop Charge**
Tao Sun, *Northwestern* & Samuel Clark, *Argonne*

09:15AM – 09:45AM **Northwestern Initiative for Manufacturing Science and Innovation**
Jian Cao, *Northwestern*

09:45AM – 10:05AM **AI for Manufacturing**
Ping Guo, *Northwestern*

10:05AM – 10:35AM **Additive Manufacturing Efforts at the Advanced Photon Source**
Andrew Chuang & Samuel Clark, *Argonne*

10:35AM – 10:55AM Break

10:55AM – 11:25AM **Industry Perspective: QuesTek Innovations**
Tanner Kirk, *QuesTek Innovations*

11:25AM – 11:45AM **Advanced Materials for Nuclear Reactor Applications**
Xuan Zhang, *Argonne*

11:45AM – 12:05PM **CHiMaD Metals Processing Facility and Materials Design**
John Patrick Reidy & Ian McCue, *Northwestern*

12:05PM – 01:05PM Group Photo & Lunch

01:05PM – 01:15PM **Breakout Charge**
Tao Sun, *Northwestern* & Samuel Clark, *Argonne*

01:15PM – 01:45PM **Breakout Session I**

01:45PM – 02:00PM Break & Transition

02:00PM – 02:30PM **Breakout Session II**

02:30PM – 02:45PM Break

02:45PM – 03:30PM **Report outs, Wrap up & Action items**

03:30PM *Adjourn*

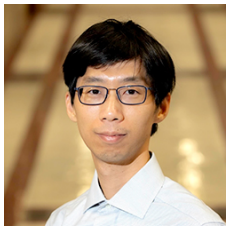
SPEAKERS & ORGANIZERS

Tao Sun | Northwestern & Argonne - NAISE Fellow
Workshop Lead Co-Organizer
Associate Professor, Department of Mechanical Engineering
Link to bio / interests

Samuel Clark | Argonne & Northwestern - NAISE Fellow
Workshop Lead Co-Organizer
Physicist, Imaging Group, X-Ray Sciences Division
Link to bio / interests

Neelesh Patankar | Northwestern & Argonne - NAISE Fellow
Director, Northwestern Argonne Institute for Scientific and Engineering Excellence
Professor, Department of Mechanical Engineering
Link to bio / interests

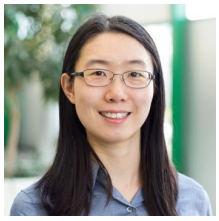
Jian Cao | Northwestern
Associate Vice President for Research, Office for Research
Director, Northwestern Initiative for Manufacturing Science and Innovation (NIMSI)
Professor, Department of Mechanical Engineering
Link to bio / interests



Ping Guo | Northwestern
Associate Professor, Department of Mechanical Engineering
Link to bio / interests

Andrew Chuang | Argonne
Physicist – Materials Physics & Engineering Group, X-Ray Sciences Division
Link to bio / interests

Tanner Kirk | QuesTek Innovations
Product Engineering Manager
QuesTek Innovations Website
Link to bio / interests



Xuan Zhang | Argonne
Principal Materials Scientist, Nuclear Science Engineering Division
Link to bio / interests

John Patrick Reidy | Northwestern
Graduate Student (McCue Group), Department of Materials Science and Engineering
Link to bio / interests

Ian McCue | Northwestern
Director, CHiMaD Metals Processing Facility
Assistant Professor, Department of Materials Science and Engineering
Link to bio / interests

Begum Gulsoy | Northwestern & Argonne - NAISE Fellow
Workshop Co-organizer
Director of Research, NAISE & Office for National Laboratories
Research Associate Professor, Department of Materials Science and Engineering
NAISE Website
Link to bio / interests
