CALL FOR ABSTRACTS

We are delighted to invite you to submit an abstract for the AVS 72nd International Symposium & Exhibition, scheduled to be held at the David L. Lawrence Convention Center in Pittsburgh, PA November 8-13, 2026. *The AVS Symposium serves as the premier venue for presenting and discussing interdisciplinary science and technology related to materials, processing, surfaces, interfaces, and devices*, catering to attendees from industry, government labs, and academia.

The AVS symposium cultivates a dynamic environment that transcends traditional disciplinary boundaries. From fundamental science to manufacturing, this weeklong symposium fosters a multidisciplinary atmosphere where participants from industry, government labs, and academia collaborate and explore research in vacuum technology, thin films, plasma science, microelectronic devices, quantum computing, 2D materials, nanostructures, biomaterials, surface phenomena–and much more!

We are delighted to announce that this year's *plenary speaker is Dr. Akihisa (Aki) Sekiguchi, Fellow of Tokyo Electron Limited's Corporate Innovation Division*. He currently sits on SEMI's Board of Industry Leaders and the CTO Forum. Dr. Sekiguchi sets TEL's strategy for corporate innovation, including in *AI, quantum computing, and advanced CMOS logic development*. His presentation will set the stage for the conference, overviewing the current semiconductor technology roadmap and highlighting where the research and discoveries being discussed at the AVS Symposium can help accelerate solutions for today's most critical challenges.

Over 25 AVS Divisions, Technical Groups, Focus Topics, and Mini-Symposia are soliciting abstracts for AVS 72. Take a moment to review the list below of diverse session themes to which you can submit your oral or poster abstract. *When submitting to your chosen topic, ensure you select either the oral or poster session.* The program committee will thoroughly review abstracts to make the most appropriate scheduling decisions as they build their sessions.

- **2D Materials (2D)**
- **Actinides and Rare Earths (AC)**
- **Advanced Microelectronic Materials (AM)**
- **Advanced Packaging (PK)**
- **Advanced Surface Engineering (SE)**
- **Advances in Battery Engineering, Interface Design, and Characterization (BT)**
- **Advances in EUV Lithography (EUV)**
- **AI/ML/Autonomous Experimentation for Thin Films Processing (AIML)**
- **Applied Surface Science (AS)**
- **Atomic Scale Processing (AP)**
- **Biomaterials Interfaces (BI) & Plenary Session (BP)**
- **Chemical Analysis & Imaging of Interfaces (CA)**
- **Electronic Materials and Photonics (EM)**
- **From Ionic Crystals to Ionic Conductivity: An Iconic Celebration of Gray W. Rubloff's 50+ Years in Science (GWR)**
- **Light Source Enabled Science (LS)**
- **Magnetic Interfaces and Nanostructures (MI)**
- **Manufacturing Science and Technology (MS)**
- **Materials and Innovations for Fusion Energy (FUS)**
- **Multifunctional and Hybrid Microsystems (MC)**
- **Nanoscale Science (NS) and Technology and Nanoscale Plenary Session (NSP)**
- **Plasma Science and Technology (PS)**
- **Quantum Science and Technology (QS)**
- **Spectroscopic Ellipsometry (EL)**
- **Surface Science (SS)**

- **The Future of Temperature Sensing (TS)**
- **Thin Films (TF)**
- **Undergraduate Poster Session (UN)**
- **Vacuum Technology (VT)**
- **AVS Quantum Science Workshop (AQS All-Invited Session)**

We are confident that you will find many topics of interest, and that you will enjoy the technical discussions and camaraderie at both the oral and poster sessions. Poster presentations are an excellent way to promote your work and engage in one-on-one interactions with many scientists and engineers in a relaxed environment. *Please note that for AVS 72, you are allowed to present one oral abstract and one poster abstract, so please consider submitting both!*

AVS 72 will also feature a special poster session to highlight undergraduate research, with prizes for the top presentations. Opportunities to apply for travel grants, as well as student, early career, and professional awards, are also available!

In addition to a vibrant technical program, *there will also be an extensive equipment and vendor exhibition, short courses, and numerous networking, career advancement, and recruitment events* for both those launching their careers and established researchers.

If you are new to the AVS community, WELCOME! We are confident that you will find the symposium to be a great place to meet new colleagues and friends with whom to share ideas for years to come. We encourage you to participate in this year's Symposium by **submitting an abstract before the deadline of Monday, May 18, 2026**.

We eagerly anticipate your valuable contribution to the AVS 72nd International Symposium & Exhibition and look forward to seeing you in Pittsburgh!

MARK LOSEGO
Georgia Tech
AVS 72 Program Chair

ANGÉLIQUE RALEY
TEL Technology Center, America LLC
AVS 72 Program Vice-Chair

AVS 72 PROGRAM COMMITTEE

PROGRAM CHAIR:
Prof. Mark Losego
Georgia Institute of Technology
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angelique_raley@avs.org

2D MATERIALS (2D)
Topic Chair: Cristina Satriano, University of Catania, Italy
Topic Co-Chair: Jyoti Katoch, Carnegie Mellon University

Rafik Addou, The University of Texas at Dallas
Matthias Batzill, University of South Florida
Huamin Li, University at Buffalo-SUNY
Peter Sutter, University of Nebraska - Lincoln
Kai Xiao, Oak Ridge National Laboratory
Fei Yao, University at Buffalo
Tiancong Zhu, Purdue University

ACTINIDES AND RARE EARTHS (AC)
Topic Chair: James G. Tobin, University of Wisconsin-Oshkosh
Topic Co-Chair: Ladislav Havela, Charles University, Prague, Czech Republic
Topic Co-Chair: David Shuh, Lawrence Berkeley National Laboratory

Miles Beaux, Los Alamos National Laboratory
Edgar Buck, Pacific Northwest National Laboratory
Tomasz Durakiewicz, Idaho National Lab
Krzysztof Gofryk, Idaho National Laboratory
Itzhak Halevy, Ben Gurion University Be'er Sheva, Israel
Paul Roussel, AWE, UK
Eteri Svanidze, Max Planck Institute for Chemical Physics of Solids, Germany
Evgenia Tereshina-Chitrova, Institute of Physics CAS, Prague, Czechia
Gertrud Zwicknagl, Technische Universität Braunschweig, Germany

ADVANCED MICROELECTRONIC MATERIALS AND DEVICES MINI-SYMPOSIUM (AM)

Topic Co-Chair: Elton Graugnard, Boise State University
Topic Co-Chair: Philip Sanghyun Lee, University of Kentucky
Parag Banerjee, University of Central Florida
Devika Choudhury, ASM
Erin Cleveland, University of Maryland
Erica Douglas, Sandia National Lab
Robert Grubbs, IMEC, Belgium
Sang M. Han, University of New Mexico
Michael David Henry, Sandia National Labs
Jessica Hilton, SPECS-TII, Inc.
SeonHee Jang, University of Louisiana
April Jewell, Jet Propulsion Lab (NASA/JPL)
Jessica Jones, Argonne National Laboratory
Jason Kawasaki, Univ. of Wisconsin - Madison
Seth King, University of Wisconsin - La Crosse
Sarah Lynch, TEL Technology Center America
Stephen McDonnell, University of Virginia
Michelle M. Paquette, University of Missouri-Kansas City
Daniel Pennachio, NRL
Somil Rathi, University of Central Florida
Angus Rockett, Colorado School of Mines
Samantha Tomiko Jaszewski, Sandia National Laboratories
George Wang, Sandia National Lab
Haozhe Harry Wang, Duke University

ADVANCED PACKAGING (PK):

Topic Co-Chair: Bart DeProspo, SARAS Micro Devices
Topic Co-Chair: Mohan Kathaperumal, Georgia Tech
Topic Co-Chair: John Lannon, Micross
Topic Co-Chair: James Papanu, TEL
Prahalad Murali, AMD

ADVANCED SURFACE ENGINEERING (SE)

Topic Co-Chair: Diana Berman, University of North Texas
Topic Co-Chair: Filippo Mangolini, The University of Texas at Austin

ADVANCES IN BATTERY ENGINEERING, INTERFACE DESIGN, AND CHARACTER-IZATION MINI-SYMPOSIUM (BT)

Topic Co-Chair: Adriana Creatore, Eindhoven University of Technology, Netherlands
Topic Co-Chair: Blake Nuwayhid, Booz Allen Hamilton (DARPA)
Topic Co-Chair: Xiao-Ying Yu, Oak Ridge National Laboratory
Andrei Kolmakov, National Institute of Standards and Technology (NIST)
Alex Kozen, University of Vermont
Samantha G. Rosenberg, Kairos Power
Tanguy Terlier, Rice University

ADVANCES IN EUV LITHOGRAPHY (EUV)

Topic Co-Chair: Alain Diebold, Univ. at Albany

Topic Co-Chair: Lior Huli, TEL Technology Center America
Danilo De Simone, IMEC, Belgium
Gregory Denbeaux, CNSE, Univ. at Albany
Gopal Kenath, IBM
Chang-Yong Nam, BNL
Ricardo Ruiz, LBNL
Lovejeet Singh, JSR Micro
Kandabara Tapily, TEL Technology Center America

AI/ML/AUTONOMOUS EXPERIMENTATION FOR THIN FILMS PROCESSING (AIML)

Topic Co-Chair: Renato Camata, University of Alabama at Birmingham
Topic Co-Chair: Michael Nolan, Tyndall National Institute, Univ. College Cork, Ireland
Topic Co-Chair: Angel Yanguas-Gil, Argonne National Lab
Dane deQuilettes, Princeton University
Martin Seifrid, North Carolina State University
Andreas Werbrouck, Ghent Univ., Belgium
Matthias Young, University of Missouri

APPLIED SURFACE SCIENCE (AS)

Topic Chair: Samantha G. Rosenberg, Kairos Power
Topic Co-Chair: Tanguy Terlier, Rice University
Jean-Paul Barnes, CEA, France
Jonathan Counsell, Kratos Analytical Ltd., UK
Michael Eller, University of Mississippi
Jodi Grzeskowiak, Tokyo Electron
Melissa Meyerson, Sandia National Laboratories
David Morgan, Cardiff University, UK
Hong Piao, FUJIFILM Electronic Materials USA., Inc.
Benjamen Reed, National Physical Laboratory, UK
Peter M.A. Sherwood, University of Washington
Lyndi Strange, PNNL
Jeff Terry, Illinois Institute of Technology

ATOMIC SCALE PROCESSING MINI-SYMPOSIUM (AP)

Topic Co-Chair: Bobby Bruce, IBM TJ Watson Research Center
Topic Co-Chair: Steven M. George, University of Colorado at Boulder
Topic Co-Chair: Eric A. Joseph, IBM Research Division, T.J. Watson Research Center
Sumit Agarwal, Colorado School of Mines
Silvia Armini, IMEC Belgium
Parag Banerjee, University of Central Florida
Ashley Bielinski, Argonne National Laboratory
Erin Cleveland, University of Maryland
John Conley, Jr., Oregon State University
Peter Gordon, Carleton University, Canada
Satoshi Hamaguchi, Osaka University, Japan
Craig Huffman, Micron
April Jewell, Jet Propulsion Laboratory (NASA/JPL)
Jessica Kachian, Kokusai Semiconductor Equipment Corporation

Keren J. Kanarik, Lam Research Corp.
W.M.M. (Erwin) Kessels, Eindhoven University of Technology, The Netherlands
Sean W. King, Intel Corporation
Han-Bo-Ram Lee, Incheon National University, Republic of Korea
Mark Losego, Georgia Institute of Technology
Adrie Mackus, Eindhoven University of Technology, Netherlands
Nathan Marchak, IBM T. J. Watson Research Center
Stephen McDonnell, University of Virginia
Austin Minnich, California Institute of Technology
Michelle M. Paquette, University of Missouri-Kansas City
Gregory N. Parsons, North Carolina State University
Angélique Raley, TEL Technology Center, America, LLC
Petra Reinke, University of Virginia
Bridget Rogers, Vanderbilt University
Tania Sandoval, Universidad Técnica Federico Santa María, Chile
Alexander Shard, National Physical Laboratory, UK
Sagar Udyavara, Lam Research
Amy Walker, University of Texas at Dallas
Virginia Wheeler, U.S. Naval Research Lab
Angel Yanguas-Gil, Argonne National Lab
Julia Zakel, IONTOF GmbH, Germany
Junjie Zhao, Zhejiang University, China

AVS QUANTUM SCIENCE WORKSHOP (AQS)

Topic Co-Chair: Ekta Bhatia, NY CREATES and University at Albany SUNY
Topic Co-Chair: Lara Gamble, Univ. of Washington
Topic Co-Chair: Kasra Sardashti, University of Maryland, College Park
Topic Co-Chair: Andre Schleife, University of Illinois at Urbana-Champaign
Philippe Bouyer, Quantum Delta, Netherlands
Joe Castellano, AIP Publishing
Charles R. Eddy, Jr., Office of Naval Research Global – London, UK
David Pappas, Rigetti Computing

BIOMATERIAL INTERFACES (BI)/ BIOMATERIALS PLENARY (BP)

Topic Chair: Christopher So, Naval Research Laboratory, USA
Topic Co-Chair: Pierluigi Bilotto, Technical University of Vienna, Austria
Topic Co-Chair: Rong Yang, Cornell University
Joe Baio, Oregon State University
Roberto Eguiluz, Univ. of California Merced
Kenan Fears, U.S. Naval Research Laboratory
Sapun Parekh, University of Texas at Austin
Ali Rafati, Medtronic, Inc.
Lars Schmuser-Steger, Aarhus Univ., Denmark
Markus Valtiner, Vienna University of Technology, Austria

CHEMICAL ANALYSIS AND IMAGING AT INTERFACES (CA)

Topic Co-Chair: Andrei Kolmakov, National Institute of Standards and Technology (NIST)

Topic Co-Chair: Xiao-Ying Yu, Oak Ridge National Laboratory

Carles Corbella Roca, NIST-Gaithersburg

Gabe Parker, ORNL

ELECTRONIC MATERIALS AND PHOTONICS (EM)

Topic Co-Chair: Erin Cleveland, University of Maryland

Topic Co-Chair: Philip Sanghyun Lee, University of Kentucky

Topic Co-Chair: Somil Rathi, Arizona State University

Yohannes Abate, Georgia State University

Andy Antonelli, Femtometrix

Parag Banerjee, University of Central Florida

Erica Douglas, Sandia National Lab

Michael A. Filler, Georgia Institute of Technology

Sang M. Han, University of New Mexico

Michael David Henry, Sandia National Labs

Jessica Hilton, SPECS-TII, Inc.

SeonHee Jang, University of Louisiana

Karen L. Kavanagh, Simon Fraser University, Canada

Jason Kawasaki, Univ. of Wisconsin - Madison

Seth King, University of Wisconsin - La Crosse

Stephen McDonnell, University of Virginia

Gary McGuire, International Technology Center

Anthony Muscat, University of Arizona

Rachael L. Myers-Ward, U.S. Naval Research Laboratory

Leland Nordin, University of Central Florida

Michelle M. Paquette, University of Missouri-Kansas City

Daniel Pennachio, NRL

Lisa M. Porter, Carnegie Mellon University

Angus Rockett, Colorado School of Mines

Samantha Tomiko Jaszewski, Sandia National Laboratories

George Wang, Sandia National Lab

Haozhe Harry Wang, Duke University

Michael Williams, Clark Atlanta University

FROM IONIC CRYSTALS TO IONIC CONDUCTIVITY: AN ICONIC CELEBRATION OF GARY W. RUBLOFF'S 50+ YEARS IN SCIENCE (GWR)

Topic Co-Chair: Parag Banerjee, University of Central Florida

Topic Co-Chair: Erin Cleveland, University of Maryland

Topic Co-Chair: Keith Gregorczyk, University of Maryland

Topic Co-Chair: Alex Kozen, University of Vermont

Topic Co-Chair: Blake Nuwayhid, Booz Allen Hamilton (DARPA)

LIGHT SOURCE ENABLED SCIENCE (LS)

Topic Co-Chair: Aaron Bostwick, Lawrence Berkeley Laboratory

Topic Co-Chair: Jessica McChesney, Argonne National Laboratory

Topic Co-Chair: Slavomir Nemsak, Advanced Light Source, Lawrence Berkeley National Laboratory

Hendrik Bluhm, Fritz Haber Institute of the Max Planck Society, Germany

Baran Eren, Weizmann Institute of Science, Israel

Jingua Guo, Advanced Light Source, Lawrence Berkeley National Laboratory

Georg Held, Diamond Light Source, UK

Bonglin Simon Mun, Gwangju Institute of Science and Technology, Republic of Korea

Anna Regoutz, University of Oxford, UK

Jean-Pascal Rueff, Synchrotron SOLEIL, France

Christopher Schlueter, PETRA-III, Germany

Joseph Strzalka, Argonne National Laboratory

Juan Velasco-Velez, ALBA, Spain

Iradwikanari Waluyo, Brookhaven National Laboratory

Joanna Nelson Weker, SLAC National Accelerator Laboratory

MAGNETIC INTERFACES AND NANOSTRUCTURES (MI)

Topic Chair: Valeria Lauter, Oak Ridge National Laboratory

Jamileh Beik Mohammadi, The University of Alabama

Markus Donath, University of Münster, Germany

Axel Enders, University of Bayreuth, Germany

Thomas Feggeler, Brookhaven National Laboratory

Zheng Gai, Oak Ridge National Laboratory

Mikel B. Holcomb, West Virginia University

Hendrik Ohldag, Lawrence Berkeley National Laboratory

Peng Wei, University of California, Riverside

MANUFACTURING SCIENCE & TECHNOLOGY (MS)

Topic Chair: Bridget Rogers, Vanderbilt University

MATERIALS AND INNOVATIONS FOR FUSION ENERGY (FUS)

Topic Co-Chair: Eric Dombrowski, Commonwealth Fusion Systems

Topic Co-Chair: Zachary Robinson, The University of Rochester

Rosemary Brown, UKAEA, UK

Charles R. Eddy, Jr., Office of Naval Research Global - London, UK

Dale Hitchcock, Savannah River National Lab

Simon Niemes, KIT, Germany

Matthew Sharpe, University of Rochester

Charles Smith, ORNL

MULTIFUNCTIONAL AND HYBRID MICROSYSTEMS (MC)

Topic Co-Chair: Matthew Jordan, Sandia National Laboratories

Topic Co-Chair: Jaesung Lee, University of Central Florida

Topic Co-Chair: Yanan (Laura) Wang, University of Nebraska-Lincoln

Jorge Castro, University of Texas at El Paso

Robert Davis, Brigham Young University

Vikrant Gokhale, Naval Research Laboratory

Sushma Kotru, University of Alabama

Robert Roberts, University of Texas at El Paso

Christian Zorman, Case Western Reserve University

NANOSCALE SCIENCE AND TECHNOLOGY (NS)/ NANOSCALE SCIENCE AND TECHNOLOGY PLENARY SESSION (NSP)

Topic Co-Chair: Alex Belianinov, Sandia National Laboratories

Topic Co-Chair: Deep Jariwala, University of Pennsylvania

Topic Co-Chair: Marek Kolmer, Ames Laboratory

Nancy Burnham, Worcester Polytechnic Institute

Pavan Challa, NIST Center for Nanoscale Science and Technology

Aubrey Hanbicki, Lab for Physical Sciences

Nick Hendricks, Heidelberg Instruments Nano AG, Switzerland

Gregor Hlawacek, Helmholtz-Zentrum Dresden - Rossendorf, Germany

Erin Iski, University of Tulsa

Joohoon Kang, Yonsei Univ., Republic of Korea

Nikolai Klimov, National Institute of Standards and Technology

Son Le, University of Maryland

Yongtao Liu, ORNL

Mausumi Mahapatra, Loyola Univ., Chicago

Andrew Mannix, Stanford University

Taisuke Ohta, Sandia National Laboratories

Radislav Potyrailo, GE Research Center

Aditya Sood, Princeton University

PLASMA SCIENCE AND TECHNOLOGY (PS)

Topic Co-Chair: John Arnold, IBM Research Division, Albany, NY

Topic Co-Chair: Kenji Ishikawa, Nagoya University, Japan

Philippe Bezard, IMEC, Belgium

Suman Bhaumik, TEL Technology Center, America, LLC

Bobby Bruce, IBM TJ Watson Research Center

Luxherta Buzi, IBM Research Division, T.J. Watson Research Center

Thierry Chevolleau, CEA-Leti, France

Emilie Despiau-Pujo, CNRS-LTM, Université Grenoble Alpes, France

Sebastian Engelmann, IBM T.J. Watson Research Center

David Go, Notre Dame University
Michael Gordon, University of California at Santa Barbara
Hisataka Hayashi, DAIKIN INDUSTRIES, LTD., Japan
Yohei Ishii, Hitachi High Technologies America Inc.
W.M.M. (Erwin) Kessels, Eindhoven University of Technology, The Netherlands
Nobuyuki Kuboi, Sony Corporation, Japan
Catherine Labelle, Intel
Thorsten Lill, Lam Research Corporation
Pingshan Luan, TEL Technology Center, America, LLC
Kenji Maeda, Hitachi High Technologies, Japan
Nathan Marchak, IBM T. J. Watson Research Center
Selma Mededovic Thagard, Clarkson Univ.
Eric Miller, IBM Research Division, Albany, NY
Phong Nguyen, Air Liquide Laboratories
Mitsuhiro Oomura, KIOXIA, Japan
Erwine Pargon, CNRS-LTM, Université Grenoble Alpes, France
Angélique Raley, TEL Technology Center, America, LLC
Francois Reniers, Université libre de Bruxelles, Belgium
Mohan Sankaran, University of Illinois at Urbana-Champaign
Ashish Sharma, Lam Research Corp.
Yu-Hao Tsai, TEL Technology Center, America, LLC
Necip Uner, Middle East Technical University, Turkey
Christophe Vallee, University at Albany
Joseph Vella, TEL Technology Center, America, LLC, USA
Steven Vitale, MIT Lincoln Laboratory
Scott Walton, Naval Research Laboratory
Jun-Chieh Wang, Applied Materials
Mingmei Wang, Lam Research Corp.
Sumaira Yasmeen, University of Colorado

QUANTUM SCIENCE AND TECHNOLOGY (QS)

Topic Co-Chair: Ekta Bhatia, NY CREATES and University at Albany SUNY
Topic Co-Chair: Kasra Sardashti, University of Maryland, College Park
Topic Co-Chair: Andre Schleife, University of Illinois at Urbana-Champaign
Charles R. Eddy, Jr., Office of Naval Research Global - London, UK
Sebastian Engelmann, IBM T.J. Watson Research Center
Lara Gamble, Univ. of Washington
Aranya Goswami, Nokia Bell Labs
Sean Jones, Argonne National Laboratory
Yan Li, Penn State University
David Pappas, Rigetti Computing
Drew Rebar, Pacific Northwest National Laboratory
Walid Redjem, University at Albany-SUNY

SPECTROSCOPIC ELLIPSOMETRY (EL)

Topic Co-Chair: Ufuk Kilic, University of Nebraska-Lincoln
Topic Co-Chair: G. Andrew Antonelli, Femtometrix
Marcel Junige, University of Colorado Boulder
Mathias Schubert, University of Nebraska-Lincoln
Nikolas Podraza, University of Toledo

SURFACE SCIENCE (SS)

Topic Co-Chair: Nan Jiang, University of Illinois - Chicago
Topic Co-Chair: Dario Stacchiola, Brookhaven National Laboratory
Liney Arnadottir, Oregon State University
Abner de Siervo, State University of Campinas, Brazil
M.Veronica Ganduglia-Pirovano, Institute of Catalysis and Petrochemistry-CSIC, Spain
Nathan Guisinger, Argonne National Laboratory
Dan Killelea, Loyola University Chicago
Joerg Libuda, Friedrich-Alexander-University Erlangen-Nuremberg (FAU), Germany
Manos Mavrikakis, University of Wisconsin - Madison
Tim Schäfer, University of Göttingen, Germany
Jason Weaver, University of Florida

THE FUTURE OF TEMPERATURE SENSING (TS)

Topic Co-Chair: Nikolai Klimov, National Institute of Standards and Technology (NIST)
Topic Co-Chair: Pavan Challa, Johns Hopkins University, National Institute of Standards and Technology (NIST)
Daniel Barker, National Institute of Standards and Technology (NIST)
Thinh Bui, National Institute of Standards and Technology (NIST)
Michal Chojnacky, National Institute of Standards and Technology (NIST)
Kevin Douglass, National Institute of Standards and Technology (NIST)
Thomas Purdy, University of Pittsburgh
Ana Rakonjac, Measurement Standards Laboratory, New Zealand

THIN FILMS (TF)

Topic Co-Chair: Elton Graugnard, Boise State University
Topic Co-Chair: Junjie Zhao, Zhejiang University, China
Saeed Almishal, Penn State University
Joe Becker, Kurt J. Lesker Company
David Bergsman, University of Washington
Ashley Bielinski, Argonne National Laboratory
Devika Choudhury, ASM
John Conley, Jr., Oregon State University
Adriana Creatore, Eindhoven University of Technology, Netherlands

Lauren Garten, Georgia Institute of Technology
Steven M. George, University of Colorado at Boulder
Robert Grubbs, IMEC, Belgium
Subhadra Gupta, University of Alabama
April Jewell, Jet Propulsion Laboratory (NASA/JPL)
Jessica Jones, Argonne National Laboratory
Alex Kozen, University of Vermont
Mark Losego, Georgia Institute of Technology
Sarah Lynch, TEL Technology Center America
Adrie Mackus, Eindhoven University of Technology, Netherlands
Austin Minnich, California Institute of Technology
Siamak Nejati, University of Nebraska-Lincoln
Blake Nuwayhid, Booz Allen Hamilton (DARPA)
Gregory N. Parsons, North Carolina State Univ.
Tania Sandoval, Universidad Técnica Federico Santa María, Chile
Sagar Udyavara, Lam Research
Richard Vanfleet, Brigham Young University
Matthias Young, University of Missouri

UNDERGRADUATE POSTER SESSION (UN)

Topic Chair: Morgan Hawker, California State University, Fresno
Topic Co-Chair: Liney Arnadottir, Oregon State University
Topic Co-Chair: Ashleigh Baber, James Madison University
Topic Co-Chair: Joshua Blechle, Wilkes Univ.
Topic Co-Chair: Erin Iski, University of Tulsa

VACUUM TECHNOLOGY (VT)

Topic Chair: Freek Molkenboer, TNO Science and Industry, the Netherlands
Klaus Bergner, VACOM, Germany
Gerardo Brucker, MKS Instruments, Inc., Pressure and Vacuum Measurement Group
James A. Fedchak, National Institute of Standards and Technology (NIST)
Russell Gleason, Infleqtion
Jay Hendricks, National Institute of Science and Technology
Giulia Lanza, SLAC National Accelerator Laboratory
Yev Lushtak, Lawrence Berkeley Laboratory
Ian Malloch, VAT Valves
Christopher Malocsay, UC Components Inc.
Keith Middleman, STFC Daresbury Laboratory, UK
Sol Omolayo, Lawrence Berkeley Laboratory University of California, Berkeley
Jacob Ricker, NIST
Julia Scherschligt, NIST
Charles Smith, ORNL
Marcy Stutzman, Jefferson Laboratory
Alan van Drie, TAE Technologies
Martin Wuest, Inficon, Liechtenstein

2D MATERIALS (2D): The 2D Materials Technical Group at AVS 72 invites abstracts showcasing the latest breakthroughs in this rapidly evolving field. We welcome contributions, both theoretical and experimental, on synthesis and scalable processing, advanced characterization (microscopy, spectroscopy), and the discovery of novel 2D materials with unique electronic, magnetic, optical, and mechanical properties. Topics span topological and quantum phenomena, functionalization, devices, and transformative applications in energy, health, environment, microelectronics, and quantum information science. Share your research, connect with a diverse audience, and compete for student poster prizes recognizing emerging talent.

Areas of Interest: The 2D Materials program covers experimental and theoretical advancements in the science and technology of two-dimensional materials, spanning from fundamental properties to devices and applications and is seeking abstracts in the following topics:
- *Synthesis and Processing of 2D Materials*
- *Advanced Characterization of 2D Materials: Electronic, Magnetic, Mechanical, and Optical properties*
- *Modification of 2D Material Properties: Atomic Defects, Functionalization, and Strain*
- *Novel Quantum 2D Materials, Heterostructures, and Layered Architecture*
- *2D Materials: Devices and Applications*

2D1: Synthesis, Processing, and Advanced Characterization of 2D Materials Oral Session
  Invited Speakers:
  Victor Brar, University of Wisconsin - Madison
  Chris Jozwiak, Lawrence Berkeley National Lab
  Roland Kawakami, Ohio State University
  Joshua A. Robinson, Pennsylvania State University, "Confinement Heteroepitaxy: A Platform for Creating 2D Metals, Alloys, and Compounds with Unique Properties"
  Raymond R Unocic, North Carolina State University

2D2: 2D Materials Devices and Applications Oral Session
  Invited Speakers:
  Pratibha Dev, Howard University
  Ma Qiong, Boston College
  Iuliana Radu, TSMC, Taiwan
  Vincent Tung, The University of Tokyo, Japan

2D3: 2D Materials Poster Session

ACTINIDES AND RARE EARTHS (AC): Actinides and Rare Earths exhibit unique and diverse physical, chemical and magnetic properties resulting from the complexity of the 5f and 4f electronic structure. The Actinide and Rare Earth Focus Topic Session concentrates on the fundamental chemistry, physics, materials, and interface science of f–electron materials with an emphasis on all aspects of nuclear technology, while facilitating the involvement of early career scientists and all interested individuals. The role of fundamental f-electron science in resolving challenges posed by actinide chemistry and materials will be central, particularly with regard to topics such as separation science, nuclear fuels, structural materials, nuclear energy processes, nuclear safeguards/forensics, and stewardship. Contemporary experimental approaches, including synchrotron radiation-based investigations and emerging techniques, all coupled to theory, will be featured to understand these complex materials.

AC1: Actinides and Rare Earths Oral Session
  Invited Speakers:
  Michael Baker, The University of Manchester | The University of Manchester at Harwell, UK
  Robert Harrison, University of Manchester, UK
  Dariusz Kaczorowski, Institute of Low Temperature and Structure Research, Polish Academy of Sciences, Poland
  Carolyn Pearce, IDREAM Energy Frontier Research Center, Pacific Northwest National Laboratory, "Environmental Radioactivity at the Department of Energy's Hanford Site: Sources and Sinks"
  Priscilla Rosa, Los Alamos National Laboratory
  Qimiao Si, Rice University

AC2: Actinides and Rare Earths Poster Session

ADVANCED MICROELECTRONIC MATERIALS AND DEVICES MINI-SYMPOSIUM (AM): The Advanced Microelectronic Materials and Devices Mini Symposium aims to bring together researchers focused on materials, processing, and devices for next generation microelectronics, such as ferroelectric thin films and a broad range of memory and logic devices and materials. The focus of this mini symposium is (1) the thin film processing necessary to enable these advanced materials in microelectronics, (2) the characterization of material and interface properties, and (3) the performance, characterization, and modeling of microelectronic devices. This mini symposium will amplify the strengths of Electronic and Materials and the Thin Film communities.

AM1+EM+TF: Advanced Microelectronic Materials and Devices Mini-Symposium Oral Session
AM2+EM+TF: Advanced Microelectronic Materials and Devices Mini-Symposium Poster Session

ADVANCED PACKAGING (PK): Much like the semiconductor industry, most of the advanced packaging industry migrated off-shore over the past 15-20 years. As a result, Advanced Packaging is listed in the CHIPS and Science Act as one of the key areas that needs to be re-shored along with device manufacturing. Investments are already being made to that end. In parallel, the boundaries between device manufacturing and device packaging as separate foundries and production lines have blurred with many device manufacturers (e.g. TSMC) becoming more vertically integrated by doing portions of advanced packaging processes internally (e.g. wafer-level packaging or wafer bumping).Similarly, the substrate manufacturers and packaging houses continue to shrink interconnect dimensions in their products and services, encroaching on dimensions typically associated with frontend foundries. This focus topic session will bring invited speakers from around the advanced packaging industry to highlight what is being done today and where the industry is headed, along with on-going research in substrates, interconnects, wafer processes, and assembly processes enabling the next-generation of advanced packaging solutions.

Areas of Interest: This focus topic session will bring invited speakers from around the advanced packaging industry to highlight capabilities, materials, substrates, interconnects, wafer and assembly processes, and metrology/test approaches enabling the next-generation of advanced packaging solutions and is seeking abstracts in the following areas:

- *Wafer level packaging/wafer bumping*
- Wafer finishing/wafer preparation
- TSV/TGV
- Heterogeneous integration
- Advanced packaging facilities and capabilities
- Substrates for advanced packaging
- Manufacturing tools and materials for advanced packaging
- Advanced packaging metrology and reliability testing

PK1: Advanced Packaging Oral Session
  Invited Speakers:
  Muhannad Bakir, Ga Tech Packaging Research Center
  Eric Beyne, IMEC, Belgium
  Tanja Braun, Fraunhofer IZM
  Mike Gleason, GreenSource Fabrication
  Greg Moore, Heidelberg Instruments
  S.V. Sreenivasan, NGMM UT/TIE
PK2: Advanced Packaging Poster Session

ADVANCED SURFACE ENGINEERING (SE): The Advanced Surface Engineering Division program will cover state-of-the-art developments of techniques and processes for improving the surface properties of materials for protection in demanding contact conditions and aggressive environments (wear-, oxidation-, corrosion-resistant, tribological surfaces). We are soliciting contributions on novel methods to tailor multifunctional properties, including quantum, electronic, magnetic, optical, and mechanical. Contributions on advanced characterization techniques of composition/nanostructure, properties, and performance as well as new surface engineering approaches for energy and materials efficiency are also highly welcome.

Areas of Interest: SE is seeking abstracts in the following areas:

•Tribological Applications, •Wear-resistant coatings for mechanical components, •Friction-reducing coatings, •Lubricating coatings,

•Corrosion Protection, •Corrosion-resistant coatings for metals and alloys, •Protective coatings for marine applications, •Optical Applications,:•Optical coatings for lasers and other optical devices, •Anti-reflective coatings, •Energy Applications, :•Fuel cell electrodes, •Solar cell coatings, •Thermal barrier coatings

SE1: Advanced Surface Engineering Oral Session
  Invited Speakers:
  Austin Drake, Air Force Research Laboratory (AFRL)
  Andrey Voevodin, University of North Texas
SE2: Advanced Surface Engineering Poster Session

ADVANCES IN BATTERY ENGINEERING, INTERFACE DESIGN, AND CHARACTERIZATION MINI-SYMPOSIUM (BT):
The Advances in Battery Engineering, Interface Design, and Characterization (BT) Mini-Symposium will focus on the roles of thin film processing and advanced characterization in battery systems. The symposium will cover the application of thin film deposition (e.g. ALD,

CVD, sputtering, evaporation) in interface design and thin film batteries, along with advanced characterization techniques related to batteries (e.g. XPS, UPS, Auger, SEM, TEM, TOF-SIMS, and EQCM).

Areas of Interest: We are excited to offer several sessions in collaboration with the Thin Film Division, Applied Surface Science Division, and Chemical Analysis and Imaging of Interfaces Division focusing on battery interfaces and their characterization. BT is seeking abstracts in the following areas:
- Thin film microbatteries
- Novel materials synthesis and processing
- Electrode-electrolyte interface engineering
- Electrode materials for solid-state batteries
- In-situ and in-operando characterization techniques
- Advanced surface analysis of solid-electrolyte interphases
- Theoretical insights of materials and battery system (e.g. DFT, MD, continuum and multi-physics modeling)

BT1+AS+CA+TF: Advances in Battery Engineering, Interface Design, and Characterization Mini-Symposium Oral Session
BT2+AS+CA+TF: Advances in Battery Engineering, Interface Design, and Characterization Mini-Symposium Poster Session

ADVANCES IN EUV LITHOGRAPHY (EUV): The most advanced lithographic patterning technology used in the semiconductor industry employs extreme ultraviolet (EUV) light at 13.5 nm. The focus topic, "Advances in EUV Lithography," will cover recent developments, opportunities, and challenges in EUV technology, as well as emerging patterning technologies, related metrology, and the environmental impact of lithography. Special emphasis will be placed on future EUV technologies, such as High NA (numerical aperture) EUV—a next-generation EUV technology. High-NA EUV lithography promises significant advancements in chip manufacturing but necessitates overcoming several challenges related to depth of focus, mask technology, resist performance, and cost of ownership. Ongoing research and development efforts across the entire ecosystem are critical for addressing these challenges and realizing the full potential of High-NA EUV technology. Some of these challenges require innovation and optimization of new patterning materials, such as the development of new photoresist platforms with high resolution, low line-edge roughness (LER), and high sensitivity; exploration of new underlayer materials to improve EUV exposure dose and throughput; and research into new film materials to support resist thinning, feature scaling, and pattern transfer.

Areas of Interest: EUV is seeking abstracts in the following areas:
- Advances in lithography equipment, process optimization, and EUV masks
- Novel patterning technologies
- EUV Photoresist fundamental and mechanisms
- Advances in film characterization, metrology, and inspection
- Sustainability technology and environmental impact of Lithography

EUV1: Advances in EUV Lithography Oral Session
  Invited Speakers:
  Robert Brainard, CNSE, University at Albany, "EUV Resist Chemistry, Mechanism, and Challenges"
  Emily Gallagher, IMEC, Belgium, "Environmental Impact of Lithography"
  Eric Liu, TEL Technology Center, America, LLC, "Outlook for Future Patterning Opportunities"
  Chris Penny, IBM, "High Na EUV Challenges and Opportunities"
  Mark Van de Kerkhof, ASML, Netherlands, "EUV Lithography: Past Present, and Future"
  Cheng Wang, LBNL, "Characterization of Latent Image of Photoresist via Critical Dimension Resonant Soft X-ray Scattering"
EUV2: Advances in EUV Lithography Poster Session

AI/ML/AUTONOMOUS EXPERIMENTATION FOR THIN FILMS PROCESSING (AIML): The integration of AI and machine learning across various domains—from accelerating scientific discovery and optimizing big data experiments to enhancing characterization techniques and advancing semiconductor technologies—is delivering a transformative approach that not only leverages computational power for innovative materials and devices but also seeks to reconcile AI methodologies with fundamental physical principles to deepen our understanding of material properties. This mini-symposium will bring together leaders in the rapidly growing field of data science, artificial intelligence, and machine learning (AI/ML) for materials, processes, and interfaces to drive scientific discovery. AI, ML and deep learning (DL) are being utilized to learn empirical representations of complex processes, understand materials at the atomic scale, and even design the next generation of advanced microelectronics for AI/ML. As researchers from academia to industry search for more effective means of advancing technology, AI/ML is being utilized as a means to reduce the burden on resources that have long relied on traditional experiments and computationally heavy modeling and simulation. This mini-symposium will bring together the community to disseminate the latest advances in the field, discuss challenges, and share future directions for AI & ML.

Areas of Interest: Abstracts are sought on topics including (but not limited to):
- ML-driven/autonomous thin-film growth
- Physics-inspired ML models in growth and processing

- AI/ML techniques in materials synthesis and automated deposition tools and processes
- AI-driven automated synthesis with looped characterization
- AI for integrating experimental and computational discovery
- Uncertainty quantification, interpretability, and trustworthy AI/ML methods

Other highlights and invited topics:
- AI in MBE and RHEED-guided MBE growth of 2D and thin film materials
- ML, simulation, and high-throughput experimental dataset integration to accelerate thin film and process discovery
- ML in atomic scale deposition
- AI/big data across semiconductor process development and foundry manufacturing
- AI for synthesis-property relationship prediction in thin films
- Self-driving labs for thin film optimization
- ML in ALD optimization and precursor identification

Other Planned Activities:
- Student Awards
- Panel discussion on AI/ML directions in thin films

AIML1: AI/ML/Autonomous Experimentation for Thin Films Processing Oral Session
  Invited Speakers:
  Ryan Comes, University of Delaware
  Sumner Harris, Oak Ridge National Laboratory, "Approaches for AI-Driven Pulsed Laser Deposition Using in Situ and Real-Time Diagnostics"
  Linda Hung, Toyota Research Institute
  Stephanie Law, Pennsylvania State University, "Understanding and Optimizing Synthesis of 2D Materials by Molecular Beam Epitaxy Using Machine Learning Techniques"
  Boris Slautin, University of Tennessee, Knoxville

AIML2: AI/ML/Autonomous Experimentation for Thin Films Processing Poster Session

APPLIED SURFACE SCIENCE (AS): **The Applied Surface Science Division provides a world-leading forum for the design and characterization of the surfaces and interfaces that underpin technologies ranging from medical implants to electronic devices.** The session topics include "**Applied Surface Science through AFM**" session which offers comprehensive insight and discussion into analysis using AFM. This year, we provide a special focus on "**SIMS data mining**", highlighting recent innovations and developments in this widely-used method. The "**Applied Surface Science in Action**" sessions provide comprehensive insight and discussion into methods used widely in industry, government and academic settings. One session will have a panel focus specifically for students to understand how applying surface science can become a great career. The "**Characterizing Battery Materials, Surfaces, and Interfaces with Data-Driven and Autonomous Methods**" session is part of a mini-symposium on batteries that aims to focus on the surface science characterization of battery interfaces along with the application of thin-film processing in battery systems. For our session we would like to address data-driven insights specifically. The **Applied Surface Science Poster Session** will capture condensed highlights on all of these subjects on Thursday evening.

The division will hold its annual **Business Meeting and Awards Ceremony** on Tuesday evening. Highlights of this event include the student award competition and the ASTM E42 Committee on Surface Analysis forum. All members of the Applied Surface Science community are invited to attend.

Areas of Interest: The ASSD program is soliciting abstracts that describe advances in cutting-edge applied research involving surfaces and interfaces. A wide range of topics will be covered including:
- energy and sustainability
- AFM applications in Surface Science
- characterizing battery materials, surfaces and interfaces
- data mining and AI with SIMS
- quantitative surface science
- Industry, standardization and metrology

AS1: Applied Surface Science Oral Session
  Invited Speakers:
  Satoka Aoyagi, Seikei University, Japan, "Data-Driven Analysis Using Explainable AI (XAI) for Surface Analysis Data, Including Mass Images'
  David Carr, 3M Corporate Research Analytical Laboratory
  Justin Gorham, NIST
  Joshua Mayersky, Tokyo Electron America
  Elias Nakouzi, PNNL

Jörg Radnik, BAM Berlin, Germany, "Quantification of Surface Functional Groups on Nano- and 2D Materials"
Gustavo F. Trindade, National Physical Laboratory, UK

AS2: Characterizing Battery Materials, Surfaces, and Interfaces with Data-Driven and Autonomous Methods Oral Session
   Invited Speakers:
Ajay Karakoti, PNNL, "Understanding Failure Mechanisms Through Multimodal Investigation of Battery Electrodes"
Nicola Perry, University of Illinois

AS3: Applied Surface Science in Action
AS4: Applied Surface Science Poster Session

ATOMIC SCALE PROCESSING MINI-SYMPOSIUM (AP): The Atomic Scale Processing Mini-Symposium is aimed to provide a unique forum to expand the scope of atomic layer deposition (ALD) and atomic layer etching (ALE) processes towards understanding the fundamentals needed to achieve true atomic scale precision and the application of such processing on various areas of interest to the broader AVS community. The emphasis will be on synergistic efforts, across multiple AVS divisions and groups, to generate area selective processes as well as novel characterization methods to advance the field of processing at the atomic scale. We are excited to offer several sessions in collaboration with Plasma Science & Technology Division, the Thin Film Division, the Spectroscopic Ellipsometry Technical Group, as well as the Electronic Materials and Photonics Division focusing on area selective deposition, atomic layer process chemistry & surface characterization, and finally both thermal and plasma based atomic layer etching and atomic layer deposition.

Areas of Interest: AP is seeking abstracts in the following themes:
- Area selective processing and patterning
- Advancing Metrology and Characterization to enable Atomic Scale Processing
- Atomic Layer Processing: Integration of deposition and etching for advanced material processing
- Thermal and Plasma enhanced Atomic Layer Etching
- Thermal and Plasma-Enhanced ALD
- Emerging Applications for ALD including Precursors and Surface Reactions

AP1+EL+PS+TF: Atomic Scale Processing Mini-Symposium Oral Session
AP2+EL+PS+TF: Atomic Scale Processing Mini-Symposium Poster Session

BIOMATERIAL INTERFACES (BI): The Biomaterial Interfaces Division is organizing a series of sessions to provide an interdisciplinary forum for the presentation and discussion of fundamental aspects of bio-interface science, engineering, and state-of-the-art characterization methods. The BI program brings together recent advances in <u>biomaterials science with those in imaging, diagnostics, surface and interface analysis methods, and theoretical and computational approaches to model biological systems,</u> starting with the traditional Monday afternoon Plenary Session on Advances in Biomaterials Science. We enthusiastically invite abstract submissions in any of the Areas of Interest below.

We also invite submissions of Flash/Poster Presentations, to be made in a dedicated session with an accompanying Networking Session during the AVS-wide poster session. Joint BID/Biointerphases prizes will be awarded for the best student Flash/Poster presentations. Early career scientists should check out the Biointerphases Special Topic Collection, The Future of Biointerface Science 2025. This collection will feature the perspective early-career scientists have on the future of biointerface science. Postdocs and senior PhD students are ***particularly encouraged*** to contribute. Selected contributing authors will be invited to present their work and compete for the Biointerphases Ascending Researcher Award. All invited speakers will be supported by a travel award and the winner of the Ascending Researcher Award and associated article will be widely promoted via email and on social and professional networks.

Areas of Interest:
The Biomaterials Interfaces Division is soliciting abstracts in fundamental aspects of bio-interface science and engineering. Areas of interest include interactions between biomolecules and surfaces, bioadhesion, fouling, microbes, and biomedical interfaces. Additionally, BID seeks abstracts in new methods of characterizing biointerfaces that involve microscopy, optical, and mechanical methods to understand biomaterials and thin films in biological media and complex environments. This includes development of SIMS, sum frequency generation and nonlinear Raman, vibrational, and Terahertz spectroscopies applied to complex biological systems.
Biomolecules and Biophysics at Interfaces
Characterization of Biological and Biomaterials Surfaces
New methods for analysis of 3D biomaterial samples
Vibrational spectroscopy in biomaterial and interface science
Functional Materials and Biosensing
Biomaterials and Nanomaterials fabrication
SIMS characterization of biomaterials

BI1: Biomaterial Interfaces Oral Session
  Invited Speakers:
  Roberto Eguiluz, University of California Merced, "Sticky Science: Unlocking Biomolecular Secrets for the Development of Wet Adhesives"
  Charles Dhong, University of Delaware
Sebastian Diaz, Naval Research Laboratory, "Peptide Based Liquid-Liquid Coacervates for Biosensing, Degradation Resistance, and as Biofoundries"
  Jing Yan, Yale University
BI2: Biomaterial Interfaces Poster Session

CHEMICAL ANALYSIS AND IMAGING AT INTERFACES (CA): Chemical and physical processes occurring at gas-liquid-plasma-solid interfaces are crucial for many applications, and yet their analysis often represents grand scientific and engineering challenges. The Chemical Analysis and Imaging at Interfaces Focus Topic symposium is designed as a cross-disciplinary "melting pot" and aims to disseminate the latest and emerging developments and trends in experimental methods and understanding of the interfacial physical and chemical processes relevant (but not limited) to device microfabrication, materials synthesis, energy/catalysis research, biomedical applications, environmental sciences, and surface modifications, to name a few. In particular, in (ex-) situ/in vivo/operando chemical imaging, microscopy, and spectroscopy studies using electron, X-ray, ion, and neutron beams, as well as optical methods and synchrotron radiation/ FEL facilities, are strongly encouraged. Attention will also be paid to correlative spectroscopy and microscopy methods, modern image/spectra processing, and AI-enabling data acquisition and analytics techniques. Contributions are invited, including but not limited to experimental, fundamental research, industrial R&D, novel analytical techniques/approaches, and metrology of realistic surfaces and interfaces.
Areas of Interest:
  - *In situ and operando characterization of interfaces related to semiconductor fabrication, including plasma environments and fast-changing processes*
  - *AI-assisted modeling and learning applied to interfacial processes characterization and analysis*
  - *Advances in multimodal measurement capabilities in the industry*
  - *Materials and interfaces for next-generation electronics and technologies*

CA1: Chemical Analysis and Imaging at Interfaces Oral Session
  Invited Speakers:
  Matthew Cherukara, Argonne National Laboratory
  Vincent Donnelly, University of Houston
  Alex Liddle, Canon Nanotechnologies
  Andrew Yost, Scienta-Omicron, Sweden
CA2: Characterization and Modeling of Battery Interfaces Oral Session
  Invited Speakers:
  David L. Jacobson, NIST
  Sen Zhang, University of Virginia
CA3: Chemical Analysis and Imaging at Interfaces Poster Session

ELECTRONIC MATERIALS AND PHOTONICS (EM): The Electronics Materials and Photonics Division (EMPD) is soliciting abstracts that will address the latest advancements in various emerging devices and materials used for, but not limited, for photonic, sensing, photovoltaic, perovskite, quantum applications, AI hardware, Microelectronics, ferroelectric, 2d materials, wide bandgap, piezoelectric, processing/fabrication, patterning, interconnect, packaging, characterization/measurements, energy conversion, storage, harvesting, batteries/electrochemical cells, simulation/modeling, and ML/AI techniques. We welcome abstracts that report both experimental and theoretical discoveries related to the correlations between structure, properties, and synthesis of new materials, as well as their integration into devices. For AVS 72, EMPD is particularly interested in abstracts that fit within several broad thematic areas:
Areas of Interest:
  - Advanced Devices and Materials for Photonic, Sensing, Quantum Applications.
  - Logic and Memory Devices and Materials: Advance in AI Hardware, Microelectronics, Processing, Interconnect, Patterning, Packaging/Heterogenous integration.
  - Advances in Wide Bandgap, Piezoelectric, Materials and Devices.
  - Materials and Devices for Energy Conversion, Storage, Harvesting, Batteries/Electrochemical Cells. Other energy-related functional materials and devices are welcome.
  - Designing next-gen electronic, photonic, and quantum materials and devices using modeling, simulation, and AI/ML techniques
A Joint Mini-Symposium in Microelectronics will be organized in collaboration with the Thin Film Division to discuss opportunities in Microelectronics with device and materials researchers.

A Flash Poster session is being organized to encourage poster presenters to showcase their work as part of the oral sessions.

As in past years, we will offer multiple awards including graduate student poster and presentation awards as well as post-doc and graduate student travel awards to help create a forum in which younger scientists can present their work and develop relationships for the future.

EM1: Electronic Materials and Photonics Oral Session
  Invited Speakers:
  Robert Kaplar, Sandia National Laboratories
  Andrew Rappe, University of Pennsylvania
  Boris Yakobson, Rice University
  Fei Zhou, Sandisk Corporation
EM2: Advanced Microelectronic Materials for Next Generation Microelectronics Oral Session
  Invited Speakers:
  Biswajeet Guha, Intel Corporation
EM3: Electronic Materials and Photonics Poster Session

FROM IONIC CRYSTALS TO IONIC CONDUCTIVITY: AN ICONIC CELEBRATION OF GARY W. RUBLOFF'S 50+ YEARS IN SCIENCE (GWR):

This special symposium honors the extraordinary career of Professor Gary Rubloff and his lasting impact on integrated semiconductor processing, surface science, and thin-film materials synthesis. Throughout his career, Prof. Rubloff pioneered the use of standard semiconductor equipment, surface-science fundamentals, and thin-film synthesis & processing to enable technologies with applications spanning semiconductor manufacturing, biomaterials, and vapor-phase thin-film synthesis. His work has culminated in recent advances in thin-film ionic materials, helping define new paradigms at the nexus of electrochemistry and microelectronics, grounded in surface science. The symposium highlights the historical and broad connections between seemingly disparate research areas that are unified through Prof. Rubloff's ingenuity, leadership, and passion. Contributions will span fundamental thin-film synthesis and processes that leverage established semiconductor design rules and toolsets toward emerging applications in biological, ceramic, and iontronic materials systems.

Areas of Interest: This special symposium will be a celebration of Professor Gary W. Rubloff's storied career from Chicago to IBM, North Carolina, and finally Maryland. We welcome submissions from those who were inspired by Professor Rubloff over the years focusing on advancing atomic- and nanoscale materials synthesis, characterization, and integration for next-generation electronic, energy, and q functional device architectures.

- *Atomic layer deposition (ALD) and vapor-phase chemistry*
- *Cell signaling and functional biological interfaces*
- *Thin-film solid-state batteries and micro-energy storage*
- *Interfaces, defects, and nanoscale transport phenomena*
- *In situ and operando characterization of thin films*
- *Materials for microelectronics, MEMS, and neuromorphic devices*
- *Scalable manufacturing and integration of functional thin films*
- *Cross-disciplinary platforms for scientific discovery*

GWR1: From Ionic Crystals to Ionic Conductivity: A Special Celebration of Gary W. Rubloff's 50+ Years in Science Oral Session
  Invited Speakers:
  Mariano Anderle, Trento University, Italy, **"**Doing Science with Gary: Accuracy, Elegance and Pleasure"
  Alain Diebold, University of Albany, "Advancing New Semiconductor Materials and Devices Thought Characterization and Metrology"
  Daniela Fontecha, University of Maryland, College Park
  Reza Ghodssi, University of Maryland College Park
  Xiaolong Luo, Catholic University of America
  A. Alec Talin, Sandia National Laboratories
GWR2: From Ionic Crystals to Ionic Conductivity: A Special Celebration of Gary W. Rubloff's 50+ Years in Science Poster Session

LIGHT SOURCE ENABLED SCIENCE (LS): Light Source Enable Science Focus Topics: The LS focus topic is focused on cutting-edge science and technology enabled by synchrotrons and free-electron lasers. We invite users, beamline scientists, instrument developers, data/software teams, and early-career researchers to share results, new capabilities, and disciplines. The program will highlight the *"cool science"* made possible by light sources — along with the cutting-edge beamline developments, novel detectors, and data analysis approaches which are driving breakthroughs in materials science, catalysis, microelectronics and quantum information science.

Areas of Interest: The LS focus topic encourage abstracts that showcase either breakthrough science or enabling advances, including (but not limited to):

- *In situ/operando studies in energy storage, catalysis, corrosion, and manufacturing*
- *Quantum materials, magnetism, superconductors, and strongly correlated systems*
- *Soft matter, polymers, complex fluids, and biomaterials*
- *Environmental/geoscience, critical minerals, and climate-relevant processes*
- *Hierarchical materials*
- *Ultrafast, time-resolved, and dynamic experiments*

LS1: Light Source Enabled Science Oral Session
  Invited Speakers:
  Andi Barbour, Brookhaven National Laboratory
  Alexander Gray, Temple University
  Juanita Hidalgo, New York University
  Lucia Perez-Ramirez, CEA Saclay, France, "Reliable Quantification of Oxygen Vacancies in Ferroelectric Hafnia Using Synchrotron-Based X-Ray Photoelectron Spectroscopy"
  Philip Ryan, Argonne National Laboratory
  Nicholas Strange, SLAC National Accelerator Laboratory
LS2: Light Source Enabled Science Poster Session

MAGNETIC INTERFACES AND NANOSTRUCTURES (MI): The Magnetic Interfaces and Nanostructures Division (MIND) soliciting abstracts on Advanced Magnetic Materials focusing on interfacially driven magnetic effects and phenomena in low dimensional structures. The program will include areas of magnetism from fundamental science to future applications. The program will feature a special session on "Emergent magnetism at molecular interfaces, chirality induced spin selectivity, molecular magnetoresistance." In addition, we will select the best graduate student presentation from finalists for the Leo Falicov Award and will also offer an award for postdoctoral fellows who will be presenting papers at the MIND sessions. The winners of both awards will be announced towards the end of the meeting.

Areas of Interest:

- ***Advanced Magnetic Materials in Low Dimensional Structures***
    - *Magnetism and electronic interactions*
    - *Emerging ferromagnetism, Epitaxially strained atomic layers and heterostructures, Anisotropy*
    - *Magneto transport, Anomalous Hall Effect, Rashba Effect*
- ***Emergent Magnetism at Molecular Interfaces, Chirality-Induced Spin Selectivity and Molecular Magnetoresistance***
    - *Magnetism at molecular interfaces*
    - *Chirality-induced spin selectivity: natural spin filter offering potential for spintronics, chemical sensing, and understanding biological processes, with mechanisms involving spin-orbit coupling-orbit within the chiral structure*
    - *Molecular magnetoresistance: next-gen spintronic devices, arising from spin-dependent electron transport, orbital effects, and spin interactions at molecule-metal interfaces*

MI1: Advanced Magnetic Materials in Low Dimensional Structures
  Invited Speakers:
  Bharat Jalan, University of Minnesota
  John Xiao, University of Delaware"
  Ming Yi, Rice University
MI2: Emergent Magnetism at Molecular Interfaces, Chirality Induced Spin Selectivity, Molecular Magnetoresistance
  Invited Speakers:
  Matthew Beard, National Laboratory of the Rockies
  Ismael Diez-Perez, King's College London, UK, "Spin-Dependent Charge Transport in Individual Chiral Peptide Sequences"
Furkan Ozturk, Caltech*,* "Electron Spin, Chiral Symmetry Breaking, and Life's Homochirality"
MI3: Magnetic Interfaces and Nanostructures Poster Session

MANUFACTURING SCIENCE & TECHNOLOGY (MS): We are looking to bring together leaders in the semiconductor manufacturing industry and academic/government lab researchers working in areas that support this expanding industry.

Areas of Interest: We are seeking abstracts in the following areas:
- *manufacturing technologies for 2.5D and 3D packaging*
- *EUV lithography*
- *digital twin and other computational methods to support manufacturing*
- *metrology*
- *processing equipment design*
- *user facilities*
- *workforce development efforts*

MS1: Manufacturing Science & Technology Oral Session
MS2: Manufacturing Science & Technology Poster Session

MATERIALS AND INNOVATIONS FOR FUSION ENERGY (FUS): The Focus Topic "Materials and Innovations for Fusion Energy" will highlight the ongoing materials science and engineering challenges associated with bringing a functional fusion power plant online. Specifically, we invite abstracts related to surface and interface interactions in both plasma-facing materials and fueling subsystems, vacuum technologies, and processing of the intake and exhaust gases. We welcome both theory and experimental work to this session. Overall, we hope that this Focus Topic can bring together groups from industry, academia, and national labs to address current challenges facing the Fusion community.

Areas of Interest: The organizers of this focus topic believe that the AVS community has relevant expertise to solve what are fundamentally surface science and materials science problems in Fusion. Specifically, we hope to bring together a community that can address challenges related to:
- *surface interactions (first-wall plasma/materials interactions, fuel processing and isotope separation)*
- *materials development (permeation barriers, fuel containment and purification)*
- *processing conditions (optimization of fuel cleanup and rebalancing)*
- *vacuum technology (the need for new pumping systems).*

FUS1: Materials and Innovations for Fusion Energy Oral Session
Invited Speakers:
Yuji Hatano, Tohoku University, Japan
Robert Kolasinski, Sandia National Lab, "The Effects of High-Flux Plasmas on the Composition and Structure of Advanced Tungsten Alloys and Ultra-High Temperature Ceramics"
Florian Priester, KIT, Germany, "Challenges in Tritium Surface Characterization: From Memory Effects to Fusion Byproducts Management"
Masa Shimada, Idaho National Laboratory
Eric Vogel, Georgia Tech
FUS2: Materials and Innovations for Fusion Energy Poster Session

MULTIFUNCTIONAL AND HYBRID MICROSYSTEMS (MC): The Focus Topic on Multifunctional and Hybrid Microsystems is dedicated to advancing the science, engineering, and application of micro- and nanoscale systems, with a strong emphasis on system-level integration, multifunctionality, and cross-domain performance. It explores how novel materials, innovative fabrication processes, advanced architectures, and heterogeneous packaging technologies converge to create integrated systems that operate seamlessly across different physical domains, including electromechanics, soft electronics, MEMS/NEMS, optomechanics, quantum phononics, RF acoustics, magnetoacoustics, bioelectronics, bio-MEMS, and robotics. The Focus Topic will also highlight system-level approaches and co-design methodologies that integrate diverse functionalities (such as sensing, actuation, signal processing, and wireless communication), optimize the synergy between these functional components and overall system architectures, and enable the creation of intelligent, adaptable, and highly integrated solutions.

Areas of Interest: Within the framework of Multifunctional and Hybrid Microsystems, six major Areas of Interest are planned as:
- *Optomechanics and Quantum Phononics*
- *RF Electroacoustics and Magnetoacoustics*
- *MEMS and NEMS*
- *Soft Electronics, Bioelectronics, Bio-MEMS, and Robotics*
- *Microscale Additive Manufacturing*
- *Heterogeneous Integration*

MC1: Multifunctional and Hybrid Microsystems Oral Session
Invited Speakers:
Jesse Berezovsky, Case Western Reserve University

Hanna Cho, The Ohio State University, "Exploring a Broad Nonlinear Dynamic Range in Next-Generation MEMS Resonators"
Eric Markvicka, University of Nebraska-Lincoln
Mingyo Park, Penn State University
Thomas Purdy, University of Pittsburgh, "All-Dielectric Cavity Electro-Optic systems for Quantum Sensing and Transduction"
Han Zhao, University of Central Florida, "A Quantum Microwave-Optical Interface via Silicon Nanomechanics"

MC2: Multifunctional and Hybrid Microsystems Poster Session

NANOSCALE SCIENCE AND TECHNOLOGY (NS): The Nanoscale Science and Technology Division (NS) seeks to help engineer the future by highlighting scientific developments in microscopy (electron, ion, and scanning probes), nanofabrication, device characterization, and photonics. We encourage submissions describing progress in materials growth, novel instrumentation and theory, as well as scientific machine learning approaches to describe phenomena at shorter timescales, in correlated systems, light-matter interactions, magnetism, and quantum phenomena.

Areas of Interest: NS is seeking abstracts in the following areas:
- *Frontiers in Nanoscale Electron, Ion, and Scanning Probes*
- *Light-Matter Interactions at the Nanoscale*
- *Advanced Nanoscale Device Technologies*
- *Multimodal Techniques in Surface and Interface Engineering at the Nanoscale*
- *Advanced Nanomaterials for Quantum and Energy Applications*
- *Nanoscale Material Synthesis*

NS1: Frontiers in Nanoscale Electron, Ion, and Scanning Probes
  Invited Speakers:
  Elizabeth Dickey, Carnegie Mellon University
  Leora Dresselhaus-Marais, Stanford University
  Yongtao Liu, Oak Ridge National Laboratory
  Anna Roslawska, Max Planck Institute for Solid State Research, Germany
  Eric Stach, University of Pennsylvania

NS2: Multimodal Techniques in Surface and Interface Engineering at the Nanoscale
  Invited Speakers:
  Nazar Delegan, Argonne National Laboratory
  James McGiver, Columbia University, "Cavity Electrodynamics of van der Waals Heterostructures"
  Kyoung-Duck Park, Pohang University of Science and Technology, Republic of Korea, "Tip-Induced Control of Quantum Light–Matter Interactions at the Nanoscale"
  Alex Reid, SLAC National Accelerator Laboratory
  Haozhe Wang, Duke University

NS3: Nanoscale Science and Technology Poster Session

PLASMA SCIENCE AND TECHNOLOGY (PS): The Plasma Science & Technology Division (PSTD) program highlights the latest advances in plasma science, ranging from fundamental studies of plasma physics and chemistry, to plasma-matter interactions and new applications for etch processing. Our global community spans academia, national facilities and industry and strives to engineer the future in plasma research applied to sustainable semiconductor processing, as well as atmospheric pressure plasmas and chemical and energy conversion, novel materials synthesis and catalysis. Novel areas such as atomic scale processing advanced packaging including photonics, AR/VR, AI/ML, power and RF devices, patterning, isotropic etch and thermal etch techniques are also of interest.

Areas of Interest: For AVS 72, the PSTD is seeking abstracts that fall within the following themes:
- ***Plasma etching, deposition, and processing for advanced device fabrication:*** *State-of-the-art front (FEOL) and back (BEOL) end of line patterning and processing for logic devices, emerging memory applications, quantum devices, and photonics; advanced packaging, chiplets & heterogeneous integration.*
- ***Plasma enhanced atomic layer processing:*** *Area selective deposition, characterization and metrology to enable atomic scale processing, atomic layer process chemistry, surface reactions and atomic layer etching. Novel thin film deposition processes and material synthesis studies are also encouraged.*
- ***Plasmas and plasma-surface interactions - experiment and modeling:*** *Fundamental understanding of plasma-surface interactions, modeling and simulation challenges associated with plasma-based materials synthesis, processing, and etching; kinetic, fluid, hybrid and data-driven models; control; and experimental validation of simulations.*
- ***Plasma sources, diagnostics, sensing, and control:*** *Novel plasma generation schemes and (ion beam) sources at low and high pressures ; plasma diagnostics ; pulsed plasmas and waveform shaping; process sensing and control schemes.*
- ***Plasmas for chemical, energy and sustainable applications:*** *Emerging venues where plasmas provide unique advantages in chemical, environmental, energy, and biological applications. New plasma processes for sustainable technologies (chemical*

conversion, batteries, fuel cells, electrochemistry, photovoltaics, low GWP gases) and atmospheric pressure processing. Making today's processes more energy efficient and environmentally friendly.

PS1: Atomic Layer Processes (ALP): Deposition (ALD), Etching (ALE), and Area Selective Patterning Oral Session
Invited Speakers:
Masanaga Fukasawa, AIST, Japan, "Atomic Layer Etching for Advanced Logic Devices"
Dren Qerimi, University of Illinois at Urbana Champaign, "Young Investigator Awardee Talk"
Yevgeny Raitses, Princeton Plasma Physics Laboratory, "Low Temperature Magnetized Plasmas for Processing of 2D Materials"
Steve Shannon, North Carolina State University, "Plasma Prize Talk: Controlling Ion Energies Through Sheath Modulation"
Kazunori Shinoda, Hitachi High Technologies, Japan, "Selective Isotropic Atomic Layer Etching via Thermal-Cyclic Processing: Broad Material Capabilities with a Focus on Work Function Metal Films"

PS2: Plasmas for Advanced Logic and Advanced Memories Oral Session
Invited Speakers:
Scott Allen, IBM
Sung-il Cho, Samsung Electronics Co., Inc., Republic of Korea
Hiroyuki Fukumizu, KIOXIA, Japan, "Investigation of Surface Reactions of SiO_2 and SiN Films Under Cryogenic Etching Process via in-Line/Situ Analysis"
Mark Kawaguchi, Lam Research Corporation
Miyako Matsui, Hitachi, Ltd., Japan, "Roughness-generation Mechanism in Ru Etching using Cl_2/O_2-based Plasma for Advanced Interconnect"
Arame Thiam, Tokyo Electron Europe, Belgium

PS3: Plasmas for Advanced Packing Oral Session
Invited Speakers:
Violeta Georgieva, IMEC, Belgium, "Challenges in Plasma Etching for 3D Interconnect Technology"
Brittany Hedrick, Tokyo Electron America, USA, "Etch Opportunities in Advanced Packaging and Optical Photonics"

PS4: Plasma Catalysis and Sustainability Oral Session
Invited Speakers:
Kurtis Fairley, Edward vacuum
Tomohiro Nozaki, Institute of Science Tokyo, Japan, "Electrifying C1 Chemistry via Nonthermal Plasma Catalysis""

PS5: Plasma-Surface Interactions Oral Session
Invited Speakers:
Shih-Nan Hsiao, Nagoya University, Japan, "Plasma-Surface Reactions in Si-Based Dielectric Materials During HF-Based Cryogenic Etching""

PS6: Plasma Sources and Diagnostics and Modeling - AI/ML Oral Session
Invited Speakers:
Fatima Jenina Arellano, ULVAC, Inc., Japan, "Machine Learning-Assisted Plasma Process Monitoring and Optimization""
James Ellis, Oxford Instruments Plasma Technology, UK, "Plasma Diagnostics for Industry: Restrictions, Reluctance, and Reward""
Dawei Gao, Zhejiang ICsprout Semiconductor, China

PS7: Plasma for Coating and Thin Films Oral Session
Invited Speakers:
Jean Philippe Soulié, IMEC Belgium, "Epitaxial Conductors to Replace Cu in Advanced Interconnect Metallization"
Luke Walker, Hereaus

PS8: Plasma Science and Technology Poster Session

QUANTUM SCIENCE AND TECHNOLOGY (QS): The Quantum Science & Technology (QS) Focus Topic at AVS 72 invites abstracts showcasing cutting-edge research across quantum science and quantum-enabled technologies. The QS program highlights recent advances spanning materials science, surfaces and interfaces, quantum devices, and diverse qubit modalities for computing and sensing. We seek contributions across a broad range of topics, including advances in materials and surface engineering to enhance quantum device performance; developments in qubit modalities such as superconducting, spin, trapped-ion, neutral-atom, donor, and photonic platforms; and innovations in quantum sensing and quantum-enhanced metrology, including nitrogen-vacancy sensors, transition-edge sensors, and superconducting nanowire single-photon detectors. Submissions addressing integration challenges and technological innovations in quantum systems, devices, and manufacturing such as cryogenic packaging, wiring, scalability, and reliability are strongly encouraged.

The symposium also welcomes work on quantum simulations and quantum-inspired technologies, including new computational and modeling approaches that incorporate quantum principles, materials modeling, and machine learning. Interdisciplinary contributions bridging quantum science with vacuum technology, thin-film growth, phononics, electronic materials, and nanofabrication are particularly encouraged. In addition, the QS program will highlight quantum education and workforce development initiatives, as well as groundbreaking research enabled by quantum user facilities and quantum information science centers, with the goal of raising awareness

of these resources and encouraging their broader use. Poster sessions will provide emerging scientists with a platform to showcase their work through posters and flash talks, while interacting with established leaders in the field.

Overall, the QS Mini-Symposium aims to help researchers leverage their traditional AVS expertise to shape their future contributions in the rapidly evolving domain of quantum science and technology. The symposium invites participation from a global community of researchers across academia, national laboratories, nonprofits, and industry.

The QS program welcomes contributions spanning fundamental science through manufacturing-focused demonstrations, with particular interest in work that links **process → materials → interfaces/defects → device performance**.

Areas of Interest: Topics of interest include, but are not limited to:
- *Surfaces/interfaces/defects limiting coherence (TLS, quasiparticles, oxide chemistry, contamination, stress)*
- *Qubit modalities (superconducting, semiconducting/spin, photonic, atomic) and scaling/reproducibility challenges*
- *Thin-film growth & processing (MBE, ALD, CVD, PVD; oxides/nitrides; epitaxy; pattern transfer; low-damage etching)*
- *Josephson junction materials/barriers: interface control, variability, reliability*
- *Quantum sensing & quantum-enhanced metrology (superconducting detectors, defect-based sensors, photonic sensing)*
- *Integration & cryogenic packaging/interconnects (2.5D/3D, low-loss dielectrics, wiring density, thermalization)*
- *Quantum simulation/modeling for materials & processes (defect/noise modeling, digital twins, data-driven methods)*
- *Workforce/ecosystem/translation (foundry pathways, standards, testbeds, partnerships)*

QS1: Quantum Science and Technology Oral Session
  Invited Speakers:
Valla Fatemi, Cornell University
Sergey Frolov, University of Pittsburgh, USA, "Quantum Devices Based on Sn-InAs Nanowire Josephson Junctions"
Peter Leek, University of Oxford, UK
Benjamin Palmer, Laboratory for Physical Sciences
David Schuster, Stanford University
Alexander Sergienko, Boston University

QS2: Quantum Science and Technology Poster Session

SPECTROSCOPIC ELLIPSOMETRY (EL): The Spectroscopic Ellipsometry Topic positions spectroscopic ellipsometry as a core, polarization resolved optical metrology for understanding materials, interfaces, and thin film systems across fabrication, characterization, and application driven research. The session emphasizes how ellipsometry provides quantitative access to optical, electronic, and structural properties, enabling direct connections between material growth, physical response, and functional performance. The topic highlights advances in ellipsometric analysis and instrumentation that extend sensitivity from atomic scale film evolution to complex anisotropic and nanostructured systems, while supporting insight into optical transitions, interfacial processes, and spatially heterogeneous responses. By bridging real time growth monitoring, detailed optical modeling, and emerging application spaces, the EL Topic reflects the evolving role of spectroscopic ellipsometry as an enabling platform for modern materials science and engineering. We will also focus on workforce development for future spectroscopic ellipsometry with a focus on student talks and awards for best oral presentation and best poster in the EL session.

Areas of Interest: EL seeks abstracts in the following areas:
- Advances in Spectroscopic Ellipsometry Methods:
  Noise reduction and signal processing techniques. In situ instrumentation and real time growth monitoring. Novel ellipsometry hardware and measurement strategies. Artificial intelligence and machine learning approaches for ellipsometric data analysis and modeling.
- Applications in Materials and Thin Films:
  Semiconductor, dielectric, and two dimensional thin films. Optical anisotropy, birefringence, chirality, and polarization resolved platforms. Nanophotonics, metamaterials, and metasurfaces. Energy related materials including solar, battery, and thermoelectric systems. Emerging and quantum materials studied using spectroscopic ellipsometry.
- Workforce Development

Student led research and training in spectroscopic ellipsometry. Best oral and best poster presentation awards.

EL1: Spectroscopic Ellipsometry Oral Session
  Invited Speakers:
Matthew Hilfiker, Onto Innovation

EL2: In-Situ Ellipsometry for Atomic Scale Processing Oral Session
  Invited Speakers:
Gottlieb Oehrlein, University of Maryland, "In-Situ Ellipsometry for Atomic Scale Processing"
Eva Schubert, University of Nebraska–Lincoln, "Atomic Processes in Surface-Limited ALD growth Studied by Real-Time Spectroscopic Ellipsometry"

EL3: Spectroscopic Ellipsometry Poster Session

SURFACE SCIENCE (SS): The Surface Science Division (SSD) is soliciting abstracts that describe advances in cutting-edge and foundational research involving surfaces and interfaces, including gas-solid and liquid-solid interactions, emphasizing studies by surface spectroscopies and microscopies. A wide range of topics will be covered from surface chemistry in liquids, to reactions on nanoparticle, alloy, oxide, chalcogenide, and low-dimension materials. We showcase advances in Operando/in-situ methods and on-surface synthesis. We will hold a special session entitled "Rising Stars", and a Celebration of Gabor Somorjai's contributions to Surface Science.

Areas of Interest: SS seeks abstracts in the following areas:
- *On Surface Synthesis*
- *Electrical, Magnetic, and Optical Properties*
- *Dynamics*
- *Chemical Reactions*
- *Reduced Dimensional Materials*
- *Heterogeneous Catalysis*
- *Photo/Electrochemistry*

SS1: Surface Science Oral Session
  Invited Speakers:
  Camilla Ferreira, Universidade Federal do Rio de Janeiro, Brazil
  Pavel Jelínek, Czech Academy of Science, Czechia
  Lindsay Merte, Malmo University, Sweden
  Timothy Minton, University of Colorado
  Matthew Montemore, Tulane University
  Oliver Monti, University of Arizona
  José Ignacio Pascual, CIC nanoGUNE, Spain
  Miquel Salmeron, Lawrence Berkeley National Laboratory
  Phillip Sautet, UCLA, "Restructuring, Fluxionality and Dynamics of Heterogeneous Catalysts in Reaction Conditions from First Principles"
  Swetlana Schauermann, Christian-Albrechts-University Kiel, Germany, "Molecular Systems for Reversible Hydrogen Storage: Atomistic-Level Insights"
  Marcel Schreier, University of Wisconsin-Madison
  Alexander Sinitskii, University of Nebraska
  Ye Xu, Louisiana State University
  Peidong Yang, UC Berkeley

SS2: Surface Science Poster Session

THE FUTURE OF TEMPERATURE SENSING (TS): The Future of Temperature Sensing Focus Topic invites abstracts to highlight the cutting-edge developments in next-generation temperature measurement science & technology. We seek contributions that explore transformative approaches to temperature metrology, driven by advances in integrated photonics, nanofabrication, optical frequency metrology, optomechanics, nitrogen-vacancy systems, and atomic and molecular platforms. We welcome both fundamental and applied research addressing the full spectrum of next-generation temperature sensing: from novel sensor architectures and readout techniques to theoretical modeling and metrological frameworks. Submissions that push the boundaries of precision, scalability, and environmental resilience are especially encouraged.

Areas of Interest: TS is seeking abstracts in areas including, but not limited to:
- **Integrated photonics-based temperature sensors**
- **Quantum-based primary thermometry** using optomechanics, Doppler broadening, and cold atomic/molecular systems
- **Nitrogen-vacancy (NV) centers** for nanoscale and quantum-enhanced temperature measurements
- **Nanoscale thermometry** for semiconductor, biological, or chemical applications
- **Optical fiber-based thermometers** for distributed sensing

We encourage submissions that push the boundaries of precision, scalability, and environmental resilience in temperature sensing technologies.

TS1: The Future of Temperature Sensing Oral Session
  Invited Speakers:
  John Davis, University of Alberta, Canada
  Sergey Dedyunin, National Research Council of Canada (NRC), Canada
  Olga Kozlova, Le Laboratoire Commun de Métrologie (LNE-Cnam), France

Stephan Krenek, Physikalisch-Technische Bundesanstalt (PTB), Germany

Jeremy Latsko, United States Air Force Metrology and Calibration (AFMETCAL), "Breaking the (Calibration) Chain: The Quantum Metrology Revolution for Assured Military Readiness?"

Graham Machin, National Physical Laboratory (NPL), UK, "Keynote Talk: The Transformation of Temperature Traceability"

TS2: The Future of Temperature Sensing Poster Session

THIN FILMS (TF): The Thin Film Division (TF) program provides a week-long forum for academic, government, and industrial researchers and practitioners to share new advances in the processing, structure, properties, and applications of thin films. Topics span from the fundamental science of thin film processing and characterization to the scale-up and commercialization of thin film deposition equipment and devices. For AVS 72 TFD is particularly seeking abstracts that fall under five broad thematic areas:

- ***Atomic Scale Processing for Thin Film Formation and Patterning***: *These sessions will highlight current advances in atomic-scale processes including energy-enhanced atomic layer deposition (ALD), atomic layer etching (ALE), area-selective deposition (ASD), and integration of deposition with etching for patterning. These sessions will be integrated with the **Atomic Scale Processing Mini-Symposium**.*
- ***Thin Film Processing for Microelectronics***: *These sessions will gather experts from academia, government, and industry to explore current challenges and opportunities in thin film processing for microelectronics. Discussions will cover chemical vapor deposition (CVD) and ALD processes for back-end-of-line (BEOL) and packaging applications, along with recent developments in deposition processes for ferroelectrics, wide band gap, and other functional materials. These sessions will be integrated with the **Advanced Microelectronic Materials Mini-Symposium**.*
- ***Vapor Synthesis of Hybrid, Organic, and Polymeric Materials (VSHOP)***: *These sessions will coalesce experts in the vapor deposition of organic, polymeric, and organic-inorganic hybrid materials including 2D and 3D frameworks using processes like molecular layer deposition (MLD), initiated chemical vapor deposition (iCVD), vapor infiltration (VPI, SIS, and ALI) and other related techniques to discuss recent advances in processing science, structure-property relations, and material applications.*
- ***Thin Films for Energy Technology***: *These sessions will address the use of thin films in technolgoies such as energy generation and storage (e.g., photovoltaics, batteries, fuel cells, capacitors, thermoelectrics), sustainable systems (e.g., membranes, separations, catalysis), and extreme environment (e.g., space, high temperature, intense radiation). These sessions will be integrated with the **Advances in Battery Engineering, Interface Design, and Characterization Mini-Symposium**.*
- ***Far from Equilibrium Films and Processing***: *For AVS 72, TFD is introducing new sessions on processes for synthesis of thin films in non-equilibrium states.*
- ***Fundamentals of Thin Films and Thin Film Processing***: *These sessions will focus on the foundational aspects of nucleation and growth behaviors during thin film deposition, encompassing in-situ characterizations and multi-scale modeling.*

All graduate student participants are encouraged to submit an application for the Harper Award along with their abstract. Besides giving their session talk, the four Harper Award finalists will also compete in a special session giving interactive "TED-Style Talks" for the top prize.

TF1: Atomic Scale Processing: Thin Film Formation and Patterning Oral Session
  Invited Speakers:
  Parag Banerjee, University of Central Florida
  Necmi Biyikli, University of Connecticut
  Christophe Detavernier, University of Ghent, Belgium, "In Vacuo XPS as a Window Into ALD Growth"
  Woo-Hee Kim, Hanyang University, Republic of Korea, "Atomic Layer Etching of Metals and Oxides for Advanced Angstrom-Scale Fabrication"
  Miika Mattinen, University of Helsinki, Finland, "Chemistry (and Some Physics) of Atomic Layer Deposition of Two-Dimensional Metal Dichalcogenides"
  Joachim Schnadt, Lund University, Sweden, "Understanding the Chemical Reaction Mechanisms of Oxide, Nitride and Metal ALD: Insights from Operando X-Ray Photoelectron Spectroscopy"
  Angel Yanguas-Gil, Argonne National Laboratory

TF2: Thin Films for Microelectronics Oral Session
  Invited Speakers:
  Zsofia Baji, HUN-REN Centre for Energy Research, Hungary, " When Growth Has Not Yet Begun: Nucleation and Interface Control in Atomic Layer Deposition"
  Chris Hinkle, University of Notre Dame
  Andrew Meng, University of Missouri
  Shivani Srivastava, Micron Technology, "Memory Centric Ai and the Role of Advanced Materials in Future Microelectronics"

TF3: Vapor Synthesis of Hybrid, Organic, and Polymeric Materials (VSHOP) Oral Session
  Invited Speakers:
  Sumit Agarwal, Colorado School of Mines
  Jeffrey Long, Naval Research Laboratory
  Stefan Schröder, Kiel University, Germany, "Designing Functional Polymer Thin Films via Initiated Chemical Vapor Deposition"
  Tamar Segel Peretz, Technion Israel Institute of Technology, Israel
  Michael Tsapatsis, Johns Hopkins University

TF4: Thin Films for Energy Technology Oral Session
  Invited Speakers:
  Zahra Fakhraai, University of Pennsylvania
  Caroline Sutter-Fella, Lawrence Berkeley National Laboratory

TF5: Thin Films for Batteries Oral Session
  Invited Speakers:
  Paul Braun, University of Illinois at Urbana-Champaign, "Plasma Modification of Li-Ion Battery Cathodes for High Voltage Cycling"
  Neil Dasgupta, University of Michigan
  Chuan-Fu Lin, Catholic University of America, "Understanding the Electrically-Limited Reaction Kinetics for Conversion Electrodes Using Lateral Thin Film Platforms'
  Andrew Westover, Oak Ridge National Laboratory, "Thin Li Metal Films For Advanced Li Metal Batteries"

TF6: Far from Equilibrium Thin Films and Processes Oral Session
  Invited Speakers:
  Lucas Caretta, Brown University, "Designing Topology, Spin-Split Magnetism, and High-Speed Dynamics in Ultrathin Multiferroics"
  Tina Rost, Virginia Tech
  Zac Ward, Oak Ridge National Laboratory, "Automating Entropy-Assisted Synthesis"

TF7: Fundamentals of Thin Films and Thin Film Processing Oral Session
TF8: Thin Film Poster Session

UNDERGRADUATE POSTER SESSION (UN): AVS 72 will host its sixth annual undergraduate poster session, open to any undergraduate conducting research on an AVS-related topic. This special session provides undergraduate researchers the opportunity to present and network with students, professors, and industry leaders! We welcome the newest members of AVS to share their important work with all Society members and greatly encourage participation. Registration is discounted for undergraduate students and limited travel assistance may be available. Cash awards will be given for the top poster presentations!

Areas of Interest: All undergraduate students conducting research in any topic relevant to the AVS is welcome to submit a poster abstract in any of the AVS 72 topical areas listed above!
UN1: Undergraduate Poster Session

VACUUM TECHNOLOGY (VT): Vacuum technology and the Vacuum Technology Division (VTD) are at the heart of the AVS, with vacuum technology fundamental to the groundbreaking science across the divisions. The VTD program will cover vacuum research for applications including fusion energy and gravitational wave detectors, as well as advances in our core subjects of vacuum measurements, pumping, and gas dynamics. We are soliciting abstracts in these topics, and welcome novel applications that require new vacuum techniques and technology Additionally, VTD will host the popular "Ask the Experts" (ATE) booth during exhibit hours. This informal forum, staffed by leading vacuum experts, offers attendees an opportunity to ask questions, discuss challenges, and explore ideas for innovative solutions. We look forward to receiving your contributions and advancing the discussion on critical topics in vacuum technology and materials science.

Areas of Interest: VT is seeking abstracts in the following areas:
- *Fusion energy*
- *Gravitational wave detectors*
- *Gas flow through materials*
- *Miniaturized vacuum analytical instruments*

Other Highlights:
- *Ask the Expert Booth*
- *Student prizes (poster and oral)*
- *Early Career award*
- *Flash poster session*

VT1: Vacuum Technology Oral Session
  Invited Speakers:
  Michał Krysztof, Wroclaw University of Science and Technology, Poland, "Miniaturized Vacuum Analytical Instruments"

David Ruzic, University of Illinois at Urbana Champaign, "Vacuum Walls in Fusion Reactors"
Orlando Teodoro, Nova de Lisbon, Portugal, **"**Vacuum Technology in Cork Science: From Permeability to TCA Desorption"
Jordan Vanosky, California Institute of Technology, "UHV Requirements for Cosmic Explorer Beamtube"
VT2: Vacuum Technology Poster Session

ALL-INVITED SESSIONS

AVS QUANTUM SCIENCE WORKSHOP (AQS): Quantum science and technology are transitioning rapidly from fundamental research to early-stage deployment, driven by advances in materials, devices, systems integration, software, and applications in computing, sensing, networking, and metrology. As this transition accelerates, progress increasingly depends not only on scientific breakthroughs, but also on the coordinated development of shared infrastructure, a skilled and adaptable workforce, and effective pathways for translating research into impact. This all-invited workshop will bring together leaders from across the quantum ecosystem, including government, national laboratories, nonprofits, industry, startups, and academia, to provide complementary perspectives on the current state of quantum technologies and the challenges that must be addressed to enable scalable and sustainable growth. Speakers will discuss the role of public–private partnerships, national and regional infrastructure, workforce development efforts, and ways to accelerate translation from research to real-world applications. A central focus of the workshop will be identifying near-term priorities and actionable strategies for building a resilient quantum ecosystem that can support both innovation and deployment. The invited talks will be followed by a panel discussion aimed at synthesizing cross-sector insights and highlighting opportunities for collaboration across disciplines and institutions. This workshop will serve as a programmatic anchor for the Quantum Science & Technology activities at AVS 72 and will be complemented by QS mini-symposium sessions throughout the week that explore technical advances in quantum materials, devices, integration, sensing, and manufacturing. We invite all AVS attendees interested in shaping the future of quantum technology to participate in this workshop and contribute to defining pathways for infrastructure development, workforce training, and translation to impact.

AQS1: AVS Quantum Science Workshop Session (ALL-INVITED SESSION)
- **Government:** Dr. Matthew LaHaye (AFRL)
- **National Lab:** Dr. Travis Humble (ORNL)
- **Non-profit:** Dr. Corey Stambaugh (Maryland Capital of Quantum), "The Capital of Quantum"
- **Start-up:** Dr. Mehdi Namazi (Qunnect Inc.)
- **Industry:** Dr. Sebastian Hassinger (Amazon, AWS)
- **Academia:** Prof. Saikat Guha (University of Maryland)

This workshop will be followed by QS scientific sessions throughout the week that delve deeper into technical advances in quantum science and technology.

BIOMATERIALS PLENARY (BP): The Biomaterials Interfaces program kicks off with the traditional Biomaterials Plenary Session. This year we are pleased to have presentations from three prominent scientists who will present seminars.
BP1: Biomaterials Plenary Session (ALL-INVITED SESSION)
  Invited Speakers:
  Kenan Fears, Naval Research Laboratory
  Daeyeon Lee, University of Pennsylvania
  Tak-Sing Wong, Penn State University, "Synthetic Brochosomes: From Biomimicry to Function"

NANOSCALE SCIENCE AND TECHNOLOGY PLENARY SESSION (NSP): The Nanoscale Science and Technology Plenary Session (NSP): The Nanoscale Science and Technology Division starts the week with a plenary session featuring a talk from the Nanotechnology Recognition Award winner. Following this talk, we will have our Early Career and Graduate Student competitions. Please join us for these engaging talks on nanoscale science and technology and for lively discussion during a reception, immediately after the competitions. All graduate students, early career, and senior personnel are encouraged to submit applications for NS Graduate Competition, Early Career Competition, and Professional Awards.
NSP1: Nanoscale Science and Technology Plenary Session (ALL-INVITED SESSION)

SPECIAL SESSIONS & EVENTS

AVS 72 PLENARY LECTURE:
Dr. Akihisa Sekiguchi, Corporate Fellow of Tokyo Electron Ltd. Corporate Innovatoin Division will present the Plenary Lecture on Monday, November 9, 2026, at 8:30 a.m.

AVS VENDOR EXHIBIT: The Exhibit comprises an extensive display of tools, equipment, and services for Surface Science; Biomaterial Interfaces; Electronic Materials & Photonics; Magnetic Interfaces; Manufacturing Science; Nanoscience; Thin Film; Plasma Science; Vacuum Technology, educational material, career services and professional literature, journals and publications. Each year, the technical

symposium expands into new and exciting technical disciplines which bring new exhibitors showing new technology and research methods. The continuously expanding technical program consistently keeps our Symposium fresh and exciting for exhibitors and attendees alike. The exhibition will be open from Tuesday morning until Thursday afternoon (November 10-12, 2026). Reserve your booth today using our online system (link to AVS 72 Exhibition Sales) or contact us at exhibits@avs.org for more information.

AVS LATE BREAKING ABSTRACT SUBMISSIONS: There will be opportunities for presentation of post-deadline discoveries in all fields relevant to the AVS membership. Submissions that address topics in surfaces, interfaces, films, nanometer-scale phenomena, emerging technologies, or new innovations. Our Call for Late Breaking Abstracts will launch in early August with a September 14, 2026 deadline. Submissions will be used to fill holes in the program and grow the poster sessions, and they must be submitted via the AVS website by Monday, September 14, 2026. Notification of acceptance/rejection will be made soon thereafter. Please check the AVS 72 website for details and abstract submission guidelines in early August after the AVS 72 Technical Program launches.

AVS SPONSORSHIP PROGRAM: AVS is a not-for-profit Society that offers a myriad of services, programs and events related to science and technology in the fields of vacuum, materials, interfaces and processing to scientists and engineers from around the world. An extensive recognition and exposure program, which is active before and during the Symposium, is available to our Symposium Sponsors. Symposium Sponsor logos will appear on the AVS website, in the Technical/Exhibitor Program, on signage and slide shows at the Symposium. The earlier AVS Symposium Sponsorships ensure the greatest exposure. To learn more about Sponsorship opportunities, please contact exhibits@avs.org or Yvonne Towse at 212-248-0200 ext. 222 or **yvonne@avs.org**.

Dorothy M. and Earl S. Hoffman Travel Grants

The Hoffman Travel Grants have been created in an effort to promote student involvement in AVS and encourage their participation in the annual AVS International Symposium. These travel grants will be given to any applying students who meet the following criteria: 1) you must be the presenter of an accepted Symposium abstract, 2) you must be a full-time student, 3) the grant is not transferable, 4) you must attend the Symposium to receive the grant and, 5) you are not eligible to receive the grant if you are receiving any other travel support from AVS. An invitation e-mail will be sent to eligible students (early August 2026) and the student should apply for the grant by responding to the invitation email. The application deadline is Monday, September 28, 2026. Should your application be approved, you will receive an e-mail notification by Monday, October 5, 2026. Grants will be given on a random basis until the 2026 funds are depleted. Funds for the grant recipients will be available at the Symposium Registration Manager's desk, and you will also be asked to present a student I.D. Please note that all travel grants must be collected at the meeting.

ONLINE ABSTRACT SUBMISSION ONLY: www.avsconferences.org

Deadline: 11:59 p.m. ET, Monday, May 18, 2026

Supplemental data (1-2 pages, 1MB) will also be accepted via the submission site.

Instructions may be found at the web site above.

*** *A presenter may present ONE ORAL AND ONE POSTER at the Symposium****

Contributed oral presentations are 15 minutes and invited talks are 30 minutes.

All submitting authors should review the areas of interest for which their desired topic is seeking abstracts and then submit their abstract to an oral or poster session. Presenters may submit two different abstracts at AVS 72 – an oral and a poster.

ORAL Sessions: Rooms will be set up with projectors, screens, microphones, and laptops (PCs).
POSTER Sessions: Each poster presenter will be allotted space that is 4 feet wide by 4 feet high. Please make your poster no larger than 46 inches wide by 46 inches high to ensure it fits nicely into the allotted space.

AVS NATIONAL STUDENT AWARDS

Students may apply for one National Student Award and one Division/Group Award in a given year.

Each year, the AVS solicits nominations for eight graduate student awards. These are the Russell and Sigurd Varian Award, the Nellie Yeoh Whetten Award, the Dorothy M. and Earl S. Hoffman Award, two Dorothy M. and Earl S. Hoffman Scholarships (N.B. the Hoffman Award and Scholarships are distinct from the Hoffman Travel Grants described above) and three Graduate Research Awards. The nomination procedures are on www.avs.org or through Angela Klink (212-248-0200, ext. 221 or **angela@avs.org**) Applicants should use the AVS online award submission site. **The deadline is May 18, 2026.**

AVS DIVISION/GROUP STUDENT/EARLY CAREER AWARDS

The AVS Divisions and Groups invite applications from student and early career presenters for numerous awards. Review the full list here and note the submission deadlines and the requirements for each award.