



37th Annual Symposium of the Pacific Northwest Chapter of AVS, The Science and Technology Society



**SEPTEMBER 9-11, 2026
DISCOVERY HALL
PACIFIC NORTHWEST NATIONAL LABORATORY
RICHLAND, WA**



For the Abstract Book!

Welcome to the 37th Annual Symposium of the Pacific Northwest Chapter of the AVS (PNWAVS)

On behalf of the organizing committee, we warmly welcome you to the Pacific Northwest National Laboratory campus for the 37th Annual Symposium of the Pacific Northwest Chapter of the AVS (PNWAVS) Meeting. We hope that colleagues and friends, together with new arrivals in the field, will find the sessions stimulating and that you will create, renew, and deepen acquaintances and collaborations throughout the conference.

Please scan the QR code on the front page to download the official Conference App. The app provides instant access to the full conference schedule, the Abstract Book, venue maps, session locations, and other important logistical details to help you make the most of your experience.

Additionally, once inside the app, you can interact with our built-in AI Assistant to quickly find answers to your questions, get personalized recommendations, and receive real-time updates throughout the event.

If there is anything we can do to improve your visit, please visit our registration desk located in the Discovery Hall lobby.

Conference Chair

Ajay Karakoti

Pacific Northwest National Laboratory

Program Committee:

Ajay Karakoti, *Pacific Northwest National Laboratory*

Jean-Sabin McEwen, *Washington State University*

Karthik Srinivasan, *Boise State University*

David Bergsman, *University of Washington*

Timothy Kowalczyk, *Western Washington University*

Local Arrangements:

Heather Roney, *Pacific Northwest National Laboratory*

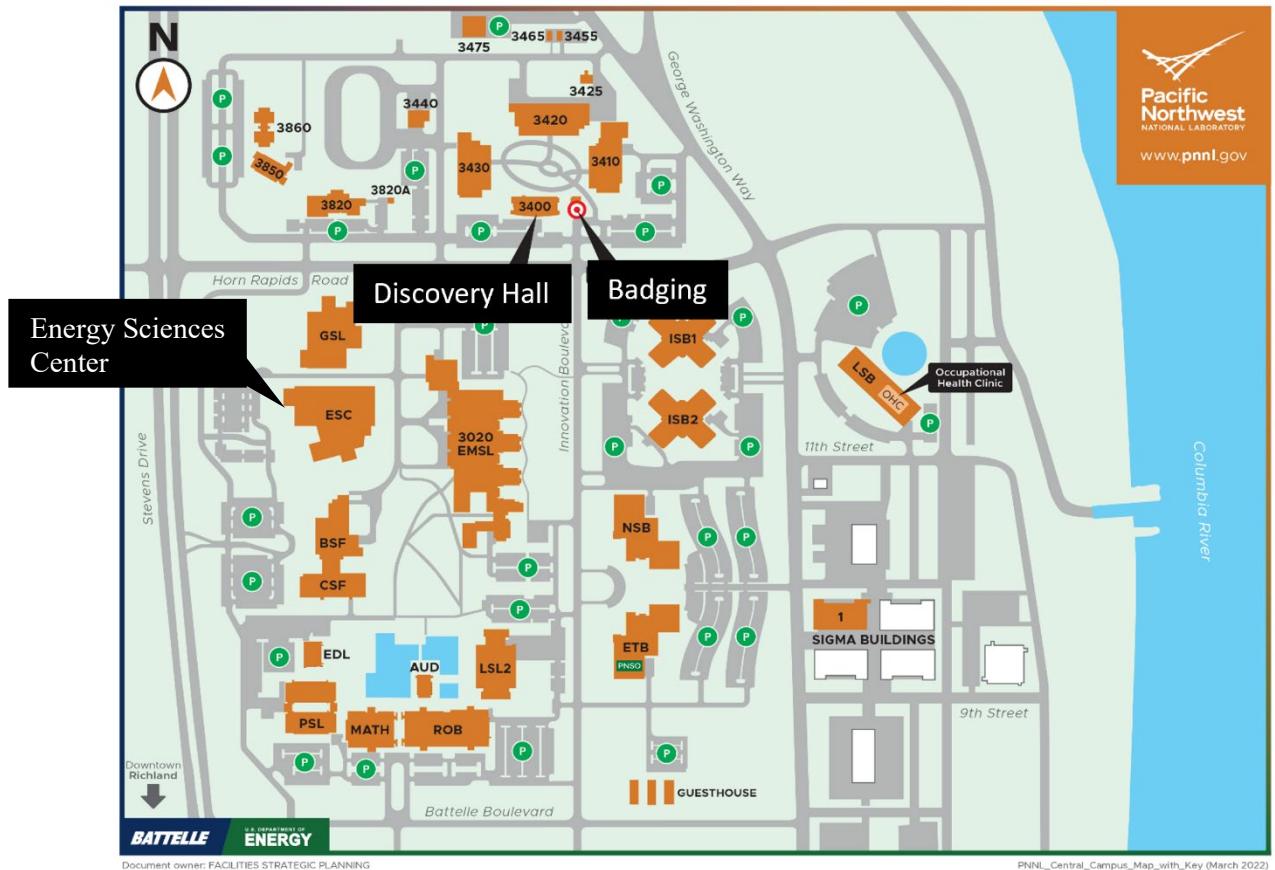
Theva Thevuthasan, *Pacific Northwest National Laboratory*

Shuttha Shutthanandan, *Pacific Northwest National Laboratory*

Bhuvana Modachur Sivakumar, *Pacific Northwest National Laboratory*

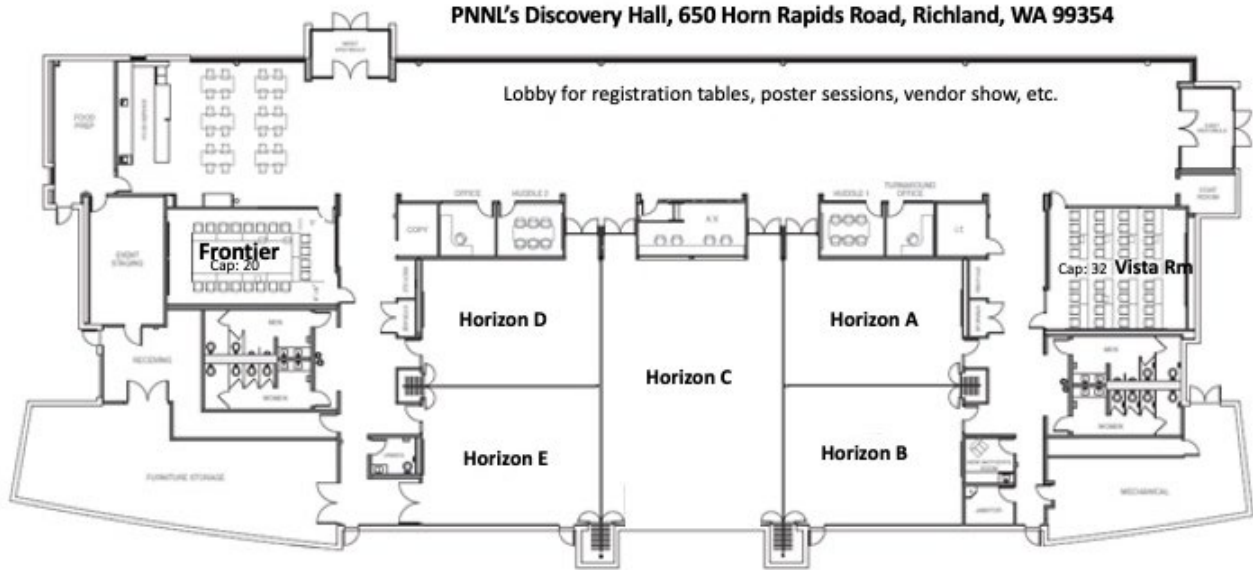
Joe Gray, *Palmborg Associates*

Pacific Northwest National Laboratory Map



Discovery Hall Map

PNNL's Discovery Hall, 650 Horn Rapids Road, Richland, WA 99354



Vendor Exhibit and Sponsors

We would like to thank the following sponsors for their generous contribution toward the success of this conference. Please visit the vendor exhibition in the Discovery Hall lobby. We greatly appreciate their support for this symposium!

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Workshop on Autonomous Scientific Workflows

Wednesday, September 9, 2026		Energy Sciences Center
8:45 – 8:55	Opening and Welcome Remarks	Ajay Karakoti <i>Pacific Northwest National Laboratory</i>
9:00 – 10:00	Machine Learning-Enabled Control of Thin Film Deposition	Tiffany Kaspar <i>Pacific Northwest National Laboratory</i>

10:00 – 10:15 Break

10:15 – 11:15	Electrons, Images, Agents: A Modern TEM Toolkit – Semanti Mukhopadhyay	Semanti Mukhopadhyay <i>Pacific Northwest National Laboratory</i>
11:15 – 12:15	The Autonomous Lab: A Modular, AI-ready Lab in the Loop	Dan Curhan <i>Ginkgo Bioworks</i>
12:15 – 1:30	Working Lunch: Automated ML-Aided Workflow for XCT Image Analysis Automation	Hasitha Wijesuriya, Maruti Mudunuru, and Layton Washburn <i>Pacific Northwest National Laboratory</i>
1:30 – 3:30	A Hands-On Tutorial: Agentic AI for Surface Science	Semanti Mukhopadhyay, Lance Yao and Kavın Thangaraj <i>Pacific Northwest National Laboratory</i>

3:30 – 3:45 Break

3:45 – 5:45	Lab Tours	
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5:30 – 7:30 PNWAVS Welcome Reception at Energy Sciences Center

37th Annual Symposium of the Pacific Northwest Chapter of the AVS

THURSDAY, SEPTEMBER 10, 2026

DISCOVERY HALL

8:00 – 8:10	Welcome and Logistics	Ajay Karakoti <i>Pacific Northwest National Laboratory</i>
8:10 – 8:20	Opening and Welcome Remarks	Robert Rallo <i>Pacific Northwest National Laboratory</i>

Session 1 **Synthesis and Surface Engineering**

Chair: **Hyoju Park**, *Pacific Northwest National Laboratory*

8:20 – 9:00	Invited Talk Surface Engineering of Gold Nanorods for Enhanced Sensing Performance	Ying Bao <i>Western Washington University</i>
9:00 – 9:40	Invited Talk Synthetic control of cation distribution and defect formation in high entropy oxides for water oxidation	Le Wang <i>Pacific Northwest National Laboratory</i>
9:40 – 10:00	Navigating Metastability: Predictive and Unconventional Approaches to the Synthesis of Rare Earth Silicon Pnictides	Gayatri Viswanathan <i>Rice University</i>
10:00 – 10:20	From Bulk Transition Metal Dichalcogenides to Monolayers, The Intercalated Way	Shannon Lee <i>Pacific Northwest National Laboratory</i>

10:20–10:40 Break and **Vendor Exhibit** in Discovery Hall Lobby

Session 2 **Nanoscale Phenomena**

Chair: **Thien Nguyen**, *Pacific Northwest National Laboratory*

10:40 – 11:20	Invited Talk Nanoscale conversion mechanisms in iron oxides control reactivity for electrified steelmaking	Paul Kemplar <i>University of Oregon</i>
11:20 – 11:40	Defect-mediated phase evolution in electrodeposited nickel by thermal annealing	Hyoju Park <i>Pacific Northwest National Laboratory</i>
11:40 – 12:00	Atom Probe Tomography of Coated 316 Stainless Steel Cladding: Mapping Elemental Distribution at Grain Boundaries	Francelia Sanchez <i>Pacific Northwest National Laboratory</i>

12:00 – 1:00 Lunch and **Vendor Exhibit** in Discovery Hall Lobby

Session 3 **Materials for Energy Storage**

Chair: **Paul Kemplar**, *University of Oregon*

1:00 – 1:40	Invited Talk Defect and Interface/Interphase Engineering in Electrode Materials from Rechargeable Batteries	Claire Xiong <i>Boise State University</i>
1:40 – 2:00	Investigation of Solid-State Electrolyte Interfaces with Surface-Sensitive DNP-NMR	David Bazak <i>Pacific Northwest National Laboratory</i>
2:00 – 2:20	Physical vapor deposited thin films as model systems for batteries	Celeste Melamed <i>University of Oregon</i>
2:20 – 2:40	From Electrolyte to Anode: Interfacial Reaction Pathways and Ion Transport in Sodium Solid State Batteries	Thien Nguyen <i>Pacific Northwest National Laboratory</i>

2:40 – 3:00 Break and **Vendor Exhibit** in Discovery Hall Lobby

Session 4 **Capability Developments for Enabling Future Scientific Endeavors:**

Chair: **Claire Xiong**, *Boise State University*

3:00 – 3:20	Femtosecond laser for depth profiling – XPS	James Lallo <i>ThermoFisher Scientific</i>
3:20 – 3:40	Developments in sample preparation, loading, and pre-analysis treatment for Cryo-XPS of volatile and soft materials	Chris Moffet Kratos Analytical
3:40 – 4:00	Reconfigurable Automation Carts: Ginkgo Bioworks' Modular RACs Provide Throughput and Flexibility in Autonomous Labs	Dan Curhan <i>Ginkgo Bioworks</i>

Session 5 **Catalysis Session- 1: Controlling Selectivity**

Chair: **Juye Kim**, *Oregon State University*

4:00 – 4:40	Invited Talk Ligand-controlled selectivity of single atom catalysts: oxidation of ethanol by Rh/Fe ₃ O ₄ (001)	Ben Jackson <i>Pacific Northwest National Laboratory</i>
4:40 – 5:00	Understanding ethylene selectivity for ethane oxidation on Cl-substituted IrO ₂ (110) through microkinetic modeling	Jungwon Yun <i>Oregon State University</i>

Session 6 **Poster session**

Chair: **Shuttha Shutthanandan**, *Pacific Northwest National Laboratory*

5:00 – 7:30	Student Poster Competition and General Posters
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7:30 – 9:00	Banquet Dinner Plenary Talk by Vinod Konaganti, <i>Amazon</i> - Surfaces at Scale: AI-Driven Discovery of Catalysts, Sorbents, and the Autonomous Laboratory
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FRIDAY, SEPTEMBER 11, 2026

DISCOVERY HALL

7:50 – 8:00	Chair Greeting	Ajay Karakoti <i>Pacific Northwest National Laboratory</i>
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Session 7 Catalysis session – 2: Site Specificity and Substrate Effects

Chair: **Ben Jackson**, *Pacific Northwest National Laboratory*

8:00 – 8:40	Invited Talk Bringing Acid Catalysis into Electrocatalysis: How Acid Sites Promote Glycerol Oxidation on Pt	Juye Kim <i>Oregon State University</i>
8:40 – 9:00	Co-Adsorption of Acetic Acid with H ₂ O on Anatase TiO ₂ (101)	Joshua Wagner <i>Pacific Northwest National Laboratory</i>
9:00 – 9:20	Site-Specific Deuterium Adsorption in Nitrogen-Doped Graphene and Porous Carbon Materials	Zbynek Novotny <i>Pacific Northwest National Laboratory</i>
9:20 – 9:40	Influence of Substrate Interactions on the Growth of MoO ₃ on Graphene/Ru(0001) and Highly Oriented Pyrolytic Graphite	Buddhika Alupotha Gedara <i>Pacific Northwest National Laboratory</i>

9:40–10:00 Break in Discovery Hall Lobby

Session 8 Integrated Sciences – From Quantum Phenomena to Atmospheric Sciences and

Beyond Chair: **Ajay Karakoti**, *Pacific Northwest National Laboratory*

10:00 – 10:40	Early Career Award Talk: 3D Atomic Strain Mapping of Er:CeO ₂ Using Multislice Electron Ptychography	Kayla X. Nguyen /Elle Schnee <i>University of Oregon</i>
10:40 – 11:10	Freestanding Metal Film Device Platform for In Situ Electron Magnetic Circular Dichroism and Hall-Voltage Measurements	Libor Kovarik <i>Pacific Northwest National Laboratory</i>
11:10 – 11:40	Evolution of Aerosol Properties from Ground to Aloft: Physicochemical Changes, Phase Behavior, and Cloud Interactions	Nurun Nahar Lata <i>Pacific Northwest National Laboratory</i>
11:40 – 12:00	Multifunctional Peptoid Nanomembranes for Chemical Agent Degradation and Antiviral Applications	Hoang Thi Kim <i>Pacific Northwest National Laboratory</i>
12:00 – 12:30	Awards Ceremony	

12:30 Box Lunch

1:00 – 2:00 PNWAVS Board of Directors Meeting

Poster Session

Chair: **Shuttha Shutthanandan**, *Pacific Northwest National Laboratory*

Graduate Student Poster Session - Thursday September 10, 2026, 5:00 PM to 7:30 PM			
Poster Number	Name	Institution	Title
GS 1	Raj Shekhar	University of Oregon	Morphology control enables Electrowinning from inactive FeOx at fast rates
GS 2	Micah Wilson	Oregon State University	Anion-Induced Solvation Effects on Charge Storage Competition in Aqueous Mg-Ion Prussian Blue Cathode
GS 3	Kylee Lamberson	Oregon State University	Area-Selective Deposition of Tungsten Oxide
GS 4	Saowaluk Soonthornkit	Oregon State University	Composition Engineering of $\text{SrCo}_{1-x}\text{Ir}_x\text{O}_3$ Perovskite Electrocatalysts for Acidic Oxygen Evolution
GS 5	Arjan Saha	Washington State University	Energetics of Water Adsorption on H- and CO-Precovered Pt(111) Surfaces: Solvent – Adsorbate Interactions
GS 6	Noah Montrose	Boise State University	Influence of Surface Finish on Electrochemical Performance of ALD Corrosion Barriers on Additively Manufactured SS316L
GS 7	Chukwuma Ndiva	Oregon State University	First-Principles Investigation of Water Activation on Rh Single-Atom Catalysts Supported on $\text{Fe}_3\text{O}_4(001)$
GS 8	Rachel Galfo	University of Oregon	Structural Influences on Solvent Co-Intercalation in Transition Metal Diselenide Thin Films
GS 9	Hsin-Mei Kao	Oregon State University	Direct visualization of sacrificial layer dissolution during freestanding membrane release processes using Cryo-ToF-SIMS
GS 10	Zhicheng Yu	Washington State University	Quantifying the Impact of "29" Copper Surface Oxide Fluxionality on Single-Site Pt-Catalyzed Low-Temperature CO Oxidation
GS 11	Christian Andrade	Oregon State University	Hydrogen Dissociation and spill over for Pt single Site on $\text{CeO}_2(100)$
GS 12	Annabella Talbott	Western Washington University	Fabrication and Investigation of Two-Dimensional Gold Nanosnowflakes for SERS Applications
GS 13	Asif Bhuiyan	Boise State University	Design and fabrication of sputtered amorphous silicon carbide photonic ring resonators

GS 14	Miguel Mancias	Boise State University	Stress annealed CoFeBNb Ribbons for High-Performance Electrical Applications
GS 15	Sarah Pooley	Boise State University	Effect of Electropolishing on Morphology and Adhesion of Nanostructured Anodic Tantalum Oxide Thin Films
GS 16	Brandon King	Boise State University	Understanding Microstructural Differences at Volumetric Energy Density Interfaces for Laser Powder Bed Fusion SS 316L
GS 17	Casey Mezerkor	University of Oregon	Elucidation of the Hematite Direct Reduction Mechanism Using In Situ Spectroscopy
GS 18	Carinna Lapson	University of Oregon	Mechanistic Understanding of the Surface Modulation in Lead Acid Batteries
GS 19	Wenhao Zhou	University of Washington	Interfacial Structure and Metal Coordination in Crystalline Peptoid Membranes
GS 20	Yongjun Kwon	Washington State University	Fundamental Study and System Development of Radical-mediated Electrochemical Reactions for Biogas Upgrading
GS 21	Sebastian Peck	University of Washington	Enhancing Metal-Free Carbonic Anhydrase Mimics via Active-Site Residue Modification with Peptoid Nanosheet Co-Assembly

Undergraduate Student Poster Session - Thursday September 10, 2026, 5:00 PM to 7:30 PM

Poster Number	Name	Institution	Title
UGS 1	Anton Escher	Oregon State University	Understanding Growth and Evolution of Tungsten Oxide Thin-Films Via Programmable Chemical Vapor Reactor
UGS 2	Elizabeth Sterley	Western Washington University	Calculating the stability of layered oxysulfide perovskites for solar energy conversion
UGS 3	Ava Kimel	Western Washington University	Synthesis of Silver Nanostructures on Silk Fibroin Microparticles via Direct Seed Mediated Growth
UGS 4	Nikki Nikolas	Western Washington University	Precipitation and Modification of Silk Fibroin Particles to Interface with Metal Plasmon Resonators

High School Student Poster Session - Thursday September 10, 2026, 5:00 PM to 7:30 PM			
Poster Number	Name	Institution	Title
HS1	Sanah Khan	Hanford High School	PNNL High School Summer Research Internship in Critical Materials Recovery

General Poster Session - Thursday September 10, 2026, 5:00 PM to 7:30 PM			
Poster Number	Name	Institution	Title
PS 1	Henry Han	Pacific Northwest National Laboratory	Surface Engineering of Beta-Alumina Solid Electrolytes with Salt-Modified Sodiophilic Porous Carbon for Molten-Sodium Batteries
PS 2	Khyati Anand	Pacific Northwest National Laboratory	Optical Bandgap Engineering and Magnetic Responses in Hybrid Halide Frameworks
PS 3	Ding Peng	Pacific Northwest National Laboratory	Atomic-scale insights into antiphase boundaries in Fe ₃ O ₄ and high-entropy spinel thin films
PS 4	Amal Berhan	Pacific Northwest National Laboratory	Crystallization Induced H/D Exchange in Water Examined From 141 to 149 K
PS 5	Sun Hae Ra	Pacific Northwest National Laboratory	Interfacial control of framework growth and critical-mineral recovery
PS 6	Sophie Liu	Pacific Northwest National Laboratory	Optimization pH Stability Mapping and Automated Data Management in All-Iron Redox Flow Battery Electrolyte Screening
PS 7	Peipei Wang	Pacific Northwest National Laboratory	Fabrication of Foam Targets for Laser Produced Plasma Based EUV Generation
PS 8	Kavin Thangaraj	Pacific Northwest National Laboratory	Resolving Surface Chemistry at Soil Mineral - Organic Interfaces Across MONet Soils: A High-Throughput Multimodal Approach

PNWAVS: Pacific Northwest Chapter of AVS

PNWAVS was founded in 1962 as the first local chapter of the AVS. We are a nonprofit organization which promotes communication, dissemination of knowledge, recommended practices, research, and education in the use of vacuum and other controlled environments to develop new materials, process technology, devices, and related understanding of material properties for the betterment of humanity.



Website: www.pnwavs.org

E-mail: pnwavs@gmail.com

2026 PNWAVS Board Members

Executive Officers	E-mail
Chair: Ajay Karakoti	ajay.karakoti@pnnl.gov
Vice-Chair: Jean-Sabin McEwen	js.mcewen@wsu.edu
Past Chair: Arthur Barnard	awb1@uw.edu
Secretary: Tiffany Kaspar	Tiffany.Kaspar@pnnl.gov
Treasurer: Theva Thevuthasan	theva@pnnl.gov
Vice-Treasurer: Líney Árnadóttir	Liney.Arnadottir@oregonstate.edu
Vendor Exhibit Coordinator: Joe Gray	joegray3@palmborgassociates.com
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Bhuvaneswari Sivakumar	bhuvana@pnnl.gov
Karthik Srinivasan	karthiksrinivasa@boisestate.edu

PNWAVS Past Chairs

Name	Year(s) served	Affiliation during service (if known)
Roland R. LaPelle	1962-1964	Boeing
Edwin Srebnik	1964-1966	
Joseph L. Rumney	1967-1970	
Larry S. Price	1967-1971	
Kenneth W. Bird	1970-1971	
B. Michael Wareham	1972	
Johnnie E. Schmauder	1973-1974	
Wallace C. Budke	1975-1978	
M. Tom Thomas	1979	Pacific Northwest [National] Laboratory
Virginia E. Lowe	1982	Boeing
Paul R. Davis	1983-1984	Oregon Graduate Center
Michael A. Bayne	1985	Tektronix
John F. Wager	1986	Oregon State University
Philip R. Watson	1987-1989	Oregon State University
Eric M. Stuve*	1990	University of Washington
David G. Castner*	1991-1992	University of Washington
J. Thomas Dickinson*	1993	Washington State University
Scott A. Chambers*	1994	Pacific Northwest National Laboratory
John P. LaFemina	1995	Pacific Northwest National Laboratory
Mark Bussell	1996	Western Washington University
Steve Joyce	1997	Pacific Northwest National Laboratory
Marjorie A. Olmstead*	1998-1999	University of Washington
J. Thomas Dickinson*	2000	Washington State University
Michael Henderson*	2000-2001	Pacific Northwest National Laboratory
Fumio S. Ohuchi*	2001-2002	University of Washington
Gregory S. Herman*	2002-2003	Hewlett-Packard
Theva Thevuthasan*	2003-2004	Pacific Northwest National Laboratory
David Patrick	2004-2005	Western Washington University
Kerry Hipps*	2006	Washington State University
Zdenek Dohnalek*	2007-2008	Pacific Northwest National Laboratory
Ursula Mazur	2009	Washington State University
Shuttha Shutthanandan*	2010	Pacific Northwest National Laboratory
Alex Chang	2011	Oregon State University
Tiffany Kaspar*	2012	Pacific Northwest National Laboratory
Louis Scudiero	2013	Washington State University
Mark Engelhard*	2014	Pacific Northwest National Laboratory
David N. McIlroy	2015	University of Idaho
Scott Smith	2016	Pacific Northwest National Laboratory
Liney Arnadottir*	2017	Oregon State University

Yingge Du	2018	Pacific Northwest National Laboratory
David Y. Lee	2019	Washington State University
Zihua Zhu*	2020	Pacific Northwest National Laboratory
Zhenxing Feng	2021	Oregon State University
Elton Graugnard	2022-2023	Boise State University
Vijay Murugesan	2024	Pacific Northwest National Laboratory
Arthur Barnard	2025	University of Washington

*** AVS Fellows**



Schedule Overview

Wednesday, September 9, 2026

Workshop on Autonomous Scientific Workflows

7:30–8:30 am **Badging:** Discovery Hall / Access Control Office, 650 Horn Rapids Rd, Richland
Workshop: Energy Science Center, Pacific Northwest National Laboratory, *Platinum Room, 3340 Stevens Dr, Richland, WA*

8:00–8:45 am Light continental breakfast and registration
8:45–8:55 am Opening and welcome remarks
9:00–10:00 am [Machine Learning-Enabled Control of Thin Film Deposition](#)
10:00–10:15 am **Break**
10:15–11:15 am [Electrons, Images, Agents: A Modern TEM Toolkit](#)
11:15 am–12:15 pm [The Autonomous Lab: A Modular, AI-Ready Lab in the Loop](#)
12:15–1:30 pm **Working Lunch:** [Automated ML-Aided Workflow for XCT Image Analysis Automation](#)
1:30–3:30 pm [Agentic AI for Surface Science: A Hands-On Tutorial](#)
3:30–3:45 pm **Break**
3:45–5:45 pm Lab tours Meet at ESC Lobby
5:30–7:30 pm **PNWAVS welcome reception**

Thursday, September 10, 2026 **37th Annual PNWAVS Symposium, Discovery Hall, Pacific Northwest National Laboratory, 650 Horn Rapids Rd, Richland, WA**

7:30–8:30 am Badging; light continental breakfast and registration
8:00–8:10 am Chair greetings
8:10–8:20 am Opening and welcome remarks
8:20–10:20 am [Session 1: Synthesis and Surface Engineering](#)
10:20–10:40 am **Break and Vendor exhibit**
10:40 am–12:00 pm [Session 2: Nanoscale Phenomena](#)
12:00–1:00 pm **Lunch**
1:00–2:40 pm [Session 3: Materials for Energy Storage](#)
2:40–3:00 pm **Break and Vendor exhibit**
3:00–4:00 pm [Session 4: Capability Developments for Enabling Future Scientific Endeavors](#)
4:00–5:00 pm [Session 5: Catalysis I—Controlling Selectivity](#)
5:00–7:30 pm [Session 6: **Student poster competition**](#), general poster session and **Vendor exhibit**
7:30–9:00 pm **Banquet dinner** with [plenary talk](#)

Friday, September 11, 2026 **37th Annual PNWAVS Symposium, Discovery Hall, Pacific Northwest National Laboratory, 650 Horn Rapids Rd, Richland, WA**

7:30 am Light continental breakfast
8:00–9:40 am [Session 7: Catalysis II—Site Specificity and Substrate Effects](#)
9:40–10:00 am **Break**
10:00 am–12:00 pm [Session 8: From Quantum Phenomena to Atmospheric Sciences and Beyond](#)
12:00–12:20 pm **Awards ceremony**
12:20–12:30 pm Closing remarks
12:30 pm **Box lunch**
1:00–2:00 pm PNWAVS Board of Directors meeting
