NORM 2024 Program Summary

	Sun June 22	Mon June 23			Tues June 24			Wed June 25			
Plenary Talks	**Eve**	**AM**	**PM**	**Eve**	**AM**	**PM**	**Eve**	**AM**	**PM**	**Eve**	**Plenary Talk Title**
Jose Almirall											National Science Foundation; Programs in the Chemistry Division and Beyond
Susan Ebeler											Chemistry in a Glass: The Borders and Bonds of Wine Chemistry
Jorge Cham											The Power of Procrastination
Simon Pimblott											Nuclear – The Energy of Tomorrow

	Sun June 22	Mon June 23			Tues June 24			Wed June 25		
NORM Workshops	**Eve**	**AM**	**PM**	**Eve**	**AM**	**PM**	**Eve**	**AM**	**PM**	**Eve**
I2I Part 1: Story of the Cosmic Crisp Apple										
ACS Career Workshop: Finding Yourself										
I2I Part 2: Business Model Canvas Workshop and Fast Pitch Contest										
Concept Mapping in the Science Classroom										
ACS Career Workshop: Networking										
Safety Luncheon										
ACS Career Workshop: Resume Reviews										

NORM 2024: Breaking Borders & Building Bonds: June 22nd - 27th, 2024

	Sat June 21	Sun June 22	Mon June 23			Tues June 24			Wed June 25			Thurs June 26
NORM Events	PM	Eve	AM	PM	Eve	AM	PM	Eve	AM	PM	Eve	AM
Breaking Borders: Building Bonds at the Palouse Discovery Science Center												
Reception with ACS Governance												
Main Poster Session												
Exposition												
Chemistry in a Glass Reception												
Safety Poster Competition												
Dounuts with Directors												
Building Bonds/NORM Lounge												
Technical Sessions												
Snack/Coffee Break Sponsored by ChemScene												
Pizza Lunch												
WCC Luncheon												
Afternoon Snack Sponsored by Bettersize												
WSU & University of Idaho Alumni Reception												
Screening of The PhD Movie												
Fun Run To (not From) the Bears												
WSU Nuclear Reactor Tours												
Snack/Coffee Break Sponsored by Shimadzu												
Academic & Employment Fair												
Undergraduate Poster Session												
Ice Cream Social Sponsored by WIBS												
I2I Part 1: Story of the Cosmic Crisp Apple												
NORM 2024 Awards Banquet												
Senior Chemists Breakfast												
ACS Career Workshop: Finding Yourself												
I2I Part 2: Business Model Canvas Workshop and Fast Pitch Contest												
Snack/Coffee Break												
Concept Mapping in the Science Classroom												
ACS Career Workshop: Networking												
Safety Luncheon												
ACS Career Workshop: Resume Reviews												
Crossing the Border into Moscow												
NOR Board Meeting												

NORM 2024: Breaking Borders & Building Bonds: June 22nd - 27th, 2024

	Sun June 22	Mon June 23		Tues June 24		Wed June 25		
Catalysis Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Integration of Thermal Catalysis and Electrocatalysis							Jean-Sabin McEwen & Qiaowan Chang	The presence of internal and external electric fields can affect the catalytic activity and selectivity of heterogeneous catalysts. Recent advances in the synthesis, characterization, and computational modeling of catalytic materials have made measuring and predicting field influences more accessible. Consequently, field-assisted catalysis has emerged as a leading area of research in electrocatalysis. This symposium aims to foster the cross-pollination of knowledge for discovering and studying phenomena and mechanisms in thermal heterogeneous catalysis and electrocatalysis.
Breaking Borders and Building Bonds Through Catalysis							Jack Zhang	This session is dedicated to all aspects of catalysis. Homogeneous, heterogeneous, mixed, molecular catalysis, and biocatalysis. Topics can cover life sciences, electrochemistry, organometallics, photochemistry, experimental and theoretical studies, and efforts towards green catalytic processes.

	Sun June 22	Mon June 23		Tues June 24		Wed June 25		
Synthesis Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Creativity in Metal-Ligand Bonding							Rick Thompson	Ligands have evolved far beyond being the inert, organic ancillaries of transition metals. This session will discuss and celebrate new instances of creative ligand design including cooperativity, redox non-innocence, secondary coordination sphere interactions and more.
Breaking Borders and Building Bonds Through Synthesis							Wilson Bailey	Fundamental research in all branches, theory, or practice of organic and inorganic synthesis. Sessions will focus on broad approaches at synthesis from natural products total synthesis and transformation methodology to coordination chemistry, supramolecular chemistry, and inorganic complex design. Mechanistic studies, both experimental and theoretical should provide novel insight into the course of a chemical reaction. Multi-step synthetic methods, new strategies towards targets of interest.

	Sun June 22	Mon June 23		Tues June 24		Wed June 25		
Chemical Biology Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Advances in Medicinal Chemistry							Cliff Berkman	This symposium invites researchers in the medicinal chemistry and chemical biology space from academia, the pharmaceutical industry, and research institutions. The program will highlight research and development of emerging technologies spanning the spectrum from bench to bedside.
Biochemistry and Biomedicine/Cancer Biochemistry and Biology/Biomedical Engineering and Applications							Weimin Li	This session features the use of biochemistry in biological and biomedical research works at mechanistic, phenotypic, engineering, translational, and clinical levels. Research using omics, mathematical, statistical, AI/machine learning, computational or molecular modeling, and biomaterial technologies to address biological or biomedical questions are welcome to join this symposium.
Breaking Borders and Building Bonds in Chemical Biology							Travis Denton and Anjali Sharma	This symposium will utilize molecular design to probe questions for in vitro or in vivo studies. Mechanistic studies, cell biology work, toxicology, medicine and pharmacokinetics, proteins, nucleic acids, sugars, proteins, or organismic studies are welcome. Exploring cellular function from either a chemical or a biological (or both) prospective can lead to advances for many applications. Medicinal chemistry and chemical neuroscience as well as bioconjugate chemistry would apply to this symposium.
Emerging Technologies for Targeted and Controlled Drug Delivery							Anjali Sharma	This symposium is set to feature presentations by both emerging and established distinguished speakers in the realms of targeted drug delivery, biomaterials, nanotherapeutics, and nanomedicine. Additionally, discussions will cover mechanisms of nanotherapeutics, focusing on achieving target-specific delivery to enhance effectiveness while minimizing potential toxicity.

	Sun June 22	Mon June 23		Tues June 24		Wed June 25		
Chemistry in the Community Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Project SEED, REUs, CUREs, and Partners in Science: Engaging the Community in Research Experiences							Don Warner	This symposium spotlights programs dedicated to fostering authentic research experiences for novice researchers. It invites participants, mentors, and organizers from diverse initiatives such as those who implement course-based research experiences, Research Experiences for Undergraduates (REUs), which are typically NSF or NIH-funded summer research programs for undergraduates, Project SEED, an ACS program providing mentored research experiences for economically disadvantaged high school students, and Partners in Science, funded by the Murdock Charitable Trust, pairing high school teachers with mentors to develop relevant research skills. The symposium encourages describing specific programs and sharing stories about the benefits, successes, challenges, and lasting impacts of these programs.
Breaking Borders and Building Bonds through Chemistry in the Community							Ashley Lamm	Outreach and service in the community broadly defined.
Undergraduate Research							Paul Buckley and Jeremy Lessman	This poster session is open to undergraduates only and will occur in conjunction with the Academic Recruitment Fair.

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Chemistry Away from the Bench Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
The Chemistry of Historical Archaeology							Ray von Wandruszka	Undergraduate researchers at the University of Idaho partake in a project in which they analyze and identify artifacts that are sent to the lab by museums, state institutions, other universities, and archaeology firms from all across North America. Apart from having a lot of fun with the work, students are also exposed to a wide variety of analytical techniques and the need to find the right approach for each artifact.
Computation in Molecular Sciences							Jagdish Patel and Marty Ytreberg	Join us at the "Computation in Molecular Sciences" symposium, where leading experts converge to explore the intricate realms of molecular modeling, material simulations, computational chemistry, drug design, quantum calculations, and diverse computational analyses including artificial intelligence. This symposium serves as a dynamic platform to unveil groundbreaking advancements in understanding and manipulating the complexities of chemicals, materials, and biochemical phenomena through cutting-edge computational approaches.
Computational Chemistry: From Theory to Applications							Kirk Peterson	This symposium will range from new theoretical developments in both quantum chemistry and molecular simulations to applications designed to predict or interpret experiments. Applications of computational chemistry relevant to environmental issues or energy-related areas are particularly welcome.
Advancing Chemistry through Computation and Artificial Intelligence							Ram Devanathan	Computation and artificial intelligence have a critical role in accelerating chemistry by rapidly identifying molecules with desired properties, designing new materials, illuminating reaction mechanisms, and advancing drug development. This interdisciplinary symposium will explore the latest advances in computation and the potential of large language models, machine learning, and generative artificial intelligence in the field of chemistry.
Breaking Borders and Building Bonds through Chemistry Away from the Bench							Kirk Peterson	With chemistry spreading to a multi-discipline science, many advances in chemistry do not occur in a traditional laboratory setting. This symposium welcomes contributions that advance chemistry outside of the traditional laboratory setting which may include field work, computational analysis, or even casual observations at home.

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Environmental Challenges Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Engineering Solutions for Environmental Chemistry Challenges							James Moberly	This symposium will capture application driven research in environmental chemistry, sustainability focused chemistry, valorization and recycling of wastes into useful products, and similar applications toward environmental chemistry challenges.
Breaking Borders and Building Bonds Through Environmental Challenges							James Moberly	This symposium will accept contributions in the areas of complex environmental phenomena (i.e., climate change), biogeochemical cycling, bioremediation and biotechnology, data science, occurrence, fate, and behavior of aquatic or terrestrial contaminants (both on land and in air), sustainable systems, resource recovery, land use management, water research, agricultural research, chemical answers to questions in plant pathology, nematology, entomology, pest management, and crop science.

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Pushing Limits of Detection Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Pushing the Boundaries of Sensitivity							Christine Gobrogge	This symposium will provide a forum to discuss the advances in instrument development and detection.
New Frontiers in Mass Spectrometry and Gas-Phase Ion Manipulation							Brian H. Clowers	Focusing broadly on techniques that exploit gas-phase ions for analytical gain, this symposium aims to present new developments, approaches, and methods using mass spectrometry and or ion mobility spectrometry. Given the wide applicability of both techniques, speakers will address both fundamental and applied aspects of these techniques.
Breaking Borders and Building Bonds at the Limits of Detection							Erin Linskey	This symposium will bring together all parts of the analytical operations of measurement science including sampling, measurements, and data analysis: New methods of sampling, emerging contaminants (i.e., PFOA/PFOS). Topics can include bioanalytical chemistry; forensics, archaeological, and medical sciences; chemometrics and data processing; mass spectrometry, microscale and nanoscale systems; electrochemistry; elemental and molecular characterization techniques and instrumentation development; sensing; separations; -omics; new directions in analysis.

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Energy Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Chemical Theory and Mechanisms for Sustainable Energy Conversion and Production							Bin Liu	This symposium provides an opportunity to obtain an overview of the current status and latest progress based on mechanistic studies employing density functional theory, molecular simulations, and various synthetic, characterization tools to study waters-splitting, CO_2 conversions, and sustainable energy and fuel productions.
Biobased Materials and Products							Armando McDonald	Biobased products are materials are critical for producing sustainable products from renewable resources that helps guide us away from fossil fuels. Various feedstocks (agricultural and forestry residues, food waste, municipal waste, etc) can be used for generating these products via various processes (thermal, chemical, biological). These products have the potential for being direct replacements for synthetic products.
Unlocking a Sustainable Future: Harnessing the Power of the Hydrogen and Beyond							Haiyan Zhao and Aaron Wilson	Hydrogen is widely viewed as a key enabler of energy transition. Our symposium explores the vast potential processes and technologies for H_2, biofuels, fossil fuel mitigation, renewable natural gas, carbon capture and more. Together, let's chart a course towards a greener, more sustainable world. Your presence is key to the transformative dialogue that will shape the energy landscape of tomorrow.
Exploring the Chemistry of Next-Generation Coolants and Solvents: Radiation-Induced Chemistry							Gregory Holmbeck	Nuclear fission has been championed as a sustainable and reliable carbon-free energy source for providing baseload electricity to bridge the transition between fossil fuels and renewable energy sources. To achieve the widespread adoption of nuclear fission technologies and meet society's growing demand for safe and clean energy, multiple advanced reactor designs and fuel cycle processes are under development. Many of these new technologies envision the use of next-generation coolants and solvents, such as organic solvents, ionic liquids, and molten halide salts. To explore the utility and applicability of these new media under process conditions, a deeper molecular-level understanding of their energetics, structure, interfacial processes, and radiation-induced chemical properties is needed. This symposium will present an overview of our current knowledge and challenges in this area through invited and contributed talks from leading experts. This session will highlight new fundamental and applied research that targets understanding ionizing radiation-induced processes in complex systems that utilize next-generation coolants and solvents.
Exploring the Chemistry of Next-Generation Coolants and Solvents: Structure and Properties of Coolants, Fuels and Solvents							Ruchi Gakhar	Nuclear fission has been championed as a sustainable and reliable carbon-free energy source for providing baseload electricity to bridge the transition between fossil fuels and renewable energy sources. To achieve the widespread adoption of nuclear fission technologies and meet society's growing demand for safe and clean energy, multiple advanced reactor designs and fuel cycle processes are under development. Many of these new technologies envision the use of next-generation coolants and solvents, such as organic solvents, ionic liquids, and molten halide salts. To explore the utility and applicability of these new media under process conditions, a deeper molecular-level understanding of their energetics, structure, interfacial processes, and radiation-induced chemical properties is needed. This symposium will present an overview of our current knowledge and challenges in this area through invited and contributed talks from leading experts. This session will focus on advances in understanding the structure and dynamics of next-generation coolants and solvents, and the identification of emergent behavior for solutes (e.g., actinides and corrosion and fission products) in extreme environments.
Exploring the Chemistry of Next-Generation Coolants and Solvents: Interfacial Processes Under Extreme Environments							Simerjeet Gill	Nuclear fission has been championed as a sustainable and reliable carbon-free energy source for providing baseload electricity to bridge the transition between fossil fuels and renewable energy sources. To achieve the widespread adoption of nuclear fission technologies and meet society's growing demand for safe and clean energy, multiple advanced reactor designs and fuel cycle processes are under development. Many of these new technologies envision the use of next-generation coolants and solvents, such as organic solvents, ionic liquids, and molten halide salts. To explore the utility and applicability of these new media under process conditions, a deeper molecular-level understanding of their energetics, structure, interfacial processes, and radiation-induced chemical properties is needed. This symposium will present an overview of our current knowledge and challenges in this area through invited and contributed talks from leading experts. This session will present advances in our mechanistic knowledge of interfacial processes that underpin the molecular level properties and behavior of structural materials in extreme environments, including highly corrosive coolants and solvents, high temperature, and ionizing radiation fields.
Breaking Borders and Building Bonds through Energy							Haiyan Zhao	In particular, this symposium emphasizes mechanistic understanding of the relevant chemical processes. Detailed mechanisms depicting complex processes related to sustainable chemical and energy productions, energy conversions are instrumental to a variety of technologies that advance energy conversions, non-carbon-based fuel productions, and CO2 utilizations. In the past twenty years, we witnessed how the mechanisms established with the state-of-the-art computational, characterization, and experimentation techniques have led to the theories and principles responsible for new materials discovery and system design. Ultimately, the pace of the fuel cell, battery, and green hydrogen production revolution has accelerated.

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Interfaces Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
3D Printing of Biomaterials and Drug Delivery							Susmita Bose and Amit Bandyopadhyay	This session will include presentations in the areas of (I) Processing of 3D printed biomedical devices, (ii) tissue-biomaterial interactions, (iii) in vitro and in vivo property evaluation, (iv) nanoscale surface modification and encapsulation of drugs for bone healing, (v) drug delivery from micro and nanoscale devices.
Creating and Breaking the Borders in Molecular Recognition							Gonzalo Campillo-Alvarado and Kraig Wheeler	The discovery, application, and study of non-covalent interactions and supramolecular aggregates have sparked transformative advances in materials chemistry, bridging various disciplines such as organic, inorganic, analytical, and physical chemistry. Notably, molecular recognition has revolutionized catalysis, sensing, separations, drug delivery, and the emerging fields of molecular machines and dynamic materials. This symposium provides a dynamic platform for interactive discussions and presentations on the broad scope of molecular recognition and its diverse applications. Encouraging cross-disciplinary collaborations and the exchange of innovative ideas, we invite experimental and theoretical chemists to participate, encompassing the molecular recognition of small molecules in solution, gas, and solid-state.
Interfacial Chemistry Enables Sustainable and Resilient Infrastructure Materials							Xianming Shi	This session will feature several talks that showcases how understanding and/or manipulating the chemistry at interfaces within infrastructure materials can translate to enhanced durability, environmental sustainability, and/or resilience of such materials (cementitious composites, polymeric composites, wood composites, asphaltic materials, etc.). The interfacial chemistry plays an enabling role in recent advances of infrastructure materials. The session will conclude with a roundtable discussion on how chemists and infrastructure engineers could collaborate to tackle important challenges faced by the infrastructure industry.
Electrochemistry							Frank Cheng	This symposium seeks the latest advancements in electrochemistry. Topics may include energy storage and conversion, corrosion, sensors, bioelectrochemistry, chemically modified electrodes, electrosynthesis, electrocatalysis and electrochemistry of carbon and other materials.
Structures, Kinetics, and Thermodynamics at Interfaces							Ursula Mazur	We welcome contributions regarding physio-chemical aspects of processes at soft and solid interface, such as structures, and kinetics and thermodynamics of chemical reactions, adsorption, and solvation. Basic theories intended to explain these interfacial processes and results of advanced ab initio and molecular-dynamics simulations will also be accepted.
Breaking Borders and Building Bonds at Interfaces							Jeff Bell	Interdisciplinary topics from chemists, engineers, physicists, and biologists towards interfacial discoveries and processes for applications. Materials science, biological and medical applications of materials, bioengineering, solid-state chemistry (including sol-gel chemistry) and functional inorganic devices, organic electronic devices, nanostructured materials, composites, polymers, surfaces, and the many applications. This track will also include the fabrication and processing of electronic, magnetic, or optical materials and devices.

	Sun June 22	Mon June 23		Tues June 24		Wed June 25		
Nuclear Science Track	**Eve**	**AM**	**PM**	**AM**	**PM**	**AM**	**Organizer**	**Symposium Description**
Advances in Actinide and Lanthanide Chemistry							Jim Boncella, Xiaofeng Guo, and Neil Henson	The chemistry of compounds encompassing the 5f and 4f elements. From fundamental studies of their synthesis, structure, and bonding to separations chemistry to nanoparticle chemistry.
The Nucleus, Radiation, and Chemistry Today							Alexander Chemey	This symposium will focus on all areas of nuclear chemistry, radiochemistry, radiation chemistry, and nuclear medicine.
Geochemistry and Mineralogy of Critical Metal Elements							Xiaofeng Guo, Johannes Haemmerli, Xin Zhang, and Zheming Wang	The symposium aims to establish a platform for interdisciplinary researchers from chemistry, geology, biology, computational chemistry, and materials sciences to share research on geochemistry and mineralogy of critical metals, in terms of their resources, formation and alteration, deposit mining, tailing waste, and separation/remediation. Appropriate topics include but are not limited to: Rare-earth elements mineralization and fractionation; Mineral nucleation and crystal growth mechanisms; Chemistry of hydrothermal fluids and minerals; Molecular simulations and solubility/speciation and spectroscopic studies; Fluid-driven reactive transport and thermodynamic modeling in natural systems; Waste contamination and remediation; Recycling critical metals from tailing waste.
Advancements and Training in Nuclear Materials Processing and Sensing in Harsh Environments							Sam Bryan and Neil Henson	The ability to detect small quantities of analytes from complex environments such as complex environmental solutions, nuclear reprocessing streams, and related wastes can be challenging. The work presented in this symposium will describe the development of various analytical techniques including electrochemistry, spectroscopy, separation science, and radiochemistry, that are working to resolve these challenges. This symposium is also directed at workforce development in nuclear and non-proliferation applications.
Materials in the Nuclear Fuel Cycle: From Cradle to Grave							John McCloy and Xiaofeng Guo	The proposed symposium will bring together a group of experimental and theoretical scientists focused on issues and challenges in solid state and materials chemistry raised in the nuclear fuel cycle. Appropriate topics include but are not limited to: Actinide and rare-earth elements mineralization and recovery; Accidental tolerant fuels, ceramic and metallic fuel, molten salt fuel cycle; Spent nuclear fuel and waste form dissolution, degradation, and long-term stability; Rad waste contamination and remediation; Nuclear waste geological disposal.
Breaking Borders in the Nuclear Science Enterprise							Neil Henson	This symposium will provide a forum to present recent progress in the application of nuclear science to current problems including the startup of next gen nuclear reactors, progress on cleanup at the Hanford site, developments in forensics for non-proliferation, response to unplanned radiological events, etc.