Monday, June 3: Workshop/Tutorial Day 0	
5:30 p.m.	**Reception:** As part of the annual Neutron Scattering User Meeting, the Shull Wollan Center (SWC) (Building 8630, next to the Guest House) will host a welcome reception and open house on the evening of Monday, June 3rd. The purpose of this event is to provide an opportunity for neutron researchers to learn about the SWC by touring the building and participating in discussions with our research affiliates. All are welcome to attend!

Tuesday, June 4: Day 1	
Session 1 Chair: Olivier Delaire, SNS/HFIR User Group Executive Committee (SHUG-EC) Chair	
8:00 a.m.	**Registration opens**, SNS 8600, first-floor lobby
8:45 a.m.	**Workshop Introduction,** Iran Thomas Auditorium **Olivier Delaire,** SHUG Executive Committee Chair Duke University
9:00 a.m.	**Welcome** Iran Thomas Auditorium ***Challenges at the Frontiers of Matter and Energy*** **Dr. Harriet Kung,** Associate Director of Science for Basic Energy Sciences, Department of Energy Building on over a decade-long of strategic planning, the Basic Energy Sciences program in DOE's Office of Science continues to engage the scientific community in charting new research directions for our program. This presentation will highlight program priorities and potential new funding opportunities in FY 2020. Specifically, research in support of quantum information sciences, microelectronics, data analytics, and computational materials and chemical sciences will be emphasized.
9:30 a.m.	Keynote 1: ***At the Intersection of Neutron Scattering and Nuclear Materials Research*** Iran Thomas Auditorium **Brent Heuser,** University of Illinois Light Water Nuclear Reactor (LWR) technology and the development of advanced nuclear reactors depend on materials innovation and mitigating deleterious environmental effects.

	The talk will focus on the utility of neutron scattering techniques to interrogate LWR structural materials. Emphasis will be placed on the study of hydrogen precipitation and transport, the ability to ***now*** perform neutron scattering measurements at very low hydrogen concentration, and the use of the newest generation of neutron scattering instruments to interrogate nuclear materials.
10:15 a.m.	***Collaboration Break,*** SNS 8600, first-floor lobby ***- light refreshments*** • Posters about HFIR and SNS instrument updates will be on display throughout the lobby • The Neutron Science Outreach Trailer will be open for view outside the lobby • Exhibitors from PennState Materials Research Institute 2D Crystal Consortium, The Johns Hopkins University Platform for the Accelerated Realization, Analysis & Discovery of Interface Materials (PARADIM), ORNL The Center for Nanophase Materials (CNMS), and Oak Ridge Leadership Computing Facility will be in the lobby
10:30 a.m.	Keynote 2: **Scattering Neutrons from Cuprate Superconductors: Past, Present, and Future** Iran Thomas Auditorium **John Tranquada**, Brookhaven National Laboratory The 1986 discovery of superconductivity in $La_{2-x}Ba_xCuO_4$ was tremendously exciting. The observation of antiferromagnetic order in the parent compound La_2CuO_4 by neutron diffraction a year later provided motivation for me to join the Neutron Scattering Group at Brookhaven. The main tool at the time was the triple-axis spectrometer, which allowed exploration of excitations and correlations in the thermal-energy range. The development of time-of-flight spectroscopy at ISIS more than a decade later made it possible to explore the full bandwidth of the antiferromagnetic excitations, which can extend above 300 meV. To take full advantage of this technique, we had to wait for the SNS, where the high flux now makes it practical to obtain four-dimensional data from rotating crystal measurements, often revealing unexpected features. With time, new issues arise. We have done recent transport measurements on a crystal of $La_{2-x}Ba_xCuO_4$ to high magnetic fields at a composition that exhibits stripe order in zero field. The measurements suggest a gradual dimensional reduction of superconducting correlations with field, from 3 to 2 to 1 dimensional above 25 T. Does spin stripe order survive to these fields? We will need the Second Target Station and a dedicated high-field instrument in order to answer this question.
11:15 a.m.	**HFIR & SNS Facilities Source Updates,** Iran Thomas Auditorium **Hans M. Christen,** Division Director Neutron Scattering Division, Oak Ridge National Laboratory **Fulvia C. Pilat,** Division Director Research Accelerator Director, Oak Ridge National Laboratory **Tim Powers,** Division Director Research Reactors Division, Oak Ridge National Laboratory Updates will be given on the current and future run cycles of HFIR and SNS.

12:00 p.m.	***Table Topics Working Lunch –*** Tent on the SNS 8600 ground-floor back patio A subject matter expert is there to lead the discussion with the people who sit at that table. Each table will have a sign with a number and topic. Get your food from our buffet and join a table.
	Oak Ridge National Laboratory Speakers include: Table 1: Powder Diffraction, Stuart Calder Table 2: Single Crystal Diffraction, Bryan Chakoumakos, and Katie Andrews Table 3: WAND2, Matthias Frontzek Table 4: VULCAN, Matthew Frost Table 5: Residual Stress, Jeffrey Bunn Table 6: Imaging, Hassina Bilheux Table 7: Center for Structural Molecular Biology, Sai Venkatesh Pingali Table 8: Bio Deuteration, Kevin Weiss Table 9: Magnetism Reflectometry, Timothy Charlton Table 10: Small Angle Scattering, Lisa DeBeer-Schmitt Table 11: Spin Echo, Laura Stingaciu Table 12: Larmor Labelling, Fankang Li Table 13: Chemical Spectroscopy, Yongqiang (YQ) Cheng Table 14: Direct Geometry Spectroscopy, Doug Abernathy and Gabriele Sala Table 15: Triple Axis Spectroscopy, Songxue Chi and Marcus Daum Table 16: Development and Polarization, Lowell Crow Table 17: Polarization Tutorial Workshop, Barry Winn Table 18: High Temperature, Rebecca Mills and Dante Quirinale Table 19: Pressure, Mark Loguillo Table 20: Low Temperature and Magnets, Chris Redmon Table 21: Center for Nanophase Materials Sciences, exhibitor table Table 22: OLCF, exhibitor table Table 23: 2D Crystal Consortium, PennState Materials Research Institute, exhibitor table Table 24: Platform for the Accelerated Realization, Analysis and Discovery of Interface Materials (PARADIM), The Johns Hopkins University, exhibitor table
1:15 p.m.	**Poster Slam:** Iran Thomas Auditorium **Host: Sudipta Gupta,** SHUG Executive Committee Member Louisiana State University Each poster presenter for the Best Student Poster competition will receive one minute to summarize their poster topic. Student poster presenters, please be in the Iran Thomas Auditorium by 1:00 p.m.
Parallel Sessions **Session 2 Chairs:** **Session A – Eugene Mamontov,** SHUG Executive Committee Member **Session B – Sudipta Gupta,** SHUG Executive Committee Member	

2:00 – 3:00 p.m.	**Session A** **Unique Sample Environments of SNS-HFIR** CONFERENCE ROOM C156	**Session B** **Capabilities of Center for Nanophase Materials Sciences (CNMS) and SNS-HFIR and Proposal Calls** IRAN THOMAS AUDITORIUM
	Session Chair: **Gary Lynn**, Sample Environment Group Leader Oak Ridge National Laboratory	**Session Chair:** **Adam Rondinone**, CNMS Research Staff and Outreach Coordinator Oak Ridge National Laboratory
2:00 p.m.	Introduction: "**Sample Environments at SNS-HFIR"** **Gary Lynn**, Sample Environment Group Leader Oak Ridge National Laboratory	Introduction: **"Add a Little Nano to Your Neutrons at the Center for Nanophase Materials Sciences"** **Adam Rondinone**, CNMS Research Staff and Outreach Coordinator Oak Ridge National Laboratory
2:10 p.m.	***"Neutrons & Not So High-Pressure Physics: Why? How? What?"*** **Andrey A. Podlesnyak**, Neutron Scattering Scientist Direct Geometry Team Oak Ridge National Laboratory	
2:30 p.m.	***"Capabilities for Soft Matter Studies Using Neutron Scattering Techniques at ORNL"*** **Lilin He**, Neutron Scattering Scientist Large Scale Structures Group Oak Ridge National Laboratory	***"Covalent Functionalization of Surface-modified Nanoparticles in Experimental Adhesive Resins"*** **Fernando Esteban Florez,** Assistant Professor Division of Dental Biomaterials Department of Restorative Sciences University of Oklahoma College of Dentistry
2:50p.m.	Panel Discussion – All Speakers	Panel Discussion – All Speakers
3:00 p.m.	***Collaboration Break,*** SNS 8600, first-floor lobby ***light refreshments*** • Posters about HFIR and SNS instrument updates will be on display throughout the lobby • The Neutron Science Outreach Trailer will be open for view outside the lobby. • Exhibitors from PennState Materials Research Institute 2D Crystal Consortium, The Johns Hopkins University Platform for the Accelerated Realization, Analysis & Discovery of Interface Materials (PARADIM), ORNL The Center for Nanophase Materials (CNMS), and Oak Ridge Leadership Computing Facility will be in the lobby	
Parallel Sessions **Session 3 Chairs:** **Session A – Jarek Majewski,** SHUG Executive Committee Member **Session B – Dvora Perahia,** SHUG Executive Committee Member		
3:30 – 4:30 p.m.	**Session A** **Soft Matter and Biology Neutron Scattering** CONFERENCE ROOM C-156	**Session B** **Interfaces and Reflectometry: Challenges in Grazing Incidence Neutron Scattering** IRAN THOMAS AUDITORIUM
	Session Chair: **Hugh O'Neill,** Bio-Labs Team Lead Large Scale Structures Group Oak Ridge National Laboratory	**Session Chairs**: **Valeria Lauter,** Neutron Scattering Scientist Large Scale Structures Group Oak Ridge National Laboratory

		John Francis Ankner, Neutron Scattering Scientist Large Scale Structures Group Oak Ridge National Laboratory	
3:30 p.m.	Introduction: "**A Multimodal Small-Angle Neutron Scattering Instrument for Biological Systems Science at Second Target Station**" **Shuo Qian**, Neutron Scattering Scientist Large Scale Structures Oak Ridge National Laboratory	3:30 p.m.	Introduction: "**GISANS Challenges"** **Valeria Lauter and** **John Francis Ankner,** Neutron Scattering Scientists Large Scale Structures Group Oak Ridge National Laboratory
3:55 p.m.	***"Perspectives on Structural Characterization of Membrane Proteins Involved in Photosynthetic Processes"*** **Barry Bruce**, Professor Biochemistry & Cellular and Molecular Biology Department University of Tennessee	3:50 p.m.	Topic: Magnetism ***"New Artificial Magnetic Honeycomb Lattice for Emergent Physics and Spintronics Application"*** **Deepak Singh,** Assistant Professor Magnetism and Superconductivity Research Laboratory University of Missouri
4:05 p.m.	***"Investigating the Effect of Charge-Charge Interaction on the Solution Self-assembly of Sequence-defined Ionic Peptoid Block Copolymers"*** **Donghui Zhang,** Professor of Chemistry Louisiana State University	4:00 p.m.	Topic: Soft Matter ***"Neutron Reflectometry for Probing Polymer Films with Strong and Weak Intermolecular Binding"*** **Svetlana Sukhishvili,** Professor and Director of Soft Matter Facility Texas A&M University
		4:10 p.m.	Topic: Electrochemistry ***"Dynamics and Evolution of Electrochemical Interfaces"*** **Gabriel Veith,** Thin Films and Fundamentals Team Lead Chemical Sciences Division Oak Ridge National Laboratory
4:20 p.m.	Panel Discussion – All Speakers	Panel Discussion – All Speakers	
4:30 p.m.	**Group Photo, Iran Thomas Auditorium Stage**		
5:00 p.m.	SNS Tours—Meet in Building SNS 8600, lobby HFIR Tours—Vans outside main entrance of SNS Building 8600		
6:00 p.m.	**Poster Reception**, SNS 8600, ground-floor back patio, (if there is rain: SNS 8600 atrium and lobby) Suzanne Parete-Koon, Host In lieu of working dinner, heavy hors d'oeuvres will be served. • Research posters that represent the breadth of interests and capabilities across the SNS and HFIR user communities will be displayed • Best Student Poster competition comprises of 40 student poster presenters who will display their research to compete for three top prizes, which will be awarded at the SHUG Town Hall		
7:30 p.m.	Close of Day		

Wednesday, June 5: Day 2	
Session 4 Chair: Allyson Fry-Petit, SHUG Executive Committee Member	
8:00 a.m.	**Early Career Panel,** Iran Thomas Auditorium This discussion panel is designed for students and post-docs pursuing a career that involves neutron scattering. Hear perspectives from academicians and instrument scientists at different career stages. The panelists will share their experiences, outline challenges and share successes. Adam Aczel, Staff Scientist High Flux Isotope Reactor Oak Ridge National Laboratory Olivier Delaire, Associate Professor of Mechanical Engineering and Materials Science and Physics Duke University Allyson Fry-Petit, Professor of Chemistry California State University Sudipta Gupta, Post-Doctoral Fellow Department of Chemistry Louisiana State University Dvora Perahia, Professor of Chemistry and Physics Clemson University
9:00 a.m.	**Welcome,** Iran Thomas Auditorium **Hans M. Christen,** Division Director Neutron Scattering Division, Oak Ridge National Laboratory
9:15 a.m.	Keynote 3: ***Neutron Scattering for Probing Internal Structure of Intelligent Soft Matter*** Iran Thomas Auditorium **Eugenia Kharlampieva**, University of Alabama at Birmingham Macromolecular self-assembly and bio-inspired fabrication of polymeric nanostructures are of interest for a broad spectrum of applications in bio nanotechnology. This talk will focus on resolving the architecture of nano-thin polyelectrolyte coatings and hollow particles (capsules) produced by layer-by-layer (LbL) assembly on inorganic templates where interactions between adjacent layers are controlled by either electrostatic or hydrogen-bonding forces. Our study establishes a basis for regulating the organization of self-

	assembled polymer films, crucial for developing nanostructured responsive materials with controllable functions.
10:00 a.m.	***Collaboration Break,*** SNS 8600, first floor-lobby ***- light refreshments*** • Posters about HFIR and SNS instrument updates will be on display throughout the lobby • The Neutron Science Outreach Trailer will be open for view outside the lobby • Exhibitors from PennState Materials Research Institute 2D Crystal Consortium, The Johns Hopkins University Platform for the Accelerated Realization, Analysis & Discovery of Interface Materials (PARADIM), ORNL The Center for Nanophase Materials (CNMS), and Oak Ridge Leadership Computing Facility will be in the lobby
10:15 a.m.	Keynote 4: ***Uncovering the Chemistry of Solids with "in situ" Neutron Diffraction*** Iran Thomas Auditorium **Efrain Rodriguez**, University of Maryland Historically, neutron powder diffraction has been one of the most powerful means to obtain the structure of crystalline solids. Progress quickly escalated after Hugo Rietveld introduced his method for quantitative analysis of diffraction data from his least squares technique. Since then neutron instrumentation has improved in both flux and resolution; therefore, the community of materials and solid-state chemists now seek to push the boundaries of what neutron diffraction can teach us about the chemical reactivity of solids. In this lecture, I will cover some of the recent progress in chemical studies with "*in situ"* neutron diffraction whereby a crystalline material is measured under sample environments that change the chemical composition of the sample with time.
11:00 a.m.	**Current and Future Beam Lines,** Iran Thomas Auditorium **Moderator: Crystal Schrof,** Scientific & Program Service Manager Neutron Sciences Directorate, Oak Ridge National Laboratory **Andrew Payzant**, Group Leader, Materials Engineering Neutron Scattering Division, Oak Ridge National Laboratory **Mark D. Lumsden,** Group Leader, Spectroscopy Neutron Scattering Division, Oak Ridge National Laboratory **Matthew G. Tucker,** Group Leader, Diffraction Neutron Scattering Division, Oak Ridge National Laboratory **Hugh O'Neill,** Team Lead, Bio-Labs Neutron Scattering Division, Oak Ridge National Laboratory This panel will discuss upgrades to current beam lines and plans for future beam lines. Questions from the audience are highly encouraged.
11:45 a.m.	**Second Target Station,** Iran Thomas Auditorium **Ken Herwig**, Group Leader, Instrument Methods, Projects and Technologies Neutron Technologies Division, Oak Ridge National Laboratory

	Oak Ridge National Laboratory (ORNL) is moving forward with a conceptual design for a third neutron source: the second target station at SNS, to address emerging science challenges. The second target station will complement ORNL capabilities at the SNS first target station and HFIR by filling gaps in materials research that require the combined use of intense, cold (longer wavelength) neutrons and instruments that are optimized for exploration of complex materials. Together these three facilities form an unbeatable combination that will maintain a U.S. global leadership position in neutron science capabilities. This talk will provide an update on the STS concept.
12:15 – 1:45 p.m.	***Data Reduction and Analysis Table Topics Working Lunch*:** Tent on the SNS 8600, ground-floor back patio Introduction: What is working? What is not? **Jay Billings,** Group Leader, Scientific Computing and Software Engineer Neutron Scattering Division, Oak Ridge National Laboratory **Garrett Granroth,** Neutron Scattering Scientist Direct Geometry Neutron Scattering Division, Oak Ridge National Laboratory An overview of SNS/HFIR data reduction and analysis techniques will be given followed by discussion and feedback with a data subject matter expert at each lunch table. This feedback will be used to build our data discussion forum at the SHUG Town Hall. Each table will have a sign with a number and topic. Get your food from our buffet and join a table. Table 1: SANS Soft Matter, Sudipta Gupta Table 2: SANS Hard Matter, Garrett Granroth Table 3: Bio-SANS, Jarek Majewski Table 4: Bio-Diffraction, Jay Billings Table 5: Powder Diffraction: Engineering, Eugene Mamontov Table 6: Powder Diffraction: Chemistry, Allyson Fry-Petit Table 7: Single-Crystal Diffraction: Biology, Vickie Lynch Table 8: Single-Crystal Diffraction: Condensed Matter/Diffuse Scattering, Andrei Savici Tables 9 and 10: Spectroscopy: Hard Condensed Matter (Magnetism/Lattice), Olivier Delaire Tables 11 and 12: Spectroscopy: Chemical, Peter Peterson Table 13 and 14: Analysis, Modeling and Simulation, Ricardo Miguel Ferraz Leal and Jose Borreguero Calvo Table 15: Data Visualization, Ross Whitfield Table 16: Reflectometry Liquids, Matthieu Doucet Table 17: Reflectometry Magnetic, Adam Aczel Table 18: Spin Echo, Steve Hahn Table 19: Imaging, Jean Bilheux
Parallel Sessions **Session 5 Chairs:** **Session A – Adam Aczel,** SHUG Executive Committee Member **Session B – Eugene Mamontov,** SHUG Executive Committee Member	

1:45 – 2:45 p.m.	**Session A** **Neutron Scattering at the Frontiers of Chemistry** CONFERENCE ROOM C-156	**Session B** **Science Opportunities of Neutron Imaging for Materials and Engineering** IRAN THOMAS AUDITORIUM
	Session Chairs: **Katharine Page,** Neutron Scattering Scientist Powder Diffraction Team Oak Ridge National Laboratory **Luke Daemen,** Neutron Scattering Scientist Chemical Spectroscopy Team Oak Ridge National Laboratory	**Session Chairs:** **Ke An,** Neutron Scattering Scientist Materials Engineering Team Oak Ridge National Laboratory **Hassina Bilheux,** Neutron Scattering Scientist Materials Engineering Team Oak Ridge National Laboratory Introduction: **Ke An,** Neutron Scattering Scientist Materials Engineering Team Oak Ridge National Laboratory
1:45 p.m.	Introduction: ***"Neutron Scattering Frontiers in Geosciences"*** **Nancy Ross,** Professor of Mineralogy Geosciences Department Virginia Polytechnic Institute and State University	
2:05 p.m.	***"Neutron Scattering for Batteries and Fuel Cells: Current State and Future Perspective"*** **Jue Liu**, Neutron Scattering Scientist Powder Diffraction Oak Ridge National Laboratory	1:45 p.m. ***"The Importance of VENUS"*** **Anton Tremsin**, Full Research Physics University of California, Berkeley
2:20 p.m.	***"Structural Phenomena and Lattice Dynamics of Flexible Materials"*** **Matthew Ryder,** Shull Fellow Chemical Spectroscopy Oak Ridge National Laboratory	2:15 p.m. ***"Multiscale Analysis of Batteries Using X-ray and Neutron Imaging"*** **George Nelson,** Associate Professor Mechanical & Aerospace Engineering Department University of Alabama in Huntsville
2:35 p.m.	Panel Discussion – All Speakers	Panel Discussion – All Speakers

Parallel Sessions
Session 6 Chairs:
Session A – Adam Aczel, SHUG Executive Committee Member
Session B – Jarek Majewski, SHUG Executive Committee Member

2:45 – 3:45 p.m.	**Session A** **Quantum Materials** CONFERENCE ROOM C-156	**Session B** **Diffuse Scattering** IRAN THOMAS AUDITORIUM
	Session Chairs: **Clarina Dela Cruz,** Neutron Scattering Scientist Powder Diffraction Team Oak Ridge National Laboratory **Daniel Pajerowski,** Neutron Scattering Scientist Direct Geometry Team Oak Ridge National Laboratory	**Session Chair:** **Christina Hoffmann,** Neutron Scattering Scientist Single Crystal Diffraction Team Oak Ridge National Laboratory Invited Speakers from the Satellite Diffuse Scattering Workshop will present a session.
2:45 p.m.	**"Spin Dynamics of the Elemental Quantum Spin Liquid β-Mn"** **Joseph Paddison**, Junior Research Fellows Physics Department University of Cambridge	**"The Impact of Diffuse Scattering on Materials Research"** **Stephan Rosenkranz,** Senior Group Leader Neutron and X-ray Scattering Argonne National Laboratory
3:05 p.m.	**"Hybrid Skyrmions in Gd/Fe Multilayers"** **Dustin Gilbert**, Assistant Professor Materials Science & Engineering University of Tennessee Knoxville	**"3D Pair Distribution Function Analysis to Resolve Real Structures"** **James Martin,** Professor Department of Chemistry North Carolina State University
3:25 p.m.	**"Extract Potential Hamiltonian from Neutron Scattering Data Using a Machine Learning Assisted Approach"** **Anjana Samarakoon,** Postdoctoral Research Associate Direct Geometry Team Oak Ridge National Laboratory	**"Model-free Analysis of Short-Range Magnetic Correlations in Single Crystals"** **Nikolaj Roth,** Ph.D. Student Department of Chemistry Aarhus University
3:35 p.m.	Panel Discussion – All Speakers	Panel Discussion – All Speakers
3:45 p.m.	***Collaboration Break,*** SNS 8600, first-floor lobby ***- light refreshments*** • Posters about HFIR and SNS instrument updates will be on display throughout the lobby • The Neutron Science Outreach Trailer will be open for view outside the lobby • Exhibitors from PennState Materials Research Institute 2D Crystal Consortium, The Johns Hopkins University Platform for the Accelerated Realization, Analysis & Discovery of Interface Materials (PARADIM), ORNL The Center for Nanophase Materials (CNMS), and Oak Ridge Leadership Computing Facility will be in the lobby	
4:00 p.m.	**SHUG Town Hall,** Iran Thomas Auditorium **Host: Olivier Delaire,** SHUG Executive Committee Chair • Best Student Poster Contest Award Ceremony • The SHUG Award for Excellence in Beam Line Science • New SNS-HFIR Programmatic Proposal Program • SHUG Data Reduction and Analysis Forum, insights from earlier lunch discussions • Outreach and community organization: – How can the neutron community better train its new users and share expertise? – Improving communication with SHUG and ORNL management	

	– Suggestions for engaging new users and growing the community – Users' involvement in defining scientific opportunities and priorities for the SNS Second Target Station (STS) • SHUG bylaws corrections/revisions • Your comments and input: please bring up questions and feedback to the SHUG-EC for a productive discussion
5:00 p.m.	SNS Tours—Meet in Building SNS 8600 lobby HFIR Tours—Vans outside main entrance of Building 8600
6:00 p.m.	Adjourn