

Scientific Opportunities for a US-based Muon Spectroscopy Facility

Day 1 - February 1, 2021

ALL TIMES ARE SHOWN AS EASTERN TIME ZONE

8:00 am - 8:15 am (ET)	Welcome & Opening Remarks	Despina Louca University of Virginia	
	Dr. Louca is the Maxine S. and Jesse W. Beams Professor of Physics at the University of Virginia. She is a neutron scatterer by training and is currently serving as the president of the Neutron Scattering Society of America (NSSA). Dr. Louca's research is in materials physics, focusing on understanding the interactions of spin, charge and lattice degrees of freedom, and of their role in phase transitions observed in strongly correlated electron solids that exhibit properties such as magnetoresistance, superconductivity and multiferroicity. She is a fellow of the American Physical Society. Dr. Louca sees immense value in bringing muon spectroscopy in the US and is spearheading this effort to get not just the muon community involved but the neutron community as well in making this happen.		
8:15 am - 9:05 am (ET)	Muon Spin Relaxation (MuSR) and Neutron Scattering Studies in Quantum Materials	Yasutomo Uemura Columbia University	Monitor: Despina Louca
	Dr. Uemura is a Professor at Columbia University and the inaugural recipient of the Toshimitsu Yamazaki prize for outstanding, sustained work in μ SR with long term impact on science. His foundational work in the areas of spin glasses, quantum magnetism and unconventional superconductivity give him a unique perspective on the power of muon techniques and their impact on condensed matter research.		
9:05 am - 9:55 am (ET)	Battery Materials with Muons	Jun Sugiyama CROSS-Tokai	Monitor: Despina Louca
	Dr. Sugiyama has a long history of using muon beams for industry-oriented research into battery materials. As a former researcher with Toyota Central R&D Laboratories, he has been a premier expert in measuring lithium and sodium ion diffusion rates in batteries. He brings tremendous insight into the industry motivations for a next-generation muon source.		
9:55 am - 10:10 am (ET)	<i>Break</i>		
10:10 am - 11:00 am (ET)	Muon Spin Relaxation in Semiconductors and Oxides	James Lord ISIS Neutron and Muon Source	Monitor: Travis Williams
	Dr. Lord is an instrument scientist on the HiFi muon Instrument at the ISIS Neutron and Muon Source. His research focuses on condensed matter systems, specifically semiconductors and oxides. Dr. Lord is also an expert on muon instrumentation and research using high magnetic field measurements using muon spectroscopy.		
11:00 am - 11:50 am (ET)	Ionic Diffusion	Peter Baker ISIS-RAL	Monitor: Travis Williams
	Dr. Baker is an instrument scientist at the ISIS Neutron and Muon source, which hosts pulsed muon beams for performing a wide range of scientific experiments. Dr. Baker's research combines probing ionic diffusion with magnetism and superconductivity, which highlights the versatility of muon spectroscopy as a technique.		
11:50 am - 12:30 pm (ET)	<i>Lunch</i>		
12:30 pm - 1:30 pm (ET)	Breakout: Quantum Materials	Collin Broholm Johns Hopkins University	Monitor: Travis Williams
	Quantum Materials are the largest research area for μ SR around the world, and the development of a next generation muon source will open up new research directions. This session will discuss possible avenues for new research in frustrated materials, topological states, low-dimensional systems and beyond.		
1:30 pm - 2:30 pm (ET)	Breakout: Chemistry & Battery Materials	Iain McKenzie TRIUMF	Monitor: Travis Williams
	μ SR has been a unique tool for studying the structure, dynamics and reactions of free radicals and studying the behavior of labelled molecules in soft matter and biologically relevant materials. μ SR has also been used to study ionic diffusion, catalysis and battery materials. This session will discuss how a next-generation source with orders of magnitude increases in flux can facilitate new research directions.		
2:30 pm (ET)	<i>Adjourn</i>		

Day 2 - February 2, 2021**ALL TIMES ARE SHOWN AS EASTERN TIME ZONE**

8:00 am - 8:50 am (ET)	Low-Energy Muons	Thomas Prokscha Paul Scherrer Institute	Monitor: Greg MacDougall
	Dr. Prokscha is the Head of the Low-Energy Muon group at PSI, the world's best source for low energy muon beams. He brings an unparalleled vision for the development and future need for studies using low-energy muon beams, including to thin films, devices and surface studies.		
8:50 am - 9:40 am (ET)	The Muon-fluorine Interaction: A Model Quantum System for Exploring Decoherence	Stephen Blundell Oxford University	Monitor: Greg MacDougall
	Dr. Blundell is a Professor of Physics in Oxford University, whose research employs μ SR to study superconductivity and magnetism in a range of organic and inorganic materials. His recent work developing the technique DFT+ μ demonstrates the inaruguable benfits of combing advanced computational techniques and muon science.		
9:40 am - 10:00 am (ET)	<i>Break</i>		
10:00 am - 10:50 am (ET)	From Correlations to Functionality using Depth Resolved Spin Resonance Techniques	Sarah Dunsiger TRIUMF/Simon Fraser U.	Monitor: Clarina dela Cruz
	Dr. Dunsiger is a research scientist in TRIUMF's Center for Molecular and Materials Science and Adjuct Professor at Simon Fraser University. Her work using low energy μ SR and beta-NMR demonstrates the unique power of depth-resolved resonance probes to illuminate the effects of surfaces in quantum materials and interfaces in functional magnetic heterostructures..		
10:50 am - 11:50 am (ET)	Breakout: Low-Energy Muons	Alannah Hallas University of British Columbia	& Alan Tennant Oak Ridge National Lab
	Low-energy muon beams are a rapidly-growing area of μ SR research, due to their ability to probe surface states and depth-resolved properties. Currently, low-E μ SR beams have been limited by low flux, but a new μ SR facility has the capability to overcome this shortcoming. This session will discuss the scientific needs for low-E μ SR capabilities in a future US facility.		
11:50 am - 12:30 pm (ET)	<i>Lunch</i>		
12:30 pm - 1:30 pm (ET)	Breakout: Broader Impacts	Aidy Hillier ISIS-RAL	
	The benefits of a high-flux domestic muon source extend beyond the applications of μ SR. This session will focus on the broader impacts of a next-generation muon source, including integration with SEE testing and fundamental physics. It will also discuss new developments within the user community and opportunites for growth.		
1:30 pm - 2:00 pm (ET)	Summary of Breakouts	Greg MacDougall University of Illinois	
	Dr. MacDougall is a Research Professor at the University of Illinois at Urbana-Champaign. He specializes in the growth and characterization of novel quantum materials, and has years of experience utilizing μ SR and neutron scattering instrumentation at National Laboratories. In recent years, he has been working with ORNL to help develop plans for the next-generation SEEMS muon facility.		
2:00 pm - 2:30 pm (ET)	SEEMS Presentation	Travis Williams Oak Ridge National Lab	
	Dr. Williams is an Instrument Scientist within the Neutron Sciences Directorate at ORNL. His work focuses on f-electron systems using both neutrons and μ SR. He has been involved in developing the science case for the Second Target Station as well as the conceptual design for a muon source at the SNS.		
2:30 pm - 2:45 pm (ET)	Future Plans	Clarina dela Cruz Oak Ridge National Lab	
	Dr. dela Cruz is the head of the Quantum Materials Initiative within the Neutron Sciences Directorate at ORNL. In this role, she is responsible for evaluating internal research proposals and coordinating external funding opportunities by ORNL staff, including work on a future ORNL muon source.		
2:45 pm (ET)	<i>Adjourn</i>		