The Neutron Scattering Society of America is pleased to announce the 2020 recipients for its four major prizes.

Prof. Thomas P. Russell
University of Massachusetts at Amherst

is the recipient of the

2020 Clifford G. Shull Prize

of the Neutron Scattering Society of America (NSSA) with the citation:

"For his pivotal role in the application of neutron reflectivity and small angle neutron scattering to polymer science and his important work on behalf of the neutron scattering community."

Prof. Thomas P. Russell

The Neutron Scattering Society of America (NSSA) established the Clifford G. Shull Prize in Neutron Science to recognize outstanding research in neutron science and leadership promoting the North American neutron scattering community. The prize is named in honor of Prof. Clifford G. Shull, who received the Nobel Prize in 1994 with Prof. Bertram Brockhouse for seminal developments in the field of neutron science. The establishment of the prize was announced at the inaugural American Conference on Neutron Scattering (ACNS) in 2002.

The nominations were reviewed by a committee of experts in the field of neutron science and the NSSA is pleased to announce that the recipient of the 2020 Shull Prize is Prof. Thomas P. Russell, of the University of Massachusetts at Amherst. The prize and a $5000 honorarium will be awarded at the 2020 ACNS in Boulder, CO, July 12-16, 2020 (https://www.mrs.org/acns-2020).

The experimental investigation of the interfacial behavior of polymers, while critical for much fundamental and applied research, was severely limited by available techniques. In a series of landmark publications, Prof. Russell pioneered the use of neutron reflectivity in polymers. He demonstrated his innovative thinking by combining novel preparation methods with selective labeling of polymer chains in advance depth profiling to the nanometer level. A quantitative description of the interdiffusion of polymers emerged, confirming earlier theoretical arguments. Russell's efforts in neutron reflectivity enabled the study of interfacial and confinement effects with unprecedented spatial resolution. His efforts have paved the way for countless other research groups worldwide to use neutron reflectivity in the study of polymers, a now essential technique for the field. Work by Russell and coworkers on block copolymer thin films anticipated and enabled the explosive development of these materials for lithographic applications

Russell has further contributed to the field of polymer science by demonstrating the generation and control of nanoscopic structures using gradient electric fields and neutron reflectivity. These methodologies are now being used to develop ultra-high density magnetic storage arrays and separations media.

In addition to his work with neutron reflectivity, Russell has also made important contributions to polymer science using Small Angle Neutron Scattering (SANS). He has used SANS to study unusual lower critical ordering temperature behavior in certain diblock copolymers, and used the results to design materials that have both an upper and a lower critical temperature.

Alongside his tremendous scientific contributions, Russell has served the neutron scattering community throughout his career. He has written important reviews on the use of neutron reflectometry and SANS for polymer science, was the first Vice-President of the NSSA, and chaired committees that laid the foundations and performance parameters for the Spallation Neutron Source at Oak Ridge National Laboratory.

Prof. Russell earned his Ph.D at the University of Massachusetts at Amherst, and worked at the Universities Mainz as a Research Fellow and the IBM research division as a research staff member before becoming a Professor in Polymer Science and Engineering Department at the University of Massachusetts in 1996, where he has worked for the majority of his career. Among other honors, Prof. Russell was elected as a member of the National Academy of Engineering and the National Academy of Inventors. He is a Fellow of the NSSA, the American Physical Society, the American Chemical Society, the Materials Research Society, and the American Association for the Advancement of Science.

The Neutron Scattering Society of America
http:///www.neutronscattering.org

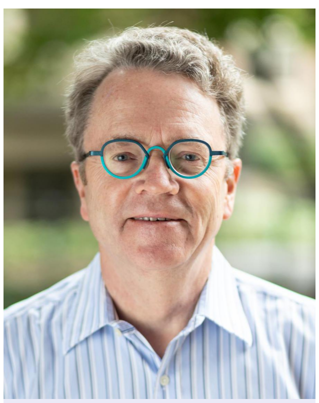
Prof. Timothy P. Lodge
University of Minnesota

is the recipient of the

2020 Sustained Research Prize

of the Neutron Scattering Society of America (NSSA) with the citation:

"For his pivotal contributions to the fundamental understanding of polymer structure, thermodynamics, and dynamics though the use of small angle neutron scattering."



Prof. Timothy P. Lodge

The Neutron Scattering Society of America (NSSA) established the Sustained Research Prize to recognize a sustained contribution to a scientific subfield, or subfields, using neutron scattering techniques, or a sustained contribution to the development of neutron scattering techniques. The primary consideration is an enduring impact on science. Preference is given to nominees whose work was carried out predominantly in North America.

The nominations were reviewed by a committee of experts in the fields to which neutron scattering contributes. The NSSA is pleased to announce that the 2020 recipient of the Sustained Research Prize is Prof. Timothy P. Lodge of the University of Minnesota. The prize and $2500 honorarium will be awarded at the 2020 ACNS in Boulder, CO, July 12-16, 2020 (https://www.mrs.org/acns-2020).

Prof. Lodge is a recognized leader in the use of neutron scattering to study the structure and thermodynamics of polymers, including polymer chain dimensions, critical phenomena, and macromolecular self-assembly. Small-angle neutron scattering (SANS) has played a key role in his research addressing these phenomena. Lodge's work is regarded as being exceptional in both creativity and technical depth, and has helped to define how neutron methods can be used to understand polymer self-assembly and thermodynamics. In this way, his work is in no small part responsible for the prominent role of neutron scattering in the field of polymer physics.

Throughout his four decade professional career, Lodge has made extensive use of SANS to gain fundamental understanding of polymers, contributing important ideas to experimental design and modeling. One area in which his contributions were particularly influential is in tailoring polymer chemistries for SANS so as to extract maximal, or otherwise unachievable, information from neutron scattering measurements. This includes Lodge's discovery and fundamental investigations of block polymer-stabilized bicontinuous microemulsions, where he and his group carefully designed co-polymer molecules to identify the thin regions of thermodynamic space where bicontinuous morphologies form and can be studied. Such studies have become guiding examples for how polymer design can be used in concert with neutron scattering to characterize interfacial properties of multi-phase polymers and soft materials more generally.

Prof. Lodge earned his Ph.D. at the University of Wisconsin, and was a National Research Council postdoc at NIST in 1981 before joining the faculty in the Department of Chemistry at the University of Minnesota in 1982, where he currently holds the title of Regents Professor. He has received numerous awards and accolades for his research, including Hermann Mark Award from the American Chemical Society, and Fellowship in the NSSA as well as the American Association for the Advancement of Science.

The Neutron Scattering Society of America

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Prof. Matthew E. Helgeson
University of California, Santa Barbara

is the recipient of the

2020 Science Prize

of the Neutron Scattering Society of America (NSSA) with the citation:

"For his development and use of neutron scattering methods with application to non-equilibrium thermodynamics and rheology of complex fluids and soft materials."

Prof. Matthew E. Helgeson

The Neutron Scattering Society of America (NSSA) established the Science Prize to recognize a major scientific accomplishment or important scientific contribution within the last 5 years using neutron scattering techniques. Nominees must be within 12 years of receiving their PhD degree. Preference shall be given to applicants whose work was carried out predominantly in North America.

The nominations were reviewed by a committee of experts in the scientific areas to which neutron scattering contributes, and the NSSA is pleased to announce that the 2020 recipient of the Science Prize is Prof. Matthew E. Helgeson of the University of California, Santa Barbara. The prize and $2500 honorarium will be awarded at the 2020 ACNS in Boulder, CO, July 12-16, 2020 (https://www.mrs.org/acns-2020).

Prof. Helgeson is known for his research on colloidal fluids including suspensions, emulsions and gels, and particularly the development and application of Small Angle Neutron Scattering (SANS) techniques to these materials. Helgeson's background is in the use of rheo-SANS, a technique that enables SANS to probe solutions under fluid deformations. In the past five years he has greatly expanded this technique in several ways. First, he extended the rheo-SANS measurements to USANS (Ultra Small Angle Neutron Scattering), and showed how the combination of rheology probes and the two neutron methods gives structural information under flow over an unprecedented range of length scales. A second development was the creation of a new sample environment involving a fluidic four roll mill (FFoRM). The four roll mill extends previous rheo-SANS capabilities, primarily limited to shearing deformations, to the creation of essentially arbitrary fluid deformations. This dramatically expands rheo-SANS capabilities, enabling them to mimic industrial processing conditions. His group recently combined his advances in rheo-SANS with the development of new thermoresponsive colloidal systems to make significant breakthroughs in understanding colloidal gels. Using combined SANS/USANS experiments, Helgeson's group was the first to suggest that colloidal gelation could be tuned between different mechanisms, percolation and arrested phase separation, depending on the thermal quench to the gelled state. This unified the two disparate proposed mechanisms. The results have led researchers in the field to recognize large-scale structural heterogeneity as a critical feature that controls colloidal gel rheology.

Helgeson has substantially advanced the fundamental understanding of nanoemulsions and various materials derived from them. His exceptional use of neutron scattering has enabled these seminal advances in soft matter science and engineering. For example, Helgeson has also made important contributions to the study and engineering of multiple emulsions ("droplets within droplets"). These materials are revolutionizing particle engineering due to their sophisticated compartmentalized structure, but have yet to be broadly translated to nanoscale droplets where their greatest advantages lie. Helgeson has pioneered this area by using SANS to demonstrate how multiple nanoemulsions of various morphologies could be controllably produced by combining high-energy processing with creative manipulation of nanoscale interfacial mechanics. Helgeson's clever use of contrast variation SANS enabled the rigorous validation and quantification of multi-phase droplet structures.

Prof. Helgeson earned his Ph.D. from the University of Delaware in 2009, and performed postdoctoral research at the Novartis-MIT Center for Continuous Manufacturing. In 2012, he joined the faculty at the University of California, Santa Barbara, where he remains today. He has received several awards recognizing his research, including the DOE and NSF Early Career Awards (2014 and 2015), as well as the NSSA's Outstanding Student Research Prize (2008). Helgeson has served the neutron scattering community as a Member at Large of the NSSA Executive Committee since 2015, and as Technical Program Co-Chair of ACNS in 2018.

The Neutron Scattering Society of America

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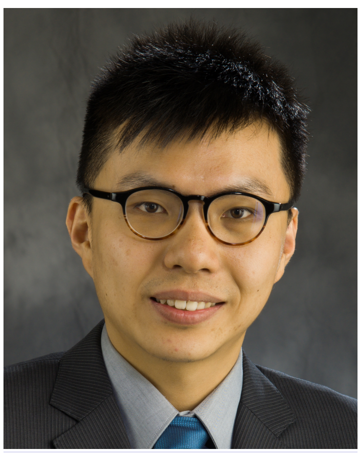
Mr. Johnny Ching-Wei Lee
University of Illinois at Urbana Champaign

is the recipient of the

2020 Prize for Outstanding Student Research

of the Neutron Scattering Society of America (NSSA) with the citation:

"For seminal neutron scattering experiments forming time-resolved structure-property-processing relations of polymeric materials."



Mr. Johnny Ching-Wei Lee

The Neutron Scattering Society of America (NSSA) established the Prize for Outstanding Student Research to recognize outstanding accomplishments in the general area of neutron scattering by graduate or undergraduate students who have performed much of their work at North American neutron facilities. Nominees must be either current graduate students or scientists within two years of receiving their PhD.

The nominations were reviewed by a committee of experts in the field of neutron science and the NSSA is pleased to announce that the recipient of the 2020 Prize for Outstanding Student Research is Mr. Johnny Ching-Wei Lee from University of Illinois at Urbana-Champaign. The prize and $1000 honorarium will be awarded at the 2020 ACNS in Boulder, CO, July 12-16, 2020 (https://www.mrs.org/acns-2020).

Johnny Ching-Wei Lee is an experimental neutron scattering scientist and rheologist with a focus on polymeric materials. Over the course of his very productive graduate career, Lee has authored six first author papers, of which four used simultaneous rheology and neutron scattering measurements to directly connect the structure and mechanical properties of complex fluids undergoing non-linear deformation. Lee has paid particular attention to the rheological behavior of polymeric materials, and the methods by which his hypotheses can be tested by neutron scattering. His work has probed some of the core assumptions at the heart of polymer rheology, and he has provided novel and elegant solutions that rely on neutron scattering data to provide molecular-level confirmation.

Lee's work has contributed to the challenging problem of understanding large-amplitude oscillatory shear (LAOS). In the field of rheology, the primary objective is to measure the mechanical properties of complex fluids and soft solids and to develop direct relationships between these properties and the underlying microstructure. Lee's approach is unique, in that he has combined new theoretical insights with time-resolved neutron scattering. He used combinations of rheology, time-resolved rheo-Small Angle Neutron Scattering (rheo-SANS), and theory, to show that the most important metric is the "recoverable strain". Lee also formulated a generic approach to forming transient structure-property-processing relations in soft matter, showing how the transient symmetries exhibited by soft materials under highly nonlinear flows are mirrored by certain rheological symmetries. He exploited these correlations to show how complex transient responses can be viewed as simple trajectories through a rheo-scattering space that provides a clear understanding of how structural changes manifest themselves in the rheological responses of soft materials. The ideas that Lee has developed in his studies of LAOS have also translated into studies of fundamental relations in the linear viscoelastic regime. In this area, Lee has developed the ideas of recoverable and unrecoverable strains, and has shown how textbook definitions of linear viscoelasticity lack a crucial contribution that can be exploited to gain deeper understanding of how soft materials respond to deformations and flows. Johnny Ching-Wei Lee is quickly becoming recognized for his ability to perform time-resolved SANS, rheology, and rheological theory at the highest level.

Mr. Lee received his B.S. in Chemical Engineering from National Taiwan University in 2013. He is currently a Ph.D. candidate in the Department of Chemical Engineering at University of Illinois at Urbana-Champaign. He is also a recipient of the University of Illinois' Glenn E. and Barbara R. Ullyot Graduate Fellowship (2019) and Hanratty Fellowship (2017).