2011 NIST Workshop on Neutron Measurements to Advance the Manufacture of Soft Materials

A workshop to identify challenges in soft materials manufacturing that can be addressed using neutron-based measurement science.

June 2-3, 2011
Admin. Bldg. (101), Lecture Room B
Gaithersburg, MD, United States
Workshop Program
Thursday, June 2 - Lecture Room B

Welcome and Introductions

8:30  Speaker Set-up -- Continental Breakfast Provided
9:00  Opening Remarks — Ronald Jones, Director, nSoft Consortium, Polymers Division, NIST
9:10  Welcome and Introduction to NIST — Richard Cavanagh, Deputy Director, Material Measurement Laboratory, NIST
9:30  NIST Office of Technology Partnerships — Paul Zielinski, Director, Technology Partnerships Office, NIST

Neutrons for Manufacturing

9:45  Understanding the Branched Structure of Polyethylene and Other Polymers using SANS — Gregory Beaucage, Professor and Director of NanoPower Africa, Department of Chemical and Materials Engineering, University of Cincinnati

Coffee Break

Opportunities in Soft Materials I

10:30  Rheo-SANS Studies of Complex Fluids — Norman Wagner, Professor and Chairperson, Department of Chemical Engineering, University of Delaware
11:00  DuPont’s Analytical Frontier: From Synchrotron X-rays to Cold Neutrons — David Londono, Corporate Center for Analytical Sciences, DuPont

Lunch

Opportunities in Soft Materials II

1:00  Exploring New Opportunities for United Technologies with Neutrons — Alex Norman, Physical Sciences, United Technologies Research Center
1:30  Hierarchical Structure of Carbon Black in Elastomer Composites — Richard Hall, Cabot Corporation

Coffee Break

Opportunities in Soft Materials III

2:30  Structure and Dynamics of Biological Systems — Susan Krueger, Neutron Condensed Matter Science Group, NIST Center for Neutron Research, NIST
3:00  Interfacial Rheology of Monoclonal Antibody Solutions: Using Neutrons to Understand Relevant Bio-Physics — Jai Pathak, Formulations Group, MedImmune
3:30  Protein Assembly, Surfaces, and Surfactants” - Christopher Roberts, Associate Professor, Department of Chemical Engineering, University of Delaware

4:00  Summary and Discussion — Ronald Jones, Director, nSoft Consortium, Polymers Division, NIST
4:30  Tour of the NIST Center for Neutron Research — Dan Neumann, Leader, Neutron Condensed Matter Science Group

7:00  Dinner (optional, not included in Registration) — Details provided at end of program
Workshop Program
Friday, June 3 - Lecture Room B

NIST Capabilities in Soft Materials and Neutrons I
8:30 Speaker Set-up -- Continental Breakfast Provided
9:00 Soft Materials at NIST — Eric Lin, Chief, Polymers Division, NIST
9:30 Overview of the NIST Center for Neutron Research — Dan Neumann, Leader, Neutron Condensed Matter Science Group, NIST Center for Neutron Research, NIST

Coffee Break

NIST Capabilities in Soft Materials and Neutrons II
10:30 Membrane Dynamics Measured by Neutron Spin Echo — Michihiro Nagao, Instrument Scientist, Neutron Spin-Echo Spectrometer, NIST Center for Neutron Research
11:00 Seeing Water and Lithium with Neutrons — Daniel Hussey, Instrument Scientist, Neutron Imaging Facility, Ionizing Radiation Division, NIST
11:30 Capabilities in Sample Environment and Support Services at the NCNR — Juscelino Leao, Sample Environment Team, NIST Center for Neutron Research

Lunch

Poster Session (Hall of Flags)
1:00 Posters from NCNR, NIST Polymers Division, University of Delaware, and others. Poster titles and list of participants on subsequent pages

Coffee Break

2:30 Participant Discussion of Measurement Needs (Lecture Room B)

3:00 Closing Remarks
1. Gelation in a Model Nanoparticle System with Short-Range Interactions — Aaron Eberle, NIST Center for Neutron Research

2. Small Angle Neutron Scattering and Rheological Analysis of Therapeutic Monoclonal Antibodies at High Concentrations — Eric Yearley, Department of Chemical Engineering, University of Delaware

3. Solubilization Capacity of a Crosslinked Micellar Gel — Steve Kline, NIST Center for Neutron Research

4. Structure of PTEN Tumor Suppressor in Fluid Lipid Membranes — Hirsh Nanda, NIST Center for Neutron Research

5. Protein Structure in Solid State Environments — Sheila Khodadadi, NIST Center for Neutron Research

6. Structure and Properties of Membranes for Clean Water — Edwin Chan, Polymers Division, NIST

7. Effect of Tethering on the Surface Dynamics of a Thin Polymer Melt Layer — Bulent Akgun, NIST Center for Neutron Research

8. A high strain rate testing methodology for high performance fibers — Jae Hyun Kim, Polymers Division, NIST

9. Interfacial Structure, Dynamics, and Transport of Polyelectrolyte Membrane Materials for Fuel Cells — Brandon Rowe, Polymers Division, NIST

10. Enrichment of Metallic Armchair Nanotubes — Xioamin Tu, Polymers Division, NIST

11. Tabletop Method for Quantifying Protein Stability in Freeze-Dried Matrix through Beta Relaxation — Marc Cicerone, Polymers Division

12. Subdomain Structure of a Homopolymer-Block Copolymer Blend: A Small Angle Neutron Scattering Study — Huagen Peng, Polymers Division, NIST

13. Structural Study of Polymer-Fullerene Solutions for Organic Photovoltaics — Margaret Sobkowicz, Polymers Division, NIST

14. Finite Size Effects on Water Uptake and Interfacial Lamellar Structure in Nafion Thin Films — Steven DeCaluwe

15. Paul Butler, NIST Center for Neutron Research - ??

16. Kendra Erk, Polymers Division — Interfacial Rheology

17. Eddie McCarthy, Polymers Division — Sustainable Composites
18. Soft Materials at Georgetown University — Daniel Blair, University of Georgetown
Cost (not included in registration): $23.99/person + tax and gratuity

Please bring Cash!!

Four Course Menu
Includes salad, appetizer, entrée, dessert and non-alcoholic beverage.

Salad
Choice of Caesar or Fresh Greens

Fresh Antipasti (one per three guests)

CALAMARI FRITTI  Crispy calamari served with fresh lemon and arrabbiata sauce

SPINACH ARTICHOKE DIP  Baby spinach and artichoke hearts baked with aged Italian cheeses. Served with focaccia bread

MOZZARELLA ALLA CAPRESE  Vine-ripened tomatoes with fresh mozzarella, extra virgin olive oil, aged balsamic vinegar and fresh basil

CRAB-STUFFED MUSHROOMS  Fresh mushrooms filled with lump crabmeat, shrimp and Italian seasonings

TOMATO BRUSCHETTA  Ripe tomatoes, fresh basil, garlic and extra virgin olive oil with grilled focaccia bread

Select one from the following:

Handcrafted Pasta

PENNE RUSTICA  Succulent shrimp, roasted chicken and aged prosciutto with Parmesan cream sauce then baked until golden

PASTA MILANO  Roasted chicken, sun-dried tomatoes, fresh mushrooms and imported farfalle pasta in a roasted garlic cream sauce

SAUSAGE VESUVIO  Italian sausage sautéed with orcchiette pasta, arugula, roasted tomatoes, cannellini beans and extra virgin olive oil

LASAGNA AL FORNO  Baked with authentic Bolognese meat sauce, ricotta and mozzarella cheese. Topped with tomato sauce and fresh basil

FETTUCCINE ALFREDO WITH ROASTED CHICKEN  Imported fettuccine pasta sautéed with cream, butter, Parmesan cheese and tender chicken

Chicken

CHICKEN SCALOPPINE  Sautéed chicken with artichokes, mushrooms, aged prosciutto and lemon butter with capellini pasta

CHICKEN PARMIGIANA  Parmesan-crusted chicken breast baked with tomato sauce and mozzarella. Served with capellini pasta

POLLO CAPRESE  Juicy chicken simply grilled with extra virgin olive oil and fresh lemon. Served with Capellini Pomodoro and fresh mozzarella

Seafood

SHRIMP PORTOFINO  Jumbo shrimp sautéed with fresh spinach, mushrooms and pine nuts in a lemon butter sauce with imported capellini pasta

KING SALMON  King salmon filet simply seasoned with cracked black pepper and sea salt. Served with sun-dried tomato and spinach orzo

Desserts

CHOCOLATE CAKE  Drizzled with homemade ganache and topped with praline

TIRAMISU  Ladyfingers soaked in espresso, then layered between rich mascarpone cream

SIMPLE LEMON POUND CAKE  Delicate slices of lemon pound cake garnished with fresh strawberries
Poster Session

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Contact: Ronald Jones, x4624, 224/B314

National Institute of Standards and Technology
U.S. Department of Commerce