Multi·Angle

Summer 2015

Contents

LSU Dates

The acclaimed Light Scattering University (LSU) course, held in Santa Barbara, CA on the American Riviera, is guaranteed to demystify light scattering, work you hard but feed you well, and explain how to get the most from your Wyatt Technology instruments. Enroll now!

The next available classes begin July 7, August 11, and Sept 22. Dyna-LSU classes begin July 23, August 13, and Sept. 24. Check the full schedule.

Regional User Meetings

Want a Protein/Biotech or Nanoparticle/Polymer meeting to happen in your area? Let us know!

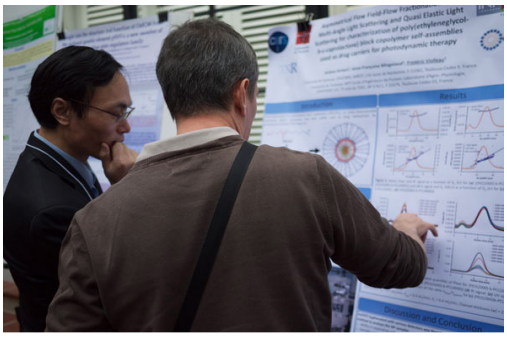
Contact marketing@wyatt.com today.

Light Scattering in the Nano World: ILSC 2015
Nov. 3 - 4, 2015

First Call for Posters!

Poster Presentations are encouraged and are now being accepted. Each poster submitted will receive $100 off the ILSC registration fee for the person presenting.

In addition to the poster sessions and presentations describing cutting-edge applications of light scattering in the life sciences, chemistry and biotechnology, ILSC 2015 will feature a special symposium entitled "Light Scattering in the Nano World" devoted to nanoparticle characterization in health and environmental research.



Full program now available!
Visit www.wyatt.com/ILSC.

The 2015 ILSC offers these additional satellite events:

Short Courses | Nov. 2, 2015
Introductory & advanced courses: MALS, DLS and more

Would you like an introductory course on basic light scattering, a refresher on ASTRA 6 or an introduction to advanced techniques such as CG-MALS? Our series of half-day courses are not only a great way to prepare for ILSC, but also a good excuse for traveling to Santa Barbara in November! View the schedule and course details.

Focus Meeting | Nov. 5, 2015
Method development for light scattering applications in biotherapeutic formulation

A one day focus meeting will address practical issues encountered in light scattering applications to biologic and small-molecule therapeutic formulation. Guest speakers from industry as well as Wyatt scientists will discuss how they meet these challenges. View details.

Light Scattering University | Oct. 27 - 30, 2015

Our renowned user training courses Light Scattering University and DynaLSU for MALS and DLS users, respectively, will be held the week before ILSC in order to accommodate those who would like to attend both events. Register Here.

WHAT'S NEW @WYATT

Upcoming Seminars

» **2015 Protein Society**
July 23, 2015 in Barcelona, Spain

Molar Mass, Size, Charge and Interactions: The Light Scattering Toolkit for Essential Biophysical Characterization and Quality Control

Dr. Dan Some, Director of Marketing and Principal Scientist

Register Here!

» **2015 Controlled Release Society**
July 26, 2015 in Edinburgh, Scotland

The Light Scattering Toolkit for Characterization and Formulation of Drug Delivery Nanoparticles

Dr. Dan Some, Director of Marketing and Principal Scientist

» **2015 Bioprocessing Summit**
August 4, 2015 in Boston, MA

Molar Mass, Size, Charge and Conformation: Light Scattering Tools for Biophysical Characterization of Macromolecules

Dr. John Champagne, Northeast Regional Manager & Senior Applications Scientist

Webinars

On-Demand Webinars

» Charge it! Electrophoretic Mobility as a Tool for Characterizing Nanoparticle Stability

» Molar Mass, Size, Charge, and Interactions: Light Scattering Tools for Essential Biophysical Characterization

» Automation of Biologics Formulation Preparation and Stability Studies

New Publications

» Nanoparticle Toxicity: Responding to Analytical and Regulatory Challenges with Field-Flow Fractionation

We've upgraded our website.

We're excited to announce our new website is live!

Please explore the new structure to find more information on the applications of light scattering, an expanded Support Center, and a searchable library of Application Notes. In addition, we're now mobile-friendly!

Visit the new site today and see what Wyatt can do for you.

FOCUS ON: Frank von der Kammer

In the early 1990's, Frank became one of the pioneers of combining MALS with Field-Flow Fractionation. After finishing his master's degree in 1995, Frank started his Ph.D. thesis: "Characterization of Environmental Colloids applying Field-Flow Fractionation - Multi Detection Analysis with Emphasis on Light Scattering Techniques" at the Hamburg University of Technology (TUHH) under Prof. Ulrich Förstner. He obtained his first miniDAWN and symmetrical Flow-FFF from Wyatt Europe in 1996, upgraded to a DAWN EOS coupled to Sedimentation FFF in 1999, and started investigating the size distribution of natural colloids. At that time, the word "nanoparticle" had not yet been coined, and this type of work was still considered exotic.

Frank paved the way for novel and advanced experimental protocols on how to extract and prepare stable suspensions of natural colloids, and provided the method development on how to separate them using Flow-FFF and Sedimentation FFF. He coupled both techniques with the DAWN, and was one of the first scientists to publish accurate size distributions based on MALS results. With his idea of online coupling of DLS with MALS, he was ahead of his time.

Wyatt Europe actually came up with a prototype unit containing a correlator which was added to a DAWN EOS. A true online measurement was not yet possible, but the system worked fairly well in a stop-flow mode, resulting in the ability to measure a couple of DLS runs during an FFF separation. Frank proved that the combination of MALS, DLS and Sedimentation FFF yielded access to particle shape distributions, but these results were not yet published due to the lack of reference colloids for true validation of the results.

After completing his Ph.D. in 2005, Frank was appointed to a research position at the University of Vienna, where he is still working today. His group has become one of the world's

leading research units working on the impact of nanoparticles in the environment. His group has participated in leading roles in numerous EU projects including the "NanoSafety Cluster" and the "NanoDefine" projects, both of which must set the standards and regulations for the handling, management, and risk assessment of nanomaterials. The Kammer group continues contributing ground-breaking results on the evaluation of possible hazardous effects of nanoparticles in our environment, the food chain, and our drinking water.

Some of Frank's latest publications focus on the development of validated sizing methods in food and cosmetics, universally applicable nanoparticle reference materials and standards, and on the harmonization of methodology used in the field.

Wyatt Technology is pleased to feature Frank von der Kammer as a plenary speaker at ILSC 2015 in the special symposium on nanoparticle characterization, where he will present *FFF-MALS-ICPMS Methods for the Analysis of Nanomaterials in Substances and Products*.

CAREERS

Excellence is our passion. Wyatt customers know they can rely on Wyatt to provide the best instruments, training and support available. If supporting cutting-edge science is your passion, Wyatt may be the place for you!

- Application Scientist – Analytical Services
- Application Scientist – Customer Service
- Application Scientist – DC Region
- Application Scientist – NE Region
- Application Scientist – NJ Region
- Graphic Designer
- Intellectual Property Technical Assistant
- Manufacturing Engineer
- Regional Sales Manager – Bay Area
- Software Development Engineer
- VP of Sales – North America

HIGHLIGHT: Wyatt Instruments Play an Important Role in Nanotechnology Research

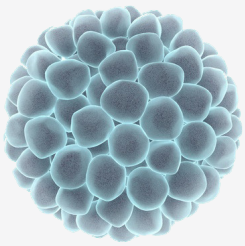
In anticipation of the upcoming International Light Scattering Colloquium (ILSC) with the featured symposium "Light Scattering in the Nano World", it seemed like a good time to share some interesting nanotechnology research utilizing Wyatt instruments. The trajectory of research, discovery and invention within the field of nanotechnology is diverse and rapid with applications for engineered nanoparticles spanning multiple disciplines and consumer uses.

Within the field of drug delivery, researchers at the Albert Einstein College of Medicine in collaboration with scientists at Oregon State University, created curcumin-encapsulated nanoparticles (curc-np) for potential use as a topical antimicrobial wound healing agent (Krausz et al. 2015). A DynaPro NanoStar was used to determine the average hydrodynamic diameter and polydispersity index of the engineered curc-np. Once characterized, the synthesized curc-np was further shown to accelerate wound healing in vitro and in vivo.

At the University of Florida, researchers created pH-sensitive nanoparticles as a possible agricultural delivery option for nutrients, fertilizers and pesticides (Hill et al. 2015). The strategy was to create reagent loaded nanoparticle polymers that were small enough to diffuse through the plant cell wall intact, but hydrolyze and release the encapsulated components upon transport to the alkaline pH of the plant phloem. This site-specific delivery is highly desirable to target biochemical pathways that take place in the phloem. The Optilab T-rEX and miniDAWN TREOS along with ASTRA software were used to detect and calculate absolute molecular weights and polydispersities of the nanoparticle polymers.

Silver nanoparticles (AgNPs) are commonly used in food storage containers due to their antimicrobial activity. Because of the direct contact with consumable products, this particular use of nanotechnology has raised concerns over biological and environmental nanoparticle migration, uptake and degradation, leading to a growing interest in developing methods for detecting AgNPs in food. Scientists in Germany evaluated the reproducibility of AF4–ICP-MS as a method for detecting the presence, quantity and size of AgNPs in chicken meat (Loeschner et al. 2015). Researchers spiked enzymatically treated tissue with varying amounts of AgNPs suspensions and utilized an Eclipse 3+ to separate the AgNPs from other components of the sample preparation. Following separation, additional analytical tools could be used to further characterize the AgNPs. The study resulted in a reproducible method that can potentially be utilized by regulatory agencies in Europe and globally.

Keynote and plenary speakers at ILSC will have more to say about this fascinating area of research. We encourage you to explore their work (see the ILSC 2015 program) and search Wyatt's online bibliography for additional publications related to nanotechnology research.



References

Hill et al. 2015. *Biomacromolecules* 16, 1276–1282.
Krausz et al. 2015. *Nanomedicine: Nanotechnology, Biology and Medicine* 11, 195–206.
Loeschner et al. 2015. *Food Chemistry* 181, 78–84.

THIS TIME IT'S PERSONAL: Social@Wyatt

As a small, family-owned and operated company, we consider every customer to be part of the Wyatt Technology family. We do our best to get to know you first-hand; and, as a family, we like to keep in touch! Several Social Media channels help us accomplish this:

LinkedIn Groups
Ask your light scattering peers for advice, keep up-to-date with the latest Wyatt news, or reconnect with LSU classmates through our LinkedIn groups.

Wyatt Technology - open to anyone interested in the technology and applications of light scattering for characterization of macromolecules and nanoparticles in solution. Get the latest news and join the technical discussions.

Light Scattering University Graduates – for active users of Wyatt instruments.

Join our community Social@Wyatt for topical discussion groups.