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## **Chemist Alan Marshall explains 'Key to Exploiting Nature's Isotopic Complexity'**

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By Keith Arterburn

On April 17, internationally-known chemist Dr. Alan G. Marshall spoke to more than 50 INL researchers and staff for an hour on Reading Chemical 'Fine Print': The Key to Exploiting Nature's Isotopic Complexity.

Marshall, a distinguished professor of chemistry at Florida State University and director of the National High Magnetic Field Laboratory Ion Cyclotron Resonance Program, outlined the benefits of his patented invention, the Fourier transform ion cyclotron resonance mass spectrometer (FT-ICR-MS). He specifically addressed the ability of this technique to offer 10-100 times higher mass resolving power and mass accuracy than other mass analyzers.

He noted that this technology has wide application for research and improves analysis capabilities for mass spectrometric research ranging from investigations in geochemistry to biochemistry, pharmacy and energy science. Marshall has used FT-ICR-MS in analyzing South American crude oil and the characterization of saturated and unsaturated oils. Additionally, he has employed FT-ICR-MS to determine the genetic makeup in several proteins. FT-ICR-MS offers definitive evidence of the chemical identity of the compounds in complex mixtures and enables scientists to attain answers for complicated unknown systems.

After earning his doctorate from Stanford University, Marshall received wide acclaim for his chemical research. His awards and recognition include selection as an Alfred P. Sloan Fellow, the American Chemical Society Award in Chemical Instrumentation, Eastern Analytical Symposium Award, American Chemical Society Field-Franklin Award in Mass Spectrometry, Spectroscopy Society of Pittsburgh Maurice F. Hasler Award, New York Society for Applied Spectroscopy Gold Medal, and the American Society for Mass Spectrometry Distinguished Contribution Award.

Marshall has received more than 29 distinguished scientific honors from universities and scientific societies. His extensive publication record totals more than 460 refereed articles and he is a much-sought-after scientific presenter. Marshall is a Fellow of both the American Physical Society and the American Association for the Advancement of Science. He holds four U.S. patents, including the first and primary patent on FT-ICR-MS.

The seminar was co-sponsored by INL's Interfacial Chemistry Department, the national Society of Applied Spectroscopy (SAS), and the Snake River Local Chapter of the SAS. While visiting INL, he discussed with the Interfacial Chemistry Department the possibility of collaborating with the INL mass spectrometry team on wavelength-resolved multiphoton photodissociation of discrete gas-phase complexes.

Before and after the seminar series presentation, Marshall toured IRC laboratories, hosted by INL researchers of the Interfacial Chemistry Department. SAS is sponsoring additional speaking opportunities to western SAS chapters during April.

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