

## **Patents and Publications of Rex E. Gerald II**

Near-Electrode Imager, J. W. Rathke  
R. J. Klingler, K. Woelk, and R. E. Gerald II  
US Patent # 6,046,592, issued April 4, 2000

Nuclear Magnetic Resonance Detector Used for Reducing Probe Ringing  
R. E. Gerald II, L. H. Nunez, and J. W. Rathke  
US Patent # 6,191,583 B1 issued February 20, 2001

Flat Metal Conductor Principal Detector Element for NMR Analysis of a Sample  
R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
US Patent # 6,469,507 issued October 22, 2002

Two-Dimensional  $B_1$ -Gradient NMR Imager  
R. E. Gerald II, R. L. Greenblatt, and J. W. Rathke  
US Patent # 6,538,444 issued March 25, 2003

Nuclear Magnetic Resonance Imaging Apparatus  
R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
US Patent # 6,674,283 issued January 6, 2004

Rotational Exchange Gradient Imager for In Situ Magnetic Resonance Analyses in Ultracentrifuge Sedimentation of Biological Materials and Rheology Investigations  
R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
US Patent # 6,720,769 issued April 13, 2004

Video Toroid Cavity Imager  
R. E. Gerald II, J. Sanchez, and J. W. Rathke  
US Patent # 6,774,635 issued August 10, 2004

Passively Shimmed Principal Detector Element for Toroid Cavity Detector NMR Probes  
R. E. Gerald II, and J. W. Rathke  
US Patent # 6,788,064 issued September 7, 2004

NMR Detector for Supported Monolayer and Multilayer Films  
R. E. Gerald II, L. E. Iton, and J. W. Rathke  
US Patent # 6,791,326 issued September 14, 2004

Capillary TCD for High-Pressure NMR  
R. E. Gerald II, M. A. ter Horst, R. J. Klingler, M. J. Chen, and J. W. Rathke  
Patent Application (DOE), filed June 20, 2005, patent pending

Toroid Cavity/Coil NMR Multi-Detectors

R. E. Gerald II, A. D. Meadows, J. S. Gregar, and J. W. Rathke  
Patent Application (DOE), filed June 13, 2005, patent pending

Active Membrane Having Uniform, Physico-Chemically Functionalized Ion Channels and a Method Making the Same

R. E. Gerald II, K. J. Ruscic, D. N. Sears, L. J. Smith, R. J. Klingler, and J. W. Rathke  
Patent Application (DOE), filed January 7, 2005, patent pending

Improved Aluminum Oxide/Lithium Iodide Solid-State Separator/Electrolyte

R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
Provisional Patent Application (ANL), filed August 2, 2005, patent pending

Molecule Nanoweaver Methodology

R. E. Gerald II, R. J. Klingler, J. W. Rathke, R. Diaz, and L. Vukovic  
Provisional Patent Application (ANL), filed September 19, 2005, patent pending

NMR Characterization of Thin Films

R. E. Gerald II, R. J. Klingler, J. W. Rathke, R. Diaz, and L. Vukovic  
Provisional Patent Application (ANL), filed September 22, 2005, patent pending

High Cation Transport Polymer Electrolyte

R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
Response to 2<sup>nd</sup> Office Action, filed January, 2005, patent pending

Batteries Using Active Membrane Having Uniform, Physico-Chemically Functionalized Ion Channels and a Method for Making the Same

R. E. Gerald II, K. J. Ruscic, D. N. Sears, L. J. Smith, R. J. Klingler, and J. W. Rathke  
Patent Application filed January 7, 2005, patent pending

## Publications and Presentations

### Papers in Professional Journals and Book Chapters

Gerald II, R. E., Hyman L. G., Ladbury, R., Resmer, R., and Fernandez, E.

*Cryogenics.* 23: 73 (1983). (ISSN:0011-2275)

**A simple engineering calibration for platinum resistance thermometers in the temperature range 4.2 K-273 K.**

Yang, Nien C., Gerald II, R. E., and Wasielewski, M. R.

*J. Am. Chem. Soc.* 107: 5531 (1985). (ISSN:0002-7863)

**Chemistry of Exciplexes. 19. Exciplex-Promted Electron Transfer in 1-(Pheylaminol)-3-(9-Anthryl) propanes.**

Yang, Nien C., Minsek, W., Johnson, D. G., Larson, J. R., Petrich, J. W., Gerald II, R. E., and Wasielewski, M. R.

*Tetrahedron.* 45: 4669-4681 (1989). (ISSN:0040-4020)

**Photochemistry of Polychromophoric Arylamines.**

Jameson, C. J., Jameson, A. K., Gerald II, R. E., and de Dios, A. C.

*J. Chem. Phys.* 96: 1676 (1992). (ISSN:0021-9606)

**Nuclear magnetic resonance studies of xenon clusters in zeolite NaA.**

Jameson, C.J., Jameson, A.K., Gerald II, R.E., and de Dios, A.C.

*J. Chem. Phys.* 96: 1690 (1992). (ISSN:0021-9606)

**129Xe Nuclear magnetic resonance studies of xenon in zeolite CaA.**

Gerald II, R. E., Bernhard, T., Haeberlen, U., Rendell, J., and Opella, S.

*J. Am. Chem. Soc.* 115: 777 (1993). (ISSN:0002-7863)

**Chemical shift and the electric field gradient tensors for the amide and carboxyl hydrogens in the model peptide N-Acetyl-D, L-valine: A single crystal deuterium NMR study.**

Jameson, A. K., Jameson, C. J., and Gerald II, R. E.

*J. Chem. Phys.* 101: 1775-1786 (1994). (ISSN:0021-9606)

**Cage-to-cage migration rates of Xe atoms in Zeolite NaA from magnetization transfer experiments and simulations.**

Jameson, A. K., Jameson, C. J., de Dios, A. C., Oldfield, E., Gerald II, R. E., and Turner, G.

*Solid State Nucl. Magn. Reson.*, 4(1): 1 (1995). (ISSN:0926-2040)

**129Xe MAS spectra of xenon in zeolite NaA. Direct observation of mixed clusters of Co-adsorbed species.**

Jameson, C. J., Jameson, A. K., Gerald II, R. E., and Lim, H.-M.

*J. Chem. Phys.* 103: 8811 (1995). (ISSN:0021-9606)

**Xe<sub>n</sub> clusters in the alpha cages of zeolite KA.**

Gerald II, R. E., Krasavin, A. O. and Botto, R. E.  
*J. Magn. Reson. A* 123: 201-206 (1996). (ISSN:1064-1858)  
**A Selective-Echo Method for Chemical-Shift Imaging of Two-Component Systems.**

Woelk, K., Gerald II, R. E., Klingler, R. J., and Rathke, J. W.  
*J. Magn. Reson. A* 121: 74-77 (1996). (ISSN:1064-1858)  
**Imaging Diffusion in Toroid Cavity Probes.**

Rathke, J. W., Klingler, R. J., Gerald II, R. E., Kramarz, K. W., Woelk, K.  
*Progress in Nuclear Magnetic Resonance Spectroscopy* 30: 209-253 (1997). (ISSN:0079-6565)  
**Toroids in NMR spectroscopy.**

Jameson, C. J., Jameson, A. K., Gerald II, R. E., and Lim, H. M.  
*J. Phys. Chem. B* 101, 8418 (1997). (ISSN:1089-5647)  
**Anisotropic Xe Chemical Shifts in Zeolites. The Role of Intra- and Intercrystallite Diffusion.**

D. M. Gregory, R. E. Gerald II, and R. E. Botto  
*J. Magn. Reson. A* 131(2) 327 (1998). (ISSN:1064-1858)  
**Pore-Structure Determinations of Silica Aerogels by  $^{129}\text{Xe}$  NMR Spectroscopy and Imaging**

Gerald II, R. E., Klingler, R. J., Sandi, G., Johnson, C. S., Scanlon, L. G., and  
*J. Power Sources* 89 (2), 237-243 (2000). (ISSN:0378-7753)  
 **$^7\text{Li}$  NMR Study of Intercalated Lithium in Curved Carbon Lattices.**

G. Sandi, R. E. Gerald II, L. G. Scanlon, C. S. Johnson, R. J. Klingler, and J. W. Rathke  
*J. New Mater. Electrochem. Syst.* 3, 13 (2000). (ISSN:1480-2422)  
**Molecular Orbital and Li-7 NMR Investigation of the Influence of Curved Lattices in Lithium Intercalated Carbon Anodes.**

K. Woelk, B. L. J. Zwank, P. Trautner, E. Lehnhofer, J. Bargon, R. J. Klingler, R. E. Gerald II, and J. W. Rathke  
*J. Magn. Reson.* 145, 276-290 (2000). (ISSN:1090-7807)  
**Finite-Difference Approach for the High-Precision Analysis of Rotating-Frame Diffusion Images.**

D. E. Fremgen, R. E. Gerald, E. S. Smotkin, R. J. Klinger, and J. W. Rathke  
*J. Supercrit. Fluids* 19, 287-298 (2001). (ISSN:0896-8446)  
**Microemulsions of Water in Supercritical Carbon Dioxide: An In-Situ NMR Investigation of Micelle Formation and Structure.**

R. E. Gerald II, J. Sanchez, C. S. Johnson, R. J. Klingler, and J. W. Rathke,  
*J. Phys. Condens. Matter* 13, 8269-8285 (2001). (ISSN:0953-8984)  
**In Situ Nuclear Magnetic Resonance Investigations of Lithium Ions in Carbon Electrode Materials Using a Novel Detector.**

- P. Trautner, K. Woelk, J. Bargon, and R. E. Gerald  
*J. Magn. Reson.* 151, 284-290 (2001). (ISSN:1090-7807)  
**Angular Flow in Toroid Cavity Probes.**
- K. Woelk, P. Trautner, H.G. Niessen, and R. E. Gerald II,  
*J. Magn. Reson.* 159, 207-212 (2002). (ISSN:1090-7807)  
**RIDE'n RIPTRing Down Elimination in Rapid Imaging Pulse Trains.**
- K. Woelk, B. L. J. Zwank, J. Bargon, R. J. Klingler, R. E. Gerald II, and J. W. Rathke  
*In Chapter 8 of Spatially Resolved Magnetic Resonance*, Eds., P. Blümller, B. Blümich, R. Botto, and E. Fukushima, Wiley-VCH, New York, pp. 101-110 (1998)  
**Imaging Diffusion with Non-Uniform  $B_1$  Gradients.**
- R. E. Gerald II, R. J. Klingler, J. W. Rathke, G. Sandi, and K. Woelk  
*In Chapter 9 of Spatially Resolved Magnetic Resonance*, Eds., P. Blümller, B. Blümich, R. Botto, and E. Fukushima, Wiley-VCH, New York, pp. 111-119 (1998)  
**In Situ Imaging of Charge Carriers in an Electrochemical Cell.**
- D. M. Gregory, R. E. Gerald II, D. J. Clifford, and R. E. Botto:  
*In Chapter 13 of Spatially Resolved Magnetic Resonance*, Eds., P. Blümller, B. Blümich, R. Botto, and E. Fukushima, Wiley-VCH, New York, pp. 163-177 (1998)  
 **$^{129}\text{Xe}$  MRM Characterization of Pore Structures in Silica Aerogels.**
- J. W. Rathke, R. J. Klingler, R. E. Gerald II, D. E. Fremgen, K. Woelk, and C. J. Elsevier  
*NMR Spectroscopy: Chemical Synthesis Using Supercritical Fluids*, Eds., P. G. Jessop and W. Leitner Wiley-VCH, Weinheim, pp. 165-194 (1999).
- C. J. Jameson, A. K. Jameson, A. C. de Dios, R. E. Gerald II, H. L. Lim and P. Kostikin  
*In Chapter 23 of Modeling NMR Chemical Shifts: Gaining Insights into Structure and Environment*, Eds., J. C. Facelli and A. C. de Dios, Am. Chem. Soc. Symp. Series 732, Washington, DC, pp. 345-348 (1999).  
**Application of Nuclear Shielding Surfaces to the Fundamental Understanding of Adsorption and Diffusion in Microporous Solids.**
- R. E. Gerald II  
*Solid-state Nuclear Magnetic Resonance, In Encyclopedia of Analytical Chemistry: Applications, Theory and Instrumentation*, Robert A. Meyer Editor-in-Chief, John Wiley & Sons, Chichester, pp. 12,306-12,335 (2000).

## Papers in other Academic Journals

Klingler, R. J., Rathke, J. W., Woelk, K., Kramarz, K. W., and Gerald II, R. E.  
**Applications of toroids in high-pressure NMR spectroscopy.**  
*American Chemical Society, Division of Fuel Chemistry Preprints 40: 415 (1995).*

Rathke, J. W., Klingler, R. J., Chen, M. J., Kramarz, K. W., and Gerald II, R. E.  
**Toroid NMR Studies. Proc. Of the Tenth DOE/BES Heterogeneous Catalysis and Surface Chemistry.**  
*Research Conf., Lake Conroe, TX, May 21-24, 1996, pp. 121-124 (1996).*

L. Nunez, R. E. Gerald, E. S. Grownay, M. D. Kaminski, and S. E. Aumeier  
**Nondestructive NMR Technique for Moisture Determination in Radioactive Materials.**  
*Progress Report ANL-98/17 (July 1998)*

G. Sandi, R. E. Gerald, R. J. Klingler, J. W. Rathke, K. A. Carrado, and R. E. Winans  
**Studies of Electrolyte Penetration in Carbon Anodes by NMR Techniques**  
*Proceedings of the Lithium Battery Symposium, 194th Meeting of the Electrochemical Society, November 1-6, 1998, Boston, MA*

G. Sandi, R. E. Gerald II, L. G. Scanlon, K. A. Carrado, and R. E. Winans  
**Computational, Electrochemical and  $^7\text{Li}$  NMR Studies of Lithiated Disordered Carbon Electrodes in Lithium Ion Cells.**  
*Mater. Res. Soc. Symp. Proc., Materials for Electrochemical Energy Storage and Conversion II-Batteries, Capacitors and Fuel Cells, 496, 95, (1998).*

R. E. Gerald II, L. H. Nuez, R. J. Klingler, and J. W. Rathke:  
 **$^7\text{Li}$  NMR Imaging at the Surface of an Aerospace Alloy.**  
*The Chemist, 76(2) 45 (1999).*

D. M. Gregory, R. E. Gerald II, G. D. Cody, and R. E. Botto  
**Recent Advances in Magnetic Resonance Microscopy to the Physical Structure Characterization of Carbonaceous and Inorganic Materials.**  
*213<sup>th</sup> Am. Chem. Soc. National Meeting, San Francisco, CA. Apr 13-17, 1997, Preprints, Vol. 42 No. 1, pp. 283-288.*

J. W. Rathke, R. J. Klingler, M. J. Chen, R. E. Gerald II, and K. W. Kramarz  
**Cobalt(I) Salt Formation in Hydroformylation Catalysis.**  
*The Chemists 80(1):9-12 (Summer 2003).*

A. K. Jameson, C. J. Jameson, A. C de Dios, E. Oldfield, and R. E. Gerald II  
**Direct Observation of Distributions of Mixed Clusters of Coadsorbed Species in Zeolite NaA.**  
*in Zeolite Science 1994: Recent Progress and Discussions, Eds. H. G. Karge and Fritz Haber, Studies in Surface Science and Catalysis, Vol. 98, Elsevier Science B. V., Amsterdam, pp. 85-86 (1995).*

### Papers Presented at International Scientific Meetings

Selected from over 150 presentations

- R. E. Gerald II, S. Heckmann, and J. W. Rathke  
**Characterizing Toroid Cavity Detectors for Investigations of Thin Films.**  
*43<sup>rd</sup> Experimental Nuclear Magnetic Resonance Conf., Pacific Grove, April 14-19, 2002*
- R. E. Gerald II, J. W. Rathke, and G. S. Schade  
**Surface Enhanced NMR.**  
*Illinois State University Faculty Members' Group Discussion,*  
Departments of Chemistry and Physics, Normal, IL, May 8, 2002
- R. E. Gerald II, J. W. Rathke, and G. S. Schade  
**Self-Assembled Monolayers Probed by a Novel NMR Detector.**  
*University of Illinois at Springfield Group Discussion with Professor Department of Chemistry, Springfield, IL, May 9, 2002*
- R. E. Gerald II, J. Sanchez, R. J. Klingler, and J. W. Rathke  
**Electrochemical/NMR Detectors.**  
*8<sup>th</sup> Int. Symp. on Polymer Electrolytes, Santa Fe, NM, May 24, 2002*
- R. E. Gerald II, J. Sanchez, R. J. Klingler, and J. W. Rathke  
**Advances in ENMR of Solid-State Electrolytes.**  
*44<sup>th</sup> Rocky Mountain Conf. on Analytical Chemistry, Denver, CO, July 30- August 3, 2002*
- R. E. Gerald II, J. W. Rathke, R. J. Klingler, K. Woelk, M. J. Chen, E.R.J. Sanchez, and C. R. Jones  
**Toroid Cavity NMR Imagers.**  
*DOW Chemical Company Scientific Staff Members' Meeting,*  
Argonne National Laboratory, Argonne, IL, August 2002
- R. E. Gerald II, L. E. Iton, J. W. Rathke, G. R. Schade, and B. Yavuz  
**NMR Detection of a Contiguous Alkanethiol Monolayer.**  
*University of Chicago Nanohybrid Structures Workshop, Chicago, IL, November 15-16, 2002*
- R. E. Gerald II, J. Sanchez, R. J. Klingler, and J. W. Rathke  
**NMR Technology for In Situ Analyses of Coin Cells.**  
*5<sup>th</sup> IBAHBC, Waikoloa, HI, January 7-10, 2003*
- R. E. Gerald II, M. J. Chen, R. J. Klingler, and J. W. Rathke

**Toroid Cavity Detectors for Homogeneous Catalysis Studies in Supercritical Fluids.**  
*44<sup>th</sup> Experimental Nuclear Magnetic Resonance Conf.,  
Savannah International Trade & Convention Center, Savannah, GA, March 30-April 4,  
2003*

- R. E. Gerald II, D. N. Sears, K. J. Ruscic, R. J. Klingler, and J. W. Rathke  
**NMR Studies of Confined Molecules in Porous Al<sub>2</sub>O<sub>3</sub> Films.**  
*45<sup>th</sup> Rocky Mountain Conf. on Analytical Chemistry, Denver, July 27-31, 2003*
- R. E. Gerald II, J. Sanchez, D. N. Sears, K. J. Ruscic, R. J. Klingler, and J. W. Rathke  
**Probes for NMR Investigations of Dendrites, Intercalation Compounds, and Hybrid Al<sub>2</sub>O<sub>3</sub>/ PEO Electrolytes.**  
*NATO Advanced Research Workshop and Conference:  
New Carbon Based Materials for Electrochemical Energy Storage, APS,  
Argonne National Laboratory, Argonne, IL, October 19-24, 2003*
- R. E. Gerald II, R. J. Klingler, J. W. Rathke, L. E. Iton, and S. M. Gilligan  
**NMR Investigations of Butanol SAMs on Gallium Metal Surfaces.**  
*Discussion with Prof. Peter Pershan, Harvard University and Prof. Moshe Deutsch,  
Bar Ilan University, ChemMatCARS at the APS, Argonne, IL, November 19, 2003*
- R. E. Gerald II, R. J. Klingler, and J. W. Rathke  
**Rotational Exchange Gradient Imager Invention.**  
*Patent discussion with probe developers from Varian, Inc., 2004  
Varian Users' Conference, Stanford University, Stanford, CA, April 16-17, 2004*
- R. E. Gerald II, S. M. Gilligan, L. E. Iton, R. J. Klingler, and J. W. Rathke  
**NMR Studies of SAMs and tBLMs on Liquid Metal Surfaces Using a Novel Toroid Cavity Detector.**  
*45<sup>th</sup> Experimental Nuclear Magnetic Resonance Conf.,  
Pacific Grove, CA, April 18-23, 2004*
- K. J. Ruscic, R. E. Gerald II, D. N. Sears, R. J. Klingler, and J. W. Rathke  
**Optimization of a Novel Hybrid Electrolyte Battery System: NMR as a Means to Investigate Physical Chemistry Inside of Nanochannels.**  
*45<sup>th</sup> Experimental Nuclear Magnetic Resonance Conf.,  
Pacific Grove, CA, April 18-23, 2004*
- R. E. Gerald II  
**Creating a Marketable Technology Portfolio: A Personal Experience- The Toroid Cavity Imager.**  
*Seminar presented at Argonne National Laboratory, Chemical Engineering Division  
Argonne, IL, July 14, 2004*
- R. E. Gerald II, R. Diaz, D. N. Sears, K. J. Ruscic, R. J. Klingler, and J. W. Rathke

**Devices for Synthesis and NMR Studies of Porous Al<sub>2</sub>O<sub>3</sub> Films.**

*46<sup>th</sup> Rocky Mountain Conf. on Analytical Chemistry,  
Denver, August 1-5, 2004*

R. E. Gerald II, R. Diaz, D. N. Sears, K. J. Ruscic, R. J. Klingler, and J. W. Rathke

**NMR and FTIR Studies of Al<sub>2</sub>O<sub>3</sub>-LiI Solid-State Electrolytes.**

*15<sup>th</sup> ISMAR Conference, Ponte Vedra, FL, October 24-28, 2004*

R. E. Gerald II, R. J. Klingler, J. W. Rathke, and R. Diaz,

**Toroid Cavity NMR Detectors for In Situ Investigations in Magnetic, Electric, and Centrifugal Fields.**

*229<sup>th</sup> American Chemical Society National Meeting, San Diego, CA (Invited) March 13-17, 2005*

R. E. Gerald II, R. Diaz, K. J. Ruscic, D. N. Sears, R. J. Klingler, and J. W. Rathke

**Alumina Membranes Provide Unidirectional Pathways for Lithium Ion Transport.**

*46<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference, Providence, RI, April 10-15, 2005*

S. Saha, W. W. Brey, R. E. Gerald II, and J. W. Rathke

**RF Field Distribution inside a Toroidal Cavity Detector.**

*46<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference, Providence, RI, April 10-15, 2005*

R. E. Gerald II, R. Diaz, L. Vukovic and J. W. Rathke

**Apparatus for Generating Magnetic Field by Rotation of Charged Dielectric.**

*Presentation to David Lewis and John Heinrich of Revolution NMR, LLC, Fort Collins, CO, July 29, 2005*

R. E. Gerald II, L. Vukovic, R. Diaz, R. J. Klingler, and J. W. Rathke

**Molecule Nanoweaver.**

*47<sup>th</sup> Rocky Mountain Conference on Analytical Chemistry, Denver, July 31-August 4, 2005*

R. E. Gerald II, L. Vukovic, R. Diaz, K. J. Ruscic, R. J. Klingler, and J. W. Rathke

**NMR Imaging of Ions Confined in Nanopores.**

*47<sup>th</sup> Rocky Mountain Conference on Analytical Chemistry, Denver, July 31-August 4, 2005*

Oc Hee Han, Seen Ae Chae, Rex E. Gerald II, Rocio Diaz, Robert J. Klingler, Jerome W. Rathke, and Klaus Woelk

**Hybrid Inductor for Near Electrode Imager.**

*47th Experimental Nuclear Magnetic Resonance Conference*

*April 23 ~28, 2006, at Asilomar Conference Center, Pacific Grove, CA, USA*

**Invited Talks**

*Analytical Chemistry Seminar Series, Department of Chemistry,  
University of North Carolina, Chapel Hill, NC*

**In Situ NMR of Thin Films.**

February 7-10, 2002

*Int. Workshop on Nanocomposites: Materials, Neutrons, and Data Interpretation, Argonne National Laboratory, Argonne, IL*

**Synopsis of Poster #9: Thin Film NMR.**

March 30, 2002

*8<sup>th</sup> Int. Symp. on Polymer Electrolytes, Santa Fe, NM*

**In Situ NMR of Electrochemical Systems.**

May 24, 2002

*ANL Undergraduate Research Interns Seminar Series, DEP, Argonne National Laboratory, Argonne, IL*

**1-D and 2-D Toroid Cavity NMR Imagers.**

June 12, 2002

*Instrument Development Group, National High Magnetic Field Laboratory, Tallahassee, FL*

**Analysis of the RF Current Distribution in TCDs.**

September 22, 2003

*NSF ChemBio Workshop, Florida State University, Tallahassee, FL*

**NMR Investigations of SAMs on Liquid Metal Surfaces.**

September 23-26, 2003

*Department of Chemistry, University of Missouri, Rolla, MO*

**Novel NMR Detectors for In Situ Investigations of Electrochemical Systems.**

March 15, 2004

*NSF-NIRT proposal discussion with Prof. C. Jameson, Department of Chemistry and Luis Wedgewood, et. al., Department of Chemical Engineering, University of Illinois/Chicago, Chicago, Illinois*

**Toroid Cavity Detectors.**

October 19, 2004

*Department of Chemistry, Clark University Worcester, MA*

**Unusual NMR Probes.**

December 21, 2004

*205<sup>th</sup> Electrochemical Society Meeting San Antonio, TX*

**Ceramic Monolith Provides Unidirectional Ion-Conducting Channels for Lithium-Ion Cells.**

May 9-13, 2004

*Department of Chemistry and Department of Mechanical, Materials & Aerospace Engineering, Illinois Institute of Technology, Chicago, IL*

**Toroid Cavity Detectors for NMR Spectroscopy and Imaging.**

March 23, 2005

*Argonne's career development and leadership workshop Department of Educational Programs, Argonne National Laboratory, Argonne, IL*

**In Situ Electrochemical/NMR Analyses.**

June 8, 2005

*Summer Undergraduate Research Participants Seminar Series, Department of Educational Programs, Argonne National Laboratory, Argonne, IL*

**Toroid Cavity Detectors Invented at Argonne for NMR Spectroscopy and Imaging.**

June 29, 2005

*Korea Basic Science Institute, Daegu Center, Daegu, Korea*

**Overview of Toroid Cavity Detectors for NMR Spectroscopy and Imaging.**

November 3, 2005

*Korea Basic Science Institute, Daegu Center, Daegu, Korea*

**NMR Imaging of Confined Guest Molecules in Aluminum Oxide Nanopores.**

November 8, 2005

*Korea Institute for Ceramics Engineering and Technology, Seoul, Korea*

**Alumina Membranes and Nanoparticles for Solid-State Ion Conductors.**

December 2, 2005

*American Chemical Society Conference, PACIFICHEM-2005, Manoa, HI*

**NMR Imaging Molecular Confinement in AAO.**

December 19, 2005

*Department of Chemistry, University of Hawaii, Manoa, HI*

**Toroid cavity detector technology.**

December 21, 2005

*BIO-2006 Conference, Chicago, IL*

**Molecule Nanoweaver.**

April 10, 2006

*Department of Chemistry, Missouri State University, Springfield, MO*

**Rotating Frame NMR Imaging with Toroid Cavity Detectors.**

April 18, 2006