

## CURRICULUM VITAE

**Dr. Thomas MEERSMANN**

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### EDUCATION

1997 Ph.D. in Chemistry, Université de Lausanne, Switzerland (advisor:  
*Professor Geoffrey Bodenhausen*)  
1993 Chemie-Diplom (Chemistry Masters), Universität Tübingen, Germany

### ACADEMIC POSITIONS

Since 2006 Associate Professor (tenured), Chemistry, Colorado State University  
2000 – 2006: Assistant Professor (tenure track), Chemistry, Colorado State Univ.

### OTHER POSITIONS

2007 Invited visiting Professor, Victoria University of Wellington, New Zealand (6 months – host: Professor Paul Callaghan, MacDiarmid Institute for Advanced Materials and Nanotechnology).  
2001 Invited visiting Professor, Université Pierre et Marie Curie, Paris, France (1 month) (Professors *Jaques Fraissard & Antoine Gedeon*)  
1998 – 2000 Postdoctoral fellow, Lawrence Berkeley National Laboratory and Alexander von Humboldt Foundation, Feodor-Lynen postdoctoral fellow, University of California, Berkeley (advisor *Professor Alexander Pines*)  
1997 – 1998 Independent research scientist, National High Magnetic Field Laboratory (NHMFL), Tallahassee, Florida (7 months)  
1993 – 1994 Visiting research scholar, Cambridge University, Department of Chemistry, UK, in the laboratory of Dr. James Keeler (5 months).

### HONORS & AWARDS

2001 NSF CAREER award  
1998 Alexander von Humboldt Foundation: Feodor-Lynen research fellowship in science.  
1997 Université de Lausanne: award for Ph.D. thesis: "Prix de la Faculté"  
1983 German science competition: State competition for young scientists (Jugend Forscht –Landeswettbewerb Niedersachsen)

### TEACHING

C474	Physical Chemistry I (Quantum Mechanics)	2000F, 2001F, 2002F, 2004F
C478	Physical Chemistry Laboratory	2002S
C593	NMR, Diffusion Msrmts and MRI Techniques	2003S, 2004S, 2005S
C111	General Chemistry I	2003F, 2008F
C571	Quantum Chemistry	2005F
C471	Physical Chemistry for the Bio-Sciences	2006F
C476	Physical Chemistry II (Thermodynamics)	2007S, 2008S
C475	Physical Chemistry Laboratory I	2008F

## **PUBLISHED WORKS**

### **Refereed Journal Articles**

*From work before 2000:*

- 1.) D. Raftery, H. Long, T. Meersmann, P. J. Grandinetti, L. Reven, and A. Pines\*, "High-Field NMR of Adsorbed Xenon Polarized by Laser Pumping" *Phys. Rev. Lett.* **66** (1991) 584-587.
- 2.) T. Meersmann, and G. Bodenhausen\* "Transverse Relaxation in Proton NMR. Separate Measurement of Decay Rates of In-phase and Antiphase Coherences" *J. Magn. Reson. A* **115** (1995) 277-282.
- 3.) T. Meersmann, M. Schwager, V. Varma and G. Bodenhausen\* "Little-Known Advantages of Very High Fields in NMR" *J. Magn. Reson. A* **119** (1996) 275-279.
- 4.) T. Meersmann and G. Bodenhausen\* "Relaxation-induced oscillations of spin-echo envelopes" *Chem. Phys. Lett.* **257** (1996) 374-380.
- 5.) D. Jeannerat et. al., "Two Years of NMR Developments at the National High Magnetic Field Laboratory in Tallahassee, USA", *Chimia* **50** (1996) 633-638.
- 6.) T. Meersmann, S.A. Smith, and G. Bodenhausen\*, "Multiple Quantum Filtered Gas-Phase Xenon-131 NMR Spectroscopy as a Surface Probe", *Phys. Rev. Lett.* **80** (1997) 1398-1401.
- 7.) T. Meersmann\* and M. Haake, "Gas Phase <sup>131</sup>Xe Quadrupolar Splitting", *Phys. Rev. Lett.* **81** (1998) 1211-1214.
- 8.) G. Pavlovskaya, A. Blue, S.J. Gibbs, M. Haake, F. Cros, L. Mailer and T. Meersmann\*, "Xenon-131 Surface Sensitive Imaging of Aerogels in Liquid Xenon Near the Critical Point." *J. Magn. Reson.* **137** (1999) 258-264.
- 9.) L. Kaiser, T. Meersmann, J. Logan, and A. Pines\*, "Visualization of gas flow and diffusion in porous media" *Proc. Nat. Acad. Sci.* **97** (2000) 2414-2418.
- 10.) P. Sozzani, A. Comott, R. Simonutti, T. Meersmann, J.W. Logan, and A. Pines\*, "A porous crystalline molecular solid explored by hyperpolarized xenon", *Angewandte Chemie* **39** (2000) 2695-2698.
- 11.) T. Meersmann, J.W. Logan, R. Simonutti, S. Calderelli, A. Commotti, P. Sozzani, L. Kaiser and A. Pines\*, "Exploring single-file diffusion in one-dimensional nanochannels by laser-polarized Xe-129 NMR spectroscopy", *J. Phys. Chem. A* **104** (2000) 11665-11670.
- 12.) T. Meersmann\*, M. Dechamps and G. Bodenhausen\* "Probing the Surfaces of Aerogels by Multiple Quantum Filtered Xenon-131 NMR Spectroscopy", *J. Am. Chem. Soc.* **123** (2001) 941-945.
- 13.) L.G. Kaiser, J.W. Logan, T. Meersmann, and A. Pines\* "Dynamic NMR Microscopy of Gas Phase Poiseuille Flow", *J. Magn. Res.* **149**, (2001) 144 – 148.

*From independent work at Colorado State University (undergraduate researchers indicated by '#'):*

- 14.) M. G. Mortuza, A. Satyanarayana, G. E. Pavlovskaya, T. J. Dieken#, and T. Meersmann\*, "Spin-Exchange Optical Pumping of High-Density Xenon-129" *J. Chem. Phys.*, **118**, (2003), 1581-1584.
- 15.) S. Anala, G.E. Pavlovskaya, P. Pichumani, T.J. Dieken#, M.D. Olsen and T. Meersmann\*, "In Situ NMR of Combustion", *J. Am. Chem. Soc.* **125**, (2003), 13298 –13302.
- 16.) G.E. Pavlovskaya, C.F. Horton-Garcia#, C. Dybowski, D.R. Corbin and T. Meersmann\*, "Metallic Clusters and Color Changes in Silver-Exchanged Zeolites: <sup>109</sup>Ag Solid State NMR and Optical Studies", *J. Phys. Chem. B*, **108**, (2004), 1548-1589.

- 17.) C.F. Horton-Garcia, G.E. Pavlovskaya and T. Meersmann\*. "Introducing  $^{83}\text{Kr}$ -NMR spectroscopy as a new probe of void space in solids", *J. Am. Chem. Soc.* **127**, (2005), 1958-1962.
- 18.) K. Bartik, Ph. Choquet, A. Constantinesco, G. Duhamel, J. Fraissard\*, JN. Hyacinthe, G.E. Pavlovskaya, J. Jokisaari, E. Locci, T.J. Lowery, M. Luhmer, T. Meersmann, I.L. Moudrakovshi, K.L. Pierce, A. Pines, J. Ripmeester, V-V Telkki, W.S. Veeman, "Xenon NMR as a probe for microporous and mesoporous solids, polymers, liquid crystals, solutions, flames, protein, imaging." *l'Actualité Chimique*, **287**, (2005), 16 -34.
- 19.) G.E. Pavlovskaya, Z. Cleveland, C.F. Stupic, R.J. Basaraba, and T. Meersmann\*, "Hyperpolarized Krypton-83 as a New Contrast Agent for Magnetic Resonance Imaging", *Proc. Nat. Acad. Sci.*, **102**, (2005) 18275-18279.
- 20.) C.F. Stupic, Z. Cleveland, G.E. Pavlovskaya, and T. Meersmann\*, "Quadrupolar Relaxation of Hyperpolarized Krypton-83 as a Probe for Surfaces", *Solid State NMR Spectr.*, **29**, (2006) 79-84.
- 21.) Z. Cleveland, G.E. Pavlovskaya, C.F. Stupic, C.F. LeNoir#, and T. Meersmann\*, "Exploring Hyperpolarized Krypton-83 by Remotely Detected NMR Relaxometry", *J. Chem. Phys.* **124**, (2006) 044312.
- 22.) Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, John E. Repine, Jan B. Wooten, and Thomas Meersmann\*, "Hyperpolarized  $^{83}\text{Kr}$  and  $^{129}\text{Xe}$  NMR Relaxation Measurements of Hydrated Surfaces: Implications for Materials Science and Pulmonary Diagnostics" *J. Am. Chem. Soc.* **129**, (2007), 1784-1792.
- 23.) Zackary I. Cleveland, and Thomas Meersmann\*, "Studying Porous Materials with Krypton-83 NMR Spectroscopy". *Magnetic Resonance in Chemistry*, **45**, (2007), S12-S23.
- 24.) Zackary I. Cleveland, Galina E. Pavlovskaya, Karl F. Stupic, Jan B. Wooten, John E. Repine, and Thomas Meersmann\*, "Detection of Tobacco Smoke Deposition by Hyperpolarized Krypton-83 MRI." *Magnetic Resonance Imaging*, **26**, (2008), 270-278.
- 25.) Zackary I. Cleveland, and T. Meersmann, "Density Independent Contributions to Longitudinal Relaxation in  $^{83}\text{Kr}$ ." *CHEMPHYSICHEM*, **9**, (2008) 1375-1379.
- 26.) Zackary I. Cleveland, Galina E. Pavlovskaya, Karl F. Stupic, Randall J. Basaraba, Nancy D. Elkins, John E. Repine, and Thomas Meersmann\*, "In Situ Hyperpolarized  $^{83}\text{Kr}$  MRI of Lungs" *Journal of Magnetic Resonance* **195**, (2008), 232-237.
- 27.) Zackary I. Cleveland, and T. Meersmann, "Binary Collision Induced Longitudinal Relaxation in Gas-Phase  $^{83}\text{Kr}$ ", *Journal of Chemical Physics*, **129**, (2008), 244304-1 - 6.

#### Refereed Chapters in Books:

- 1.) G.E. Pavlovskaya and T. Meersmann\*. "Hyperpolarized  $^{129}\text{Xe}$  NMR spectroscopy, MRI and dynamic NMR microscopy for the in situ monitoring of gas dynamics in opaque media including combustion processes.", in: *Nuclear Magnetic Resonance Imaging in Chemical Engineering*, Stapf, Han (Eds.) Wiley-VCH publishers, Weinheim, Germany, (2005).
- 2.) G.E. Pavlovskaya and T. Meersmann\*. "Hyperpolarized  $^{83}\text{Kr}$  MRI", in: *Magnetic Resonance Microscopy*, Codd, Seymour (Eds.), Wiley-VCH publishers, Weinheim, Germany, (2009).

#### Patents/Copyrights

- 1.) T. Meersmann, Z. Cleveland, Carl F. Stupic, G.E. Pavlovskaya, 'NUCLEAR ELECTRIC QUADRUPOLAR PROPERTIES OF HYPERPOLARIZED GASES TO PROBE SURFACES AND INTERFACES', *Utility Patent Application to USPTO*

## **PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES / PROFESSIONAL MEETINGS/WORKSHOPS**

### *Lectures and seminars related to independent work at Colorado State University*

- 1.) **2001**, “*Novel Tools to Investigate Porous Materials: Multiple Quantum Filtered  $^{131}\text{Xe}$  NMR Spectroscopy and Continuous Flow Laser Polarized  $^{129}\text{Xe}$  for Diffusion Measurements*”, 42th Experimental Nuclear Magnetic Resonance Conference (ENC), Orlando, Florida, March 2001.
- 2.) **2001**, “*Single File Diffusion in the One-Dimensional Gas-Phase within Nanochannels by Continuous-Flow Laser-Spin-Polarized Xenon-120 NMR Spectroscopy*”, Université Pierre et Marie Curie (Paris VI), Paris - Jussieu, France June 2001, presentation as visiting professor.
- 3.) **2001**, “*Principles of Rubidium Vapor Pumping and its Applications in Magnetic Resonance Imaging and NMR Spectroscopy*”, Lausanne, Switzerland, June 2001, invitation by Nestlé
- 4.) **2002**, “*Production of laser-polarized xenon in mixtures with high noble gas partial pressures*”, NMR<sup>2</sup> conference, Salt Lake City, Utah, May 2002, invited presentation.
- 5.) **2002**, “*Hyper-Polarized Xenon-129 NMR Spectroscopy in Material Sciences: Basic Concepts and Novel Applications*”, Southern Illinois University, Carbondale, November 15, 2002, invited by the Department of Chemistry.
- 6.) **2003**, “*Hyper-Polarized Xenon-129 NMR Spectroscopy in Material Sciences: Basic Concepts and Novel Applications*”, Clark University, Worcester, Massachusetts, July 9 2003, invited by the Department of Chemistry.
- 7.) **2003**, “*Dynamics of Methane Combustion by In Situ NMR Spectroscopy using High Density Xenon-129 Optical Pumping*”, 45<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, July 28-31, 2003.
- 8.) **2003**, “*Hyperpolarization, Spins & Fire*”, initialization of the Rocky Mountain Magnetic Resonance (RMMR) at CSU (joint operation of the Chemical Engineering, Chemistry and Veterinarian Science Departments), September 16, 2003.
- 9.) **2003**, “*High Density Xenon-129 Optical Pumping for In-Situ NMR Spectroscopy of Methane Combustion*”, 7th International Conference on Magnetic Resonance Microscopy, Snowbird, Utah, September 20-25, 2003.
- 10.) **2003**, “*Multiple-Quantum Filtered (MQF) NMR Spectroscopy and MRI as a Probe in Material Sciences and Biology*”, Rocky Mountain Magnetic Resonance (RMMR) workshop, CSU, December 4th 2003.
- 11.) **2004**, “*Nuclear Magnetic Resonance Spectroscopy and Magnetic Resonance Imaging of Combustion*”, Richmond, Virginia, February 13, 2004, invited by Philip Morris.
- 12.) **2004**, “*Study of open and catalytic combustion processes by NMR spectroscopy*”, University of Delaware, Newark, Delaware, March 15, 2004, invited by the Department of Chemistry and Biochemistry .
- 13.) **2004**, “*NMR Spectroscopy and Combustion*” 45th Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, April 18-23, 2004.
- 14.) **2004**, “*Prospects of Krypton-83 NMR Spectroscopy For Material Sciences*” 46<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 2-5, 2004.
- 15.) **2004**, “*MRI of Combustion*”, 15<sup>th</sup> Annual Varian Workshop, Fort Collins, Colorado, August 6, 2004. invited presentation.
- 16.) **2004**, “*Development of a new analytical tool: In situ NMR and in situ MRI of high-temperature reaction*”, 228<sup>th</sup> National Meeting of the American Chemical Society, Division of Petroleum Chemistry (ACS Fall meeting), Philadelphia, Pennsylvania, August 22-26, 2004.
- 17.) **2004**, “*Studies of gas dynamics in materials by spin-polarized  $^{129}\text{Xe}$ -NMR spectroscopy*”, Colorado State University, Fort Collins, Colorado, September 20, 2004, invited by the Department of Physics.

- 18.) **2004**, “*Study of open and catalytic combustion processes by NMR spectroscopy*”, Colorado School of Mines, Golden, Colorado, September 24, 2004, invited by the Department of Chemistry.
- 19.) **2004**, “*In situ NMR and MRI of open and catalytic combustion processes*”, University of Colorado, Boulder, Colorado, October 22, 2004 invited by the Department of Chemistry.
- 20.) **2004**, “*In situ NMR spectroscopy and in situ Magnetic Resonance Imaging (MRI) of Combustion in Opaque Media*”, 6<sup>th</sup> Philip Morris USA Symposium on Fundamental Science, Richmond Virginia, October 26-28, 2004, invited presentation.
- 21.) **2004**, “*In-situ NMR of open and catalytic combustion processes*”, Colorado School of Mines, Golden, Colorado, November 19, 2004, invited by the Department of Chemical Engineering.
- 22.) **2005**, “*Recent Advances with hyperpolarized gases in NMR and MRI*”, Society of Western Analytical Professors (SWAP), Colorado State University, Fort Collins, Colorado, January 14-15 2005.
- 23.) **2005**, “*Novel advances with hyperpolarized gases in magnetic resonance imaging*”, 229<sup>th</sup> National Meeting of the American Chemical Society, Division of Physical Chemistry (ACS Spring meeting), San Diego, California, March 13 -17, 2005, invited presentation.
- 24.) **2005**, “*Recent developments in NMR and MRI using hyperpolarized gases*”, Princeton University, Princeton, New Jersey, March 29, 2005, invited by the Chemistry Department.
- 25.) **2005**, “*NMR Spectroscopy and MR Imaging using Hyperpolarized Xenon and Krypton*”, Georgetown University, Washington, DC, March 31, 2005, invited by the Chemistry Department.
- 26.) **2005**, “*Hyperpolarized Xenon and Krypton in NMR Spectroscopy and MR Imaging*”, Columbia University, New York, NY, April 4, 2005, Chemistry Department.
- 27.) **2005**, “*Novel Contrast in MR Imaging through Hyperpolarized Krypton-83*”, Harvard Medical School, Charlestown, Massachusetts, April 5, 2005, Massachusetts General Hospital, MRI Center.
- 28.) **2005**, “*Novel Contrast in MR Imaging through Hyperpolarized Krypton-83*”, Harvard University, Cambridge, Massachusetts, April 6, 2005, Harvard-Smithsonian Center for Astrophysics.
- 29.) **2005**, “*Recent Advances in NMR Spectroscopy and MR Imaging with Hyperpolarized Xenon and Krypton*”, Massachusetts Institute of Technology MIT, Cambridge, Massachusetts, April 7, 2005, Francis Bitter Magnet Laboratory.
- 30.) **2005**, “*Introducing Hyperpolarized Krypton-83 MRI*”, 46th Experimental Nuclear Magnetic Resonance Conference (ENC), Providence, Rhode Island, April 10-15, 2005, invited presentation.
- 31.) **2005**, “*Hyperpolarized Xenon and Krypton in NMR Spectroscopy and MR Imaging.*”, Sandia National Laboratory, Albuquerque, New Mexico, May 6, 2005, invited by NMR Division.
- 32.) **2005**, “*Introducing Krypton-83 NMR Spectroscopy, Hyperpolarized (hp) Krypton-83 and hp Krypton-83 MR Imaging.*”, NMR<sup>2</sup> (regional) conference, Albuquerque, New Mexico, May 7, 2005, invited presentation.
- 33.) **2005**, “*Recent developments in NMR and MRI using hyperpolarized gases.*”, University of California, Los Angeles, California, May 16, 2005, invited by the Chemistry Department.
- 34.) **2005**, “*Hyperpolarized Xenon and Krypton for NMR Spectroscopy and MR Imaging.*”, University of California, Irvine, California, May 17, 2005, invited by the Chemistry Department.
- 35.) **2005**, “*Hyperpolarized Xenon and Krypton for NMR Spectroscopy and MR Imaging.*”, University of California, Riverside, California, May 18, 2005, invited by the Chemistry Department.
- 36.) **2005**, “*Hyperpolarized Xenon and Krypton for NMR Spectroscopy and MR Imaging.*”, California Institute of Technology, Pasadena, May 16, 2005, invited by the Chemical Physics Division.
- 37.) **2005**, “*NMR & MRI Beyond Boltzmann*”, Colorado State University, Fort Collins, October 6, 2005, Tenure presentation at Chemistry Department.
- 38.) **2006**, “*Hyperpolarized <sup>83</sup>Kr as a probe for surfaces and its application as a novel contrast agent in MR imaging*”, Purdue University, West-Lafayette, Indiana, March 8, 2006, invited by the Chemistry Department.
- 39.) **2006**, “*Hyperpolarized <sup>83</sup>Kr as a probe for surfaces and its application as a novel contrast agent in MR imaging.*” 3<sup>rd</sup> Xenon in Materials Meeting (XeMat III), Ottawa, Canada, June 1 – 3 2006.

- 40.) **2006**, “*Beyond Boltzmann: Hyperpolarized <sup>83</sup>Kr (S = 9/2) as a Probe for Surfaces and as Novel Contrast Agent in Magnetic Resonance Imaging*”, Florida State University, Tallahassee, Florida October 16, 2006, invited by the Chemistry Department.
- 41.) **2006**, ‘*Hyperpolarized Krypton-83 Lung Imaging*’, Thomas Meersmann, Webb-Waring Institute for Cancer, Aging and Antioxidant Research, Denver Colorado, October 30, 2006.
- 42.) **2007** ‘*Spin relaxation in hyperpolarized krypton-83 and xenon-129*’, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, John E. Repine and Thomas Meersmann, ‘New Frontiers in Imaging’ APS Symposium, APS March meeting, Denver, Colorado, March 5 – 9 2007.
- 43.) **2007** ‘*Studies of gas dynamics using hyperpolarized <sup>129</sup>Xe Magnetic Resonance*’ McDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand, August 30, 2007. Paul Callaghan group seminar.
- 44.) **2007** ‘*Hyperpolarized krypton-83 as a novel contrast agent in MRI*’, University of Western Sydney Symposium on NMR Imaging and Diffusion, Campbelltown, Australia, October 27, 2007. Invited contribution.
- 45.) **2007** ‘*Nuclear magnetic Resonance beyond Boltzmann: Hyperpolarized noble gases as MRI contrast agents in materials and organisms*’ Victoria University of Wellington, New Zealand November 30, 2007. Invited by the School of Chemical and Physical Sciences.
- 46.) **2007** ‘*Nuclear magnetic Resonance beyond Boltzmann: Hyperpolarized noble gases as MRI contrast agents in materials and organisms*’ Magritek, Wellington, New Zealand December 10, 2007.
- 47.) **2008** ‘*Hyperpolarized krypton-83 as a novel contrast agent in MRI*’ Department of Medical Biophysics, University of Toronto, February 25, 2008. Invited by Sunnybrook Health Sciences Centre.
- 48.) **2008** ‘*Hyperpolarized Krypton-83 MRI of Lungs – A Feasibility Study*’ EUROMAR 2008, St. Petersburg, Russia, July 6 – 12, 2008. Invited contribution.

#### **Poster and Seminar Presentations by the Meersmann Group since 2000**

- 1.) **2002**, 41th Experimental Nuclear Magnetic Resonance Conference, Asilomar Conference Center, Pacific Grove, California, April 14-19, 2002, 3 poster, presenting Authors: Satyanarayana Anala, Muhammad G. Mortuza Galina E. Pavlovskaya.
- 2.) **2002**, 44<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, July 28-August 1 2002, 2 poster, Presenting Author: Satyanarayana Anala, Galina E. Pavlovskaya.
- 3.) **2003**, 42th Experimental Nuclear Magnetic Resonance Conference, Savannah, Georgia, March 30 – April 4, 2003, 3 posters, presenting Authors: Satyanarayana Anala, T. Meersmann, Galina E. Pavlovskaya.
- 4.) **2003**, Gordon Research Conference on Magnetic Resonance, Newport, Rhode Island, June 15-20, 2003, 2 poster, presenting authors: Galina E. Pavlovskaya, T. Meersmann
- 5.) **2003**, “*Metallic Clusters and Colors in Silver Exchanged Zeolites; <sup>109</sup>Ag and <sup>133</sup>Cs NMR studies.*” 45<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, July 28-August 1, 2003, 1 poster, presenting author: Charlene Horton-Garcia.
- 6.) **2003**, “*Divergent Velocity Fields during Contraction Flow of Viscoelastic Fluids*”, 7th International Conference on Magnetic Resonance Microscopy, Snowbird, Utah, September 20-25, 2003, Galina E. Pavlovskaya, oral presentation.
- 7.) **2004**, “*Introducing Krypton NMR Spectroscopy as a Probe of Void Space in Solids.*” & “*Divergent Velocity Fields during Contraction flow of a viscoelastic fluid*”, 43th Experimental Nuclear Magnetic Resonance Conference, Asilomar Conference Center, Pacific Grove, California, April 18-23, 2004, 2 poster, presenting Authors: Charlene Horton-Garcia, Galina E. Pavlovskaya.
- 8.) **2004**, “*Formation of metallic nanoparticles in Zeolites RHO: solid state <sup>109</sup>Ag and <sup>133</sup>CS NMR studies*”, 46<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 2-5, 2004, 1 poster, presenting authors: Zackary Cleveland, Galina E. Pavlovskaya.

- 9.) **2005**, “*Characterization of divergence in velocity fields during entry flow of a viscoelastic fluid by MRI velocimetry methods*”, The Society of Rheology 76<sup>th</sup> annual meeting, Lubbock, Texas, February 13-17, 2005, Galina E. Pavlovskaya, **oral presentation**.
- 10.) **2005**, “*Advances in High Density Optical Pumping*”, 46th Experimental Nuclear Magnetic Resonance Conference (ENC), Providence, Rhode Island, April 10-15, 2005, 1 Poster, presenting author: Zackary Cleveland.
- 11.) **2005**, ‘*Hyperpolarized Krypton-83 as a new Contrast Agent for MR Imaging.*’, Galina E Pavlovskaya, Zackary I Cleveland, Randall J. Basaraba, Thomas Meersmann, 47<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 1-4, 2005, poster presentation.
- 12.) **2005**, ‘*Relaxation of <sup>83</sup>Kr in Porous Media*’, Karl Stupic, Galina E. Pavlovskaya, Zackary I. Cleveland, and Thomas Meersmann, 47<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 1-4, 2005, poster presentation.
- 13.) **2005**, ‘*Introducing Krypton NMR Spectroscopy as a Probe of Void Space in Solids.*’, Charlene Horton-Garcia, Galina E. Pavlovskaya, and Thomas Meersmann, 47<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 1-4, 2005, poster presentation.
- 14.) **2005**, ‘*Novel Production and Application of High-Density Optically Pumped Gases*’, Zackary I. Cleveland, Karl Stupic, Galina E. Pavlovskaya, Cathrine LeNoir, and Thomas Meersmann, 47<sup>th</sup> Rocky Mountain Conference, Denver, Colorado, August 1-4, 2005, poster presentation.
- 15.) **2006**, ‘*Hyperpolarized krypton-83 as a surface sensitive contrast agent for MR imaging*’, Karl F. Stupic, Galina E. Pavlovskaya, Zackary I. Cleveland, and Thomas Meersmann, 45<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, April 24-28, 2006, poster presentation.
- 16.) **2006**, ‘*Remotely Detected NMR Relaxometry with hyperpolarized <sup>83</sup>Kr.*’, Zackary I. Cleveland, Galina E. Pavlovskaya, Karl F. Stupic, and Thomas Meersmann, 47<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, April 24-28, 2006, poster presentation.
- 17.) **2006** ‘*Hyperpolarized Krypton-83 NMR Relaxation Studies of Bovine Lung Surfactant.*’ Karl F. Stupic, Zackary I. Cleveland, Galina E. Pavlovskaya, and Thomas Meersmann, 48<sup>th</sup> Rocky Mountain Conference, Breckenridge, Colorado, July 24-27, 2006, poster presentation.
- 18.) **2006** ‘*Investigating the Surface Induced Relaxation of Hyperpolarized <sup>83</sup>Kr and <sup>129</sup>Xe.*’ Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, and Thomas Meersmann, 48<sup>th</sup> Rocky Mountain Conference, Breckenridge, Colorado, July 24-27, 2006, poster presentation.
- 19.) **2007** ‘*Newtonian Fluid Flow in a Porous Medium with Transverse Permeability Discontinuity*’, Galina E. Pavlovskaya, ‘*New Frontiers in Imaging*’ APS Symposium, APS March meeting, Denver, Colorado, March 5 – 9 2007, **oral presentation**.
- 20.) **2007** ‘*Hyperpolarized <sup>83</sup>Kr as a MRI Contrast Agent*’, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, John E. Repine and Thomas Meersmann, ‘*New Frontiers in Imaging*’ APS Symposium, APS March meeting, Denver, Colorado, March 5 – 9 2007, **oral presentation**.
- 21.) **2007** ‘*Introducing Hyperpolarized Xenon-131 Directly Detected by NMR Spectroscopy*’, Karl F. Stupic, Zackary I. Cleveland, Galina E. Pavlovskaya, John E. Repine and Thomas Meersmann, ‘*New Frontiers in Imaging*’ APS Symposium, APS March meeting, Denver, Colorado, March 5 – 9 2007, **oral presentation**.
- 22.) **2007** ‘*Investigating Surface Chemistry Changes Using Hyperpolarized <sup>83</sup>Kr NMR and MRI.*’, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, Jan B. Wooten, John E. Repine and Thomas Meersmann, ‘49<sup>th</sup> Rocky Mountain Conference, Breckenridge, Colorado, 22- 26 July 2007, **oral presentation**.
- 23.) **2007** ‘*TBD*’ Galina Pavlovskaya, McDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand, August 30, 2007. Paul Callaghan group seminar.
- 24.) **2007** ‘*Hyperpolarized Krypton-83: a quadrupolar hp noble gas isotope for NMR and MRI*’, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, Nancy D. Elkins, Jan B. Wooten, John E. Repine, Thomas Meersmann, Center for In Vivo Microscopy, Duke University Medical Center, Durham, North Carolina, September 26, 2007, **invited seminar**.
- 25.) **2007** ‘*Hyperpolarized Krypton-83 MRI AND NMR Spectroscopy: Prospects for Pulmonary Biomedicine*’, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, Thomas Meersmann, John E. Repine, Nancy D. Elkins, Jan B. Wooten, and Randall J. Basaraba, National Institutes of

- Health, National Graduate Student Research Festival, NIH Intramural Research Campus, Bethesda, Maryland, October 11-12, 2007, **poster**.
- 26.) **2007** “*Hyperpolarized  $^{83}\text{Kr}$  MRI and NMR Spectroscopy: Prospects for Pulmonary Biomedicine*”, Zackary I. Cleveland, Karl F. Stupic, Galina E. Pavlovskaya, Nancy D. Elkins, Jan B. Wooten, John E. Repine, Thomas Meersmann, National Institutes of Health, National Institute on Aging, Laboratory of Clinical Investigation, Gerontology Research Center, Baltimore, Maryland, October 15, 2007, **invited seminar**.
- 27.) **2007** ‘*TBD*’ Galina Pavlovskaya, University of Western Sydney Symposium on NMR Imaging and Diffusion, Campbelltown, Australia, October 27, 2007, **invited seminar**.
- 28.) **2008** ‘Surface sensitive quadrupolar splitting in hyperpolarized  $^{131}\text{Xe}$  gas phase NMR’ Karl F. Stupic, Galina E. Pavlovskaya, Thomas Meersmann, 49<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, March 9 - 14, 2008, poster presentation.
- 29.) **2008** ‘Hyperpolarized Krypton-83 MRI of Rat Lungs’ Zackary I. Cleveland, Galina E. Pavlovskaya, Nancy D. Elkins, Karl F. Stupic, John E. Repine, and Thomas Meersmann, 49<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, March 9 - 14, 2008, poster presentation.
- 30.) **2008** ‘Quadrupolar Splitting of  $^{131}\text{Xe}$  studied by NMR in Boltzmann and Hyperpolarized Systems’ Karl F. Stupic, Galina E. Pavlovskaya, Thomas Meersmann, 50<sup>th</sup> Rocky Mountain Conference on Analytical Chemistry, Breckenridge, Colorado, July 27-31, 2008.
- 31.) **2009** ‘Lung Functional Magnetic Resonance using Hyperpolarized Krypton-83’ Karl F. Stupic, Nancy D. Elkins, Galina E. Pavlovskaya, John E. Repine, and Thomas Meersmann, 50<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, March 29 – April 3, 2009, poster presentation.
- 32.) **2009** ‘ $^{83}\text{Kr}$  and  $^{129}\text{Xe}$  Chemical Shift Studies in Model Porous Solids’ Charlene F. Horton-Garcia, Elias Y. Haddad, Galina E. Pavlovskaya, and Thomas Meersmann, 50<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, March 29 – April 3, 2009, poster presentation.
- 33.) **2009** ‘Revisiting High Magnetic Field Dependent Quadrupolar Splitting of  $^{131}\text{Xe}$  Gas Phase NMR’. Karl F. Stupic, and Thomas Meersmann, 50<sup>th</sup> Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar Conference Center, Pacific Grove, California, March 29 – April 3, 2009, poster presentation.