



## Canadian NMR news

Forward us any news of interest to the  
Canadian NMR community.

Submitted by Yining Huang (Western)

### News from Western

After three years of planning and construction, the new 45,000-square-foot, \$15-million Materials Science Addition (MSA) at the University of Western Ontario has opened. The new building houses state-of-the-art teaching laboratories for first-year chemistry and physics. Several research groups in materials sciences from Chemistry will also have new labs in the new building. Our group is moving into a fully furnished new lab with 1380-sq-ft space.



**The New Materials Science Building**

[http://communications.uwo.ca/com/western\\_news/stories/making\\_first-year\\_labs\\_crystal\\_clear\\_20080919442775/](http://communications.uwo.ca/com/western_news/stories/making_first-year_labs_crystal_clear_20080919442775/)

The departmental NMR Facility has already been relocated to the new MSA building. The new NMR facility room has 1900 sq ft. In addition to the new NMR room, we also have a brand-new NMR manager: Dr. Mathew Willans who recently joined our department as the NMR Facility Manager. Mat just completed his PhD in solid-state NMR spectroscopy at the University of Alberta under the supervision of Prof. Rod Wasylishen. Welcome to Western, Mat!

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**Dr. Mathew Willans**

Our NMR technician, Dr. Steven (Zhimin) Yan played a key role in the successful relocation of our NMR facility last summer. He has recently accepted a position as a technical officer in the Supramolecular Nanoscale Assembly (Dr. Fenniri's) Group in the National Institute for Nanotechnology, NRC in Edmonton. Part of his duty is to manage the INOVA 600 spectrometer installed there last January. We will miss him, but wish him the best.

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## NMR upgrades at the University of Ottawa

Busy times for Glenn Facey and David Bryce (University of Ottawa); the new Avance III 200 console for solids was successfully installed in October, and the brand new Avance III 400 MHz solid-state NMR instrument is coming in November.

<http://www.science.uottawa.ca/%7Edbryc159/index.html>

Glenn Facey shares his expertise in superconducting NMR magnets with readers of a "Superconductor Week" newsletter, volume 22, # 4 (2008) 1-3.

*This and much more on the University of Ottawa NMR Facility Blog celebrating its One Year Birthday!*

<http://u-of-o-nmr-facility.blogspot.com/>

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## New NMR Lab at UofT

Major construction is underway at the Chemistry Department of UofT:

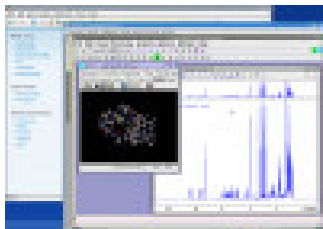
<http://www.chem.utoronto.ca/facilities/nmr/NMRBlog/>

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Submitted by Andre Charbonneau (NRC-IMSB)

## Remote access NMR

With the availability of high performance networking infrastructure across Canada, remote instrumentation over the Internet is



becoming an increasingly viable solution. Not only does it offer significant savings by alleviating travel related costs, but also facilitates resource sharing and better instrument utilization. During 2008, researchers at the University of Ottawa, the University of Alberta and the University of Manitoba accessed the Bruker 900 MHz NMR instrument at the National Ultrahigh-field NMR Facility for Solids using SpectroGrid. Developed at the National Research Council Canada by the Information Management Services Branch, SpectroGrid is an application which leverages on open-source technologies to facilitate secure remote access to scientific instruments and computational resources.

The remote desktop component of SpectroGrid is based on the Virtual Network Computing (VNC) technology. In addition to providing a cross-platform solution, VNC offers stability and good application responsiveness, even on lower bandwidth connections. Security in SpectroGrid is implemented using the Secure Shell (SSH) and certificate-based client and server authentication. These open-source technologies allow researchers to seamlessly and securely access instruments across the country. From a desktop computer, they can view and interact with the NMR software as if they were sitting at the instrument's console. All the information is securely and transparently transferred in an encrypted connection between the researcher's desktop and the remote instrument. More details about the design and security features of SpectroGrid can be found in a recently published paper. Efforts are underway to further develop SpectroGrid and to deploy the application to more organizations and institutes across Canada.

**A. Charbonneau, V. Terskikh**, "SpectroGrid: Providing Simple Secure Remote Access to Scientific Instruments," *22<sup>nd</sup> International Symposium on High Performance Computing Systems and Applications*, 9-11 June 2008, *IEEE HPCS (2008)* 76-82.

<http://dx.doi.org/10.1109/HPCS.2008.17>

Visit the SpectroGrid website for more information

<http://www.spectrogrid.org>

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Submitted by Mike Lumsden (Dalhousie)

## ARMRC Fall NMR Workshop

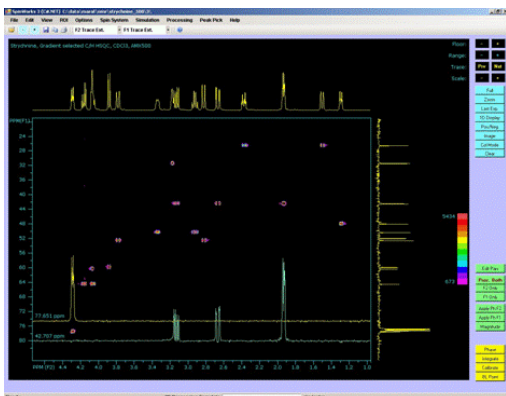
Atlantic Region Magnetic Resonance Center (ARMRC) organizes the 3<sup>rd</sup> Annual Fall NMR Workshop to be held on Saturday, November 15, 2008 in the Chemistry Building, Dalhousie University (Halifax). The workshop will consist of seminars from ARMRC staff emphasizing practical aspects of NMR, contributed oral and poster presentations, Facility tours with detailed introductions on research methods.

<http://armrc.chemistry.dal.ca/workshop.htm>

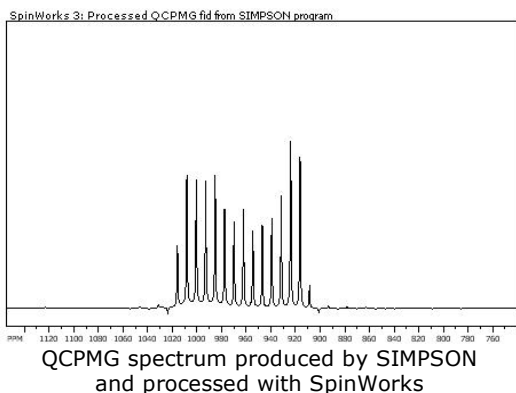
Submitted by Kirk Marat (University of Manitoba)

## SpinWorks

SpinWorks is a freeware software package for the processing and display of 1D and 2D data. Also included are modules for the simulation and analysis of second order spectra, and dynamic (exchange broadened) NMR spectra.



While many processing packages seem targeted to the biological NMR community, SpinWorks focus is synthetic organic and inorganic chemists. However, SpinWorks does just as good a job at processing 2D BioNMR data as any other package that I am aware of. An effort has been made to create a coherent easy to follow user interface, and to obtain as much processing information as possible from the data set. For many of 2D experiments, simply clicking the "Process" button is all you need to properly process your 2D data.



These versions of SpinWorks are currently available for download:

**SpinWorks 2.5.5** This is a Win32 version that should run on anything from Windows 95 and up. It also runs under WINE on Linux and under assorted Windows emulators on Macs.

Supported data formats are Bruker (UXNMR/XwinNMR/Topspin) and Varian (VNMR/VNMRJ) for 1D and 2D. Tecmag (1D and 2D) and JEOL (1D only) are supported, but not thoroughly tested. 1D spectra can also be saved and read in JCAMP-DX format. SpinWorks 2 is in maintenance mode (no further development).

**SpinWorks 3** Runs under the Microsoft .NET runtime environment. Hopefully it will run on other .NET environments as well, such as the Linux mono package (testing under way). The aim is eventually to have the program platform independent and open source. Fully supported data formats are Bruker (UXNMR/XwinNMR/Topspin) and Varian (VNMR/VNMRJ). JCAMP-DX is supported for 1D only. SpinWorks 3 can also read simulated FIDs and spectra produced by the SIMPSON program.

**SpinWorks 3.1** A beta test version of this release will be available very soon (target date: Nov 1, 2008). This release adds the ability to read 2D and 3D processed data from NMRPIPE, Hilbert transforms, and a band-fitting (deconvolution) feature. This release also addresses a number of issues resulting from the use of "," instead of "." as the decimal separator in many parts of the world, and several other upgrades and bug corrections.

For more information, documentation and downloads visit

<http://www.umanitoba.ca/chemistry/nmr/spinworks/index.html>

- Kirk

Kirk Marat, Ph.D., NMR Facility Manager  
Dept. of Chemistry, University of Manitoba  
Winnipeg, MB, R3T 2N2, CANADA

C#, What C++ should have been  
ph. (204) 474-6259 FAX: (204) 474-7608

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## 50 years of NMR at McMaster

In early May a well-attended one-day symposium in Hamilton was held to celebrate 50 years of NMR at McMaster. A recollection of this event by Lynn Easson-Irvine (*McMaster Daily News*) can be found here

<http://dailynews.mcmaster.ca/story.cfm?id=5412>

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## NMR BootCamp 2008 – Mission Accomplished ! (+ Photos)

<http://www.nanucbootcamp.com/>

the 2009 NANUC BootCamp will be organized at the University of Alberta with topics in small molecule NMR and advances in NMR processing and visualization software.

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### PCCP call for papers (1): Solid-State NMR

*Phys Chem Chem Phys* journal has announced a themed issue on Solid-State NMR which will be guest-edited by Paul Hodgkinson (Durham, UK) and Stephen Wimperis (Glasgow, UK). This issue will be published in August 2009, to coincide with the 6<sup>th</sup> Alpine Conference on Solid-State NMR in September 2009. The themed issue will be displayed at the conference, maximizing the visibility of published works. PCCP is welcoming submissions to this themed issue.

<http://www.rsc.org/Publishing/Journals/CP/News/2008/SolidStateNMR.asp>

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### PCCP call for papers (2): Modern EPR spectroscopy: beyond the EPR spectrum

Another announcement by PCCP welcomes submissions to a themed issue on Modern EPR spectroscopy which will be published prior to the 7<sup>th</sup> European Federation of EPR Groups conference in Antwerp in September 2009.

[http://www.rsc.org/Publishing/Journals/CP/News/2008/Modern\\_EPR\\_Spectroscopy.asp](http://www.rsc.org/Publishing/Journals/CP/News/2008/Modern_EPR_Spectroscopy.asp)

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### Year-2008 nuclear quadrupole moments

*It's time to update your reference tables !*

**P. Pyykkö**, "Year-2008 nuclear quadrupole moments," *Molecular Physics* (2008) online.

<http://dx.doi.org/10.1080/00268970802018367>

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### Canadian NMR blogs and news sites

Solid-State NMR Literature Blog (Rob Schurko's group, Windsor)

<http://ssnmr.blogspot.com/>

NMR Facility Blog (Glenn Facey, Ottawa)

<http://u-of-o-nmr-facility.blogspot.com/>

NMR Facility Blog (Tim Burrow, Toronto)  
<http://www.chem.utoronto.ca/facilities/nmr/NMRBlog/>

NMR News (Albin Otter, Alberta)  
[http://nmr.chem.ualberta.ca/nmr\\_news.htm](http://nmr.chem.ualberta.ca/nmr_news.htm)

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## NMR Theses Recently Defended

*Congratulate your students here!*

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**Lindsay Cahill** (Department of Chemistry, McMaster University) May 2008

Research supervisor: Gillian Goward

Ph.D. thesis: "Solid-State NMR Studies of Lithium Ion Dynamics in Cathode Materials for Lithium Ion Batteries"

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**Peter Gordon** (Department of Chemistry, Carleton University) September 2008

Research supervisor: John Ripmeester

M.Sc. thesis: "Probing the local structure of pure ionic liquid salts with <sup>35</sup>Cl, <sup>79</sup>Br and <sup>127</sup>I Solid-state NMR"

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**Jianfeng Zhu** (Department of Chemistry, University of Western Ontario) July 2008

Research supervisor: Yining Huang

Ph.D. thesis: "Characterization of Inorganic Framework and Lamellar Materials by Solid-state NMR Spectroscopy"

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## Recognition



**Gang Wu** (Queen's University) has been promoted to the rank of **Professor**.

At Queen's Department of Chemistry **Prof. Gang Wu** carries out an extensive research program in Physical and Computational chemistry involving solid-state NMR. Gang Wu is also a frequent user of the 900 NMR Facility in Ottawa.

<http://www.chem.queensu.ca/people/faculty/Wu/index.htm>

*Congratulations, Gang !*

Photo from : <http://www.chem.queensu.ca>



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**Le prix Acfas** (L'Association francophone pour le savoir) – **Adrien-Pouliot 2008** pour la coopération scientifique avec la France est remis à **Pierre Harvey**, professeur au Département de chimie de l'Université de Sherbrooke.

[http://www.acfas.ca/prix/2008/pages/harvey\\_pierre.html](http://www.acfas.ca/prix/2008/pages/harvey_pierre.html)

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**David Bryce** (University of Ottawa) received funding from the Ontario Research Fund towards "Advancing knowledge through the magnetic properties of atomic nuclei".

*From the citation:* "Nuclear magnetic resonance (NMR) spectroscopy is a technique that exploits the magnetic properties of certain nuclei of atoms. Many different types of information can be obtained from using an NMR spectrometer. Dr. David L. Bryce at the University of Ottawa is using the technology to conduct experiments on solid materials. While fundamental in nature, his research has potential long-term applications in areas ranging from novel functional materials (new materials-based devices) to the biochemical and health sectors".

[http://www.mri.gov.on.ca/english/news/Orf101708\\_ottawa\\_bd.asp](http://www.mri.gov.on.ca/english/news/Orf101708_ottawa_bd.asp)

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**Josef Zwanziger** (Dalhousie) has been awarded an NSERC Discovery Accelerator Grant to support his research on "Materials in Fields: Spectroscopic Investigation of Stress and Electrical Response of Materials".

[http://chemistry.dal.ca/News%20and%20Opportunities/More\\_Good\\_News.php](http://chemistry.dal.ca/News%20and%20Opportunities/More_Good_News.php)

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**Natalie Goto** (University of Ottawa) has been awarded a Government of Ontario Early Researcher Award to study Bacterial Cell Division using NMR spectroscopy.

*From the citation:* "Bacteria divide symmetrically at the cell mid-point to produce two equal-sized cells, but how do bacteria know where the middle is? Dr. Natalie Goto's research team will focus on one of the proteins important for this "middle-finding" function. Their work will improve the understanding of bacterial cell division, the disruption of which is sought in the development of antibiotics".

[http://www.media.uottawa.ca/mediaroom/news-details\\_1508.html](http://www.media.uottawa.ca/mediaroom/news-details_1508.html)

## On the move

**Mathew Willans** joins the Department of Chemistry at the University of Western Ontario as the NMR Facility Manager. Mathew has just completed his Ph.D. in solid-state NMR spectroscopy at the University of Alberta under the supervision of Prof. Rod Wasylshen.

*On behalf of all Canadian NMR managers we congratulate Mathew on accepting this position. Good luck, Mat!*

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**Scott Kroeker** (University of Manitoba) returned from a year-long sabbatical at the University of Cambridge. Working in the Department of Earth Sciences with Ian Farnan, he used high-temperature NMR to study phase separation processes in model nuclear waste glasses and melts.

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**Steven (Zhimin) Yan** has accepted an NMR technical officer position in the Supramolecular Nanoscale Assembly Group at the NRC National Institute for Nanotechnology in Edmonton.

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**Joseph Weiss** joined David Bryce's group at the University of Ottawa as a graduate student in August 2008. Joey graduated from uOttawa in 2008 and is currently working on preparing air-sensitive compounds for study by solid-state NMR spectroscopy.

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**Peter Pallister**, after finishing his Summer Student term with Igor Moudrakovski and John Ripmeester in Ottawa (NRC-SIMS), Peter has joined the NRC group as a graduate student at Carleton University.

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**Jonathan Derouin**, the 900 NMR Facility probe technician, has left the Facility in October to pursue other career opportunities. We wish Jon the best!

## the 900 NMR Facility News

### Travel support program for students and young scientists

Students and young scientists from Canadian Universities are welcome to apply for a travel stipend towards full or partial reimbursement of their travel expenses incurred while visiting

the 900 Facility. All requests should be submitted by a supervisor in advance of the trip and include a cost estimate. Requests should be forwarded to the Facility manager for review and approval by the Steering Committee.

#### Recent Travel Grant Recipients

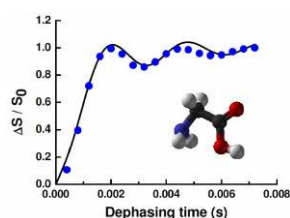
**Andre Sutrisno** (University of Western Ontario)

[http://nmr900.ca/policies\\_e.html](http://nmr900.ca/policies_e.html)

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#### New bio-NMR probes

Two new NMR probes have been recently added to a growing array of tools at the 900 Facility.



The previously announced 4 mm CP/MAS  $^1\text{H}/^{13}\text{C}/^{15}\text{N}$  probe has passed its first tests in mapping  $^{13}\text{C}$ - $^{15}\text{N}$  REDOR distances, as in this experiment with Glycine performed by Eric Ye (the 900 Facility).

The second probe is a flat-coil *E-free* probe built by Bruker U.S.A for experiments with biological samples oriented on glass plates. The probe is equipped with four r.f. channels,  $^1\text{H}/^{13}\text{C}/^{15}\text{N}/^{31}\text{P}$  and is scheduled for testing.

All probes from our unique probe collection are readily available to the Facility users. Please enquire.

[http://nmr900.ca/probes\\_e.html](http://nmr900.ca/probes_e.html)

#### Upcoming NMR Events

*Let everyone know about upcoming NMR-related events at your University or Lab. NMR conference announcements are also welcome.*

#### 50<sup>th</sup> ENC

March 29 - April 3, 2009, Asilomar, Pacific Grove, California

<http://www.enc-conference.org/>

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**The 4<sup>th</sup> Annual Solid-State NMR Workshop** at the 92<sup>nd</sup> Canadian Chemistry Conference and Exhibition (CSC 2009)

May 30–June 3, 2009, Hamilton, ON

[http://nmr900.ca/events\\_e.html](http://nmr900.ca/events_e.html)

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**CSC 2009** the 92<sup>nd</sup> Canadian Chemistry Conference and Exhibition

May 30–June 3, 2009, Hamilton, ON

[http://www.cheminst.ca/index.cfm?ci\\_id=3850&la\\_id=1](http://www.cheminst.ca/index.cfm?ci_id=3850&la_id=1)

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**XeMat 2009** the 4<sup>th</sup> International Symposium on Xenon NMR of Materials

June 8-10, 2009, Ruka Fell, Kuusamo, Finland

<http://cc.oulu.fi/~nmrlab/xemat/>

#### XXXI Finnish NMR Symposium

June 10-12, 2009, Ruka Fell, Kuusamo, Finland

<http://cc.oulu.fi/~nmrlab/NMRsymposium/>

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**VIVA III** the 3<sup>rd</sup> Annual West Coast NMR Minisymposium

June 2009, Simon Fraser University, Vancouver, B.C.

<http://www.sfu.ca/chemistry/facilities/nmr/index.html>

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#### The 51<sup>st</sup> Annual Rocky Mountain Conference on Analytical Chemistry

July 19-23, 2009, the Snowmass Conference Center and Silvertree Hotel in Snowmass, Colorado.

#### Announcement

The 51<sup>st</sup> Rocky Mountain Conference on Analytical Chemistry will take place **July 19-23, 2009** at the Snowmass Conference Center and Silvertree Hotel in Snowmass, Colorado. This is a change from the previously announced 2009 dates originally intended for Estes Park, Colorado. Please mark your calendars accordingly. See the web-site for details:

<http://www.rockychem.com/>

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**ICASS 2009** 55<sup>th</sup> International Conference on Analytical Sciences and Spectroscopy

August 9-12, 2009, Kingston, Ontario

<http://www.icass.ca/>

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#### MOOT 22 NMR Symposium

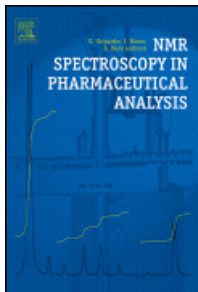
October, 2009, Ottawa, ON

<http://www.mootnmr.org>

## NMR books

*Disclaimer: For your information only. In this bulletin we are not endorsing any products or services.*

### NMR Spectroscopy in Pharmaceutical Analysis



**Eds:** I. Wawer, B. Diehl, U. Holzgrabe  
**Hardcover:** 528 pages  
**Publisher:** Elsevier Science; 1<sup>st</sup> edition (October 10, 2008)  
**Language:** English  
**ISBN-10:** 0444531734  
**ISBN-13:** 978-0444531735

Elsevier: "... the aim of the book is to describe the possibilities of NMR in pharmaceutical analysis. Beside the introduction to the physical fundamentals and techniques the principles of the application in drug analysis are described: quality evaluation of drugs, polymer characterization, natural products and corresponding reference compounds, metabolism, and solid phase NMR spectroscopy for the characterization drug substances, e.g. the water content, polymorphism, and drug formulations, e.g. tablets, powders ..."

<http://www.amazon.com/gp/product/0444531734/>

## NMR Jobs and Vacancies

*You are welcome to post here your vacancies, openings, and related announcements. We can also post short "job wanted" requests.*

### Listings of NMR jobs and vacancies

Canadian NMR Jobs

[http://nmr900.ca/ssnmr\\_jobs.html](http://nmr900.ca/ssnmr_jobs.html)

NMR jobs on the NMR Information Server

<http://www.spincore.com/nmrjobs/>

List of NMR jobs and Post-Doc positions maintained by Dror Warschawski

<http://apex.ibpc.fr/wws/arc/nmr>

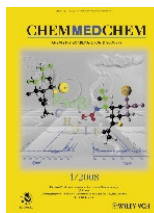
NMR jobs on SpectroscopyNow.com

<http://www.spectroscopynow.com/coi/cda/list.cda?type=Job&chld=0>

## Canadian NMR Research Highlights

*Research highlights and most recent NMR publications by Canadian research teams.*

### Cover article in *Chem Med Chem*



A research team from the National Research Council Canada Institute for Biological Sciences (**NRC-IBS**) uses NMR spectroscopy to study new approaches to pharmaceutically control two bacterial pathogens in this cover article in *ChemMedChem*.

**D.J. McNally, I.C. Schoenhofen, R.S. Houliston, N.H. Khieu, D.M. Whitfield, S.M. Logan, H.C. Jarrell, J.-R. Brisson,** "CMP-Pseudaminic Acid is a Natural Potent Inhibitor of PseB, the First Enzyme of the Pseudaminic Acid Pathway in *Campylobacter jejuni* and *Helicobacter pylori*," *ChemMedChem* **3** (2008) 55-59.

<http://dx.doi.org/10.1002/cmdc.200700170>

### NMR papers in *PNAS*

Protein NMR is a subject of two recent papers by Canadian researchers in *PNAS*

**P. Vallurupalli, D.F. Hansen, and L.E. Kay,** "Structures of invisible, excited protein states by relaxation dispersion NMR spectroscopy," *Proc. Natl. Acad. Sci. USA* **105** (2008) 11766-11771.

<http://dx.doi.org/10.1073/pnas.0804221105>

**H. Mizuno, T.K. Mal, M. Walchli, A. Kikuchi, T. Fukano, R. Ando, J. Jeyakanthan, J. Taka, Y. Shiro, M. Ikura, A. Miyawaki,** "Light-dependent regulation of structural flexibility in a photochromic fluorescent protein," *Proc. Natl. Acad. Sci. USA* **105** (2008) 9227-9232.

<http://dx.doi.org/10.1073/pnas.0709599105>

### *Angewandte Chemie*

**G.S. Ananchenko, I.L. Moudrakovski, A.W. Coleman, and J.A. Ripmeester,** "A Channel-Free Soft-Walled Capsular Calixarene Solid for Gas Adsorption," *Angewandte Chemie International Edition* **47** (2008) 5616-5618.

<http://dx.doi.org/10.1002/anie.200800071>

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## Coordination Chemistry Reviews

In this review **Robert Morris** (University of Toronto) tabulates structures and NMR properties of almost 200 iron, ruthenium and osmium complexes containing dihydrogen, and presents a variety of interesting trends based on the H-H bond length.

**R.H. Morris**, "Dihydrogen, dihydride and in between: NMR and structural properties of iron group complexes," *Coordination Chemistry Reviews* **252** (2008) 2381-2394.

<http://dx.doi.org/10.1016/j.ccr.2008.01.010>

Web: <http://www.chem.utoronto.ca/~rmorris/>

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## Concepts in Magnetic Resonance

This review article by a research team from UofT highlights applications of dissolved oxygen as a paramagnetic probe in NMR studies of proteins, primarily via O<sub>2</sub>-induced paramagnetic shifts in <sup>13</sup>C, <sup>19</sup>F, and <sup>1</sup>H spectra, as well as via relaxation rate enhancement.

**I. Bezsonova, J. Forman-Kay, R.S. Prosser**, "Molecular Oxygen as a Paramagnetic NMR Probe of Protein Solvent Exposure and Topology," *Concepts in Magnetic Resonance Part A* **32A** (2008) 239-253.

<http://dx.doi.org/10.1002/cmr.a.20118>

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## Recent NMR Publications

We are listing here most recent NMR publications by Canadian research groups as they appear on the [www.nmr900.ca](http://www.nmr900.ca) website. Although we are doing our best keeping track of your publications, this list should not be considered complete. You are encouraged to let us know of your recent publications as they become available.

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## Memorial University of Newfoundland

**A. Gonzalez-Horta, D. Andreu, M.R. Morrow, J. Perez-Gil**, "Effects of palmitoylation on dynamics and phospholipid-bilayer-perturbing properties of the N-terminal segment of pulmonary surfactant protein SP-C as shown by <sup>2</sup>H NMR", *Biophysical Journal* **95** (2008) 2308-2317.

<http://dx.doi.org/10.1529/biophysj.108.132845>

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## Dalhousie University

**A. Sadeghi-Khomami, M.D. Lumsden, and D.L. Jakeman**, "Glycosidase Inhibition by Macrolide Antibiotics Elucidated by STD-NMR Spectroscopy," *Chemistry and Biology* **15** (2008) 739-749.

<http://dx.doi.org/10.1016/j.chembiol.2008.05.017>

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## University of New Brunswick

**E. Veliyulin, I.V. Mastikhin, A.E. Marble, B.J. Balcom**, "Rapid determination of the fat content in packaged dairy products by unilateral NMR," *Journal of the Science of Food and Agriculture* **88** (2008) 2563-2567.

<http://dx.doi.org/10.1002/jsfa.3391>

**Z. Zhang, A.E. Marble, B. MacMillan, K. Promislow, J. Martin, H. Wang, B.J. Balcom**, "Spatial and temporal mapping of water content across Nafion membranes under wetting and drying conditions," *Journal of Magnetic Resonance* **194** (2008) 245-253.

<http://dx.doi.org/10.1016/j.jmr.2008.07.011>

**J. Zhang, R.P. MacGregor, B.J. Balcom**, "Liquid Crystal Diffusion in Thin Films Investigated by PFG Magnetic Resonance and Magnetic Resonance Imaging," *Chemical Physics Letters* **461** (2008) 106-110.

<http://dx.doi.org/10.1016/j.cplett.2008.06.090>

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## Université de Montréal

**H. Thérien-Aubin, X.X. Zhu**, "NMR Spectroscopy and Imaging Studies of Pharmaceutical Tablets Made of Starch," *Carbohydrate Polymers* (2008) in press.

<http://dx.doi.org/10.1016/j.carbpol.2008.08.010>

**H. Thérien-Aubin, W.E. Baille, X.X. Zhu**, "Diffusion of molecular probes and the effects of their interactions with polymer matrices as studied by pulsed-field gradient NMR spectroscopy", *Canadian Journal of Chemistry* **86** (2008) 579-585.

<http://dx.doi.org/10.1139/V08-036>

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## McGill University

**M. Prakesch, A.Y. Denisov, M. Naim, K. Gehring, P. Arya**, "The discovery of small molecule chemical probes of Bcl-X-L and Mcl-



1", *Bioorganic & Medicinal Chemistry* **16** (2008) 7443-7449.  
<http://dx.doi.org/10.1016/j.bmc.2008.06.023>

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### University of Ottawa

**C.M. Widdifield, R.P. Chapman, D.L. Bryce,** "Chlorine, Bromine, and Iodine Solid-State NMR Spectroscopy," *Annual Reports on NMR Spectroscopy* (2008) in press. (**invited contribution**)

**S.C.C. Shih, I. Stoica, N.K. Goto,** "Investigation of the utility of selective methyl protonation for determination of membrane protein structures," *Journal of Biomolecular NMR* **42** (2008) 49-58.  
<http://dx.doi.org/10.1007/s10858-008-9263-1>

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### NRC-IBS


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