

ALEXANDRE LUSSIER

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LONG TERM GOAL:

To obtain a research position in the field of alternative energy

EDUCATION:

Ph.D. Physics, Montana State University, Bozeman, Montana, USA (November 2005)

M.S. Physics, Montana State University, Bozeman, Montana, USA (2001) (GPA 3.94)

B.A. Physics, Western State College, Gunnison, Colorado, USA (1999) (GPA 3.97)

Diplôme d'études collégiales in pure science, Cégep de Granby, Québec, Canada (1991)

CITIZENSHIP & LANGUAGES:

Canadian — French and English written and spoken fluently

PROFESSIONAL SKILLS:

- Laboratory-based Techniques: Vibrating Sample Magnetometry (VSM), X-ray Photoelectron Spectroscopy (XPS), X-ray Diffraction (XRD), familiar with Scanning Electron Microscopy (SEM)
- Synchrotron-based Techniques: X-ray Absorption Spectroscopy (XAS), X-ray Magnetic Circular Dichroism (XMCD), X-ray Resonant Magnetic Scattering (XRMS), familiar with X-ray Absorption Fine Structure (XAFS)
- Ultrahigh vacuum systems
- Ceramic synthesis by tape casting
- Metal evaporation and chemical vapor deposition
- Machining
- Computer Skills:
 - Technical drawing in AutoCAD and Solid Works
 - Standard Microsoft software (Word, Excel, PowerPoint)
 - Data analysis in Igor Pro, Origin, and Mathematica
 - Programming in MATLAB and LabView
 - Web design in Microsoft FrontPage, Netscape Composer, and HTML
 - Drawing in Corel Draw and Adobe Illustrator
- Teaching and public speaking

EXPERIENCE:

January 2006-Present: *Postdoctoral Researcher*
Montana State University, Bozeman, Montana, USA

- Develop a testing apparatus for fuel cell assemblies (design, ordering, assembling of gas management and electronic components, and programming)
- Identify mechanisms responsible for sulfur poisoning of solid oxide fuel cell anodes
- Synthesize fuel cell materials and assemblies by tape casting techniques
- Develop sulfur tolerant anodes through synthesis, testing, and characterization
- Use synchrotron-based techniques to characterize fuel cell materials and interfaces

2000-2005: *PhD Student (condensed matter physics)*
Montana State University, Bozeman, Montana, USA

- Conducted research in thin magnetic films and interfaces (list of publications included on last page)
- Developed collaborations with other research labs and industry
- Trained and directed research of Master's students

Summer Semester 2002: *University Instructor*

Montana State University, Bozeman, Montana, USA

- Taught general physics for pre-med and architecture students
- Prepared and presented six lectures per week
- Coordinated labs with teaching assistants

1999-2000: *Teaching Assistant*

Montana State University, Bozeman, Montana, USA

1997-1998: *Foreman*

Celtic Reforestation Services Inc., Prince-George, British Columbia, Canada

- Hired and trained employees
- Planned and controlled daily production and quality

1994-1996: *Tree Planter*

Celtic Reforestation Services Inc., Prince-George, British Columbia, Canada

- Awarded the company's "Top Planter Award" for three consecutive seasons

1997-1999: *Student / Athlete*

Western State College, Gunnison, Colorado, USA (1998-1999)

Rocky Mountain College, Billings, Montana, USA (1996-1997)

- All-American NCAA Division 1, 1998

1994-1996: *Full Time Athlete & Coach (alpine ski racing)*

Various Teams, Québec, Canada

- Best world ranking: 204th
- Assisted in training of athletes in North America and Europe while competing

1992: *Construction*

Plein Air International, Granby, Québec, Canada

- Designed, manufactured, and installed outdoor playground equipment

AWARDS:

- Finalist, Best Student Presentation Award, Magnetism and Magnetic Materials Conference, Jacksonville, Florida, 2004
- Academic Fellowship, Montana State University, Bozeman, Montana, 1999-2000
- Alumni Award recipient, Western State College, Gunnison, Colorado, 1999
- Who's Who Among Students in American Universities and Colleges, USA, 1997
- Academic All American 1st team (Rocky Mountain College), Billings, Montana, 1997
- Canadian Who's Who, 1997
- Nominated for Governor General's Award for high school and CEGEP, Québec, Canada, 1988 and 1991

ADDITIONAL EXPERIENCE:

2004-Present: *Co-founder*

GAS / Intrinsic Cycling Team (non-profit), Bozeman, Montana, USA

- Co-founded the team in 2004
- Organized and promoted competitive and non competitive events, including charity work

ADDITIONAL ENDEAVORS:

- Competing in road biking, mountain biking, trail running, triathlon, and skiing
- Regularly practicing rock climbing, ice climbing, swimming, reading and playing the guitar

PUBLICATIONS :

Mechanism for SOFC Anode Degradation from Hydrogen Sulfide Exposure

A. Lussier, S. Sofie, J. Dvorak, and Y.U. Idzerda, (Accepted for publication in the International Journal of Hydrogen Energy)

Chemical Inhomogeneity and Mixed State Ferromagnetism in Diluted Magnetic Semiconductor Co:TiO₂

S. Ogale, D. Kundaliya, S. Mehraeen, L.F. Fu, S. Zhang, A. Lussier, J. Dvorak, N. Browning, Y.U. Idzerda, T.i Venkatesan, (Accepted for publication in Chemistry of Materials)

Stress Relaxation of LSMO and LCMO at SOFC Interfaces

A. Lussier, J. Dvorak, S. Stadler, J. Holroyd, M. Liberati, E. Arenholz, S.B. Ogale, T. Wu, T. Venkatesan, and Y.U. Idzerda, (In press in Thin Solid Films)

Magnetic Characterization of CoFeB/MgO and CoFe/MgO Interfaces

E. Negusse, A. Lussier, J. Dvorak, Y.U. Idzerda, S. R. Shinde, Y. Nagamine, S. Furukawa, and D. D. Djayaprawira, Applied Physics Letters **90** (2007) 092502

XAS Characterization of Growth Parameter Effects for Pulsed Laser Deposited Co_xTi_{1-x}O_{2-δ} Films

A. Lussier, J. Dvorak, Y.U. Idzerda, S.R. Shinde, S.B. Ogale, and T. Venkatesan, Physica Scripta **T115** (2005) 623-5

Percolative Ferromagnetism in Anatase Co:TiO₂

S. R. Shinde, S. B. Ogale, Abhijit S. Ogale, S. J. Welz, A. Lussier, Darshan C. Kundaliya, H. Zheng, S. Dhar, M.S.R. Rao, R. Ramesh, Y. U. Idzerda, N. D. Browning, T. Venkatesan, cond-mat/0505265

Comparative x-ray absorption spectroscopy study of Co-doped SnO₂ and TiO₂

A. Lussier, J. Dvorak, Y.U. Idzerda, S.B. Ogale, S.R. Shinde, R.J. Choudary, and T. Venkatesan, J. Appl. Phys. **95** (2004) 7190

Characterization for Strontium Titanate/Fe₃O₄ and TiN/ Fe₃O₄ Interfaces

A. Lussier, Y.U. Idzerda, S. Stadler, S.B. Ogale, S.R. Shinde, and T.Venkatesan, J. Vac. Sci. Technol. B **20** (2002)1609-13

Single crystal EPR determination of the spin Hamiltonian parameters for Fe₈ molecular clusters

S. Maccagnano, R. Achey, E. Negusse, A. Lussier, M.M. Mola, S. Hill, N.C. Dalal, Polyhedron (Elsevier) **20** (2001) 1441-5

PRESENTATIONS :

Mechanism for SOFC Anode degradation from Hydrogen Sulfide
MS & T Conference, Detroit, Michigan, September 2007

SOFC Degradation from Hydrogen Sulfide Exposure
TMS 2007 Conference, Orlando, Florida, February 2007

Interfacial Strain Induced Variations in Fuel Cell Cathode Materials
MS & T Conference, Cincinnati, Ohio, October 2006

Possible Polaron Manifestation in the XAS of Cobalt-Doped TiO₂
MMM Conference, San Jose, California, November 2005

Novel Manifestations in Co-doped TiO₂
NW Section APS, Victoria, British Columbia, Canada, May 2005

From Magnetite to Spintronics (Invited Talk)
Montana Academy of Sciences Annual Meeting, March 2005

XAS Investigation of Cobalt-doped TiO₂
PCSI Conference, Bozeman, Montana, January 2005

Cobalt Site Symmetry in Cobalt-doped Oxides
MMM Conference, Jacksonville, Florida, November 2004

X-ray Studies of Cobalt-doped Semiconducting Oxides (Poster Presentation)
Gordon Research Conference, Big Sky, Montana, August 2004

Are Magnetically Doped Transition-metal Oxides Spin Glasses?
APS 2004 March Meeting, Montreal, Québec, Canada, March 2004

Structural Information, by X-ray Absorption Spectroscopy, on Cobalt-doped Oxides (Student Award Recipient)
PCSI 2004, Kona, Hawaii, January 2004

Magnetism in Cobalt-doped TiO₂ and Other Magnetic Oxides
MMM/Intermag joint conference, Anaheim, California, January 2004

XAS Determination of Growth Parameter Effects for PLD grown Co_xTi_{1-x}O_{2-d} Films (Poster Presentation)
XAFS 12, Malmö, Sweden, June 2003

Characterization of Strontium Titanate/Fe₃O₄ and TiN/Fe₃O₄ Interfaces
MMM 2002, Tampa, Florida, November 2002

Characterization of Strontium Titanate/Fe₃O₄ and Titanium Nitride/Fe₃O₄ Interfaces (Student Award Recipient)
PCSI 2002, Santa Fe, New Mexico, January 2002

The Effects of TiN Overlayers on Fe₃O₄ Thin Films
MMM 2001, Seattle, Washington, November 2001