

Brian Niebergal

(Public Version)

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Profile

Self-motivated individual with excellent analytical, computational, and interpersonal skills. Has **8 years** of research experience in applying complex mathematical concepts to solve problems and effectively communicating the results.

Core Skills

Analytical: Excellent analytical and problem solving skills enhanced by solving complex physics and mathematics problems over the last ten years.

Computational: Expertise in numerically solving (partial & ordinary) differential equations, especially in the area of computational fluid dynamics (reaction-diffusion, multi-fluid, exotic matter). Proficient with other techniques such as data visualization, Monte-Carlo, parallel (high-performance) computing, optimization, etc. Strong knowledge of C/C++, Visual FORTRAN 95, PERL, SQL, UNIX shell, Mathematica, MATLAB, and IDL.

Leadership: Demonstrated by being the Chair of the Departmental Graduate Student Association, organizer of a research journal club, participation in committees, and intern supervision of MSc & PhD students.

Communication & Interpersonal: Excellent writing skills - 15 publications and numerous successful research proposals. Great public speaking abilities cultivated by multiple presentations to world-class experts in my field, as well as lecturing to undergraduate classes. Strong interpersonal skills exemplified by multiple productive research visits and ongoing collaborations.

Education

University of Calgary

- PhD Candidate Physics - 2006 → Present (Expected graduation date Dec. 2010)
- MSc Astrophysics - 2004 → 2006
- BSc Astrophysics w/ Minor in Applied Mathematics - 1998 → 2003

Industry Work Experience

CLINICARE Corporation

Programmer Analyst

Calgary, AB
1997 - 2003

- Worked both full and part time while attending University and High School.
- Primary duties included developing and supporting software (using Business Basic),
- Programming web interface (CGI) scripts (using PERL, UNIX shell, & SQL),
- Projects involving communication between technical and non-technical employees,
- and Website administration.

Travel Network Communications

Programmer Consultant

Sydney, Australia
Dec. 2000 - Mar. 2001

- Web interface (CGI) programming in PERL and SQL.

- Designed and coded a web interface that included a database, secure login, and financial reports.

Research

Publications (abridged - see CV for complete list of 15)

- NIEBERGAL, B., OUYED, R., NEGREIROS, R., WEBER, F. 2010.
"Meissner effect and vortex expulsion in color-superconducting quark stars, and its role for reheating of magnetars." Physical Review D 81, 043005.
- STAFF, J., NIEBERGAL, B., OUYED, R., PUDRITZ, R., CAI, K. 2010.
"Confronting 3-Dimensional Time-Dependent Jet Simulations with Hubble Space Telescope Observations." The Astrophysical Journal 722, 1325-1332.
- NIEBERGAL, B., OUYED, R., LEAHY, D. 2007.
"SGRs and AXPs proposed as ancestors of the Magnificent Seven." Astronomy and Astrophysics 476, L5-L8.
- NIEBERGAL, B., OUYED, R., LEAHY, D. 2006.
"Magnetic Field Decay and Period Evolution of Anomalous X-Ray Pulsars in the Context of Quark Stars." The Astrophysical Journal 646, L17-L20.
- OUYED, R., NIEBERGAL, B., DOBLER, W., LEAHY, D. 2006.
"Three-Dimensional Simulations of the Reorganization of a Quark Star's Magnetic Field as Induced by the Meissner Effect." The Astrophysical Journal 653, 558-567.

Scientific Presentations

- Beijing University - Compact Stars in the QCD Phase Diagram May 2009 - "Evolution of Quark-nova Compact Remnant"
- Louisiana State University March 2009 "Evolution of Quark-nova Compact Remnant"
- Compact Stars in the Rockies (Banff, Canada) June, 2008. "Quark-Nova Remnants (SGRs/AXPs)."
- San Diego State University (San Diego, USA) May, 2007. "Quark-Nova Remnants (SGRs/AXPs)."
- Purdue University (West-Lafayette, USA) May, 2007. "SGRs and AXPs in the Quark-Nova Scenario."
- Canadian Astronomical Society/Société Canadienne d'Astronomie (Kingston, Canada) May, 2007. "A New Model for Gamma-ray Bursts."
- Nordic Institute for Theoretical Physics (NORDITA, Stockholm, Sweden) Sep, 2006. - "SGRs and AXPs in the Quark-Nova Scenario."
- DARK Cosmology Centre (University of Copenhagen, Denmark) Sep, 2006 - "SGRs and AXPs in the Quark-Nova Scenario."
- Canadian Astronomical Society/Société Canadienne d'Astronomie (Calgary, Canada) June 2006.
 "Magnetic Field Decay and Period Evolution of Anomalous X-Ray Pulsars in the Context of Quark Stars."

Teaching

Teaching Assistant

- **Computational Physics:** UNIX, C/C++, FORTRAN 95, Mathematica, MATLAB, IDL, LaTeX. (Partial and ordinary) differential equation integration, Monte-Carlo techniques, root-finding.
- **Engineering Physics:** Acoustics, optics and radiation.
- **Astrophysics:** Orbital mechanics. Planetary interiors, geology, and atmospheres. Solar structure, magnetism and cycles. Comets, asteroids, meteorites. Origins.
- **Introductory Physics:** Mechanics, kinematics, electromagnetism, and thermodynamics. Harmonic motion, waves, fluids.

Supervision

- Assisted in supervision of PhD & MSc students, undergraduates, and summer students.

Professional Development

- Chair, Physics Department Graduate Student Association
- Committee Member, Faculty of Science Promotions committee
- Committee Member, Physics department Head Selection committee
- Founder, of the “Physics & Astronomy Commons” social space
- Committee Member, Physics department Community Building committee
- Organizer, Research group Journal Club
- Organizing International Conferences - CDJO 2004, URJA 2005, CASCA 2006, Kingston Meeting 2007

Notable Awards

- Faculty of Graduate Studies Scholarship (\$1300)
- iCore ICT PhD Scholarship (\$36,000 p.a.)
- International Fellowship Abroad (\$6500)
- Alberta Learning Award (\$2000)
- NSERC PGS-D Scholarship (\$21,000 p.a.)
- Alberta Graduate Student Scholarship (\$2000)
- Dean's Entrance Award (\$4000)
- Sigma Xi Grant-in-Aid of Research (\$2500)

Other Interests

Traveling: I have traveled to countries in South America from Argentina to Colombia. While working in India I used the weekends to explore the south-eastern part of the country. Also Australia & New Zealand, and various places in China, Europe, USA and Mexico.

Hobbies: Hiking, skiing, bicycling and car/motorcycle repair.

Sports: Hockey, soccer, squash and others.