JUAN DAVID BLANDON

Department of Physics and Astronomy
The University of Oklahoma
440 W. Brooks St.
Norman, OK 73019
jdb@ou.edu
(321) 274-6783

OBJECTIVE

To find a faculty or researcher position where I can employ my experience in theoretical atomic physics.

EDUCATION

University of Central Florida (UCF), Orlando, FL
Doctor of Philosophy in Physics, 2009
Dissertation Topic: *Development of theoretical and computational methods for three-body processes.*
Advisor: Dr. Kokoouline

University of Central Florida (UCF), Orlando, FL
Master of Science in Physics, 2006
MS Thesis: *Development of theoretical and computational methods for few-body processes in ultracold quantum gases*
Advisor: Dr. Kokoouline

University of Florida (UF), Gainesville, FL
Bachelor of Science in Physics, 2004
Minor in Mathematics

RESEARCH EXPERIENCE

Postdoctoral Researcher, University of Oklahoma, Norman, OK , 2009 - present

- Currently working with Prof. Gregory Parker and his research group on developing theoretical and computational methods to study Efimov physics and coherent control of atomic/molecular processes using photoassociation and magnetic Feshbach resonances. Co-authored National Science Foundation three-year proposal with Prof. Parker.

Graduate Research Assistant, UCF Physics Department, Orlando, FL, 2005 - 2009

- From 2006 – 2009, collaborated with Dr. Kokoouline on developing a method for calculating three-body bound states and resonances using two coupled three-body channels. We applied this method to calculate pre-dissociated vibrational states in H_3, and a Van der Waals model system. This work was published by Physical Review Letters. It is possible, in principle, to incorporate into this method the R-matrix hyperspherical adiabatic approach to calculate three-atom recombination ($X+X+X \rightarrow X+X_2$) rate constants, and to study quenching and other three-body processes.
- From 2005 – 2006, collaborated with Dr. Kokoouline and Prof. Françoise Masnou-Seeuws on two separate projects. These were theoretical treatments which employed computer modeling to study (1) three-body recombination in ultracold degenerate gases

and (2) the many-body problem of Bose-Einstein condensation. Work culminated in MS thesis and first two publications.

Summer Intern, Sandia National Laboratories, Livermore, CA, 2007

- Employed molecular dynamics simulations to study phonon wave packet scattering in GaN semiconductor with defects. Project lasted eight weeks and was directed by Dr. Aubry of SNL (presently at Stanford University) and Dr. Schelling of UCF Physics Department. The objective was to calculate reflection and transmission coefficients from the lattice dislocation, and to calculate heat conductivity in GaN. Calculations were carried out using Sandia supercomputer clusters, using a Fortran code provided by Dr. Schelling.

RESEARCH PUBLICATIONS

- "Geometrical phase driven predissociation: Lifetimes of $2^2A'$ levels of H_3," J. Blandon and V. Kokoouline, *Phys. Rev. Lett.* **102**, 143002 (2009).
- "Correlation diagrams in collisions of three identical particles," N. Douguet, J. Blandon, and V. Kokoouline, *J. Phys. B: At. Mol. Opt. Phys.* **41**, 045202 (2008).
- "Calculation of three-body resonances using slow variable discretization coupled with complex absorbing potential," J. Blandon, V. Kokoouline, and F. Masnou-Seeuws, *Phys. Rev. A* **75**, 042508 (2007).

CONFERENCES

Gordon Research Conferences: Quantum Control of Light and Matter, South Hadley, MA, 2009

- Facilitated poster presentation on development of time-independent approach to treat pre-dissociation in triatomic hydrogen with a conical intersection.

American Physical Society DAMOP Meeting, Charlottesville, VA, 2009

- Oral presentation on development of new method to treat three-body pre-dissociation near a conical intersection, with an application to H_3.

National Superconducting Cyclotron Laboratory, Lansing, MI, 2009

- Invited oral presentation on the continuing development of our approach to study three-body processes, such as systems with a conical intersection, Efimov states, three-body recombination, and gas phase chemical reactions.

McKnight Fellowship Mid-Year Meeting, Tampa, FL, 2008

- Chaired and helped organize the first Physical Sciences panel at a McKnight Doctoral Fellowship meeting.

McKnight Fellowship New Fellows Orientation, Tampa, FL, 2008

- Administered oral presentation on coping skills throughout the first four years of the Ph.D. Program.

American Physical Society DAMOP Meeting, State College, PN, 2008

- Facilitated poster presentation on two-channel calculation of Feshbach resonances in H_3 and model three-body system.

Sandia National Laboratories Student Symposium, Livermore, CA, 2007

- Offered oral presentation on using molecular dynamics to study heat transport in gallium nitride with lattice defects.

American Physical Society April Meeting, Jacksonville, FL, 2007
- Contributed oral presentation on the development of a novel method to calculate three-body resonances using slow variable discretization and complex absorbing potential.

International Conference on Atomic Physics, Innsbruck, Austria, 2006
- Co-authored on a poster presented by Dr. Kokoouline on ongoing calculations of Efimov resonances in model three-body system based on ^{4}He atoms as well as a study of three-body resonances in a model system of identical bosons with nucleon mass.

American Physical Society DAMOP Meeting, Knoxville, TN, 2006
- Presented a poster on ongoing calculations of Efimov resonances in model three-body system based on ^{4}He atoms as well as a study of three-body resonances in a model system of identical bosons with nucleon mass. Research was done under tutelage of Dr. Kokoouline.

European Union COMOL Training School & Workshop, Les Houches, France, 2006
- Contributed a poster presentation on calculations of three-body resonances using slow variable discretization coupled with complex absorbing potential. Research was done under tutelage of Dr. Kokoouline at the University of Central Florida Physics Department.

American Physical Society March Meeting, Montreal, Canada, 2004
- Facilitated oral presentation at the Undergraduate SPS Session in the 2004 APS March Meeting. Presentation based on research done on superfluid-^{3}He in Dr. Meisel's lab at the University of Florida.

COMPUTER SKILLS

- Parallel computations
- Extensive use of supercomputer accounts at NERSC and NCSA for Ph.D. research
- Proficient in Fortran, MPI, gnuplot, Latex, Python, C^{++}, Maple, Matlab, Mathematica, Jmol, Ensight, Shell, HTML, Open Office and Microsoft Office.
- Linux and Windows
- Open Office and Microsoft Office

TEACHING EXPERIENCE

Graduate Teaching Assistant/Instructor of Record, UCF Physics Department, Orlando, FL, 2004 - 2006
- Achieved Instructor of Record status.
- Certified through UCF's semester-long GTA Certificate Program.
- Taught seven sections of Introductory Physics I Lab through Fall 2004/Spring 2005 and Introductory Physics II Lab through Summer 2005.
- Prepared syllabi, lesson plans, and quizzes.
- Prepared and facilitated lectures, labs, and graded all lab reports and quizzes.
- Worked closely with multiple faculty members of the Physics Department.
- Offered weekly office hours to help students with complementary lecture session and

graded exams for the lecture session.
- Proctored exams for lecture sessions.
- Managed situations with a diversity of students in implementing lab class policy.
- Substituted professor for one lecture of junior-level Mathematical Methods in Physics.

LANGUAGES

- Fluent in Spanish

AWARDS & HONORS

- UCF Graduate Travel Award, Spring 2009
- Featured in McKnight Doctoral Fellowship semi-annual newsletter, February 2008 (p.3)
- UCF Graduate Travel Award, Spring 2008
- McKnight Doctoral Fellowship, 2006-2009
- UCF Graduate Research Fellowship, Summer 2006
- UCF Graduate Travel Award, Spring 2006
- Member of National Society of Collegiate Scholars, 2000 - Present

PROFESSIONAL REFERENCES

- Dr. Viatcheslav Kokoouline, Assistant Professor
  University of Central Florida Department of Physics
  Email: slavako@physics.ucf.edu
- Dr. Gregory Parker, Professor and Chair of Physics Department
  University of Oklahoma
  Email: parker@nhn.ou.edu
- Dr. Patrick Schelling, Assistant Professor
  University of Central Florida Advanced Materials Processing and Analysis Center, and Department of Physics
  Email: pschell@mail.ucf.edu
- Dr. Hari Saha, Professor
  University of Central Florida Department of Physics
  Email: hps1@physics.ucf.edu

PROFESSIONAL MEMBERSHIPS

McKnight Alumni Association, 2009 – Present
American Physical Society Topical Group on Few-Body Systems and Multiparticle Dynamics, 2008 - Present
American Physical Society Forum on International Physics, 2008 - Present.
American Physical Society, 2003 - Present
Society of Physics Students, 2001 - 2006

RESEARCH INTERESTS

- few-body processes
- atomic/molecular/optical physics
- many-body processes
- Bose-Einstein condensation
- degenerate Fermi gases
- molecular-dynamics simulations
- nanotechnology
- biophysics
- medical applications of physics
- coherent/quantum control

SERVICE EXPERIENCE

Co-founder and president, Colombian Student Association at UCF, Orlando, FL, 2008-2009

- Objective of association is to build bridges of understanding between UCF community and Colombian students on campus, and to provide support and networking throughout the academic careers of Colombian students at UCF.

Secretary, Knights for McKnight, Orlando, FL, 2008-2009

- This registered student organization at UCF is composed of McKnight Doctoral Fellows who attend UCF. The purpose of this organization is to expand the mission of McKnight Doctoral Fellowship at UCF, provide networking for members, encourage interdisciplinary research, carry out volunteer work in our community via mentoring programs, and promote the MDF amongst outstanding UCF students.

Active member, Society of Physics Students-UCF Chapter, Orlando, FL, 2006

- Worked with other SPS members to provide graduate students with more electives, workshops, grant monies, and health insurance.

Active member, Society of Physics Students-UF Chapter, Gainesville, FL, 2000 - 2004

- Co-authored solution manuals for Introductory Physics I and II, which were used to raise funds for the club.
- Participated in physics shows for elementary school students.
- Participated in GRE preparation sessions and Feynman Lectures discussions hosted by club.

VOLUNTEER WORK

Alternative Spring Break Program-UCF, Orlando, FL, 2005
Trip Facilitator

Supervised spring break trip to New Orleans with a group of UCF volunteer students. Worked with Volunteers of America in New Orleans in homes/shelters for alcoholics, drug addicts and the mentally challenged. Also volunteered in after-school programs for elementary school students.

H.A.B.L.A-UF Chapter, Gainesville, FL, Fall 2003-Spring 2004
Volunteer

Taught basic English to mostly adult immigrant workers in the Gainesville area.

America Reads! Program-UF, Gainesville, FL, 2002
Volunteer

Taught literacy classes to children living in public housing in Gainesville.