

Martin Charles Kandes

Contact Information

Department of Physics
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Citizenship

United States of America

Education

Ph.D. in Computational Science

CLAREMONT GRADUATE UNIVERSITY & SAN DIEGO STATE UNIVERSITY, AUGUST 2007 – PRESENT

- Cumulative GPA: 3.97

M.S. in Physics

SAN DIEGO STATE UNIVERSITY, AUGUST 2005 – PRESENT

- Thesis: *Multimode Interferometry of Bose-Einstein Condensates in a Circular Waveguide*
- Advisor: Dr. Michael Bromley, Assistant Professor of Physics
- Cumulative GPA: 4.00

B.S. in Physics with Highest Honors

B.S. in Numerical and Applied Analysis Mathematics

UNIVERSITY OF MICHIGAN, ANN ARBOR, SEPTEMBER 1999 – MAY 2004

- Thesis: *Measurement of the ^{129}Xe Permanent Electric Dipole Moment*
- Advisor: Dr. Timothy Chupp, Professor of Physics and Biomedical Engineering
- Cumulative GPA: 3.29

Experience

Graduate Research Assistant

DEPARTMENT OF PHYSICS, SAN DIEGO STATE UNIVERSITY, AUGUST 2006 – PRESENT

- Created a Fortran 90 program to perform numerical calculations of the time-dependent Gross-Pitaevskii equation in one and two dimensions to simulate gravity-induced quantum interference between counterpropagating Bose-Einstein condensates within a simple circular waveguide.
- Program implements: Crank-Nicolson finite difference scheme to solve the 1D GPE; Peaceman-Rachford ADI finite difference scheme on a polar grid to solve the 2D GPE; and the Sherman-Morrison algorithm to handle periodic boundary conditions.

Graduate Teaching Associate

DEPARTMENT OF PHYSICS, SAN DIEGO STATE UNIVERSITY, AUGUST 2005 – PRESENT

- Teaching introductory undergraduate laboratory courses in classical mechanics and electromagnetism for up to 75 undergraduate students per semester.
- Award for Outstanding Teaching by a Graduate Teaching Associate, 2006 – 2007.

Visiting Research Investigator & Undergraduate Research Assistant

DEPARTMENT OF PHYSICS, UNIVERSITY OF MICHIGAN, SEPTEMBER 2003 – AUGUST 2005

- Led the research and development effort to improve the measurement sensitivity of the ^{129}Xe permanent electric dipole moment experiment using co-located ^3He and ^{129}Xe masers.
- Successfully developed new analysis algorithms for the ^{129}Xe PEDM experiment operating in free-precession mode, leading to an increase in the measurement sensitivity by a factor of 3.
- Provided maintenance and operations support for the $n + p \rightarrow d + \gamma$ asymmetry experiments ^3He neutron spin-filter at Los Alamos National Laboratory.

National Science Foundation Research Experience for Undergraduates

NATIONAL SUPERCONDUCTION CYCLOTRON LABORATORY, JUNE 2003 – AUGUST 2003

- Developed data acquisition software to aid the precision alignment process of the Segmented Germanium Detector Array used for in-beam γ -ray spectroscopy.
- Software included: RS-232C serial communications support for data acquisition from two digital theodolites; a new class architecture for an affine, coordinate-free geometric data type; and a set of residual point and tetrahedral plane analysis algorithms to reduce systematic alignment errors.

Undergraduate Research Assistant

SPIN PHYSICS CENTER, UNIVERSITY OF MICHIGAN, SEPTEMBER 2000 – FEBRUARY 2004

- Designed and built a control system for the Michigan Ultracold Spin-Polarized Atomic Hydrogen Jet's 0.2 K superfluid ^4He film.
- Independently led software development to facilitate real-time user interface, data acquisition, and control algorithms for the superfluid ^4He film controller.

- Managed data acquisition and system operations during experimental runs of the Michigan Jet and Solid Polarized Proton Target.
- Provided maintenance and operations support for a passive hydrogen maser used to monitor the polarization of the Michigan Jet's beam.
- Supported operations for stored spin-polarized proton and deuteron experiments at Indiana University Cyclotron Facility.

Academic Computing Consultant

CAMPUS COMPUTING SITES, UNIVERSITY OF MICHIGAN, SEPTEMBER 2000 – SEPTEMBER 2001

- Resolved on-site computer software and hardware related issues for students, faculty, and staff within the university computing environment.
- Supported Linux, Mac, and Windows platforms.

Honors & Awards

Cymer Incorporated ARCS Scholar

ACHIEVEMENT REWARDS FOR COLLEGE SCIENTISTS SCHOLARSHIP, JULY 2007 – PRESENT

President's Award in Research and Scholarship

1ST ANNUAL SAN DIEGO STATE UNIVERSITY STUDENT RESEARCH SYMPOSIUM, MARCH 2008

Award for Outstanding Teaching by a Graduate Teaching Associate

DEPARTMENT OF PHYSICS, SAN DIEGO STATE UNIVERSITY, MAY 2007

Phi Kappa Phi

SAN DIEGO STATE UNIVERSITY, APRIL 2007

Sigma Pi Sigma

UNIVERSITY OF MICHIGAN, ANN ARBOR, APRIL 2003

University Honors

UNIVERSITY OF MICHIGAN, ANN ARBOR, DECEMBER 2002, MAY 2003

National Society of Collegiate Scholars

UNIVERSITY OF MICHIGAN, ANN ARBOR, APRIL 2000

Publications

P.-N. SEO ET. AL. *High-efficiency resonant rf spin rotator with broad phase space acceptance for pulsed polarized cold neutron beams.* Phys. Rev. ST Accel. Beams **11**, 8, 084701 (2008).

T.E. CHUPP ET. AL. *A Large area polarized ^3He neutron spin filter.* Nucl. Instrum. Methods A **574**, 3, 500 (2007).

M.T. GERICKE ET. AL. *Upper bounds on parity-violating γ -ray asymmetries in compound nuclei from polarized cold neutron capture.* Phys. Rev. C **74**, 6, 065503 (2006).

V.S. MOROZOV ET. AL. *First Spin Flipping of a Stored Spin-1 Polarized Beam.* Phys. Rev. Lett. **91**, 21, 214801 (2003).

B. v. PRZEWOSKI ET. AL. *Vector and tensor polarization lifetimes for a stored deuteron beam.* Phys. Rev. E **68**, 4, 046501 (2003).

Conference Proceedings

B. LAUSS ET. AL. *Precision Measurement of Parity Violation in Polarized Cold Neutron Capture on the Proton.* In Proc. of the 17th Int. Conf. on Particles and Nuclei. AIP Conf. Proc. **842**, 790 (2006).

P.-N. SEO ET. AL. *Measurement of Parity-Violating Gamma-Ray Asymmetry in Compound Nuclei with Cold Neutrons.* In Proc. of the 12th Int. Symp. on Capture Gamma-Ray Spectrosc. and Related Topics. AIP Conf. Proc. **819**, 81 (2006).

K. YONEHARA ET. AL. *Status of the Michigan Ultra-Cold Spin-Polarized Hydrogen Jet.* In Proc. of the 8th Conf. on the Intersections of Part. and Nucl. Phys. AIP Conf. Proc. **698**, 639 (2004).

V.S. MOROZOV ET. AL. *Spin Flipping and Polarization Lifetimes of a 270 MeV Deuteron Beam.* In Proc. of the 15th Int. Spin Phys. Symp. and Workshop on Polarized Electron Sources and Polarimeters. AIP Conf. Proc. **675**, 766 (2003).

K. YONEHARA ET. AL. *Polarized Atomic Hydrogen Beam Tests in the Michigan Ultra-Cold Jet Target.* In

Proc. of the 15th Int. Spin Phys. Symp. and Workshop on Polarized Electron Sources and Polarimeters. AIP Conf. Proc. **675**, 872 (2003).

V.G. LUPPOV ET. AL. *Status of the Michigan Ultra-Cold Polarized Hydrogen Jet Target*. In Proc. of the 9th Int. Workshop on Polarized Sources and Targets. World Scientific Publishing Co. Ptc. Ltd. (2002).

Presentations

M.C. KANDES, O.O. SALAZAR, AND M.W.J BROMLEY. *Structure and interference of ultracold atoms in circular waveguides*. 39th Annual Meeting of the APS Division of Atomic, Molecular, and Optical Physics. Pennsylvania State University, State College, PA. Contributed Poster. May 29, 2008.

M.C. KANDES. *Multimode Interferometry of Bose-Einstein Condensates in a Circular Waveguide*. 22nd Annual California State University Student Research Competition. California State University East Bay, Hayward, CA. Invited Talk. May 3, 2008.

M.C. KANDES. *Multimode Interferometry of Bose-Einstein Condensates in a Circular Waveguide*. 1st Annual San Diego State University Student Research Symposium. San Diego State University, San Diego, CA. Contributed Talk. February 29, 2008.

M.C. KANDES, O.O. SALAZAR, M.W.J. BROMLEY, R. CARRETERO-GONZÁLEZ, AND B.D. ESRY. *Bose-Einstein condensates and their bright solitons in circular waveguides*. 38th Annual Meeting of the APS Division of Atomic, Molecular, and Optical Physics. Telus Convention Centre, Calgary, AB, Canada. Contributed Poster. June 6, 2007.