Bruno A. deHarak
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Education

B.S. in Physics, University of Kentucky (2002)
Cum Laude, Dept. Honors, 3.647 GPA
M.S. in Physics, University of Kentucky (2006)
non-thesis, 3.478 GPA
Ph.D. in Physics, University of Kentucky (2007)
Thesis topic: "Helium (e,2e) coplanar and out-of-plane experiments."

Experience

Aug. 2009 – present **Asst. Professor of Physics at Illinois Wesleyan Univ.**
I am conducting research on laser-assisted electron scattering, the use of laser induced breakdown for measuring pressure, and imaging of dust grains. I teach a variety of undergraduate physics courses for both physics majors and non-majors, including: Introductory Physics, Optics, Scientific Imaging, Experimental Methods, Mathematical Methods, and Electricity & Magnetism.

Oct. 2007 – Aug. 2009 **Postdoctoral Scholar at the Univ. of Ky (Dept. of Phys.)**
Aug. 2002 – Oct. 2007 **Research Asst. at the Univ. of Ky (Dept. of Phys.)**
Aug. 2005 – Dec. 2005 **Teaching Asst. at the Univ. of Ky (Dept. of Phys.)**
I conducted electron impact ionization studies of noble gases in the laboratory of Dr. N.L.S. Martin. The most recent research focused on laser-assisted electron-impact autoionization. As a graduate student I taught general physics recitation sections, and graded for graduate electricity & magnetism, and quantum mechanics courses. After receiving my doctorate I taught an introductory astronomy course.

Dec. 1997 – Feb. 2002 **Database Analyst and Administrator with Long John Silver's**
I was solely responsible for ensuring the integrity and availability of all of the corporation's databases, as well as being the information systems security officer for the corporation. I consulted with the programming staff on writing/tuning programs that accessed the databases. During this time I performed several database migrations and participated in the implementation of several major human resource and financial applications.

Oct. 1996 – Dec. 1997 **Systems Programmer with Lockheed Martin**
Mar. 1994 - Sep. 1996 **Data Processor with Lockheed Martin**
I installed and configured system software on mainframe and UNIX systems. Additionally, I was responsible for researching new hardware and software requirements, and providing budget justifications for these requirements. I wrote and maintained programs on a variety of platforms. I provided help desk support for all computer and network systems. I was also responsible for ensuring availability of all data center systems. Getting the facility connected to the internet was one of my major accomplishments during this time. This entailed the creation of local policies and procedures for Internet/Intranet use, distribution and maintenance of software for several hundred users, and training help desk operators.

Sep. 1988 - Feb. 1994 **Missile Electronics Tech. with Lockheed Martin**
I maintained a variety of industrial radiography systems used to inspect missiles and missile components. I participated on and led a nuclear emergency response team. A major accomplishment of mine during this time was the establishment of a component level repair capability for x-ray system circuit boards.

Jun. 1981 - Jan. 1988 Marine with the United States Marine Corps

My rank upon leaving the service was Sergeant (E5). I held the following positions:

- Avionics Technician (1983 - 1988).
- Lifeguard (1983)
- Amphibious Assault Crewman (1981 - 1983).

Publications

B.A. deHarak, Benjamin Nosarzewski, Mahsa Siavashpouri, N.L.S. Martin "Electron-helium scattering in a 1.17 eV laser field: The effect of polarization direction", Phys. Rev. A 90, 032709 (2014)

B.A. deHarak, K. Bartschat, N.L.S. Martin "Energy dependence of the (*e*,2*e*) recoil peak to binary peak ratio across He $(2p^2)^1D$ and $(2s2p)^1P$ autoionizing levels", Phys. Rev. A 89 012702 (2014)

B. Krässig, E.P. Kanter, S.H. Southworth, L. Young, R. Wehlitz, B.A. deHarak, N.L.S. Martin "Dipole-quadrupole interference spectroscopy: Observation of an autoionizing He ^1D Rydberg series", Phys. Rev. A 86 053408 (2012)

B.A. deHarak, L. Ladino, K.B. MacAdam, N.L.S. Martin "High-energy electron-helium scattering in a Nd:YAG laser field", Phys. Rev. A 83, 022706 (2011)

B.A. deHarak, K. Bartschat, N.L.S. Martin "Out-of-plane (*e*,2*e*) angular distributions and energy spectra of helium L = 0,1,2 autoionizing levels", Phys. Rev. A 82, 062705 (2010)

Nicholas L.S. Martin and Bruno A. deHarak, editors: "International Symposium on (e,2e), Double Photoionization and Related Topics & 15th International Symposium on Polarization and Correlation in Electronic and Atomic Collisions", J. Phys.: Conf. Series 212 (2010)

N.L.S. Martin, B.A. deHarak, K. Bartschat "Complex Fano assymetry parameters for helium L=0,1,2 autoionizing levels excited by electron impact", J. Phys. B 42, 225201 (2009)

N.L.S. Martin, B.A. deHarak, K. Bartschat "Complex Fano assymetry parameters for helium L=0,1,2 autoionizing levels", J. Phys.: Conf. Series 194, 042046 (2009)

B.A. deHarak, K. Bartschat, N.L.S. Martin, "Out-of-plane (e,2e) experiments on helium L = 0, 1, 2 autoionizing levels", J. Phys.: Conf. Series 194, 012022 (2009)

B.A. deHarak, K. Bartschat, N.L.S. Martin, "Recent out-of-plane (e,2e) experiments on autoionizing levels of helium", J. Phys.: Conf. Series 141, 012005 (2009)

B.A. deHarak, K. Bartschat, N.L.S. Martin, "Out-of-Plane (*e*,2*e*) Experiments on Helium *L*=0, 1, 2 Autoionizing Levels" Phys. Rev. Lett. 100, 063201 (2008)

B.A. deHarak, N.L.S. Martin, "An out-of-plane (e,2e) spectrometer using a movable electron gun", Meas. Sci. Tech. 19, 015604 (2008)

B.A. deHarak, Z. Chen, D.H. Madison, N.L.S. Martin, "Experimental and theoretical momentum transfer dependence of the He (e, 2e) cross section for incident electron energies 150 eV and 488 eV", J. Phys. B 40, 755 (2007)

B.A. deHarak, J. G. Childers, and N.L.S. Martin, "Ejected electron spectrum of He below the *N*=2 threshold", Phys. Rev. A 74, 032714 (2006)

B.A. deHarak, Z. Chen, D.H. Madison, N.L.S Martin, "Experimental and theoretical momentum transfer dependence of the He (*e*,2*e*) cross section", J. Phys. B letters. 38 (10), L145-L152 (2005)

B.A. deHarak, J.G. Childers, N.L.S. Martin, "Non-dipole effects in (*e*,2*e*) and photoelectron experiments: a comparison", JESRP 141, 75 (2004)

J. G. Childers, B.A. deHarak, and N.L.S. Martin, "Ejected electron spectrum of *Xe* between the $^2P_{3/2}$ and $^2P_{1/2}$ ionic limits", Phys. Rev. A 69, 042713 (2004)

Y.V. Sushko, B. DeHarak, G. Cao, G. Shaw, D.K. Powell, J.W. Brill, "Hydrostatic pressure effects on the magnetic susceptibility of ruthenium oxide $Sr_3Ru_2O_7$: evidence for pressure-enhanced antiferromagnetic instability", Solid State Comm. 130, 341 (2004)

Conference presentations and posters

Brad E. Sheese, Bruno deHarak "Inexpensive High-Throughput Computer-Aided Tracking of Zebrafish in the Novel Tank Paradigm" American Psychological Association Annual Convention, Washington, D.C., 2014

Joseph Plazak, Bruno deHarak "Cross-modality scene analysis research using animated ASA demonstrations" Milestones in Music Cognition: BKN25, Montreal, Canada, 2014

B.A. deHarak, N.L.S. Martin "Laser assisted free-free scattering: a test of the Kroll-Watson approximation for different targets" 45th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Madison, Wisconsin 2014

N.L.S. Martin, B.A. deHarak "Out-of-plane (e,2e) measurements with 150eV incident beam energy on He autoionizing levels" 45th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Madison, Wisconsin 2014

N.L.S. Martin, B.A. deHarak, K. Bartschat "Energy dependence of the (e,2e) recoil/binary peak ratio across He autoionizing levels" International Symposium on (e,2e), Double Photoionization and Related Topics, Hefei, China, 2013

B.A. deHarak, Benjamin Nosarzewski, Mahsa Siavashpouri, N.L.S. Martin "Eletron-helium laser-assisted free-free scattering for incident energies from 30 - 200 eV: effects of polarization direction" 2013 Joint Meeting of the APS Division of Atomic, Molecular & Optical Physics and the CAP Division of Atomic, Molecular & Optical Physics, Quebec City, Canada, 2013

N.L.S. Martin, B.A. deHarak, K. Bartschat "Energy dependence of the (e,2e) recoil/binary peak ratio across He autoionizing levels" 2013 Joint Meeting of the APS Division of Atomic, Molecular & Optical Physics and the CAP Division of Atomic, Molecular & Optical Physics, Quebec City, Canada, 2013

B.A. deHarak, Benjamin Nosarzewski, Mahsa Siavashpouri, N.L.S. Martin "Electron-helium laser-assisted free-free with variable laser polarization" 43rd Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Anaheim, California, 2012

N. St.J. Braithwaite, B.A. deHarak, N.L.S. Martin, A.J. Murray, K.L. Nixon "Development of a multipass cell for atomic collision experiments in the presence of a laser field" International Symposium on (e,2e), Double Photoionization and Related Topics, Dublin, Ireland, 2011

B.A. deHarak, L. Ladino, K.B. MacAdam, N.L.S. Martin, "Electron-helium free-free scattering in the presence of a laser field" XXVII International Conference on Photonic, Electronic and Atomic Collisions, Belfast, United Kingdom, 2011

N. St.J. Braithwaite, B.A. deHarak, N.L.S. Martin, A.J. Murray, K.L. Nixon "Development of a multipass cell for atomic collision experiments in the presence of a laser field" 42nd Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Atlanta, Georgia, 2011

B.A. deHarak, D. LaRocca, E. Baker, N. Goble, "Using Laser Induced Breakdown To Probe Pressure" 42nd Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Atlanta, Georgia, 2011

B.A. deHarak, K.B. MacAdam, N.L.S. Martin, "Free-free scattering of 50 - 350 eV incident energy electrons from helium in the presence of a laser field" Laboratory Astrophysics Workshop 2010, Gatlinburg, Tennessee, 2010

E. Baker, N. Goble, D. LaRocca, B. deHarak, "Using Laser Induced Breakdown as a Probe to Measure Pressure" Laser Science XXVI, Rochester, New York, 2010

B.A. deHarak, L. Ladino, N.L.S. Martin, "Electron-helium free-free scattering in the presence of a laser field" 41st Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Houston, Texas, 2010

N.L.S. Martin, L. Ladino, B.A. deHarak, "Electron-impact autoionization of helium in the presence of a laser field" 41st Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Houston, Texas, 2010

B.A. deHarak, L. Ladino, N.L.S. Martin, "Electron-helium scattering in the presence of a laser field at moderate incident energies" 62nd Annual Gaseous Electronics Conference, Saratoga Springs, New York, 2009

N.L.S. Martin, B.A. deHarak, K. Bartschat "Complex q parameters for helium L=0,1,2 autoionizing levels" 62nd Annual Gaseous Electronics Conference, Saratoga Springs, New York, 2009

B.A. deHarak, L. Ladino, N.L.S. Martin, "Electron-helium elastic scattering at 150 eV incident energy in the presence of a laser field" International Symposium on (e,2e),Double Photoionization and Related Topics, Lexington, Kentucky, 2009

B.A. deHarak, T.G. Porter, N.L.S. Martin, "A data acquisition system based on a novel microcontroller" 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Charlottesville, Virginia, 2009

N.L.S. Martin, B.A. deHarak, K. Bartschat "Complex q parameters for helium L=0,1,2 autoionizing levels" 40th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Charlottesville, Virginia, 2009

B.A. deHarak, K. Bartschat, N.L.S. Martin, "Out-of-plane (*e,2e*) angular distributions and energy spectra of He autoionizating states" 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, State College, Pennsylvanie, 2008

B.A. deHarak, K.D. Wells, K.B. MacAdam, N.L.S. Martin, "Electron impact autoionization in the presence of a laser field" 39th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, State College, Pennsylvanie, 2008

B.A. deHarak , N.L.S. Martin, "Out of plane (e,2e) experiments on helium autoionizing states." XXV International Conference on Photonic, Electronic and Atomic Collisions, Freiburg, Germany, 2007

B.A. deHarak , N.L.S. Martin, "Out of plane (e,2e) experiments on an autoionizing resonance using 488 eV incident energy electrons." 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Calgary, Canada, 2007

B.A. deHarak , N.L.S. Martin, "Out of plane (e,2e) experiments on helium autoionizing states." 38th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Calgary, Canada, 2007

N.L.S. Martin , B.A. deHarak , S.H. Southworth , E.P. Kanter , B. Kraessig , L. Young , R. Wehlitz , "DIQUIS observation of n=2→7 He 2pnp ^{1}D autoionizing resonances." Synchrotron Radiation Center Users Meeting 06, Stoughton, Wisconsin, 2006

B.A. deHarak , N.L.S. Martin, "The use of a shaped mesh lens in electron optics." 37th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Knoxville, Tennessee, 2006

N.L.S. Martin , B.A. deHarak , S.H. Southworth , E.P. Kanter , B. Kraessig , L. Young , R. Wehlitz , "DIQUIS observation of n=2→7 He 2pnp ^{1}D autoionizing resonances." 37th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Knoxville, Tennessee, 2006

S.H. Southworth, R.W. Dunford, E.P. Kanter, B. Krässig, L. Young, R. Wehlitz, B.A. deHarak, and N.L.S. Martin, "Dipole and nondipole interactions in photoelectron angular distributions" 20th International Conference on X-ray and Inner Shell Processes, Melbourne, Australia, 2005

B.A. deHarak and N.L.S. Martin, "Determination of an (*e,2e*) apparatus instrument function using a SIMION simulation" XXIV International Conference on Photonic, Electronic and Atomic Collisions, Rosario, Argentina, 2005

B.A. deHarak, Z. Chen, D. H. Madison and N.L.S. Martin, "(*e,2e*) scattered electron angular distributions for the direct ionization of helium" XXIV International Conference on Photonic, Electronic and Atomic Collisions, Rosario, Argentina, 2005

B.A. deHarak , N.L.S. Martin, "Determination of an (*e*,2*e*) apparatus instrument function using a SIMION simulation" 36th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Lincoln, Nebraska, 2005

B.A. deHarak, N.L.S. Martin, Zhangjin Chen, D.H. Madison, "Momentum transfer dependence of the He (*e*,2*e*) cross section: scattered electron angular distributions" 36th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Lincoln, Nebraska, 2005

B.A. deHarak, N.L.S. Martin, "(*e*,2*e*) experiments on the direct ionization of helium." 35th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Tuscon, Arizona, 2004

B.A. deHarak, N.L.S. Martin, "The ejected electron spectra of Helium autoionizing levels below the N=2 threshold." 34th Annual Meeting of the Division of Atomic, Molecular and Optical Physics, Boulder, Colorado, 2003

Y. Sushko, O. Naumenko, B.A. deHarak, G. Cao, "Pressure-temperature-magnetic field phase diagram of the bilayered perovskites $Sr_3Ru_2O_7$ and $Ca_3Ru_2O_7$ probed by SQUID magnetometry and magnetotransport measurements." Annual March Meeting of the American Physical Society, Austin, Texas, 2003

B.A. deHarak, Y.V. Sushko, "High-pressure studies of electrical transport and magnetic susceptibility in $Ca_3Ru_2O_7$" Annual March Meeting of the American Physical Society, Indianapolis, Indiana, 2002

Y. Sushko, B.A. deHarak, G. Shaw, J. Brill, G. Cao , J. Crow, "High-pressure enhanced antiferromagnetism in $Sr_3Ru_2O_7$" Annual March Meeting of the American Physical Society, Indianapolis, Indiana, 2002

Invited talks

Some photons, an electron, and an atom, Physics Department Colloquium, Dept. of Physics, Illinois State University, 8 April 2014

An electron, an atom, and a photon, Physics Department Colloquium, Dept. of Physics, Missouri University of Science & Technology, 19 September 2013

The effects of polarization direction on electron-helium laser-assisted free-free scattering, International Symposium on (e,2e), Double Photoionization and Related Topics, Hefei, China, 2 August 2013

Laser-assisted electron impact autoionization of Helium, Physics Department Colloquium, Dept. of Physics, Western Illinois University, 1 October 2011

Laser-assisted electron impact autoionization, 62nd Annual Gaseous Electronics Conference, Albany, NY, October 2009

Out-of-Plane (e, 2e) Experiments on Helium L=0, 1, 2 Autoionizing Levels, XXVI International Conference on Photonic, Electronic and Atomic Collisions, Kalamazoo, MI, July 2009

Recent out-of-plane (e,2e) experiments on autoionizing levels of helium, International Conference on Many Particle Spectroscopy of Atoms, Molecules, Clusters and surfaces, Paris, France, July 2008

Electron impact autoionization in the presence of a laser field, Environmental and Biological Applications of Lasers, Cairo, Egypt, January 2008

Out of plane (e,2e) experiments on an autoionizing resonance, 1st US-Africa Nanosciences Workshop, iThemba Labs, Cape Town, South Africa, 28 January 2007

Studies in Disagreement: Why We're Still Hitting Helium Atoms with Electrons, Physical Chemistry Seminar, Dept. of Chemistry, University of Kentucky, 23 October 2006

Grants, fellowships and awards

National Science Foundation *Investigator Initiated Research Grant*	2014
Illinois Wesleyan University *Recentering the Humanities: Course development Grant*	2014
Illinois Wesleyan University *Curriculum Development Grant*	2011
Illinois Wesleyan University *Artistic and Scholarly Development Grant*	2010
University of Kentucky *Steckler Fellowship*	2006/2007
Department of Education *GAANN Fellowship*	2003/2004
University of Kentucky *Summer Research and Creativity Grant*	2002

Committee and service work

Member of the University Hearing Committee	2013-present
Chair of the Faculty Committee on Diversity	2012-present
Member of the University Committee for Diversity	2012-present
Member of the Faculty Committee on Diversity	2010-2012
Member of the Pre-Engineering Committee	2010-present
Member of the University Council for Religious Life	2010-present
Co-Organizer of the Natural Sciences Colloquium Series	2010-present
Co-Advisor for the IWU Society of Physics Students	2009-present
Referee for Physical Review Letters	2013
Referee for the Journal of Physics: B	2008-2011
Reviewer for the Georgia National Science Foundation	2009, 2011, 2012
Referee for Physical Review A	2011
Reviewer for the Research Foundation – Flanders (FWO)	2011
Reviewer for the U.S. National Science Foundation	2009
Co-chair of the (e,2e) 2009 conference organizing committee	2007-2009
Organizer of the departmental Careers Outside Academia Seminars	2006-2008
Member of the UK Physics Dept. Graduate Program & Curriculum Committee	2006-2007
Member of University of Kentucky Graduate Student Congress	2006
Chairman of the UK Physics Dept. Graduate Student Council	2005-2007
Member of the Physics Dept. Chairman Search Committee	2004