

Michael Courtney, PhD

Ballistics Testing Group P.O. Box 24 West Point, NY 10996

email: Michael_Courtney@alum.mit.edu

curriculum vitae

Education **Massachusetts Institute of Technology**

1995 Ph.D. in Atomic, Molecular and Optical Physics. GPA: 4.7/5.0

Louisiana State University (Baton Rouge)

1989 B.S. Summa Cum Laude in Physics. GPA: 3.95/4.0

Research Experience

Ballistics Testing Group

2001-present

Developing acoustic methods for gunfight reconstruction from audio recording(s). Methods include time and frequency domain analysis. Developed methods in terminal ballistics showing a ballistic pressure wave contributes to wounding and incapacitation. Working to apply periodic orbit theory to acoustic reconstructions.

Cisco Systems/Aironet Wireless Communications

1995-2002

Design validation, calibration and testing of microwave devices using standard RF measurement, signal processing, and numerical analysis techniques. Test software written in LabVIEW and C.

Department of Physics, MIT

1989-1995

Theoretical and experimental investigations into links between classical and quantum dynamics. Computation of spectra and periodic orbits of Rydberg atoms in strong electric and magnetic fields. Developed spectroscopic methods for observing effects of classical orbits in spectra.

Chemistry Department, Brookhaven National Laboratory

1988-1989

VUV ionization of calcium and magnesium including 9th harmonic generation of pulsed Nd:YAG laser. Coherent dephasing of quantum beats in OH⁻ and ArOH⁻.

Department of Physics and Astronomy, LSU

1986-1989

Multiphoton ionization of calcium in an intense laser field. Theoretical work on computation of thermal cyclotron absorption coefficients.

Teaching Experience

Western Carolina University, Cullowhee, NC

2006

Director of Forensic Science Program, Assistant Professor of Physics Responsible for originating program including curriculum development, accreditation, administration, recruiting, and maintaining active research program in ballistics and acoustics. Teaching and curriculum development in Physics and Forensic Science.

Lorain County Community College, Elyria, OH

2002-2006

Assistant Professor of Physics Taught introductory courses in Physics, Algebra, Statistics, and Forensic Science. Also taught College 101. Supervised undergraduate research in Physics and Forensic Science. Tutored Calculus.

Office of Minority Education, Massachusetts Institute of Technology **1993**

Tutored Math, Physics, Computer Science and English for two semesters.

Teaching Experience (continued) **Department of Physics, Massachusetts Institute of Technology 1993-1994**
Teaching assistant for Quantum Electronics and Laser Spectroscopy for two semesters.
Teaching assistant for Atomic, Molecular and Optical Physics for one semester.

PhD Thesis **Rydberg Atoms in Strong Fields: A Testing Ground for Quantum Chaos**

Awards **Finalist for 1995 American Physical Society Award** for Outstanding Doctoral Thesis Research in Atomic, Molecular, or Optical Physics

LSU University Medal (1989) for graduating first in class

Publications (External Ballistics) *Acoustic methods for measuring bullet velocity*, M Courtney, in press, Applied Acoustics (2007), doi:10.1016/j.apacoust.2007.05.004.

The truth about ballistic coefficients, M Courtney, A Courtney, (2007).
<http://arxiv.org/ftp/arxiv/papers/0705/0705.0389.pdf>

An acoustic method for determining ballistic coefficients, M Courtney, A Courtney, (2007). <http://arxiv.org/ftp/arxiv/papers/0705/0705.0391.pdf>

Using sound of target impact for acoustic reconstructions of shooting events, M Courtney, A Courtney, (2006). www.ballisticstestinggroup.org/impactsound.pdf

(Terminal Ballistics) *Links between traumatic brain injury and ballistic pressure waves originating in the thoracic cavity and extremities*, A Courtney, M Courtney, in press (2006).

Review of criticisms of ballistic pressure wave experiments, the Strasbourg goat tests, and the Marshall and Sanow data, M Courtney, A Courtney, (2007).
<http://arxiv.org/ftp/physics/papers/0701/0701268.pdf>

Ballistic pressure wave contributions to rapid incapacitation in the Strasbourg goat tests, M Courtney, A Courtney, (2007). <http://arxiv.org/ftp/physics/papers/0701/0701267.pdf>

Relative incapacitation contributions of pressure wave and wound channel in the Marshall and Sanow data set, M Courtney, A Courtney, (2007).
<http://arxiv.org/ftp/physics/papers/0701/0701266.pdf>

A method for testing handgun bullets in deer, M Courtney, A Courtney, (2007).
<http://arxiv.org/ftp/physics/papers/0702/0702107.pdf>

(Education) *Acoustic Measurement of Potato Cannon Velocity*, M Courtney, A Courtney, in press, The Physics Teacher (Scheduled Winter 2007). Pre-print:
<http://arxiv.org/ftp/physics/papers/0612/0612118.pdf>

Five Frequently Fatal Freshman Physics Fantasies, M Courtney, N Althausen, A Courtney. Physics Education, (42) 116, (2007). Pre-print:
<http://arxiv.org/ftp/physics/papers/0605/0605152.pdf>

Who is the Customer in Higher Education? M Courtney, A Courtney, (2006).
<http://arxiv.org/ftp/physics/papers/0612/0612117.pdf>

Measuring Bullet Velocity with a PC Soundcard, M Courtney, B Edwards, (2006).
<http://arxiv.org/ftp/physics/papers/0601/0601102.pdf>

Teaching Wave Physics and Fourier Analysis with the Bass Guitar, M Courtney, N Althausen, (2006). <http://arxiv.org/ftp/physics/papers/0605/0605154.pdf>

(Theory,
Chaos/Atomic
Physics)

Core-induced chaos in diamagnetic lithium, M Courtney, D Kleppner, Phys Rev A **53**, 178 (1996).

Initial conditions of closed classical orbits from quantum spectra, M Courtney, Chaos **6**, 1 (1996).

Scaled-energy spectra and closed classical orbits of the hydrogen atom in parallel electric and magnetic fields, M Courtney, Phys Rev A **51**, 4558 (1995).

Classical, semiclassical, and quantum dynamics of lithium in an electric field, M Courtney, N Spellmeyer, H Jiao, D Kleppner, Phys Rev A **51**, 3604 (1995).

Recurrences associated with a classical orbit in the node of a quantum wave function, JA Shaw, JB Delos, M Courtney, D Kleppner, Phys Rev A **52**, 3695 (1995).

New Class of Universal Correlations in the Spectra of Hydrogen in a Magnetic Field, BD Simons, A Hashimoto, M Courtney, D Kleppner, BL Altshuler, Phys Rev Let **71**, 2899 (1993).

(Theory,
Astrophysics)

Thermal Cyclotron Absorption Coefficients, G Chanmugam, PE Barrett, K Wu, MW Courtney, Astrophysical Journal Supplement Series **71**, 323 (1989).

(Experiment,
Chaos/Atomic
Physics)

Closed Orbit Bifurcations in Continuum Stark Spectra, M Courtney, H Jiao, N Spellmeyer, D Kleppner, J Gao, JB Delos, Phys Rev Let **27**, 1538 (1995).

Quantum Chaos and Rydberg Atoms in Strong Fields, M Courtney, H Jiao, N Spellmeyer, D Kleppner, in the proceedings of the 4th Drexel Symposium on Quantum Nonintegrability (1995).

Long-period Orbits in the Stark Spectrum of Lithium, M Courtney, H Jiao, N Spellmeyer, D Kleppner, Phys Rev Let **73**, 1340 (1994).

Nonresonant multiphoton ionization of calcium atoms in an intense laser field, LF DiMauro, D Kim, MW Courtney, M Anselment, Physical Review A **38**, 2338 (1988).