

CONTACT
INFORMATION

Laboratory for Atmospheric and Space Physics
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EDUCATION

University of California, Los Angeles, USA

Ph.D., Physics, 2010
• Dissertation title: *Structure of an Expanding Laser-Produced Plasma*
M.S., Physics, 2005

University of Rochester, Rochester, New York USA

B.S., *magna cum laude* Physics, 2004

HONORS AND
AWARDS

U.S. DOE/ORISE Fusion Energy Sciences Fellowship, 2005-2008
Phi Beta Kappa, 2004
Rush Rhees Merit Scholarship, Univ. Rochester, 2000-2004

RESEARCH

Laboratory for Atmospheric and Space Physics

Supervisor: Mihaly Horanyi

*Research Scientist***July 2010 - Present**

Started work in July of 2010 at the Colorado Center for Lunar Dust and Atmospheric Studies (CCLDAS) with a main emphasis on constructing a dust accelerator facility for the study of hypervelocity dust impacts. As of April 2011, this goal has been achieved, with work on publishable research topics beginning immediately. In parallel with accelerator construction, I have been working to develop the CCLDAS experimental program through the design of a ultrahigh-vacuum chamber for impact physics, and worked with students on instrument concepts such as LPLUS (Langmuir Probes for the Lunar Surface).

University of California, Los Angeles

Advisor: Walter Gekelman

*Graduate Student Researcher***July 2004 - June 2010**

Ph.D research on the dynamics of expanding laser-produced plasmas, emphasizing turbulence, wave activity at the plasma boundary and interaction with a background magnetized plasma. Performed direct experimental measurement on an expanding laser-produced plasma using three-dimensional probe sampling, uncovering electrostatic structures at the plasma boundary (Phys. Rev. Lett. 105, 195003, 2010).

Lawrence Livermore National Laboratory, Livermore, CA

Sponsors: Dustin Froula, Siegfried Glenzer

*FES Fellowship Practicum***March-June, 2007**

Performed characterization on a new gas-jet design for laser-wakefield acceleration, at the LLNL Jupiter laser facility. Designed an optical interferometer to measure neutral gas density versus time, as a function of axial location in a gas-filled tube. Experiments based on this design are ongoing.

University of California, Los Angeles

Sponsor: Professor Walter Gekelman

*Research Experience for Undergraduates***June-August, 2003**

Developed and constructed an optical probe to perform correlation measurements in the Large Plasma Device at UCLA, over the 10 week REU period. Designed probe hardware and a sixteen-port vacuum feedthrough for optical fibers, along with a photodiode array to read out signals.

PUBLICATIONS

A. Collette and W. Gekelman *Structure of an Exploding Laser-Produced Plasma*. Phys. Rev. Lett. 105, 195003 (2010)

W. Gekelman, E. Lawrence, A. Collette, et al. *Magnetic field line reconnection in the current systems of flux ropes and Alfvén waves*. Phys. Scr. T142 014032 (2010)

C. Constantin, W. Gekelman, P. Pribyl et al. *Collisionless interaction of an energetic laser produced plasma with a large magnetoplasma*. Astrophys. Space. Sci., DOI 10.1007/s10509-009-0012-z (2009)

A. Collette and W. Gekelman *Two-dimensional micron-step probe drive for laboratory plasma measurement*. Review of Scientific Instruments 79, 083505, 2008

S. Vincena, W. Gekelman, M.A. Van Zeeland, J. Maggs, A. Collette *Quasielectrostatic whistler wave radiation from the hot electron emission of a laser-produced plasma*. Phys. Plasmas 15 072114, 2008

W. Gekelman, S. Vincena, and A. Collette *Visualizing three-dimensional reconnection in a colliding laser plasma experiment*. IEEE Trans. Plasma Sci. 36 (4) 2008

N. L. Kugland et al. *High K- α x-ray conversion efficiency from extended source gas jet targets irradiated by ultra short laser pulses* Appl. Phys. Lett. 92, 241504 (2008)

W. Gekelman, A. Collette, S. Vincena. *Three Dimensional Current Systems Generated by Plasmas Colliding in a Background Magnetoplasma*. Physics of Plasmas 14, 062109, 2007

CONFERENCES

A. Collette, M. Horanyi, T. Munsat, Z. Sternovsky, The CCLDAS Team *Impact Physics Experiences at the Colorado Center for Lunar Dust and Atmospheric Studies*. 11th International Workshop on the Interrelationship between Plasma Experiments in the Laboratory and Space (IPELS), Whistler, BC, 2011

A. Collette, M. Horanyi, T. Munsat et al. *The Colorado Center for Lunar Dust and Atmospheric Studies*. AGU Fall Meeting, San Francisco, 2010

A. Collette *Structure of an Exploding Laser-Produced Plasma (invited talk)*. APS DPP Fall Meeting, Chicago, 2010

A. Collette and W. Gekelman *Waves and Fine Structure in Expanding Laser-Produced Plasmas*. Turbulent Mixing and Beyond: Second International Conference and Advanced School. July 27, 2009

A. Collette et al. *Colliding Laser-Produced Plasmas on LAPD*. APS Division of Plasma Physics

Conference, Dallas, Texas, USA. November 17 - November 21, 2008

A. Collette et al. *Colliding Laser-Produced Plasmas on LAPD*. APS Division of Plasma Physics Conference, Orlando, Florida, USA. November 12 - November 16, 2007

A. Collette et al. *Colliding Laser-Produced Plasmas on LAPD*. 9th International Workshop on the Interrelationship between Plasma Experiments in Laboratory and Space. Cairns, Australia. August 5 - August 10, 2007

A. Collette et al. *Current Systems Generated by Colliding Laser-Produced Plasmas*. APS Division of Plasma Physics Conference, Philadelphia, Pennsylvania, USA. October 30 - November 3, 2006.

W. Gekelman and A. Collette *Magnetic Turbulence in Colliding Laser-Produced Plasmas*. APS Division of Plasma Physics Conference, Philadelphia, Pennsylvania, USA. October 30 - November 3, 2006.

A. Collette et al. *Laser-Produced Colliding Plasmas on LAPD*. APS Division of Plasma Physics Conference, Denver, Colorado, USA. October 24 - October 28, 2005

OTHER SKILLS

- Author of a Python data-storage interface now used at multiple scientific institutions (<http://h5py.alfven.org>)
- Designed a micro-probe-drive system using vacuum-compatible ceramic motors, capable of accurately positioning a magnetic field probe down to 100 microns (Review of Scientific Instruments 79, 083505, 2008)
- Operated and repaired commercial Nd:YAG (2J, 8ns) laser systems, including rod replacement and realignment
- Operated and maintained laboratory high-vacuum systems, including practical experience designing vacuum control and interlock systems