

**Sandra G. Biedron, Ph.D. (PI)**

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*Education*

2001 Ph.D. in Accelerator Physics, Lund University, Lund, Sweden

1994 B.S. Chemistry and Biology, Minor Math, Trinity Christian College, IL, USA

- present Additional management and technical continuing education classes to stay current in the fields, including Management of Scientific Laboratories; Ultrashort Laser Induced Filaments: Propagation in Transparent Media; Beam Quality; Windows, Substrates, and Coatings for HEL Applications; Introduction to High Power Microwave Systems; High Power Microwave Technologies; High-Energy Lasers; Atmospheric Propagation

*Professional Experience*

2011 - Present Associate Professor of Electrical & Computer Engineering, Colorado State University, USA

2005 - 2011 Director and Physicist, Department of Defense Project Office, Argonne National Laboratory and Associate Director, Argonne Accelerator Institute, USA

2007 - 2011 Technology and Management Consultant, FERMI@Elettra Project, Trieste, Italy

2007 - 2012 Honorary Senior Research Fellow, Victoria, Australia

2006 - 2011 Visiting Researcher, University of Maryland, USA

2003 - 2005 Applied Physicist and Project Manager, Member of the Applied Science and Technology and National Security Associate Laboratory Directorship, Argonne National Laboratory, USA

2002 - 2003 Physicist, Member of the Administration of the Experimental Facilities Division at the Advanced Photon Source, Argonne National Laboratory, USA

1998 - 2002 Chief of Operations of Accelerator Research and Development and Member of the Main Control Room Operations Group at the Advanced Photon Source, Accelerator Operations Division, Argonne National Laboratory, USA

1997 - 2003 Member of the Accelerator Physics Group, MAX-Laboratory, Sweden

1995 - 1998 Member of the Accelerator Physics Group at the Advanced Photon Source, Accelerator Systems Division, Argonne National Laboratory, USA

1995 - 1996 Database designer and administrator for experimental data (35,000 data tapes) and a run-time logbook using Oracle. Experiment 871, Fermi National Accelerator Laboratory, USA

1993 - 1995 Analytical Chemist as Scientific Associate, Energy Systems Division, Argonne National Laboratory, USA

### *Synergistic Activities*

#### 1. Honors

- 2013 Committee member and organizer, DOE workshop on laser technologies
- 2012 Fellow, SPIE (International Society of Optics and Photonics).
- 2011 DOE Accelerator R&D task force committee for Congress.
- 2010 Letter of Commendation, Presented by the Chief of Naval Research,
- 2009 Served as Leader of the Security and Defense Working Group for the Department of Energy's Symposium and Workshop "Accelerators for America's Future." The symposium and workshop brought together more than 400 scientists to examine the challenges for identifying, developing and deploying accelerators to meet the nation's and allies' needs in Discovery Science, Medicine and Biology, Industrial Applications and Production, Energy and Environment, and Security and Defense. <http://www.acceleratorsamerica.org/index.html>. Report available on-line.
- 2008 Guest of Honor, Recruit Graduation, Great Lakes Naval Station, invited by the Commanding Officer, Recruit Training Command of the United States Navy
- 2007 Nominated and selected by the National Academies of the United States to participate in the Committee on the Scientific Assessment of Free Electron Laser Technology for Naval Applications to perform a critical technology review of high-power FELs.
- 2006 Nominated and elected to serve as the Particle Accelerator Science and Technology Representative for the Administrative Committee of the Nuclear and Plasma Sciences Society of the IEEE
- 2004 Invited participant and invited speaker for the DOE/NSF/NIH (Department of Energy, National Science Foundation, and National Institutes of Health) Workshop on Opportunities in THz Science, 12-14 February 2004. Report available on-line.
- 2004 Invited Lecturer at the Institute of Physics, Academy of Sciences of the Czech Republic.
- 2003 Senior Member of the IEEE, Nominated by the Nuclear Plasma Sciences Society Members
- 1990 Leadership Award presented by the Veterans of Foreign Wars

#### 2. Selected Service Activities

- Member, NATO Sensors and Electronics Technology Panel
- Associate Editor, IEEE Photonics Journal
- Editor, Two SPIE Publications
- Reviewer for Physical Review, Special Topics Accelerators and Beams; the International Journal of Optics; Proceedings of the IEEE; Journal of Pharmaceutical

Science – analytical tools reviewer; the Journal of Directed Energy; the Applied Physics Letters; the Journal of Applied Physics; Nuclear Instruments and Methods in Physics Research A; the European Physical Journal D; Nuovo Cimento B; IR Physics and Technology.

- Reviewer for the Office of Naval Research's programs; the Czech Science Foundation; the Israeli Science Foundation; the Dutch Ministry of Economics and Ministry of Science; for the Multi-disciplinary Research Initiative for Free-Electron Lasers for the Joint Technology Office; the Soft X-ray Free-Electron Laser Program at BESSY, Berlin, Germany; the National Science Foundation; the SPARX Free-Electron Laser Project, Frascati, Italy
- Nominated SPIE Symposium Committee Member; International Free-Electron Laser Conference Scientific Program Committee (2002, 2004, 2009, 2010, 2011, 2012); Particle Accelerator Conference Program Committee (2003, 2009, 2011); Particle Accelerator Conference International Organizing Committee (2006-2011); Program committee for workshops on high-harmonic seeding for present and future short wavelength free-electron lasers (FELs) (2008 and 2010); IR-MMW THz Conference Program Committee (2010); Directed Energy Professional Society, Free-Electron Laser Program Chair and Member of the Program Committee (2008); Working Group Leader for Diagnostics and Controls for the Workshop on High Average Power, High Brightness Beams, UCLA, (2004 and 2009); SPIE Executive Committee for the Conference Tracks for Optics and Photonics, Optical Engineering & Applications (2008-2009); Program Chair and Co-chair, SPIE's X-Ray, Gamma-Ray, and Particle Technologies (2006-2009); SPIE Conference Radiation Technologies, X-Ray Systems and Technologies; Fourth Generation X-Ray Sources and Optics (2004 and 2005); Co-organizer of the 21st ICFA Beam Dynamics Workshop on LASER-BEAM INTERACTIONS, Stony Brook, USA (2001); Co-organizer of the Workshop on the Generation and Uses of VUV and Soft X-Ray Coherent Pulses held in Lund, Sweden, (2001)
- 2003-Present. Free Electron Laser (FEL) Technical Area Working Group (TAWG) Member (Invited) for the High Energy Laser Joint Technology Office of the U.S. Office of the Secretary of Defense (OSD)
- SPIE Awards Committee (2003-2005)
- SPIE Scholarship and Grant Awards Committee (2003-2007), Chair 205, 2006
- SPIE Education Committee (2005-2007)

#### *Published work*

44 Refereed technical journal publications; 1 U.S. Patent; 72 invited conference and review presentations; 47 contributed conference presentations and proceedings.

#### *Significant Publications Related to this Research*

- E. Allaria, et al., "Highly Coherent and Stable Pulses from the FERMI Seeded Free-Electron Laser in the Extreme Ultraviolet," Nature Photonics 6 (2012) 699.

- M. Dal Forno, P. Craievich, S. Biedron, D. Castronovo, S. DiMitri, N. Faure, D. La Civita, G. Penco, L. Remiz, R. Vescovo, D. Wang, D. Zangrando, "High Energy RF Deflectors for the FERMI@Elettra Project," Proceedings of the International Particle Accelerator Conference 2013, Shanghai, China.
- N. Sipahi, T. Sipahi, C. Aldophsen, S.G. Biedron, S.V. Milton, and C. Adolphsen, "Passively Driving X-Band Structures to Achieve Higher Beam Energies," Proceedings of the International Particle Accelerator Conference 2013, Shanghai, China.
- Sandra Biedron, Luca Giannessi, Erik Mansten & Sverker Werin, "Second Workshop on High Harmonic Seeding for Present and Future Short wavelength Free-Electron Lasers" Synchrotron Radiation News, Vol 24 (5) 2011.
- S. Di Mitri et al., "Commissioning and Initial and Initial Operation and Initial Operation of FERMI@Elettra, Proceedings of the International Particle Accelerator Conference, September 2011, San Sebastian Spain.
- S.G. Biedron and S.V. Milton, "Next-generation light sources in 2010," IEEE Photonics Journal, Volume 3, Issue 2, (248 - 254).
- S.G. Biedron, et al., "Impact of Electron Beam Quality on Nonlinear Harmonic Generation in High-Gain Free-Electron Lasers," Physical Review Special Topics, Accelerators and Beams 5 (2002) 030701.
- S.V. Milton et al., "Measured Exponential Gain and Saturation of a Self-Amplified Spontaneous Emission Free-Electron Laser," originally published in Science Express as 10.1126/science.1059955 on May 17, 2001; Science, Vol. 292, Issue 5524 (2001) 2037.
- L.-H. Yu, et al. "High-Gain Harmonic Generation Free-Electron Laser," Science 289 (2000) 932.

*Patent*

United States Patent, "Modular Approach to Next-Generation, Short-Wavelength, Laser-Like Light Sources," 09/916,458, submitted 31 July 2001, publication number 2003/0026300A1, Patent Number 6,831,933.

*Graduate and Post-doctoral Advisees*

Graduate Advisees: Matt Virgo (Ph.D. University of Maryland 2010); Evelyne Meier (Ph.D. Monash University, 2011); Theodore Burleson (M.S., CSU, 2013); Karen Horovitz (CSU); Jonathan Edelen (CSU); Auralee Morin (CSU); Chris Hall (CSU); Joel Williams (CSU); Alex D'Audney (CSU); Nihan Sipahi (CSU), Taylan Sipahi (CSU); Joshua Einstein (CSU)

*Accelerator Engineering Internship Program*

Established in 2012 at CSU. Three students (undergraduate and High-school) participated. In 2013, eleven students participated (undergraduate and high-school).