

BOSHENG ZHANG

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Objective

A full time position starting around Oct. 2014, in a leading company utilizing expertise in microscopy, lasers, optics, EUV, nano and programming

Summary

- Physics Ph.D. candidate with strong mathematical, physics and optics background
- **Specialized** in microscopy, lasers, optics, EUV, nano and programming
- **> 5 years** lab hands-on experience; Spearheaded the full life cycle of challenging projects, including strategic planning, theoretical modeling, numerical simulation, designing, hardware purchasing/machining, data acquisition software development, and data processing
- Team player good at communicating constructively, negotiating and reaching agreements
- Quick learner, hard worker, with excellent problem solving/debugging ability

Education

- **University of Colorado Boulder** Boulder, CO
Ph.D. in Physics GPA 3.78/4.0 *Expected Aug-Dec 2014*
- **University of Arizona** Tucson, AZ
Physics Ph.D. program GPA 4.00/4.0 *2007 - 2008*
- **University of Science & Technology of China (USTC)** Hefei, Anhui, China
B.S. in Physics GPA 3.80/4.0 *2007*

Research Experience

- **Kapteyn-Murnane Group at JILA, Univ. of Colorado** Boulder, CO
Research Assistant *Jan 2009 - present*
 - Prototyped/designed/constructed
 - * the world's first general lensless tabletop EUV microscope
 - * *Holodeck* – a microscope performing real-time holographic reconstruction
 - * Velocity Map Imaging (VMI) spectrometer that uses an electrostatic lens for the study of molecular reaction dynamics
 - Developed and optimized a tabletop EUV source using the high harmonic generation (HHG) approach; Improved EUV flux by simulating gas pressure distribution in the HHG waveguide using Finite Element/Volume Methods, and engineering the waveguide design
 - Fabricated/characterized EUV optics: • IR-rejecting EUV mirrors • SiC/Al/SiC sandwich filters • multilayer EUV mirrors, at *Colorado Nanofabrication Lab (CNL)*, and *The Center for X-Ray Optics*
 - Created software
 - * for implementing *state-of-the-art* image reconstruction algorithms in coherent diffractive imaging EUV/X-ray microscopy (fast Matlab prototyping + high performance C/C++ optimizing)
 - * for data acquisition and operations automation, with user-friendly graphical interfaces: most notably, *Ptychoscope* (a scanning full field EUV microscope), *Holodeck*, *Focus Locator*, and camera/stages control programs (with LabVIEW)
 - Collaborated with
 - * 2 leading semiconductor manufacturers to transfer EUV inspection/metrology technology from lab to industry
 - * UCLA, NIST, PSU, UCSD, APS on microscopy methods, applications, and samples

- Mentored 8 junior graduate, undergraduate, summer REU (Research Experience for Undergraduates) and high school students

- **The Center for X-Ray Optics, Lawrence Berkeley National Laboratory** Berkeley, CA
Research Assistant Aug 2013
 - Characterized multilayer EUV mirrors with dedicated synchrotron beamline and end station

Skills

- C/C++ (OpenCV, Armadillo, FFTW libraries), Matlab, LabVIEW, Mathematica, Shell Scripting
- OS: Linux, Mac OS X, Windows
- AutoCAD, Solidworks, Google SketchUp, CleWin
- Inkscape, Adobe Illustrator, ImageMagick
- Image Processing
- ANSYS Fluent
- AFM, SEM, Optical Microscope
- Nanofabrication: etching, sputtering, deposition, dicing, photolithography, e-beam lithography
- Machine Shop skills
- Basic electronics
- CW/nano/pico/femtosecond lasers
- Vacuum and EUV systems

Publications

7. B. Zhang, M. Seaberg, D. Adams, et al., *Full field tabletop EUV coherent diffractive imaging in a transmission geometry*. **Optics Express** 21, 21970 (2013).
6. B. Zhang, M. Seaberg, D. Adams, et al., *Coherent diffractive imaging microscope with a tabletop high harmonic EUV source*. **Proc. SPIE** 86810H (2013).
5. M. Seaberg, B. Zhang, D. Adams, et al., *Tabletop coherent diffractive imaging of extended objects in transmission and reflection geometry*. **Proc. SPIE**, 88510Y (2013).
4. D. Gardner, B. Zhang, M. Seaberg, et al., *High numerical aperture reflection mode coherent diffraction microscopy using off-axis apertured illumination*. **Optics Express** 20, 19050 (2012).
3. D. Hickstein, P. Ranitovic, S. Witte, X.-M. Tong, Y. Huismans, P. Arpin, X. Zhou, K. Keister, C. Hogle, B. Zhang, et al., *Direct Visualization of Laser-Driven Electron Multiple Scattering and Tunneling Distance in Strong-Field Ionization*. **Physical Review Letters** 109, 073004 (2012).
2. M.-C. Chen, P. Arpin, T. Popmintchev, M. Gerrity, M. Seaberg, B. Zhang, et al., *Bright, Coherent, Attosecond Soft X-Ray Harmonics Spanning the Water Window from a Tabletop Source*, **Ultrafast Phenomena XVII**, 9 (2011).
1. M.-C. Chen, P. Arpin, T. Popmintchev, M. Gerrity, B. Zhang, et al., *Bright, Coherent, Ultrafast Soft X-Ray Harmonics Spanning the Water Window from a Tabletop Light Source*. **Physical Review Letters** 105, 173901 (2010).

Selected Presentations

Coauthored 25 oral and poster presentations.

- **SPIE Advanced Lithography** San Jose, CA
Coherent diffractive imaging microscope with a tabletop high harmonic EUV source Feb 2013
- **OSA Conference on Lasers and Electro-optics (CLEO)** San Jose, CA
Coherent diffraction imaging with an apertured illumination support May 2012

Teaching Experience

Teaching Assistant: • Led labs/discussions • Graded homeworks/exams • Held office hours
 Physics Department, Univ. of Colorado (Aug 2008-Dec 2008); Univ. of Arizona (Aug 2007-May 2008)

Community Service

- **PISEC (Partnerships for Informal Science Education in the Community)** Boulder, CO
Teaching science to underrepresented K-12 students Feb 2009