

Xiaojing Huang

Postdoctoral Research Associate
Geophysical Laboratory
Carnegie Institution of Washington

Advanced Photon Source
Argonne National Laboratory

Education

Ph.D. in Physics, Stony Brook University, Stony Brook, NY, 2009.

Thesis: "Cryo Soft X-ray Diffraction Microscopy with Biological Samples"

Advisor: Prof. Chris Jacobsen

M.A. in Physics, Stony Brook University, Stony Brook, NY, 2005.

B.S. in Physics, Fudan University, Shanghai, China, 2003.

Research Interests

- X-ray Diffraction Microscopy/Coherent Diffractive Imaging
- Bragg Coherent Diffractive Imaging
- Scanning X-ray Diffraction Microscopy/Ptychography

Research Experience

Postdoctoral Research Associate, Jan. 2011 – current, Geophysical Laboratory, Carnegie Institution of Washington.

Advisor: Dr. Wenge Yang, Dr. Ross Harder, Prof. Ian Robinson.

- *Extending Bragg Coherent Diffraction Imaging technique on high pressure studies*
- *Investigating elastic and plastic response of single crystal under high pressure*
- *Developing a new method for rheology study under extreme conditions*

Postdoctoral Research Associate, Feb. 2010 – current, London Centre for Nanotechnology, University College London, stationed at Advanced Photon Source, Argonne National Laboratory.

Advisor: Prof. Ian Robinson, Dr. Ross Harder.

- *Developing Bragg Coherent Diffraction Imaging technique*
- *Developing phase retrieval method for imaging highly strained crystalline structure*
- *Investigating strain fields in silicon-on-insulator and gold nanocrystals*
- *Improving precision of sample stage using confocal microscope*
- *Standardizing file formats and creating a software distribution platform*

Research Assistant, Jul. 2004 – Dec. 2009, X-ray Optics & Microscopy Group, Stony Brook University.

Advisor: Prof. Chris Jacobsen

- Applying coherent X-ray diffraction microscopy on dried and frozen-hydrated biological samples at ALS, Lawrence Berkeley Lab
- Frozen-hydrated and freeze-dried sample preparation
- Expertise in vitrobot automation and plunge-freezing
- Diffraction data reconstruction with phase retrieval algorithms
- Simulations on signal-to-noise ratio estimation, 3D data handling and comparison of algorithm performances
- Silicon square aperture and beam stop fabrication
- Beamline upgrade, alignment and diagnostics
- Design and development of anti-contamination device, liquid nitrogen cooling and auto-refilling system
- IDL programming, parallel processing computations

Research Assistant, Jul. 2004 – Sep. 2004, E-beam Lithography Group, Lucent-Bell Labs.
Advisor: Prof. Chris Jacobsen

- Electron Beam etching and Scanning Electron Microscope imaging
- Plasma etching, gold deposition and nickel plating

Research Assistant, Jul. 2001 – Jul. 2003, State Key Lab for Advanced Photonic Materials & Devices, Fudan University
Advisor: Prof. Pei-nan Wang

- Synthesis and analysis of III nitride quantum dots
- Spectral analysis of Nd-doped phosphate glass

Teaching Experience

Teaching Assistant, Sep. 2003 – Jun. 2004, Physics Department, Stony Brook University.

- Classical Physics I&II, Laboratory Section Lecturer

Publications

Xiaojing Huang, Ross Harder, Gang Xiong, Xiaowen Shi and Ian Robinson, "Propagation uniqueness in coherent diffractive imaging", submitted to *Physical Review Letters*.

Xiaojing Huang, Huijie Miao, Johanna Nelson, Joshua Turner, Jan Steinbrener, David Shapiro, Janos Kirz, and Chris Jacobsen, "Anti-contamination device for cryogenic soft x-ray diffraction microscope", submitted to *Nuclear Instruments and Methods in Physics Research Section A*.

Eric Dufresne, Ross Harder, Matthieu Chollet, Yuelin Li, Steven Leake, Loran Beitra, **Xiaojing Huang** and Ian Robinson, "A technique for high-frequency laser-pump x-ray probe experiments at the APS", accepted by *Nuclear Instruments and Methods in Physics Research Section A*.

Gang Xiong, **Xiaojing Huang**, Steven Leake, Marcus C. Newton, Ross Harder and Ian Robinson, "Coherent X-ray Diffraction Imaging of ZnO nanostructures under Confined Illumination", accepted by *New Journal of Physics*.

Xiaowen Shi, Gang Xiong, **Xiaojing Huang**, Ross Harder and Ian Robinson, "Structural inhomogeneity in Silicon-On-Insulator probed with Coherent X-ray Diffraction", *Zeitschrift fuer Kristallographie*, Vol 225, 610-615 (2010).

Xiaojing Huang, Johanna Nelson, Jan Steinbrener, Janos Kirz, Joshua Turner and Chris Jacobsen, "Incorrect Support and Missing Center Tolerances of Phasing Algorithms", *Optics Express*, Vol 25, 26441-26449, (2010).

Marcus Newton, Ross Harder, **Xiaojing Huang**, Gang Xiong, Ian K. Robinson, "Phase retrieval of diffraction from highly strained crystals", *Physical Review B*, Vol 18, 165436, (2010).

Jan Steinbrener, Johanna Nelson, **Xiaojing Huang**, Stefano Marchesini, David Shapiro, Joshua Turner and Chris Jacobsen, "Data preparation and evaluation techniques for x-ray diffraction microscopy", *Optics Express*, Vol. 18, Issue 18, pp. 8598-18614, (2010).

- Selected for publication on *Virtual Journal of Biological Physics Research*, Vol. 6, Issue 13, (2010).

Johanna Nelson, **Xiaojing Huang**, Jan Steinbrener, David Shapiro, Janos Kirz, Aaron Nieman, Josh Turner and Chris Jacobsen, "High Resolution x-ray diffraction microscopy of specifically labelled yeast cells", *Proceedings of the National Academy of Science USA*, Vol. 107, Issue 16, pp. 7235 – 7239, (2010).

- Featured in Lawrence Berkeley National Laboratory Research Highlights, April, (2010).

Xiaojing Huang, Johanna Nelson, Janos Kirz, Enju Lima, Stefano Marchesini, Huijie Miao, Aaron Neiman, David Shapiro, Jan Steinbrener, Andrew Stewart, Joshua Turner and Chris Jacobsen, "Soft X-ray diffraction microscopy of a frozen hydrated yeast cell", *Physical Review Letters*, Vol. 103, Issue 19, 198101, (2009).

- Featured in Research Highlights on *Nature*, Vol. 462, 254, (2009).

- Featured in the November 10th issue of *Physics World*, 40907, (2009).

- Selected for publication on *Virtual Journal of Biological Physics Research*, Vol. 18, Issue 12, (2009).

Xiaojing Huang, Huijie Miao, Jan Steinbrener, Johanna Nelson, David Shapiro, Andrew Stewart, Joshua Turner and Chris Jacobsen, "Signal-to-noise and radiation exposure considerations in conventional and diffraction x-ray microscopy", *Optics Express*, Vol. 17, Issue 16, pp. 13541-13553, (2009).

- Selected for publication on *Virtual Journal for Biomedical Optics*, Vol. 4, Issue 10, (2009).

Huijie Miao, Kenneth Downing, **Xiaojing Huang**, Chris Jacobsen, Janos Kirz, Stefano Marchesini, Johanna Nelson, David Shapiro, Jan Steinbrener and Andrew Stewart, "Cryo diffraction microscopy: ice condition and finite supports". X-ray Microscopy: Proceedings of the 9th International Conference, Zurich, Switzerland. *Journal of Physics: Conference Serie (IOP)*, Vol. 186, 012055, (2009).

Enju Lima, David Shapiro, Pierre Thibault, Tobias Beetz, Veit Elser, Malcolm Howells, **Xiaojing Huang**, Chris Jacobsen, Huijie Miao, Aaron Neiman, Andrew Stewart and David Sayre, "Diffraction Microscopy: Reconstruction of the Complex-Valued Image of a Yeast Cell". X-ray Microscopy: Proceedings of the 8th International Conference, Tokyo, Japan, *The Institute of Pure and Applied Physics (IPAP), IPAP Conference Series*, Vol. 7, pp. 392-395, (2006).

Presentations

- Nov. 2008, Laboratory for Imaging Research and Informatics, Stony Brook, NY

"X-ray diffraction microscopy on yeast cells"

- May 2009, Joint BNL/SBU Microscopy Meeting, Upton, NY
"Signal to noise and minimum dose imaging in X-ray diffraction microscopy and transmission x-ray microscopy"
- Oct. 2009, University of California, Los Angeles, CA
"X-ray diffraction microscopy with freeze-dried and frozen hydrated yeast"
- Oct. 2009, Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley, CA
"X-ray diffraction microscopy with freeze-dried and frozen hydrated yeast"
- Nov. 2009, Advanced Photon Source, Argonne National Laboratory, Argonne, IL
"X-ray diffraction microscopy with freeze-dried and frozen hydrated yeast"
- Dec. 2009, Brookhaven National Laboratory, Upton, NY
"X-ray diffraction microscopy with freeze-dried and frozen hydrated yeast"
- May. 2010, Graduate Award Colloquium, Stony Brook, NY
"Cryo soft x-ray diffraction microscopy with biological specimens"
- May. 2010, CDI Workshop for Biological Applications at NSLS-II, Upton, NY
"X-ray diffraction microscopy for eukaryotic cells: progress and challenges"
- Sep. 2010, Advanced Photon Source User Science Seminar, Argonne, IL
"Bragg coherent diffractive imaging on silicon-on-insulator"

Awards and Societies

- President's Award to Distinguished Doctoral Student, Stony Brook University, 2010.
- National Scholarship Award, Chinese Ministry of Education, 2002.
- People's Scholarship 1st rank, Fudan University, 2001.
- American Physical Society member.
- Optical Society of America member.

Other Professional Activities

- Journal Reviewer: Applied Physics Letters, Applied Optics, Journal of Optical Society of America A, American Institute of Physics (AIP) conference proceedings
- Grant Reviewer: Jean Bennett Memorial Student Travel Grant, Student Chapter Education Outreach Grants of Optical Society of America.