**COMPRES Beamline Scientist Annual Report**

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**6BMB Beamline, APS**

**Mineral Physics Institute, Stony Brook University**

As a Research Scientist fully supported by COMPRES, I have been working at X17B2 (NSLS) Beamline run by Stony brook University for more than three years and now I am the solo staff at 6BMB Beamline (APS). My job focuses are to maintain smooth and safe operation of beamlines; to support users logistically, experimentally, and scientifically; to identify and satisfy user needs; and to develop instrumentation / procedures important for technique advancements. In this review period, from October 2014 to September 2015, the main focus is successful transition from X17B2 to 6BMB and NSLS-II. As the only staff at APS 6BMB, with the support from Stony Brook staff, I was able to make the 6BMB beamline operational ahead of schedule. The following sections summarize my activities and time allocations.

**Decommissions of X17B2 (15%)**

Disposal and transfer of all chemicals and chemical waste of X17B2

Lead decontamination of all major equipment to be transferred to NSLS-II, Stony Brook University, and APS

Removed and disposed all electric, hydraulic, and pneumatic cables or lines

Uninstalled X17B2 main station and side station

Sorted and packed all items in the X17B2 end station, lab, and storage area

Participated trucking equipment and materials back to Stony Brook University

**Setup and test Sam85 at Stony Brook University (10%)**

Setup and test ran SAM85, the press to be installed at APS at HP Lab of Stony Brook University

Collected SAM85 press test data for APS safety review

Coordinated with APS safety group for press safety review process

Prepared Safety Operation Procedures documentation and received official approval from APS

**Move to APS and setup of 6BMB Beamline (35%)**

Went through and passed all APS training for beamline staff

Coordinated users’ accounts setup at APS for rigging services and beamline operation

Coordinated and supervised equipment move into APS, electrical and mechanical inspection

Coordinated with APS for 6BMB beamline floor plan finalization

Installation of SAM85 press and control system, including ran electrical cables, built hydraulic systems, and installed all motors

Machined all supporting parts for motors, optical, and imaging system

Procurement of materials and labor for beamline setup and user operation (in progress)

**Improvement of 6BMB Beamline optical system (15%)**

Redesigned front conical slits mounting system to improve optical alignment; machined most parts for the redesigned front conical slit

Realigned front and rear conical slits manually and optically many times to achieve perfect alignment; greatly decreased XRD peak width

Designed, machined, and installed shielding system to dramatically reduce background

**User support (25%)**

Participated user proposal review and beamtime allocation; assisted users with APS proposal and ESAF procedures

Prepare safety orientation documents and administrated to each user

Supported every user group with beamline operation

Coordinated and supervised Yale University RDA press shipping to APS, inspection, installation, uninstallation, and shipping back to Yale

**Scientific projects (0%)**

No time to work on any scientific project

**Publications**

1. Wang, SM; Zang, CP; Wang, YK; Wang, LP; Zhang, JZ; Childs, C; Ge, H; Xu, HW; **Chen, HY**; He, DW; Zhao, YS; “Revisit of Pressure-Induced Phase Transition in PbSe: Crystal Structure, and Thermoelastic and Electrical Properties” , *Inorganic Chemistry*, 54 (2015) 4981
2. Bai, JM; Hong, J; **Chen, HY**; Graetz, J; Wang, F; “[Solvothermal Synthesis of LiMn1-xFexPO4 Cathode Materials: A Study of Reaction Mechanisms by Time-Resolved in Situ Synchrotron X-ray Diffraction”,](http://apps.webofknowledge.com/full_record.do?product=WOS&search_mode=GeneralSearch&qid=12&SID=3DTJKOFKPxlCsRKulEt&page=1&doc=1&cacheurlFromRightClick=no) *Journal of Physical Chemistry C* 119 (2015) 2266
3. Liu, CH; **Chen, HY**; Ren, Z; Dardona, S; Piech, M; Gao, HY, Gao, PX; “Controlled Synthesis and Structure Tunability of Photocatalytically Active Mesoporous Metal-based Stannate Nanostructures”, *Applied Surface Science*, 296 (2014) 53
4. Liu, CH; Roder, R; Zhang, LC; Ren, Z; **Chen, HY**; Zhang, ZH; Ronning, C; Gao, PX; “Highly Efficient Visable-light Driven Photocatalysts: A Case of Zinc Based Nanocrystal Aseemblies”, *Journal of Materials Chemistry A*, 2 (2014) 4157
5. Li, Y., Y. Zou, T. Chen, X. Wang, X. Qi, **H. Chen**, J. Du, and B. Li (2015), P-V-T equation of state and high-pressure behavior of CaCO3 aragonite, *American Mineralogist*, Volume 100 (2015), 2323–2329

**Users assisted by PI’s name and institute**

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| Li, Li | Stony Brook University |
| Weidner, Donald | Stony Brook University |
| Whitaker, Matthew | Stony Brook University |
| Burnley, Pamela | University of Nevada at Las Vegas |
| Kohlstedt, David | University of Minnesota |
| Mei, Shenghua | University of Minnesota |
| Durham, William | Massachusetts Institute of Technology |
| Karato, Shun-ichiro | Yale University |
| Wang, Liping | University of Nevada at Las Vegas |
| Girard, Jennifer | Yale University |