**ALS 12.2.2 2016 Annual Report**

**COMPRES Facilities Comments**

**Bin Chen**

The operations of the beamline 12.2.2 have been quite successful in the past year. COMPRES-related users are reported to have large share of the overall beamtime (50-62%). The report emphasized three main areas of new developments: single-crystal XRD system, external heating at HP, and two-sided laser-heated radial diffraction. The collaboration between beamline 12.2.2 with compressed-supported IR setup led by Zhenxian Liu is good use of resources. The leverage of resources and investments from ALS to the beamline is commendable.

It is good t see that the single crystal XRD system development led by Christen Beavers is finally becoming operational. I noted most of the experimental works in the publication list were conducted at another beamline 11.13.1, not 12.2.2. Only 1 out of 13 seems to be Earth science or high-pressure related. In her report of 2014, it appears that no published work was conducted at beamline 12.2.2 and only one was high-pressure and earth science related.

Jinyuan Yan’s report lacks the details about the projects that he is leading or involved in. It is good to see the number of published and submitted papers has increased. Some technical details about the new externally heated diamond anvil cell would be helpful.

The GSECARS gas loading system has been overbooked. Can Beamline 12.2.2 pick up some of the load? Can they provide the usage statistics for both the gas loading system and laser drilling system?

Requested budget: not required this year?

**Arianna Gleason**

Facility meeting needs of user community: Yes. Science Highlights on studies of texture evolution at pressure and single crystal work are excellent. Progress and functionality of laser heating system is not explicitly outlined. Regarding Yan’s work, it would have been great to see more detail on the various laser-, resistive-heating systems as well as the temperature measurement diagnostics. This is a key area -- having Yan focused on improving temperature measurements and accuracy can be a benefit to the whole community. Beavers efforts to get high pressure single crystal capabilities available to users seems reasonable. HPSTAR’s alignment with COMPRES user community, and in particular at 12.2.2, is interesting. Is there a different way to optimize this cooperation?

**Anne Pommier**

*-Science*: Some highlights on studies of the texture and compressibility of single crystals at HP are presented (33 pubs listed). The 2015 Facility Committee report pointed out the lack of pubs related to Earth Sciences for C. Beavers (1/16): this has not been improved (0/13 this year), and it is still unclear if those pubs come from this beamline or other beamlines.

*-User community:* 26 users from 22 institutions.COMPRES users get 50-62% of the available time, which is higher than the 35% guaranteed under the COMPRES agreement with ALS. It is still unclear whether or not users can use the single crystal diffraction in the absence of C. Beavers.

*-Management team:* The report by J. Yan is weak, lacks care, and provides very little details. The same comment was made last year by the Facility Committee. His co-authorship record has been improved compared to previous years (4 pubs+4 in review). C. Beavers’ report is stronger (13 pubs).

*-Facility:* The radial diffraction with laser heating is not operational yet (still in development). There is better record of gas loading and laser mills users, following recommendation from the previous Committee report. However, the recommendation to organize a hands-on workshop together with PX^2 has not been done (but is part of planned activities). It is unclear if staff visits between ALS and PX^2 are occurring.

**Mark Rivers**

Most of my comments directly echo those from our 2015 report on the ALS:

The beamline continues to improve, and the management team is functioning well. The laser heating system is reported to be working well. COMPRES continues to do an excellent job leveraging considerable funding from the ALS. An improved setup for single crystal diffraction is being implemented with a high-precision diffractometer and a new CMOS detector. The COMPRES investment in a translation stage and collimator will be commissioned in the next 3 months.

The fraction of publications related to Earth science is about 50%, but these are the ones they think are COMPRES related, they have omitted the ones that are definitely not. In the publications listed by Christine Beavers in her report only 1 out 13 appears to be Earth science related. Since COMPRES is supporting Beavers to develop single-crystal diffraction, it is important that it attracts COMPRES users. I think there is only 1 single crystal high-pressure publication in their list?

The report from Jinyuan Yan was not as strong as that from Beavers. He lists a number of projects that he worked on, but with insufficient details to determine how successful they have been. How is the radial diffraction laser heating not working? What is the progress on the internal heating system? How many boron-kapton gaskets have been provided, etc. The number of publications on which he is a co-author has increased from 1 last year to 4 published and 4 submitted this year, which is a nice improvement. It appears that he spends 5-6 days per month assisting users. This seems low to me, and I wonder if the other 75% of his time is being as productive as it should?

Simon Parson’s student being there is a good sign, that is a major single-xtal group.

For the last 2 years the COMPRES report said: “The Committee recommends that 12.2.2 staff keep better records of gas loading and laser mill users …” The report this year again did not include this information.

Last year we recommended that ALS 12.2.2 and PX^2 coordinate their efforts to be able to process each other’s data,visits to the other facility, and workshops. 12.2.2 does say that they are developing export software so their data should be able to be processed with any “commercial” single crystal package. They also say they plan a workshops once the new ES1 station is complete. But there is not mention of interfacing with PX2.

What station will the new $200K CMOS detector go on, and what are its characteristics?

**Dan Shim**

* The IR+XRD combination which ALS can offer is really great and unique at the moment.
* The external heating development sounds great but how they can provide the capability to users as there are many different types of DACs out there. Only users with BX90 cells can benefit from their capability? Or Can they lend BX90 cells to users? How can it actually contribute to the COMPRES community?
* Yan's report mentioned about 2D temperature measurement method. However, I cannot find any detailed explanation on in in their reports or any other documents.