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Keeping Science Going at BESSY II

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Though life on the planet was turned upside down due to the worldwide pandemic, the teams at Helmholtz-Zentrum Berlin (HZB) learnt to adapt, implementing national health guidelines, and keeping science going at one of the largest research infrastructures in Germany.

As of publication, we will have spent more than a year living with the pandemic. Since March 2020, when Germany went into lockdown for the first time and HZB went into minimal operation, only our BESSY II synchrotron remained ready in "warm standby" (Fig. 1). This allowed us to undertake SARS-CoV-2-related research nearly straight away if necessary. We initiated also an exceptional rapid-access programme for scientists to be able to use our beamlines exclusively for research on SARS-CoV-2.

Looking back over the last year, we have learnt to deal with many unexpected situations and made on-demand adjustments due to the health circumstances. Adversity was turned to opportunity as our persevering staff worked, and continues to work, to increase remote access for experiments, broaden collaboration with other light source facilities in Europe and worldwide, and develop digital workshops and conferences.

Remote access and collaborations across borders

Maintaining access that is safe for our users is our first priority at all times. Due to increasing infection rates, Berlin was designated a risk zone after summer 2020. This situation made it impossible for us to welcome users from areas outside Berlin. Nevertheless, BESSY II was up and running again after the regular maintenance shutdown period. Therefore, we encouraged remote access. We received scientists' samples for experiments mailed to us so that the HZB beamline scientists on site were able to run the experiments successfully for the users. Some users were even able to run their experiments remotely themselves online. As we were mostly open for Berlin users, we also discovered a new version of remote access. Some international users contacted colleagues in Berlin to come to BESSY II and do their experiments for them. This created new collaborations we were very happy to support.

In general, we can say that mail-in and online services were highly appreciated and widely used, as depicted in 2020 beamtime distribution (Fig. 2).

Flow of information and worldwide support

Collaboration is the core of science. After the first weeks dealing with the Covid-19 pandemic, the User Office at BESSY II worked hand-in-hand with other facilities in order to collect information on initiatives and set-ups from several other scientific institutions in Europe. These are members of ERF-AISBL (Association of European-level Research Infrastructure Facilities), which organised the information for users so that they could know what to expect at each location. The results are presented in a webpage [1]. This initiative was carried out by CERIC (Central European Research Infrastructure Consortium) under the ACCELERATE programme funded by the European Union Framework Programme for Research and Innovation Horizon 2020.

The global collaboration Lightsources.org is very important to BESSY II as well. The pandemic brought regular online check-in meetings, during which representatives shared information and experience about the actual situation at their respective facilities. This was and continues to be an enriching and valuable exchange on best practises for internal and science communication during a crisis. The Lightsources.org group offers valuable support during this exceptional period, facilitating interinstitutional transfer of knowledge and promoting external communication via a regularly updated webpage where all scientific publications related to SARS-CoV-2 are cited [2].

Development of digitalisation

As a result of the pandemic, many members of staff worked from home ("home office"), a mode which was not as common in Germany as it may be in other countries. We learnt how to deal with the very strict General Data Protection Regulation (GDPR) in Germany and explored the benefits of taking part in online meetings without moving from our desks. With travelling being nearly impossible after summer, we decided to go digital for our

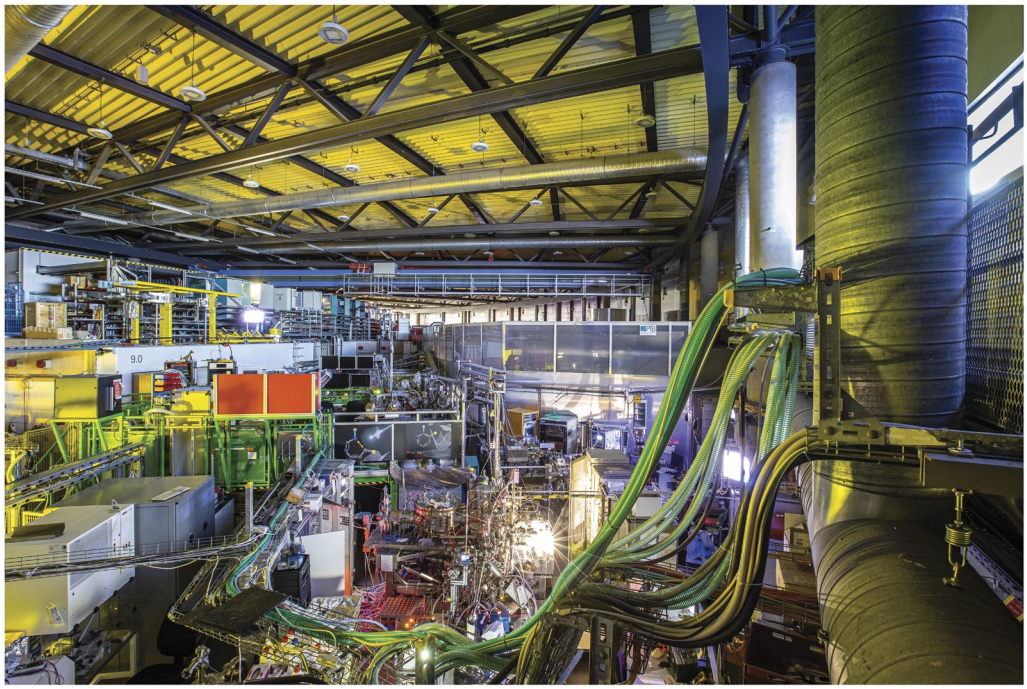

Figure 1: Experimental hall of BESSY II at night. Thanks to a very long exposure and only one yellow light, this picture reveals a new perspective on this place. (© HZB/Silvia Steinbach)

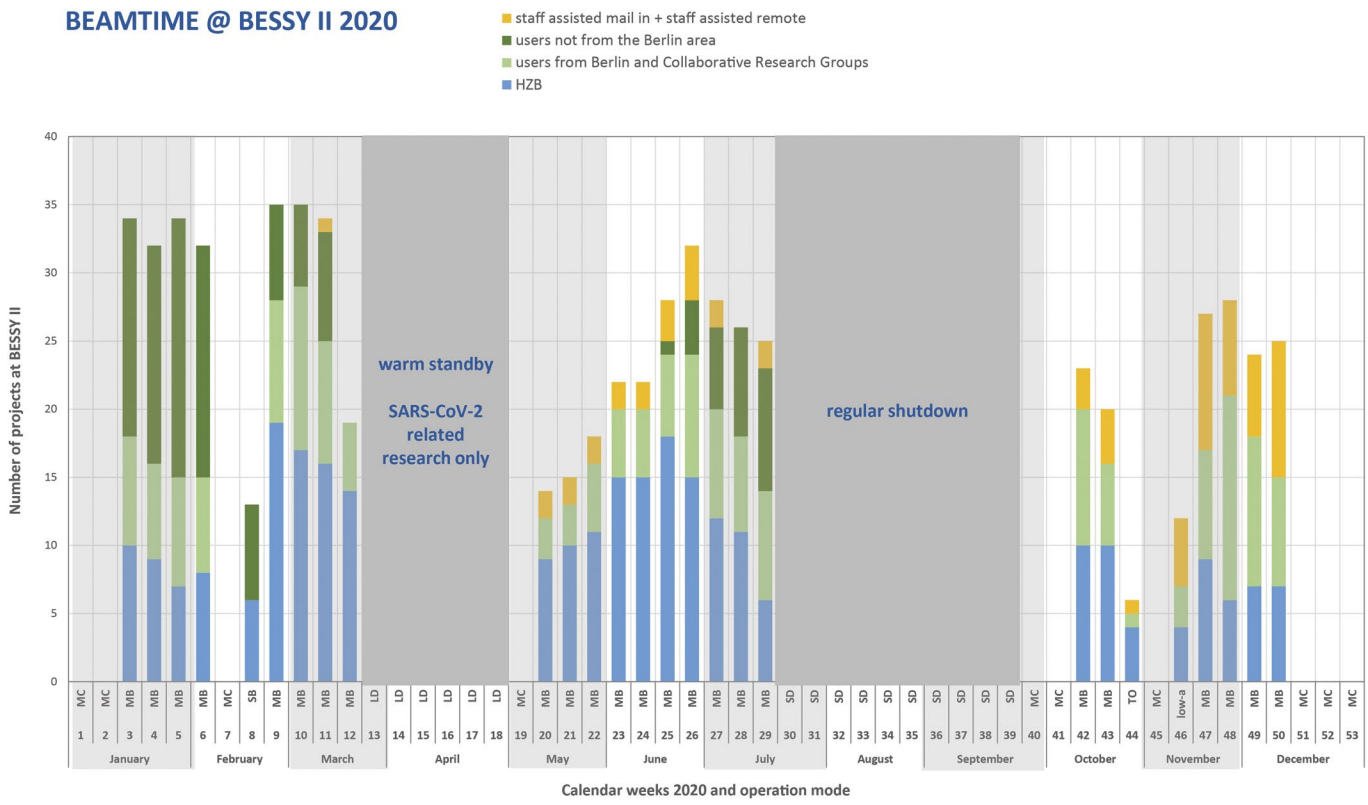

Figure 2: Beamtime at BESSY II throughout 2020.

annual User Meeting in December 2020 – this was a first for us that worked out really well. We decided to conduct a leaner version of our gathering and conducted a 1-day event. Beforehand, all users received a goody bag with a few themed surprises (pen, HZB puzzle, biscuit, et.). Even if the entire day was online, we insisted on many personal moments during the day, so we held a few light and amusing lobby discussions during the User Meeting to make the breaks enjoyable and fun. We received many encouraging notes afterwards from people far away who probably would not have attended in person – this is a supportive consolation for all the in-person moments we were not able to enjoy during this online User Meeting. The experience has inspired us to think about wider access for our next User Meeting to address those who are interested users but may not be able to travel here for some reason. A hybrid version of the User Meeting permitting all to attend either in person or digitally looks like an opportunity that we will be considering carefully. In addition, we are also amazed how much this digital format reduced the carbon footprint of our User Meeting.

Another aspect to mention concerning digital access for working meetings is the number of workshops we were able to set up in 2020 for our BESSY Upgrade project. The Conceptual Design Report (CDR) of our future BESSY light source is being worked on by a team. They are seeking suggestions and expressions of needs from the scientific community. A few workshops had been planned for 2020 that were moved to a virtual format. The easy access and feasibility of these online workshops caused us to hold more meetings than we had originally planned. The input from national and international experts on various topics (catalysis, energy storage, materials design, etc.) is extremely valuable. These online scientific expert workshops made it possible to continue our work on the CDR without too much interruption during the pandemic.

Prospects for the future

There have been and still are many challenges to overcome during this unprecedented health crisis. However, we wanted to cover in this article the lessons learnt during this first year of living and working with the pandemic. The main result has certainly been the many opportunities for digital meetings, workshops, and even conferences. It gives us an invaluable chance to approach, include, and collaborate with researchers usually not present at live events for reasons of travel costs, childcare, and health issues, to name a few.

In this drive for expansion, inclusion, and integration of various communities from research and industry, we continue to explore ways to engage and network digitally. We are thinking of "digital user twinning", and have recently released our first virtual tours in 360° format [3] to welcome interested people to our synchrotron and the many specialized HZB laboratories on its two campuses in Berlin (Fig. 3). While we wait impatiently to open our physical doors fully again in the future, we are striving to open our digital doors more fully now.

References

1. https://erf-aisbl.eu/research-infrastructures-offer-for-research-on-covid-19/
2. https://lightsources.org/lightsource-research-and-sars-cov-2/
3. http://www.helmholtz-berlin.de/virtual-tours

Figure 3: A garden on the roof! Located in Berlin-Adlershof, one of Germany's biggest technology parks, BESSY II is easily recognizable from the air. (© HZB/Dirk Laubner)