

PREFACE

It is my great pleasure to share our research highlights based on the Photon Factory (PF) users' program during fiscal 2020 (April 2020 – March 2021). Since the PF users' program started in 1983, about 19,500 research papers have been published. We are proud to have produced a considerable number of papers describing breakthroughs in broad areas of materials science, chemical science, earth science, life science, instrumentation and techniques, and accelerator. I hope that this latest issue of PF Highlights will lead to new discoveries in scientific studies.

The PF launched its new organization on April 1, 2019, to strengthen its facility and research capabilities. While many synchrotron-radiation facilities have been built or planned around the world, the PF has been re-born by returning to its roots. The primary mission of the PF is to nurture new techniques and young people to lead synchrotron-radiation science through research and development. The second mission is to promote various researches related to materials and life as an advanced infrastructure facility.

If the 1980s marked the dawn of synchrotron-radiation science, we need to move in a new direction to make the 2020s a second dawn. Low emittance synchrotron-radiation facilities are becoming more and more common around the world, but this is also placing greater technical constraints on operating their light sources. We will increase the flexibility of our light sources and open up new research areas by our only one and number one beamlines with characteristic synchrotron-radiation beams.

In 2020, as a short-term plan, we started to improve the performance of the PF ring by replacing old accelerator components with new ones. In this project, we choose the components suitable or meaningful for the new facility, which we are working on as a long-term plan to be realized in the early 2030s. In addition to normal applications, unique experiments can be performed by simultaneous use of two synchrotron-radiation beams in the new facility. In the next issue of PF Highlights, we will introduce the conceptual design of the "Hybrid Ring", which is a candidate for the new facility and makes two-beam applications possible.

Finally, it is with great pleasure that we report on the establishment of the PF Alumni Association. Professor Toshiaki Ohta, one of the early staff members of the PF, has been elected as the first president. Not only staff but also users and others are welcome to become members of this association. With the advice and support of the User Association and Alumni Association, the PF will successfully carry out its missions.

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