

## Preface

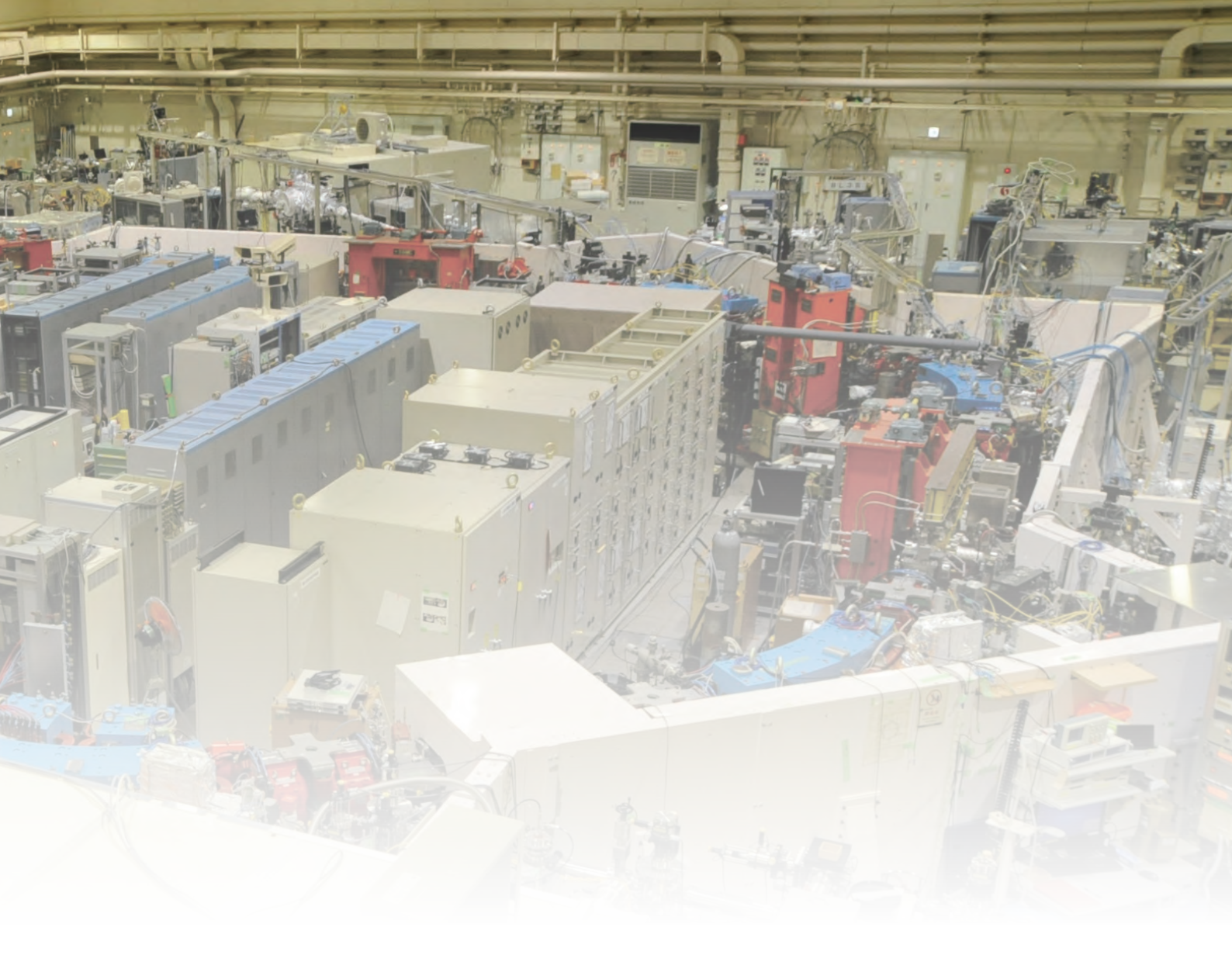
This Activity Report covers scientific and technological activities carried out using the UVSOR-III Synchrotron in FY2020 (April 2020 - March 2021). We present scientific examples of how the users study at the UVSOR Synchrotron Facility.

The present UVSOR-III Synchrotron is one of the most advanced low-energy SR facilities of the 3rd generation SR in the world and is now one of the critical resources in doing molecular science. The UVSOR-

III Synchrotron has a small electron storage ring but has powerful 6-undulator beamlines (3 VUV and 3 in-vacuum soft X-ray undulators) with 8-dipole beamlines. We never stop improving and upgrading our micro- and nano-scale photoabsorption and photoemission approaches and in situ/operando measurements in the VUV and soft X-ray regions, based on our strategic international collaboration program in molecular science. We are grateful to all the people who use our facility and support our efforts.

UVSOR operates for 40 weeks/year (ca. 2,200 h user time), accepts ~230 proposals, about ~1,000 individual researchers counting total ~ 4,000 people\*day/year. Most users stay for one or two weeks for experimenting. To continue high-level achievements in science and technology at the UVSOR-III Synchrotron, our in-house staff is constantly committed to maintaining and improving high-performance accelerators and beamlines. The FY2020 was a challenging year for all researchers, and COVID-19 issues gave a major impact on synchrotron users around the world. Almost all the projects have been done after rearrangement of the beamtime,





fortunately, however, we might be realized in the future there was a problem in experimental quality in a sense of limited manpower in the experiments as well as a lack of experience for on-site experiments of the students. The details on the action are described in the Activity Report.

On the experimental side, technology development will not stop, hence we will make a progress on the imaging-related techniques to inspire advanced molecular science. We have started to construct the new endstation at the undulator-based soft X-ray beamline BL6U. The new apparatus of the photoelectron momentum microscope is developing day by day. Indeed, the project was affected a bit by COVID due to a delay of the construction term and installation steps, etc. In the beamline BL1U, we have conducted in developing the novel light sources, including pulsed- $\gamma$  ray and their use for the measurements. To optimize the high-power laser light to UVSOR-III for versatile use, we arranged the endstation layout of BL1U. The advanced SR-related instrument will offer opportunities in characterizing the electronic structure of surface atomic sites, thin films, molecular adsorbates, bulk crystals, and so on.

We started to discuss the possibility to construct the post-UVSOR-III as a long-term plan for sustainable development. We look forward to receiving your feedback and suggestions on the continuing evolution of the UVSOR Synchrotron Facility. And we hope many users will perform excellent work by fully utilizing the UVSOR-III Synchrotron as a unique international hub for the SR research in advanced molecular science.

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Satoshi Kera

Director of the UVSOR Synchrotron Facility