

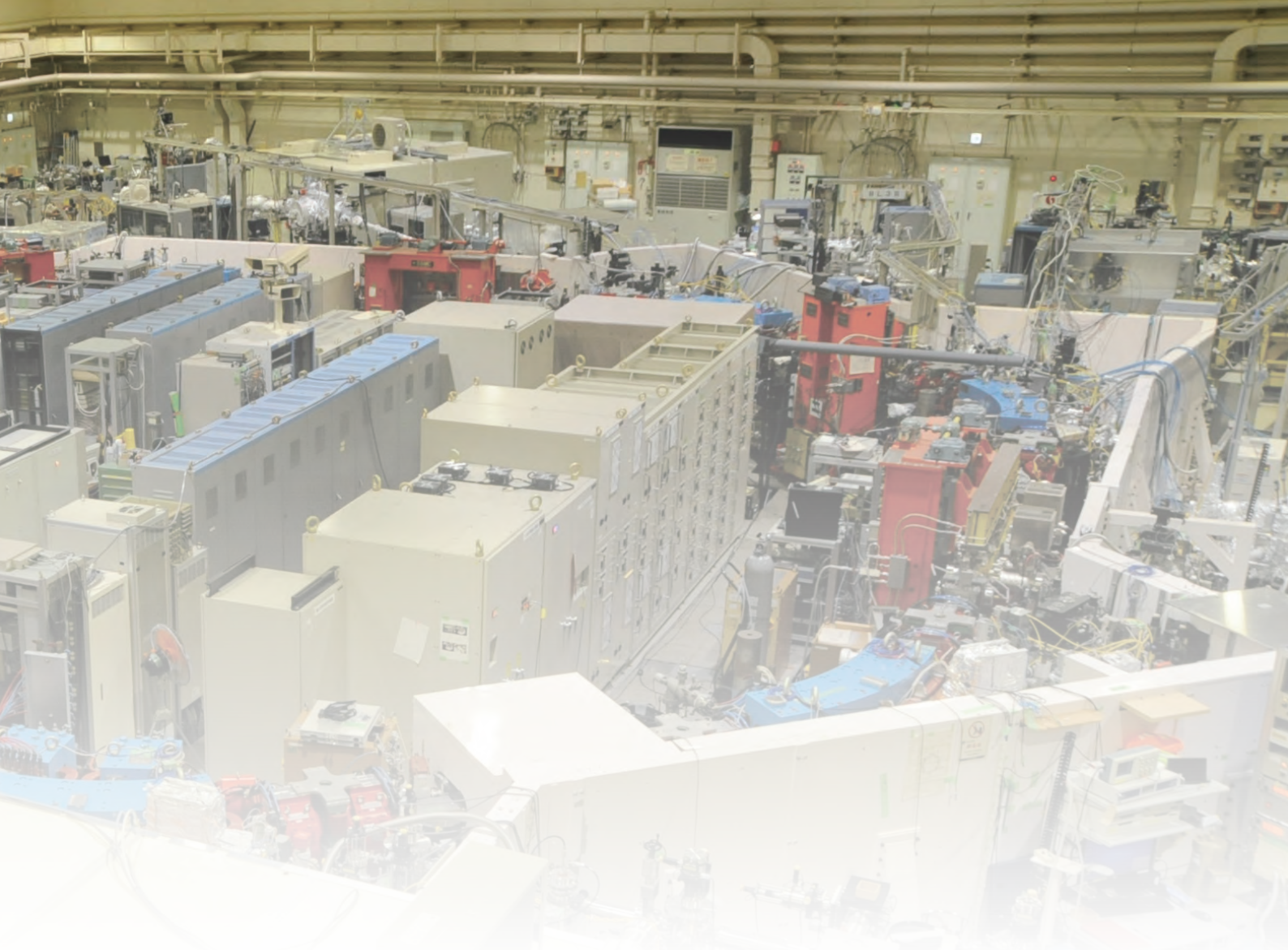
Preface



This Activity Report covers scientific and technological activities carried out using the UVSOR-III Synchrotron in FY2021 (April 2021 - March 2022). 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 to accelerate the investigation of 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 continue improving and upgrading our micro- and nano-scale photoabsorption and photoemission approaches and in situ/operando measurements in the IR, 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 ~600 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. Research activity has been affected by COVID-19 worldwide, however, the daily life of scientists seems to be renovated. Of course, it has impacted overseas researchers who cannot travel to Japan. We support some of their research



by doing the experiment on their behalf.

In terms of personnel, Assistant professors, Takuji Ohigashi and Masaki Fujimoto left UVSOR. They will kindly support the beamlines by cross-appointment contract in FY2022. The support office staff, Hisayo Hagiwara retired, who has been dedicated as a secretary for a quite long time since the early days of UVSOR.

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 since 2020. The new instrumentation of the photoelectron momentum microscope is developing and you may see the final whole picture of the apparatus in FY2022, which consists of a double-hemispherical analyzer with spin detector. In the beamline BL1U, we have conducted in developing the novel light sources, including pulsed- γ 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. In FY2022, we will test the new orbit trajectory for doing the γ -ray experiments daily to avoid affecting other beamlines. 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 have discussed the possibility to construct the post-UVSOR-III as a long-term plan for sustainable development since 2019. 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.

April 2022

Satoshi Kera

Director of the UVSOR Synchrotron Facility