
Message from the Director

Reflecting on 2024, I am filled with a sense of pride, gratitude, and motivation for all we've accomplished. As we continue to expand and enhance our research facilities, significant progress has been made, marking a pivotal moment in both our operations and the scientific achievements.

In terms of achievements, 2024 saw our user community reach a new milestone of 2,929 users, with 1,830 experimental runs and 13,861 user visits. These efforts have contributed to the publication of 619 SCI research papers, of which 58% have an impact factor higher than that of *Phys. Rev. Lett.*, underscoring the critical role that NSRRC plays in advancing scientific discovery.

In 2024, a series of alarming earthquakes caused beam disruptions at the Taiwan Light Source (TLS) and the Taiwan Photon Source (TPS). After the magnitude 7.1 Hualien earthquake on April 3, our accelerators were restored to normal and stable operation within just a few hours. We are grateful for the support and concerns expressed by other synchrotron radiation facilities during this period. Although these events resulted in a slight decrease in annual availability—99.4% for the TLS and 97.7% for the TPS—the overall performance remains highly satisfactory.

Looking ahead, NSRRC is committed to expanding the capabilities of TPS. Currently, 18 beamlines are operational, with plans to increase to 26 by 2029. This expansion will include a dedicated beamline for industrial applications, fostering deeper collaboration with industry partners. We have also launched a call for letters of interest for new beamlines, and an Infrared Microspectroscopy Beamline has been selected. The addition of this new infrared beamline will further broaden the spectral range of the TPS and strengthen the research in the fields of biomedicine and semiconductors.

As these advancements unfold, we also take time to reflect on the legacy of the TLS. Inaugurated in 1993, TLS is not only an exemplification of Taiwan's ability to develop cutting-edge technologies in ultra-high vacuum technologies, precision magnets, and instrumentation, but also a cornerstone of scientific research in Asia. With over 225,000 user visits and more than 7,000 SCI publications, TLS's impact is undeniable. However, age-related issues are beginning to emerge, with key components experiencing wear and the discontinuation of their production. NSRRC foresaw this situation more than a decade ago, leading to the construction of the TPS, designed to replace and surpass the TLS, particularly in X-ray capabilities. The time for this transition is approaching.

Moreover, while NSRRC has earned international recognition for the high-quality user support, maintaining this expertise with limited manpower has become increasingly challenging. Following a thorough evaluation of economic considerations and user research needs, the Board of Trustees has resolved to operate TLS until the end of 2028, with partial operation possible in 2029 if needed. As TPS beamlines are phased in, TLS beamlines will gradually be scaled down, with all users ultimately transitioning to the TPS.

NSRRC is committed to supporting users throughout this transition. We will continue offering training courses and workshops to help users maximize the potential of the new TPS facilities and broaden their research opportunities. By embracing these changes, we will ensure our user community remains at the forefront of global scientific research.

Looking to the future, NSRRC will continue pushing the boundaries of scientific frontiers, advancing accelerator technologies, and driving innovation in experimental techniques. Our goal is not just to collect data but to transform the data into actionable insights that can help solve the world's fundamental challenges and support industries in overcoming critical issues.



Chia-Hung Hsu
Director