Plan of TPS Phase-III Beamlines

The third phase of the Taiwan Photon Source (TPS) beamline project is being officially launched in 2021 after completion of the second phase of the project in 2020. After completion of the second phase of the beamline construction project, more than sixteen beamlines are operational in TPS, including thirteen insertion devices and three bending magnets. At present, TPS is generally operated at 500 mA with high stability.

The third phase of the beamline construction project includes four insertion devices and five bending magnets, for nine beamlines in total. In these nine beamlines, three are soft X-ray beamlines, one is a tender beamline, and the other five are hard X-ray beamlines. The primary objective of the third-phase beamlines is to move the beamlines of the present Taiwan Light Source (TLS) to TPS, and also to serve users and to provide the most updated technology.

The TPS phase-III beamlines include:
1. **TPS 11A** *In-situ* Serial Protein Crystallography
2. **TPS 14A** Small-angle X-ray Scattering
3. **TPS 18A** Powder X-ray Diffraction
4. **TPS 34A** Soft X-ray Absorption Spectroscopy
5. **TPS 35A** Dragon
6. **TPS 36A** Tender X-ray Absorption Spectroscopy
7. **TPS 38A** X-ray Absorption Spectroscopy
8. **TPS 43A** Ambient Pressure X-ray Photoemission Spectroscopy
9. **TPS 47A** High Resolution X-ray Absorption Spectroscopy

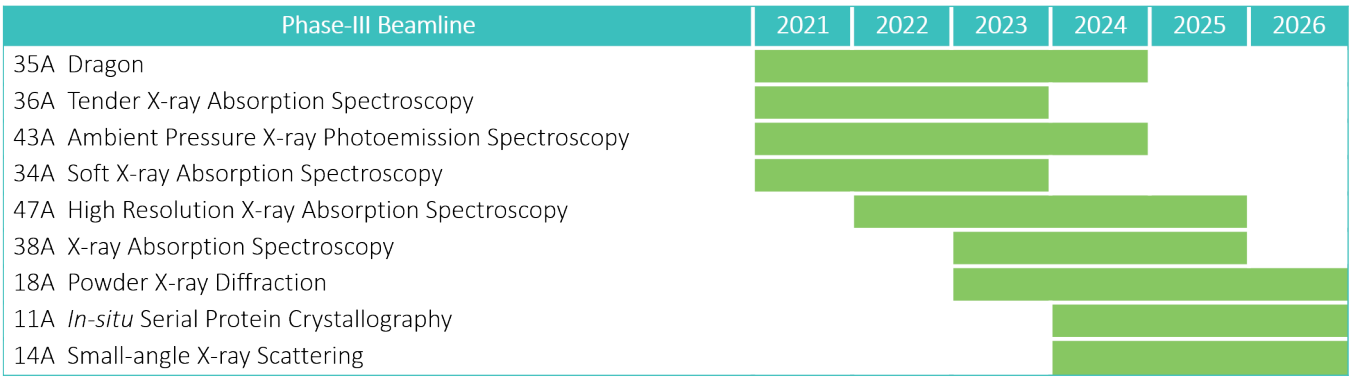

Fig. 1: Construction schedule of TPS phase-III beamlines.

The current construction schedule of the TPS phase-III beamlines is shown in **Fig. 1**. It is estimated to take six years to complete the construction of these nine beamlines, scheduled from 2021 to 2026. The floor map of the TPS beamlines is shown in **Fig. 2**.

The main purpose of the third phase of the beamline is to relocate the beamlines of the present TLS and to continue to develop and to achieve the most important scientific topics. It includes more challenging protein crystallography on site, mainly for proteins that cannot be successfully resolved at present. The other eight beamlines include small-angle scattering, powder diffraction, a dragon beamline, X-ray absorption spectra, soft X-ray absorption spectra, chamber pressure/vacuum photoelectron spectra, soft X-ray absorption spectra *etc.*, all transferred from the present TLS. The functions of these eight beamlines in operation are expected to replace the scientific research and development capabilities of TLS in the least time. (Reported by Gung-Chian Yin)

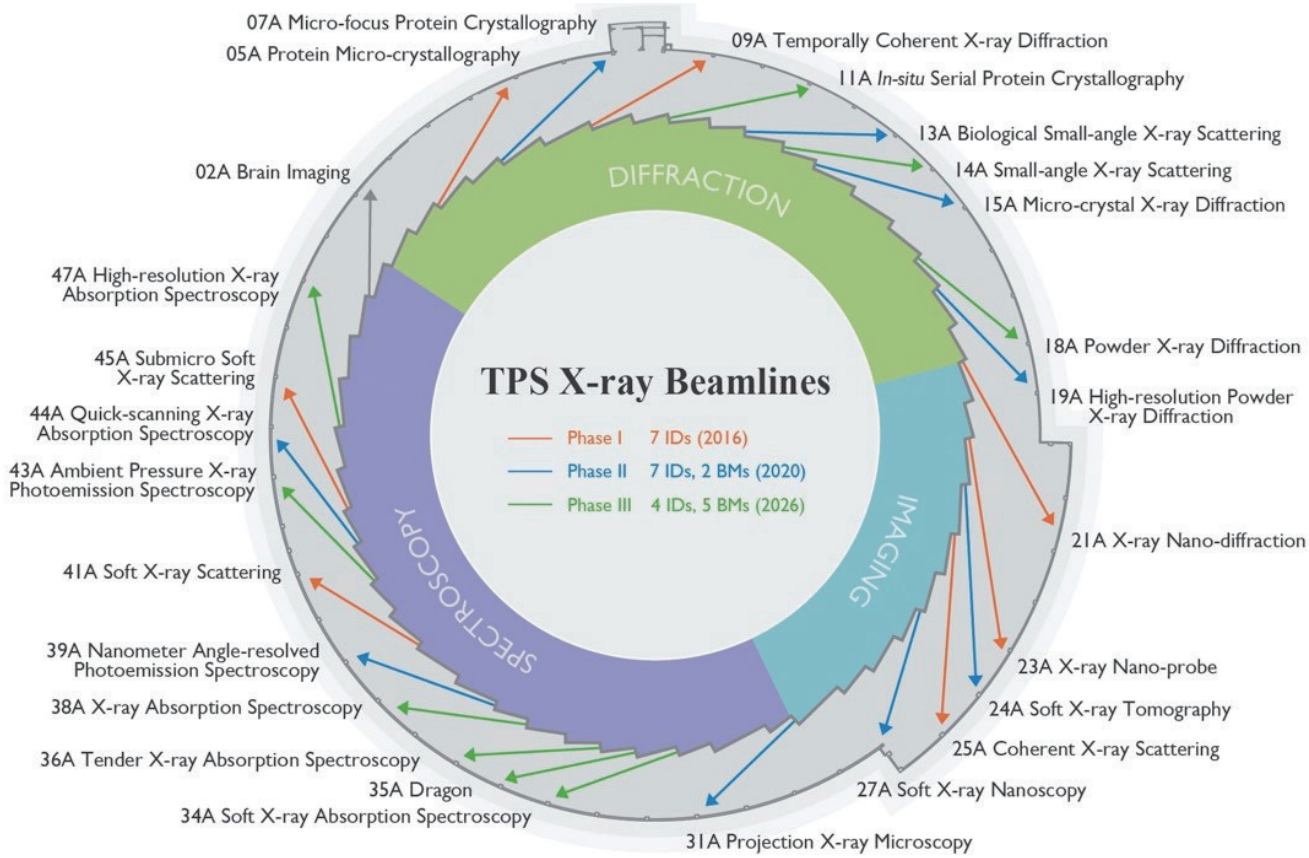

Fig. 2: TPS phase beamline map; phase I is shown in orange, phase II in blue and phase III in green.