The synchrotron facilities in Thailand

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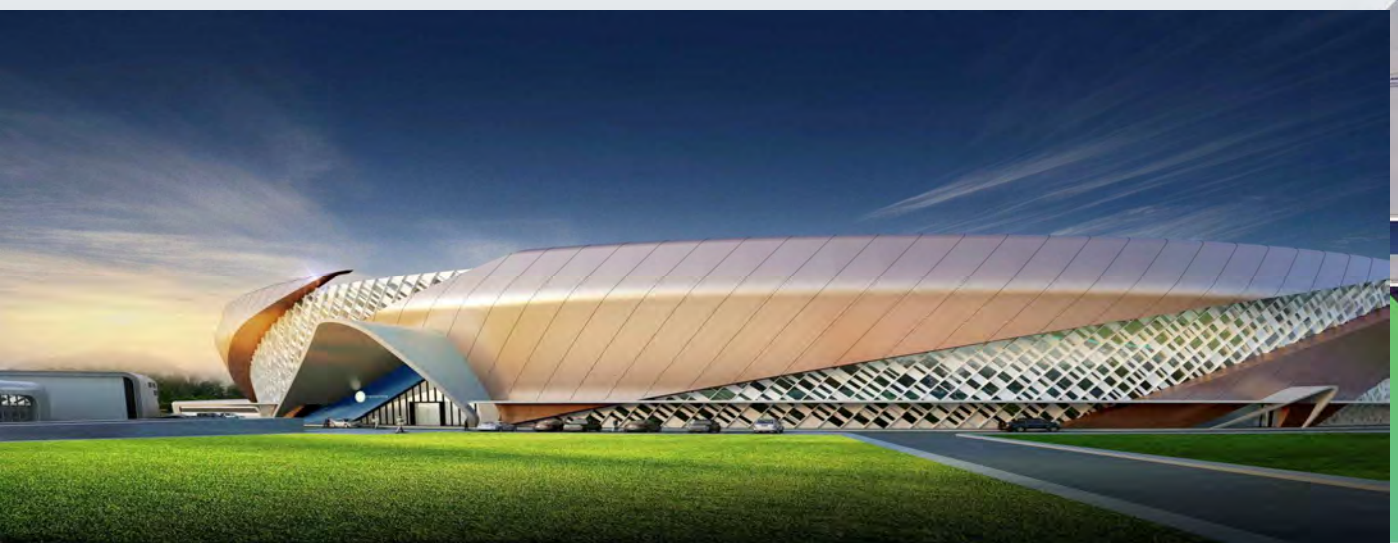
Synchrotron Light Research Institute (Public Organization)



The Synchrotron Light Research Institute (Public Organization)

Siam Photon Source (SPS) : Located near the city of Nakhon Ratchasima, 250 km NE of Bangkok

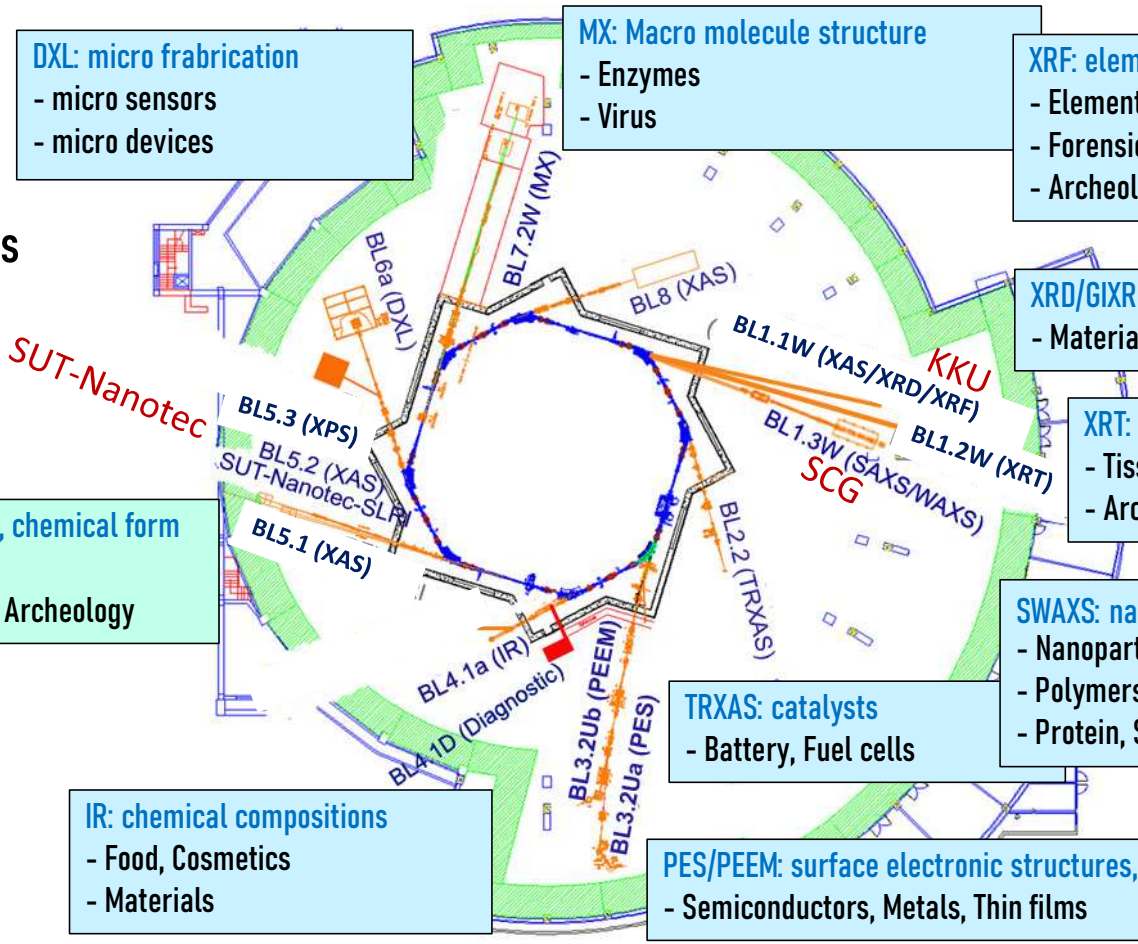
3 GeV SPS-II : Located near the city of Pattaya, 200 km SE of Bangkok

The Synchrotron Light Research Institute

- Public Organization under the supervision of MHESI
- Operating the Siam Photon Source (1.2 GeV synchrotron Light Source) and the Siam Photon Laboratory
- Servicing synchrotron experimental stations and supporting facilities for Thai, ASEAN and international users
- Developing synchrotron-related technologies (accelerators, ultra high vacuum, high precision engineering, …)
- Design and construction of the Siam Photon Source-II (3 GeV synchrotron light source)

The Siam Photon Laboratory : Nakhon Ratchasima

11 Experimental Stations
in operation



DXL: micro frabrication
- micro sensors
- micro devices

MX: Macro molecule structure
- Enzymes
- Virus

XRF: elemental analyses
- Elemental composition
- Forensic science
- Archeology

XRD/GIXRD: Crystal structures,
- Materials, Thin films

XRT: 3D x-ray imaging
- Tissues, Bones, Fibers
- Archeology, Medicine

XAS: atomic arrangement, chemical form
- Atomic structures
- Environment, Materials, Archeology

SWAXS: nano structures
- Nanoparticles, micelles
- Polymers, Bio materials
- Protein, Starch

TRXAS: catalysts
- Battery, Fuel cells

IR: chemical compositions
- Food, Cosmetics
- Materials

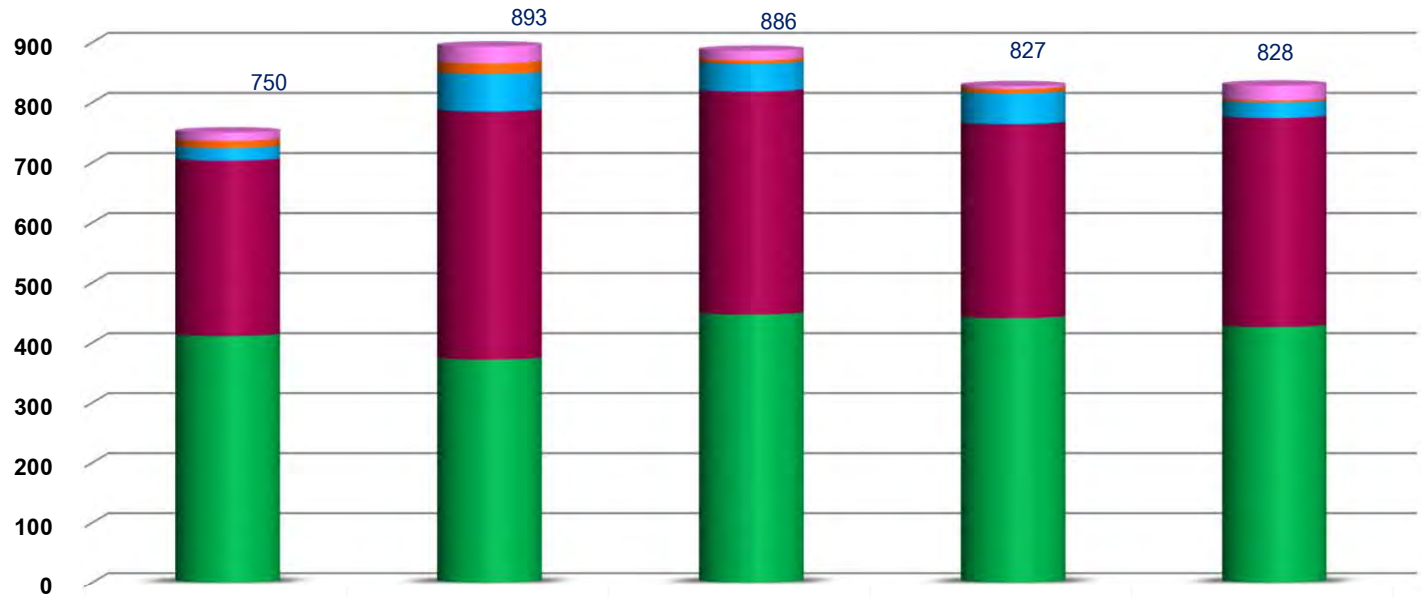
PES/PEEM: surface electronic structures, microspectroscopy
- Semiconductors, Metals, Thin films

Synchrotron + Analytical equipment

- Microscopy
  - X-ray Tomography
  - PEEM
  - SEM
  - TEM
- Micro-Nano-Angstrom structural analyses
  - X-ray Tomography
  - Small/Wide Angle X-ray Scattering
  - X-ray Diffraction
  - X-ray Absorption Spectroscopy
  - Macromolecular Crystallography
  - XRD
- Elemental & Chemical Identification
  - X-ray Fluorescence
  - X-ray Absorption Spectroscopy
  - Infrared Spectroscopy
  - FTIR
  - FT-Raman
  - WDXRF
  - ICP-MS
  - HPLC
  - HR LC-MS
  - GCMS
- Surface structure analyses
  - Grazing Incident XRD
  - Grazing Incident SAXS
  - Photo Emission Spectroscopy
  - Surface XAS
  - SEM
  - TEM
  - AFM
- Fabrication (micromachining, devices)
  - X-ray Lithography
- Complementary analytical equipments
  - …
- Sample preparation systems
  - Protein crystallization
  - …

5-Year SLRI Users Statistic

Including participants for mail-in sample projects during COVID-19 pandemic situation



	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
INTERNATIONAL	14	28	16	5	25
ASIA	12	18	6	7	4
ASEAN	21	62	46	51	25
PRIVATE SECTOR	292	413	371	323	348
ACADEMIC	411	372	447	441	426

Challenges

Human resource

- Need more skilled scientists for wide range of application
- Need more active user groups

Tangible applications

- Require more ideas and experiences for tangible applications to gain public and political supports

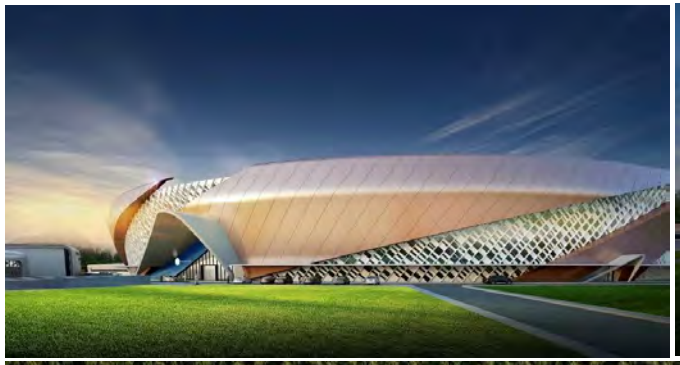
Financial supports

- Financial supports would help increase participation and collaboration among ASEAN users
- Financial supports for student training would help long term participation and collaboration

Japan-ASEAN-facility collaboration would be extremely helpful for the above problems

The Siam Photon Source II

- 4th generation 3 GeV synchrotron light source, scheduled to be in operation in 2030



The Siam Photon Source – II

Design and construction in collaboration with international synchrotron communities.

SLRI is already working closely with Japan, especially SPring-8, for the SPS-II project. Collaboration with ASEAN countries would be of great benefit.

Possible collaboration

- Participating beamlines from ASEAN
- Visiting scientists
- Student trainings
- Joint graduate programs


Thank you