

Next Generation Light Source Design Studies

Keywords: Accelerator, Physics, Synchrotron



CONTACT

Dr Rohan Dowd

Australian Synchrotron

rohand@ansto.gov.au



Eugene Tan

Australian Synchrotron

eugene.tan@ansto.gov.au

The Accelerator Physics group at the Australian Synchrotron is currently designing a new, next generation synchrotron light source to meet Australia's future X-ray science infrastructure needs. A conceptual design report for a new 400-450m, 3GeV electron storage ring is currently being developed, along with the associated linear accelerators. The design will incorporate the latest storage ring lattice techniques as well as compact acceleration technologies and will be used as the basis for Australia's next light source. The new light source will seek to achieve a competitive sub 100 pm radian beam emittance, giving it several orders of magnitude increase in brightness over the current Australian Synchrotron. It will incorporate a 3 GeV linear accelerator utilising compact X-band acceleration technology developed by CERN, a 4th generation multi-bend achromat lattice, and be able to host over 50 world class beamlines.

Student Opportunities:

A student interested in this project will have the opportunity to work on a range of topics dependent on the students' interests. They will receive training and supervision in Accelerator Physics, with the opportunity to attend international accelerator schools and conferences throughout the project. They will also have the ability to use the Australian Synchrotron accelerator systems to train in accelerator operation and conduct feasibility studies and experiments in beam dynamics and instrumentation. Possible topics include: - Beam impedance and instabilities - Beam injection schemes - Compact linear accelerator design, - Beam dynamics and particle tracking simulations - Magnet design and lattice optimisation - RF accelerating cavity design - Electron Source design (either RF photocathode or laser-plasma source).