

## Experimental Methods Program

Written by Administrator

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Professor Andrew Peele  
Physics, La Trobe University  
Experimental Methods Program Team

[Academic & Research Members](#) |

[Students Members](#)

For further information on [Andrew Peele](#) Experimental Methods Program team and their work please contact

### **Address Department of Physics**

La Trobe University  
Victoria 3086, Australia

**Email** a.peele@latrobe.edu.au  
**Phone** +61 3 9479 2651  
**Fax** +61 3 9479 1552

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This program is developing the techniques that will be used in X-ray imaging experiments, building on our recent successes using curved beam illumination to aid image recovery. The fabrication of test samples within CXS forms an important part of this development work, since it will allow us to investigate critical aspects of the phase retrieval problem. These include the design of the experiment, the sensitivity of the phase recovery algorithms to noise, partial coherence, radiation damage and systematic effects such as internal translation of the beam or the various optical components.

Since the duty cycle for synchrotron experiments is so long, and because many of the features of diffractive imaging using X-rays can be simulated using visible sources, CXS is currently installing an experimental laser research laboratory. By a suitable scaling of the relevant variables and the careful selection of scattering targets it is possible to simulate almost all of the features of an X-ray experiment using relatively inexpensive components and visible coherent light sources in a laboratory.

The Experimental Methods Program will work closely with the Theory and Modeling Program to put in place effective methods of image recovery in advance of the commissioning of the Australian Synchrotron facility in 2007. This will allow CXS to hit the ground running when this national resource becomes available.