



PSICHÉ : Pression Structure Imagerie par Contraste à Haute Énergie (=Pressure Structure Imaging by Contrast at High Energy)

SOLEIL staff:

J.P Itié (Head of beamline)

N. Guignot (Scientist)

A. King (Scientist)

P. Zerbino (Technical assistant)

Areas of application, instrumentation and methodologies used

Energy range: 15-100 keV for white beam - 15-50 keV for monochromatic beam

PSICHE is a beamline dedicated to x-ray diffraction under extreme conditions (pressure-temperature) and to high-energy absorption contrast tomography (20-50 keV).

To perform the various experiments planned on the beamline, 4 different operating modes will be set up:

- 1) White beam mode: energy dispersive x-ray diffraction
- 2) Focused monochromatic mode: angular dispersive x-ray diffraction
- 3) Unfocused monochromatic mode: high energy resolution tomography
- 4) Unfocused pink beam mode: high flux tomography.

Sample environment: Diamond anvil cells - Paris-Edinburgh pressure cell - large-volume multi-anvil cell - Raman device for *in-situ* measurements - pressure measuring device.

Major disciplines

X-ray diffraction: Materials under extreme conditions - Geosciences (earth structure), physics (molecular solids, functional materials, strongly correlated electron materials, etc.), chemistry (synthesis of hard materials), biology (protein folding and unfolding).

Tomography: Metallurgy, metallic alloys under strain (including under high pressure).