

## The Scottish Centre for the Application of Plasma-based Accelerators

SCAPA, the Scottish Centre for the Application of Plasma Accelerators, is the SUPA flagship project. It will encompass high energy electron, ion and photon beams, with high intensity and excellent time structure. SUPA teams will investigate possible applications of this accelerator technology as a source of high energy beams and use the beams for the development of new detector technologies.

### Radiotherapy

High energy electrons promise to be a superior alternative to conventional radiotherapy using high energy gamma-rays. SCAPA's compact accelerator design allows the construction of a versatile, compact treatment modality. SUPA is investigating the use of SCAPA in radiotherapy with the Institute for Cancer Research.

Further medical applications of this novel accelerator technology include the production of radio-isotopes in photofission reactions and imaging using electron beam tomography.

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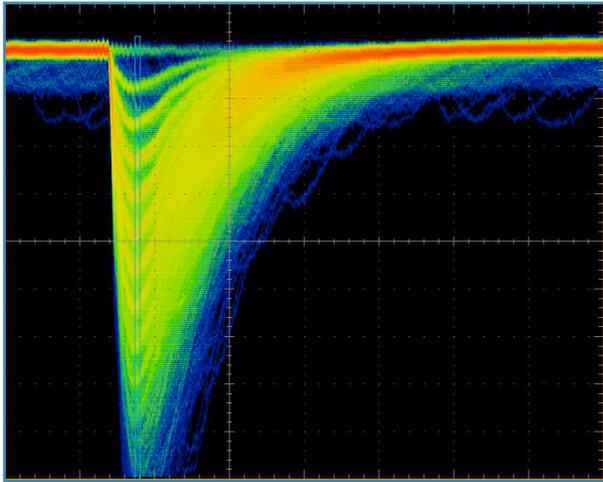
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# From Fundamental Research to Medical Applications

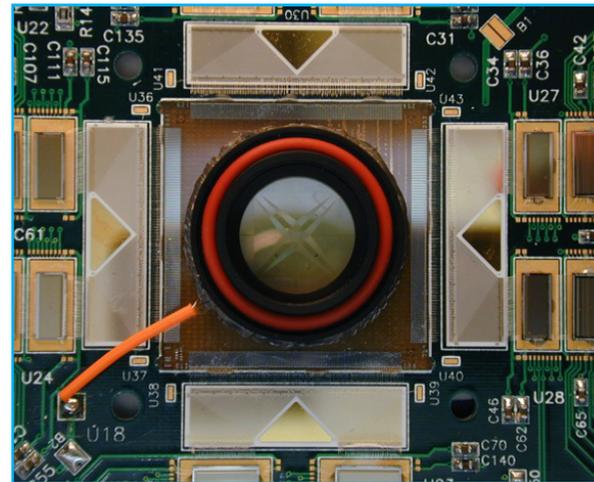
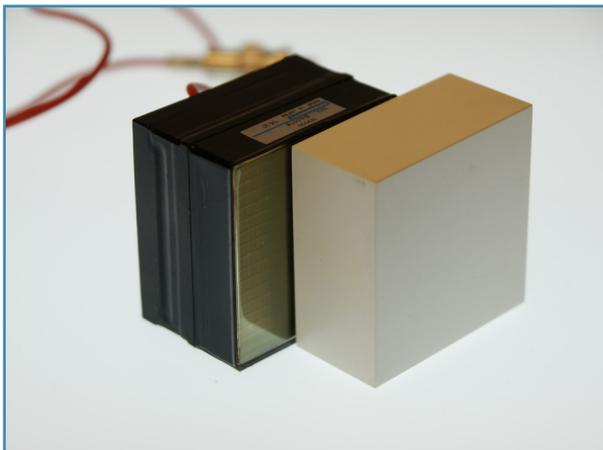
Accelerator and Detector  
Development in SUPA



## Detectors for Medical Imaging

Modern Nuclear Physics experiments rely on very high precision, superior energy resolution, fast timing and a high pulse rate capability. These characteristics are highly desirable for a wealth of medical imaging applications, from SPECT and PET to gamma cameras and dosimetry.

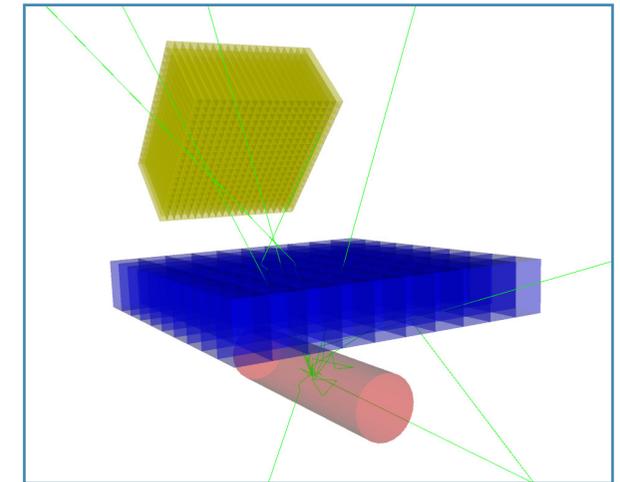
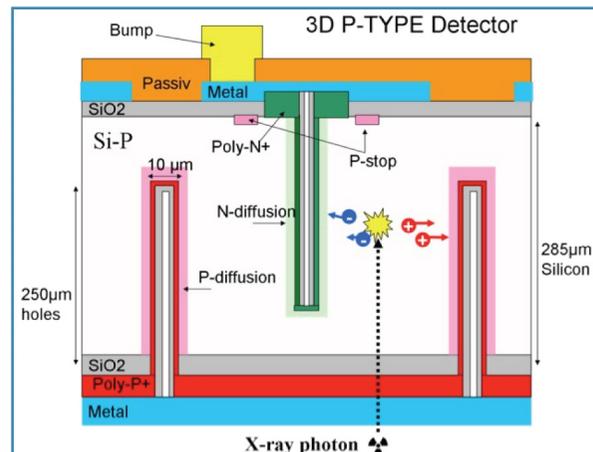
The SUPA team has professional expertise with both small scale and the very largest scale detector systems. We successfully apply our knowledge to a large variety of fields, focussing on fast timing and high resolution apparatus.



## Semiconductor Detectors

Semiconductor detectors provide a highly granular, highly integrated, precision solution for a variety of imaging applications. The SUPA team has particular expertise in the development of new detector systems and in their application to a variety of medical problems.

SUPA detector technology has been successfully applied to phase-contrast X-ray imaging, with further developments ongoing. These detector technologies are to be developed further, with applications such as retina prosthesis in mind.



## Simulation and Data Analysis

All projects in medical imaging and radiotherapy research rely on computer models to predict performance and to understand the response of the system.

The SUPA team has a thorough understanding of state-of-the-art software to simulate both interaction of radiation with the body and modelling the response of complex detector systems.

Modern detector systems produce large quantities of data. The expertise of the SUPA teams from fundamental research in large experiments is at hand to help here.

