Name of Service/Facility /Experiment :	CALICE
Established:	First seedcorn grant Dec 2002, current grant Oct 2005
Level of Funding :	Approx £0.9M p.a.

Brief Description: Primary Aims and Objectives

The scientific objectives of the ILC are at the forefront of particle physics and address major questions in the field: the origin of mass, the nature of the fundamental particles and the structure of the forces between them. The ILC will excel in precision measurements of Standard Model (SM) parameters and the properties of any other particles found by the LHC, as well as having a significant discovery potential in its own right.

The main scientific objectives of the CALICE programme are to understand the requirements of an ILC detector calorimeter and to evaluate the performance of several possible calorimeter technologies such that we will know how to build a detector capable of delivering the ILC physics programme.

Within the UK, the principal objective is to make major contributions to the CALICE programme and to establish a UK leading role in key areas. This will allow the UK to participate in the ILC detector collaborations, potentially to lead the construction of a major detector component and ultimately to exploit the ILC data.

Contribution to delivering STFC strategic priorities/roadmap:

- Please refer to the STFC website at: http://www.so.stfc.ac.uk/roadmap/

Of the key science questions listed, the ILC will help to answer:

- **"What is the origin of mass?" Assuming the Higgs exists, the ILC will be able to make precision measurements of its properties for comparison with predictions of the SM or extensions of it, an essential requirement if we are to claim that we understand the origin of mass. These include branching fractions for Higgs decays to W and Z bosons, b and c quarks, taus, gluons and photons. A crucial measurement will be the cross-section for multi-Higgs production, which depends on the size of the Higgs self-coupling.**
- **"Is there a unified theory of all particle interactions?" The SM describes all current experiments but is unsatisfactory as a fundamental theory. It is widely assumed that new particles will be discovered at the LHC. These may help explain the apparently arbitrary elements of the SM and provide a more unified theory. The ILC will be able to make precision measurements of the properties of such new particles to confirm if they provide such an explanation or if there is more to be discovered.**
- **"What are the laws of physics in extreme conditions?" The ILC will be the highest energy e^+e^- collider ever built and so will be able to study lepton interactions in detail under unprecedented conditions.**