



**UK – Thailand**  
**Capacity Building in Software and Hardware Infrastructures and Data Handling**  
**through Astronomy 2016**  
**Pathways to Impact Statement**

**Project Title** *[up to 150 characters]*

Using astronomy surveys to train Thai researchers in handling Big Data

**Pathways to Impact Statement**

Impact forms a major component of our project, since its primary objective is the training of Thai students in economically important data-handling skills. We outline in section 2 of our Case of Support the need for training in the area to help progress the Thai economy to the “high-income” level, and the subsequent reduction in levels of poverty. Within our Case for Support, we also explain how these training objectives will be delivered through hands-on training within the UK, research projects, and practical workshops within Thailand. We therefore refer the reader to our Case for Support for further details on this specific aspect of our Pathways to Impact, rather than reiterating them here.

There is also significant scope for our project to have impact beyond that highlighted in our Case for Support. With GOTO producing vast amounts of data on a nightly basis (~250 gigabytes of imaging per night, representing millions of individual astronomical sources), it is crucial that any automatic analysis software can work fast enough to analyse this data. This level of analysis efficiency is unprecedented in research astronomy, meaning the students will have to identify innovative means to achieve it. As such, there is the prospect that the resulting highly efficient database management system and analysis software can be used in areas beyond astronomy that also generate large amounts of rapidly updated digital data. The UK PI’s host university, the University of Sheffield, has a team of support staff who specialise in facilitating interdisciplinary communication within the University and beyond. The UK PI will work with this team to investigate the prospect of our research impacting other research areas.

By developing automatic analysis software and data management systems for use with astronomy data, there is also the prospect that it can be adapted for other uses within NARIT. Their rapidly expanding network of telescopes is producing increasingly large amounts of data that need to be processed and analysed. This is especially the case for their network of robotic telescopes distributed across Thailand and the Thai Southern Telescope in Chile. Data from these telescopes will be far more accessible to Thai students and the public if they can be analysed automatically by a standard pipeline. On completion of the project, the partners will explore the possibility of adapting the analysis software to work with these telescopes. The proposed project therefore offers the opportunity to increase the impact of NARIT’s facilities on the Thai students and the general public.

We also wish to note that GOTO is among a small number of transient surveys that are effectively pre-cursors to the LSST, which STFC has recognised as being strategically important for UK astronomical research. GOTO will encounter many of the challenges that will face the LSST, not least in terms of automated data handling. By exploiting GOTO data to develop a data centre running efficient automated analysis pipelines, there is clear potential for our research to have real impact on the development of such systems for the LSST project. In light of this, the UK partners will provide feedback from our project to the LSST consortium via the UK’s network of affiliate LSST PIs.