

An Adaptable Imaging Camera

The aim of this project is to design and develop a range of adaptable optical elements based on liquid crystal (LC) technology suitable for use in a miniature imager for space applications. This will produce a lens system that will provide a focussing image scaling (zooming) capability without moving parts. The aperture would be continuously variable in size, and the camera would incorporate a tuneable filter. A particular use might be for lightweight cameras on planetary landers. There is also huge commercial potential in the ability to produce non-mechanical controllable imaging lenses. The project envisages development of a breadboard lens system, which will form the basis for both flight development and a prototype product

Astronomical Instrumentation Group, University of Durham

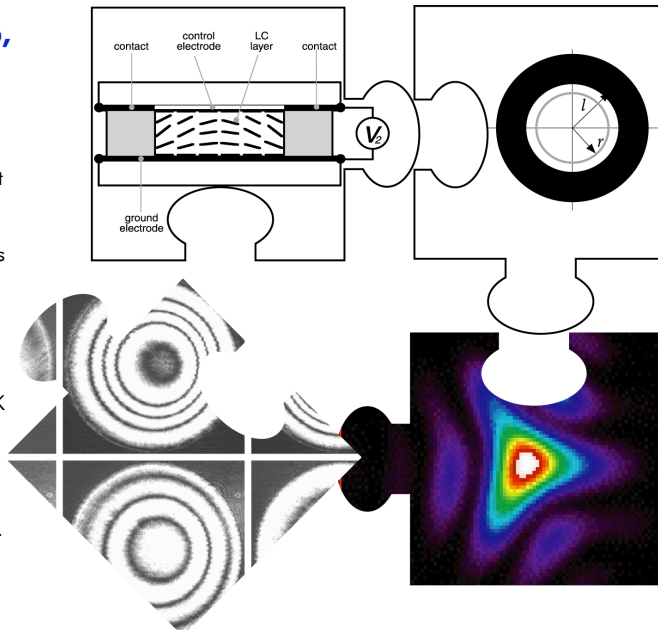
Comprising about 30 researchers, postdocs, engineers, and technicians, the University of Durham's AIG is one of the largest ground-based astronomical instrumentation groups in the UK—specialising in adaptive optics and spectroscopy. The Group, in partnership with others, has designed, built, and commissioned a number of large astronomical instruments around the World, including the UK common-user adaptive optics system for the William Herschel Telescope (NAOMI) and a multi-object spectrograph for the Gemini Telescope (GMOS). The AIG has pioneered the use of LC phase modulation technology for use in both astronomical and industrial applications—working with a variety of companies—holds 3 patents and has published more than 50 papers on LC technology.

[aig-www.durham.ac.uk](http://www.durham.ac.uk/aig)

CRL-Opto

CRL-Opto has over 70 years experience in electro-optical technology—developing and licensing new liquid crystal technologies. The company's current range of standard products and services includes transmissive miniature LCDs, reflective micro displays, fast switching ferroelectric shutters, and microfabrication and a specialist coatings service.

www.crlpto.com



Astrium

Astrium is the largest European spacecraft manufacturer and has an extensive heritage in many areas of space applications, from telecommunication and earth observation satellites to deep space and science missions. As part of its strategy for the future, Astrium Ltd is developing a unique expertise for miniaturized planetary landers, expanding the Beagle-2 concept for application to further Mars landers (through the Artemis project) and landers for near-Earth asteroids.

www.astrium-space.com

Optical Surfaces Ltd.

Optical Surfaces Ltd was founded in 1962 and is well known as a manufacturer of astronomical and space optics and is also a regular supplier in the high power laser arena to laboratories around the world.

www.optisurf.com

MSSL

Founded in 1957, the Mullard Space Science Laboratory is the largest and oldest university space science group in the UK. MSSL has an enviable record in the development of successful space instrumentation with involvement in over 220 rocket launches and more than 30 satellites, in collaborations with Europe, America, Japan and the USSR/Russia. The laboratory has a complement of 150 staff and students with expertise in astrophysics, plasma physics, solar physics, Earth remote sensing and detector physics, together with engineering design groups and fabrication and test facilities.

www.mssl.ucl.ac.uk

Richard Bingham

Dr Bingham is chief optical designer for the project, and has considerable experience in ground and space based optical instrumentation. He operates his own design practice in Cambridge (Optical Design Service) and works part time as an optical designer and consultant at UCL.

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The Adaptable Imaging Camera is sponsored by: