



Space Research Centre  
 Department of Physics and Astronomy  
 University of Leicester

# Technologies from Space Exploration

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**SPACE IDEAS HUB**  
 INNOVATIVE DESIGN, ENGINEERING, ANALYSIS & SUPPORT



*NEREUS Workshop Torino, 19<sup>th</sup> October 2011.*

## *NEREUS*

# Direct Outcomes from Space Exploration

- Economic Impact
- Regional Focus
- Growth via SMEs
- Disruptive Technologies
- Inspiration
- Recruitment to STEM Subjects
- Interdisciplinary Research
- Policy Influence (Climate Change)
- International Collaboration
- Technology Transfer

**Top** – radar image of Earth-crossing Apollo asteroid 4660 Nereus

**Bottom** – Nereus, the Old Man in the Sea from Homer's Illiad.

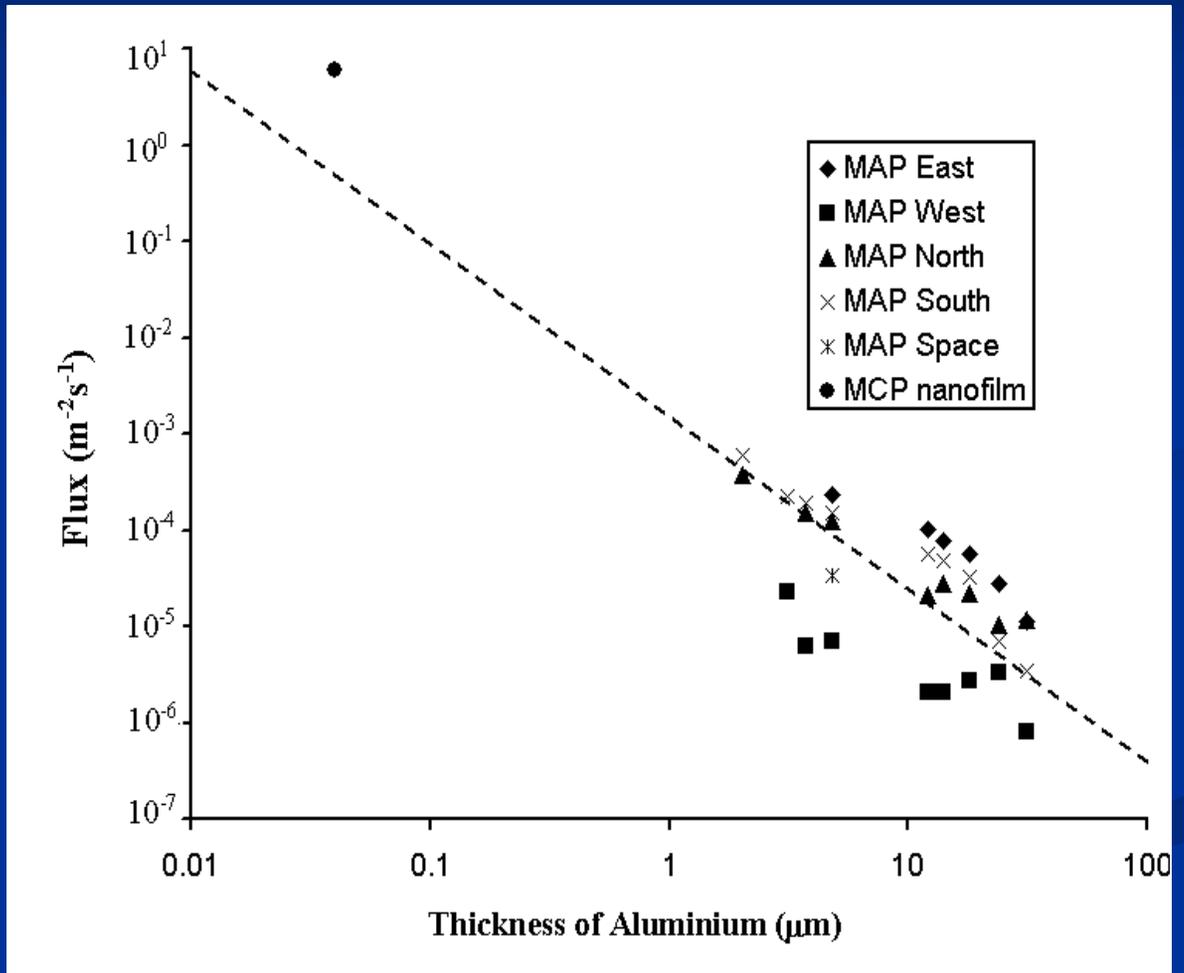
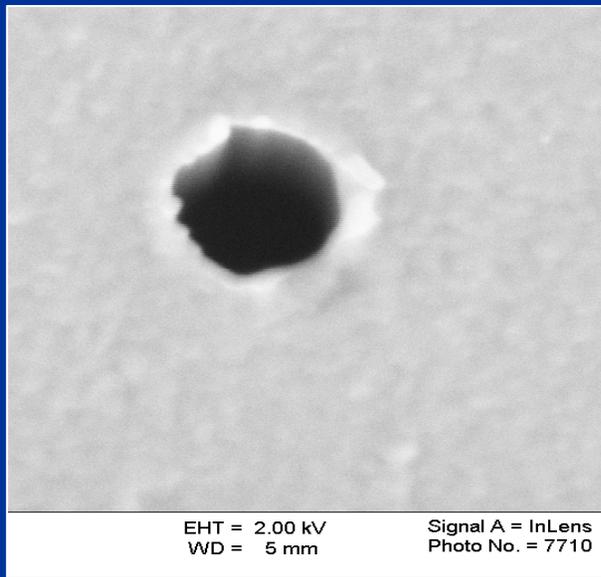
# The University of Leicester Space Research Centre

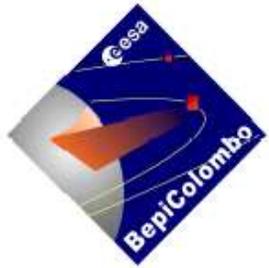
- 100 staff and postgraduate students, housed in purpose-built accommodation
- 550 sq.m Phase III of Michael Atiyah Building – opened January 2011
- Diversified funding for 6 current space projects and for laboratory programme in detectors and optics
- Grant and Contract portfolio in excess of €20 M
- Nationally recognised for Knowledge Exchange
- Partnerships with National and Regional Industry
- Interacting with the ESA Centre and Harwell ISIC
- BioImaging Unit (1998)
- THES nomination “Outstanding contribution to Innovation and Technology”
- *emda*–funded Technology Audit by Qi3 in 2007
- Three associated spin-off companies
- G-STEP (2008)
- Space IDEAS Hub (2010)
- Partner in NERC/TSB Centre for Earth Observation Instrumentation
- STFC IPS Fellow (Tim Maskell, appointed 2009)

# The UK and the ISS : Dust and Debris detection

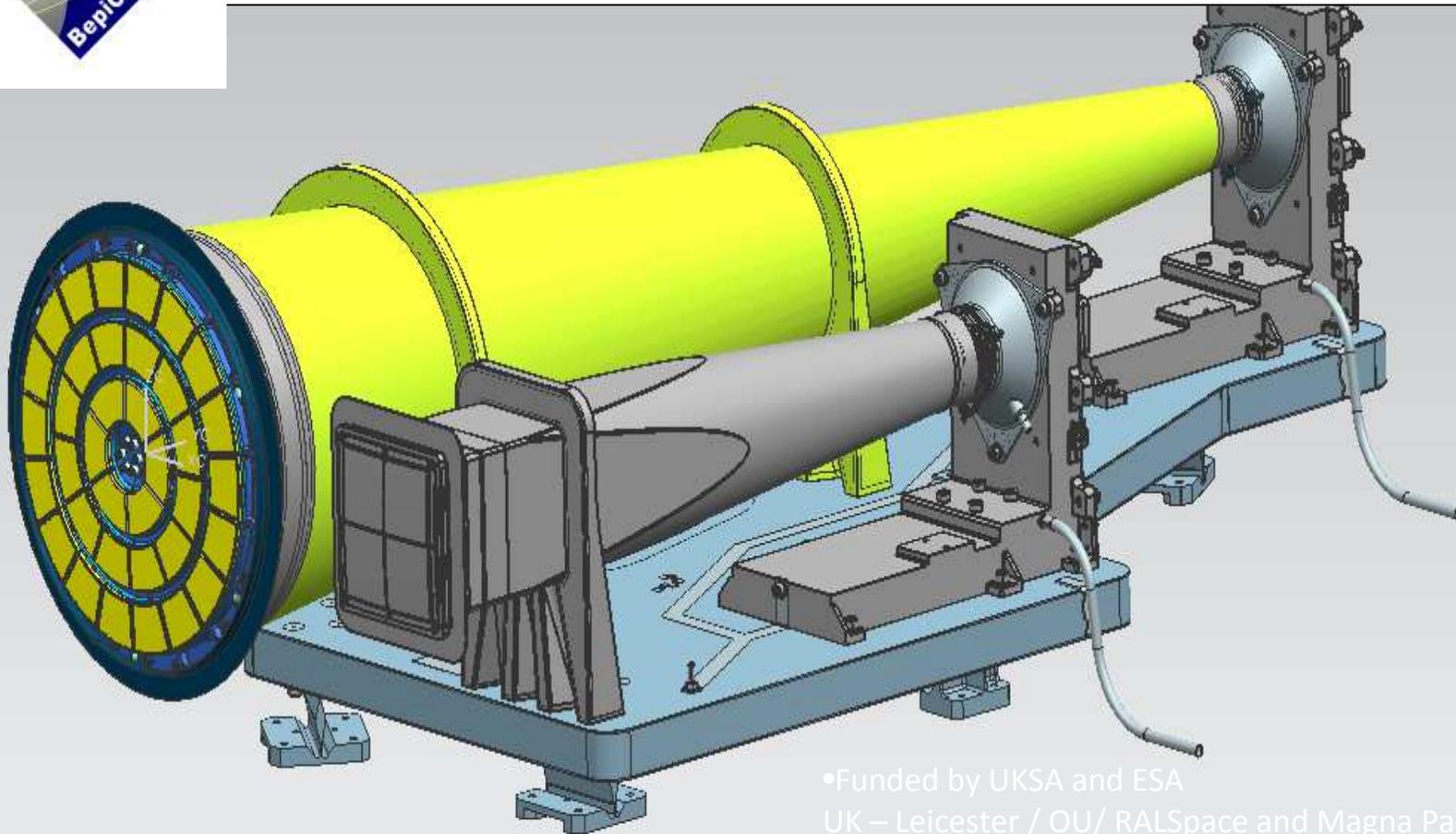
Microchannel Plates bearing 60nm thick Al film thermal barriers were exposed on the Russian PIRS module to the external ISS environment for 734 days

- The films are ~ a factor of 10 more sensitive than previous foils
- The impacts reveal the presence of a high density of previously unobservable nanoscale particles either debris or natural dust





# The BepiColombo Mercury Imaging X-ray Spectrometer (MIXS)\*



- Funded by UKSA and ESA
- UK – Leicester / OU/ RALSpace and Magna Parva
- Spain – CAB/INTA
- Germany – MPE Garching, Lindau
- Finland – Helsinki, FMI, OIA

# James Webb MIRI



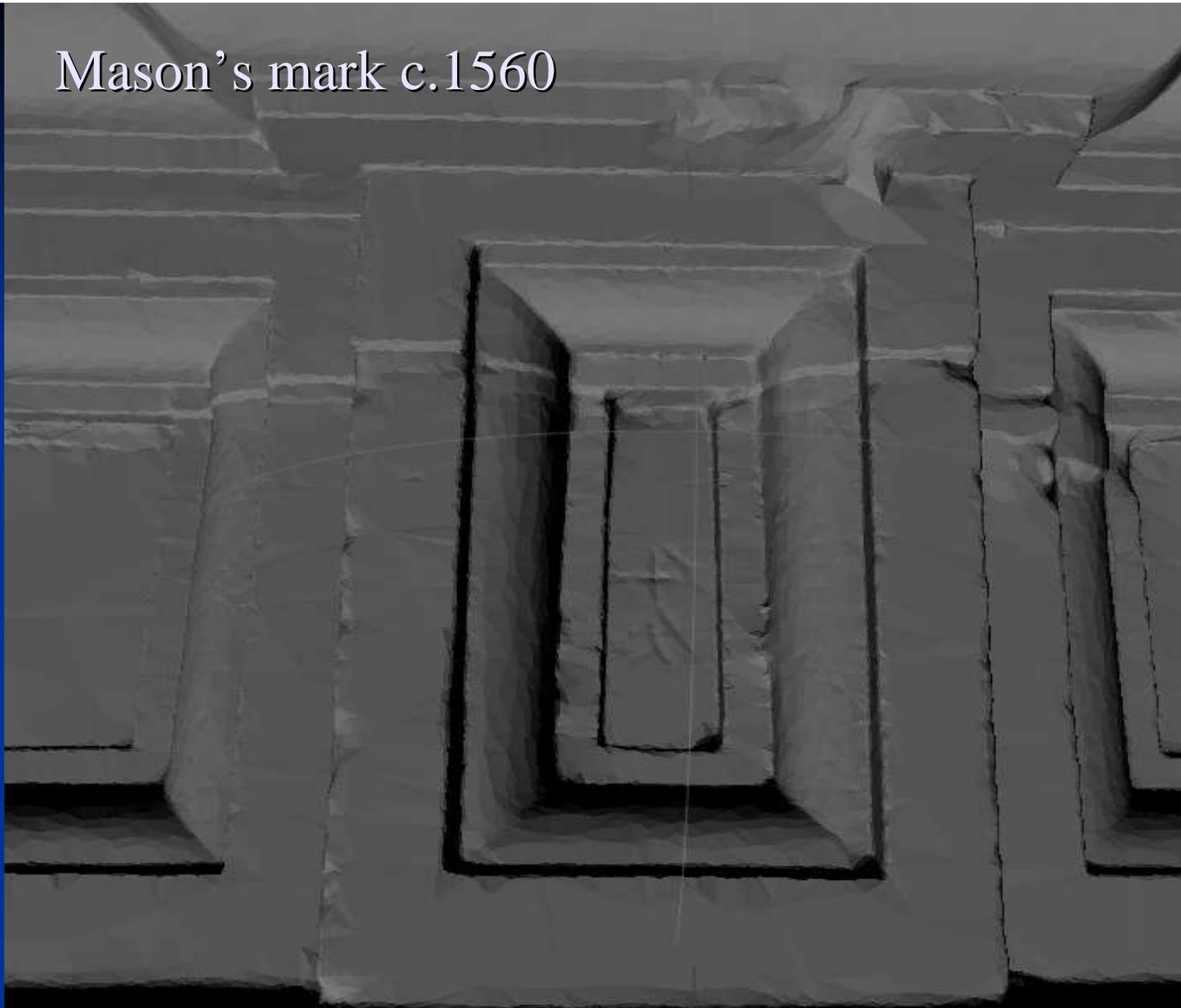
*Astrosat* Soft X-ray Telescope CCD focal plane camera

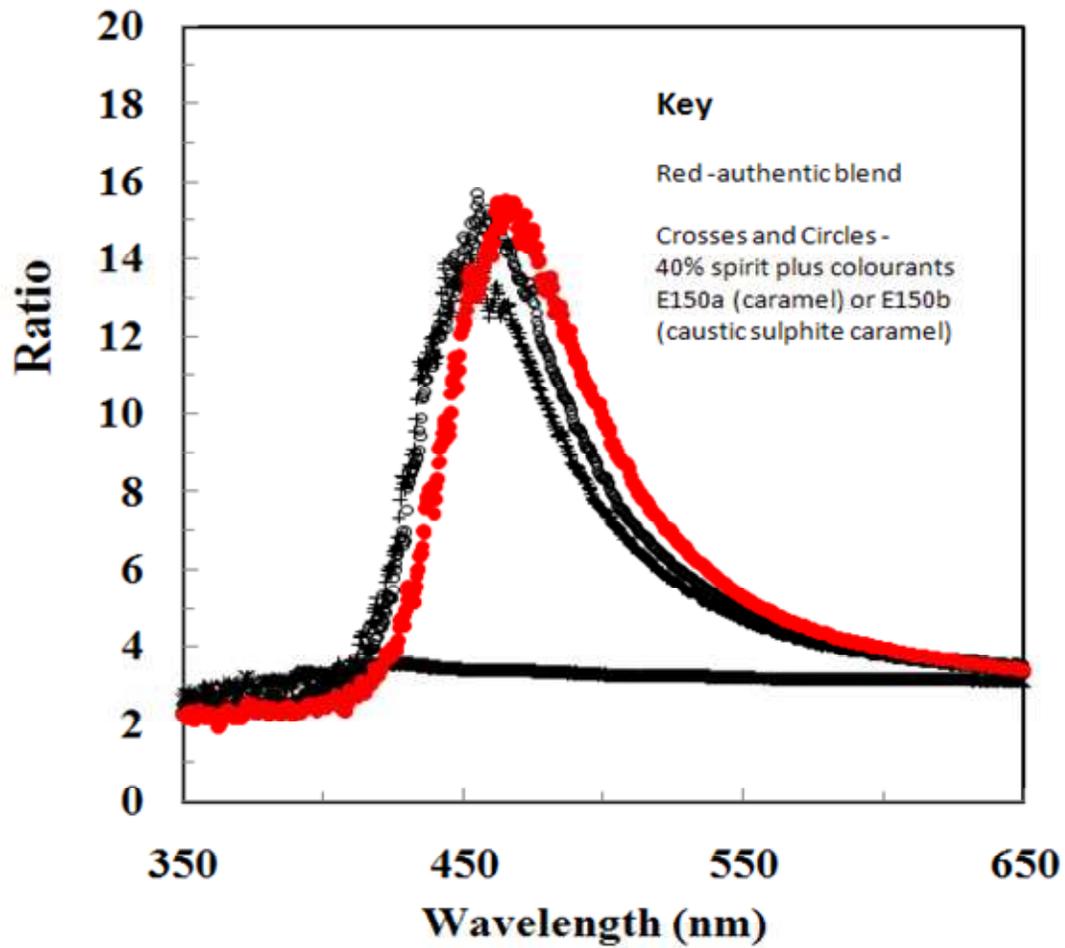


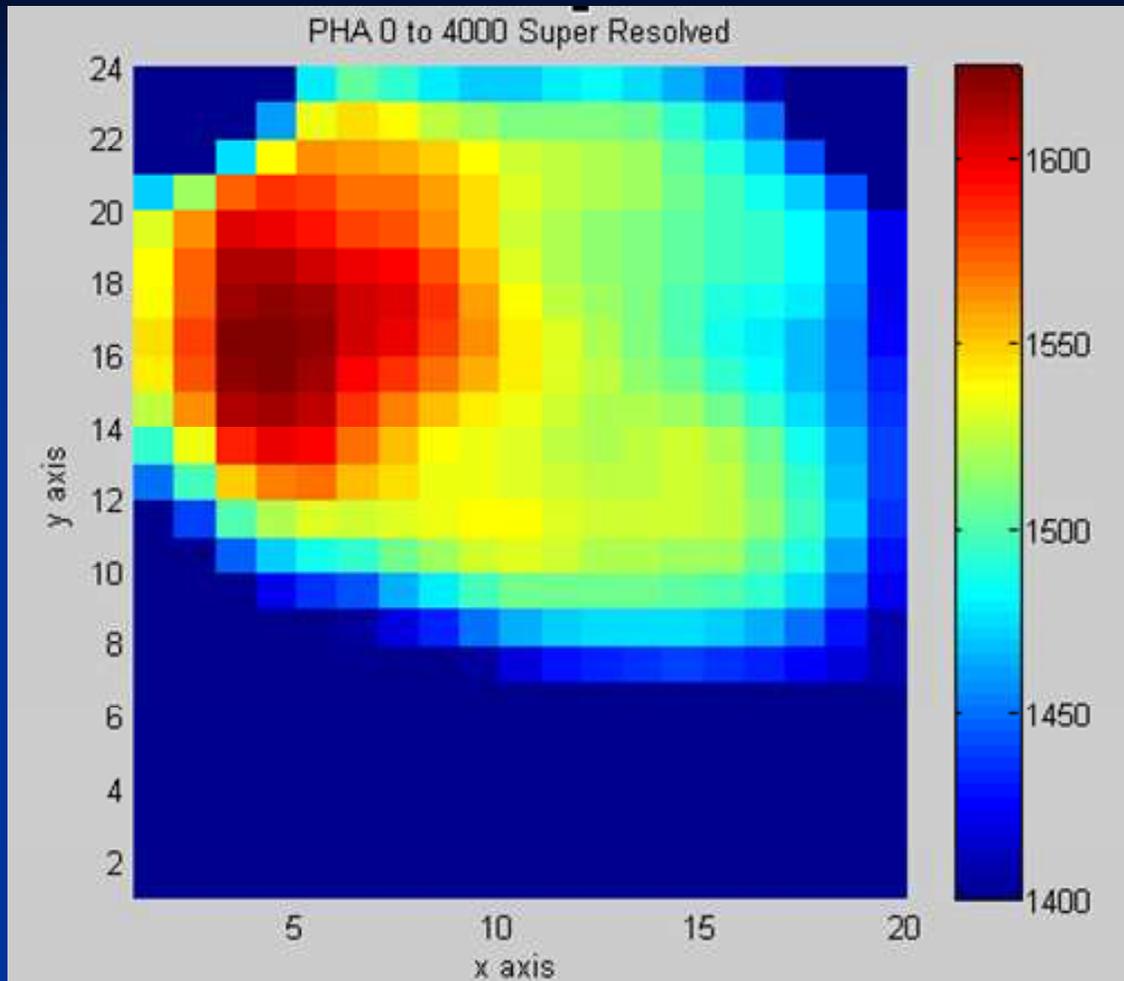
# Space Science and Cultural Heritage



Mason's mark c.1560







S-CAM III : Hyper Spectral, Super-Resolved Image of a single cell

# The National Space Centre , Leicester

- Millennium flagship project for the East Midlands region
- Opened July 2001 by Her Majesty the Queen
- 2.2 million visitors
- 60,000 school children 8-14 each year
- Space Now
- NEO information centre
- Space Academy
- NSC Creative
- CEO Chas Bishop (chasb@spacecentre.co.uk)

