



Press Release

The Big Vision: Very Large Active Pixel Sensors for Medical and Scientific Imaging

The £4.5m Basic Technology MI-3 Consortium has successfully made one of the World's largest monolithic active pixel sensors. With an imaging area of approximately 6 cm square, the nearly 2 million, 40 micron pixels, this CMOS-based imager has been specifically developed to meet demanding clinical applications such as x-ray portal imaging and mammography as well as the x-ray crystallography of proteins and other large molecules. With unique programmable stages for resetting individual pixels within the overall exposure time, this imager can cope with the very high range of intensities experienced in these types of applications. As the sensor is much larger than standard integrated circuits, the photolithography masks used have to contain a set of building blocks that contain only sections of the entire sensor. The sensor is "stitched" together during the fabrication process so allowing complete sensors of different sizes to be constructed.

The next step is to produce wafer-scale imagers - in excess of 13 cm square - and by combining a very small number of such devices realise imaging systems that approach the width of the human torso. This approach will eliminate the need for expensive and inefficient lenses and so enable lower-cost, more sensitive and faster medical imaging systems.

These sensors were developed by the CMOS Sensor Design Group at STFC's Rutherford Appleton Laboratory in association with the University of Sheffield and University College London.

Professor Nigel Allinson, leader of the MI-3 Consortium, said, "Very large active pixel sensors could soon be making a major impact medical imaging by further reducing the need for the old technology of film. The UK has a World-lead in such sensors for scientific and medical applications - it is a lead we intend to maintain."

Dr Renato Turchetta, leader of the design team, explained that "wafer-scale CMOS sensors are now a reality and the team is ready to take the digital revolution a step further in order to revolutionise scientific and medical imaging."

Notes to Editor

MI-3 is a four-year £4.5m project funded by the UK Research Council Basic Technology programme (www.rcuk.ac.uk/basictech). The consortium consists of leading groups in detector technology, microelectronics, particle physics, space science, bio-sciences and medical physics at the Universities of Sheffield, Glasgow, Liverpool, Surrey, York, Brunel University, University College London, Medical Research Council Laboratory of Molecular Biology (Cambridge), Institute of Cancer Research, and Science and Technology Research Council (STFC) Rutherford-Appleton Laboratory. The consortium is led by the University of Sheffield.

Further information, please contact:

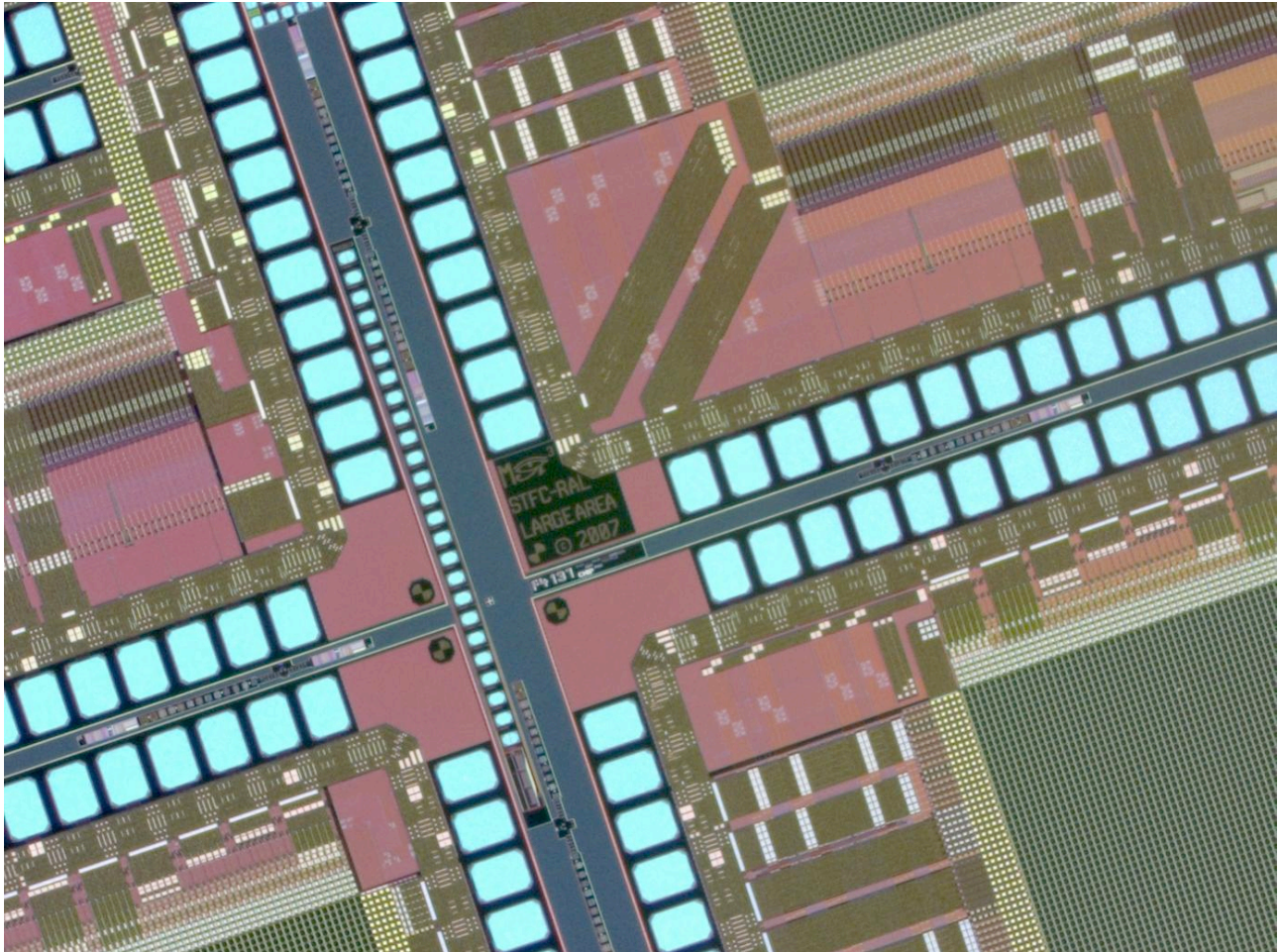
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or

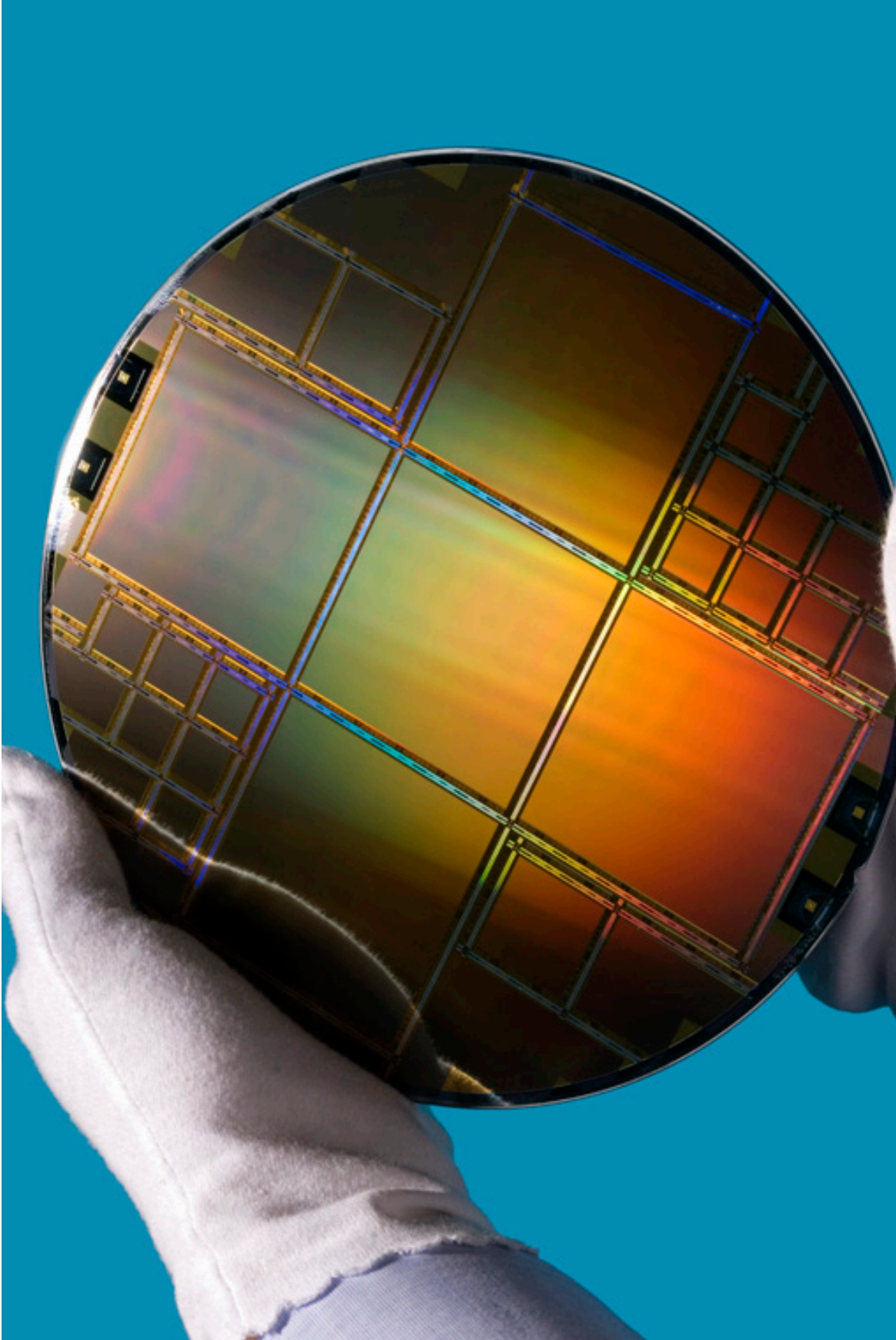
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Figures (Figures are available as individual jpg files - please contact)

Close-up intersection of four imagers - note MI-3 logo



Complete wafer of Large Area Sensors - note different sized imagers



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