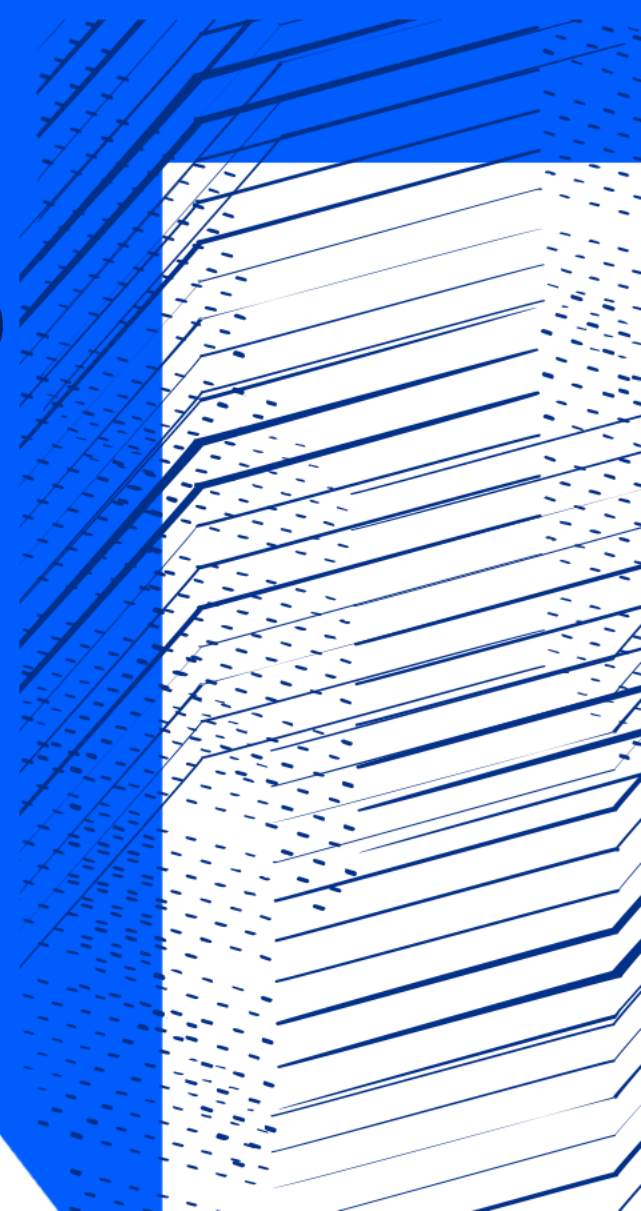




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# CMOS Sensor Design Group Introduction

Nicola Guerrini  
Group Leader  
October 2019



# Outline

**1 UKRI and STFC**

**2 Detector Division**

**3 CMOS Sensor Design Group  
Capabilities**

**4 Past Projects**

**5 Questions**





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# UKRI and STFC

A brief introduction...



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# UKRI and STFC





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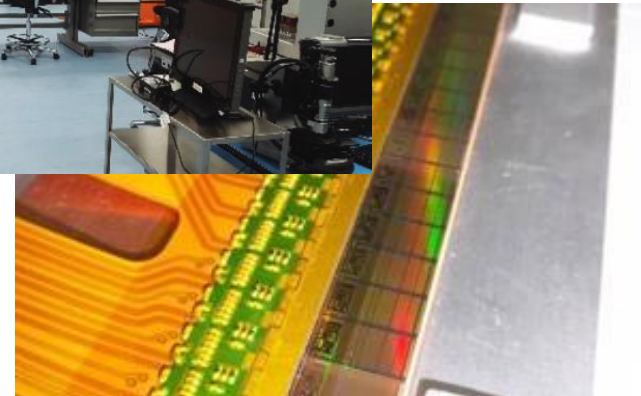
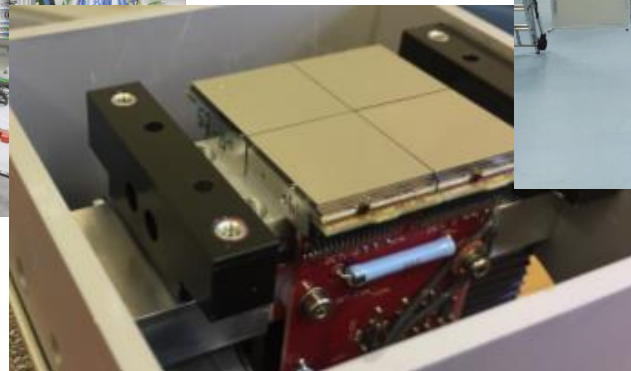
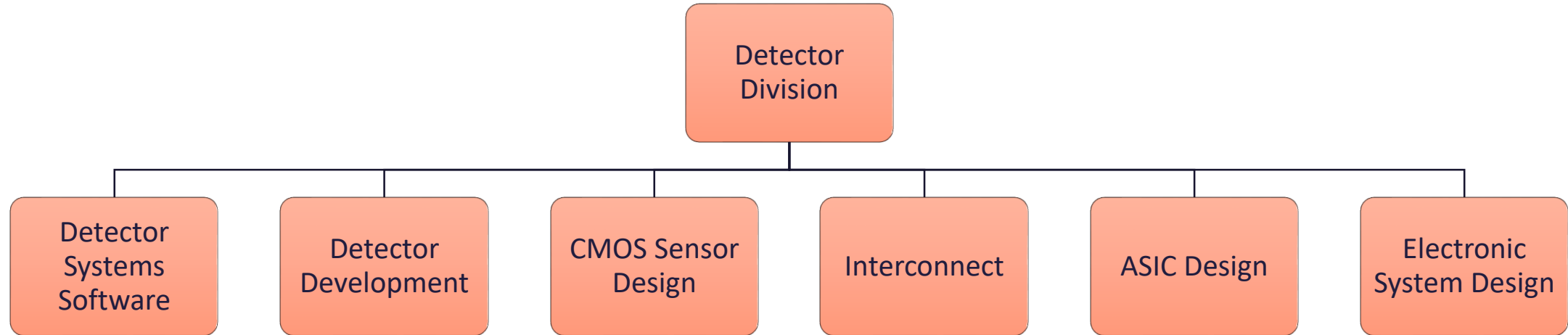
# Detector Division

Detector Development Capabilities



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# Detector Division





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# CSDG Capabilities

CMOS Image Sensor History and  
Capabilities at STFC



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# CMOS Sensor Design

- More than 20 years experience in CIS/MAPS design for science applications
- Good relationships with multiple cutting edge foundries
- Access to state-of-the-art design tools
- In-house testing facilities
- Large IP portfolio (ADC, LVDS, PLL etc.) and experience ranging from simple “3T” pixels to “intelligent” pixels
- Experience with stitching and other advanced processes
- Rolling programme of IP development







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# Past Projects

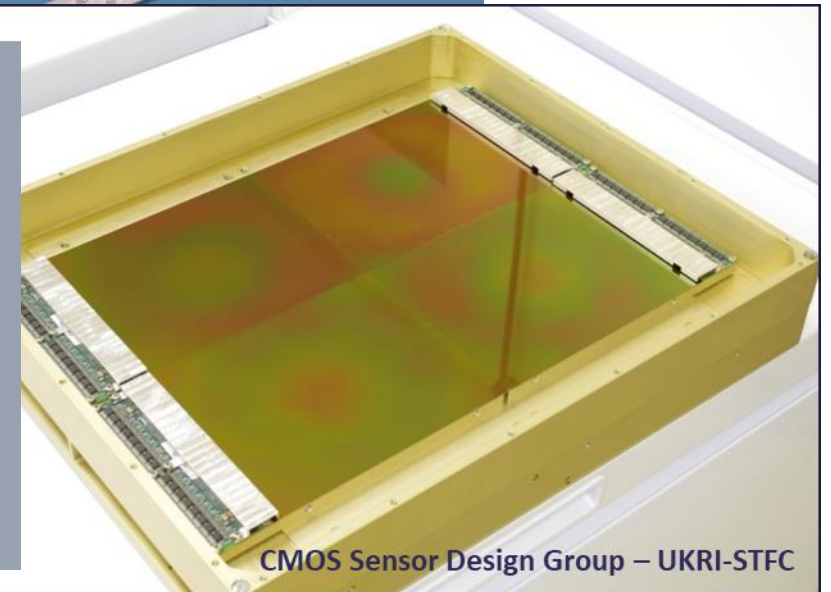
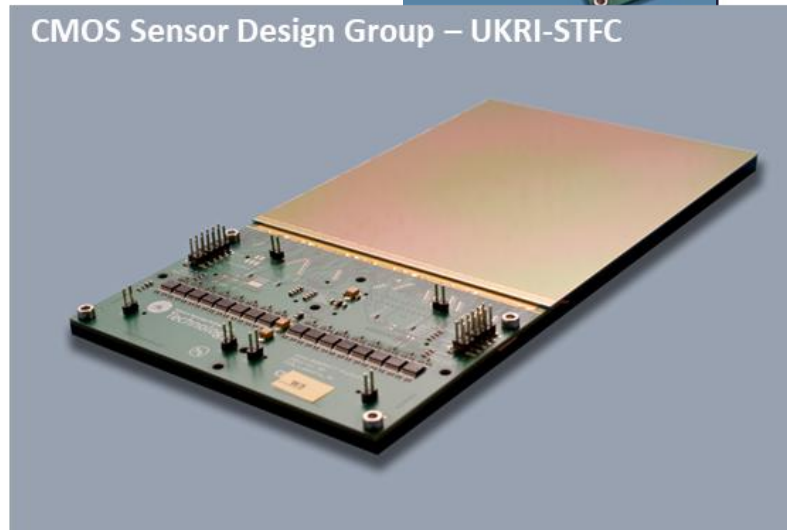
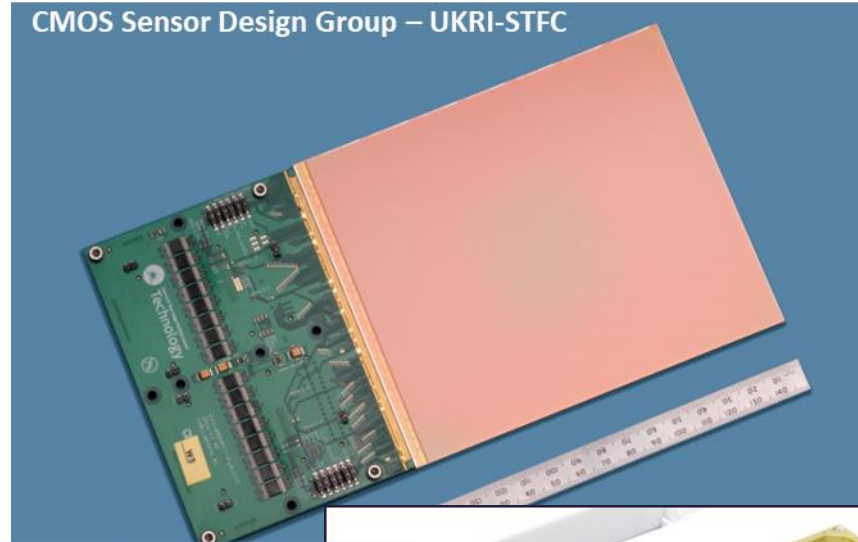
Previous CSDG Projects



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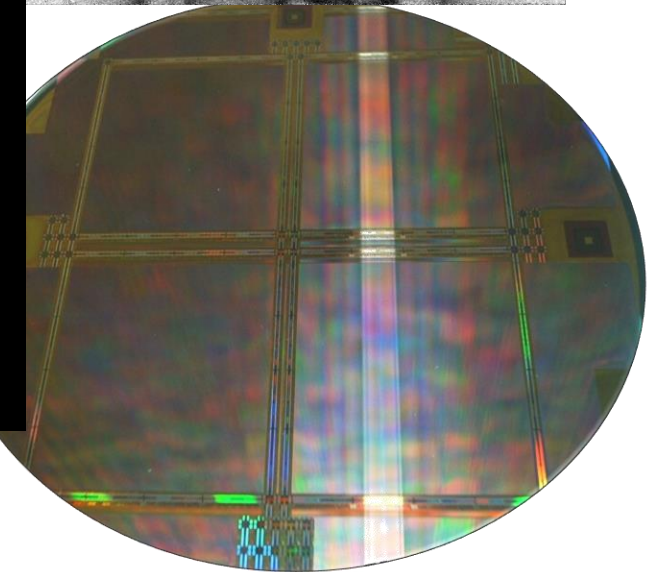
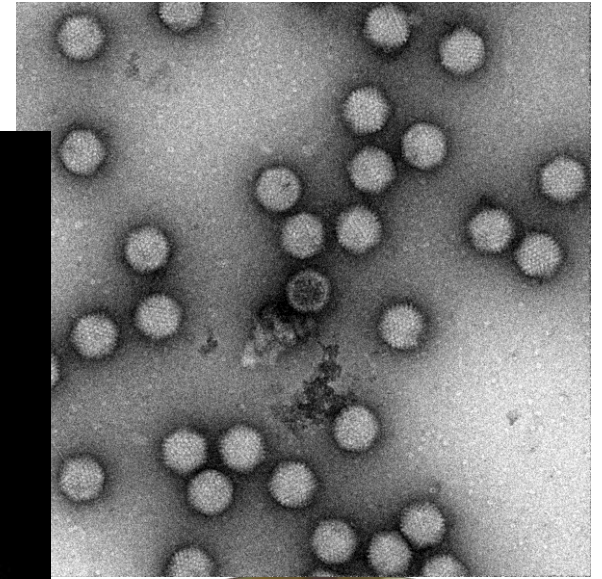
# Large Area CMOS Sensors

- Wafer scale sensor
- 6.7 Mpixels, 30fps, 45e- noise
- Stitched in 180nm
- Pixels on 3 sides allows tiling to cover larger areas
- In volume production



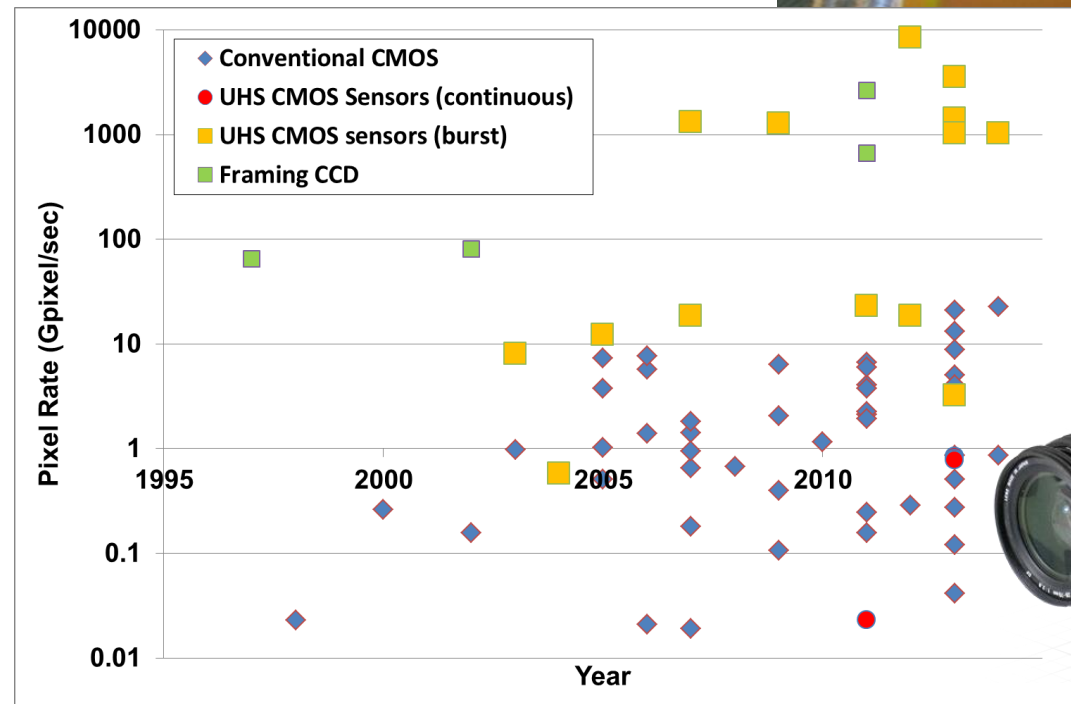
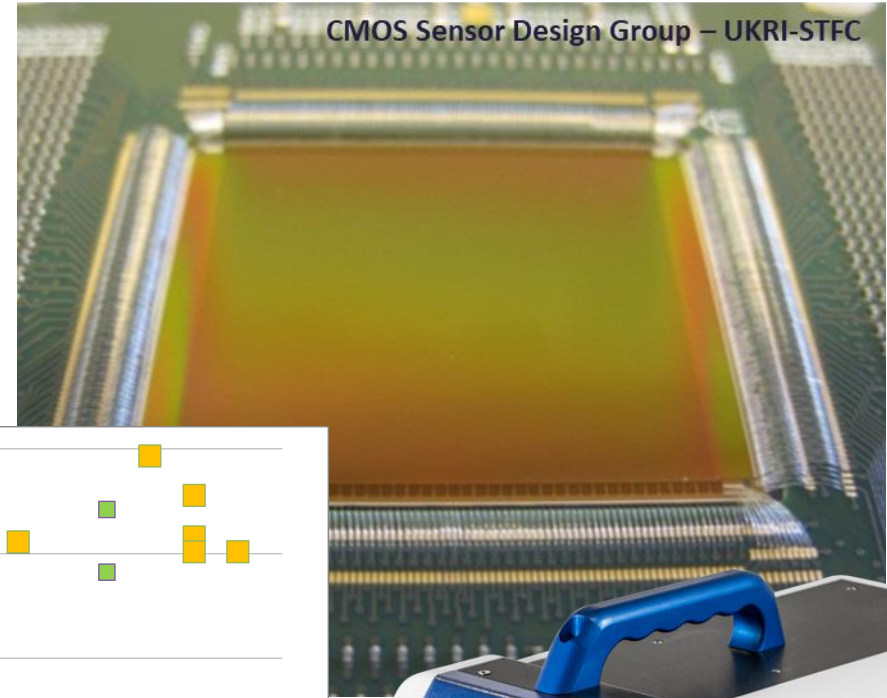
# CMOS Sensors for TEM

- First CMOS sensors in TEM
- 61x63 mm<sup>2</sup> silicon area
- 4 sensors on a 200 mm wafer
- 16 million pixels, 4Kx4K array
- 14  $\mu\text{m}$  pixels
- Radiation hard
- Nobel Prize in 2018



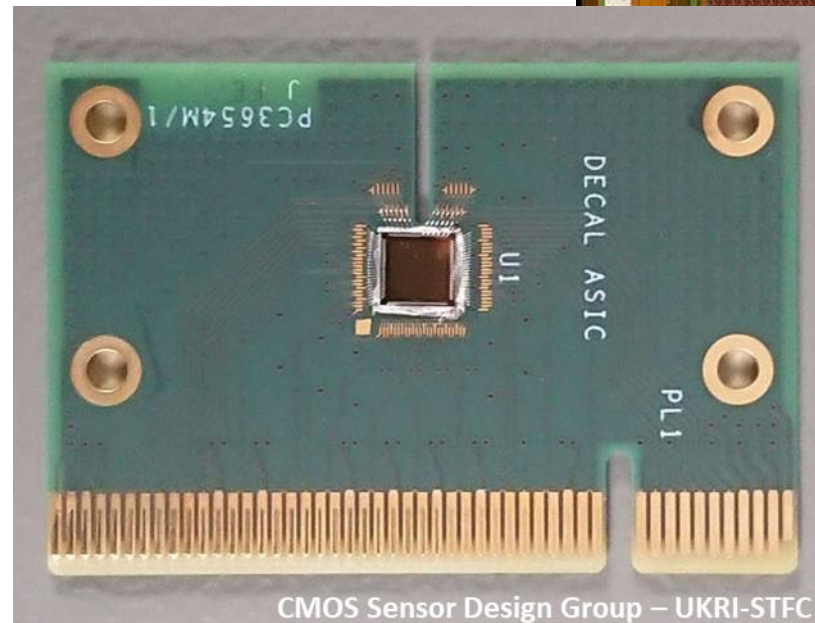
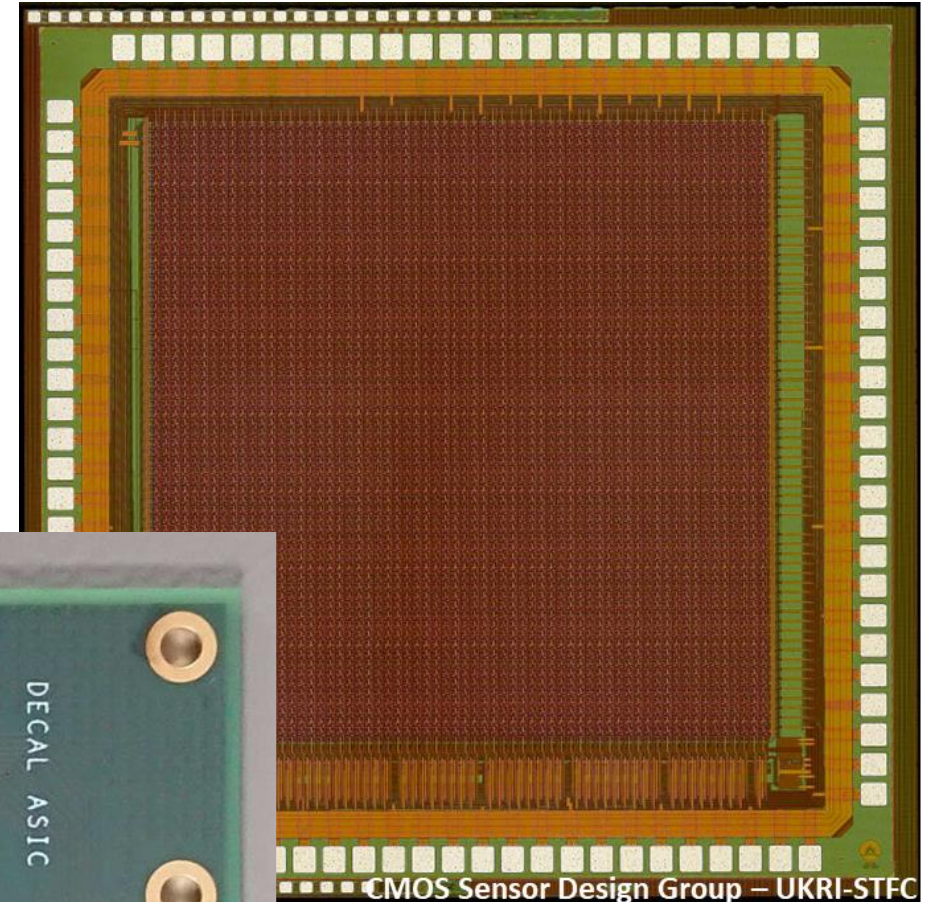
# Ultra High Speed CMOS Sensors

- 0.7 Mpixels camera
- 5,000,000 frames per second
- State-of-the-art process



# CMOS Sensors for Calorimetry

- Test structure for Digital Calorimetry in future colliders
- Sums hits in a 5x5mm area
- Re-configurable to operate as strip tracker
- TowerJazz 180nm





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# Questions?



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# Thank you

Contact

[iain.sedgwick@stfc.ac.uk](mailto:iain.sedgwick@stfc.ac.uk)

For more information, visit:

<https://www.technologysi.stfc.ac.uk/Pages/CMOS-Sensors-Design.aspx>



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