LEONARDO

Leonardo Electronics

Latest Detector Developments in IR

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Southampton
19/03/2024


Electronics


Helicopters


Aircraft


Cyber &
Security


Space


Unmanned
Systems


Aerostructures

Infrared Detectors Southampton UK

World leader in design, development and manufacture of high performance infrared detectors

- 70 year heritage in R&D and manufacture of IR Detectors
- Fully integrated capability from material growth to volume manufacture
- 200 employees including world leading scientists
- 3000m^2 clean rooms (including class 100)
- Infrared sensitive material growth specialising in 2 detector technologies
- Supplying a diverse range of markets and applications

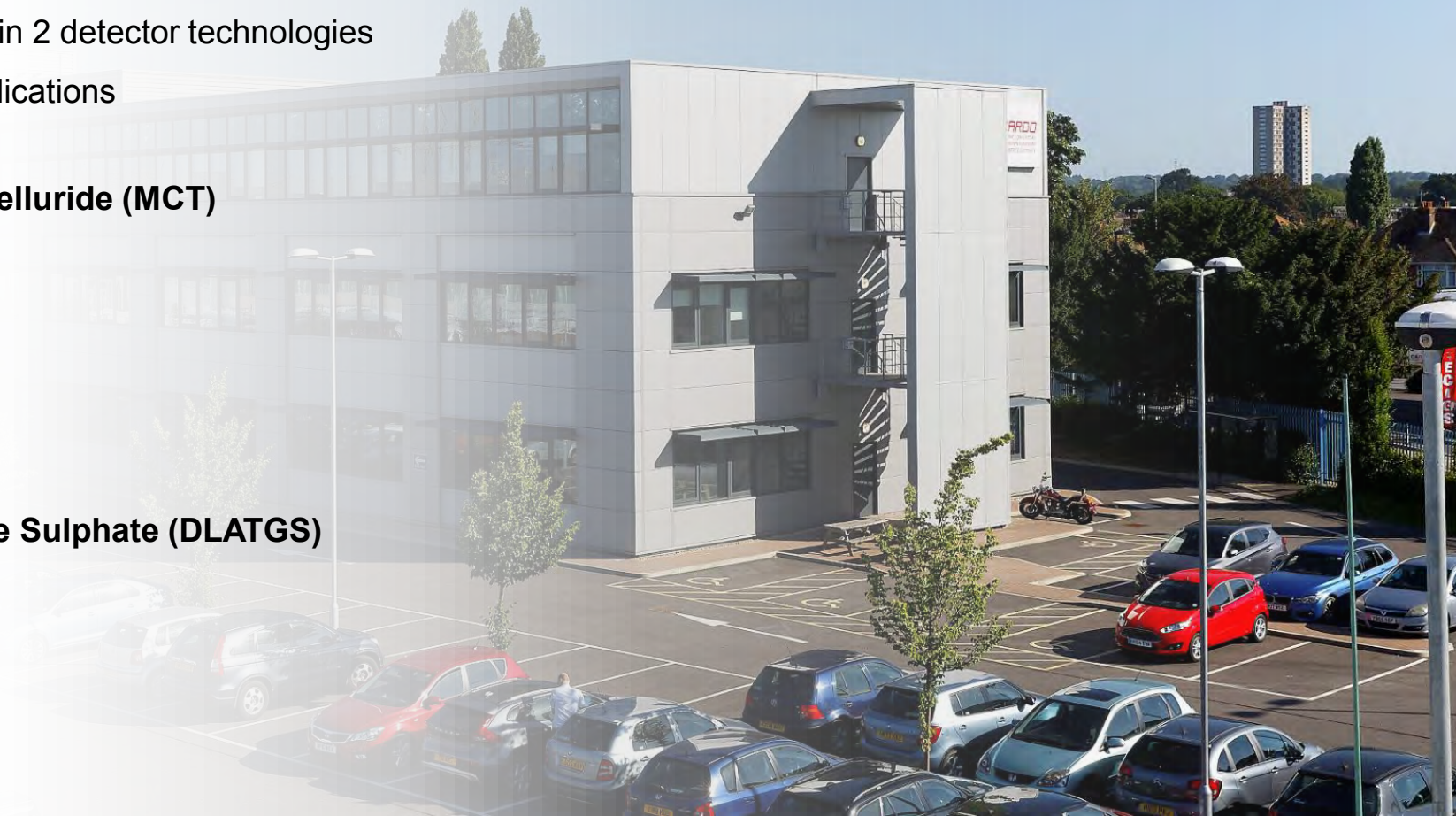
High performance cooled Mercury Cadmium Telluride (MCT)

Focal Plane Array detectors

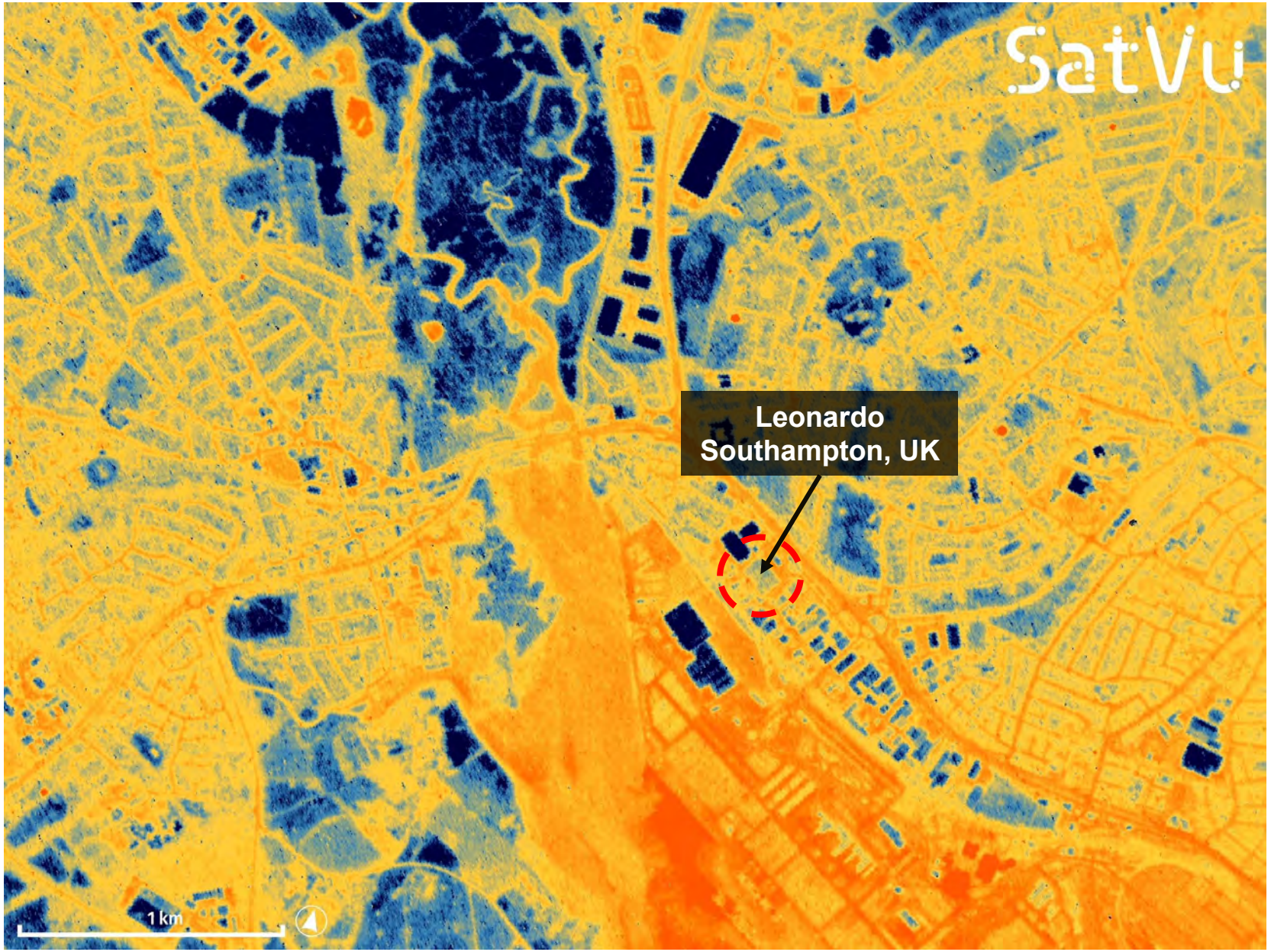
- Space and Astronomy
- Guidance systems
- Thermal imaging

Single element Deuterated L-AlanineTriglycene Sulphate (DLATGS) pyroelectric detectors

- Space and Astronomy
- Infrared spectroscopy

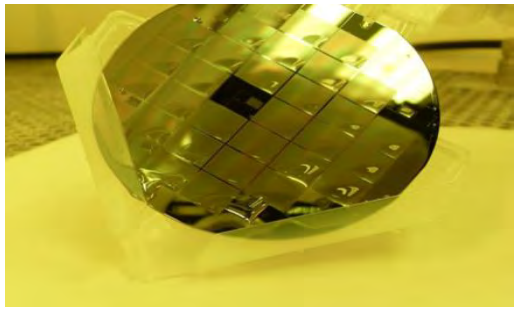


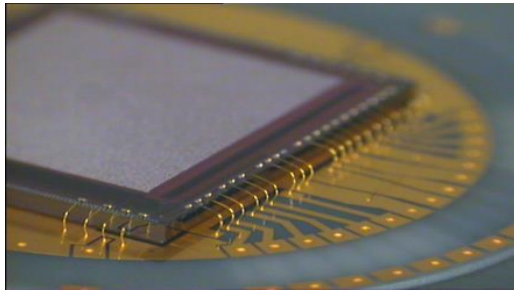
Photos courtesy of SatVu

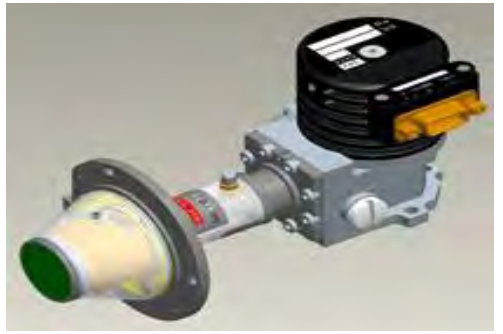


Photos courtesy of SatVu

Infrared Detector Manufacture







MOVPE Growth

Wafer Fab

Focal Plane Array

Detector Assembly

Dewar Assembly

Leonardo UK – Scientific Infrared Detectors

Scientific uncooled

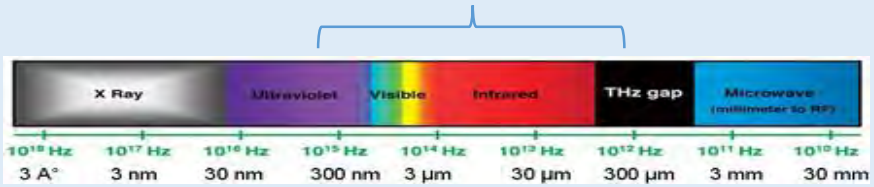
DLATGS (Deuterated L-Alanine doped Triglycene Sulphate) – high performance pyroelectric

Bench top FT-IR Spectrometer

Hand held

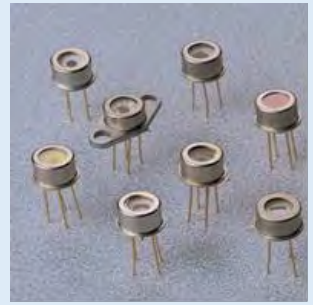
Thermal emission spectrometer on Mars Rover

DLATGS covers 0.2µm to >100µm



Used on:

- NASA Mars Rovers,
- OSIRIS Rex
- LUCY (Jupiter) missions
- FORUM earth observation



Leonardo UK – Scientific Infrared Detectors

MCT (HgCdTe) - based on GEN III MOVPE

Large space programmes

IASI-NG (Airbus/CNES)

NASA PACE

Low cost IDCAs for space.

PACE

Space programme management and QA systems

Stretching technology

Radiation hardness experience

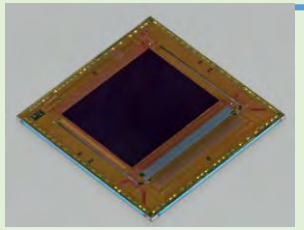
Astronomical instrumentation

Wavefront sensors

Fringe trackers

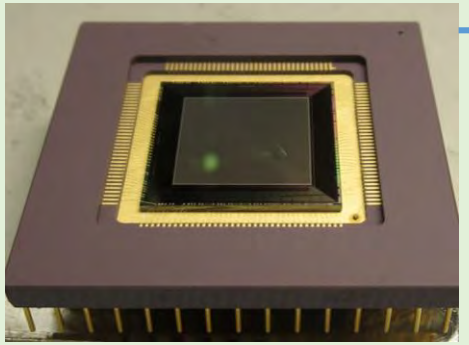
Rapid time domain imaging

Satellite optical telecoms



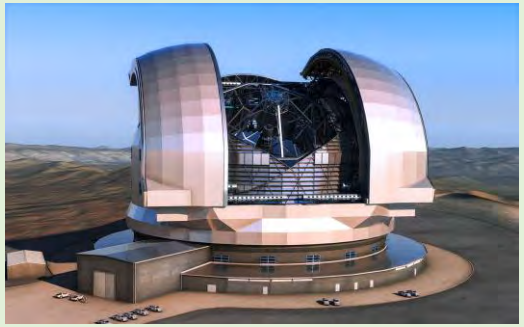
Saphira 320x256/24µm

VLTI



Large Saphira 512x512/24µm

ELT

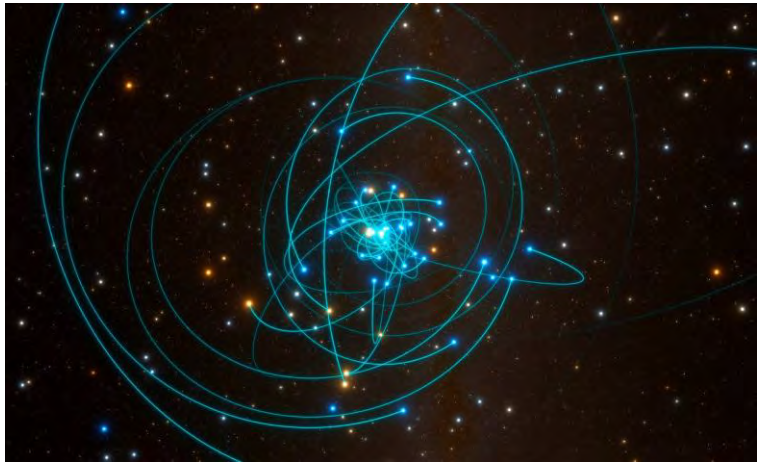


Astronomy – Nobel prize for physics 2020

The 2020 Nobel Prize was awarded to Rainer Genzel, Andrea Ghez and Roger Penrose for research on black holes.

SAPHIRA detectors were installed in the four ESO-VLT ground telescopes that helped experimentally confirm the existence of the supermassive black hole at the center of our galaxy.

SAPHIRA 2D SWIR avalanche photodiodes (APD) allow extremely sensitive, high speed measurements for adaptive optics control and fringe tracker in the interferometer connecting the 4 telescopes.



Leonardo are proud that the development of electron avalanche photodiode **SAPHIRA** arrays enabled the instrument **GRAVITY.**

Photos courtesy of ESO