

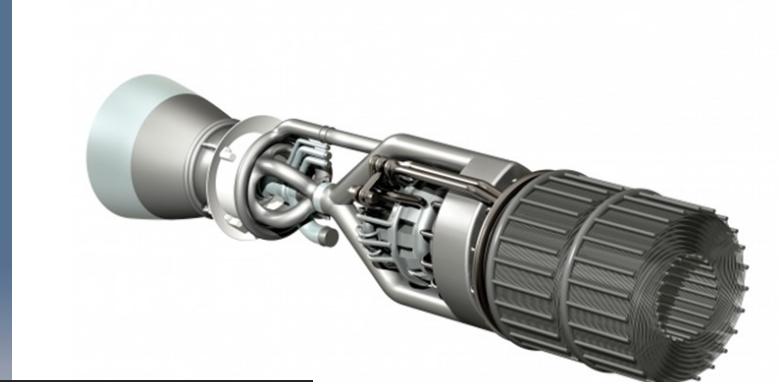


UK Space Agency Up-date

9 June 2021

Prof Chris Castelli
Director of Programmes





- Introduction
- Impacts of Covid
- The National Space Strategy
- Space Science Programme
- Constellations – dark and quiet skies
- *ESA Peer Review – PRT (if time)*





£16.4bn

Total space industry income
in 2018/19



5.1%

Share of global
space economy
in 2018/19



45,100

Direct employees
in 2018/19



2.6x

UK average
labour
productivity

13%

Space
Manufacturing

13%

Space
Operations

71%

Space
Applications

3%

Ancillary
Services



2.8%

2-year average
growth rate
(CAGR)



1 in 3

Employees are
female



£702m

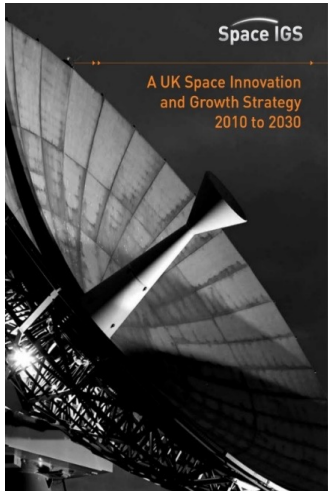
R&D expenditure
in 2018/19



3 in 4

Employees with
a primary degree
or higher

Building a long-standing strategic ambition



2010 - the sector sets out ambitious plans for sector growth.



2017 - Government's Industrial Strategy sets out how UK can thrive in commercial space age



2018 - The space industry outlines a bold partnership strategy 'Prosperity from Space'



Today – Government have established a National Space Council to oversee the development of a National Space Strategy.



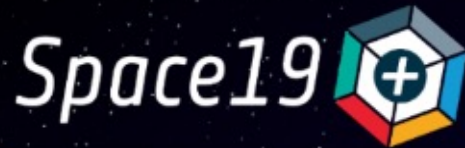
“A new UK Space Strategy will establish a dedicated innovation programme to build the skills, technologies and supply chains that will put cutting-edge British innovation in robotics and satellites, including earth observation to tackle climate change, at the heart of the world’s space economy and exploration.” – UK R&D Roadmap, July 2020

Goals

We help to deliver the UK's strategic ambitions in space through:

1. Grow and level up the space economy
2. Promote the values of Global Britain
3. Protect and defend our national interests
4. Enrich lives in the UK and around the world
5. Lead frontier scientific discovery & inspire the nation

UKSA – ESA Subscription



Exploration

- **£180m** into space exploration
- Mission to bring the first samples back from Mars
- Second flight for British Astronaut Tim Peake before 2024
- UK role in lunar gateway with NASA



UK invested **£374m/€435 m pa**

£1.5bn/€1.66bn over 5 years

Science

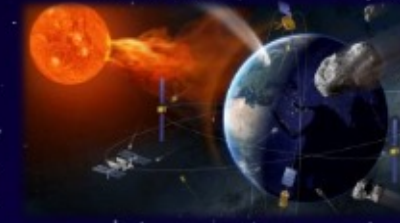
- 10% increase to mandatory science budget
- **£600m** contribution over 5 years

Earth Observation

- £200m including £140m for the Copernicus Space Segment
- UK led TRUTHS mission to tackle climate change

Telecommunications

- £250m in ARTES telecommunications programme
- Enabling faster 5G
- Applications from space-based data



Space Safety and Security

- **£80m** investment including UK leadership in L5 space weather mission
- UK role in ADRIOS, space debris removal mission

- **£16M** satellite navigation innovation
- **£12M** commercial spaceflight support (micro-launch)
- Over **£30M** space technology support



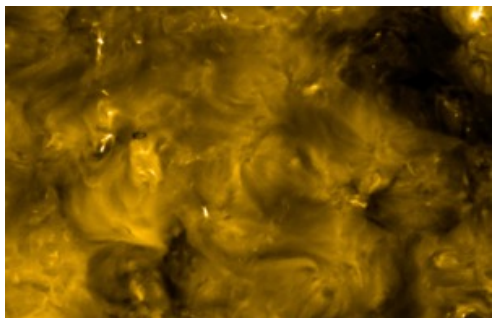
Recent Highlights

Solar Orbiter launched in February 2020

UK Space Agency national investment of £20M in build and development of instruments

UK built spacecraft via £200M ESA contracts to industry

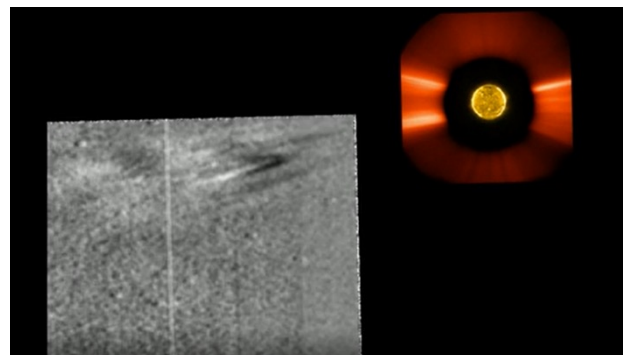
July 2020 – First imagery released reveals never before seen mini solar flares dubbed ‘Campfires’



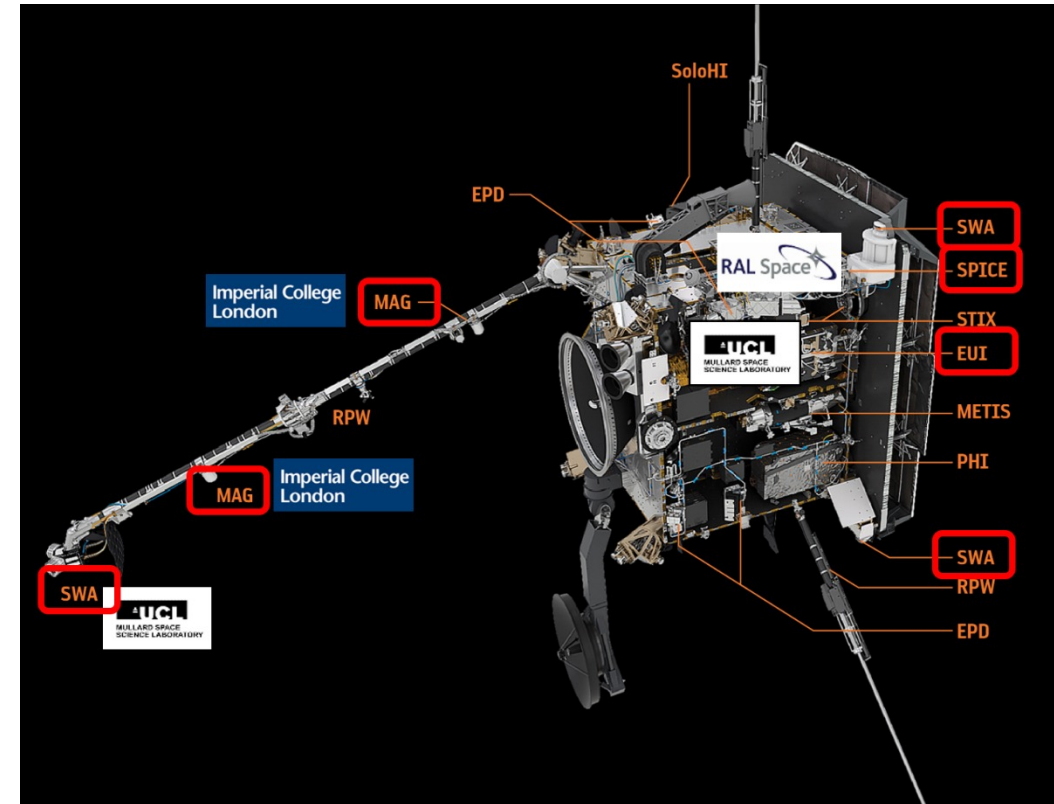
Solar Orbiter/EUI Team (ESA & NASA); CSL, IAS, MPS, PMOD/WRC, ROB, UCL/MSSL



May 2021 – First video of CME released



Solar Orbiter/EUI Team/Metis Team/SoloHI team/ESA & NASA



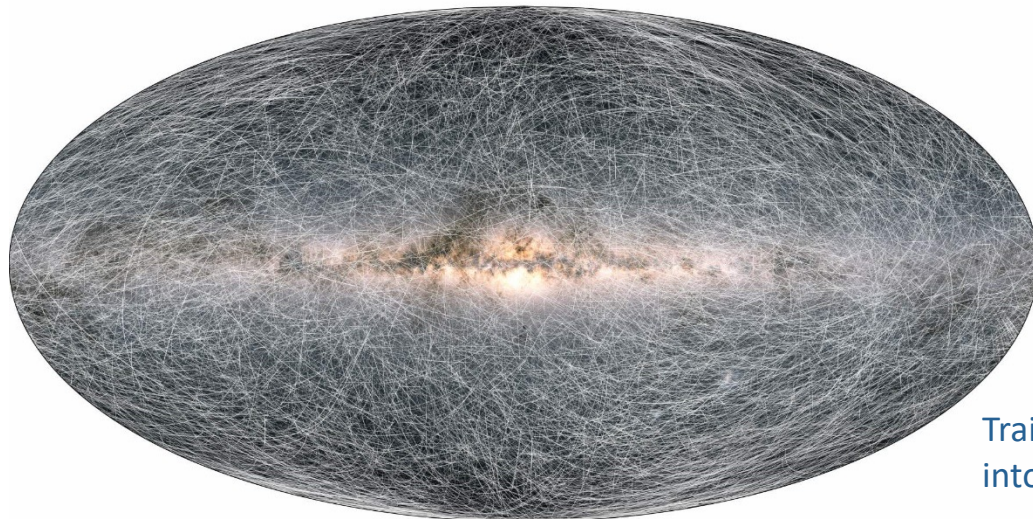
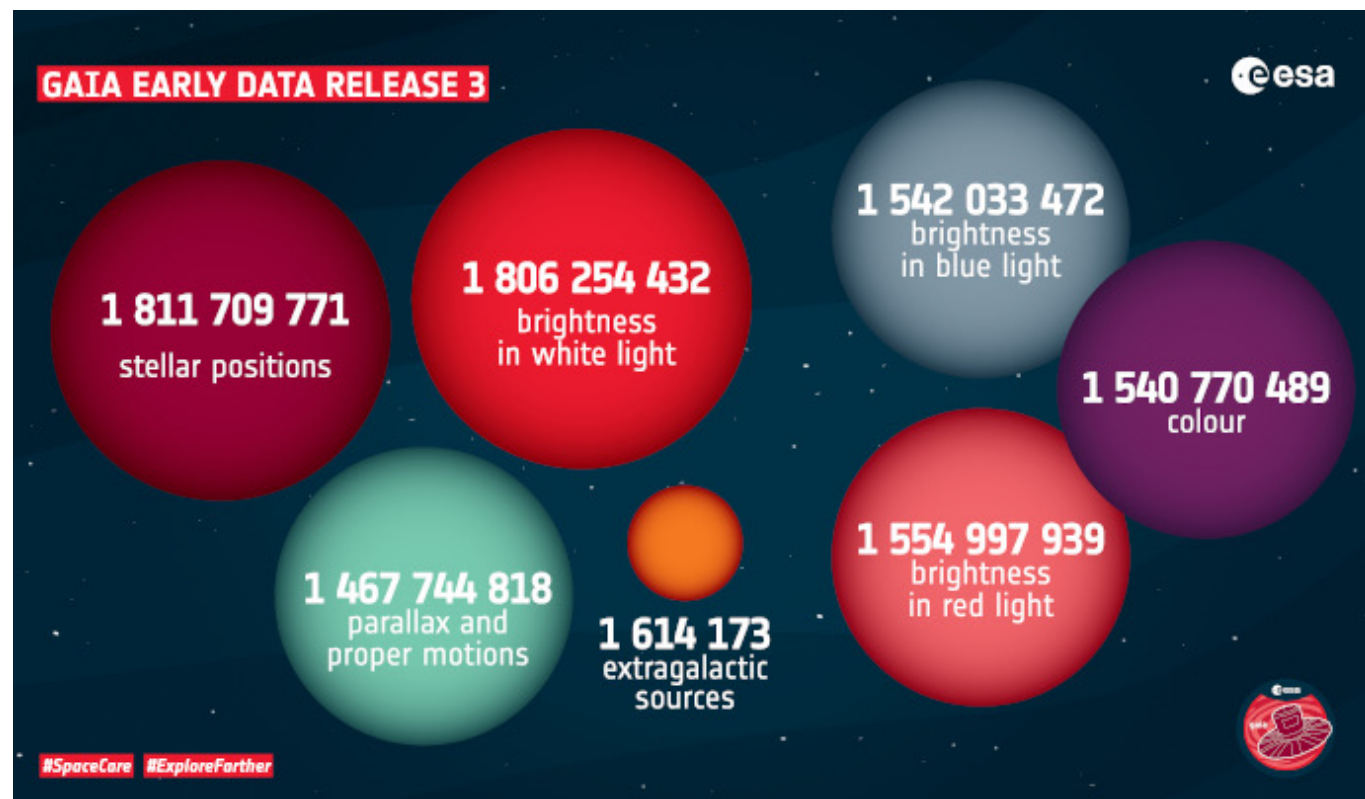
November 2021 – Full Science Operations begin...

Recent Highlights

Gaia Early Data Release 3 (ERD3) – December 2020

Most accurate data yet for nearly two billion stars

UK Space Agency national investment over £20M for UK groups at the heart of Gaia Data Processing and Analysis Consortium (DPAC); Cambridge, MSSL (UCL), Edinburgh, Leicester



Trails track star motions 400,000 years into the future

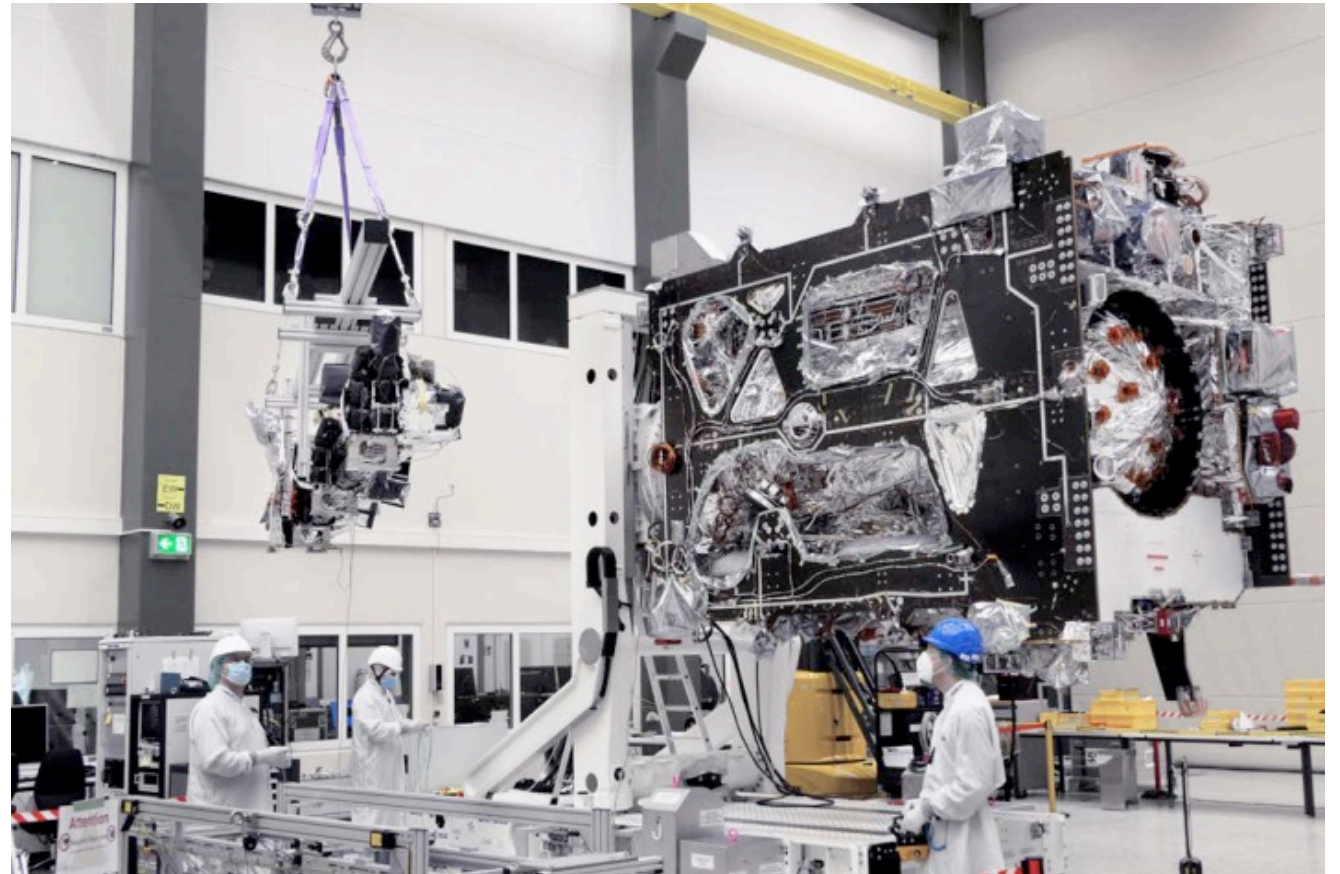
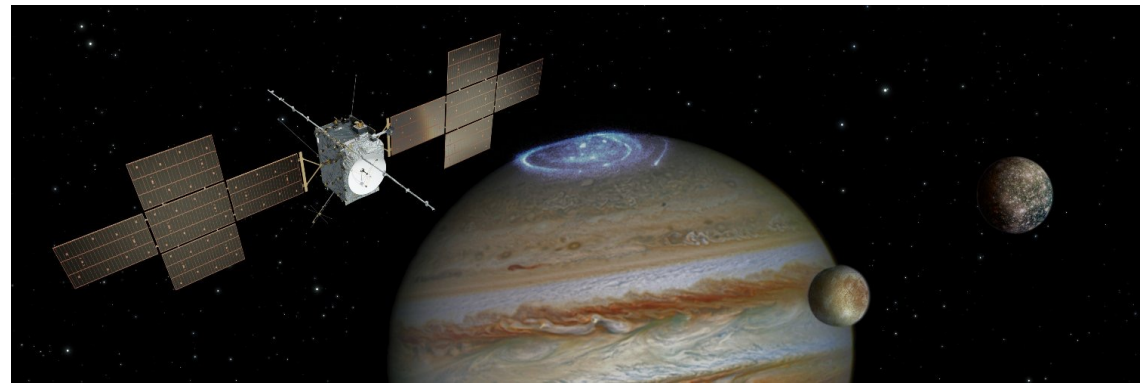
Full Gaia Data Release 3 scheduled early 2022...

Recent Highlights

JUICE (Jupiter Icy Moons Explorer) mission - Flight Model of UK-led Magnetometer instrument (JMAG) delivered May '21

UK Space Agency national investment £9M for instrument
Principal Investigator, Prof Michelle Dougherty, Imperial College London + contributions to two other instruments (JANUS and PEP)

JUICE due for launch in September 2022, to reach Jupiter orbit insertion in 2031 followed by a 4 year nominal mission



JMAG Boom integration at Airbus DE, Feb '21

Up next...

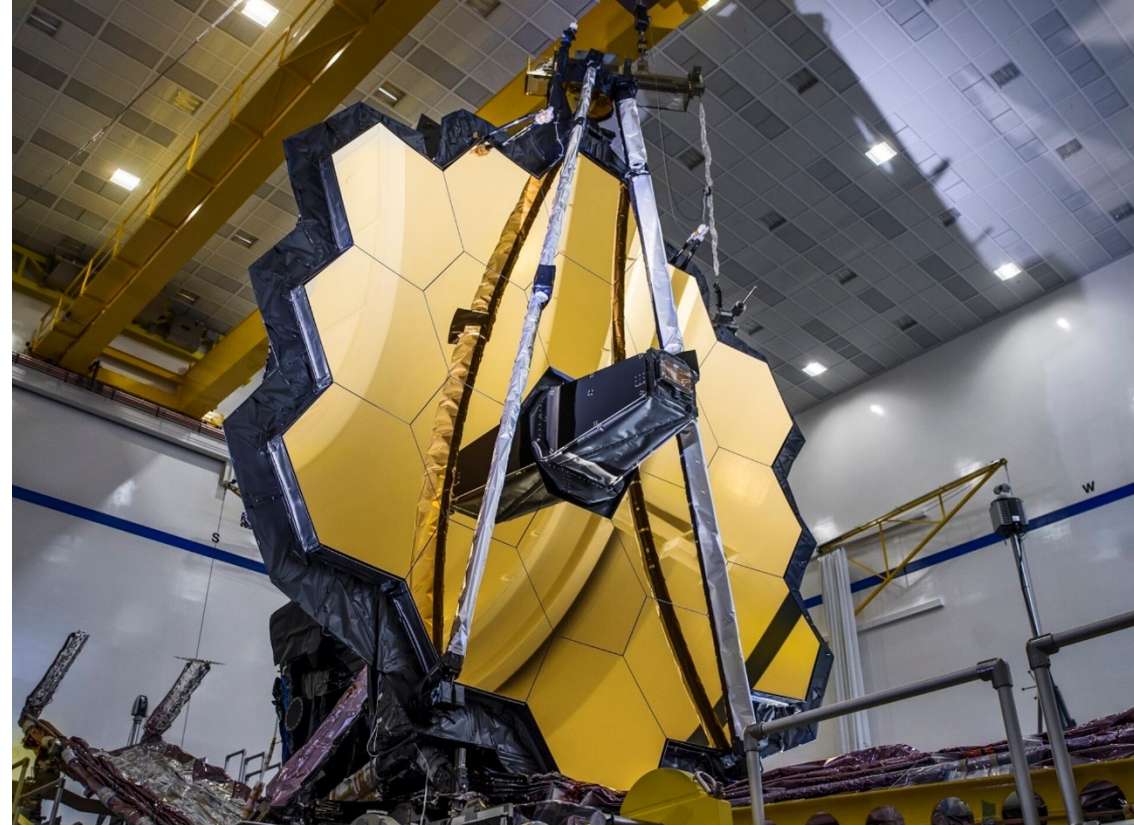
James Webb Space Telescope (JWST), launching November 2021

The UK (UK Space Agency since 2011 and STFC) has invested almost £20M in the development phase of MIRI (Mid InfraRed Instrument) and has continued to support essential post-delivery testing

Instrument PI Prof Gillian Wright (UK ATC), leads a European consortium of 10 countries, first instrument to be delivered to JWST

JWST General Observer Cycle 1 completed April '21 – UK has more approved proposals than any country outside of US (and 26% of all ESA countries)

30% of all General Observer Cycle 1 proposals were for MIRI time





Dark & quiet skies

The era of mega-constellations

- Currently ~7000 satellites in orbit
- Rocket bodies and large debris ~ 28k objects tracked
- Starlink currently has ~1400 satellites with plans filled for 40,000
- OneWeb has launch 182 with plans for around 6000

