

The ESA Council Meeting at Ministerial Level 2022 (CM22)

Dr. Paul Bate, CEO UKSA

Mark Bacon, Director of International

Maria Cody, Head of ESA Policy Team

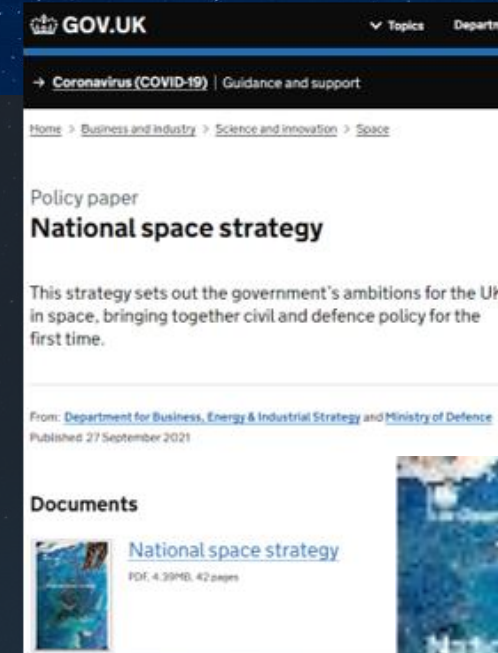
UK Approach to CM22

ESA offers > 50 optional programmes

Prioritisation Process:

- **The National Space Strategy (NSS).**
- **UKSA North Star Metric:**
 - To maximise total investment into the UK space sector.
- **UKSA Value Proposition:**
 - Catalyse investment, Deliver space capabilities and missions and Champion the power of space to inspire.

Stakeholder Engagement: Reflected in the CM22 Business Case.



UK Approach to CM22

“UK mission leadership driving growth, safety and sustainability on Earth, and discovery and inspiration for all”

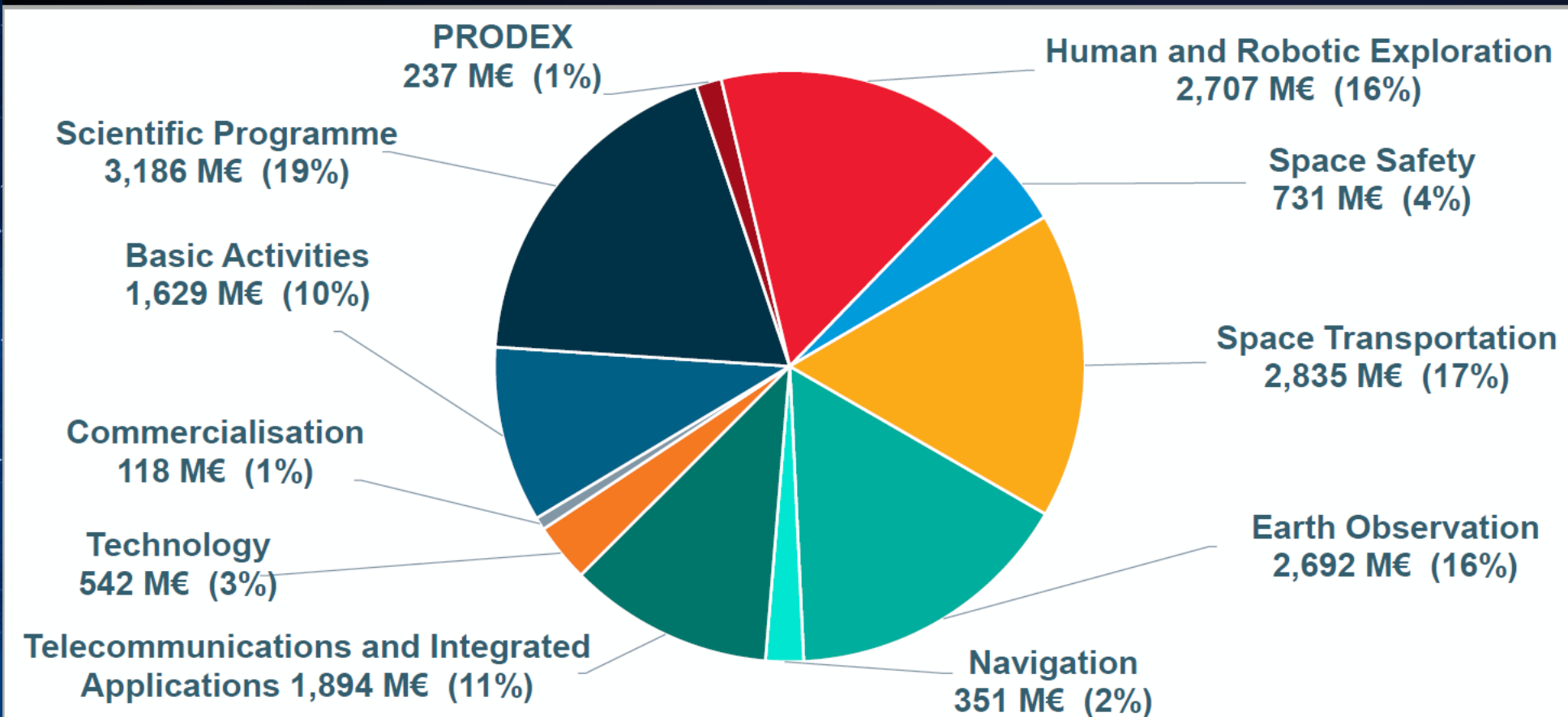
Focus on:

1. Mission Leadership
2. Driving growth in:
 - a) Existing UK Strengths
 - Recognising value of leading missions to steer the programme toward UK strengths
 - b) Capturing new markets.

CM22 Overall (all Member States)

Total Subscriptions 16.9 B€

Mandatory Activities and CSG for 5 years



CM22 Overall (all Member States)

Subscriptions per Contributor



Contributor	CM19		CM22	
	Subscriptions M€, 2019 economic conditions	Share per Contributor	Subscriptions M€, 2022 economic conditions	Share per Contributor
Austria	190	1.3%	229	1.4%
Belgium	816	5.6%	946	5.6%
Czech Republic	150	1.0%	146	0.9%
Denmark	128	0.9%	136	0.8%
Estonia	9	0.1%	26	0.2%
Finland	110	0.8%	148	0.9%
France	2,664	18.4%	3,202	18.9%
Germany	3,294	22.7%	3,512	20.8%
Greece	84	0.6%	87	0.5%
Hungary	97	0.7%	87	0.5%
Ireland	81	0.6%	96	0.6%
Italy	2,282	15.7%	3,083	18.2%
Luxembourg	129	0.9%	131	0.8%
Netherlands	345	2.4%	465	2.8%
Norway	284	2.0%	281	1.7%
Poland	166	1.1%	197	1.2%
Portugal	102	0.7%	114	0.7%
Romania	168	1.2%	122	0.7%
Spain	852	5.9%	932	5.5%
Sweden	244	1.7%	317	1.9%
Switzerland	542	3.7%	634	3.7%
United Kingdom	1,655	11.4%	1,892	11.2%
Latvia			3	0.0%
Lithuania			5	0.0%
Slovakia			12	0.1%
Slovenia	5	0.0%	20	0.1%
Canada	114	0.8%	98	0.6%
Total	14,511	100.0%	16,923	100.0%



UK CM22 Investment

£1.588bn / €1.854bn over 5 years

Exploration

- **£217m/€254m** into space exploration
- **Rosalind Franklin**
- Flagship collaboration with NASA on **Mars Sample Return**
- UK roles in **Lunar Gateway** and **Lunar Pathway**
- **3 UK astronauts (including world first para-astronaut)**

GSTP:

- **£71m/€83m** including **SOLARIS**, **EEE** and **Endure**

Mandatory incl Science

- **£618m/€722m** contribution over 5 years

Applications and Telecommunications

- **£207m/€242m** including
 - **£17m/€20m** in **ARTES BASS** plus **£34m/€39m** reallocated
 - **£190m/€222m** in **ARTES Telecoms** which includes **£51m/€60m** for **Moonlight**

Space Safety

- **£111m/€130m** including **Vigil**, **ADRIOS** and **COSMIC**

Earth Observation

- **£314m/€367m** including
- UK led **TRUTHS** mission to tackle climate change
- **CLIMATE-SPACE**
- **Aeolus-2**
- **FUTURE EO**

Navigation Innovation

- **£31m/€36m** including **NAVISP**, **LEO PNT** and **GENESIS**

STS

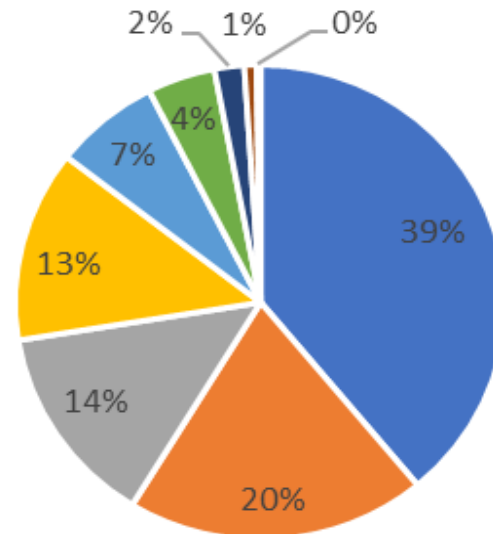
- **£13m/€15m** for **BOOST!**

Business Incubation Centre

- **£4m/€5m** into **Scale-Up!**

UK CM22 Investment

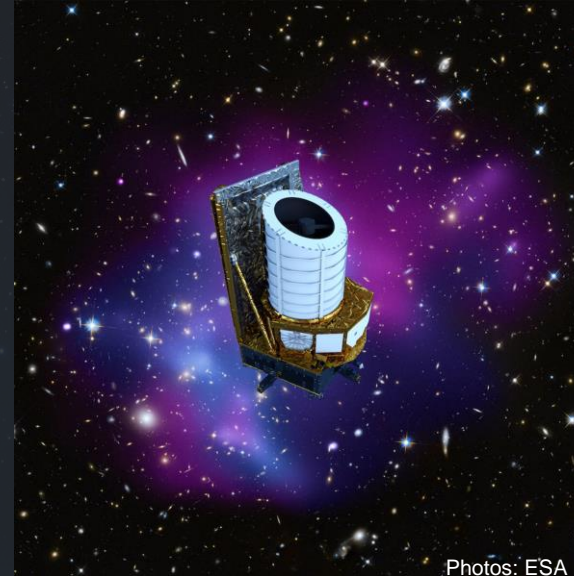
Final UK CM22 Investment (£M)



- Mandatory (Science and facilities)
- Earth Observation (EO)
- Exploration
- Telecoms and applications (ARTES)
- Space Safety & Space weather
- Technology (GSTP)
- Position, Navigation and Timing (NAVISP)
- Small launchers (CSTS)
- Scale Up

Science Programme (and Basic Activities)

- Mandatory Programme for ESA.
- ESA Science programme and core ESA facilities, including research, datasets, test facilities and large launch facilities for ESA missions.
- UK research base leads on many of the top missions in this ESA programme, including:
 - **JUICE:** Jupiter Icy Moons Explorer (science observations of Ganymede, Callisto, & Europa).
 - **Euclid:** Mission to map the geometry of the Universe and better understand dark matter / energy.



£618m/€722m contribution
over 5 years.

Applications and Telecommunications

- **ARTES Telecommunications**
(Core Competitiveness and Strategic Programme Lines)
 - Focused on early telecoms technology development across the space, ground and network segments of the satellite communications sector.
- **ARTES Applications**
(Business Applications and Space Solutions)
 - Growing the whole UK economy through the innovative use of space data and assets to connect global Britain, expand business potential and improve lives.



£207m/€242m contribution - 5 years

Programme	(£m/€m)
ARTES Telecommunications	£190m/€222m
ARTES Applications (BASS)	£17m/€20m plus £34m/€39m

Applications and Telecommunications

- **Space for 5G**
 - Supports the integration of satellite technologies into 5G and 6G communication networks.
- **Scylight**
 - Supports the development of free space optical and quantum communications.
- **Moonlight**
 - Development and launch of a lunar communications and navigation constellation to support future lunar exploration, with institutional and private customers.
- Others, including **PPP Sunrise** and **Future Preparation**.



Photo: ESA

£207m/€242m contribution - 5 years

Programme	(£m/€m)
Space for 5G	£68m/€79m
Scylight	£21m/€25m
Moonlight	£51m/€60m
Others	£67m/€78m

Exploration

- **Mars Exploration**, including
 - **Rosalind Franklin** (formerly ExoMars)
 - UK takes on major new role developing the landing platform for Rosalind Franklin.
 - **Mars Sample Return**
 - Flagship collaboration with NASA to return Martian samples to Earth.

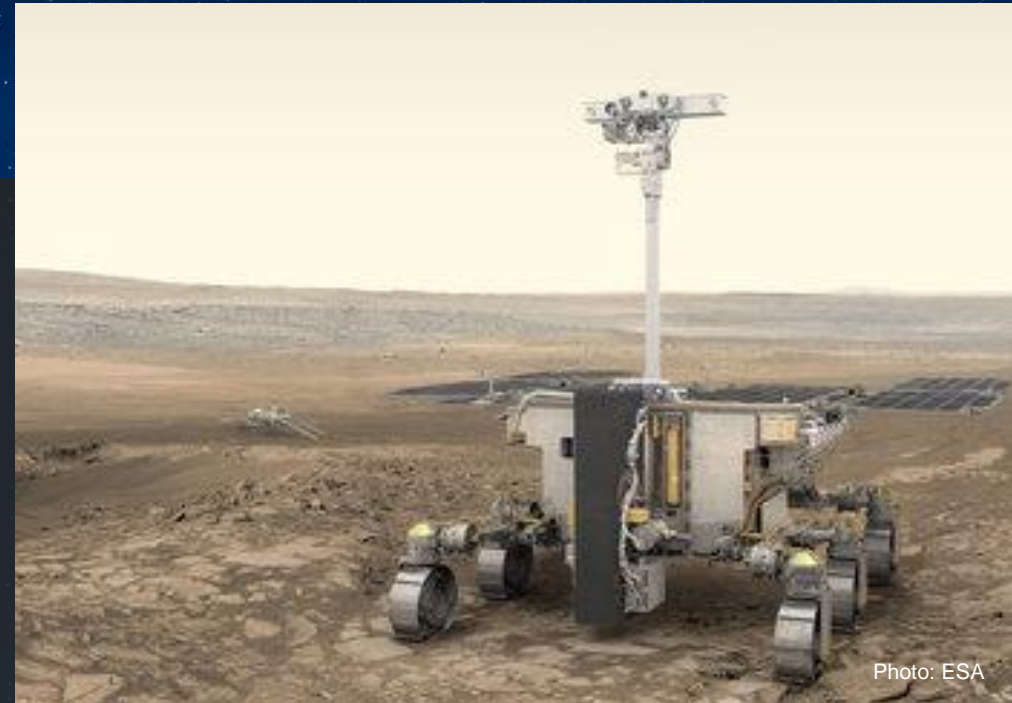


Photo: ESA

£217m/€254m contribution - 5 years

Programme	(£m/€m)
Mars Exploration	£142m/ €166m

Exploration

- **Astronaut**
 - 3 new astronauts, including the world's first para-astronaut (John McFall, Rosemary Coogan and Meganne Christian).
- **Lunar Gateway**
 - International endeavour with NASA that will expand human presence into the Solar System.
- **Lunar Pathfinder**
 - Lunar Pathfinder spacecraft – designed to provide affordable communications services to lunar missions.
- **Argonaut (EL3)**
 - European Cargo lunar lander that will contribute to Artemis programme.
- Others, including **SciSpace**, **EXPERT**



Photo: ESA



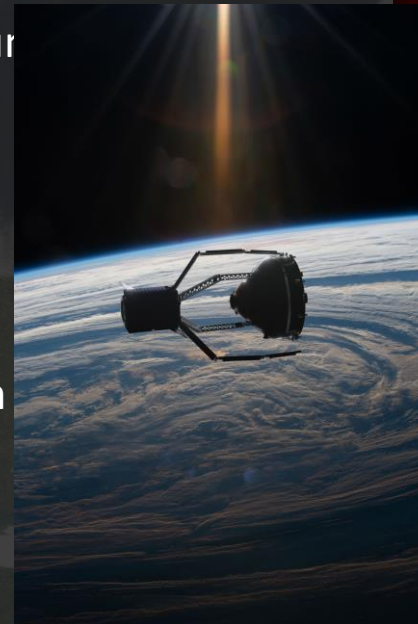
Photo: ESA

£217m/€254m contribution - 5 years

Programme	(£m/€m)
Human Exploration	£75m/ €88m

Space Safety

- **Vigil (L5) – space weather**
 - Flagship UK-led mission to build protection against extreme solar events by monitoring the Sun and inner heliosphere from Lagrange point L5, away from the sun-earth line.
- **ADRIOS – Sustainable Growth**
 - Adrios-1 / Clearspace-1 mission to demonstrate safe debris capture and removal from space.
 - Adrios-2 a demonstration of in-orbit servicing through satellite life extension mission
- **COSMIC**
 - Core activities and smaller missions covering severe space weather, near-earth objects and clean space sustainability.



£111m/€130m contribution - 5 years

Programme	(£m/€m)
Vigil (L5)	£81m/ €95m
ADRIOS	£17m/ €20m
COSMIC	£13m/ €15m



Navigation Innovation

- **Navigation Innovation & Support Programme**
 - UK designed programme to promote innovation, investment, and growth in the space Position, Navigation and Timing sector.
- **LEO PNT**
 - Will help companies develop innovative solutions when worldwide commercial interest is high in LEO constellations of all kinds, especially for telecommunications and PNT. LEO PNT will help make positioning and timing provision more robust and more resilient.
- **GENESIS**
 - Mission designed to improve on the accuracy of the International Terrestrial Reference Frame by combining a number of sensors and positioning technologies.

£31m/€36.5m contribution - 5 years

Programme	(£m/€m)
NAVISP	£27m/€32m
LEO PNT	£3m/€4m
Genesis	£0.45/€0.52



Earth Observation

- **TRUTHS**
 - UK-led ESA climate mission, designed to create a 'climate calibration observatory' in space as well as calibrate other missions to 'climate quality'.

- **Aeolus-2**
 - An operational follow-on from the Aeolus mission. It is intended to provide a continuous data set of operational, global wind profile observations for over ten years, with a first launch in 2030.

- **FutureEO**
 - The basis for all EO developments and missions in ESA, covering mission feasibility, science missions such as BIOMASS, mission management and calibrations, as well as new tools for the analysis and use of the data for novel applications.

£314m/€367m contribution

Programme	(£m/€m)
TRUTHS	£133m/€156m
Aeolus-2	£61m/€71m
FutureEO	£94m/€110m

Earth Observation

- **CLIMATE-SPACE**
 - Drives climate science and services.
 - Focal point – ESA Climate Office in Harwell also hosts World Climate Modelling Office.
- **Copernicus Space Component – 4**
 - Provides continued access to Copernicus EO data above freely available standard routes - supporting UK EO sector.
- **InCubed-2**
 - Supports rapid growth of the EO commercial market by fostering innovation, including novel technologies that are close to market.
- **ESA Digital Twin Earth**
 - A new ESA programme, this will utilise ESA EO assets as well as other ecosystems to create understandable, actionable information from scientific data.

£314m/€367m contribution

Programme	(£m/€m)
CLIMATE-SPACE	£15m/€18m
Copernicus Space Component - 4	£4.25/€5m
InCubed-2	£1.71/€2m
ESA Digital Twin Earth	£5m/€5.84

Earth Observation – National and ESA Investment Package



£122.6 million committed to five ESA programmes. A further £66 million is allocated to 12 UK-led projects.

Supporting Skills and Training within the EO sector:

- SENSE Centre for Doctoral Training Programme for EO (NERC)
- Transatlantic Training Hub (NERC)

Whole Value Chain – Programmes to support integrated approaches to developing EO applications:

- EO Technology Programme (UKSA)
- **FutureEO (ESA)**

Upstream - Satellite and Sensor Development:

- **InCubed-2 (ESA)**
- EO Technologies (STFC)
- Small Satellite Calibration Facility (STFC)

Upstream/Midstream - Launch and Operation of Satellites:

- **Aeolus-2 (ESA)**
- **TRUTHS (ESA)**

Midstream - Digital Infrastructure and Data Processing:

- UK Marine and Climate Advisory Service (MCAS) (Met Office)
- Climate Data Facility (NERC)
- EO Data Hub (NERC)

Midstream/Downstream – Data Exploitation:

- **Digital Twin Earth (ESA)**
- National Digital Twin Initiative (Met Office)

Downstream – Earth Observation Services:

- UK Marine and Climate Advisory Service (MCAS) (MetOffice)
- UK/Australia EO AgroClimate Programme (STFC)
- EO BlueZone Projects (Innovate UK)
- Surface Temperature Global Network (STFC)

Commercial Space Transportation Services and Support Programme (STS)

- **Boost!**
 - Supports the UK implement our national space flight objectives.
 - Continued ESA support to the development of UK Commercial Launch systems.
 - Expands the range of Commercial Space Transportation Services eligible to apply for Boost funding.

£13m/€15m contribution - 5 years

Technology Development

- **General Support for Technology Programme (GSTP)**
 - Takes leading-edge technologies that are not ready to be sent into space and develops them to be used in future ESA missions and builds UK capability and resilience.
 - Sits at the core of ESA support for future science and technology.
 - **SOLARIS** - exciting project that could help ensure Europe becomes a key player in the international race towards clean energy solutions for mitigating climate change.
- **Electrical, Electronic, Electro-Mechanical Components (EEE) Sovereignty**
 - Safeguarding UK/ESA microchip development and building quality and effective supply chain providing less reliance on overseas markets.
- **ENDURE**
 - Will develop European Radio-Isotope Power systems, which will power missions where solar power is insufficient.

££71m/€83m contribution - 5 years

Programme	(£m/€m)
GSTP (Incl. SOLARIS)	£ 36m/€42m
EEE Sovereignty	£13m/€15m
ENDURE	£22m/€26m

News Coverage



BBC

UK-built Mars rover saved from museum retirement

51 minutes ago
Franklin rover Mars mission



The UK, along with Italy, has invested a lot in Rosalind Franklin. And more will be required

By Jonathan Amos
BBC Science Correspondent
@BBCAMos

The Telegraph

COMMENT

EU dithering will not stop Britain working with the European Space Agency

UK's commitment to industrial research remains more important than ever despite Union blocking association with European programmes

GEORGE FREEMAN
MINISTER FOR SCIENCE, RESEARCH & INNOVATION
22 November 2022 - 4:27pm



sky news

British Paralympian John McFall becomes European Space Agency's first disabled astronaut

The 41-year-old, from Frimley in Surrey, lost his right leg in a motorcycle accident when he was 19 and went on to compete for Great Britain at the Paralympic Games.



Rishi Sunak
@RishiSunak
United Kingdom government official

Fantastic news for the British space sector – reaching new heights every day.

Huge congratulations to Rosemary Coogan and Meganne Christian, and to John McFall for becoming the world's first parastronaut 🚀

The Guardian

Paralympic athlete from UK in latest intake of ESA astronauts

John McFall, 41, becomes first astronaut with physical disability to be recruited by European space agency



McFall and Rosemary Coogan at the Grand Palais Éphémère in Paris.

BBC

16:11 23 Nov

John McFall proud to take part in Esa's bold project



John McFall has been telling the BBC about his excitement at becoming Esa's first disabled astronaut.

He says he is very proud and grateful to have been given this opportunity, in "such a brave and bold project".

itv NEWS

Former Durham University student to become UK's third ever astronaut

TYNETEES | SCIENCE | ASTRONAUT | DURHAM UNIVERSITY | Thursday 24 November 2022 at 9:20am



Analysis

Space exploration has broken a new frontier – a para-astronaut is long overdue

Once it was Shackleton in Antarctica or Hillary on top of Everest that inspired wonder. Now it's the space men and women who are finding new frontiers.



Thomas Moore
Science correspondent @SkyNewsThomas

sky news

BBC NEWS

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Science & Environment

Europe's research ministers to commit billions to 'space race'

2 days ago

Europe is a world leader in satellites that monitor the Earth's surface from space

By Jonathan Amos
BBC Science Correspondent
@BBCAMos

UK CM22 Team Photo



Q&A

Any further questions / information please contact:

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