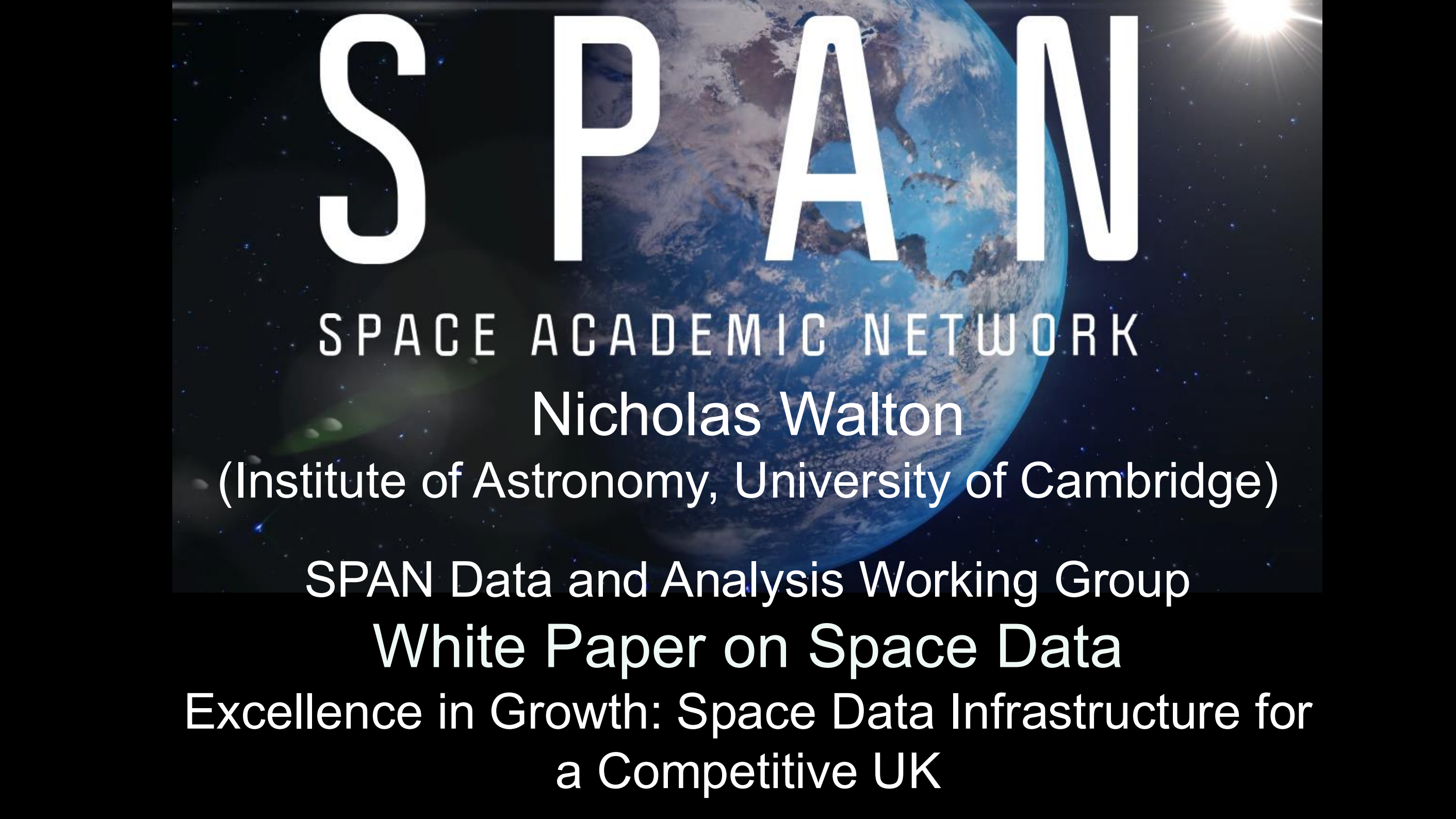




SPAN

SPACE ACADEMIC NETWORK

Nicholas Walton

(Institute of Astronomy, University of Cambridge)

SPAN Data and Analysis Working Group

White Paper on Space Data

Excellence in Growth: Space Data Infrastructure for
a Competitive UK

SPAN SPAN Data White Paper:

Presentation slides

The SPAN white paper 'White Paper on Space Data Excellence in Growth: Space Data Infrastructure for a Competitive UK' is available for download from

<https://span.ac.uk/publications/>

at:

<https://span.ac.uk/wp-content/uploads/2026/03/span-data-whitepaper-v1.0.pdf>

SPAN Data and Analysis Working Group

- This paper developed by the SPAN SDAWG
 - Brings together academics working across space science in the widest sense, with an interest or background in 'data'
 - University academics involved in the development and operations of space science and earth observation missions, especially in the development of the data processing
 - Academics and software engineers from National Laboratories (e.g. RALSpace, UKATC)
 - Scientists and policy representatives from related groups, e.g. DSTL, MetOffice
 - Policy representatives from funding agencies, e.g. UKSA, STFC, NERC
- Paper includes input from the wider SPAN network
 - Working Groups: Science & Exploration, Engineering, Earth Observation

Why Space Data Matters

Space is an increasing area of importance and is underpinning an increasing significant volume of economic activity

The UK Space Agency currently organises its activity across 7 themes, with four now identified as higher priority

Launch and Space Transportation

Space Domain Awareness (SDA)

Satellite Communications

In Orbit Servicing, Assembly and Manufacturing (ISAM)

Space Science and Exploration

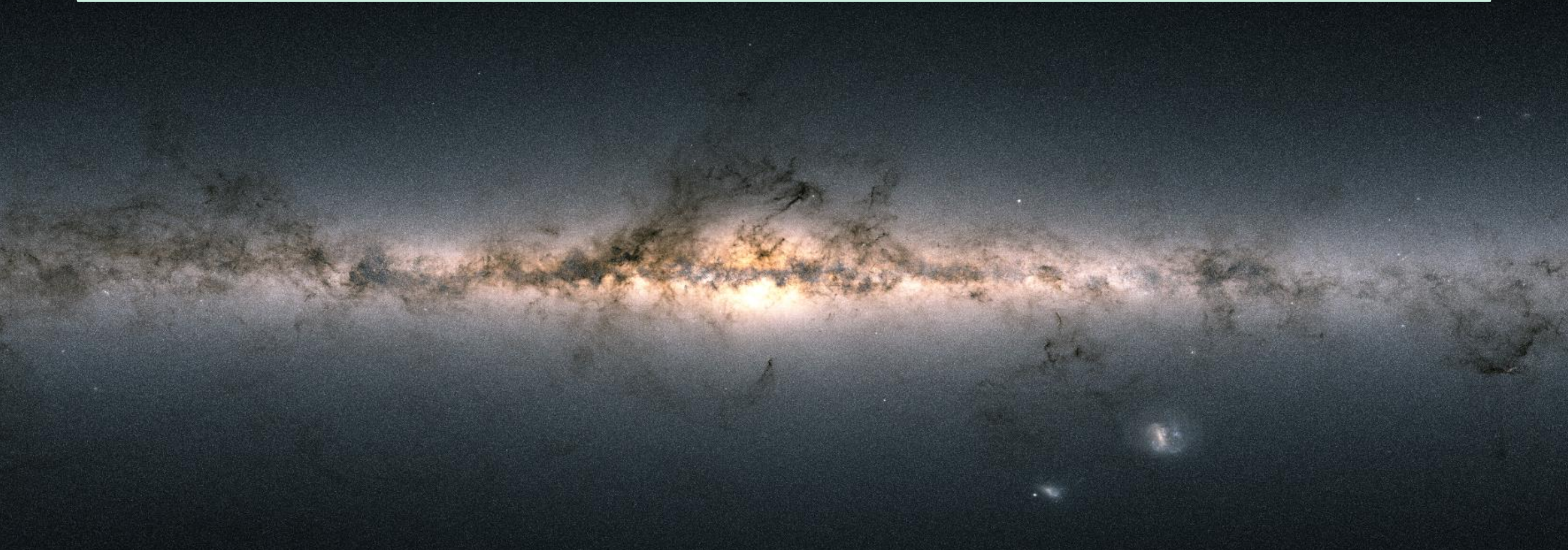
Earth Observation (EO)

Position, Navigation, and Timing (PNT)

Within each of these activities Data infrastructure is the mechanism through which hardware investment generates economic return

Economic returns are significant: £1 invested returns £7.5

Case Study: ESA Gaia



From Science to Data to Impact

CREDIT
ESA/Gaia/DPAC

16 Mar 2026

Nic Walton @ IoP, London

5

→ ANATOMY OF THE MILKY WAY



Gaia: dissecting the Milky Way

**CUTTING EDGE
SCIENCE**

Bulge

Globular clusters

Disc

Sun

How did our Milky
Way form? What is
our past present
and future?

Sun

Stellar halo



Gaia's Camera – 1 Billion Pixels

106 CCDs – 0.38 m²

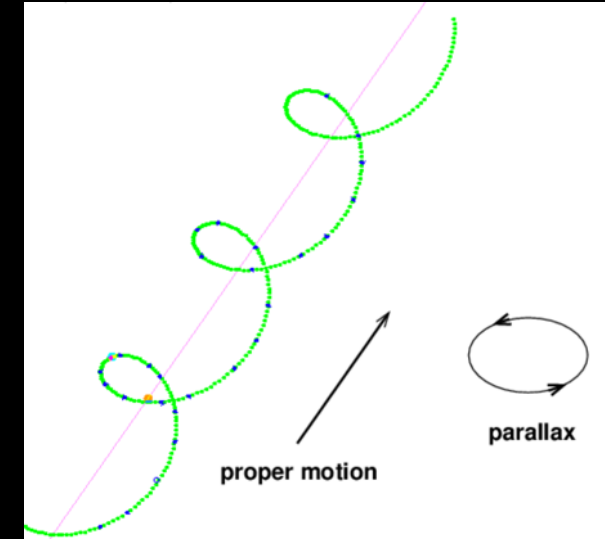
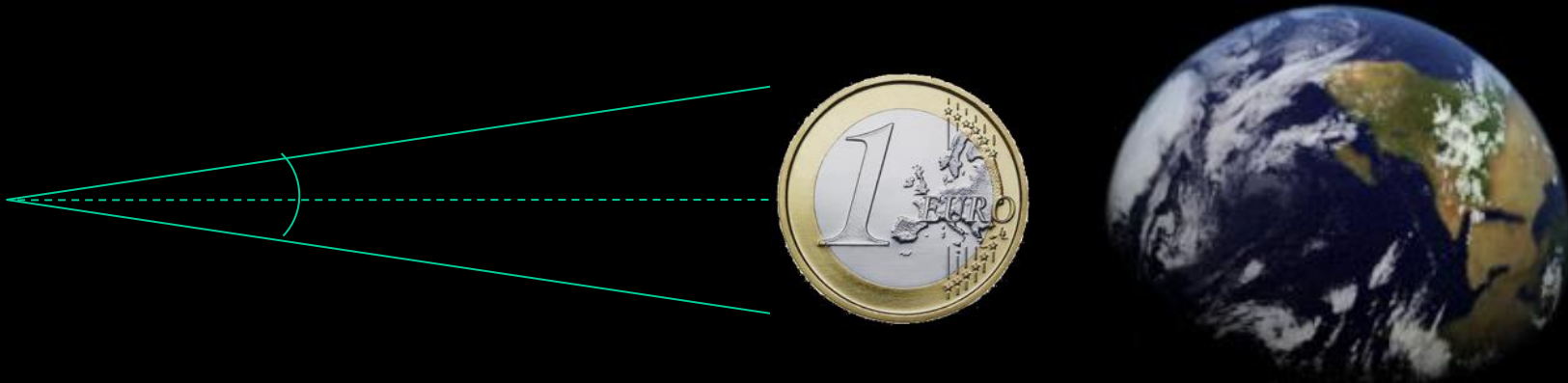
largest focal plane flown in space

Image courtesy EADS-Astrium

**TECHNOLOGY &
INDUSTRY**

Gaia: Astrometry in the extreme

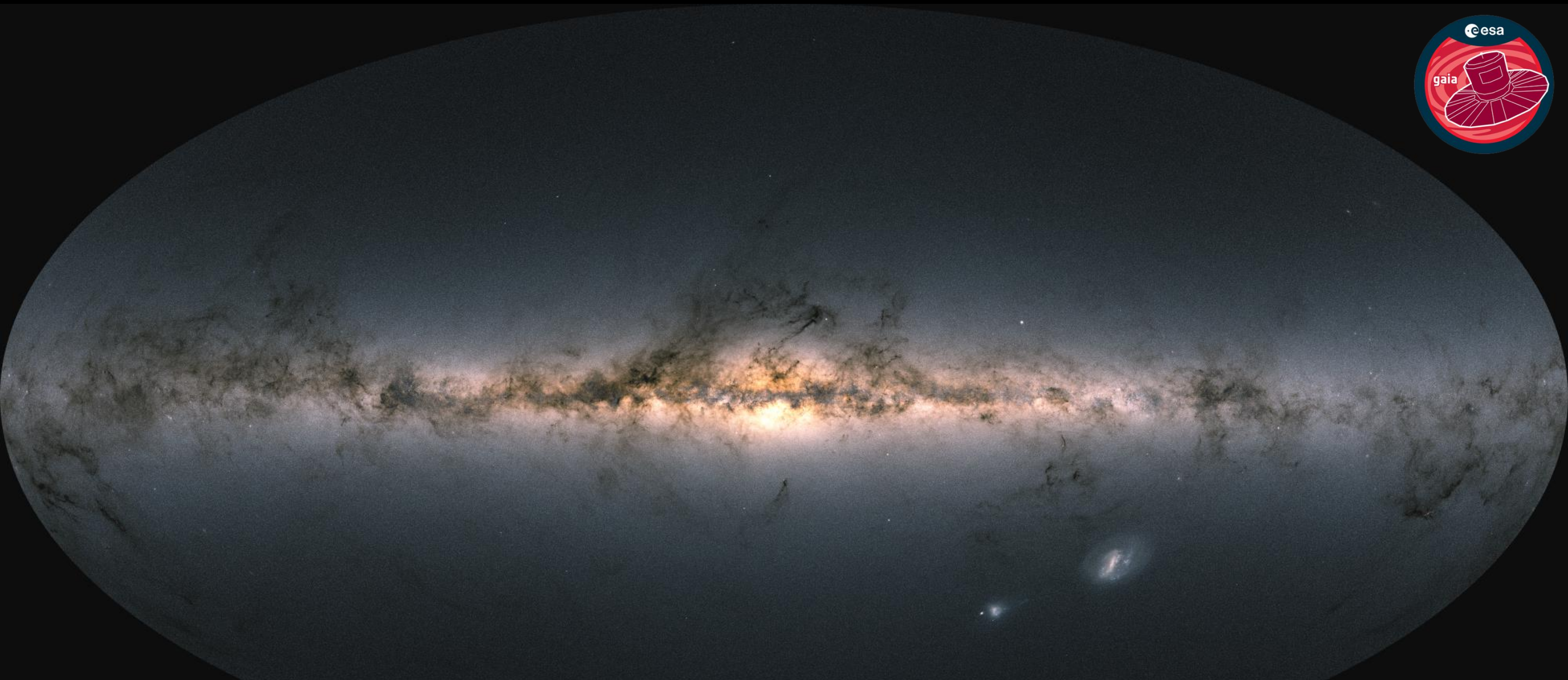
PUSHING THE ENVELOPE



Gaia precision to ~ 10 micro-arcseconds

Enables distances to be measured with $\sim 10\%$ errors to ~ 10 Kpc ($= \sim 32,000$ light years)

This is the equivalent of a Euro coin on the earth as seen by the next human on the moon!



OPEN SCIENCE, AND MORE OPEN SCIENCE

Gaia EDR3 (~1.5 Billion) sources (Dec 2020) / Credit ESA/Gaia/DPAC

TRANSFORMATIONAL SCIENCE

 The best Milky Way animation, by Gaia



Watch later Share

→

SCIENCE & EXPLORATION

The best Milky Way animation, by Gaia

15/01/2025 68377 VIEWS 677 LIKES 505409 ID 00:02:05



LIKE DOWNLOAD



DETAILS RELATED

This is a new artist's animation of our galaxy, the Milky Way, based on data from ESA's Gaia space telescope.

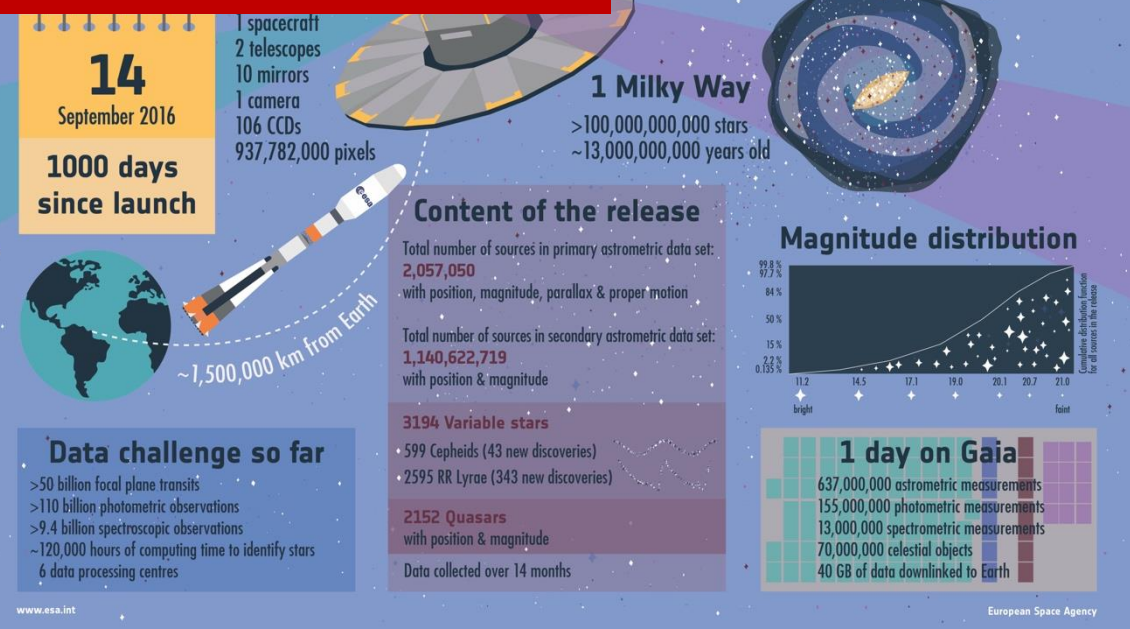
Gaia has changed our impression of the Milky Way. Even seemingly simple ideas about the nature of our galaxy's central bar and the spiral arms have been overturned. Gaia has shown us that it has more than two spiral arms and that they are less prominent than we previously thought. In addition, Gaia has shown that its central bar is more inclined with respect to the Sun.

No spacecraft can travel beyond our galaxy, so we can't take a selfie, but Gaia is giving us the best insight yet of what our home galaxy looks like. Once all of Gaia's observations collected over the past decade are made available in two upcoming data releases, we can expect an even sharper view of the Milky Way.

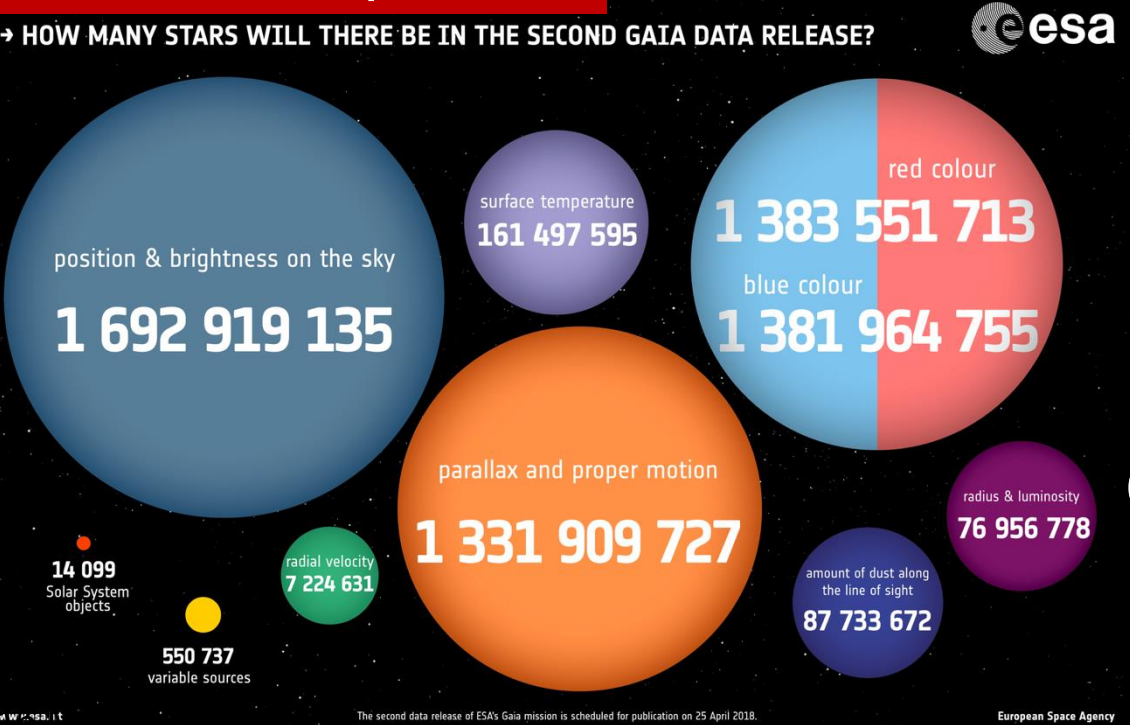
Watch on  YouTube

ESA GAIA VIDEO 'The best Milky Way animation, by Gaia' – can be download from https://www.esa.int/ESA_Multimedia/Videos/2025/01/The_best_Milky_Way_animation_by_Gaia

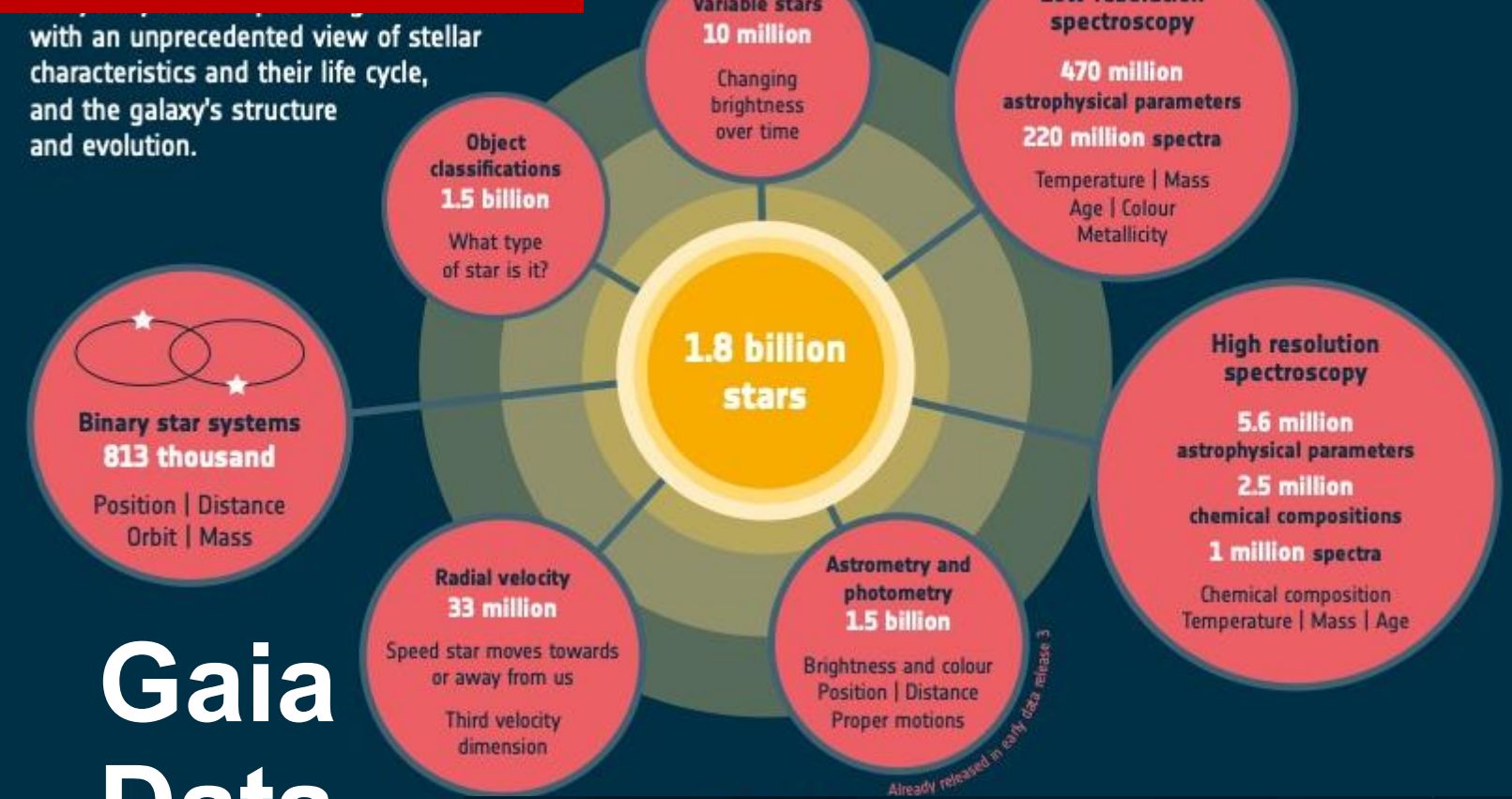
Gaia DR1: Sep 2016



Gaia DR2: Apr 2018

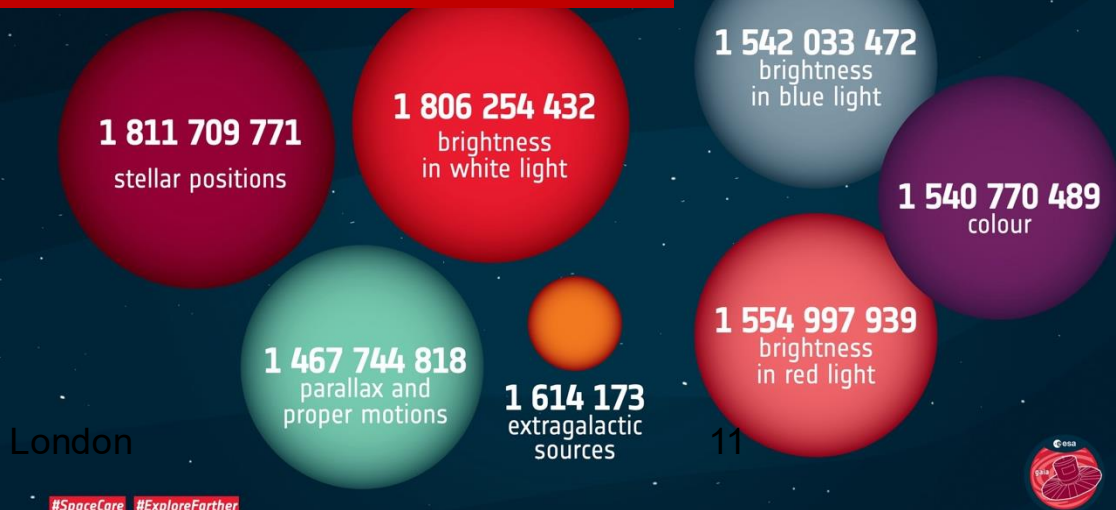


Gaia DR3: Jun 2022



Gaia Data Releases
increasing complexity,
increasing size

Gaia EDR3: Dec 2020



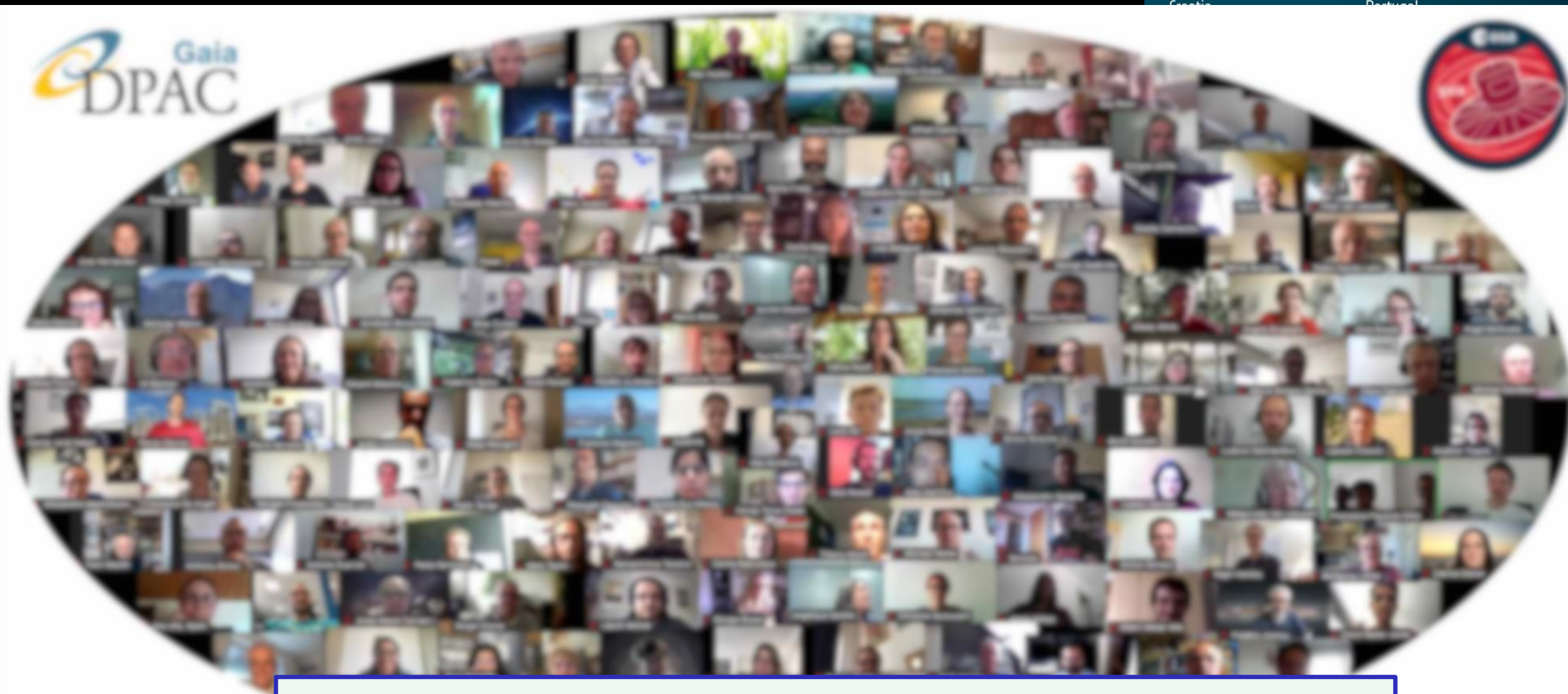
The People Behind Gaia Data Releases

GAIA DATA PROCESSING AND ANALYSIS CONSORTIUM



Austria
Belgium
Croatia

Italy
Poland
Portugal



PEOPLE MAKE IT HAPPEN

Now working on
Gaia DR4 (Dec
2025, 66 months
of data)
DR5 ~2030 (10+
yrs of data)

Gaia UK responsible for the processing and analysis of the photometric data, the spectrophotometric data, photometric science alerts and with essential contributions to the spectroscopic data

SPAN
SPACE ACADEMIC NETWORK

Gaia DR3 Science Examples



<https://k-poster.kuoni-congress.info/eas-2023/poster/77628391-074f-4689-867f-79d6342116fc>

Take a look at Tineke Roegiers' (Gaia ESA Outreach coordinator) EAS 2023 presentation: click through each link for more info, papers etc.

15,500 peer reviewed papers to date (Jan 2026) based on Gaia data

**QUALITY DATA
UNDERPINS
QUALITY SCIENCE**

ESA/Gaia/DPAC

The billion ways of using the Gaia data
Tineke Roegiers¹

Solar System
Though Solar System science is not the primary goal for Gaia, a lot is achieved on this front since Gaia started releasing its data. When scanning, Gaia captures any object it scans across and thus observes many asteroids next to stars and galaxies. Apart from Gaia's own data on Solar System objects, there are many indirect ways in which Gaia data influences our knowledge of the Solar System. The below list of topics can never be complete and

Stars
The large, homogeneous all-sky Gaia catalogue of stars is a treasure chest for new discoveries, and brings substantial samples of special stars for detailed investigation. A taste of studies, discoveries and opportunities where Gaia helps out is given below. This is only a tiny selection of the many topics touched by the scientific community related to stars.

25pc sample
Early 2023 brought an update to the catalogue of nearby stars: CNS5. Within a sphere with 25pc radius around the Sun a total of 5931 objects are known now. This catalogue strives for completeness and was updated with the star information from Gaia's Early Data Release 3. The CNS5 is a great sample to study the Milky Way. This catalogue can be used to test a variety of theories and improve models of the Galactic Disk.

Milky Way
Mapping the Milky Way is the core goal of Gaia and so it does, in full detail, in many dimensions. Stars and structures in the Milky Way are mapped, as well as dust and interstellar matter in between the stars. Gaia also maps the astrophysical information such as stellar ages, metallicity, and more. This variety of Milky Way mapping is highlighted in Gaia's Multi-dimensional Milky Way, based on 10 Gaia sky maps. Full details explaining the

Galaxies
Next to stars, asteroids, moons, comets, spacecraft, quasars, ... Gaia also observes galaxies. If observed as a whole, they show up as extended objects. First results from the processing of these extended objects were published with Gaia Data Release 3, leading to 4.8 million galaxy candidates (20% of which have redshift estimates). Gaia also observes individual stars inside galaxies, if these galaxies are close enough. This is the case for the Andromeda

Earth orbit and L2
Some spacecraft orbiting Earth or located at L2 are powerful in studying a specific target with great detail. To make most efficient use of these telescopes, pointing them to the most promising sources is important. This is where Gaia helps out. Gaia, being an all-sky homogeneous survey, brings the perfect catalogue to make a first selection of interesting candidates for follow-up. In this way we capture the best stars to follow the nearlies to

Earth
On Earth, life has improved for astronomers following up on stellar occultations. With the star positions and motions of Gaia's first data release came improved predictions of the stellar occultation shadow paths on Earth. These shadow paths and their timing predictions are used to deploy the ground observations of these events. With each Gaia data release, the predictions improved and the chances of observing a stellar occultation increased. Through stellar

Star groups
Some stars belong together. They travel together through space bound by a mutual gravitational attraction. In June 2022 Gaia published a catalogue of multi-star systems, containing stars with few companions. Gaia's full catalogue of over 1.8 billion stars is also heavily used to discover and improve our knowledge of stellar clusters, star groups composed of many stars.

100pc sample
As part of Gaia's Early Data Release 3, the Gaia Catalogue of Nearby Stars (GCNS) was published. With this catalogue, a unique census of stars within 100 pc of our Sun became available. At this distance, the coolest stars become too faint for Gaia's survey limit. Choosing 100pc hence allows to get a complete census of Gaia stars, including the coolest ones. Such a complete and homogeneous sample is important for studies of the Galaxy.

Milky Way Halo
Following Gaia's first data release, an extended study was performed revealing rich structures of the nearby stellar halo. More studies followed soon, when more and better data became available with each Gaia data release. Below a small selection is given to demonstrate Gaia's impact on our knowledge of the Milky Way halo.

Quasars
Gaia also observes distant quasars, many of them billions of lightyears away from the Sun and the Milky Way. The Gaia catalogue contains 1,614,173 quasars used to construct the Gaia Celestial Reference Frame. With the high quality of Gaia EDR3, Gaia was for the first time capable of observing the tiny effect of the acceleration of the solar system with respect to the distant universe. This effect was deduced from the aberration of light seen in these

Sun
Though Gaia never looks at the Sun with its telescopes, it is capable of observing the Sun nonetheless. Close watch is kept on all temperature changes affecting the Gaia spacecraft as they have the potential of influencing the observations captured. The small drop in solar irradiance caused by the transit of a cooler sun spot can be measured with Gaia's temperature monitors.

Cavities in space
There is something to be learned from the absence of stars as well. A gigantic cavity in space was found by combining Gaia's 3D information with powerful new data science techniques in order to map molecular clouds in 3D gas density space. This led to the discovery of a gigantic cavity in space.

Local Bubble
Local Bubble has a radius of about 500 lightyears or 150pc. The Sun happens to be travelling through this bubble on its journey through the Milky Way. While known for decades, only with help from Gaia's Early Data Release 3 we finally understood its origin and the impact it has on the gas around it. It turns out that the Local Bubble is a source of our nearby stars.

MW satellites
When Gaia maps the stars, it continues to do so beyond the edge of the Milky Way. As long as the sources are bright enough, they are observed. The Gaia catalogues thus includes samples of stars from the Milky Way satellites and neighbouring galaxies. These samples are interesting to study historical events that shaped our Milky Way. While looking for the remains of smaller galaxies merging with our own Milky Way, a new merger event was discovered: Pontus

Stories published on this topic:
• The power of the third dimension - the



Gaia DR4 and Beyond

<https://www.cosmos.esa.int/web/gaia/release>

66 months of data, ~2.5 Billion sources

Full astrometric, photometric, and radial-velocity catalogues.

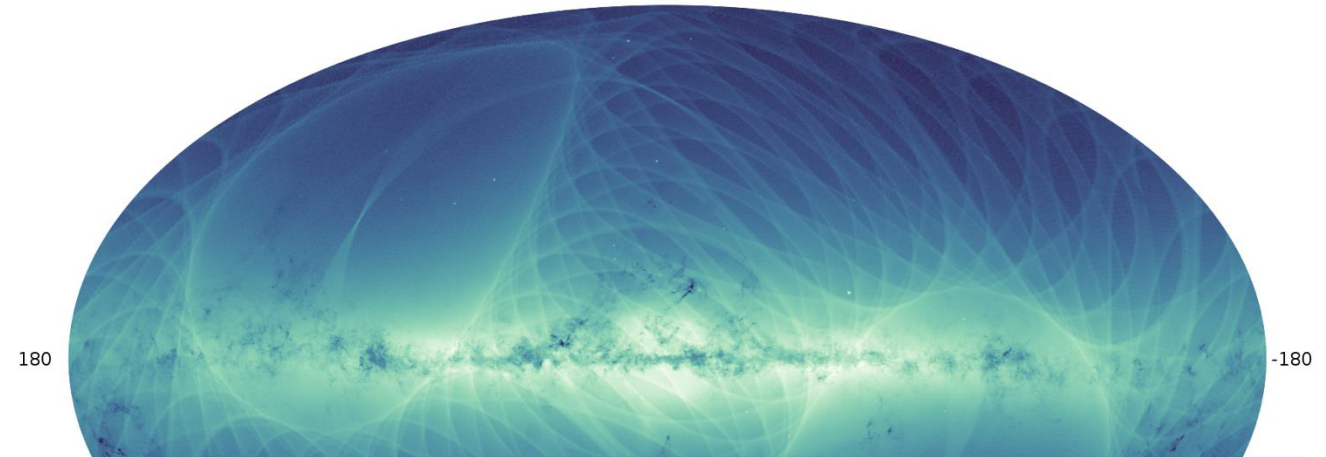
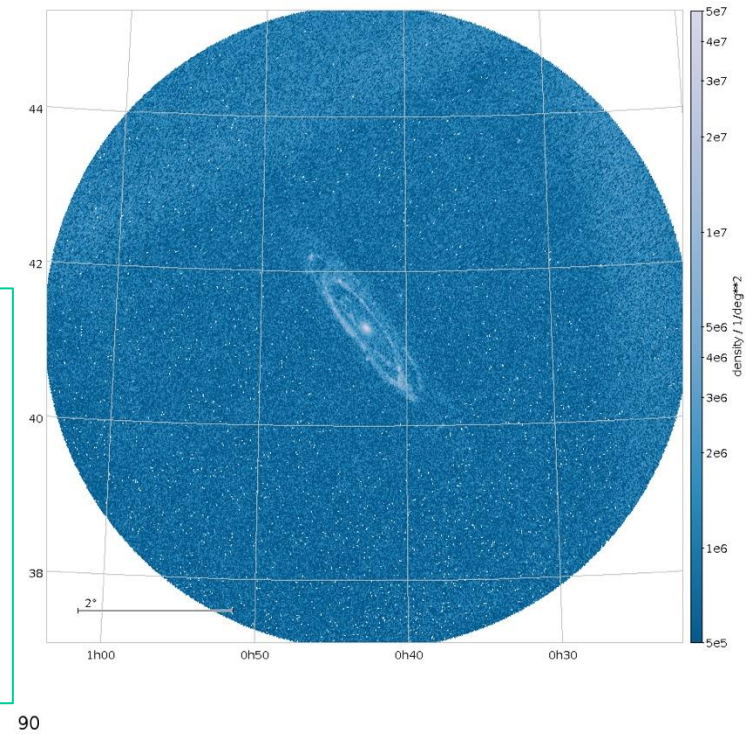
All available variable-star and non-single-star solutions.

Source classifications (probabilities) plus multiple astrophysical parameters (derived from BP/RP, RVS, and astrometry) for stars, unresolved binaries, galaxies, and quasars. Some parameters may not be available for faint(er) stars.

All epoch and transit (reduced) data for all sources.

Future DR5 release will include the full mission extension data

Map shows early DR4 cross match run - 142 billion detections processed – 750K CPU hours on MareNostrum
Insert shows zoom in on M31
Credits: ESA/Gaia/DPAC, F. Torra, J. Portell, J. Castañeda, M. Bernet, S. Bartolomé and CU3-IDU/DPCB team



**REALISING THE
FULL POTENTIAL**



Gaia DR4: Epoch data for everything!

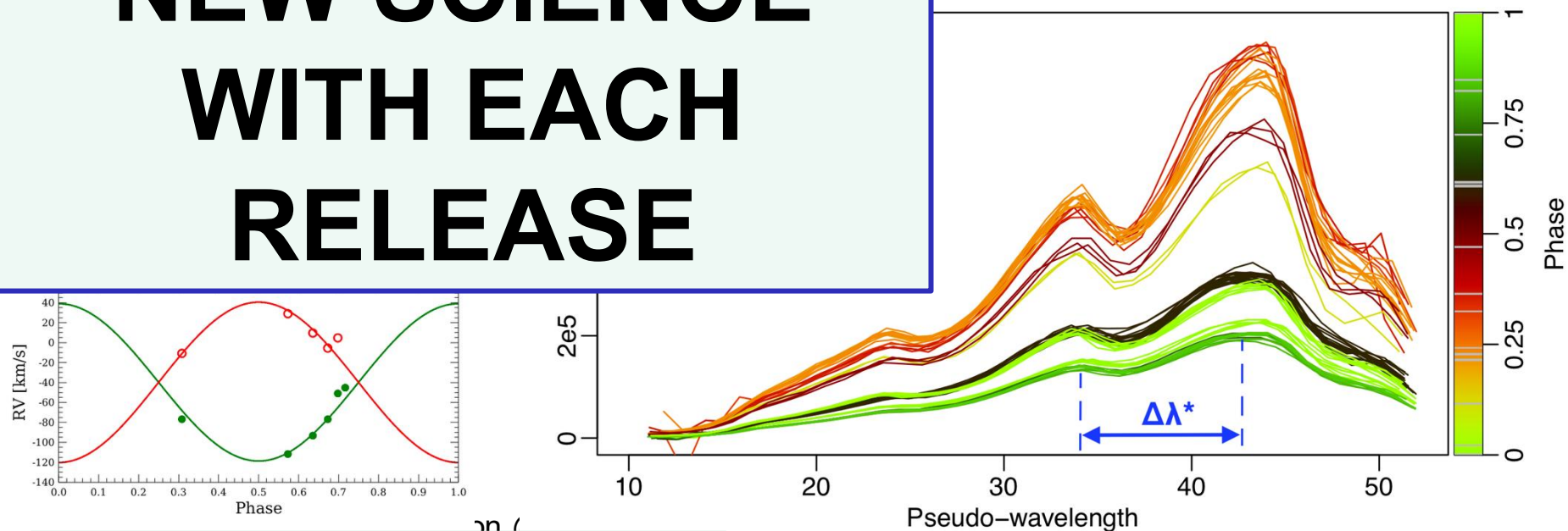
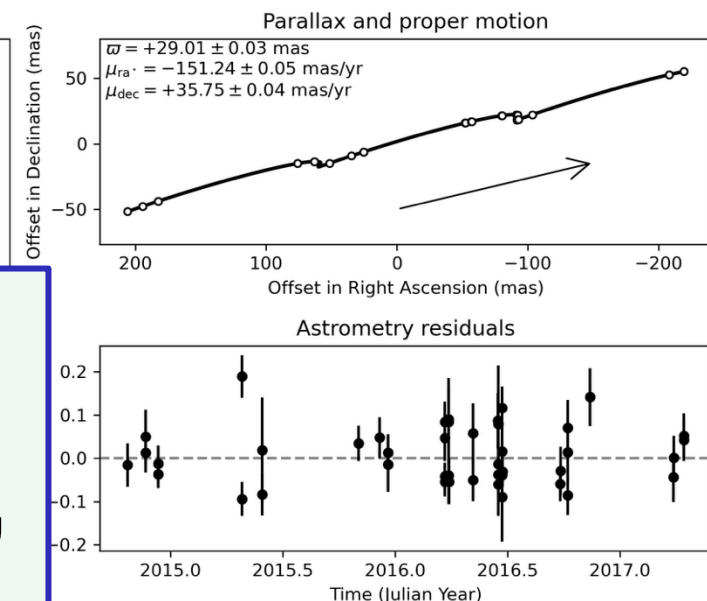
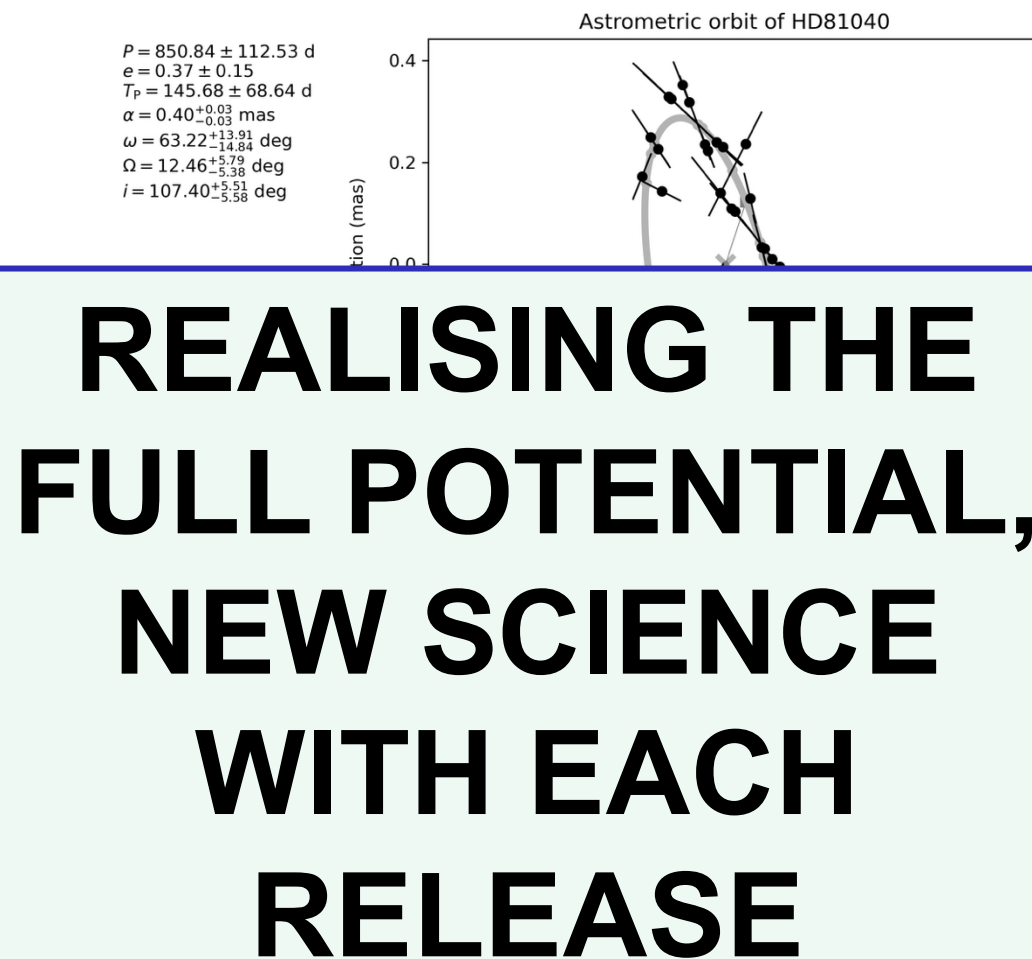
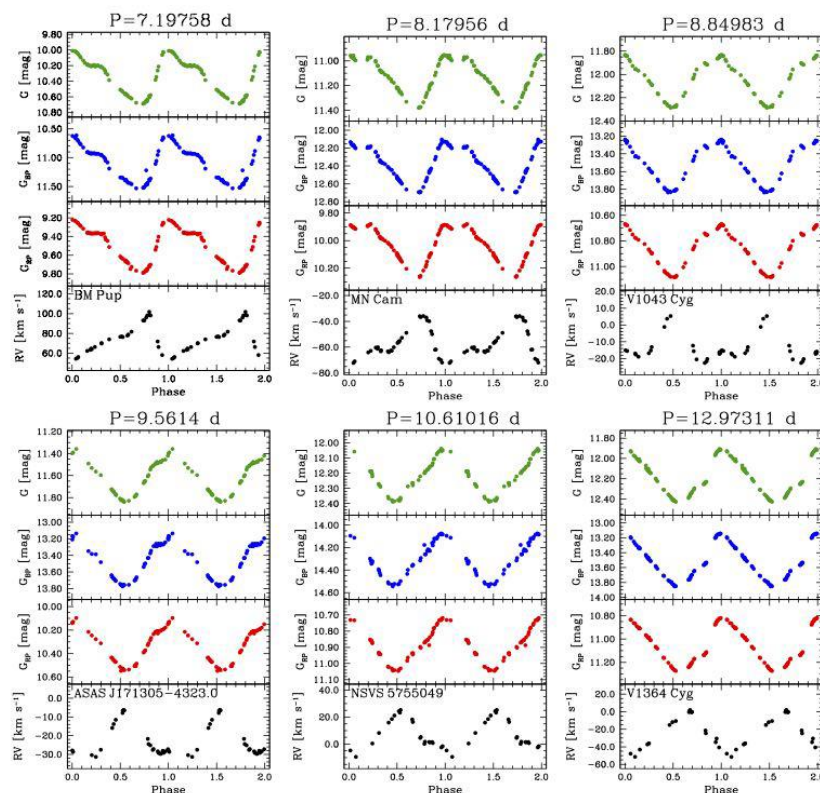
Epoch astrometry

Epoch light curves

Rad vel time series

XP spectra time series

RVS spectra time series



All images: credit: ESA/ Gaia/ DPAC

Independent report highlights **impact** of UK contribution to the Gaia mission

<https://www.gov.uk/government/news/report-highlights-impact-of-uk-contribution-to-the-gaia-mission>

published: 10 Oct 2023

Figure 5 Publications by year: total publications and UK involvement

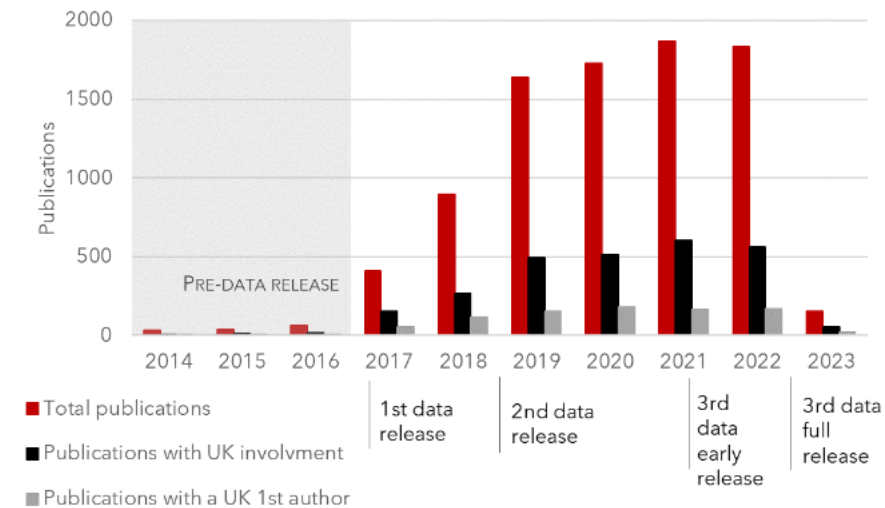
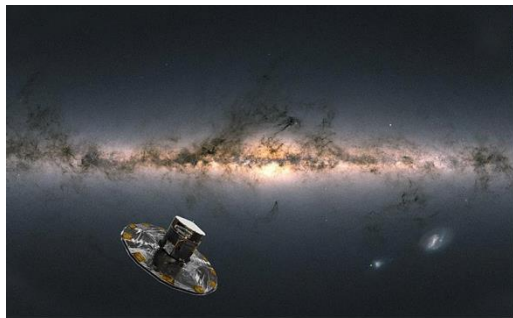
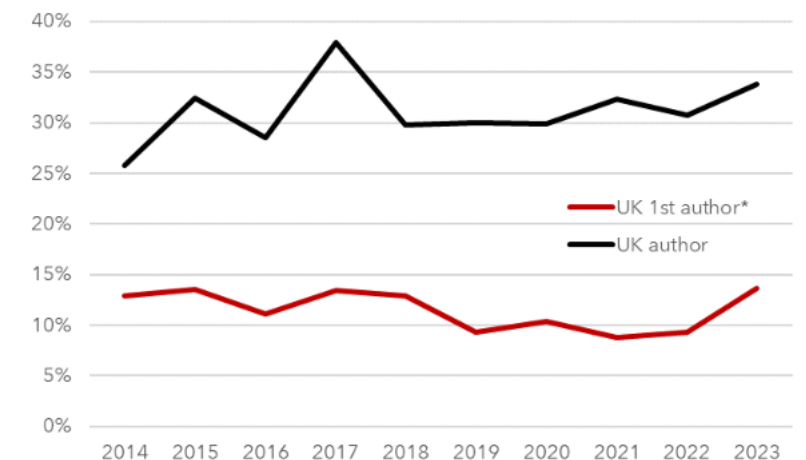


Figure 6 Proportion of publications with a UK author or first (corresponding) author



Gaia Interim Impact Evaluation

Interim Impact Report for the  UK SPACE AGENCY

know.space

March 2023

**Excellent
Value for Money**

IMPACT

“There can be little doubt that **Gaia is a scientific success story**. Our report highlights how UK funding has enabled the processing and release of high-quality data that is of huge value to the global scientific community, helping to advance the frontiers of human knowledge. The impact is also set to continue for years and decades to come.”

“Our analysis also shows how funding has helped to **expand the reach and reputation of the UK space sector**, develop sought-after data skills, inspire the next generation, and lead to **widespread ‘spillover’ benefits** as new advanced statistical methods, algorithms and capabilities are applied elsewhere in the space sector and beyond.”

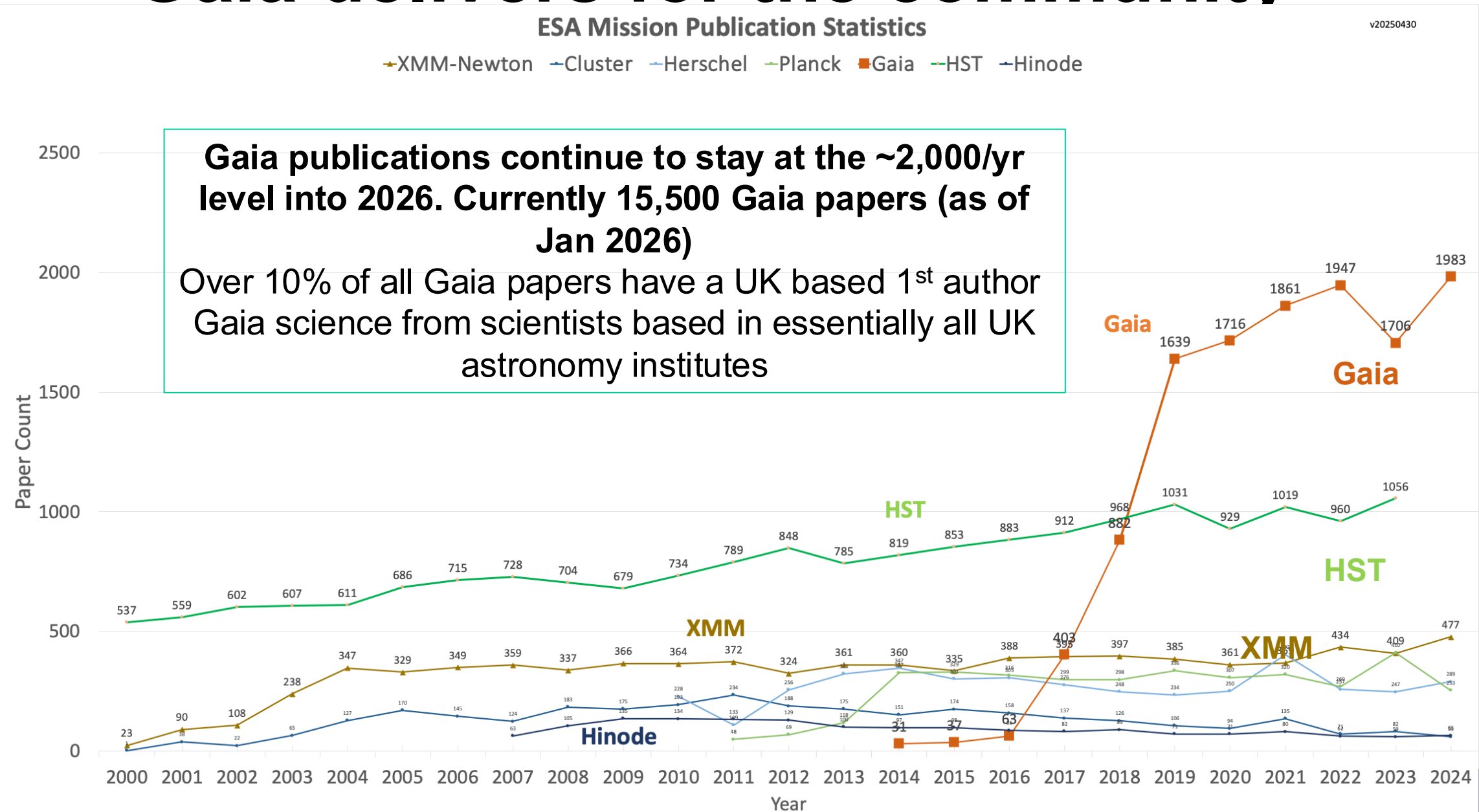
16 Mar 2026

Nic Walton @ IoP, London

Papers, Science, Impact: value for money for the UK

Gaia delivers for the community

SCIENCE IMPACT

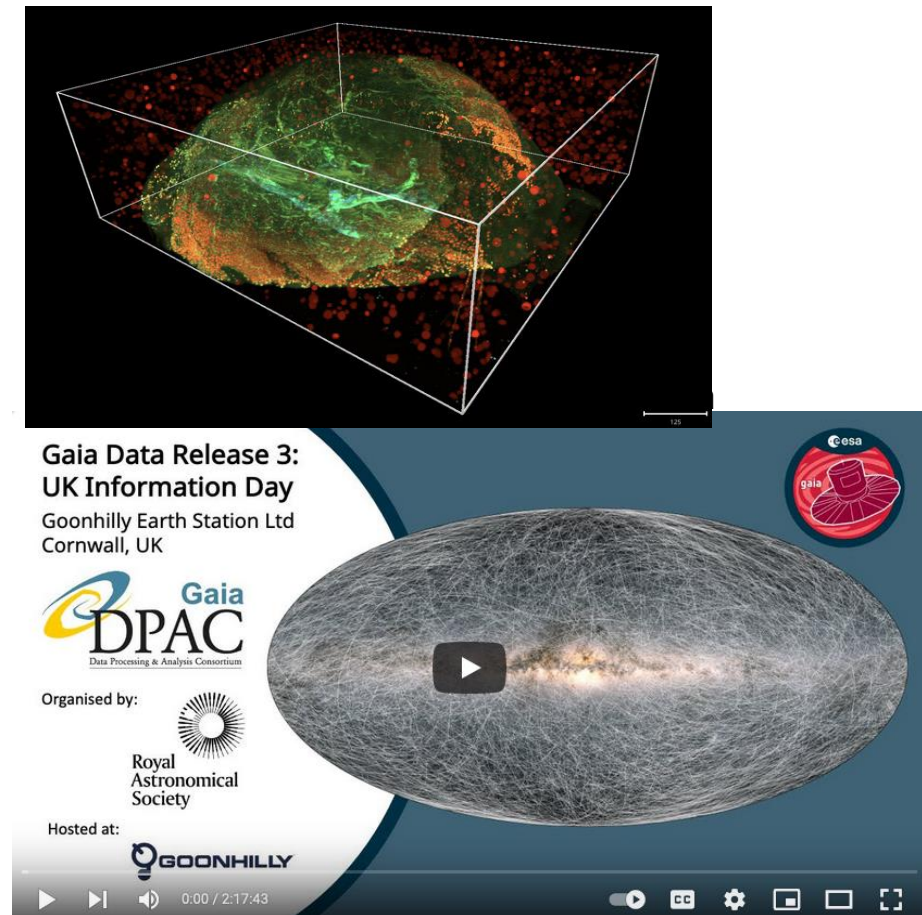


See: arXiv:2402.12818v1 and <https://www.cosmos.esa.int/web/gaia/peer-reviewed-journals>

Training, Impact, Skills Gaia UK delivers

ECONOMIC, SOCIETAL IMPACT

- Training: Gaia underpins a significant fraction of UK astronomy research projects
 - Gaia is the most requested facility of STFC AAP supported science
 - Most UK astronomy groups (33) involved in Gaia EDR3 and DR3 related papers
- Knowledge Transfer: building on Gaia 'Big Data' techniques
 - Leveraging expertise in large scale distributed processing
 - Training via STFC PhD CDTs
 - Techniques used in medical imaging
- Outreach
 - Workshops at the RAS NAM meetings
 - Training through wider EU networks



SPANS's Space Data White Paper

This paper generated to review space data state of the art and areas where policy and investment can underpin the UK ambitions in Space

UK Space Data: A World-Leading Portfolio

Space Science	JWST (MIRI lead), Gaia (DPAC), Solar Orbiter, Euclid (VIS lead), PLATO, ARIEL (UK lead), JUICE, LISA, BepiColombo, ExoMars	UK lead roles on multiple ESA space science missions
Earth Observation	Copernicus/Sentinel, Biomass, FORUM, MicroCarb, NovaSAR	
Space Domain Awareness	Met Office MOSWOC, Solar Orbiter MAG, Vigil (L5), BGS observatories, Chilbolton, NSpOC	

The UK has deep involvement in 20+ current space missions with significant data processing responsibilities

UK Data Infrastructure Landscape

Mission Data Processing Centres	Cambridge (Gaia), Edinburgh (Euclid), UCL/MSSL (SolOrb), Leicester (Bepi)
IRIS	Coordinated computing, storage & networking for STFC science communities
DiRAC	Distributed HPC across 4 universities. Co-designs hardware for science
AIRR	AI Research Resource: Isambard-AI (Bristol) & Dawn (Cambridge). Pre-exascale
CEDA / JASMIN	EO & atmospheric data. Data-intensive computing for environmental science
EO Data Hub	UK Pathfinder for EO data access. Led by NCEO. Low-TRL exploration
ESA ESDC / ESO SAF	European archives: full range of ESA missions + ground-based data at the ESO Science Archive

But: No UKSA data policy. Unclear agreements on cross council access to facilities (e.g. UKSA use of IRIS)

A Computing; big data, HPC and data infrastructure

Top Level Key recommendations

Key 1:

[People] we recommend developing and investing in a professional software engineering / computational skills base in Astronomy. This has many implications and requirements, including career development with clear progression pathways in academia and improving the diversity of the workforce. Such careers have to be promoted and considered as an integral part of our science/research portfolio. Traditional metrics for academic performance are often inappropriate for measuring the impact and usefulness of computationally focussed outputs. New assessment criteria, for example based on industrial models, should be adopted by the astronomy community to give proper credit to essential contributions that technicians and software engineers provide.

People

Key 2:

[Data, Open, Archive, User-to-Data] we recommend that missions and facilities plan an integrated approach for data products and software tools: their design, delivery, maintenance and development should be sufficiently planned for and resourced already at the onset and for the lifetime of the mission/facility. We recommend that initiatives be supported for the long term preservation and scientific use of data.

Life cycle planning

Key 3:

[Data, Archive, User-to-Data, Open, Green] we recommend to adopt and further develop a "Tiered" approach for Data Infrastructure, for all types of data pertaining to astrophysics, including models, simulations and mocks, and where beneficial to connect with similar frameworks developed for other disciplines of science. A 'Tiered' Distributed Analysis model maximises the transformation of science data to scientific results, organising and sharing expertise to benefit from economies of scale, with attention given to preventing the exclusion of individual communities, as well as monitoring and minimising the environmental cost.

'Tiered' data architecture

Key 4:

[Open, User-to-Data, People, Green] we recommend embracing a fully collaborative, open and synergistic view when it comes to the astronomy-computing ecosystem,

Open data

encompassing data, software, processing, analysing and modelling. The community should implement and support official mechanisms to monitor, acknowledge and reward behaviours that model this ambition.

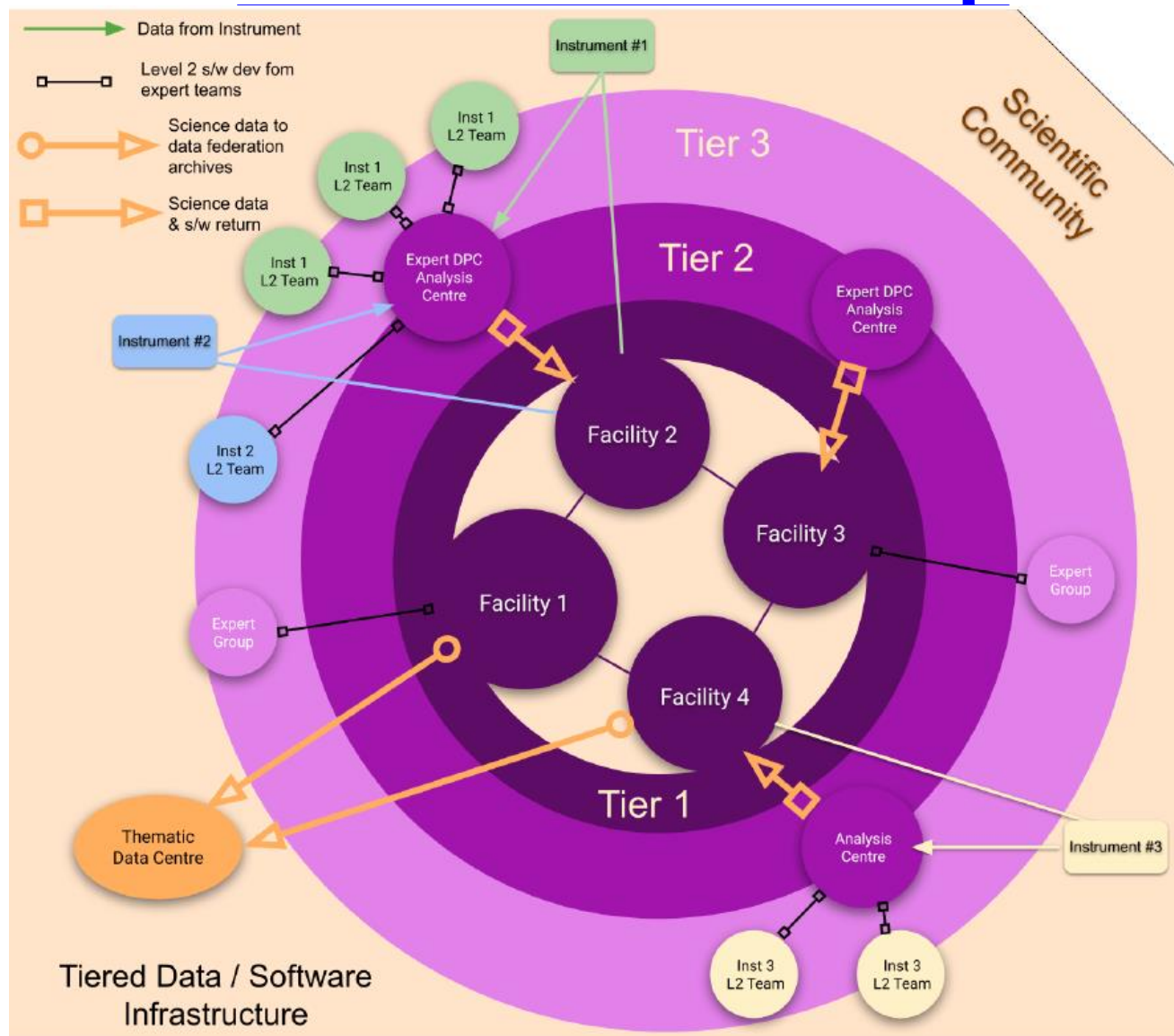
Open science, data and software sharing, archives, cloud computing, platforms and service infrastructure represent various facets of an integrated view of computing in astronomy: this should be acknowledged and acted upon.



Keywords in brackets refer to specific sections of this document:

- [Open] = The paradigm change: Open Science, Data and Software sharing
- [Data] = Mission / Facility data processing
- [Archive] = Archives for data and software

Example White Paper Input Astronet Roadmap



Nic Walton @ IoP, London

23

Critical Challenges: Pipelines & Software

Generating the underpinning data products

- Funding (can) prioritise hardware over software investment
- Data planning is often not planned and resourced at all stages of a space mission (from concept study through to post-operations final data releases)
- Short term nature of funding: 1 to 3yr grants vs 10–20yr mission lifetimes.
- Pipeline knowledge held by small teams, with potential loss of capacity across missions

Critical Challenges: Coordination

- The UK Space Agency currently lacks a clear data policy comparable to the more joined-up approaches adopted by organisations such as NERC (e.g. EO Data Hub, EDS).
- The lack of unified national space data infrastructure means that UK-held space data is fragmented across multiple repositories with no single discovery portal.
- Space data has no defined place within the emerging national data library framework, representing both a gap and an opportunity for strategic engagement.

Critical Challenges: Skills and Capacity

- Skills gaps in analysis pipeline development, advanced data analytics and AI/ML applications remain a critical constraint.
- Shortage of personnel with combined domain science and software engineering expertise affects the UK's ability to develop and maintain data pipelines, exploit new analysis techniques, and maximise scientific return from space data investments.
- Limited structured career paths for Research Software Engineers, especially in non-industrial settings (e.g. Academia)
- Recruitment issues, many space organisations struggle to recruit appropriately skilled data staff

Critical Challenges: Data Resilience

- Space recognised as Critical National Infrastructure
- Critical dependencies on external data (e.g. NASA/NOAA) and commercial cloud platforms (e.g. AWS, Google Cloud)
- Potential reductions in US science budgets threaten access to key data archives (e.g. NASA Planetary Data System and Astrophysics Data System)
- Key infrastructure (e.g. Sentinel Hub) owned by non-UK entities
- National Space Operations Centre will depend on robust data architectures connecting ground sensors, space weather monitoring, and orbital tracking

Critical Challenges: AI, Cloud & Emerging Risks

- Cloud platforms may potentially scrape data for LLM training: data sovereignty, licensing and IP concerns
- EU AI Act classifies AI systems by risk level: EO systems used for critical infrastructure monitoring may fall within regulated categories
- AI trustworthiness, validation, and reproducibility challenges for scientific applications
- International standards for AI in space applications are in their early stages: UK should contribute to shaping them
- Satellite mega-constellations impacting astronomical observations

Policy Context: Timelines

- Nov 2025: ESA budget: latest CMIN25 saw a £1.7B commitment from the UK (now 5th largest funder of ESA after Germany., France, Italy and Spain)
- Mar 2026: Significant UK Gov announcement on UK Space funding investment (£500M) in the period 2026-2030
- Apr 2026: Restructuring of 'Space' coordination with UK Space Agency joining DSIT ('reducing bureaucracy', 'cutting duplication')
- Late 2026: 'Plan for Space' to be publish by UK Gov

The SPAN Data White Paper can inform the Plan for Space and the UKRI's ongoing Infrastructure Roadmap refresh

The International Policy Context

- NASA SPD-41 Science Implementation Policy: mandates data management plans for all science missions from proposal stage: the UK has no equivalent
- ESA EarthCODE: requires FAIR compliance for space data
- EOSC EU Node: launched Oct 2024, first node of European research data federation
- EU AI Act: classifies AI by risk level with implications for EO in regulated contexts
- ESA Voyage 2050: 3 Large mission themes to 2050+, each at unprecedented data scales
- Astronet Roadmap: data infrastructure equally important as instrumentation

Ten Priority Actions

#	Action	Priority	Cost Band
1	1.2	Develop a UK Space Data Policy	LOW
2	7.1	Space Data Coordination Within DSIT	LOW
3	4.1	Assess International Data Dependencies	LOW
4	1.1	Pipeline Planning in Mission Design (incl. calibration/QA)	LOW
5	2.1/2.2	Prepare for Next-Generation Missions & Surveys	LOW+MED
6	1.4/3.3	Strengthen Pipeline Expertise & Career Pathways	LOW+HIGH
7	1.3	Establish UK Space Data Discovery Service	MED
8	4.3	Engage with European Open Science Cloud	MED
9	5.1/5.3	Address Environmental Sustainability	LOW+MED
10	7.2	Sustainable Funding for Coordination & Roadmap	LOW

Aligning with Current Space Priorities

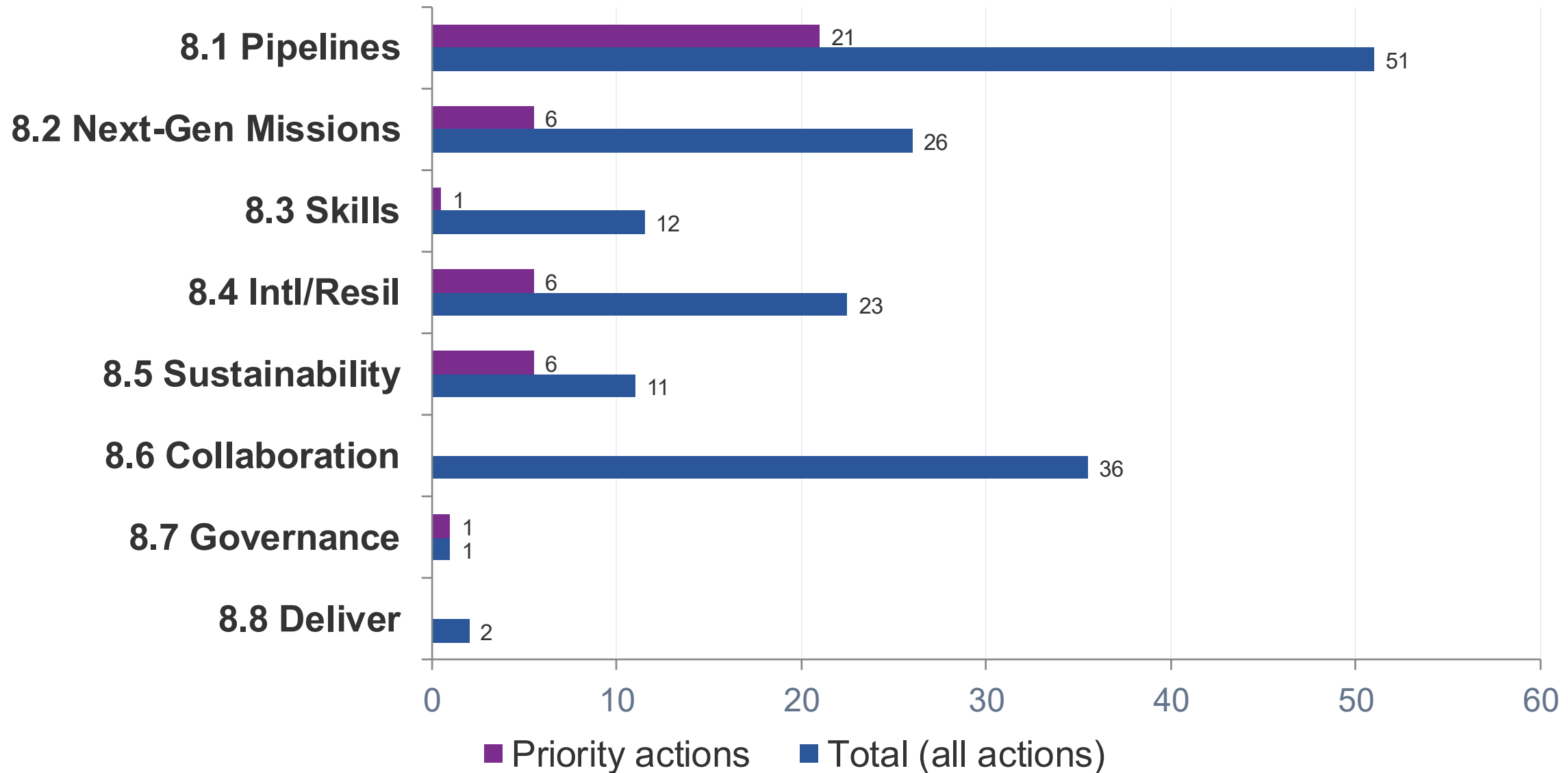
Space Data Theme	SatComms*	Access*	ISAM*	SDA*	EO	PNT	Space Science
8.1 Pipelines	●	●	●	●	○	○	○
8.2 Next-Gen Missions				●	○		○
8.3 Skills	●	●	●	●	○	○	○
8.4 Intl/Resil				●	○	○	○
8.5 Sustainability	●	●	●	●	○	○	○
8.6 Collab	●		●		○		○
8.7 Governance	●	●	●	●	○	○	○
8.8 Delivery	●	●	●	●	○	○	○

● = serves priority subsector ○ = serves non-priority subsector * = Government priority [30]

Action Types and Resource Ranges

Band	Cost (over 3 to 5 year timeframe)	Nature of Investment
LOW	< £1M	Policy, reviews, assessments, coordination. Achievable through reprioritisation of existing budgets or modest additional funding.
MEDIUM	£1M – £10M	Service development, pilot programmes, fellowship schemes, standards engagement. Requires dedicated programme funding but within scale of existing UKSA/STFC call mechanisms (e.g. NSIP, STFC grants).
HIGH	> £10M	Infrastructure build, sustained multi-year programmes, large-scale computing/storage. These will require a spending review case or co-investment with national infrastructures e.g. IRIS, JASMIN, AIRR, SCIF.

ROM Implementation Costs



Time for Action: Implementation in Phases

Initial Phase: from year 1:

- All 10 priority topics. Data Policy, DSIT coordination, dependencies, pipeline planning, next-gen missions, RSE workforce, Discovery Service, EOSC, environment, roadmap.

Phase 2: from years 2-3:

- Everything above plus: fellowships, apprenticeships, science-ready data services, ML/AI, open ecosystem, multi-messenger, real-time pathways, equitable access.

Phase 3: from year 3-4 onwards:

- Everything above plus: tiered infrastructure, resilience capability, regional clusters, co-location labs. 'High' items can leverage investment in related programmes, co-investment across DSIT agencies, etc.

The Role of SPAN

SPAN's role: complement and inform DSIT and UKRI and other relevant bodies, agencies.

- Independent analysis and community consultation
- Cross-mission perspective no single institution can offer
- Technical review to support government decision-making
- The collective academic voice in space data policy

Next Steps: Short term (1-2 years)

- Submit whitepaper to DSIT as input to the Plan for Space (2026)
- Engage new DSIT space unit on data infrastructure oversight function
- Support development of UK Space Data Policy through SDAWG expertise
- Position UK space data within UKRI Infrastructure Roadmap refresh
- Contribute academic perspective to spending review discussions for data infrastructure investment
- Develop spending review case for HIGH-cost infrastructure items

Next Steps: Longer term (3-5 years)

- Establish UK Space Data Policy by 2027
- Implement tiered processing infrastructure leveraging IRIS, JASMIN, DiRAC, AIRR
- Support ESA Voyage 2050 data planning (e.g. for L4 Enceladus, L5 GaiaNIR)
- Build Discovery Service prototype
 - connecting space science, EO and SDA data
- Connect to EOSC federation; engage with EU frameworks (AI Act, Data Act, Space Act)
- Develop environmental impact reduction plans for UK space data infrastructure

Space for Discussion

- Discussion now from first look at the challenges and actions
 - Feedback on priorities, coverage (what's missing), implementation possibilities, audience and consumers for the White Paper
- This White Paper should be update in light of community feedback
 - SPAN will update the document to reflect feedback
- The document will be reissued considering progress made against the action plan
- The look ahead for the White Paper currently runs for the upcoming five years through to 2031
 - Within this period there will be development of DSIT plans for Space for the following spending review period (from 2030), where inputs to strengthen Space Data are timely

Summary

- Embed data infrastructure in the Plan for Space as a cross-cutting enabling framework to support wider UK Space priorities
- Adopt the 10 priority actions for near term implementation
 - 7 of 10 are 'Low' cost, policy changes, not capital spend
- Ensure the new DSIT UKSA unit has data infrastructure oversight
 - coordinate data investment alongside hardware and mission commitments
- Invest in people: the pipeline workforce is the binding constraint
 - Underpin longer term RSE posts, career pathways, dual-sector fellowships
- Recognise data as the mechanism through which hardware investment generates scientific, economic and societal return

SPAN SPAN Data White Paper:

Presentation slides

The SPAN white paper 'White Paper on Space Data Excellence in Growth: Space Data Infrastructure for a Competitive UK' is available for download from

<https://span.ac.uk/publications/>

at:

<https://span.ac.uk/wp-content/uploads/2026/03/span-data-whitepaper-v1.0.pdf>