Armagh Observatory and Planetarium

Annual Report and Accounts
For the year ended 31 March 2025

Laid before the Northern Ireland Assembly
under clause 8 of The Armagh Observatory and Planetarium (Northern Ireland) Order 1995,
as amended by Schedule 1, clause 6 of the Audit and Accountability (Northern Ireland)
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For the year ended 31 March 2025

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The Trustees' Annual Report for the year ended 31 March 2025

The Board of Governors and Management Committee, who are the Trustees for Armagh Observatory and Planetarium (AOP) have pleasure in presenting the annual report and financial statements for this charity for the year ended 31 March 2025. These financial statements have been prepared in accordance with the accounting policies set out in note 1 to the accounts, with the guidance issued by the Department of Finance on the form and contents of the Annual Reports and Accounts of Executive Non-Departmental Public Bodies, *The Armagh Observatory and Planetarium (Northern Ireland) Order 1995* and Accounting and Reporting by Charities: Statement of Recommended Practice (SORP) applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102). The Remuneration and Staff report is prepared in accordance with the direction set out in The Government Financial Reporting Manual (FReM) 2024-25.

The sponsor Department for Armagh Observatory and Planetarium is the Department for Communities (DfC) (the Department).

Objectives and Activities

The organisation's statutory functions are set out at Article 4 of *The Armagh Observatory and Planetarium (Northern Ireland) Order 1995* (the Order). The Order requires that '*the Governors shall, for the purpose of developing and improving the knowledge, appreciation and practice of astronomy and related sciences, maintain and manage the Armagh Observatory and Planetarium and may take such other action as the Governors may think proper for the purpose of acquiring or disseminating knowledge relating to astronomy and related sciences'.*

In accordance with Paragraph 8(1) of Schedule 1 of the Order, the Armagh Observatory and Planetarium (AOP) Board of Governors has delegated the primary responsibility for the governance and management of AOP to a Management Committee with the statutory purpose of 'developing and improving the knowledge, appreciation and practice of astronomy and related sciences'.

AOP's Management Committee has corporate responsibility for ensuring that AOP fulfils the aims and objectives set by the Department for Communities (the sponsor Department) and approved by the Minister and for promoting the efficient, economic and effective use of resources.

As the primary responsibility for the governance and management of AOP has been delegated to a Management Committee, the Governors considered that the role of Charity Trustees would more appropriately align with their remit. The Board of Governors agreed in principle to this. The Charity Commission of Northern Ireland recommended that the Members of the Management Committee be appointed as Trustees for the Charity alongside the Members of the Board of Governors. Accordingly, both the Members of the Board of Governors and the Members of the Management Committee are Charity Trustees.

Armagh Observatory is the oldest scientific institution in Northern Ireland, and the longest continuously operating astronomical research institute in the UK and Ireland. Armagh Planetarium is also the oldest operating planetarium in the UK and Ireland.

A Strategic Plan for 2021-26 was launched in September 2021 and this is now being implemented. The strategy is built around four strategic themes –

These strategic themes support the delivery of a number of Programme for Government Outcomes and have potential for synergies with multiple departmental strategies and objectives.

Our Mission:

> *"Our mission is the pursuit of knowledge and understanding of the cosmos, and the sharing of that knowledge in order to inspire future generations and enrich the intellectual, economic, social and cultural life of all."*

Our Vision:

> *"Our vision is to be recognised as an international centre of scientific excellence for the pursuit of astronomy and the public understanding of science, for our capacity for innovation and our extraordinary heritage, a place our community can be proud of."*

The organisation operates on the international stage and receives core funding from the Department and the receipt of external grants from the UK Science and Technology Facilities Council (STFC), and other grant-awarding bodies.

Our strategic objectives:

- To be a must-visit tourist destination
- To provide a vibrant community hub valued by and accessible to all
- Recognition as a significant Astronomical Heritage site
- To be recognised as a key player in international research and a centre for the public dissemination of science for national and international observatories
- To provide a valued resource used by a range of professional organisations for STE(A)M education
- To have a reputation that attracts high-profile international scientific conferences and events
- To be a leading-edge cultural and educational destination; a prestigious research institution and a regional hub for a shared state of the art data visualisation facilities and immersive visitor experience
- To develop an Integrated Masterplan and Capital Development Plan for collaborative development of the AOP site and surrounding area as a centre of Research, Education and Leisure – enhancing opportunities for local people and contributing to the renaissance of the city.

Specifically for 2024-25, our objectives were:

1. To retain the current baseline complement of research staff necessary to ensure the minimum level of critical mass for a research organisation is maintained
2. To maintain the vitality of the PhD programme by enrolling a minimum of 3 new Astronomy PhD students each year to maintain a minimum student population of 12 over the 4-year study period
3. To retain a baseline level of staff that will ensure AOP can continue to provide a vibrant programme of activities and events throughout the year to maintain/increase 2023-24 visitor numbers and customer satisfaction levels
4. Continue to safeguard and maintain our built and natural heritage and historic instruments and collections
5. To retain baseline levels of staff that will ensure AOP can continue to maintain a governance framework which reflects best practice and provides the necessary assurances to stakeholders as set out in the Partnership Agreement between AOP and DfC
6. Maximise AOP's admission income through investment in an increased event programme
7. Maximise AOP's trading income through continual review of stock and pricing
8. Make applications for additional funding to supplement the ability to provide a range of educational programmes and outreach activities
9. Maximise income from private hire of AOP facilities for conferences and events
10. Implement Governance arrangements and staffing support structure for the AOP Redevelopment Project
11. Maximise the use of internal resources and grant funding to deliver in accordance with the Redevelopment Project Plan and funders terms of offer
12. To participate within the Astronomical Observatories of Ireland Partnership (AOI) work-streams based on the agreed areas of co-operation (Research, Heritage, Education/Outreach and Placemaking)
13. To participate in the AOI Governance and Oversight structures agreed by the partnership.

Achievements against specific key performance indicators are also listed on page 19.

Public Benefits

The Trustees confirm that they have complied with their duty to have regard to the guidance on Public Benefit produced by the Charities Commission of Northern Ireland under Section 4 of the Charities Act (Northern Ireland) 2008 (the public benefit requirement statutory guidance) and that this has informed the activities of the organisation in the year to 31 March 2025. This is demonstrated in the following summary of Principal Activities which provides detail on how the organisation has delivered against its objectives and the public benefit which has flowed from this.

Principal Activities

Impact of Brexit

With the full implementation of the UK's EU withdrawal agreement, AOP has encountered several visa issues for non-UK or Irish citizens when crossing between the two jurisdictions on the island of Ireland. One of our PhD students was unable to obtain a visa in time to travel to Galway to give a presentation at INAM (the Irish National Astronomy Meeting) in August 2024 and had to present remotely from Armagh. We are also encountering issues with the planned relocation of the Lindsay Scholar from Dublin to Armagh for their second year of study as they are an EU citizen enrolled in Trinity College Dublin.

The requirement to pay, in full and in advance, NHS costs in addition to visa costs for the full contract term is also adding considerable pressure to new non-resident students and Post Doctoral Research Assistants (PDRA's). Charges have nearly doubled over the last year. A PDRA, who has joined AOP on a prestigious Leverhulme grant that will help allow AOP to develop its data-visualisation ambitions, was faced with a total visa and NHS costs of more than £11,000 for himself and his family. AOP needs to find ways to alleviate these initial hurdles, as some HEI institutions already do for PDRAs through loans and in some cases full reimbursements (e.g. in several UK universities); if not AOP will otherwise risk being unable to attract talent, fill critical skill gaps, and live up to its ambition of being an equal-opportunities workplace.

Dublin Institute for Advanced Studies (DIAS), AOP's partner in the Astronomical Observatories of Ireland, had to cancel a planned away-day for all staff to Armagh scheduled for 17 October 2024. DIAS intended to take their entire staff to AOP for the day (about 50 were expected) as part of an internal staff engagement activity. However, several members of DIAS are no longer able to travel across the NI-RoI border due to the nature of their visas. DIAS could not discriminate against some members for what was a staff engagement event and so regrettably had to cancel their trip to Armagh.

AOP Research and its International Standing

AOP is one of the oldest scientific research institutes in the UK and Ireland with a long-established reputation of research excellence. It is also one of very few astronomical institutions in the world to have a modern planetarium where its research can be effectively communicated and where a research-informed outreach and public engagement activity can be sustained. AOP is strategically engaged in front-line research in several key areas of astrophysics. These range from the study of our Solar System to that of distant galaxies, in keeping with the long and varied history of scientific achievements of the Armagh Observatory and with the desire to be perceived by the public as leaders in the strands of astronomical research that are communicated through the Planetarium.

Typically, around a third of AOP's research is funded by the award of project-specific external grants mainly from the UK Science and Technology Facilities Council (STFC), together with several ad hoc grants. These grants support projects led by individual research astronomers with the provision of PhD scholarships, post-doctoral research assistant salaries, computing equipment and observation/conference travel funding. In 2025, AOP researchers contributed to secure €700,000 from the European Space Agency for funding across different EU institutions for a monitoring campaign of potentially hazardous Near-Earth Asteroids. This will fund one PhD student at AOP. AOP researchers also submitted four applications for STFC grants providing funding for one Post-Doctoral Research Assistant (PDRA) each, plus salary staff contribution and estate costs. This is in addition to an EU-Horizon Advance Grant application to establish a premier research group of students and PDRAs working on massive stars in Armagh. While these efforts underscores AOP's ability to seek research funding, it is important to stress that its permanent staff numbers are nonetheless close to the minimum critical value to ensure its sustainability in the UK funding landscape. For instance, both the number of UKRI PhD studentships and the availability of UKRI grants to publish research in open access format depend critically on staff numbers, which for AOP translate in considerable fluctuations for these research income streams.

AOP research requires the use of state-of-the-art observing and computing facilities internationally in order to obtain new astronomical data and allow its analysis. STFC and UK government support provides access to world-class international facilities, and AOP research staff regularly are awarded telescope time on some of the most sought-after telescopes in the world such as the European Southern Observatory (ESO) Very Large Telescope (VLT) and Atacama Large Millimetre Array (ALMA) or the Hubble Space Telescope (HST). In addition, through AOP's membership of the UK SALT Consortium, its research staff have access to the 11-metre diameter Southern African Large Telescope (SALT). AOP is also a founder member of the international Gravitational-wave Optical Transient Observer (GOTO) project; a member of the UK consortia involved in building the detectors for Inouye Solar Telescope (IST); LOFAR (Low Frequency Array) radio telescope project and a consortium member of the Cherenkov Telescope Array (CTA) gamma-ray observatory and the BlackGem project which conducts optical surveys from Chile. Finally, AOP is in a leadership position for nearly a quarter of all the observing time dedicated to Large Programs run by the 15-meter diameter James Clerk Maxwell Telescope (JCMT) in Hawaii.

The European Southern Observatory Very Large Telescope, with its array of 8-metre diameter telescopes in Chile.

These facilities can be extremely expensive to run so that, through the award of their use, the international astronomical community essentially entrusts astronomers at Armagh to make effective use of the data. For instance, the running cost of one observing night at VLT is about £50,000 whereas the cost of one HST orbit worth of observing time is around $75,000. This year alone, AOP researchers secured 12 nights at VLT and over 50 HST orbits. Furthermore, by leveraging on South African collaborations AOP researchers secured over 50 hours of SALT telescope time, or ten times the guaranteed time that AOP secures through its yearly contribution to SALT.

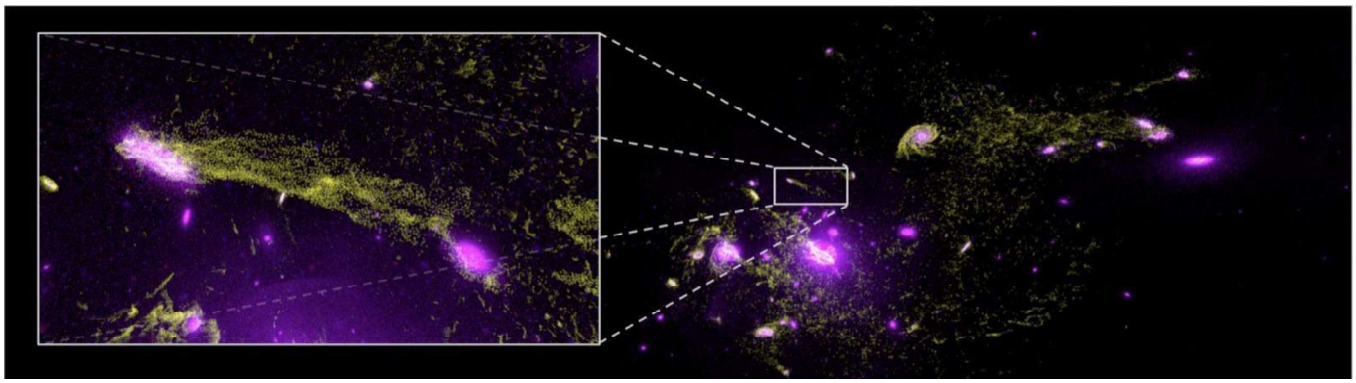
AOP research staff also play a full role in the international astronomical community. For instance, they serve on committees of bodies such as the Royal Astronomical Society (RAS), STFC, the International Astronomical Union (IAU), ESO time allocation panels, assess grant and research proposals on behalf of external funding agencies, review scientific papers and edit international academic journals, and act as external PhD examiners in the UK and beyond. AOP researchers also sit on scientific advisory panels or lead specific projects with future ground-based observing facilities (Vera Rubin Observatory, ELT-METIS, VLT-BlueMUSE), space satellites and missions (European Space Agency's future Plato and Comet Interceptor missions) and large-scale surveys (MOONs).

At the XXXII General Assembly of the International Astronomical Union, held in Cape Town in August 2024, three AOP astronomers were elected as Presidents of IAU Commissions. They were (i) Stefano Bagnulo, President of Commission B6 – Astronomical Photometry and Polarimetry – part of Division B (Facilities, Technologies & Data Science), (ii) Michael Burton, President of Commission C4 – World Heritage and Astronomy – part of Division C (Education, Outreach & Heritage and (iii) Simon Jeffery, President of Commission G5 – Stellar and Planetary Atmospheres – part of Division G (Stars and Stellar Physics).

The international reputation of AOP research staff is also underscored by their ability to attract their international peers to Armagh either on research visits or organising international conferences and workshops at the Planetarium. For instance, in September 2024 AOP welcomed over 44 delegates for the UK Star Formation Conference, thanks to the initiative and coordination of AOP's staff and student's efforts by AOP's Öpik fellow and to funding from the RAS. A well-attended public talk was part of the itinerary, given by Professor Derek Ward-Thompson of the University of Central Lancashire. As another example of AOP's reputation, this year has been the second in a row when AOP has been able to secure all its top candidates for the appointment of PhD students and research fellows, including the recruitment of AOP's new Öpik fellow starting in October 2025.

AOP research staff are also involved in the training of PhD students who also play a key part in AOP outreach and public engagement activity. AOP students are usually registered at Queen University Belfast (QUB), through an advantageous student fee arrangement that over time has allowed AOP to attract students from all over the world and achieve a vibrant diversity in our cohort that in turn prepares our students to be STEM champions, promoting equal opportunities in physics when they help at the Planetarium. In this respect, AOP's students will now play an important role as STEM ambassadors in Northern Ireland, with AOP now being the coordinating organisation for this initiative.

In this last respect, we note that this year saw several research-led public sessions at the Planetarium in AOP's data visualisation laboratory, where staff and students use its large screen as well as immersive technologies such as the Cobra panoramic, curved screen and VR sets to instigate discussion around astronomy data and research. The arrival at AOP of a Leverhulme-funded PDRA previously based at Inter-university Institute for Data Intensive Astronomy in South Africa has allowed AOP to further investigate the use of immersive technologies not only in outreach but also in research. For instance, a particularly promising avenue concerns the agile exploration of the result of complex cosmological simulations for galaxy formation.



Immersive visualisation for both stars (purple) and gas (yellow) particles (several millions) for a simulated galaxy cluster, showing an array of gravitational and hydrodynamical processes affecting galaxy formation.

Finally, AOP continues to be committed to promoting the career development of its researchers, the integrity of its research as well as inclusion, diversity and equal opportunities in research. For this AOP has followed up on several actions for the Concordat to Support the Career Development of Researchers (see 2023-24 Annual Report), including reaching out to QUB to receive the latest training in research integrity, continuing to offer AOP's Öpik fellowship as an opportunity for progression towards independent research, supporting students and researchers development through travel funding to conferences and workshops and promoting their research with contributions to AOP's Management Committee. Besides the aforementioned QUB training opportunities, in terms Research Integrity Concordat AOP has also updated its own policies on research integrity and misconduct to the standard needed by UKRI, had internal student training on plagiarism and discussion on personal experiences of research misconduct. Finally, AOP research staff and students continue to be involved in the organisation wide Equality Diversity &Inclusion working group, and already participated in the Institute of Physics (IoP) meetings outlining the path for AOP in the new Physics Inclusion Award run by the IoP.

Research Highlights

To provide a practical understanding of how the work of AOP research contributes to the region's international reputation and understanding of the cosmos, the following provides some highlights of the research undertaken at AOP in the financial year. This draws from international collaborations and the award of observing time on highly competitive facilities, as well as direct support from the Department allowing AOP to participate in several key international projects (such as SALT, GOTO, IST, I-LOFAR, Comet Interceptor, CTA and BlackGem). Full bibliographic references can be found in the publication list appended to this report.

Stellar and Galaxy Evolution

Introduction

When we look up on a dark night, we may think that stars are immutable and isolated. Yet, although stars can live for as long as the age of the Universe, they can also undergo dramatic changes in a matter of seconds. They are also not isolated from other stars. Some are found in pairs or tight groups and more generally stars are related to each other through the very way in which they form and evolve. Stars are born from giant clouds of gas and return matter to those clouds, seeding the birth of new stars as they fade away or sometimes explode in dramatic events. Furthermore, stars produce the heavy elements necessary for the formation of rocky planets and of life as we know it.

In turn, the formation history of stars relates to the formation and evolution of the galaxies that contain them. Some galaxies no longer appear to form stars, unlike the case of the Milky Way. This may depend on whether fresh gas is available around them, on whether they have collided with other galaxies in the past or possibly also on whether their central supermassive black hole suddenly becomes active and pours out tremendous amounts of energy capable of clearing its host galaxy of any star-forming gas material. Finally, galaxies are carried by the general expansion of the Universe and the evolution of the dominant, yet unknown dark-matter material in which they themselves are embedded. Understanding the formation and evolutions of stars and galaxies therefore ultimately means understanding our origin in relation to the very fabric of the Universe.

Recent results
AOP stellar studies range from the most massive and brightest young stars to the faintest and ageing stars or stellar remnants such as white dwarfs and black holes.

The research led by Professor Jorick Vink is both theoretical and observational in nature and is supported by grants from STFC. The theoretical work is focused on understanding the formation and evolution of the most massive stars

and stellar black holes in the Universe - objects that can shine up to ten million times brighter than our Sun. A key area of investigation concerns pair-instability supernovae, a rare type of stellar explosion in which the entire star is disrupted. These events play a crucial role in enriching galaxies with heavy elements, potentially contributing more to galactic chemical evolution than all lower-mass stars combined. Recent work led by Professor Vink, together with PhD student Ethan Winch and postdoctoral researcher Gautham Sabhahit, has revealed that the most massive stars in our Milky Way undergo significant mass loss through strong stellar winds, effectively "evaporating" over time (Vink et al. 2024). However, in more pristine, metal-poor galaxies - such as those probed via gravitational wave detections - these stars retain far more of their mass (Winch et al. 2024), with important implications for the formation of massive black holes. On the observational front, Professor Vink is the Principal Investigator of the ESO-VLT Large Programme *X-Shooting ULLYSES (XShootU)*. This international collaboration brings together around 100 experts in massive star astrophysics to study the stellar properties of massive stars in the low-metallicity environments of the Large and Small Magellanic Clouds. These galaxies serve as nearby analogues to the early Universe, offering critical insights into the nature of the very first stars, which are thought to have been extremely massive. In the past year alone, the XShootU programme has produced 10 peer-reviewed publications.

More than 90% of stars will end their lives as white dwarfs - stellar remnants with a mass comparable to the Sun but compressed to the size of Earth. These objects are incredibly dense (imagine compressing a car down to the size of a coin) and they exert an intense gravitational force. We know that remnants of planetary systems once orbiting these stars eventually fall onto the white dwarf's surface. Many white dwarfs also have strong magnetic fields. A team led by staff astronomer Stefano Bagnulo previously discovered a case in which the magnetic field was channelling the accreting planetary debris onto specific regions of the white dwarf. Building on that work, the same team led by Bagnulo has now shown that this magnetically guided accretion is common in the universe. Bagnulo, together with visiting astronomer John Landstreet, also studied the magnetic field properties of white dwarfs and made another important finding: as magnetic white dwarfs age, their magnetic fields tend to align with their rotational axis. While unexpected, this result confirms a theoretical prediction from the early 1970s that had never been observed before.

An artistic impression of a magnetic white dwarf surrounded by the remnants of a planetary system.

Stars may pass through several stages after leaving the long-lived hydrogen-burning phase and becoming white dwarfs. Many become red giants, and a few become hot subdwarfs. Professor Simon Jeffery and his team study the latter, including stars that are in transition from one to another. Some hot subdwarfs evolve to become white dwarfs and show large-amplitude pulsations; AOP is at the forefront of theoretical studies of these stars; including hydrodynamical simulation of their oscillations (*Jeffery 2025*). An AOP survey using SALT to study peculiar hot subdwarfs has discovered stars with surfaces which are excessively rich in unusual elements such as lead, extremely deficient in hydrogen and most metals (*Jeffery et al. 2024*), or show extremely strong magnetic fields of a few hundred kiloGauss (*Dorsch et al. 202*4) (30 times that of an MRI scanner). The team is working to discover whether the chemical excesses are of nuclear origin or due to the formation of thin clouds in their atmospheres (*Scott et al. 2024).*

Looking further in the Milky Way, the Carina Nebula complex is a spectacular star-forming region located at 2.3 kpc, which is close enough to observe different size scales in detail. With more than 65 O-stars and more than 900 young stellar objects identified it is also the nearest analogue of more extreme star forming regions, such as 30 Doradus. The results of a major effort to study the relationship between the different gas phases in the Carina region

from 100 pc to 0.01 pc using the Australia Telescope Compact Array (ATCA), the Mopra telescope in Australia and the ALMA telescope in Chile were presented at the IAU General Assembly in Cape Town in August 2024. This is a collaboration between Chilean astronomers David Rebolledo and Guido Garay, Australian astronomer Anne Green, and Professor Michael Burton at Armagh. At large scales, CO images combined with far-infrared data from Herschel revealed the overall molecular mass and its distribution across the Carina complex. An extremely detailed map of the HI 21-cm line across the whole nebula revealed a complex filamentary structure in the atomic gas, which allowed the identification of regions where phase transition between atomic and molecular gas is happening. An ATCA 1-3 GHz radio continuum image across the whole Carina region revealed a complete and spectacular view of the ionized gas in the region. At small scales, ALMA high spatial resolution observations of molecular line tracers and dust showed that the level of stellar feedback effectively influences the fragmentation process in clumps, and provides further evidence for a higher level of turbulence in the material with a higher level of massive stellar feedback.

This work is also close to the research of AOP's previous Öpik Fellow, Dr David Eden, who was in post until December 2024. He was utilising data from multiple JCMT Large Programs to investigate the causes of star formation in the Milky Way. These Large Programs investigate multiple stages of the star-formation process from the formation of new molecular clouds (the sites of star formation; *Rani, Li, Moore, Eden et al., 2024*) to the role dense-gas (the gas most closely aligned to star formation) takes in the earliest stages of star formation; (*Eden et al., 2024*). *Eden et al. (2024)* calculated the physical properties cold cores identified by the Planck survey and determined that they were indeed tracing the youngest sites of star formation and are a distinct population of Galactic Plane surveys. *Rani et al. (2024)* investigated the kinematics of molecular clouds in the Galactic Plane and their findings suggested that the Galaxy was not impacting the rotation of these clouds, but instead it was the imprint of the processes that formed these clouds. Further JCMT data was utilised to investigate the star-forming conditions in the Galactic Centre and the amount of star formation was found to be low (*King, Moore, Henshaw, Longmore, Eden, et al., 2024*), with the magnetic fields hinted at as the cause of this (*Yang, Lai, Karoly, Pattle, Lu, Eden, et al., 2025*).

Finally, linking to external galaxies, Professor Marc Sarzi's long standing interest in central supermassive black holes (SMBHs) resulted in several papers within the WISDOM collaboration, which focuses on the study of galactic nuclei using ALMA observations for the molecular gas in these regions. This particularly cold phase of the interstellar medium can indeed lead to accurate black-hole mass measurements as it is often found in relaxed and regularly-rotating gaseous disks, allowing us to follow very well the gravitational pull that stars and supermassive black holes have on such gas clouds near the centre of a galaxy. Taken together with the spectacular angular resolution of ALMA, comparable if not superior to that of HST, these observations allow to trace molecular gas clouds moving around central SMBHs as the planets do around the Sun, leading to relatively straightforward and very precise measurements for their mass. This was further demonstrated In *Zhang et al. (2025)*, which set the current record for the accuracy for the mass measurement of a SMBH in external galaxies, to just 5% and exceeding the gold standard set by measurements based on rare water mega-masers disks. Considering how common nuclear disks of molecular gas are, this is a promising avenue for completing the census of nearby SMBHs and further elucidate their role in galaxy evolution.

The role of SALT

The Southern African Large Telescope (SALT) is the largest telescope in the Southern Hemisphere, providing unparalleled access to the skies for its shareholders. Participation in this major international facility brings visibility throughout the worldwide research community and AOP is presently the only UK research institution to engage in collaborations with other SALT international partners, as the last holder of shares in UK SALT Consortium. Through such partnerships, AOP receives a return in terms of telescope time allocation that is equivalent to roughly 10 times its contribution. For instance, over the years a unique programme led by Professor Simon Jeffery at AOP has obtained over 1000 observations of nearly 700 objects, targeting some of the most exotic stars in the Universe and exploring their abundance in key elements such as hydrogen, helium, carbon, oxygen, and iron, as well as rarer elements such as lead and zirconium. These data contribute to a growing series of discovery papers and to the training of postgraduate research students at AOP. As the last standing organisation in the UK with shares in SALT, AOP has now a unique opportunity to promote both scientific and economic advantages in using this telescope to both the UK and Irish astronomical communities, creating further partnerships opportunities for AOP.

The 10-metre diameter Southern African Large Telescope (SALT), in the semi-desert region of the Karoo, South Africa.

Transient stars and Transiting exoplanets

Astronomers from the ancient world detected new stars, "novae" or "supernovae", which suddenly appeared in the night sky and then gradually faded from view over weeks or months. We now know that many of these "transient" events occur when one star circling a companion star unloads enough matter through the process of "accretion" to its companion to make it explode. These Supernovae 'Ia's have now been used to show the universe is expanding at an accelerating rate. However, astronomers are not sure what kind of star the companion is in these events.

It is now 30 years ago that the first planet was discovered around a regular star – an exoplanet. We now know that most stars host planets. The most common means for discovering new exoplanets is a called the *transit method* where an exoplanet has the right orbit inclination to cause a slight dip in a star's brightness once every exoplanet year. To determine the mass of the transiting body, high resolution spectroscopy is required to determine its radial velocity since the body could be a very low mass companion star or a brown dwarf whose mass is not quite high enough to start nuclear burning in its core.

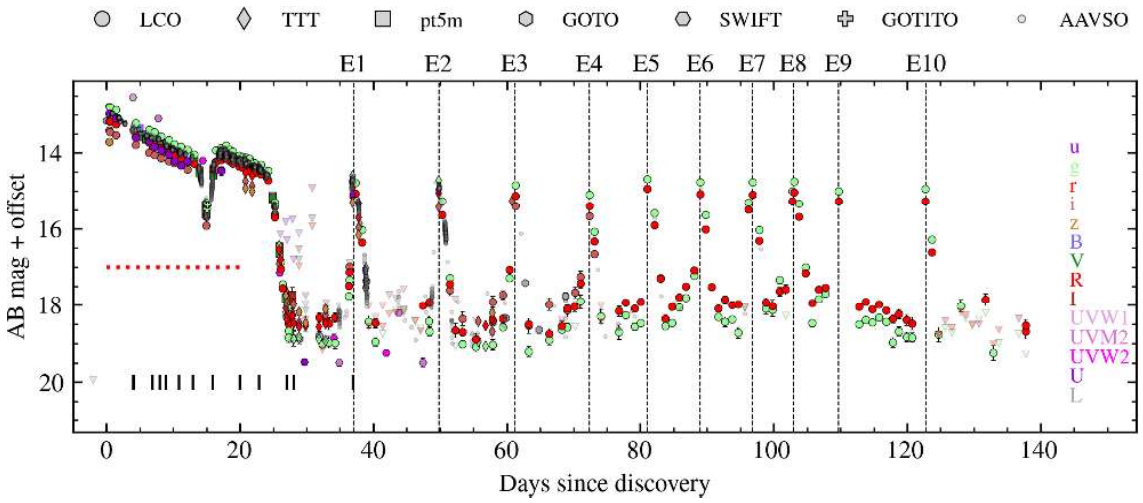
Recent results

AOP is a founding partner of the international project the *Gravitational-wave Optical Transient Observer* (GOTO) whose prime goal is to detect the optical counterpart of gravitational wave events such as the neutron star binary merger GW170817. AOP's contributions are led by Professor Gavin Ramsay. Since April 2023, the GOTO telescopes have been operating remotely and routinely from the island of La Palma in the Canaries and New South Wales in Australia. GOTO images the whole observable sky every few nights and is ready and waiting for new gravitational wave events made by Ligo and Virgo. In the meantime, GOTO has discovered more than 2000 supernovae in distant galaxies as well as outbursts from Galactic compact binaries and other variable stars. In *Warwick et al (2025)* GOTO reported on SN 2023tsz which is a rare sub-type of stripped-envelope core-collapse supernovae in a very low-mass galaxy; and in *Pursiainen et al (2025)* the discovery of AT 2024wpp which is a very luminous supernova with high velocity outflows.

The GOTO Consortium have also developed an education programme called Kilonova Seekers where people around the world can gain insight to how science is done but also make contributions to astronomical research. Kilonova Seekers have already discovered several dozen new supernova but have also made a spectacular discovery of an outburst from a previously unknown large amplitude accreting binary, GOTO0650, in our Galaxy. With the help of amateur astronomers, we were able to detect a series of ten echo outbursts after the main outburst had ended. Such observations allow theoretical models of accretion discs to be tested in detail. Other wide field surveys such as ZTF have been used to study the outburst characteristics of another class of accreting binaries called VY Scl stars *Duffy et al (2024)* and X-ray observations have been used to confront the number of accreting binaries with theoretical models *Rodriguez et al (2025)*.

Ramsay also works with colleagues in the New Generation Transient Survey (NGTS located in Chile) project together with data obtained from the TESS satellite to discover and characterise exoplanets. These include NGTS-29b which orbits its Solar analogue star every 69 days *Gill et al (2024)*; NGTS-33b which is a young super-Jupiter planet orbiting every 2.8 days around a rapidly rotating hot star *Alves et al (2024)* and NGTS 31b and 32b which are two hot Jupiter-

like planets orbiting evolved sub-giant stars (Vines et al 2025). Ramsay is also the ESA Plato Community Scientist and member of the Plato Science Working Team whose main goal is the detection of Earth sized planets around the habitable zone of Solar type stars and is due to be launched towards the end of 2026.



GOTO0650: Showing how the brightness of this newly discovered accreting binary evolved since its discovery in October 2024. These repeat outbursts provide important tests of models which predict how accretion discs change over an outburst.

Stellar Activity

We have known for many years that the number of sunspots varies on an eleven-year timescale. We can also infer the presence of spots on other stars (starspots) because as spots rotate into view, the star appears to dim since these spots are cooler than the rest of the star. The Suns' changing activity can also be traced by other means including measuring the characteristics of specific spectral lines. As timescales are expected to be years, finding evidence for stellar activity cycles on other stars takes time to emerge. Systematic and regular spectroscopic observations of Solar-like stars began during the 1960's with a focus on using the Calcium lines as an activity indicator. Subsequent studies using data such as these showed that other stars exhibit activity cycles on a similar timescale to the Sun. For lower mass stars, an activity cycle of~7 yr was detected in the star nearest to the Sun, Proxima Centauri using optical, UV and X-ray observations.

Gavin Ramsay, Professor Gerry Doyle and colleagues continue to study activity on low-mass stars and Solar type stars using data from the *TESS* satellite and ground-based telescopes such as the 10.4m Gran Telescopio Canaries on La Palma. Recently they have used data from *TESS* to search for activity cycles on low mass stars (less than half the Sun's mass). In particular, they measured the amplitude of the rotational modulation over time of several thousand stars which were observed in the *TESS* continuous viewing zones and searched for evidence that stars showed a systematic trend in the amplitude of rotation over time. They found 26 low mass stars which showed such a variation making them candidates for exhibiting stellar activity cycles of several to many years (Ramsay, Hakala & Doyle 2024). In another paper, Ramsay along with colleagues, King et al (2025) used X-ray observations to search for long term variations in the X-ray brightness of the binary DS Tuc which has two active stars.

Solar System Studies

Introduction

Our Solar System is an extraordinary natural laboratory to study the formation and evolution of planetary systems around the Sun and other stars. AOP feeds into fundamental questions about how the Solar System and the Earth formed and the development of life in the Universe. Our study of comets, asteroids and planets impacts on models of solar system formation, the ever-present hazard to civilization if asteroids or comets hit our planet and on the origin of water and organic compounds necessary for life to exist. The space industry benefits from improved detailed knowledge and understanding of the near-Earth and interplanetary environment.

Recent results

The Rubin telescope, seen here under the glittering light of the Milky Way at the Atacama Desert in Chile. The facility is expected to begin commissioning operations in 2025.

Dr Apostolos Christou reported the successful recruitment of a PDRA to work on a project funded by a Leverhulme Trust research grant. The project aims to develop advanced Artificial Intelligence tools that will be used to sift through the huge volume of asteroid data expected from the Rubin telescope. Dr Alexander Sivitilli joined AOP on the 1 January 2025 and has been working to develop software for AOP's Data Visualisation Laboratory facility and to incorporate the latest datasets on asteroid properties into the DVL astrophysical databases suite. Sivitilli has also been working closely with PhD student Andrew Marshall-Lee in developing Artificial Neural Network (ANN) algorithms, with a view to apply them to the problem of finding families of asteroids created by ancient collisions in the main Belt of asteroids between Mars and Jupiter. Collisions are a fundamental driver of planetary system evolution and applying the new algorithms to the Rubin data promises to reveal the 4 billion year history of our solar system in unprecedented detail.

The 15,000 asteroids known to cross the Earth's orbit – known as near-Earth asteroids – are as prone to breaking up as their counterparts between Mars and Jupiter. However, their orbits frequently bring them close to the Earth and the gravity of our planet scatters them onto completely different orbits like a cluster being struck by the cue ball in a pool table, creating an additional challenge to the problem of finding families among near-earth asteroids. In a paper published in Monthly Notices of the Royal Astronomical Society, PhD student Alice Humpage and Apostolos Christou carried out numerical simulations on the in-house *Sirius* computer cluster with the aim to quantify the scattering rate for NEAs. An important finding of the work is that this rate varies across the different orbit types, with orbits strongly tilted to the ecliptic plane being the least prone to the scattering and suggesting that a search for families should prioritise asteroids in the less-affected orbits. Another significant outcome of the work is that the scattering growth over time can be approximated by a simple mathematical function, potentially providing a method to date the families.

Shooting stars, also known as meteors, are caused by bits of debris from space burning up high in the atmosphere. Their observation allows astronomers to map out the debris distribution along the Earth's orbit and even determine which comet or asteroid they may have come from, a 'poor man's sample return'. Since the time of Ernst Öpik, Armagh has been a leading centre of meteor research. In a recent study published in the journal Icarus, Apostolos Christou and Maria Gritsevich (University of Helsinki, Finland) ask the question whether meteors could be observed in the atmosphere of the neighbouring planet Venus. In the study, Christou and Gritsevich found that, on average, an observer would see about twice the number of meteors on Venus than on Earth, making our neighbouring planet the better place to do meteor astronomy. In the future, cameras placed in orbit around Venus and looking down on the nightside would allow astronomers to study the space debris populations at two different locations in the solar system. This work also generated a popular article in Universe Today, a space and astronomy news site.

Finally, polarimetry is a special technique that analyses the light and can be used as a powerful remote sensing tool and which, when it comes to Solar system studies, can reveal the size and composition of asteroids. Bagnulo secured funding from the European Space Agency (ESA) to use polarimetry for the monitoring Near-Earth Asteroids (NEAs), a key component of ESA's planetary defence strategy. Understanding the size and trajectory of NEAs is critical, as these objects could potentially impact Earth. Funding was used to recruit a PhD student who will start in October 2025.

Education and Community Outreach

Planetarium
AOP is a unique institution that brings together cutting-edge research and public engagement, all within a heritage-rich environment steeped in scientific legacy. Its public programme is built on four foundational pillars: education, inspiration, entertainment and outreach. Established in 1968, the Planetarium is internationally recognised as a pioneering centre of excellence dedicated to advancing public understanding of science.

At the heart of the Planetarium's mission is the education and dissemination of scientific and astronomical knowledge. It serves a broad and diverse audience – from young children to older adults – through its comprehensive school's programme and dynamic public outreach initiatives. Whether onsite or offsite, AOP is committed to making astronomy and science accessible, engaging and inspiring for all.

AOP offers a comprehensive education programme designed to inspire and inform individuals about astronomy and space science. This includes an onsite school's programme tailored for all educational levels from Nursery through to Third Level, engaging students with interactive workshops and immersive fulldome experiences. These sessions explore Earth, space, and the physical sciences, sparking interest in STEM subjects. For schools in the Republic of Ireland, a Junior Cycle programme provides modular content aligned with the national curriculum, allowing teachers to select topics that best suit their classroom needs.

In recent years, AOP has significantly expanded its outreach efforts, supported by external funding and the establishment of a dedicated Tours and Outreach Officer role. During 2024-25, we delivered a wide-reaching outreach programme across Ireland's border counties, fully funded by Science Foundation Ireland. A parallel initiative, supported by the UK Space Agency, brought science engagement to schools across Northern Ireland. These efforts resulted in our highest-ever offsite engagement figures, reaching approximately 25,000 individuals through school visits, science festivals, and community events including sessions for groups such as Scouts. This represents a marked increase from the 11,000 people reached during 2023-24. We are committed to continuing outreach as a core activity, particularly for schools unable to visit our facilities due to geographical constraints. Outreach will also remain a key part of our involvement in science festivals and special events. Special credit goes to Dr Rok Nežič, AOP's Tours and Outreach Officer, who coordinated and delivered the majority of the programme, travelling across Ireland in our electric van to make science accessible to communities far and wide.

In 2024-25, AOP launched *Space Cadets*, an after-school STEM education programme designed for children aged 7 to 11. Delivered as themed, one-hour weekly sessions, the initiative aims to spark curiosity and build lasting interest in space science. Initially funded by the International Astronomical Union, *Space Cadets* has proven highly successful, and we now aim to sustain and expand it beyond the original funding period. The education team also ran *Little Astronomers*, a monthly club for pre-school children, which consistently sold out, highlighting the strong demand for early years science engagement. AOP also took part in global initiatives such as *One Hundred Hours of Astronomy*, hosting afternoon solar viewing sessions that attracted a wide range of visitors. This experience underscored the untapped potential of afternoon programming for families and special interest groups.

With our education programme at full capacity and bookings consistently high, there is clear scope to grow our afternoon offerings, catering to both after-school audiences and adult learners. However, it is worth noting that while school visitor numbers remained strong overall, we did experience a number of cancellations due to teacher strikes and disruptions in public transport services provided by Translink. Additionally, the education team hosted two placement students from Stranmillis University College. These placements not only support teacher training but also enrich our programme by bringing in fresh ideas and new approaches from future educators. We also had a Tourism and Hospitality placement student from Monaghan Institute with us for two weeks.

Another key funding source in 2024-25 was the ASDC *Bold Futures* programme, through which the Planetarium partnered with local autism support groups to make astronomy more accessible for neurodiverse students. This initiative builds on the success of our 2023-24 project and reinforces our ongoing commitment to inclusive science education. In addition, we offer tailored shows in Makaton, British Sign Language (BSL), Irish Sign Language (ISL), Irish and Ulster Scots, ensuring that diverse linguistic and communication needs are met.

A milestone this year was the hosting of our first fully *Accessible Day* in March 2025 which was an event designed to welcome visitors that need quieter spaces, lower volumes and reduction of people on the premises to ensure queuing is at a minimum. Due to its success, a new series of Accessible Sundays will now take place quarterly as a regular feature of our public programming.

Accessibility remains a core priority at AOP. Our goal is to be as inclusive as possible, ensuring everyone has the opportunity to experience the wonder of the cosmos making us a "space for all." We host monthly dome shows in both BSL and ISL, including our popular *CapCom Go* film. This year, we expanded our interpreted content to include *Perfect Little Planet*, a children's tour of the solar system, offering greater value for both school groups and public audiences. In addition, we provided BSL and ISL interpretation for our live Christmas experience *Mission Santa*, as

well as our festive dome show *The Alien Who Stole Christmas*. Further advancing our accessibility, we added Makaton signing to *Astronaut George*, a dome show that launched in May 2024. Thanks to ASDC funding, Education Officer Mark Grimley also introduced Makaton signage throughout the building, improving communication support for non-verbal visitors.

Monthly relaxed dome show sessions are now a standard part of our programme, alongside relaxed workshop sessions designed to create a welcoming and supportive environment for all visitors, particularly those with sensory sensitivities. We have renewed our JAM (Just A Minute) Card registration, and all front-line staff are now trained to recognise and support JAM Card users. In addition, our team has completed Level One Makaton training, further enhancing our ability to communicate inclusively. Our sensory bags which were developed in collaboration with the *Bold Futures* forum and made possible through funding from the ASDC *Bold Futures* initiative have been very well received. These resources have proven invaluable for schools and families, helping to create a more comfortable and accessible experience for neurodiverse visitors.

Our stargazing nights continued to be a major success in 2024-25, regularly reaching full capacity. Prominent astronomical events such as the planetary alignment, generated high public interest and provided valuable insights into audience demand. While many nights were affected by cloudy weather, we maximised the visitor experience by offering alternative activities, including simulated night sky sessions in the dome.

This year also marked the pilot of corporate dome hire for music and wellness events, with highly positive outcomes. *Mesmerica*, an immersive audiovisual experience, delivered by an external company, has expanded our corporate hire portfolio and attracted return visitors to other AOP programmes. *Sound Journey Under the Stars*, a relaxation and sound therapy session hosted by another external provider, has further showcased the Planetarium as a distinctive venue for alternative experiences. These external events are scheduled in addition to AOP's core programming and represent a growing area of opportunity. While we receive support via an events tender, it is important to acknowledge that coordination of both public events and corporate hire which is overseen by Senior Education Officer Ria McDonnell. Ria plays a vital role in maintaining communication, overseeing existing plans, and proactively seeking innovative new event opportunities to enhance the Planetarium's offerings.

To enrich the visitor experience and make greater use of our outdoor space, we launched a new children's Eco Trail featuring a workbook, sculptures, interactive clues, and an augmented reality (AR) app. In addition, an adult-focused AR app offers a guided tour of the grounds and Observatory, providing a more in-depth educational experience. This new initiative was a cross-departmental effort developed over the past year, and it has already proven successful in increasing visitor dwell time and engagement particularly on sunny days with positive feedback from both locals and tourists and the grounds are highly active! We also arranged a successful series of public events centred around the Calver Dome, which was opened to visitors for the first time in this format. These fully booked sessions included presentations and Q&A opportunities led by our PhD students, offering the public a rare chance to engage directly with current astronomical research and the people behind it.

Although our summer season did not meet projected targets or match the figures from the previous year, it remains encouraging when compared to pre-Covid benchmarks. Visitor numbers were 20% higher than those recorded in 2019, demonstrating sustained long-term growth. In contrast, many other visitor centres across the UK and Ireland reported an average decline of around 8% compared to 2019 levels. Insights shared at recent Tourism Northern Ireland (TNI) and ASDC conferences confirmed that this dip in summer 2024 attendance was part of a broader trend affecting the wider visitor attraction sector throughout 2024-25. In this context, our performance remains strong and resilient.

We are pleased to report the successful outcome of a funding application for the Northern Ireland STEM Ambassadors programme, securing a two-year contract to establish AOP as the official STEM Ambassador Hub for Northern Ireland. This funding, which totals approximately £200,000 over two years, has enabled the recruitment of a dedicated Project Manager and Admin Officer, both now in post to support effective programme delivery. As the regional hub, AOP will play a central role in connecting schools and community groups with STEM Ambassadors, offering pupils opportunities to engage with real-world professionals and explore the diverse range of STEM careers available. This initiative will significantly enhance our links with industry and raise AOP's profile within the STEM education and outreach sector across Northern Ireland. Over the course of the two-year programme, we aim to strengthen and support a growing network of thousands of volunteers, who will help bring STEM to life in classrooms, colleges, and universities. Through inspiring careers events, hands-on activities and inclusive outreach, we will work to challenge stereotypes and open young minds to the endless possibilities of a future in STEM.

This year, the Education Team experienced the temporary and permanent departure of three senior staff members due to maternity leave, a career break, and relocation for new employment opportunities. In response, we successfully completed recruitment for two key roles: Operations Manager and Education Assistant. Additionally, we introduced a new post of Theatre Producer and Astronomy Communicator to support the development of innovative programming and storytelling within the dome. We are delighted to welcome Jessica Moon as our new Operations Manager, Emma-Jayne Malcolmson as Education Assistant, and Kerem Çubuk to the newly created role of Theatre

Producer and Astronomy Communicator. Their appointments bring fresh energy, ideas, and expertise to the team, and we look forward to the contributions they will make to AOP's continued growth and success.

The addition of a dedicated Digital Theatre role with expertise in dome content creation and collaboration with external partners has already proven to be a significant asset to AOP. In his new role, Kerem Çubuk has actively contributed to revenue generation through external dome show production, most notably with the development and sale of the *Sound Journey Under the Stars* dome experience. AOP was also commissioned by the European Space Science Committee (ESSC) to produce a bespoke planetarium show celebrating 50 years of European space exploration. This commemorative show marks the anniversary of the formation of the European Provisional Space Science Advisory Board in April 1974, which ultimately led to the creation of the European Space Agency (ESA). The show premiered at the Strasbourg Planetarium on 16 April 2024 as part of a high-profile gala event.

In addition to external productions, Kerem has significantly enhanced AOP's internal offerings. He reimagined our flagship presenter-led show, *Look Up: Our Night Sky*, by designing a new user interface featuring custom control panel pages. This innovation offers greater flexibility for presenters and allows for a more tailored, dynamic delivery of content. Furthermore, Kerem collaborated with Lovisa Redpath to create a brand-new toddler dome show titled *Our Wee Planets*, which has quickly become a favourite with our pre-school audiences. This charming and engaging programme is now a staple of our weekend and school holiday schedule and proudly a home-grown AOP original.

One of the standout moments of the year was the visit of NASA astronaut Cady Coleman on 19th September, made possible through our valued connection with the US Consulate in Belfast. A distinguished chemist and engineer, Dr. Coleman has flown on two Space Shuttle missions in 1995 and 1999 and spent 159 days aboard the International Space Station during her 2011 mission. Notably, she played a key role in deploying the Chandra X-ray Observatory during her 1999 flight. We were honoured to welcome students from four local schools to attend her inspiring talk, delivered under the Planetarium dome. Her first-hand accounts of life in space and the future of exploration captivated the audience and left a lasting impression on all who attended. Dr. Coleman also made a surprise appearance at the UK Star Formation Workshop taking place at AOP that same day, where she gave a brief but impactful presentation. Remarkably, several of the visiting scientists at the workshop had used data from the Chandra X-ray Observatory in their own research, creating a special moment of connection between astronaut and astronomers.

A range of other inspiring events took place throughout the year with highlights including the Engineers Open House Weekend, featuring hands-on rocket-making activities, and the Our World from Space Saturday Club, a monthly programme engaging young people with space science and environmental themes. We collaborated with Armagh City, Banbridge and Craigavon Borough Council for events as part of the Food and Cider Festival, and welcomed families to take part in orienteering in the Astropark during February Half-Term. Special public events such as *First Light: 230 Years of Observations from Armagh* and the European Open Heritage Day, which gave visitors a chance to experience the historic Calver Telescope, were particularly well received. We also hosted *Our Planet and the Universe*, an event held as part of the IAU's 100 Hours of Astronomy global celebration, and continued our Data Visualisation Laboratory (DVL) sessions with the astronomers interacting with visitors to the Planetarium, bringing data-driven learning to life. Other standout events included a full-day Scouts Takeover, during which the organisation booked the Planetarium exclusively and delivered a bespoke programme of shows and workshops for its members.

Finally, our staff proudly participated in the ASDC Annual Meeting, delivering presentations that showcased the innovative and impactful work being carried out at AOP and reinforcing our position as a leading science communication centre.

History and Heritage

History and Heritage Policy

AOP boasts a collection of over 34,000 historic documents, rare and antiquarian books, scientific instruments and photographs, up from 33,000 entries at the start of the financial year. This collection is unique on the Island of Ireland and one of the best-preserved observatory collections in the United Kingdom. The heritage policies implemented ensure that the collection is cared for in accordance with best practice and has allowed ongoing historical research. AOP remains represented on the Board of Directors of the Northern Ireland Museums Council by the Museum Collections Officer who began their three-year term in September 2023.

The eMuseum has 16,406 objects available for public viewing on the armagh.space website and also on the newly launched Museum Data Service. The Planetarium display cases have hosted one loaned in exhibition 'The Drawings of the 3rd Earl of Rosse', which launched on 30 January 2025, and was made possible by collaboration within the Astronomical Observatories of Ireland. Two additional exhibitions based on the AOP Historical Collection, 'Cabinet of Curiosities' (curated by students from QUB History after workshops with AOP Museum Staff) and 'From the Library' ran during the year. AOP accepted three donations in 2024-25 including the return of the 1912 Ellison Reflector, made possible by a grant from the Esme Mitchell Trust.

In accordance with AOP's policy of making our collection available for the public and researchers to use we have continued to facilitate public information requests. The 2024-25 financial year brought 31 requests facilitated by the Museum Collections Officer. This included a three week stay by a MA Student at QUB, and several visits by academics from around the world to access the Historical Collection for their own research. AOP has continued to work with the Geography Department of QUB and was awarded funding for a third Northern Bridge Collaborative Doctoral Award PhD to begin in October 2025.

2024-25 saw the final year of the National Lottery Heritage Fund project 'Wisdom Begins with Wonder'. This project was funded to run from May 2022 and it was extended to run until the end of December 2024 and has seen the successful implementation of a volunteer program. Since launching, the volunteer program facilitated over 1,234 hours of voluntary work in AOP, with more volunteers awaiting projects. The position of Museum Collections Officer, which was funded from June 2022 – December 2024 by the project, has been retained on temporary contract to continue the volunteer program, provide access to researchers and maintain the collection. At present the five active volunteers are working on varied projects including academic research, archival work, and preventative conservation. In total volunteers have accessioned 1,148 new objects to the AOP Historical Collection in 2024-25.

AOP continues to publish history related research throughout the 2024-2025 period. This has included the publication of a book commissioned by the International Planetarium Society, '100 Years of Planetaria' (2025). This book featured contributions from four AOP staff members and one AOP PhD Student, as well as one retired staff member. In addition, one academic article and one non-peer reviewed article featured in publications.

Library and Archives

AOP's suite of technical equipment and historic collection is complemented by the finest astronomical study library on the Island of Ireland. The library provides an essential reference resource for AOP research, and especially for its student and young researcher cohort. It contains approximately 3,400 textbooks, monographs, special reports, and conference proceedings covering nearly all disciplines in astronomy. Some 17,000 volumes from nearly two hundred scientific journal titles including nearly complete runs of all the major astronomy journals, as well as journals of significant historical interest.

During 2024-25 the collection has been supplemented by 41 new books on topics relevant to AOP research. Some 20 texts and conference proceedings were purchased with end-of-year funds. Acquisitions also include student theses completed in recent years, and donations by staff and associates of AOP.

The AOP library is a reference library, with materials primarily consulted *in situ*, for which records are not currently maintained. Longer term loans are managed using a digital loan form; such materials are still expected to remain on AOP premises. There were 30 recorded loans in 2024-25. Library returns are maintained by the Museum Collections Officer. No journal binding was undertaken. 12 books have featured in 3 temporary exhibitions.

Whilst still under enormous pressure for space, the AOP library remains an attractive space and a more effective research tool, with potential for further development and revenue generation. It is increasingly demonstrating its potential for historical discovery as well as astronomical research. It has been used for the weekly Student Discussion and for the weekly Research Seminar. It has been used monthly by the Armagh and District History group for their meetings.

Meteorological Record

As part of AOP's primary research role, staff and students take daily readings of a wide range of meteorological parameters at Armagh and maintain the Observatory's unique 230-year meteorological record and databank. This is believed to be the longest daily climate series in the UK and Ireland from a single site (though the log book for the period June 1825 to December 1832 appears to have been lost), as well as being one of the longest in the world. The climate station has been continuously maintained since July 1795 with readings currently taken every day at 09:00 (GMT). The World Meteorological Organisation (WMO) has recognised Armagh with Centennial Station status for its longevity and importance in contributing to the climate record.

The automated weather station (AWS) was installed by the Met Office in 2019, sampling the weather every minute. This now provides the primary source of weather data in the Met Office records (e.g., temperature, pressure, rain fall, windspeed) since it is automatically uploaded to the Met Office. The instruments are inside a second Stevenson Screen within an expanded meteorological enclosure to ensure that the AWS enclosure is identical to those used by the Met Office in their UK-wide network. Manual collection still continues and provides the only source for some of the data collected (e.g. sunshine) at Armagh.

Calibration of these data has enabled researchers and government agencies to use the Armagh series for reports and research into global warming. The data contributes to the UK Meteorological Office's main climate database and are released to the general public on a monthly basis through press releases and on our climate website (https://weather.armagh.space) whilst also contributing to the UK Meteorological Office's main climate database.

Climate change is a subject of strategic importance for Northern Ireland in this era of climate variability. Armagh's unique climate record provides an exceptionally long historical baseline, enabling better informed judgements to be made as to how Northern Ireland's climate has responded and is responding to climate change world-wide. AOP has a movable exhibition on the climate change in the Copernicus Hall, centred around an interactive Puffersphere presentation, together with supporting exhibits which expand on local impacts.

A series of python scripts store, analyse and provide access to the weather data base via the weather webpage listed above. This includes both the manual data as well as the automated weather station data. This takes the monthly observers log, provides a means of entering the information via an online log, and in addition automatically downloads the data received from the automated station, to ingest these data sets into a new database. Analysis scripts then allow this database to be interrogated, e.g. to find climate extrema over any date range of interest. This includes enquiring about weather on any single day (as might be used in a visitor display in the Planetarium), as well as examining the data set over any period of interest and searching for climate records (extrema) over a period of interest. The automated weather station data is available to inspect online, in addition to the manual data. Plotting tools allow the user to see the weather over any time period, as well as to find when extrema in the various measured parameters occurred.

The two new PhD students (Michael Stroet and Ciarán Furey) were trained in October 2024 on undertaking weather observations, and then accredited as Level 1 Met Observers by the Director. This forms part of their PhD training in the techniques of scientific data measurement and analysis. A list of qualified Meteorological Observers, as well as those observers who participated in the daily weather measurements each year, has been added to AOP's weather webpages (see https://www.armagh.space/weather/weather-observers-acknowledgements).

The highest and lowest dry bulb air temperatures recorded from 01/04/24 to 31/03/25 were 25.0°C on 07/09/24 and -5.3°C on 10/01/25, respectively, with the warmest and coldest days (derived from the average of the daily max & min temperatures) being 24/06/24 (19.3°C) and 08/01/25 (-2.6°C). The lowest grass minimum temperature, of -9.9°C, was also recorded on 08/01/25. The wettest day for the year was on 22/11/24 when 35.8mm of rain fell, whereas the sunniest day was 10/05/24 when 13.0 hours of sunshine were recorded.

Armagh experienced two severe winter storms, Storm Darragh on 06/12/2024 - 07/12/2024 and Storm Éowyn on 24/01/2025. While we were spared some of the damage experience elsewhere on the island, nevertheless it had significant impact at AOP, especially in our woodland. A magnificent three-stemmed beech tree lost one of its stems in Storm Darragh and then further major branches in Storm Éowyn, necessitating the need to remove the tree as the remaining trunk was rotten and presented a safety hazard. We estimate that this beech tree was about 300 years old, so pre-dating the foundation on the Observatory.

During Storm Éowyn the maximum wind speed recorded by AOP's Automated Weather Station was 35 m/s, which occurred at both 08:08 and 08:28 on 24/01/2025. Winds speeds in excess of 15 m/s were recorded virtually continuously from 03:45 in the morning to 15:15 in the afternoon. These are measured using the station's Robinson Cup anemometer. The pressure fell to 969.6 hPa that day, the second lowest recorded during the year (with the lowest reading of 965.9 hPa recorded 2 days later on 27/01/2025).

A meteorological event of a quite different nature was recorded in February 2025 with a near absence of sunshine over an extended period. From 08/02/2025 to 18/02/2025 less than 0.2 hours/day of sunshine was recorded each day by the Campbell-Stokes sunshine recorder, with a grand total of just 30 minutes sunshine measured over this entire 11 day period.

Support

AOP is committed to ensuring fit for purpose governance and support services to support the delivery of organisational objectives.

Information and Communications Technology (ICT)
ICT is fundamental to the delivery of AOP's mission as a leading scientific organisation and its operational and strategic goals. ICT operates in a fast-changing environment and it will always be the aim to provide the best service and equipment within the resources available.

An ICT Strategy 2024-2028 was approved in March 2025. Progress against the targets will be reported to Audit and Risk Assurance Committee (ARAC) each quarter.

At an organisational level, the ICT Strategy will pursue the following outcomes to support this delivery:

- Protect the users, systems, data and reputation of AOP;
- Facilitate in-office and remote working;
- Facilitate cloud computing where practical and economic;
- Provide backup to recover from critical data loss;

- Provide cyber security compatible with supporting operational needs;
- Provide ICT training, support and assistance to users;
- Manage the ICT network across AOP;
- Renewal and/or repair of ICT equipment at AOP.

ICT is required to provide an overarching support structure to ensure fit for purpose technology and systems that facilitate the needs of research, education, heritage and corporate services, planning for the future, whilst at the same time protecting against risk.

AOP continues to modernise and improve its centralised ICT hub. All devices are now managed using Intune and are secured using multi-factor authentication and device registration. Auto patching of all Linux, Windows and Mac devices has reduced our exposure to cyber-attack. The focus now moves to software run on the devices as the next level of risk develops.

The biggest risk to AOP still remains user error through clicking on malicious links in emails. AOP mitigates this through regular reinforcement of messaging and a focus on continuing to educate users in best practice and system etiquette.

Finance
AOP has a well-established finance function. Financial policies and procedures are continually being enhanced to ensure that AOP meets the governance standards required. This includes the application of public sector procurement controls, meeting prompt payment targets and providing regular and ad hoc financial information within AOP and to DfC.

AOP continues to experience significant cost pressures within a core budget that has remained relatively static for 7 years.

Human Resources
A Human Resources Strategy 2022-26 has been developed and approved and is supported by an annual Human Resources Action Plan. The 2024/25 plan has been implemented to include:

- Maintaining a Fit for Purpose Organisation Structure – review of the skills-gap paper and workforce planning papers in light of available budget and future needs; completion of necessary recruitment and training in a timely matter and identifying short term opportunities to plug skills gaps with short term projects or engagements;
- Continual review of Operating Models – supporting the Head of Education & Outreach in recruitment and retention of staff and reviewing staffing needs in the context of budgets and affordability.
- Employing and Investing in Motivated and Engaged Staff – supporting the annual appraisal process; completing/revising a rolling training plan; reviewing implementation of training plans in the context of available budget; preparing a case for award of a special bonus scheme; preparing for engagement events and supporting the health and wellbeing of PhD students; and
- Fair and Equitable Employment Policies and Procedures – completion of the annual Fair Employment return, retention of Bronze Diversity Mark Award, review of policies, and induction and refresher training as required.

Diversity and Inclusion
AOP has an obligation under Section 75 of the Northern Ireland Act to ensure that equality of opportunity and good relations are central to policy making, policy implementation and review as well as service delivery. AOP monitors the composition of its workforce in terms of community background and sex and uses an equal opportunities monitoring form questionnaire. AOP submits an annual Fair Employment Monitoring return to the Equality Commission detailing staff composition and that of job applicants to AOP posts.

In the AOP Strategic Plan 2021-26 we state that having Fair and Equitable Employment Policies and Procedures is one of our key elements in delivering high standards. AOP has a number of policies in place including an Equal Opportunities Policy. We have also agreed a new ED&I Strategy & Action Plan 2025-2028 which incorporates a number of actions including reviewing, monitoring and training in policies and practices.

AOP currently holds the Diversity Mark NI Bronze Award and we continue to work through our targets as follows:
- To develop an Equality, Diversity and Inclusion Strategy;
- To increase the number of female research staff at AOP from 2 to 4; and
- To increase female representation on the AOP Management Committee from 3 to 5.

AOP retained Juno Practitioner status in August 2023. This is an award scheme that recognises and rewards university physics departments, schools of physics, and related institutes and organisations that can demonstrate

they have taken action to address gender equality at all levels and to foster a more inclusive working environment. In June 2024 AOP became a signatory to the new Institute of Physics Inclusion Award that is currently being developed.

Governance
Governance and accountability continue to be strengthened and improved and risks reduced as demonstrated by external and internal audit reviews. Actions arising from effectiveness reviews undertaken by both ARAC and the Management Committee have also resulted in enhanced arrangements.

Future Redevelopment Project
AOP manages an extensive property estate which includes nine separate buildings, including the Grade A listed Observatory and a circa 20-acre historic estate. There are also several leases associated with land and property.

An Outline Business Case (OBC) for the AOP Estate Redevelopment Project, as approved by the Management Committee at its 125th meeting, was approved by the Board of Governors at the 2023 Annual Visitation and submitted to DfC in July 2023. To support the project a funding bid was made to the Heritage Lottery, "*Wisdom Begins with Wonder at the Armagh Observatory and Planetarium: where the past meets the future*" for c£6m. This was successful and AOP were awarded the funding in March 2024, to come in two stages, a Development and a Delivery phase. However it has proved not possible for DfC to provide the necessary match component for AOP to be able to accept these funds. AOP was asked to update and re-submit the OBC. This was done with the help of the Strategic Investment Board who were engaged to assist, and the updated case (now known as OBC1) was approved by the Management Committee at a special meeting on 3 March 2025, endorsed by Archbishop McDowell on behalf of the Board of Governors, and re-submitted to DfC. This will be progressed in the 2025-26 financial year.

Funding required for the Outline Business Case (OBC1), which relates to the redevelopment of the AOP site, was approved by the Minister of Communities on 30 June 2025. In terms of the funding application, a total amount of £3,973k has been approved for the three years ending 31 March 2028.
Previously, The National Lottery Heritage Fund (NLHF) had allocated funding in the amount of £ 1,324k which was dependent on funding procured from other sources amounting to three-fold the funding allocated by NLHF.
The funding grant from DfC is therefore 75% of the total funding grant of £5,297k, with the balance of 25% being funded by NLHF.

The redevelopment project is imperative to future proof AOP's role into the next generation. The case for change is predicated by an estate that is outdated and misaligned to the expectations of modern day visitors; a restricted footprint on challenging topography that limits incremental or add-on extensions to increasing its capacity; and a dome technology that is on the precipice of transformational change that will render the existing visitor experience technically unsustainable within the next decade.

The case made in the OBC is centred around five spending objectives:

1) To create a world-renowned centre of astronomical research excellence that attracts international conferences and research visitors.
2) To create a state-of-the-art facility to educate the public and future generations of young people in science and astronomy across the island of Ireland.
3) To create a relevant, inspiring and dynamic visitor experience for the domestic and international tourist visitor market.
4) To preserve the heritage of the scientific instruments and the Observatory, while maximising the public's enjoyment of, and access to, the heritage site and collections held by AOP.
5) To improve the long-term viability and sustainability of AOP; having an attraction that is unique within NI and Ireland; and encouraging economic development through promoting it as a state-of-the-art facility.

NetZero
AOP's international research standing, and unique record of uninterrupted meteorological observations has allowed it to effectively communicate on the issue of climate change (CC) to the public, thanks also to the design and installation of a temporary CC exhibition in the Planetarium and of a CC Puffersphere display demonstrating AOP's own commitment to reducing its carbon footprint.

Moving in this direction, AOP are now using more efficient LED lights, following the standards of the International Dark Sky Association, and installed two new green energy power generation stations based on wind and solar power, the Smartflower and Windtree, with a respective nominal peak power of 2.5 and 16 kW (see figure below). Whereas the Windtree still needs to be connected to the main grid as AOP awaits NIE grid permission to do so, the Smartflower has produced 1.25 mega Watts since its installation in June 2024. Furthermore, an analysis of its energy production demonstrates its high efficiency, showing how it can reach its peak power even early in the morning when the Sun is still low in the sky. While these installations do not generate sufficient power to cover all the needs of the Planetarium, they will serve to illustrate the role that renewable energy technologies can play in harnessing energy from wind and the Sun, also adding to AOP's education offering.

AOP's Smartflower and Windtree. The Smartflower follows the movement of the Sun in the sky thus always maximising the flux of solar energy received. The WindTree can harness the power from even a light breeze of wind and unlike standard wind turbines it is silent and visually appealing.

Despite these efforts, AOP remains aware of its significant challenges in decarbonising its research and education activities, both internal and external, and as informed from AOP's 2022 carbon baseline review and decarbonization strategy. Reducing energy consumption in the planetarium remains complicated due to technical difficulties in monitoring electricity consumption, while installing solar panels on its roof would not make financial sense while AOP awaits confirmation of possible redevelopment plans for the Planetarium. In the Observatory, better insulation or more sustainable forms of heating clash with the need to retain the Georgian character of this building. Finally, reducing indirect, scope 3 emissions due to our own visitor travel to Armagh and due to our own international, mostly research-related travel also proves very difficult. In this respect, AOP is aware that other visitor centres in the UK are adopting more realistic, albeit still ambitious and transparent decarbonisation plans, and will engage with them to better understand our own NetZero direction of travel.

Achievements and Performance

The targets set for AOP in the 2024-25 Business Plan are shown in the following table. Actual performance achieved is shown along with the corresponding achievement in the previous financial year, where applicable.

Targets were achieved or exceeded in many areas; however, three out of four targets were not met. Whilst the total visitors target was exceeded the target in respect of school visitors was not achieved due to a number of school cancellations as a result of education and bus strikes and also snow. Failure to meet the remaining two targets is beyond AOP's control in that they are reliant upon external factors.

KPI	Description	Target	As at 31 March 2025	As at 31 March 2024 (where applicable)	Comments
1	Maintain overall on-site visitor numbers: Public Schools	**72,000** 60,000 12,000	Public 52,245	60,097	Total 63,903 visitors There were a number of school cancellations due to teacher and bus strikes and disruptions due to snowfalls.
			School 11,658	11,808	
2	5% uplift in off-site engagement numbers	11,500	24,484	n/a	
3	Achieve a 90% overall customer satisfaction rating of 4 or above out of 5	90%+ evaluation ratings ≥ 4	90.92%	90.83%	
4	Achieve £644,550 income from admissions and sales	£644,550	£528,671	£592,494	

Progress Key: Complete, Not Achieved

Financial Review

Operating Results

In the financial year to 31 March 2025, the value of charity funds decreased by £0.041m, summarised below:

	2025 £	2024 £
Total incoming resources	3,546,337	3,354,210
Total outgoing resources	(3,914,671)	(3,978,546)
Net deficit	**(368,334)**	**(624,336)**
Gains on the revaluation of fixed and heritage assets	283,841	500,740
Actuarial gains on defined benefit pension scheme	43,000	(121,000)
Net movement in funds for the year	**(41,493)**	**(244,596)**
Movement in Restricted Funds		
Capital financing		
Capital grants received	140,000	435,000
Government grant fund	(788,014)	(826,567)
Revaluation reserve	46,935	271,372
Pension reserve	-	(158,000)
Movement in Unrestricted Funds		
Restricted	72,681	(100,091)
Unrestricted	486,905	133,690
	(41,493)	**(244,596)**

The total income for the year was £3.546m, an increase of £0.192m from 2023-24, mainly due to an increase in DfC resource of £0.420m less a reduction in capital grant income of £0.295m, together with an increase in other grants of £0.149m, offset by an decrease in operating income of £0.071m.

Expenditure was £3.915m, a decrease of £0.064m from the previous year. Staff costs continue to be the largest component of operational expenditure, comprising 61% of all direct costs.

Unrestricted operating costs are funded primarily by DfC grant-in-aid. The balance of such unrestricted operating costs is funded by contributions from external grants, operating income, trading activities and miscellaneous income. We continue to seek other funding streams to maintain this important source of funds. In 2024-25 the Department provided 70% of the total income through recurrent and capital grant allocations (2023-24: 71%).

Net Assets

Net assets at 31 March 2025 were £12.434m (31 March 2024: £12.476m).

Reserves

The AOP reserves policy is included in note 1 of the accounts. Total accumulated funds are as follows:

Funds at 31 March	**2025**	**2024**
	£	£
Restricted funds	120,618	47,937
Unrestricted funds	4,591,583	4,752,692
Revaluation Reserve	7,722,181	7,675,246
Total Charity Funds	**12,434,382**	**12,475,875**

Going Concern

The Trustees are satisfied that the organisation is a going concern on the basis that it has a reasonable expectation that it will continue in operation for the foreseeable future. The financial statements are therefore prepared on a going concern basis.

Pension Reserve

AOP is a member of Northern Ireland Local Government Officers' Superannuation Committee (NILGOSC) which manages Local Government Pension Scheme (LGPS) Northern Ireland, which in turn provides a defined benefits pension to employees. At 31 March 2025 the surplus was calculated by independent actuaries at £2,888,000 (2024: surplus £1,175,000). The assets, defined benefit obligation and current service cost shown in note 19 to the accounts have been calculated based on the data and results of the 2022 triennial actuarial valuation. AOP has applied the principles of IFRIC14 in relation to pension surplus restriction. IFRIC14 requires allowances to be made for a minimum funding requirement, which limits the amount of economic benefit available to the excess of the value of prospective current service costs above the funding requirement.

Key Risks and Uncertainties

At year end, the key risks were identified as:

- Reputation – loss of confidence in AOP's ability to deliver acceptable level of research of international value due to significantly limited resources;
- Engagement:
  - Visitors – limitations to provide experiences that attract new and returning visitors and/or failure to engage local pride in AOP as a cherished asset;
  - Partners and collaborators – inadequate support and commitment from key stakeholders to be able to deliver future vision;
- Resources:
  - Staff – limited resources to recruit and retain an appropriately skilled, highly motivated and engaged workforce of sufficient capacity to satisfactorily deliver AOP objectives;
  - Financial – insufficient or poor management of allocated funds could result in sustainability objectives not being met and/or 'value for money (VfM)' objectives not being achieved;
- Asset Management:
  - Buildings and Heritage – lack of adequate planning for the long-term development needs of the estate and assets resulting in increasing reliance on remedial intervention and inadequate resources to protect and preserve heritage assets from irreparable decline;
  - Other physical assets including ICT – lack of adequate planning for the upkeep and renewal of plant and equipment resulting in reduced service delivery; and
- Governance and Planning:
  - Inadequate implementation or maintenance of best practice approaches to corporate governance and risk management resulting in loss of confidence and reputational damage and/or legal challenges;
  - Inadequate information/data security measures resulting in information breaches and/or cyber security breaches.

Integral to AOP's Risk Management Strategy of AOP, management regularly review the inherent level of risk for each of the above aspects and how the risk is currently managed. An Action Plan is documented to reduce the level of risk, mindful of the risk appetite or risk aversion of the organisation. This Risk Register is reviewed on a quarterly basis by the Audit and Risk Assurance Committee and approved by the Management Committee. A separate Risk Register is also used to identify and track risks associated with ICT. Many of the above risks derive from the uncertainty relating to funding. Until AOP has adequate funding appropriate to its needs and long-term security of funding, this situation is likely to continue. In managing these funding risks, the organisation has developed and maintained close communication links with the Department of Communities and submitted in-year monitoring bids for additional funding while carefully monitoring spend and financial resources. For many of the above risks all reasonable steps within AOP's control are being taken to mitigate the risk.

The above risks also take account of recommendations from internal and external audit reports. Significant progress has been made in addressing the weaknesses identified in previous years and considerable effort has been put into the management of these risks going forward.

Plans for Future Periods

In 2021, AOP published a Strategy for 2021-26 with the four key themes of Enduring Relevance, National and International Standing, Offering More and Pursuing our Priorities.

Leading on from this AOP has prepared a Business Plan for 2025-26 for consideration by the Department. The business plan has been developed in the context of an unclear and uncertain financial environment, however AOP remains focused and optimistic towards continued achievements within its key priority areas. The Business Plan also emphasises the importance of furthering the redevelopment project while also maintaining the active research, education and outreach programmes conducted by AOP.

The Astronomical Observatories of Ireland Partnership
Drawing upon the deep links between the historic observatories of Armagh, Birr and Dunsink, AOP has formed a strategic partnership to strengthen our relationship – the Astronomical Observatories of Ireland (or AOI).

Three broad thematic areas are covered by the partnership:

1. Research: collaborative approaches to research which draw on the strengths of the partners to add value to our contributions to scientific knowledge.
2. Education, Heritage and Cultural Programming: building capacity across our three sites, including local and national relationships, to progress a UNESCO World Heritage application as a transnational property.
3. Impact and Place Making: developing complementary approaches that leverage the impact of our institutions in the areas of environment, community engagement, economy and tourism.

The first meeting of the AOI Oversight Board took place in the Armagh Observatory Boardroom on 9 September 2024. Representing AOP were Archbishops John McDowell and Eamon Martin, for Birr Scientific Heritage Foundation Maria McGovern and Councillor John Carroll and for Dublin Institute for Advanced Studies Professors Mary Fowler and Janet Drew.

AOI also received €250k through Shared Island funding from the RoI Government, distributed via Fingal Council, for projects at each of the three observatories.

Following feedback received from a preliminary application made in 2023, a full application was made in 2024 for the AOI to join the UNESCO World Heritage Tentative List for Ireland. The Director, along with the Registrar of DIAS (Eucharia Meehan) and the Director of Dunsink Observatory & Chair of the Birr Scientific and Heritage Foundation (Peter Gallagher), were then interviewed on 23 January 2025 by the Expert Advisory Group appointed by the Irish Government to consider our application.

Structure, Governance and Management

Armagh Observatory and Planetarium is a single statutory corporation and arms-length body (ALB). 'The Governors of The Armagh Observatory and Planetarium' are as described in *The Armagh Observatory and Planetarium (Northern Ireland) Order 1995*.

This 1995 Order superseded the original 1791 Act of the Irish Parliament entitled '*An Act for Settling and Preserving a Public Observatory and Museum in the City of Armagh For Ever'*, and an Amendment of the 1938 Act ('The University and Collegiate and Scientific Institutions Act [Northern Ireland], 1938').

AOP is a registered charity under the title "The Armagh Observatory and Planetarium".

Board of Governors

AOP is governed by a Board of Governors. Membership of the Board of Governors consists of:

- the Church of Ireland Archbishop of Armagh;
- the Dean of the Church of Ireland Cathedral of Armagh;
- the other members of the Chapter of the Church of Ireland Cathedral of Armagh;
- one Department nominee;
- one Queen's University Belfast (QUB) nominee; and
- up to three additional members nominated by the Board of Governors.

The Order places a statutory duty on "the Governors of Armagh Observatory and Planetarium" to maintain and manage AOP with the purpose of "developing and improving the knowledge, appreciation and practice of astronomy and related sciences."

The Board of Governors (the Board) has retained a role to ensure that the culture and character, history and patrimony embodied in AOP are protected and preserved and that the institution is managed in line with the statutory purpose outlined in the Order. This role will normally be fulfilled through an Annual Review meeting (visitation) where the Board will receive assurance as to the management and performance of AOP from the Management Committee.

Management Committee of Armagh Observatory and Planetarium

The Board has delegated primary responsibility for the governance and management of AOP to a Management Committee. The Management Committee has corporate responsibility for ensuring that AOP fulfils the aims and objectives set by the Department and approved by the Minister and for promoting the efficient, economic and effective use of resources. The Management Committee provides leadership, challenge, oversight, support and encouragement to the Director and staff.

The Management Committee comprises:

- three nominees from the Board of Governors;
- six nominees from the Department appointed through open competition;
- one nominee of Queen's University, Belfast;
- one nominee of the Science and Technology Facilities Council (STFC);
- one nominee of the Dublin Institute for Advanced Studies (DIAS);
- a Chair appointed through open competition; and
- up to three additional members co-opted by the Board of Governors. This is by exception and subject to Departmental approval.

The following committees are established as sub-committees of the Management Committee.

Audit and Risk Assurance Committee (ARAC)

The ARAC is a sub-committee of the Management Committee established in accordance with DAO (DoF) 02/25 Corporate governance in central government departments: Code of good practice NI (2025) and NIAO Effective Audit and Risk Assurance Committees Good Practice Guide (2025) (superseding DAO (DFP) 06/13 - Corporate governance in central government departments: Code of Good Practice NI 2013, and in line with the HM Treasury

Audit and Risk Assurance Committee Handbook (DoF 03/18)) to advise the Board of Governors, the Management Committee and the Director of AOP as Accounting Officer and to support them in their responsibilities for issues of organisational risks, internal control, governance and their associated assurances and in reviewing the reliability and integrity of these assurances.

Staffing Policy and Remuneration Committee

The Staffing Policy and Remuneration Committee is a sub-committee of the Management Committee and provides advice and recommendations to the Management Committee on employment issues.

Research and Education Advisory Committee

The Research and Education Advisory Committee is a sub-committee of the Management Committee and advises it on research and education issues.

Redevelopment Committee

The Redevelopment Committee is a sub-committee of the Management Committee and was established to develop an Outline Business Case for redevelopment proposals.

Strategic Oversight Committee

The Strategic Oversight Committee is a sub-committee of the Management Committee, to oversee the work of the Project Board for AOP development (yet to be established). It has delegated authority to make decisions in relation to operations issues.

Further details on the membership of these Committees are set out in the Governance Statement on pages 32 to 42.

Reference and Administrative Details

Name of the Charity

The charity is registered and operates under the title of The Armagh Observatory and Planetarium.

Charity number

Registered with the Charity Commission for Northern Ireland 103948.

Principal Office

College Hill, Armagh, BT61 9DG

Trustees

Archbishop J McDowell, (Board Chair)
The Very Revd S Forster
The Venerable E Cairns
The Venerable Dr P Thompson
Revd Canon W M Adair BEM
Revd Canon M Hagan MBE
Revd Canon D Hilliard
Revd Canon B Paine (to 31 July 2024)
Revd Canon R J N Porteus (to 31 March 2025)
Revd Canon A Totten OBE (from 20 October 2024)
Revd Canon G McMurray (from 20 October 2024)
Mr G Cox
Professor A Fitzsimmons (to 1 May 2025)
Mr R Wilson OBE
Archbishop E Martin
Ms S Leslie
Mr J Briggs (Management Committee Chair)
Professor L Harra (to 30 April 2024)
Mr S Brown (to 30 April 2024)
Professor M Mathioudakis

Professor C Jackman
Professor M Darnley
Mr P Kennedy
Dr K Lemon
Mr E Rooney
Professor R Hunter (from 1 June 2024)
Ms G McVeigh (from 1 June 2024)
Mr R O'Hara (from 1 June 2024)
Professor G Cotter (from 1 October 2024)
Ms S Leverment (from 1 October 2024)

Director and Accounting Officer

Professor Michael Burton

Auditors

Northern Ireland Audit Office, 106 University Street, BELFAST, BT7 1EU

Internal Auditors

Cavanagh Kelly, 36-38 Northland Row, Dungannon, BT71 6AP

Bankers

Danske Bank, Donegal Square West, Belfast, BT1 6JS

Register of Interests

A Register of Interests is maintained for Board and Committee Members and Senior Management and is available for inspection at the Principal Address. Declared Interests by Board and Committee Members and the Director are available on the AOP website – www.armagh.space.

Related party transactions are shown in note 23 of the accounts.

Gifts

AOP adheres to the limits and rules laid out in its Partnership Agreement approved by the Department and the guidance in Managing Public Money Northern Ireland (MPMNI). There were no gifts made or accepted during the 2024-25 financial year that exceeded these limits.

Personal Data Related Incidents

AOP has considered the requirement to report personal data related incidents. It is content that there were no such incidents in the year ended 31 March 2025.

Disclosure of Audit Information

So far as the Accounting Officer is aware, there is no relevant audit information of which AOP's auditors are unaware. The Accounting Officer has taken all necessary steps to make himself aware of any relevant audit information and to establish that AOP's auditors are aware of that information.

Events after the end of the reporting period

There have been no events since the end of the financial year requiring disclosure.

Mr John Briggs
Trustee
Date: 12 November 2025

Professor Michael Burton
Director / Accounting Officer
Date: 12 November 2025

Remuneration and Staff Report

The remuneration and staff report sets out AOP's remuneration policy for Board members and senior managers, reports on how that policy has been implemented and sets out the amounts awarded to the Director. In addition, the report provides details on remuneration and staff that users see as key to accountability.

Remuneration Policy

Annual NICS pay awards are made in the context of the wider public sector pay policy. On 26 March 2025, NICS People and Organisational Development division confirmed that trade unions had accepted a pay which sees the majority of staff receiving a 9% increase on salaries over the 20 months from 1 August 2024 to 31 March 2026; this is made up of a 3% consolidated increase with effect from 1 August 2024 and a 6% consolidated increase with effect from 1 August 2025. Those who are eligible for progression will also receive that increase.

AOP staff remuneration is aligned with NICS pay scales. The Accounting Officer is authorised by DfC to approve its pay remit and business case, notifying same to DfC, prior to implementation of the pay award. Staff received the pay award, including backpay, in May 2025.

Trustees

Trustees do not receive any remuneration. They receive travel and subsistence allowances at rates and on conditions determined by AOP, subject to Departmental approval. No Trustee receives pension benefits or makes pension contributions in their capacity as a Board member. Management Committee members who were not trustees during the financial year received travel and subsistence expenses of £Nil (2024: £2,287).

Service Contracts

The Director of AOP, Professor Michael G. Burton, is the person in a senior position having authority and responsibility for directing and controlling the activities of the organisation. The service contract of the Director commenced on 1 August 2016.

Current terms and conditions for staff are those set out in various policies and individual employment contracts. Senior staff are permanent employees of AOP. The notice period for senior staff is three months. Termination payments are in accordance with contractual terms and those of the principal Civil Service Pension Scheme (NI).

Director's Remuneration (including Salary and Pension Entitlements) (Audited Information)

The following tables provide details of the remuneration and pension entitlements of the Director of the organisation.

Single Total Figure of Remuneration of Director							
	Salary (£'000)		**Pension Benefits* (£'000)**		**Total (£'000)**		**Percentage Change**
Official	**2024-25**	**2023-24**	**2024-25**	**2023-24**	**2024-25**	**2023-24**	
M.G. Burton	90-95	85-90	44	35	135-140	120-125	(9.7%)

** The value of pension benefits accrued during the year is calculated as (the real increase in pension multiplied by 20) plus (the real increase in any lump sum) less (the contributions made by the individual). The real increases exclude increases due to inflation and any increase or decrease due to a transfer of pension rights.*

*** Accrued pension benefits included in this table for any individual affected by the Public Service Pensions Remedy have been calculated based on their inclusion in the legacy scheme for the period between 1 April 2015 and 31 March 2022, following the McCloud judgment. The Public Service Pensions Remedy applies to individuals that were members, or eligible to be members, of a public service pension scheme on 31 March 2012 and were members of a public service pension scheme between 1 April 2015 and 31 March 2022. The basis for the calculation reflects the legal position that impacted members have been rolled back into the relevant legacy scheme for the Remedy Period and that this will apply unless the member actively exercises their entitlement on retirement to decide instead to receive benefits calculated under the terms of the alpha scheme for the period from 1 April 2015 to 31 March 2022.*

'Salary' includes gross salary (on an accruals basis) to the extent that it is subject to UK taxation. There was no overtime, benefit-in-kind, bonus or other allowances. The salary of the Director shown above is based on the Northern Ireland Senior Civil Service Grade 5 pay scale.

Compensation on early retirement or for loss of office

No payment for compensation on early retirement or for loss of office has been made (2023-24: £nil).

AOP Fair Pay Disclosures (Audited Information)

AOP is required to disclose the relationship between the remuneration of the Director and the lower quartile, median and upper quartile remuneration of the organisation's workforce. The banded remuneration of the Director in the financial year 2024-25 was £90,000 - £95,000 (2023-24: £85,000 - £90,000). The relationship between the mid-point of this band and the remuneration of AOP's workforce is disclosed below.

2024-25	25th percentile	Median	75th percentile
Total remuneration	£23,177	£33,791	£41,998
Pay ratio	4:1	2.7:1	2.2:1

2023-24	25th percentile	Median	75th percentile
Total remuneration	£21,053	£27,913	£33,780
Pay ratio	4.2:1	3.1:1	2.6:1

Total remuneration includes salary, overtime and performance-related bonuses. It does not include severance payments, employer pension contributions and the cash equivalent transfer value of pensions. Remuneration ranged from £23,177 to £92,500. The 25th percentile remuneration increased following a 10% increase in the NICS AA pay scale. The 75th percentile remuneration increased following backpay attributable to a remuneration increment. Because overall employment numbers are low, small changes in the staffing structure can appear disproportionate.

The percentage changes in respect of AOP are shown in the following table. It should be noted that the calculation for the Director is based on the mid-point of the band within which their remuneration fell in each year.

Percentage change for:	2024-25 v 2023-24	2023-24 v 2022-23
Average employee salary and allowances	-1.2%	8.6%
Director's salary and allowances	5.7%	6.1%
Average employee performance pay and bonuses	-100.0%	-7.2%

The small reduction in the average employee salary and allowance is offset by the o ne off non-consolidated bonus. The large increase in average performance pay and bonuses is d ue to the non-consolidated bonus ' paid to staff in year, within the pay award.
No performance pay or bonus was payable to the Director in these years

Pension Entitlements (Audited Information)

Official	Accrued pension at pension age as at 31/03/25	Real increase in pension at pension age	Accrued Lump Sum at 31/03/25	Real Increase in Lump Sum	CETV at 31/03/25	CETV at 31/03/24	Real Increase in CETV
	£'000	£'000	£'000	£'000	£'000	£'000	£'000
M.G. Burton	17	3	-	-	301	247	42

The figures enclosed are based on the previous year's guidance from the Department of Finance on the pension information that should be disclosed in accounts for 2024-25. Please note, that the CETV figures now incorporate the McCloud Underpin into calculations for eligible members, where possible. Where relevant, any additions to a CETV because of an underpin will be included. The real increase in CETVs are based on the factors in force from 30 June 2023. There have been no changes to CETV factors between 31 March 2024 and 31 March 2025. When calculating the real increase in CETV and the pension benefits accrued during the year 2024-2025 for the single total figure of remuneration, NILGOSC takes account of inflation. The CPI increase for September 2024 was 1.7%. The in-service revaluation rate for the Career Average Revalued Earnings Scheme was also 1.7%.

Pension Scheme

Pension benefits are provided through the Northern Ireland Local Government Officers' Superannuation Committee Pension Scheme (NILGOSC). For members, 1/49th of pensionable pay will be added to their pension account each year and retirement pension is based on career average earnings. Details can be obtained at http://www.nilgosc.org.uk.

Active members of the pension scheme will receive an Annual Benefit Statement. The accrued pension quoted is the pension the member is entitled to receive when they reach their scheme pension age, or immediately on ceasing to be an active member of the scheme if they are at or over pension age.

Employee contribution rates for all members for the period covering 1 April 2024 to 31 March 2025 are as follows:

Pensionable Pay	Contribution Rate
£0 to £18,000	5.5%
£18,001 to £27,700	5.8%
£27,701 to £46,300	6.5%
£46,301 to £56,300	6.8%
£56,301 to £111,700	8.5%
More than £111,700	10.5%

Employer contribution rates are determined by the Scheme's actuary every three years. Following the results of the 2022 actuarial valuation, the Committee agreed with its actuary the employer contributions of 19% for the following three years, effective from 1 April 2023. The next triennial valuation will take place as at 31 March 2025 with revised employers contribution rates set from 1 April 2026.

Cash Equivalent Transfer Values

A Cash Equivalent Transfer Value (CETV) is the actuarially assessed capitalised value of the pension scheme benefits accrued by a member at a particular point in time. The benefits valued are the member's accrued benefits and any contingent spouse's pension payable from the scheme. A CETV is a payment made by a pension scheme or arrangement to secure pension benefits in another pension scheme or arrangement when the member leaves a scheme and chooses to transfer the benefits accrued in their former scheme. The pension figures shown relate to the benefits that the individual has accrued as a consequence of their total membership of the pension scheme, not just their service in a senior capacity to which disclosure applies. The CETV figures include the value of any pension benefit in another scheme or arrangement which the individual has transferred to the NICS pension arrangements. They also include any additional pension benefit accrued to the member as a result of their purchasing additional years of pension service in the scheme at their own cost. CETVs are calculated in accordance with The Occupational Pension Schemes (Transfer Values) (Amendment) Regulations 2015 and do not take account of any actual or potential benefits resulting from Lifetime Allowance Tax which may be due when pension benefits are taken.

Real increase in CETV

This reflects the increase in CETV effectively funded by the employer. It does not include the increase in accrued pension due to inflation, contributions paid by the employee (including the value of any benefits transferred from another pension scheme or arrangement) and uses common market valuation factors for the start and end of the period. However, the real increase calculation uses common actuarial factors at the start and end of the period so that it disregards the effect of any changes in factors and focuses only on the increase that is funded by the employer.

Total Permanently Employed Staff Costs (Audited Information)

	Permanent staff £	Others[1] £	2024-25 £	2023-24 £
Wages and salaries	1,253,979	147,921	1,401,900	1,446,683
Social security costs	141,026	12,702	153,728	150,822
Employer's pension contributions	236,879	23,821	260,700	259,240
Defined benefit pension additional service cost	50,000	-	50,000	51,000
	1,681,884	184,444	1,866,328	1,907,745

[1] *"Others" includes £31,158 for agency staff*

Average staff numbers (Audited Information)

	Permanent staff	Others[2]	2024-25 Total Number	2023-24 Total Number
Average staff numbers	27.9	6.4	34.3	35.2

[2] *"Others" includes 3.59 fixed term, 2.43 casuals and 0.37 agency staff*

Staff Composition – permanent employees (full time equivalent)

	Male	Female
Directors/senior managers	2.6	2.0
Other employees	11.5	11.8

Staff Turnover

	2024-25	2023-24
Leavers as a percentage of average staff in post	17.3%	1.5%

Sickness Absence (Audited Information)
Staff sickness for the period 1 April 2024 to 31 March 2025 totalled 41 days (2024: 94 days) which equates to an average per FTE of 0.56% (2024: 1.24%).

Expenditure on External Consultancy (Audited Information)
Expenditure on external consultancy during the year was £nil (2023-24: £nil).

Off-payroll Engagements (Audited Information)
There were no "off-payroll" engagements in place as at 31 March 2025, nor were any arrangements entered into between 1 April 2024 and 31 March 2025.

Exit Packages (Audited Information)

Exit package cost band	No of compulsory redundancies	No of other departures agreed	Total no. of exit packages by cost band	Total no. of exit packages by cost band
	2024-25	2024-25	2024-25	2023-24
Total no. of exit packages	-	-	-	-
Total resource cost	Nil	Nil	Nil	Nil

Statement of the Responsibilities of the Governors and Accounting Officer

In accordance with The Armagh Observatory and Planetarium (Northern Ireland) Order 1995, The Governors shall prepare and submit to the Department a statement of accounts in respect of each financial year, and that statement shall be in such form and contain such information as the Department may direct and shall give a true and fair view of the state of the Governors' affairs at the end of the financial year and of the income and expenditure of the Governors in the financial year.

In preparing the accounts, the Accounting Officer is required to comply with the requirements of the Government Financial Reporting Manual and in particular to:

- observe the accounts direction issued by the Department of Finance, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- make judgements and estimates on a reasonable basis;
- state whether applicable accounting standards as set out in the Government Financial Reporting Manual have been followed, and disclose and explain any material departures in the accounts;
- prepare the accounts on a going concern basis; and
- confirm that the Annual Report and Accounts as a whole is fair, balanced and understandable and take personal responsibility for the Annual Report and Accounts and the judgements required for determining that it is fair, balanced and understandable.

The Department for Communities has appointed Professor M.G. Burton as Accounting Officer of AOP. The responsibilities of an Accounting Officer, including responsibility for the propriety and regularity of the public finances for which the Accounting Officer is answerable, for keeping proper records and for safeguarding AOP's assets, are set out in Managing Public Money Northern Ireland.

Statement of Disclosure of Information to the Auditors

As the Accounting Officer, I have taken all the steps that I ought to have taken to make myself aware of any relevant audit information and to establish that Armagh Observatory and Planetarium's auditors are aware of that information. So far as I am aware, there is no relevant audit information of which the auditors are unaware.

Signed:

Professor Michael Burton
Accounting Officer for Armagh Observatory and Planetarium

Date: 12 November 2025

Governance Statement

AOP is a Non-Departmental Public Body established under The Armagh Observatory and Planetarium (Northern Ireland) Order 1995.

1. Compliance with Corporate Governance Code

In 2013 the Department of Finance and Personnel published Corporate Governance in Central Government Departments: Code of Good Practice NI. The Code draws on best practice in the public, private and charity sectors by: reinforcing the importance of corporate governance as a pre-requisite to achieving good financial management; reflecting changes in governance best practice, including increased emphasis on good leadership; and promoting better governance arrangements within departmental families.

The Code is written for departments, concentrating throughout on key principles which will have wider application for other parts of the public sector. Such bodies (including arms-length bodies (ALBs)) are encouraged to consider and adopt the practices set out in the Code wherever it is relevant, practical and suits their business needs.

AOP in so far as they are relevant for an arms-length body, complies with the principles of good practice in the Corporate Governance Code.

2. Governance Framework

Accounting Officer

Name	Accounting Officer
Professor Michael Burton – Director and Chief Executive	From 1 September 2016 onwards

Board of Governors

AOP is governed by a Board of Governors. Membership of the Board of Governors consists of:

- the Church of Ireland Archbishop of Armagh;
- the Dean of the Church of Ireland Cathedral of Armagh;
- the other members of the Chapter of the Church of Ireland Cathedral of Armagh;
- one DfC nominee;
- one Queen's University Belfast (QUB) nominee; and
- up to three additional members nominated by the Board of Governors.

During 2024-25, two new Members were appointed to the Chapter of the Church of Ireland Cathedral of Armagh and two Members retired; Professor Fitzsimmons' term of office was extended for a year to facilitate discussions regarding succession planning and Mr Wilson's term was extended for a 5-year term. There are currently two vacant positions.

BOARD OF GOVERNORS			
GOVERNOR	**DATE OF APPOINTMENT**	**DATE OF EXPIRY**	**MEETINGS ATTENDED (max. 1)**
Archbishop J McDowell (Chair)	28 April 2020	None	1
The Very Revd S Forster Dean of Armagh	14 February 2021	None	1
The Ven E Cairns Archdeacon of Ardboe	13 December 2020	None	0
The Ven Dr P Thompson Archdeacon of Armagh	13 January 2019	None	1
Revd Canon W M Adair BEM	10 September 2008	None	0
Revd Canon D Hilliard	13 March 2016	None	1
Revd Canon W B Paine	7 May 2017	31 July 2024 (Retired)	0
Revd Canon R J N Porteus	1998	31 March 2025 (Retired)	0
Revd Canon M Hagan MBE	23 April 2023	None	1
Revd Canon A Totten OBE (from 20 October 2024)	20 October 2024	None	0 from 0

Revd Canon Gary McMurray (from 20 October 2024)	20 October 2024	None	0 from 0
VACANT (from 31 July 2024)			
VACANT (from 1 April 2025)			
Professor A Fitzsimmons	18 April 2019	1 May 2025	1
Mr R Wilson OBE	1 December 2019	30 November 2029	1
Archbishop E Martin	1 January 2021	31 December 2025	1
Ms S Leslie	1 June 2021	31 May 2026	1
Mr G Cox	1 March 2021	28 February 2026	1

During the Annual Visitation on 7 May 2024 the Board of Governors:

- approved the Partnership Agreement between the Department for Communities and AOP;
- endorsed the continuing membership of Revd Canon Hagan and Messrs Cox and Wilson as its nominees on the Management Committee;
- approved the appointment of three co-optees to the Management Committee;
- approved changes to the Terms of Reference for the Board and Management Committee;
- considered a new Committee and delegation process and delegated authority to the Management Committee to take forward;
- appointed two Members to the Oversight Board of the Astronomical Observatories of Ireland;
- approved an updated draft Outline Business Case for AOP Redevelopment Project for submission to DfC.

The Chairs of the Management Committee and Audit and Risk Assurance Committees provided verbal reports to the Board and the minutes of both meetings between June 2023 and April 2024 (draft) were provided.

The Board retrospectively approved the Annual Report and Accounts 2022-23 and approved the draft Annual Report and Accounts 2023-24, delegating authority to the Management Committee to sign them off.

The Board noted the Management Report for 2023-24 which included the Director's Report and a presentation on Research Highlights; Corporate Plan Objectives; Key Performance Indicators; Corporate Risk Register as at 26 March 2024 and ICT Risk Register as at 26 March 2024.

The Board considered the Mid-Term Review of the Strategic Business Plan 2021-24 and delegated authority to the Management Committee to take forward and approve the Business Plan 2024-25.

The Board noted the Code of Conduct for Board Members which had been reviewed, with no changes.

The Board confirmed that it was satisfied that comprehensive arrangements were in place to ensure that high-quality information was received to enable it to make informed decisions. Internal controls were in place to validate the accuracy and completeness of information presented to the Board.

Minutes of the meeting record the business carried out and actions agreed.

Management Committee of Armagh Observatory and Planetarium

The Management Committee comprises:

- a Chair appointed through open competition;
- three nominees from the Board of Governors;
- six nominees from DfC;
- one nominee of the Queen's University Belfast (QUB);
- one nominee of the Science and Technology Facilities Council (STFC);
- one nominee of the Dublin Institute for Advanced Studies (DIAS); and
- up to three additional members co-opted by the Board of Governors. This is by exception and subject to Departmental approval.

During 2024-25, there were eight changes to the Membership of the Management Committee. Professor Harra and Mr Brown retired on 30 April 2024; Professor Hunter, Ms McVeigh and Mr O'Hara were appointed as DfC nominees to the Management Committee from 1 June 2024; Professor Cotter and Ms Leverment were appointed as Board of Governors' co-optees to the Management Committee on 1 October 2024 and Revd Canon Totten replaced Revd Canon Hagan as one of the Board of Governors' nominees to the Management Committee. During the year Mr Wilson appointment to the Management Committee was extended for a further 5 year term.

There are currently no vacancies on the Management Committee.

MANAGEMENT COMMITTEE			
MEMBER	**DATE OF APPOINTMENT**	**DATE OF EXPIRY**	**MEETINGS ATTENDED (max. 6)**
Mr J Briggs (Chair)	1 January 2018	31 December 2027	5
Professor L Harra	1 November 2014	30 April 2024	0 from 1
Mr S Brown	1 November 2014	30 April 2024	1 from 1
Professor M Mathioudakis	11 November 2016	10 November 2026	2
Mr R Wilson OBE	1 December 2019	30 November 2029	4
Dr C Jackman	1 January 2021	31 December 2025	3
Dr M Darnley	1 January 2021	31 December 2025	6
Mr P Kennedy	1 March 2021	28 February 2026	4
Dr K Lemon	1 March 2021	28 February 2026	5
Mr E Rooney	1 March 2021	28 February 2026	6
Mr G Cox	19 May 2021	28 February 2026	6
Revd Canon M Hagan MBE	17 May 2023	18 November 2024	2 from 3
Professor R Hunter	1 June 2024	31 May 2029	1 from 5
Ms G McVeigh	1 June 2024	31 May 2029	5 from 5
Mr R O'Hara	1 June 2024	31 May 2029	4 from 5
Professor G Cotter	1 October 2024	30 September 2027	3 from 3
Ms S Leverment	1 October 2024	30 September 2027	1 from 3
Revd Canon A Totten OBE	18 November 2024	NONE	2 from 3

In April 2024, the Management Committee approved a revised draft Partnership Agreement between DfC and AOP, signed by DfC Accounting Officer on 22 May 2024 and the draft 2024-25 Business Plan, which was subsequently approved by the Minister on 16 September 2024.

The Management Committee reviewed the Terms of Reference for both the Board of Governors and the Management Committee and approved their presentation to the Board of Governors. It also agreed that the ability to enable delegation to Sub-Committees be sought at the Board of Governors.

A two-day meeting took place in June 2024. In addition to routine business over the two days the Management Committee; held a session with staff; received presentations from PhD students; and undertook Boardroom training.

The Committee considered and was content with the summary of its annual Effectiveness Review in September 2023.

In September 2024, the Management Committee considered revised Committee Structure proposals and the draft Programme for Government.

At each of its meetings throughout the year the Committee received a report from the Director, a presentation from Research or Education, updates from each of its standing sub-committees and approved relevant reports. Regular governance reports such as the Bi-Annual Assurance Statement, the Corporate Risk Register, ICT Risk Register, Key Performance Indicators and Finance reports were reviewed and approved. The Committee considered and noted amendments to policies that had been reviewed in line with the policy review process and approved new policies as appropriate.

Throughout the year, the Management Committee also considered progress on AOP's Vision and redevelopment which included updates from the Redevelopment Sub-Committee / Strategic Oversight Committee.

Internal controls are in place to validate the accuracy and completeness of information presented to the Management Committee.

Minutes of the meetings record the business carried out and actions agreed.

Audit and Risk Assurance Committee

The Audit and Risk Assurance Committee is drawn from the Management Committee and comprises a minimum of four and maximum of five members.

During 2024-25 there were four changes to membership. Professor Harra and Mr Brown retired on 30 April 2024; Ms McVeigh was appointed from 24 June 2024 and Professor Darnley was appointed from 16 December 2024. Mr Kennedy was appointed Chair from June 2024.

AUDIT AND RISK ASSURANCE COMMITTEE	
MEMBER	**MEETINGS ATTENDED (max. 5)**
Mr S Brown Chair (to 30 April 2024)	1 from 1
Professor L Harra (to 30 April 2024)	0 from 1
Mr P Kennedy Chair (from June 2024)	4
Mr E Rooney	5
Dr K Lemon	1
Ms G McVeigh (from 24 June 2024)	3 from 3
Professor M Darnley (from 16 December 2024)	0 from 1

During 2024-25 the Audit and Risk Assurance Committee considered the Internal Audit Report 2023-24; Internal Audit Plan 2024-25; reports from Internal Audit on progress against the audit plan and on outstanding recommendations; ICT Strategy Action Plan Progress Reports; ICT Risk Register; Accounting Officer's Assurance Statements; Finance Reports; updated policies; Business Continuity; Annual Report and Accounts 2023-24 and the Report to Those Charged With Governance in respect of the 2023-24 Accounts.

A dedicated Risk Management Workshop was held on 21 October 2024.

The Committee is satisfied that the integrated approach, the frequency of meetings, the breadth of the business undertaken, the skills of Members and the range of attendees at meetings of the Committee has allowed the Committee to meet the governance requirements of the organisation and assisted the Management Committee to demonstrate its stewardship of the public resources with which it is charged.

The Committee is satisfied that the organisation has robust risk management arrangements in place which are in line with the good practice in the HM Treasury 'Orange Book' and are reviewed regularly by the Management Committee.

There were five Internal Audit recommendations outstanding from prior years, three of which have been completed during 2024-25. The Committee is satisfied that progress is being made to complete the remaining outstanding recommendations. There were 15 new internal audit recommendations identified during 2024-25, 11 of which have been implemented.

Minutes of the meetings record the business carried out and actions agreed.

Staffing Policy and Remuneration Committee

The Staffing Policy and Remuneration Committee is drawn from the Management Committee and comprises a minimum of four and maximum of five members. A Special Meeting took place in September 2024 to consider SPRC's effectiveness.

During 2024-25 there were two changes to membership. Mr Brown retired on 30 April 2024 and Mr O'Hara was appointed from 24 June 2024.

STAFFING POLICY AND REMUNERATION COMMITTEE	
MEMBER	**MEETINGS ATTENDED (max. 6)**
Mr E Rooney (Chair)	6
Mr S Brown (to 30 April 2024)	1 from 1
Mr J Briggs	5
Dr K Lemon	4
Mr P Kennedy	4
Mr R O'Hara (from 24 June 2024)	3 from 4

In 2024-25, amongst other matters, the Committee considered:

- staffing and recruitment, including Skills Gaps Analysis and Strategic Workforce Planning;

- a range of Human Resources issues including progress against the Human Resources Strategy and Action Plan;
- staff and students surveys;
- updates to staff related policies, including Employers Pension Discretions Policy, Volunteer Policy, Attendance Management Policy and Performance Appraisal Policy; and
- updates against Diversity Mark actions, which included a commitment to develop an Equality, Diversity and Inclusion Strategy and the identification of a Diversity Champion.

Research and Education Advisory Committee

The Research and Education Advisory Committee is drawn from the Management Committee and comprises a minimum of four and maximum of five members.

During 2024-25 there were four changes to membership. Professor Harra (Chair) retired on 30 April 2024, Professor Hunter was appointed from 24 June 2024 and Professor G Cotter and Ms S Leverment were appointed to the Committee from 31 March 2025. Dr Lemon was appointed Chair from 1 May 2024.

RESEARCH AND EDUCATION ADVISORY COMMITTEE	
MEMBER	**MEETINGS ATTENDED (max. 4)**
Professor L Harra (Chair to 30 April 2024)	0 from 0
Professor M Darnley	4
Dr K Lemon (Chair from 1 May 2024)	4
Professor M Mathioudakis	3
Professor R Hunter (from 24 June 2024)	1 from 3
Professor G Cotter (from 31 March 2025)	0 from 0
Ms S Leverment (from 31 March 2025)	0 from 0

In 2024-25, amongst other matters, the Committee considered:

- education and outreach activities, including visitor reports and development of an Education Programme Strategy;
- research activities, including changes to the publication environment; PDRA Salaries; AOP Research Strategy; Intellectual Property matters; Concordat to Support the Career Development of Researchers; Policy on Academic Integrity in Research Code of Practice and Procedure; Research Excellence Framework (REF) updates;
- ICT needs; and
- funding opportunities.

A Local Organising Committee (LOC) comprising members from across AOP ensured the smooth delivery of one Conference held at the Planetarium in September 2024.

Redevelopment Sub-Committee

The Redevelopment Sub-Committee's membership is drawn from the Management Committee and comprises of six members.

REDEVELOPMENT SUB-COMMITTEE	
MEMBER	**MEETINGS ATTENDED (max. 2)**
Mr S Brown (Chair)	2
Mr J Briggs	1
Mr G Cox	0
Mr P Kennedy	2
Dr K Lemon	0
Mr E Rooney	2

The primary purpose of the Sub-Committee was to drive the AOP's Redevelopment Project and oversee the delivery of the outcomes and benefits, most notably initially an Outline Business Case (OBC), which was submitted to DfC on 1 June 2023.

The Redevelopment Sub-Committee met twice and considered a range of issues associated with project governance including the funding applications; planning / design issues; stakeholder engagement; risks and opportunities; programme / key milestones; project board structures and procurement of design team options.

All members of the Management Committee were invited to attend its last meeting which took place on Wednesday 11 September 2024 and Revd Canon Hagan, Mr Wilson, Professor Darnley, Professor Mathioudakis, Mr O'Hara and Professor Hunter did so.

The 'task and finish' Sub-Committee was intended to continue until the OBC was approved, however, it was replaced by a Strategic Oversight Committee which first met in June 2024.

Strategic Oversight Committee

The Strategic Oversight Committee's membership is drawn from the Management Committee and comprises 9 members.

STRATEGIC OVERSIGHT COMMITTEE	
MEMBER	**MEETINGS ATTENDED (max. 6)**
Mr J Briggs	4
Professor M Burton	6
Mr G Cox	4
Mr P Kennedy	5
Dr K Lemon	3
Mr R O'Hara	5
Mr E Rooney	6
Mr R Wilson	5
Ms G McVeigh (from 10 December 2024)	3 from 3

As outlined in the draft Terms of Reference, the purpose of the Strategic Oversight Committee (SOC) is to oversee all strands of AOP activity during the development phase of the redevelopment project to ensure there is a focus and consistency of approach towards achieving the organisation's objectives. It is intended to be more agile than the quarterly Management Committee meetings, with delegated authority to make decisions in relation to operations issues consistent with the shared vision. The Committee will also oversee the work of the Project Board for AOP development.

In 2024-25, amongst other matters, the Committee considered:

- governance matters including draft Terms of Reference; programme of meetings; core agenda items and staffing structure changes;
- redevelopment project matters including - proposals for establishment of a Project Board and design team procurement; funding matters;
- stakeholder engagement;
- draft Programme for Government (PfG) Consultation response;
- updates relating to Astronomical Observatories of Ireland;
- organisational review; and
- 2025-26 budget.

Finance Sub-Committee

An interim task and finish Finance Sub-Committee was established in December 2023 to consider the potential budget constraints faced for 2024-25 and possible actions to be taken. It last met in May 2024, culminating in a letter from the Accounting Officer to the DfC Permanent Secretary setting out identified savings and inescapable costs.

Conflicts of Interest

The organisation maintains a register of interests to ensure that potential conflicts of interest can be identified and addressed in advance of Board, Management Committee and other Committee discussions. The register is formally revisited on an annual basis. Where conflicts exist, they are recorded in the Committee minutes and the Chair of the meeting decides the most appropriate way of managing the conflict. This may include that member not taking part in discussions or making decisions on certain matters or being excluded for part or all of that meeting.

The Register of Interests for Board of Governors, Management Committee and senior staff is published on the AOP website in accordance with central government guidance.

Directors and Secretary

Professor Michael Burton is Director and Chief Executive of AOP.

The Corporate Manager provides a range of secretarial support services to the Board of Governors, Management Committee, Audit and Risk Assurance Committee and Strategic Oversight Committee; the HR and Policy Officer provides secretarial support to the Staffing Policy and Remuneration Committee and Executive Officers to the Research and Education Advisory Committee and Redevelopment Sub-Committee.

3. Business Planning and Risk Management

Business Planning

'Our mission is the pursuit of knowledge and understanding of the cosmos, and the sharing of that knowledge in order to inspire future generations and enrich the intellectual, economic, social and cultural life of all.'

'Our vision is to be recognised as an international centre of scientific excellence for the pursuit of astronomy and the public understanding of science, for our capacity for innovation and our extraordinary heritage, a place our community can be proud of.'

The pillars that support us are – Knowledge, Legacy, People and Engagement.

The five-year strategy is built around four strategic themes - Enduring Relevance, National and International Standing, Offering More and Pursuing our Priorities.

The Strategic Plan aligns closely with the aims and objectives of the Observatory and Planetarium's sponsor - the Department for Communities (DfC) – and with the broader aims and objectives of the Northern Ireland Executive's Programme for Government. The organisation's Strategic Plan 2021-26 received Departmental approval on 17 August 2021.

The work of the Observatory encompasses both internationally acclaimed research and a unique cultural heritage — scientific, historical, architectural — as well as maintaining the unique daily climate series (the longest daily series from a single site in the UK and Ireland) and undertaking a world-class programme of science in the community, which complements the Planetarium's main business of education.

The Planetarium's main business is education, and all age and social groups are welcome to visit. The educational programmes and demonstrations are designed to include participation by children of pre-nursery age up to senior citizens and all age groups in between. The primary educational aim of the Planetarium is to endorse and promote the Science, Technology, Engineering, Arts and Mathematics (STEAM) agenda which promotes scientific careers to young people. All of the ancillary activities support the primary aim, with the additional target of offering excellent value for money, both to the visitors taking part and to the public purse. The Planetarium maintains a focus on being inclusive so that all children can enjoy the Planetarium experience.

Full details of all the Observatory and Planetarium's activities are provided in comprehensive Annual Reports which are available online at: www.armagh.space.

No Ministerial Directions have been given regarding the work of AOP during 2024-25.

Risk Management

Risk Management is an essential element of AOP's corporate governance framework and is closely linked to the system of internal control and business planning process. HM Treasury Orange Book establishes the concept of risk management and provides a basic introduction to its concepts, development and implementation of risk management process in government organisations. A robust risk management process assists AOP in identifying and managing issues which may hinder the achievement of objectives. The arrangements are regularly reviewed.

As well as ensuring that there is an effective system in place to deal with threats to AOP's aims and objectives, the organisation encourages a proactive approach to innovation and well-managed risk taking where there is potential to realise sustainable improvements in the organisation's research and educational services. For this reason, the organisation's Risk Appetite is 'Open'.

The Management Committee sets the risk appetite for AOP. The Accounting Officer, Senior Management Team and other staff are responsible for ensuring that residual risks are reduced to a level as low as reasonably practicable and wherever possible consistent with the level of risk appetite established by the Management Committee.

Updates are provided to the Audit and Risk Assurance Committee on the development and implementation of the risk management process across AOP. The Audit and Risk Assurance Committee provides the Accounting Officer with objective advice on issues concerning the risk, control and governance of the organisation and the associated assurances. An update on the main points considered by the Audit and Risk Assurance Committee is provided to the Management Committee following each meeting and the Management Committee has access to all papers for the Audit and Risk Assurance Committee.

4. Fraud and Information Risk

The Accounting Officer has overall responsibility for managing the risk of fraud including:

- developing a fraud risk profile and undertaking a regular review of the fraud risks associated with each of the key organisational objectives in order to keep the profile current;
- establishing an effective fraud prevention policy and fraud response plan, commensurate with the level of fraud risk identified in the fraud risk profile;
- designing an effective control environment to prevent fraud commensurate with the fraud risk profile;
- operating appropriate pre-employment screening measures;
- establishing appropriate mechanisms for reporting fraud risk issues, reporting significant incidents of fraud, and coordinating assurances about the effectiveness of fraud prevention policies to support the Governance Statement;
- liaising with the Audit and Risk Assurance Committee;
- ensuring that all staff are aware of the organisation's fraud prevention policy and know what their responsibilities are in relation to combating fraud;
- ensuring fraud awareness training is provided as appropriate and, if necessary, more specific fraud prevention training and development is provided to relevant staff;
- ensuring that vigorous and prompt investigations are carried out if fraud occurs, is attempted or is suspected by the establishment of a Fraud Investigation Oversight Group;
- ensuring, where appropriate, legal and/or disciplinary action against perpetrators of fraud;
- ensuring, where appropriate, disciplinary action against supervisors where supervisory failures have contributed to the commission of fraud;
- ensuring, where appropriate, disciplinary action against staff who fail to report fraud;
- taking appropriate action to recover assets and losses;
- ensuring that appropriate action is taken to minimise the risk of similar frauds occurring in future; and
- ensuring that an anti-fraud culture is promoted throughout the organisation in line with the seven Nolan Principles of Public Life.

Risks to data and information held by the organisation are owned and managed by individuals designated as information asset owners. The Corporate Policy and HR Officer responds to requests for information under the Data Protection and Freedom of Information Acts following consultation with the Accounting Officer and the organisation's governing Committees, as appropriate.

AOP operates a Whistleblowing Policy which informs all members of the organisation of the standards of behaviour expected of them in carrying out their duties, and to provide information on the procedures to follow if a situation arises in which they are required to act in a way which is believed by them to be illegal, improper, or in breach of the Nolan Principles.

5. Governance and Accountability

AOP seeks to achieve excellence in good governance, in particular the precepts: (1) leadership; (2) effectiveness; (3) accountability and (4) sustainability.

The Chair of the Board of Governors has a particular leadership responsibility for securing the sustainability and vitality of the organisation in the long term; giving advice and direction in formulating AOP's forward look and overall strategy; ensuring that account is taken of guidance provided by the Minister or the Department; promoting the efficient and effective use of staff and other resources; encouraging high standards of probity amongst staff and Board and Committee members alike; and ensuring that the Board and its Committees meet at regular intervals throughout the year and that the Minutes of meetings accurately record the decisions taken and, where appropriate, the views of individual Board members.

Within AOP, the Director, supported by his Senior Management team, has responsibility for the management and effective operation of their organisation. Their operational responsibilities include:

- developing, implementing and monitoring the strategic and operational plans;
- undertaking financial management and Accounting Officer responsibilities;

- managing and developing a team of highly qualified professional and administrative staff;
- identifying and attracting sources of external income;
- promoting their respective organisations in relevant local, national and international arenas; and
- promoting Public Understanding of Science with the objective of improving the level of scientific literacy in the community and to ensure a strong link with government policy and the STEM agenda.

Members of the Board of Governors and of the Management Committee and their various Sub Committees exercise an effective challenge function on the leadership team in accordance with their respective roles in the organisation. They also provide guidance and advice on strategic and operational matters such as Human Resource issues, accountability and relationships with stakeholders.

The members of these Committees are drawn from a very wide community background within, and beyond, Northern Ireland, and provide the organisation with a correspondingly wide range of expert knowledge and advice. All the Committees of AOP operate with full transparency and accountability, and over the last year have proved effective in the discharge of their duties and responsibilities.

It was agreed by the Board of Governors and the Management Committee that the governance arrangements in place removed the need for the current Board of Governors to complete an internal self-assessment of its effectiveness.

The Board of Governors and supporting Committees receive assurances from the Director and his Senior Management Team and Internal Audit that the governance and accountability processes are being managed effectively.

During 2024-25 two members of the Senior Management Team – the Head of Corporate Services and the Head of Finance and Income Generation – tendered their resignations with effect from 30 April 2025 and 31 May 2025 respectively. The two positions have temporarily been combined into the post of Interim Head of Finance and Corporate Services pending a permanent appointment in due course.

6. Sources of Independent Assurance

Internal Audit

CavanaghKelly was reappointed as Internal Auditors for the 3 years 2023-24 – 2025-26 using CPD as the Centre of Procurement Expertise. Their work was carried out in accordance with the Public Sector Internal Audit Standards.

The three year Audit Strategy was approved by the Audit and Risk Assurance Committee in June 2023.

During 2024-25 the Audit and Risk Assurance Committee considered reports on the following areas:

Audit Assignment	**Assurance Rating**
IT Systems and Security	Satisfactory
Human Resource Management	Satisfactory
Financial – Income & Procurement	Satisfactory
Internal Audit Follow Up 2024-25	N/A

An overall satisfactory internal audit assurance opinion has been provided.

External Audit

The Comptroller and Auditor General (C&AG) is required to audit the financial statements under *The Armagh Observatory and Planetarium (Northern Ireland) Order 1995*. The C&AG is responsible for reporting whether in her opinion the financial statements give a true and fair view and whether they and the part of the Remuneration Report to be audited have been properly prepared in accordance with the Order and DfC directions made thereunder and applicable law and United Kingdom accounting standards. The C&AG is required to report whether, in her opinion, in light of the knowledge and understanding of AOP and its environment obtained in the course of the audit, she has identified any material misstatements in the Trustees' Annual Report and whether the information which comprises the Statement of the Responsibilities of the Governors and Accounting Officers and Governance Statement, as included within the Annual Report, is consistent with the financial statements. She also reports on whether, in her opinion, in all material respects, the expenditure and income presented in the financial statements have been applied

to the purposes intended by the Assembly and whether the financial transactions conform to the authorities which govern them.

A representative from the Northern Ireland Audit Office is invited to all Audit and Risk Assurance Committee meetings.

7. Review of the Effectiveness of the System of Internal Governance

The system of internal governance is designed to manage risk to a reasonable level, rather than to eliminate all risk of failure to achieve certain policies, aims and objectives; it can therefore only provide reasonable and not absolute assurance of effectiveness. The system of internal governance is based on an ongoing process designed to identify and prioritise risks to the achievement of the AOP policies, aims and objectives; to assess the likelihood of the events occurring and the impact should they be realised; and to manage the risks effectively, efficiently and economically. The system of internal governance has been in place in AOP for the year ended 31 March 2025 and up to the date of approval of the annual accounts, and accords with Department of Finance guidance.

As previously detailed in Section 2, the responsibilities of the Accounting Officer include the need to maintain a sound system of internal control which supports the achievement of the organisation's policies, aims and objectives. The review of the effectiveness of the system of internal governance has been informed by the assurances provided by relevant parties such as: Internal Audit and the Senior Management Team. Where weaknesses have been identified these have been promptly drawn, through normal reporting mechanisms, to the attention of the Audit and Risk Assurance Committee, Management Committee and/or Board of Governors, as appropriate.

The main procedures in place to monitor the effectiveness of the system of internal governance are as follows:

- ongoing independent assessment of the Observatory's research outputs;
- regular reports by financial staff on progress against principal financial targets and the projected financial outcome for the year and progress reports by staff responsible for major projects;
- detailed progress reports to the Management Committee and Board of Governors at their regular meetings and inclusion of performance measures and results against targets in the annual operating plan;
- annual reports on the system of internal control from internal auditors to the Audit and Risk Assurance Committee;
- regular Partnership meetings with officials from the Sponsor Department to consider operational and strategic issues and matters relating to the system of internal control;
- Bi-Annual Assurance Statements submitted to the Sponsor Department;
- periodic review of the AOP Risk Register by the Audit and Risk Assurance Committee, the Management Committee, the Accounting Officer and Senior Management Team and the Sponsor Department;
- continuous assessment of the quality of research through peer review of grant applications, applications for telescope time, and the submission of scientific papers to academic journals of international standing by AOP staff and students;
- peer review of the research quality, capability and output of the Observatory, and through participation in an objective external Assurance Committee, which provide an opinion on the adequacy and effectiveness of the system and contain recommendations for improvement; and
- annual reports from Northern Ireland Audit Office to the Audit and Risk Assurance Committee, the Management Committee and the Board of Governors on the Annual Report and Accounts, providing an opinion on the state of affairs of the organisation and its total incoming resources and expenditure of resources.

All reports based on the internal and external audits include opinions on the adequacy and effectiveness of risk management and the control framework in place. These matters are considered by the Audit and Risk Assurance Committee and are reported by the Audit and Risk Assurance Committee Chair to the Management Committee and the Board of Governors.

Weaknesses identified in AOP's control systems and internal governances are set out within the next section. Upon identification, plans were immediately put into place to addresses these issues.

8. Internal Governance Divergences

Update on Prior Years:

There are currently two outstanding internal audit recommendations from prior years, which are still being implemented, namely Education and Outreach activities - educational programme, a new target date set of December 2025; and Health and Safety where the risk management policy was to be updated to include the new risk assessment template – this has now been completed.

Identification of New Issues:

Of the new issues identified by internal audit during 2024/25 there remain four outstanding recommendations – two that are being implemented and two that have not yet reached the implementation date.

During its audit for 2024-25, NIAO identified no priority 1 issues to be addressed by management in their areas of responsibility. Only 1 priority 3 issue was raised.

Recommendation	Priority	Status
Our testing identified one declaration of interest which had not been completed by a member of the Management Committee. We understand that AOP remind members of the Board of Governors and Management Committee of the policy in respect of Conflicts of Interest and follow up on declarations which are not returned by members. This matter was also raised as a finding in the prior year Report to Those Charged with Governance. We recommend that AOP remind members of the Board of Governors and Management Committee of the importance of completing declarations of interest forms on an annual basis and submitting these for records.	3	Requests for members of the Board of Governors and members of the Management Committee to declare conflicts of interest were sent on 09 April 2025, and reminders again on 12 June 2025 and 27 June 2025. Declarations were not received from three members of the Board of Governors or Management Committee during the period ended 31 March 2025, but who had all resigned by 15 August 2025.

9. Conclusion

AOP has an effective governance structure and is operating to a high standard of integrity and probity. In signing this report, I have taken assurances, where available, from the Audit and Risk Assurance Committee and I will continue to monitor the Internal Audit and Northern Ireland Audit Office recommendations to ensure that all issues are appropriately addressed.

To the best of my knowledge this report provides a fair and accurate reflection of the business of AOP and of the status of the controls and checks that have been put in place to regulate and inform the organisation's committees.

Signed: **Date: 12 November 2025**

Professor Michael Burton
Accounting Officer
Armagh Observatory and Planetarium

Armagh Observatory and Planetarium
Refereed Journal Publications: April 2024 – March 2025

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Verhamme O., et al., inc. **Vink J. S.**, 2024, X-Shooting ULLYSES: Massive Stars at low metallicity: IX. Empirical constraints on mass-loss rates and clumping parameters for OB supergiants in the Large Magellanic Cloud, Astronomy & Astrophysics, 692, A91, doi:10.1051/0004-6361/202451169, https://ui.adsabs.harvard.edu/abs/2024AA...692A..91V

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Wu J., et al., inc. **Eden D.**, 2024, A Tale of Three: Magnetic Fields along the Orion Integral-shaped Filament as Revealed by the JCMT BISTRO Survey, Astrophysical Journal, 977, L31, doi:10.3847/2041-8213/ad93d2, https://ui.adsabs.harvard.edu/abs/2024ApJ...977L..31W

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Zhang H., et al., inc. **Sarzi M.**, 2025, WISDOM Project - XXII. A 5 per cent precision CO-dynamical supermassive black hole mass measurement in the galaxy NGC 383, Monthly Notices Royal Astronomical Society, 537, 520, doi:10.1093/mnras/staf055, https://ui.adsabs.harvard.edu/abs/2025MNRAS.537..520Z

Armagh Observatory and Planetarium
Non Refereed Journal Publications: April 2024 – March 2025

Burton, M & Mackle, S., 2024, Teaching Secondary School Physics in the Planetarium Dome, in The International Planetarium Society 2024 Conference Proceedings, Stiftung Planetarium Berlin, 18-25 July 2024, Editor S Mitchell. URL https://www.ips-planetarium.org/page/proceedings

Christou A., Gritsevich M., 2024, in European Planetary Science Congress. Characterising the meteoroid environment at 0.7 au from the sun with a Venus-orbiting meteor camera: a feasibility study. pp EPSC2024–204, doi:10.5194/epsc2024-204

Dyer M. J., et al., inc. **Ramsay G.**, 2024, in Marshall H. K., Spyromilio J., Usuda T., eds, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series Vol. 13094, Ground-based and Airborne Telescopes X. The Gravitational-wave Optical Transient Observer (GOTO). p. 130941X (arXiv:2407.17176), doi:10.1117/12.3018305

Gray Z., 2024, in European Planetary Science Congress. Double Trouble: Polarimetric Insights into the Didymos-Dimorphos post-DART Evolution. pp EPSC2024–458, doi:10.5194/epsc2024-458

Humpage A., **Christou A.**, 2024, in European Planetary Science Congress. A Numerical Study of Near-Earth Asteroid Family Orbital Dispersion. pp EPSC2024–910, doi:10.5194/epsc2024-910

Joo A. P., **Eden D.**, Tóth L. V., 2024, in IAU General Assembly. Pre- and protostellar cores in the 200 brightest Planck compact sources. p. 2397

Khamrat S., et al., inc. **Ramsay G.**, 2024, in Lee H. W., Chang S. J., Leung K. C., eds, Astronomical Society of the Pacific Conference Series Vol. 536, The Twelfth Pacific Rim Conference on Stellar Astrophysics. Galactic Novae in the GOTO Database. p. 35

Kolokolova L., Markkanen J., Ludet Q., Ivanova O., **Gray Z.**, Opitom C., 2024, in European Planetary Science Congress. Characterizing the dust in active asteroids by modeling their photometric and polarimetric images. pp EPSC2024–567, doi:10.5194/epsc2024-567

Mandl L., **Christou A.**, Windisch A., 2024, in EGU General Assembly Conference Abstracts. A machine learning approach to meteor light curve analysis, EGU General Assembly Conference Abstracts. p. 21463, doi:10.5194/egusphere-egu24-21463

Marshall-Lee A., Delbo M., **Christou A.**, Deienno R., Walsh K., 2024, in European Planetary Science Congress. The Efficiency of the Hierarchical Clustering Method. pp EPSC2024–980, doi:10.5194/epsc2024-980

McMahon M., 2025, The Imagined Planetarium, History Armagh, 5(4)

Mugrauer M., Michel K.-U., **Schlagenhauf S.**, Ginski C., 2024, in EAS2024, European Astronomical Society Annual Meeting. The impact of stellar multiplicity on the formation and evolution of planets. p. 715

O'Neill D., et al., inc. **Ramsay G.**, 2024, in Benn C. R., Chrysostomou A., Storrie-Lombardi L. J., eds, Society of Photo- Optical Instrumentation Engineers (SPIE) Conference Series Vol. 13098, Observatory Operations: Strategies, Processes, and Systems X. GERry: A code to optimise the hunt for the electromagnetic counter-parts to gravitational wave events. p. 1309818 (arXiv:2407.18642), doi:10.1117/12.3018319

Penttilä A., Muinonen K., Granvik M., **Gray Z.**, **Bagnulo S.**, Kolokolova L., Moreno F., 2024, in European Planetary Science Congress. Modeling linear polarization of the Didymos-Dimorphos system before and after the DART impact. pp EPSC2024–301, doi:10.5194/epsc2024-301

Rebolledo D., Green A., **Burton M.**, Garay G., 2024, in IAU General Assembly. A resolved view of the impact of massive star formation in the atomic, molecular and ionized gas in the Carina Nebula. p. 1878

Schipani P., et al., inc. **Bagnulo S.**, 2024, in Bryant J. J., Motohara K., Vernet J. R. D., eds, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series Vol. 13096, Ground-based and Airborne Instrumentation for Astronomy X. VSTPOL: making the VST a large survey telescope for optical polarimetry. p. 130967L, doi:10.1117/12.3019695

Winch E., **Vink J.**, **Higgins E.**, **Sabhahit G.**, 2024, in IAU General Assembly. Predictions for the Maximum Masses of Black Holes below the PI Boundary. p. 1014

During the reporting year, G Ramsay published many reports related to the discovery of transients, and is directly related to his work on the GOTO and BlackGem projects. The Transient Name Server (TNS) is an IAU supported service which reports newly discovered extragalactic transients. He led or was co-I on 1093 TNS Discovery Reports and 8 TNS AstroNotes. In addition, he led or was co-I on 34 GRB Coordinates Network Circular Service (GCNs), which report the results of optical followup of Gravitational Wave and Gamma-ray Burst events.

Books and Other Publications Not Listed Above: April 2024 – March 2025

McMahon M., Raposo P.M.P., Smail M., Boyce-Jacino K., (eds), 2025, 100 Years of Planetaria: 100 Stories of People, Places, and Devices. Springer.

Features contributions from Michael Burton, Heather Alexander, Terence Murtagh, Arjun Chawla and Kerem Çubuk

Armagh Observatory and Planetarium
Presentations: April 2024 – March 2025

Date	AOP Speaker	Title	Location/Mode	Category
04 Apr 2024	J. Landstreet	Magnetic White Dwarfs — An Unfinished Story	Colloquium, Department of Physics and Astronomy, University of Western Ontario, London, Ontario, Canada	Research
08 Apr 2024	S. Bagnulo	Night Time Astronomy with Sunglasses	Northern Ireland Amateur Astronomy Society, Ballyclare, Co. Antrim	Outreach
17 Apr 2024	A. Christou	Mercury vs the Taurids: A Continuing Saga	Department Seminar, Meteor Physics Group, University of Western Ontario, London ON, Canada	Research
24 Apr 2024	M. McMahon	PhD at a Museum	QUB/Ulster Museum Meeting, Belfast, Co. Antrim	Outreach
25 Apr 2024	D. Eden	MAJORS: First Results from W49	Raising the Veil on Star Formation: Near and Far Conference, Cambridge, England	Research
30 Apr 2024	K. Trakakis	Determining the Physical Conditions of the Interstellar Medium and the Structure of the Milky Way Galaxy	PhD Student Discussion Meeting, Armagh Observatory and Planetarium, Co. Armagh	Research
07 May 2024	A. Chawla	Astrophysical Data Visualisation	PhD Student Discussion Meeting, Armagh Observatory and Planetarium, Co. Armagh	Research
07 May 2024	K. Çubuk	Our Wee Planet and the Size of the Universe	Slemish College, Ballymena, Co. Antrim	Outreach
07 May 2024	K. Çubuk	Our Wee Planet and the Size of the Universe	St. Patrick's College, Ballymena, Co. Antrim	Outreach
07 May 2024	K. Çubuk	Our Wee Planet and the Size of the Universe	Castle Tower School, Ballymena, Co. Antrim	Outreach
07 May 2024	A. Philip Monai	Groups in SALT Data	PhD Student Discussion Meeting, Armagh Observatory and Planetarium, Co. Armagh	Research
18 May 2024	S. Bagnulo	Auroral Phenomena and Metal Scars at the Surface of White Dwarfs	Irish Astronomical Association 50th Anniversary Event at the Armagh Planetarium, Co. Armagh	Outreach
22 May 2024	M. Burton	A Short History of Armagh Observatory	Glasgow Philosophical Society Visit, Armagh Planetarium, Co. Armagh	Internal Outreach
22 May 2024	D. Eden	What Causes Stars to Form?	Seminar, University of Hertfordshire, Hatfield, England	Research
23 May 2024	C.S. Jeffery	The SALT / GAIA Survey of Hydrogen-Deficient Hot Subdwarfs.	The 3rd LAMOST-Kepler/TESS Workshop, Beijing Normal University, Beijing, China	Research
23 May 2024	A. Philip Monai	Unsupervised Approach to Spectral Classification of Hot Subdwarfs	The 3rd LAMOST-Kepler/TESS Workshop, Beijing Normal University, Beijing, China	Research
24 May 2024	C.S. Jeffery	Synergies Between Ground-based Spectroscopic Surveys and Space-based Photometric Missions	The 3rd LAMOST-Kepler/TESS Workshop, Beijing Normal University, Beijing, China	Research
24 May 2024	C.S. Jeffery	Theoretical Models for Blue Large Amplitude Pulsators	Stellar Physics Group, Beijing Normal University, Beijing, China	Research
29 May 2024	K. Trakakis	Where Could the Aliens Be?	PhD Day at Armagh Planetarium, Co. Armagh	Outreach
07 Jun 2024	K. Çubuk	Our Wee Planet and the Size of the Universe	ASE Conference, Teacher CPD Session, W5, Belfast, Co. Antrim	Outreach
10 Jun 2024	S. Schlagenhauf	S-PLUS MUSE - STARLIGHT and Revelations on Star Formation History of NGC 1436	S-PLUS Collaboration Meeting, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, University of São Paulo, Rio de Janeiro, Brazil (online)	Research
12 Jun 2024	D. Eden	MAJORS: First Results from W40	JCMT Users' Meeting 2024, Kuala Lumpur, Malaysia	Research
19 Jun 2024	A. Marshall-Lee	Re-writing the HCM as a Neural Network	British Planetary Science Conference, Leicester, England	Research

Date	AOP Speaker	Title	Location/Mode	Category
21 Jun 2024	J.S. Vink	What is New with Black Holes	Astrobytes, Armagh Observatory and Planetarium, Co. Armagh	Internal Outreach
24 Jun 2024	M. Burton	Armagh 2031 – 250 Years Since the Discovery of Uranus	AOP Board Dinner, Armagh Planetarium, Co. Armagh	Internal Outreach
03 Jul 2024	J.S. Vink	XShootU Science Goals	XShootU III Collaboration Meeting, KU Leuven, Belgium	Research
08 Jul 2024	J.S. Vink	50 Years of CAK	Stanfest, Fundamentals of Stellar Outflows: Celebrating and Amplifying the Scientific Life of Stan Owocki, Leuven, Belgium	Research
16 Jul 2024	D. Eden	Galactic Plane Star Formation with the JCMT	National Astronomical Meeting 2024, Hull, England	Research
17 Jul 2024	A. Philip Monai	Unsupervised Approach to Spectral Classification of Hot Subdwarfs	Poster Presentation, STFC School on Data Intensive Science 2024, University of Liverpool/Liverpool John Moores University, Liverpool, England	Research
18 Jul 2024	K. Trakakis	How to be a Star - Everything You Need to Know	Space to Learn Summer Camp, Armagh Observatory and Planetarium, Co. Armagh	Outreach
23 Jul 2024	S. Schlagenhauf	Update on S-PLUS MUSE - STARLIGHT and Revelations on Star Formation History	PhD Student Discussion Meeting, Armagh Observatory and Planetarium, Co. Armagh	Internal Outreach
25 Jul 2024	M. Burton with S. Mackle	Teaching Secondary School Physics in the Planetarium Dome	International Planetarium Society Conference, Grosse-Planetarium Berlin, Germany	Teaching/ Research
08 Aug 2024	J.S. Vink	Very Massive Stars and N-emitting Galaxies	International Astronomical Union General Assembly, Cape Town, South Africa (online)	Research
09 Aug 2024	M. Burton	World Heritage and Astronomy	International Astronomical Union General Assembly, Cape Town, South Africa	Research
09 Aug 2024	J.S. Vink	X-Shooting Ullyses: Massive Stars at Low Z	International Astronomical Union General Assembly, DIV G, Cape Town, South Africa (online)	Research
23 Aug 2024	C.S. Jeffery	The Analysis of Stellar Spectra (3 Lectures)	ICESUN Summer School 2024: Stellar Explosions and Related Objects, Yunnan Observatory, Kunming, China	Teaching
27 Aug 2024	C.J. Bulter	Trends and Cycles in the Armagh Observatory Meteorological Series	Session Historical Climatology, 35th International Geographical Congress, 2024, Dublin, Co. Dublin, Ireland	Research
27 Aug 2024	C.S. Jeffery	The Populations and Products of Merging Double White Dwarfs	The Progenitors of Supernovae and their Explosions Conference, Dali, China	Research
28 Aug 2024	K. Trakakis	Determining the Physical Conditions of the Interstellar Medium and the Structure of the Milky Way Galaxy	Poster Presentation, Irish National Astronomy Meeting (INAM), University of Galway, Co. Galway, Ireland	Research
29 Aug 2024	A. Philip Monai	Unsupervised Approach to Spectral Classification of Hot Subdwarfs	Poster Presentation, Irish National Astronomy Meeting (INAM), University of Galway, Co. Galway, Ireland	Research
30 Aug 2024	A. Chawla	Astrophysical Data Visualisation	Online Talk at Irish National Astronomy Meeting (INAM), University of Galway, Co. Galway, Ireland	Research
30 Aug 2024	S. Schlagenhauf	S-PLUS MUSE - STARLIGHT and Revelations on Star Formation History	Irish National Astronomy Meeting (INAM), University of Galway, Co. Galway, Ireland	Research
02 Sep 2024	J.S. Vink	Carbon from Massive Star Winds	Carbon in Universe Workshop, Tokyo, Japan (online)	Research
04 Sep 2024	M. Burton	A Celebration of the Career of Tom Ray	After Dinner Speech, Jets and Beyond Conference, Knockranny House Hotel, Westport, Co. Mayo, Ireland	Outreach

Date	AOP Speaker	Title	Location/Mode	Category
09 Sep 2024	A. Marshall-Lee	Characterising the Efficiency of the Hierarchical Clustering Method	European Planetary Science Congress, Freie Universität Berlin, Germany	Research
10 Sep 2024	M.E. Bailey	Armagh Observatory - Societal Impacts and Longterm Climate Archive	Aughnacloy Historical Society, Aughnacloy, Co. Tyrone	Outreach
13 Sep 2024	A. Christou	Characterising the Meteoroid Environment at 0.7 au from the Sun with a Venus-orbiting Meteor Camera: A Feasibility Study	Europlanet Science Congress 2024, Berlin, Germany (virtual)	Research
17 Sep 2024	D. Eden	MAJORS: First Results from W40	UK Galactic Star Formation Workshop 2024, Armagh Observatory and Planetarium, Armagh, Co. Armagh	Research
18 Sep 2024	M. Sarzi	The Scientific Power of IFS Observations	Irish Astronomical Association Seminar, Queen's University Belfast, Co. Antrim	Outreach
18 Sep 2024	K. Trakakis	Determining the Physical Conditions of the Interstellar Medium and the Structure of the Milky Way Galaxy	UK Galactic Star Formation Workshop 2024, Armagh Observatory and Planetarium, Co. Armagh	Research
20 Sep 2024	A. Marshall-Lee	Protecting Ireland's Dark Skies for Future Generations	Culture Night, Wild Nephin National Park, Ballycroy Visitor Centre, Ballycroy, Co. Mayo, Ireland	Outreach
20 Sep 2024	S. Schlagenhauf	Showcase on the Importance of Dark Skies with a Mobile Planetarium	Culture Night, Wild Nephin National Park, Ballycroy Visitor Centre, Ballycroy, Co. Mayo, Ireland	Outreach
24 Sep 2024	M. Burton with M. McMahon	A History of the Armagh Planetarium	Designing a Planetarium Workshop, Armagh Planetarium, Co. Armagh	Education
25 Sep 2024	G. Ramsay	Stellar Activity and the Digital Telescope	Royal Astronomical Society, London, England	Research
25 Sep 2024	G. Ramsay	Galactic Transients and the Digital Telescope	Royal Astronomical Society, London, England	Research
02 Oct 2024	J.S. Vink	The Heaviest Black Holes in the Universe	Irish Astronomical Association Seminar, Queen's University Belfast, Co. Antrim	Outreach
04 Oct 2024	M. Burton	Armagh Observatory	Alliance of Historic Observatories, Specola Vaticana, Vatican	Research/ Education/ Outreach
04 Oct 2024	K. Trakakis	The Universe - A Journey Through Time	Stargazing Evening, Armagh Planetarium, Co. Armagh	Outreach
07 Oct 2024	M.E. Bailey	Giant Comets and Their Impacts Through Time: The Most Recent Giant Comet and its Impact on Civilization	Causeway U3A, Portstewart, Co. Antrim	Outreach
08 Oct 2024	A. Chawla	HI for a Simulated Galaxy Using TNG-50	Seminar, Meerkat Fornax Group, INAF, Osservatorio Astronomico di Capodimonte, Naples, Italy	Research
08 Oct 2024	M. McMahon	The History of Astronomical Observatories in Ireland	Craigavon Historical Society, Co. Armagh	Outreach
10 Oct 2024	J.S. Vink	How Massive is the Most Massive Star	Seminar, Armagh Observatory and Planetarium, Co. Armagh	Research
05 Oct 2024	J.S. Vink	The B Supergiant Problem and the Main Sequence Width	Hot Stars with Dust Conference, Almaty, Kazakhstan	Research
17 Oct 2024	S. Bagnulo	Strong Magnetic Fields of Old White Dwarfs are Symmetric about the Stellar Rotation Axes	Seminar, Armagh Observatory and Planetarium, Co. Armagh	Research
26 Oct 2024	S. Bagnulo	The Magnetic Field of Isolated White Dwarfs	ESO, Santiago, Chile	Research

Date	AOP Speaker	Title	Location/Mode	Category
30 Oct 2024	G. Ramsay	Hunting for the Optical Counterparts of GW Events Using GOTO and BlackGem	Irish Astronomical Association Seminar, Queen's University Belfast, Co. Antrim	Outreach
31 Oct 2024	G. Ramsay	Searching for the Optical Counterpart of Gravitational Wave Events Using GOTO and BlackGem	Seminar, Armagh Observatory and Planetarium, Co. Armagh	Research
01 Nov 2024	A. Philip Monai	Visualising the Universe	DVL, Armagh Planetarium, Co. Armagh	Outreach
13 Nov 2024	J.S. Vink	How Massive is the Most Massive Star	Seminar, Liverpool John Moores University, Liverpool, England	Research
21 Nov 2024	M. Burton	From the Discovery of Uranus to the Astronomical Observatories of Ireland: An Astronomical Adventure Story	Herschel Society, Bath Royal Literary and Scientific Institution, Bath, England	Outreach
11 Dec 2024	M. McMahon	The Exhibited Planetarium	Seminar, Science and Culture Research Group, Queen's University Belfast, Co. Antrim	Research
16 Dec 2024	K. Çubuk	Unlocking New Opportunities for Visibility and Growth	Management Committee Meeting, Armagh Observatory and Planetarium, Co. Armagh	Internal Outreach
16 Dec 2024	J.S. Vink	The Search for the First Stars	Management Committee Meeting, Armagh Observatory and Planetarium, Co. Armagh	Internal Outreach
14 Jan 2025	J.S. Vink	The Heaviest Stars and Black Holes in the Universe	Seminar, Institut de Ciències del Comos, Universitat de Barcelona, Spain	Research
16 Jan 2025	J.S. Vink	The Heaviest Black Holes Below PI	Lisa Meeting, University College Dublin, Co Dublin, Ireland	Research
20 Jan 2025	S. Schlagenhauf	S-PLUS MUSE - STARLIGHT and Revelations on Star Formation History	ING Journal Club, Isaac Newton Group, Santa Cruz de La Palma, La Palma, Canaries, Spain	Research/ Outreach
23 Jan 2025	M. Burton	The Historic Astronomical Observatories of Ireland	Presentation to the Expert Review Panel for the Irish World Heritage Unit, Dublin, Co Dublin	Outreach
28 Jan 2025	M. Burton	AOP, AOI & QUB – History and Collaboration	Queen's University Belfast, Co. Antrim	Research/ Education
03 Feb 2025	C.S. Jeffery	SALT, Stellar Mergers and the Super-Hot Zombie Stars	Northern Ireland Amateur Astronomical Society, Ballyclare, Co. Antrim	Outreach
20 Feb 2025	C.S. Jeffery	Highlights form the SALT Survey of Hydrogen-Deficient Hot Subdwarfs	School of Physics, Trinity College Dublin, Co. Dublin, Ireland	Research
11 Feb 2025	A. Philip Monai	PCA + Neural Networks for Identification and Classification of Hot Subdwarfs in LAMOST Sample	PhD Student Discussion Meeting, Armagh Observatory and Planetarium, Co. Armagh	Research
27 Feb 2025	M. Burton	Molecular Clouds and Star Formation in the Milky Way	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Teaching
06 Mar 2025	M. Burton	The Historic Astronomical Observatories of Ireland – An Update on our UNESCO World Heritage Application	Seminar, Armagh Observatory and Planetarium, Co. Armagh	Research
06 Mar 2025	G. Ramsay	Superflares on the Sun and Other Stars	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Teaching
06 Mar 2025	G. Ramsay	Multi-Messenger Astronomy and Wide Field Surveys	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Teaching
07 Mar 2025	A. Marshall-Lee	The History of Our Solar System	Stargazer Evening, Armagh Planetarium, Co. Armagh	Outreach
13 Mar 2025	J.S. Vink	The Most Massive Stars	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Research/ Outreach
17 Mar 2025	G. Ramsay	High Amplitude Galactic Transients	BlackGem Consortium Meeting — University of Barcelona, Spain	Research

Date	AOP Speaker	Title	Location/Mode	Category
20 Mar 2025	C.S. Jeffery	Stellar Pulsation — Theory and Applications	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Teaching
27 Mar 2025	A. Christou	How to Travel from A to B in the Solar System: A Brief Introduction to Interplanetary Flight	Topics in Astrophysics, AOP/QUB PhD Programme, Armagh Observatory, Co. Armagh	Teaching

Armagh Observatory and Planetarium
Education and Outreach: April 2024 – March 2025

Date	Event Description
Apr 2024 – Mar 2025	Outreach at various locations with the portable dome through AOP bookings or RI bookings
Apr 2024 – Mar 2025	The Legendary Telescope Tours at Armagh Observatory
Apr 2024 – Mar 2025	DVL sessions seasonally
Apr 2024 – Mar 2025	Little Astronomers (Monthly)
Apr 2024 – Mar 2025	Our World from Space Club (Monthly)
April 2024 – Mar 2025	STEM Cadets Afterschools Club (Weekly)
8-10 Apr 2025	Meet the Buyer (outreach) Belfast
20 Apr – 12 May 2024	ec(h)o, A Digital Film Poem by Csilla Toldy
27 Apr 2024	ec(h)o, A Digital Film Poem by Csilla Toldy. Artist's Talk
4 May 2024	International Star Wars Day: May The 4th Be With You
7 May 2024	Day of the Planetaria: 100 Years of Eternity Dome show
11 May 2024	Action Deaf Youth Event for Launch of PLP in BSL
27 May 2024	Meet our PhD Students: Learn More About Aliens and Exo-Planets
29-30 June 2024	Makaton Dome Shpw Launch
Jul – Aug 2024	Robot Exhibition – An Exhibition of Robots, Cyborgs and Androids
12 Jul-23 Aug 2024	Pink Floyd's Dark Side of the Moon (50th Anniversary Dome Show), Planets 360, Queen Mercury with Love – Music Show Fridays
21 Aug 2024	BBC Conor Phillips Show at AOP
7 Sep 2024	Armagh Food and Cider Weekend 2024 Event: Edible Experiments Workshop
14 Sep 2024	European Heritage Open Day Experience the Calver Telescope
14 Sep 2024	International Observe The Moon Day
19 Sep 2024	Public Lecture and Pink Floyd Dome Show How to Take a Picture of a Black Hole by Professor Derek Ward Thompson UK Galactic Star Formation Workshop
2 Oct 2024	100 Hours of Astronomy, 100 Years of the Planetarium 2 – 5 October 2024 – Stargazing Evening
4 Oct 2024	Stargazing Evening
29 – 30 Oct 2024	Halloween at Armagh Planetscarium – Spooky Activities and Varied Meet and Greets with Popular Characters.
1 Nov 2024	Stargazing Evening
23 Nov – 23 Dec 2024	Mission Santa: An Immersive Christmas Experience
30 Nov 2024	Georgian Day Legendary Telescopes Tour
6 Dec 2024	Stargazing Evening
10 Jan 2024	Exhibit at Holiday World
24 Jan 2025	Stargazing Evening – Cancelled due to Storm Ėowyn
Jan – Apr 2025	Historic Rosse Drawings Exhibition
13 – 15 Feb 2025	NI Science Festival 2025 Event: The Ultimate Bubble Show
14 Feb 2025	Stargazing Evening
16, 22 – 23 Feb 2025	NI Science Festival 2025 Event: Orienteering at the AOP
18 – 28 Feb 2025	1pm dome show Mysteries of your Brain
18 Feb 2025	NI Science Festival 2025 Event: NI Engineering Goes Into Space
21 Feb 2025	NI Science Festival 2025 Event: Little Astronomers

Date	Event Description
22 Feb 2025	NI Science Festival 2025 Event: Life Beyond Earth Talk
23 Feb 2025	NI Science Festival Event – The Magical Sounds – Sound Spa for Families
7 Mar 2025	Stargazing Evening
8 Mar 2025	Experience the Calver Telescope: Irish Astronomy Week
13 Mar 2025	Outreach with ABC Council: Dublin
15 – 23 Mar 2025	National Lottery Open Week Event
30 Mar 2025	Accessible Sunday – For a Relaxed Day of Exploring the Cosmos

ARMAGH OBSERVATORY AND PLANETARIUM

THE CERTIFICATE AND REPORT OF THE COMPTROLLER AND AUDITOR GENERAL TO THE NORTHERN IRELAND ASSEMBLY

Opinion on financial statements

I certify that I have audited the financial statements of the Armagh Observatory and Planetarium for the year ended 31 March 2025 under the Armagh Observatory and Planetarium (Northern Ireland) Order 1995. The financial statements comprise: the Statement of Financial Activities, the Balance Sheet, the Cash Flow Statement; and the related notes including significant accounting policies. The financial reporting framework that has been applied in their preparation is applicable law and United Kingdom accounting standards including Financial Reporting Standard (FRS) 102, the Financial Reporting Standard applicable in the UK and Republic of Ireland (United Kingdom Generally Accepted Accounting Practice).

I have also audited the information in the Remuneration and Staff Report that is described in that report as having been audited.

In my opinion the financial statements:

- give a true and fair view of the state of the Armagh Observatory and Planetarium's affairs as at 31 March 2025 and of its total incoming resources and expenditure of resources for the year then ended;
- have been properly prepared in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS 102); and
- have been properly prepared in accordance with the Armagh Observatory and Planetarium (Northern Ireland) Order 1995 and Department for Communities directions issued thereunder.

Opinion on regularity

In my opinion, in all material respects the expenditure and income recorded in the financial statements have been applied to the purposes intended by the Assembly and the financial transactions recorded in the financial statements conform to the authorities which govern them.

Basis for opinions

I conducted my audit in accordance with International Standards on Auditing (ISAs) (UK), applicable law and Practice Note 10 'Audit of Financial Statements and Regularity of Public Sector Bodies in the United Kingdom'. My responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of my certificate.

My staff and I are independent of the Armagh Observatory and Planetarium in accordance with the ethical requirements that are relevant to my audit of the financial statements in the UK, including the Financial Reporting Council's Ethical Standard, and have fulfilled our other ethical responsibilities in accordance with these requirements.

I believe that the audit evidence obtained is sufficient and appropriate to provide a basis for my opinions.

Conclusions relating to going concern

In auditing the financial statements, I have concluded that the Armagh Observatory and Planetarium's use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

Based on the work I have performed, I have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the Armagh Observatory and Planetarium's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

The going concern basis of accounting for the Armagh Observatory and Planetarium is adopted in consideration of the requirements set out in the Government Financial Reporting Manual, which require entities to adopt the going concern basis of accounting in the preparation of the financial statements where it anticipated that the services which they provide will continue into the future.

My responsibilities and the responsibilities of the Trustees and the Accounting Officer with respect to going concern are described in the relevant sections of this certificate.

Other Information

The other information comprises the information included in the Trustees' annual report other than the financial statements, the parts of the Remuneration and Staff Report described in that report as having been audited, and my audit certificate and report. The Trustees and the Accounting Officer are responsible for the other information included in the annual report. My opinion on the financial statements does not cover the other information and except to the extent otherwise explicitly stated in my certificate, I do not express any form of assurance conclusion thereon.

My responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit or otherwise appears to be materially misstated. If I identify such material inconsistencies or apparent material misstatements, I am required to determine whether this gives rise to a material misstatement in the financial statements themselves. If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact.

I have nothing to report in this regard.

Opinion on other matters

In my opinion based on the work undertaken in the course of the audit:

- the parts of the Remuneration and Staff Report to be audited have been properly prepared in accordance with Department for Communities directions made under the Armagh Observatory and Planetarium (Northern Ireland) Order 1995; and
- the information given in the Trustees' Annual Report for the financial year for which the financial statements are prepared is consistent with the financial statements.

Matters on which I report by exception

In the light of the knowledge and understanding of the Armagh Observatory and Planetarium and its environment obtained in the course of the audit, I have not identified material misstatements in the Trustees' Annual Report.

I have nothing to report in respect of the following matters which I report to you if, in my opinion:

- adequate accounting records have not been kept; or
- the financial statements and the parts of the Remuneration and Staff Report to be audited are not in agreement with the accounting records; or
- certain disclosures of remuneration specified by the Government Financial Report Manual are not made; or
- I have not received all of the information and explanations I require for my audit; or

- the Governance Statement does not reflect compliance with the Department of Finance's guidance.

Responsibilities of the Board of Governors and Accounting Officer for the financial statements
As explained more fully in the Statement of the Responsibilities of the Governors and Accounting Officer, the Governors and the Accounting Officer are responsible for:

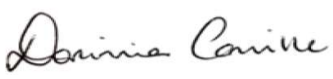
- the preparation of the financial statements and for being satisfied that they give a true and fair view;
- ensuring such internal controls are in place as deemed necessary to enable the preparation of financial statements to be free from material misstatement, whether due to fraud or error;
- ensuring the Annual Report, which includes the Remuneration and Staff Report, is prepared in accordance with the Government Financial Reporting Manual; and
- assessing the Armagh Observatory and Planetarium's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the Trustees and Accounting Officer anticipates that the services provided by Armagh Observatory and Planetarium will not continue to be provided in the future.

Auditor's responsibilities for the audit of the financial statements
My responsibility is to examine, certify and report on the financial statements in accordance with the Armagh Observatory and Planetarium (Northern Ireland) Order 1995.
My objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error and to issue a certificate that includes my opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.
I design procedures in line with my responsibilities, outlined above, to detect material misstatements in respect of non-compliance with laws and regulation, including fraud.
My procedures included:

- obtaining an understanding of the legal and regulatory framework applicable to the Armagh Observatory and Planetarium through discussion with management and application of extensive public sector accountability knowledge. The key laws and regulations I considered included the Armagh Observatory and Planetarium (Northern Ireland) Order 1995;
- making enquires of management and those charged with governance on Armagh Observatory and Planetarium's compliance with laws and regulations;
- making enquiries of internal audit, management and those charged with governance as to susceptibility to irregularity and fraud, their assessment of the risk of material misstatement due to fraud and irregularity, and their knowledge of actual, suspected and alleged fraud and irregularity;
- completing risk assessment procedures to assess the susceptibility of Armagh Observatory and Planetarium's financial statements to material misstatement, including how fraud might occur. This included, but was not limited to, an engagement director led engagement team discussion on fraud to identify particular areas, transaction streams and business practices that may be susceptible to material misstatement due to fraud. As part of this discussion, I identified potential for fraud in the following areas: revenue recognition and posting of unusual journals;
- engagement director oversight to ensure the engagement team collectively had the appropriate competence, capabilities and skills to identify or recognise non-compliance with the applicable legal and regulatory framework throughout the audit;
- documenting and evaluating the design and implementation of internal controls in place to mitigate risk of material misstatement due to fraud and non-compliance with laws and regulations;
- designing audit procedures to address specific laws and regulations which the engagement team considered to have a direct material effect on the financial statements in terms of misstatement and irregularity, including fraud. These audit procedures included, but were not limited to, reading board and committee minutes, and agreeing financial statement disclosures to underlying supporting documentation and approvals as appropriate; and
- addressing the risk of fraud as a result of management override of controls by:
    - performing analytical procedures to identify unusual or unexpected relationships or movements;
    - testing journal entries to identify potential anomalies, and inappropriate or unauthorised adjustments;
    - assessing whether judgements and other assumptions made in determining accounting estimates were indicative of potential bias; and
    - investigating significant or unusual transactions made outside of the normal course of business.

A further description of my responsibilities for the audit of the financial statements is located on the Financial Reporting Council's website www.frc.org.uk/auditorsresponsibilities. This description forms part of my certificate.
In addition, I am required to obtain evidence sufficient to give reasonable assurance that the expenditure and income recorded in the financial statements have been applied to the purposes intended by the Assembly and the financial transactions recorded in the financial statements conform to the authorities which govern them.

Report
I have no observations to make on these financial statements.



Dorinnia Carville
Comptroller and Auditor General
Northern Ireland Audit Office
106 University Street
BELFAST
BT7 1EU

28 November 2025

Armagh Observatory and Planetarium

Statement of Financial Activities for the year ended 31 March 2025

	Note	Unrestricted Funds 2025 £	Restricted Funds 2025 £	**Total Funds 2025 £**	Unrestricted Funds 2024 £	Restricted Funds 2024 £	**Total Funds 2024 £**
Income from:							
Charitable activities	2	2,726,531	635,118	**3,361,649**	2,348,511	810,084	**3,158,595**
Other trading activities	4	184,688	-	**184,688**	195,615	-	**195,615**
Total incoming resources		2,911,219	635,118	**3,546,337**	2,544,126	810,084	**3,354,210**
Expenditure on:							
Charitable activities	5	3,641,021	186,411	**3,827,432**	3,670,849	200,797	**3,871,646**
Other trading activities	7	87,239	-	**87,239**	106,900	-	**106,900**
Total outgoing expenditure		3,728,260	186,411	**3,914,671**	3,777,749	200,797	**3,978,546**
Net income / (expenditure)		)817,041(	448,707	**)368,334(**	)1,233,623(	609,287	**)624,336(**
Transfers between funds	15	376,026	)376,026(	**-**	709,378	)709,378(	**-**
Other recognised gains/(losses):							
Gains/(losses) on the revaluation of fixed assets and heritage assets	10 & 11	283,841	-	**283,841**	500,740	-	**500,740**
Actuarial gains less provisions on defined benefit pension scheme	15 & 19	43,000	-	**43,000**	)121,000(	-	**)121,000(**
Net Movement in Funds		)114,174(	72,681	**)41,493(**	)144,505(	)100,091(	**)244,596(**
Reconciliation of funds							
Total funds brought forward at 1 April 2024		12,427,938	47,937	**12,475,875**	12,572,443	148,028	**12,720,471**
Total funds carried forward at 31 March 2025		12,313,764	120,618	**12,434,382**	12,427,938	47,937	**12,475,875**

All amounts above relate to continuing operations of the organisation.
The notes on pages 64 to 76 form part of the financial statements.

Armagh Observatory and Planetarium

Balance Sheet as at 31 March 2025

	Note	2025	2024
Fixed Assets		£	£
Intangible assets	9	125,047	206,627
Tangible assets	10	9,356,826	9,607,418
Heritage Assets	11	2,996,570	2,995,970
Total fixed assets		12,478,443	12,810,015
Current assets			
Stocks	12	17,469	25,152
Debtors	13	104,982	113,140
Cash at bank and in hand	18	225,563	290,949
Total current assets		348,014	429,241
Creditors: amounts falling due within one year	14	(392,075)	(763,381)
Net current liabilities		(44,061)	(334,140)
Total assets less current liabilities		12,434,382	12,475,875
Creditors: amounts falling due after more than one year		-	-
Net assets excluding pension asset		12,434,382	12,475,875
Defined benefit pension scheme asset	19	-	-
Net assets		**12,434,382**	**12,475,875**
Funds			
Restricted funds	15	120,618	47,937
Unrestricted funds	15	4,591,583	4,752,692
Revaluation Reserves	15	7,722,181	7,675,246
Pension Reserve	15	-	-
Total Charity Funds		**12,434,382**	**12,475,875**

The financial statements on pages 61 to 76 were approved by the Board of Trustees of Armagh Observatory and Planetarium on 12 November 2025 and were signed on its behalf by

Trustee
Mr John Briggs

Accounting Officer
Professor Michael Burton

Armagh Observatory and Planetarium

Statement of cash flows for the year ended 31 March 2025

	Note	2025 £	2024 £
Net cash provided by operating activities	17	172,824	242,341
Cash flows from investing activities:			
Interest received		1,556	4,831
Purchase of tangible fixed assets		)239,766(	)335,434(
Sale of tangible fixed assets		-	-
		)238,210(	)330,603(
Increase / (decrease) in cash and cash equivalents		)65,386(	)88,262(

Further detail is reported in Notes 17 and 18.

Reconciliation of net cashflow to movement in net cash funds

		2025 £	2024 £
Increase / (decrease) in cash and cash equivalents in the year		)65,386(	)88,262(
Cash and cash equivalents at 1 April 2024		290,949	379,211
Cash and cash equivalents at 31 March 2025	18	225,563	290,949

The notes on pages 64 to 76 form part of the financial statements.

Armagh Observatory and Planetarium

Notes to the financial statements for the year ended 31 March 2025

1 Summary of significant accounting policies

(a) Basis of accounting

These financial statements have been prepared in accordance with the historical cost convention as modified by the revaluation of certain assets. The accounts comply with relevant accounting standards and disclosure requirements issued by the Department of Finance. In all other aspects the financial statements comply with the Statement of Recommended Practice applicable to charities preparing their accounts in accordance with the Financial Reporting Standard applicable in the UK and Republic of Ireland (FRS102) (Charities SORP (FRS102)).

The Trustees of Armagh Observatory and Planetarium (AOP) confirm that they have complied with their duty to have regard to the guidance on Public Benefit produced by the Charities Commission of Northern Ireland under section 4 of the Charities Act (Northern Ireland) 2008 (the public benefit requirement statutory guidance) and that this has informed the activities of the organisation in the year to 31 March 2025.

The Trustees are satisfied that there are no material uncertainties related to events or conditions which cast significant doubt on the ability of Armagh Observatory and Planetarium to continue as a going concern.

(b) Incoming resources

Grant income from Department for Communities (DfC) is shown in the Statement of Financial Activities (SOFA) in the year in which it is received. Grants that relate to specific capital expenditure are initially recognised in the SOFA and transferred to a restricted fund, Government Grant for Fixed Assets. Where no restriction on the use of the assets exists the value is transferred to an unrestricted fund. Grants that relate to specific research projects are recognised in the Statement of Financial Activities and transferred to a restricted fund. Once the relevant conditions for recognition (entitlement and certainty of value) have been met, they are transferred to funds to match the relevant expenditure. Other grants are credited to the Statement of Financial Activities when receivable.

(c) Resources expended

Resources expended are accounted for on an accruals basis. Expenditure is classified under the principal charitable activities of Research, Education and Governance & Support.

(d) Pension scheme

The organisation provides pension benefits to its employees by participating in the Local Government Pension Scheme for Northern Ireland, administered by Northern Ireland Local Government Officers' Superannuation Committee (NILGOSC), which is a defined benefit scheme. Annual contributions to the NILGOSC scheme are determined by the scheme and based on actuarial advice. The operating costs of providing retirement benefits to the organisation's employees are recognised in accounting periods in which the benefits are earned by employees, and the related finance costs and other changes in value of the assets and liabilities are recognised in the period in which they arise. AOP applies the principles of IFRIC 14 in relation to pension surplus restriction. IFRIC 14 requires allowances to be made for a minimum funding requirement, which limits the amount of economic benefit available to the excess of the value of prospective current service costs above the funding requirement.

(e) Intangible fixed assets

Intangible fixed assets represent contributions to international astronomical research projects, financed by capital grant. They are identifiable, for example, as part of a major telescope installation. The organisation benefits in the form of research participation or collaboration, which in turn contributes to the research outputs. Intangible fixed assets are stated at cost and amortised over the expected life of the project.

(f) Tangible fixed assets

The cost of tangible fixed assets is their purchase cost or valuation together with any incidental costs of acquisition. Depreciation is calculated so as to write off the cost or valuation of tangible fixed assets, less their estimated residual values, on a straight-line basis over the expected useful economic lives of the assets concerned. Land is not depreciated.
The principal annual depreciation rates used are as follows:

Buildings	Remaining asset life as valued
Digistar	20%
Fixtures and fittings	20 - 25%
Office equipment	20 - 25%
Scientific equipment	10 - 25%
Exhibits	10 - 50%
Motor Vehicles	20%

Land and buildings are included in the balance sheet at depreciated replacement cost, estimated value in use or market value. Land and buildings are professionally revalued at least every 5 years in accordance with accounting guidance. Land and buildings were last revalued as at the 31 March 2025 by Lynsey Allen MRICS on behalf of Land and Property Services. Revaluation gains (losses) are transferred to a revaluation reserve.

The valuations of Land and Buildings have been undertaken having regard to International Financial Reporting Standards (IFRS) as applied to the United Kingdom public sector and in accordance with HM Treasury guidance, International Valuation Standards and the requirements of the Royal Institution of Chartered Surveyors Valuation Global Standards 2025.

Other fixed assets (non Land & Buildings) with a life estimated over 5 years have a net book value of £45,274 at 31 March 2025. This accounts for 0.5% of the net book value of fixed assets. The Trustees do not consider it appropriate to carry out an annual indexation of such assets on grounds of immateriality.

(g) Heritage Assets

Armagh Observatory was founded in 1789 and from this date the Observatory has collected through its operations scientific items, books, furniture and other artefacts which would be considered heritage assets. It is not the policy of Armagh Observatory and Planetarium to acquire heritage assets but has collected such assets through donations and operations. As at 31 March 2024, heritage assets were re-valued for insurance purposes with reference to auction estimates for replacement. Antique books were valued by Doerr Dallas Valuations Limited. Meteorites were valued by Ulster Museum. Coram James Limited carried out a desktop valuation of clocks, scientific instruments, fine art, furniture and sculptures. The remainder were valued by experienced members of management. It is policy to regularly review the valuation of heritage assets. The heritage assets are being documented on the Collections Database and environmental controls were further improved in 2023/24.

Heritage assets are summarised in these accounts in four categories: Books; Clocks and watches; Scientific instruments; and Furniture, Artworks, etc, and are recorded in catalogues and on databases. Historic buildings which have heritage value are included within operational assets. These were included within the recent property revaluation as operational assets and continue to be used for operational purposes.

(h) Stocks

Stocks are stated at the lower of cost and net realisable value. In general, cost is determined on a first in first out basis. Provision is made where necessary for obsolete, slow moving and defective stocks.

(i) Debtors

Debtors comprise amounts due from customers, grants due, prepaid expenses and value added tax refunds.

(j) Cash at bank and in hand

Cash held in bank accounts payable on demand and cash floats.

(k) Creditors

Creditors comprise payments due to suppliers and accruals for other amounts due but not invoiced at the year end.

(l) Fund accounting

The organisation has various types of funds for which it is responsible, and which require separate disclosure, totalling £12,434,382 at 31 March 2025 (£12,475,875 at 31 March 2024).

Restricted funds

Grants or donations received which are earmarked by the donor for specific purposes. Such purposes are within the overall aims of the organisation.

Unrestricted funds

Unrestricted funds, comprising designated funds and undesignated funds, are those which are expendable at the discretion of the trustees in furtherance of the objectives of the organisation. In addition to expenditure on the provision of services, such funds may be held in order to finance capital investment and working capital.

Designated funds include the donated assets fund, the government grants fund and the general fund. The general fund is the day to day operating fund.

Donated assets are the buildings and grounds donated to the organisation in 1790 by its founder Archbishop Richard Robinson. The value is adjusted annually by any revaluation of the underlying assets.

The government grant fund represents the capital financing of the Charity's tangible fixed assets. The fund is reduced annually by a value equivalent to depreciation charged on the related assets.

Undesignated funds - These represent the revaluation reserve which records the movement from the revaluation of the Charity's assets and a pension reserve which matches the long term liability of an underfunded defined benefits pension scheme.

(m) Reserves policy

Armagh Observatory and Planetarium adopts a risk-based approach to establishing a sound system of control covering all types of risks to the aims and objectives of the organisation. There is a need to retain a sufficient level of unrestricted cash reserves to meet the risks associated with short term financial contingencies, uncertainties and demands. The Trustees do not believe there are any key assumptions or key sources of estimation uncertainty which could cause a material adjustment to the carrying amounts of assets and liabilities within the next reporting period. Armagh Observatory and Planetarium budgets to operate on an annual basis within a balanced funding formula of grant-in-aid and self-generated income.

2 Income from charitable activities

	Note	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Grant Income					
DfC Recurrent grant-in-aid		2,352,000	-	2,352,000	1,932,000
DfC In-year capital grant-in-aid		-	140,000	140,000	435,000
Total grant-in-aid from the DfC		2,352,000	140,000	2,492,000	2,367,000
Income from other grants and receipts	3	-	489,548	489,548	340,637
Total Grant Income		2,352,000	629,548	2,981,548	2,707,637
Operating Income					
Admissions		355,797	-	355,797	408,680
Profit/(loss) on disposal of fixed assets		-	-	-	-
Miscellaneous income		18,734	5,570	24,304	42,278
Total Operating Income		374,531	5,570	380,101	450,958
Total Income from Charitable Activities		**2,726,531**	**635,118**	**3,361,649**	**3,158,595**

3 Income from other grants and receipts

	Note	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
STFC Research and Studentship grants		-	225,202	225,202	270,259
Europlanet 2024 RI grant		-	-	-	8,895
UKRI Open Access block grant		-	5,848	5,848	5,668
Science Foundation Ireland grant		-	46,166	46,166	4,576
ASDC grants		-	9,167	9,167	9,583
IAU grant		-	-	-	4,270
Tourism NI grants		-	2,413	2,413	15,872
Royal Astronomical society grant		-	2,500	2,500	5,000
National Lottery Heritage Fund		-	39,995	39,995	-
DfC Sign Language Partnership grant		-	-	-	3,450
Museums Association		-	-	-	9,500
JobStart scheme		-	-	-	3,364
STEM Ambassadors grant		-	27,774	27,774	-
UKSA Space For All grant		-	10,601	10,601	-
Leverhulme grant		-	41,753	41,753	-
Shared Island grant		-	75,782	75,782	-
Sundry grants and donations		-	2,347	2,347	200
Total other grants and receipts	2	-	489,548	489,548	340,637

4 Income from other trading activities

	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Shop income	154,050	-	154,050	174,419
Rental income	30,638	-	30,638	21,196
Total Income from other trading	184,688	-	184,688	195,615

5 Expenditure on charitable activities

	Note	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Research	6	1,103,090	186,411	1,289,501	1,299,196
Education	6	1,446,180	-	1,446,180	1,509,701
Governance and Support	6	1,091,751	-	1,091,751	1,062,749
		3,641,021	186,411	3,827,432	3,871,646

6 Expenditure on charitable activities

	Note	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Research					
Staff costs		536,876	96,894	633,770	666,291
Direct costs		191,219	89,517	280,736	253,359
Support costs		140,399	-	140,399	144,004
Depreciation		234,596	-	234,596	235,542
	5	1,103,090	186,411	1,289,501	1,299,196
Education					
Staff costs		500,831	-	500,831	513,774
Direct costs		162,583	-	162,583	129,890
Support costs		260,259	-	260,259	304,978
Depreciation		522,507	-	522,507	561,059
	5	1,446,180	-	1,446,180	1,509,701
Governance and Support					
Staff costs		731,727	-	731,727	727,680
Direct costs		21,987	-	21,987	8,166
Support costs		307,126	-	307,126	296,935
Depreciation		30,911	-	30,911	29,968
	5	1,091,751	-	1,091,751	1,062,749

Included within Governance and Support costs are the following governance costs:

	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Management Committee expenses	6,911	-	6,911	3,613
Internal Audit	14,743	-	14,743	15,254
External Audit	27,400	-	27,400	26,700
	49,054	-	49,054	45,567

The cost of audit shown above includes £26,700 fees payable to Northern Ireland Audit Office for statutory audit. NIAO does not provide any other service.

7 Expenditure on trading activities

	Unrestricted Funds 2025 £	Restricted Funds 2025 £	Total Funds 2025 £	Total Funds 2024 £
Trading				
Direct costs	87,239	-	87,239	106,900
	87,239	-	87,239	106,900

Notes to the financial statements for the year ended 31 March 2025 (continued)

8 Average staff numbers and related costs

	Permanent staff	Others	2025 Number	2024 Number
Average staff numbers	27.9	6.4	34.3	35.2

Staff costs comprise:	Permanent staff £	Others £	2025 £	2024 £
Wages and salaries	1,253,979	147,921	1,401,900	1,446,683
Social security costs	141,026	12,702	153,728	150,822
Employer's pension contributions	236,879	23,821	260,700	259,240
Defined benefit pension additional service cost	50,000	-	50,000	51,000
	1,681,884	184,444	1,866,328	1,907,745

The number of employees whose employee benefits (excluding employer pension costs) exceeded £60,000 was:

	2025 Number	2024 Number
£60,001 - £70,000	6	1
£70,001 - £80,000	1	-
£80,001 - £90,000	-	1
£90,001 - £100,000	1	-

The key management personnel of the organisation comprise the trustees and the Executive Director.

The total amount of employee benefits (including employer pension contributions) received by the Executive Director for his services to the organisation was £107,893 (2024: £105,154).

There was no remuneration paid to trustees during the year (2024: Nil). Travel and subsistence expenses reimbursed to trustees amounted to £3,293 (2024: Nil).

Average student numbers and related costs (not included above)

	2025 Number	2024 Number
PhD students	8.4	7.0

	2025 £	2024 £
Student maintenance grants & stipends	186,776	135,617

9 Intangible fixed assets

	2025 £	2024 £
Cost		
At 1 April	622,018	622,018
Additions	-	-
Disposals	-	-
At 31 March	622,018	622,018
Depreciation		
At 1 April	415,391	333,811
Charge for year	81,580	81,580
Disposals	-	-
At 31 March	496,971	415,391
Net book value		
At 31 March 2025	**125,047**	**206,627**
At 31 March 2024	**206,627**	**288,207**

10 Tangible fixed assets

	Freehold Land & buildings £	Exhibits £	Assets Under Construction £	Digistar Projection System £	Scientific Equipment £	Other Equipment & Vehicles £	Total £
Cost or valuation							
At 1 April 2024	8,717,982	1,194,456	6,000	500,351	723,698	1,316,484	12,458,971
Asset revaluation	46,935	-	-	-	-	-	46,935
Additions	70,015	4,626	-	-	-	97,360	172,001
Transfers	6,000	-	(6,000)	-	-	-	-
Disposals	-	(2,624)	-	(4,192)	(51,073)	(44,548)	(102,437)
At 31 March 2025	8,840,932	1,196,458	-	496,159	672,625	1,369,296	12,575,470
Depreciation							
At 1 April 2024	-	719,115	-	401,119	653,020	1,078,299	2,851,553
Adjustment for asset revaluation	)236,906(	-	-	-	-	-	(236,906)
Charge for year	236,906	184,749	-	99,232	41,637	143,910	706,434
Disposals	-	(2,624)	-	(4,192)	(51,073)	(44,548)	(102,437)
At 31 March 2025	-	901,240	-	496,159	643,584	1,177,661	3,218,644
Net book value							
At 31 March 2025	**8,840,932**	**295,218**	**-**	**-**	**29,041**	**191,635**	**9,356,826**
At 31 March 2024	**8,717,982**	**475,341**	**6,000**	**99,232**	**70,678**	**238,185**	**9,607,418**

Tangible fixed asset additions of £172,001 as shown above were funded by DfC in-year capital grant-in-aid.

If the land and buildings had not been valued, they would have been included at the following amounts:

	2025 £	2024 £
Cost	3,961,818	3,885,803
Aggregate depreciation	(1,339,413)	(1,260,455)
Net book value based on historic cost	2,622,405	2,625,348

Notes to the financial statements for the year ended 31 March 2025 (continued)

10 Tangible fixed assets (continued)

Depreciation on tangible fixed assets for the year was £706,434 (2024: £744,987).

Land and buildings include grounds and buildings with a net book value of £2,193,642 (2024: £2,132,515) which were donated to the organisation in 1790 by Archbishop Richard Robinson, the founder of the organisation.

Armagh Observatory and Planetarium includes in fixed assets any expenditure over £1,500 (on an item or group of related items) which is expected to be used for more than a year.

11 Heritage assets

At Valuation	Books	Clocks & Watches	Scientific Equipment	Furniture, Artworks, etc	Total
	£	£	£	£	£
Carrying Amount at 1 April 2024	644,075	625,600	1,435,900	290,395	2,995,970
Additions	-	-	600	-	600
Revaluation	-	-	-	-	-
Disposals	-	-	-	-	-
Depreciation / impairment	-	-	-	-	-
Carrying Amount at 31 March 2025	644,075	625,600	1,436,500	290,395	2,996,570

It is policy to regularly review the valuation of heritage assets and to carry out a formal revaluation at least once every five years. The most recent valuation took place in 2024.

Summary of heritage asset transactions

There were no charges for impairment or disposals of heritage assets in the five years ended 31 March 2025. Through a donation, there was a single purchase costing £600 in 2024/25. Ordnance Survey maps of Ireland and map chests owned by Armagh Observatory & Planetarium but held in Robinson Library, Armagh, were valued for the first time in 2021-22 at £100,000.

12 Stocks

	2025	2024
	£	£
Goods for resale	17,469	25,152

13 Debtors

	2025	2024
	£	£
Trade debtors	36,976	35,002
Prepayments and accrued income	56,402	51,578
Other debtors	11,604	26,560
	104,982	113,140

14 Creditors: amounts falling due within one year

	2025	2024
	£	£
Trade creditors	31,641	150,577
Accruals and sundry creditors	328,581	580,562
Taxation and social security	31,853	32,242
	392,075	763,381

15 Statement of Funds

	At 1 April 2024	Income	Expenditure	Revaluation	Transfers	At 31 March 2025
	£	£	£	£	£	£
Restricted Funds						
Government grant for fixed assets	-	140,000	-	-	(140,000)	-
Other grants for fixed assets	-	-	-	-	-	-
Restricted resource grants	47,937	495,118	(186,411)	-	(236,026)	120,618
Total restricted funds	**47,937**	**635,118**	**(186,411)**	**-**	**(376,026)**	**120,618**
Unrestricted Funds						
Designated Funds						
Donated assets reserve	1,720,283	-	-	-	-	1,720,283
Government grant for assets	1,830,326	-	-	-	(648,014)	1,182,312
General fund	1,202,083	2,911,219	(3,728,260)	-	1,303,946	1,688,988
	4,752,692	**2,911,219**	**(3,728,260)**	**-**	**655,932**	**4,591,583**
Undesignated Funds						
Revaluation reserve - Land & Buildings	5,986,397	-	-	283,841	(236,906)	6,033,332
Revaluation reserve - Heritage Assets	1,688,849	-	-	-	-	1,688,849
Pension reserve	-	-	-	43,000	(43,000)	-
	7,675,246	**-**	**-**	**326,841**	**(279,906)**	**7,722,181**
Total Unrestricted Funds	**12,427,938**	**2,911,219**	**(3,728,260)**	**326,841**	**376,026**	**12,313,764**
Total Funds	**12,475,875**	**3,546,337**	**(3,914,671)**	**326,841**	**-**	**12,434,382**

Details of Transfers between funds	**£**
Release of restricted resource grant available to offset overheads	(236,026)
Release of deferred capital grant	(788,014)
Transfer of defined benefit pension service and interest cost	(43,000)
Transfer of depreciation adjustment on asset revaluation to general fund	(236,906)
General fund	**1,303,946**

16 Analysis of net assets between funds

	Pension Reserve	Revaluation Reserve	Unrestricted Funds	Restricted Funds	Total Funds
	£	£	£	£	£
Tangible fixed assets	-	6,033,332	3,448,541	-	9,481,873
Heritage assets	-	1,688,849	1,307,721	-	2,996,570
Current assets	-	-	227,396	120,618	348,014
Creditors: amounts falling due within one year	-	-	(392,075)	-	(392,075)
Net assets/(liabilities(	-	7,722,181	4,591,583	120,618	12,434,382

17 Reconciliation of net expenditure to net cash flow from operating activities

	2025 £	2024 £
Net expenditure for the year per statement of financial activities	(368,334(	(624,336(
Adjustments for:		
Depreciation	788,014	826,567
Interest received	(1,556(	(4,831)
Defined benefit pension scheme service and interest cost less contributions payable	43,000	37,000
Decrease/(increase(in stock	7,683	(5,300)
Decrease in debtors	8,158	67,885
Decrease in creditors	(304,141)	(54,644)
Net cash provided by operating activities	172,824	242,341

Notes to the financial statements for the year ended 31 March 2025 (continued)

18 Analysis of cash and cash equivalents

	31 March 2025 £	31 March 2024 £
Cash at bank and in hand	225,563	290,949
Total cash and cash equivalents	225,563	290,949

19 Pension scheme

Introduction

The disclosures below relate to the funded liabilities within the Northern Ireland Local Government Officers' Superannuation Pension Fund (the "Fund"(which is part of the Local Government Pension Scheme (Northern Ireland) (the "LGPS") and certain related unfunded liabilities which have been separately disclosed. The LGPS is a funded defined benefit plan with benefits earned up to 31 March 2015 being linked to final salary. Benefits after 31 March 2015 are based on a Career Average Revalued Earnings scheme. Details of the benefits earned over the period covered by this disclosure are set out in 'The Local Government Pension Scheme Regulations (Northern Ireland) 2014' (as amended) and 'The Local Government Pension Scheme (Amendment and Transitional Provisions) Regulations (Northern Ireland) 2014' (as amended). The unfunded pension arrangements relate to termination benefits made on a discretionary basis upon early retirement in respect of members of the Local Government Pension Scheme under the 'Local Government (Early Termination of Employment) (Discretionary Compensation) Regulations (Northern Ireland) 2007'.

Funding / Governance Arrangements of the LGPS

The funded nature of the LGPS requires participating employers and their employees to pay contributions into the Fund, calculated at a level intended to balance the pension liabilities with investment assets. Information on the framework for calculating contributions to be paid is set out in 'The Local Government Pension Scheme Regulations (Northern Ireland) 2014' and the Fund's Funding Strategy Statement. The last actuarial valuation was at 31 March 2022 and the contributions to be paid until 31 March 2026 resulting from that valuation are set out in the Fund's Rates and Adjustment Certificate. NILGOSC as the Scheme manager is responsible for the governance of the Fund.

Assets

The assets allocated to the Employer in the Fund are notional and are assumed to be invested in line with the investments of the Fund for the purposes of calculating the return over the accounting period. The Fund holds a significant proportion of its assets in liquid investments. As a consequence there will be no significant restriction on realising assets if a large payment is required to be paid from the Fund in relation to an employer's liabilities. The assets are invested in a diversified spread of investments and the approximate split of assets for the Fund as a whole is shown in the disclosures. NILGOSC may invest a small proportion of the Fund's investments in the assets of some of the employers participating in the Fund if it forms part of their balanced investment strategy.

The NILGOSC actuary, Aon Solutions UK Ltd (Aon), has provided the following details for the purposes of accounting for the Armagh Observatory and Planetarium's joint share of the Scheme in accordance with FRS 102 at 31 March 2025.

Key assumptions used by the actuary were:

	31 March 2025	31 March 2024
Discount rate	5.8%	4.8%
CPI inflation	2.5%	2.6%
Pension increases	2.5%	2.6%
Pension accounts revaluation rate	2.5%	2.6%
Salary increases	4.0%	4.1%

Mortality assumptions

	31 March 2025 Years	31 March 2024 Years
Males		
Pensioner member aged 65 at accounting date	21.6	21.7
Active member aged 45 at accounting date	22.2	22.7
Females		
Pensioner member aged 65 at accounting date	24.5	24.6
Active member aged 45 at accounting date	25.2	25.6

Notes to the financial statements for the year ended 31 March 2025 (continued)

19 Pension scheme (continued)

Asset Allocation

	Value at 31/03/2025	Value at 31/03/2024
Equities	41.3%	43.7%
Property	9.5%	9.7%
Government bonds	15.7%	17.4%
Corporate bonds	3.9%	4.2%
Multi Asset Credit	13.0%	13.3%
Cash	10.7%	5.6%
Other	5.9%	6.1%
Total	100.0%	100.0%

Reconciliation of funded and unfunded status to balance sheet

	Value at 31/03/2025 £'000	Value at 31/03/2024 £'000
Fair value of assets	12,173	11,787
Present value of funded defined benefit obligation	(9,285)	(10,611)
Funded status	2,888	1,176
Unrecognised asset	(2,888)	(1,175)
Present value of unfunded defined benefit obligation	-	(1)
Asset/(Liability) recognised on the balance sheet	-	-

The split of the liabilities at the last valuation between the various categories of members is as follows:

Active members	36%
Deferred pensioners	20%
Pensioners	44%

Amounts recognised in statement of financial activities

	Year to 31/03/2025 £'000	Year to 31/03/2024 £'000
Operating cost		
Current service cost	(313)	(303)
Financing cost		
Interest on net defined benefit liability	63	14
Interest on unrecognised asset	(56)	-
Pension expense recognised in statement of financial activities	(306)	(289)
Allowance for administrative expenses included in Current Service Cost	7	7

Amounts recognised in statement of funds

	Year to 31/03/2025 £'000	Year to 31/03/2024 £'000
Asset gains/(losses) arising during the period	(131)	617
Actuarial gains/(losses) due to changes in financial assumptions	1,749	354
Actuarial gains/(losses) due to changes in demographic assumptions	78	164
Actuarial gains/(losses) due to liability experience	4	)81(
Adjustment gains/(losses) due to restriction of surplus	(1,656)	(1,175)
Total amount recognised in statement of funds	44	(121)

Changes to the present value of defined benefit obligation

	Year to 31/03/2025 £'000	Year to 31/03/2024 £'000
Opening defined benefit obligation	10,612	10,532
Current service cost	313	303
Interest expense on defined benefit obligation	502	488
Contributions by participants	119	130
Actuarial gains/(losses) due to changes in financial assumptions	(1,749)	(354)
Actuarial gains/(losses) due to changes in demographic assumptions	(78)	(164)
Actuarial gains/(losses) due to liability experience	(4)	81
Net benefits paid out	(430)	(404)
Closing defined benefit obligation	9,285	10,612

Notes to the financial statements for the year ended 31 March 2025 (continued)

19 Pension scheme (continued)

Changes to the fair value of assets

	Year to 31/03/2025 £'000	Year to 31/03/2024 £'000
Opening fair value of assets	11,787	10,690
Interest income on assets	565	502
Remeasurement gains/(losses) on assets	(131)	617
Contributions by the employer	263	252
Contributions by participants	119	130
Net benefits paid out	(430)	(404)
Closing fair value of assets	12,173	11,787

Actual return on assets

	Year to 31/03/2025 £'000	Year to 31/03/2024 £'000
Interest income on assets	565	502
Gain/(loss) on assets	(131)	617
Actual return on assets	434	1,119

Sensitivity Analysis
Funded LGPS benefits

Discount rate assumptions

Adjustment to discount rate	**+0.1%pa**	**Base Figure**	**-0.1%pa**
Present value of total obligation (£m)	9.155	9.285	9.415
% change in present value of total obligation	-1.4%		1.4%
Projected service cost (£m)	0.202	0.212	0.222
Approximate % change in projected service cost	-4.5%		4.6%

Rate of general increase in salaries

Adjustment to salary increase rate	**+0.1%pa**	**Base Figure**	**-0.1%pa**
Present value of total obligation (£m)	9.304	9.285	9.266
% change in present value of total obligation	0.2%		-0.2%
Projected service cost (£m)	0.212	0.212	0.212
Approximate % change in projected service cost	0.0%		0.0%

Rate of increase to pensions in payment and deferred pension assumption, and rate of revaluation of pension account assumptions:

Adjustment to pension increase rate	**+0.1%pa**	**Base Figure**	**-0.1%pa**
Present value of total obligation (£m)	9.396	9.285	9.174
% change in present value of total obligation	1.2%		-1.2%
Projected service cost (£m)	0.222	0.212	0.202
Approximate % change in projected service cost	4.6%		-4.5%

Post retirement mortality assumption

Adjustment to mortality age rating assumption	**-1 year**	**Base Figure**	**+1 year**
Present value of total obligation (£m)	9.499	9.285	9.071
% change in present value of total obligation	2.3%		-2.3%
Projected service cost (£m)	0.219	0.212	0.278
Approximate % change in projected service cost	3.5%		-3.5%

Notes to the financial statements for the year ended 31 March 2025 (continued)

19 Pension scheme (continued)

Pension Surplus Restriction

AOP has applied the principles of FRS 102 in relation to pension surplus restriction. FRS 102 outlines that a defined benefit plan asset can only be recognised to the extent that the plan surplus can be recovered through reduced contributions in the future or through refunds from the plan. Aon has assessed that at 31 March 2025 the defined benefit plan asset is restricted to nil as no plan surplus can be recovered by these means.

Pensions Increase/Revaluation experience

Aon have adjusted the defined benefit obligation to reflect the impact of actual inflation being higher (or lower) than previously assumed. They have made allowance for the actual (and expected) impact of inflation on the active (CARE) liabilities, deferred liabilities and pensioner liabilities. They have allowed for inflation up to the month ending prior to the accounting date, to reflect the published CPI index at the accounting date.

Pay settlements for local government workers

The Local Government pay agreement for 2024/25 was an increase of £1,290 per annum. For a typical employer this is unlikely to be materially different to the pay increase that was assumed at the start of the accounting period. Therefore, Aon have not made an explicit allowance for any gain (or loss) from pay awards this year.

20 Capital commitments

Capital commitments at 31 March 2025 totalled £0 (2024: £58,000) in respect of expenditure on projects commenced during the year. DfC has not agreed funding for 2025/26.

21 Contingent liabilities

There were no contingent liabilities at the 31 March 2025 (2024: Nil).

22 Remote contingent liabilities (Audited)

There were no remote contingent liabilities at the 31 March 2025 (2024: Nil).

23 Related-party transactions

None of the members of the Board of Governors, the Management Committee, the Director or other related parties have undertaken any material transactions with the Armagh Observatory and Planetarium during the year. The Armagh Observatory and Planetarium has had various material transactions with a number of Government Departments, Executive Agencies and Non-Departmental Public Bodies in Northern Ireland. Most of these transactions have been with DfC, Construction and Procurement Delivery (CPD), Strategic Investment Board (SIB), Tourism NI, and the Education Authority (EA). DfC provides recurrent and capital grant-in-aid (note 2), SIB provides professional advisory and consultancy services, Tourism NI provides marketing and capital grants (note 3), and CPD and EA are the Centres of Procurement Expertise for the organisation. The Royal School Armagh leases land for playing fields at a nominal rent.

No other related party transactions took place in the year, other than certain trustees' expenses already disclosed in note 8.

24 Losses and special payments (Audited)

There were no losses or special payments during the year (2024: Nil).

25 Fees and charges (Audited)

AOP generates income from admissions, shop income and grant income. These income streams are disclosed in Notes 2, 3 and 4.

26 Financial instruments

As the cash requirements of the Armagh Observatory and Planetarium are met through grants from DfC and other grant funding bodies, financial instruments play a more limited role in creating risk than would apply to a non-public sector body of a similar size. The majority of financial instruments relate to contracts to buy non-financial items in line with the Observatory's expected purchase and usage requirements and the Armagh Observatory and Planetarium is therefore exposed to little credit, liquidity or market risk.

Notes to the financial statements for the year ended 31 March 2025 (continued)

27 Additional disclosures to comply with the Financial Reporting Manual (FReM)

FReM requires non-departmental public bodies to regard grant-in-aid received as contributions from controlling bodies giving rise to a financial interest in the residual interest of the body and hence accounting for as financing, that is by crediting them to income and expenditure reserve. In addition FReM requires grant-in-aid to be accounted for on a cash basis.

However, as the organisation is required to prepare accounts in accordance with the SORP for charities, DfC has given AOP permission to continue to treat grants as income. If AOP were required to comply with the FReM the result of this compliance would be as follows:

Statement of Financial Activities prepared under FReM

	Note	2025 £	2024 £
Incoming resources			
Incoming resources from research and other non-DfC grants	2	489,548	340,637
Operating income	2	380,101	450,958
Trading income	4	184,688	195,615
Total incoming resources		1,054,337	987,210
Resources expended			
Direct expenditure of the organisation		3,914,671	3,978,546
Total Resources expended		3,914,671	3,978,546
Net deficit for the year		(2,860,334)	(2,991,336)
Loss/(gain) on revaluation of Fixed Assets and Heritage Assets		283,841	500,740
Actuarial (loss)/gain on pension scheme		43,000	(121,000)
Amount transferred to funds		(2,533,493)	(2,611,596)

Analysis of funds prepared under the FReM

		2025 £	2024 £
Balance at 1 April		12,475,875	12,720,471
Grant-in-aid received in the year	2	2,492,000	2,367,000
Net operating costs for the year		(2,533,493)	(2,611,596)
Balance at 31 March		12,434,382	12,475,875

28 Events after the Reporting Date

1) Adjusting Events:

There were no events after the reporting date which would require adjustment to the financial statements.

2) Non-adjusting Events:

Funding required for the Outline Business Case (OBC1), which relates to the redevelopment of the AOP site, was approved by the Minister of Communities on 30 June 2025. In terms of the funding application, a total amount of £3,973k has been approved for the three years ending 31 March 2028.

Previously, The National Lottery Heritage Fund (NLHF) had allocated funding in the amount of £1,324k which was dependent on funding procured from other sources amounting to three-fold the funding allocated by NLHF.

The funding grant from DfC is therefore 75% of the total funding grant of £5,297k, with the balance of 25% being funded by NLHF.

The Accounting Officer authorised the issue of these financial statements on 12 November 2025.