

**Institution: Royal Holloway, University of London**

## 1 Context and mission

*At Royal Holloway, students and staff join a close community of inspiring people with a truly global outlook.*

The Royal Holloway Strategic Plan 2013-2020

Our mission, stated in *The Royal Holloway Strategic Plan 2013-2020*, reflects our vibrant research culture, our supportive campus, our international outlook, and our shared values. Today's university is rooted in the ethos of our two founding colleges, Bedford College (1849) and Royal Holloway College (1886), which pioneered higher education for women and merged in 1985 to form Royal Holloway, University of London. Bedford and Royal Holloway Colleges share a history of challenging social and cultural norms, and this heritage continues to inspire our commitment to equality, academic excellence, and social justice.

Royal Holloway is a Top 20 university (Times and Sunday Times 2020), with 10,500 students and an academic staff of 766 (711.58 FTE, July 2020). We are a research-intensive institution that delivers high quality research-informed teaching (NSS 25<sup>th</sup> = for overall satisfaction in 2020), and placed in Group X for KEF, having high research performance in the arts, humanities, social sciences, and sciences. Our main campus in Surrey supports our community, and its proximity to London facilitates national and international research collaborations. Situated in the M25/ M3/ M4 corridors we have prioritised relationships with regional industries since 2014, including our Local Enterprise Partnership, Enterprise M3. Our premises in Bloomsbury and Senate House, University of London, provide access to the capital's research facilities, and the University of London's School of Advanced Study. We are members of London Higher, an umbrella body representing over 50 HEIs in London, chaired by our Principal.

Royal Holloway's research environment has undergone a period of strategic change since 2014. In addition to supporting high-quality disciplinary research, we introduced an ambitious programme of challenge-led research that revitalised our approach to enabling impact. In this assessment period, we have increased our portfolio of interdisciplinary research and strengthened our research collaborations with industry, NGOs and the third sector, and with the health, cultural and heritage sectors. To support this approach, in 2019 College's Academic Board took the decision to disband three faculties (Science; Arts and Social Science; Management, Economics and Law) and create a six-school structure: Business and Management; Engineering, Physical and Mathematical Sciences; Humanities; Law and Social Sciences; Life Sciences and the Environment; Performing and Digital Arts. The Schools structure is designed for agility and sustainability, and to amplify academic voices in research leadership and strategic decision-making. In this assessment period we have expanded into new fields; in Science we introduced Electronic Engineering, enlarged Computer Science, and strengthened Neuroscience (within Psychology). In the Social Sciences, we introduced Law and grew our Business and Management School. In the Arts and Humanities, we expanded Philosophy and led significant new collaborations with the creative industries. Our REF2021 submission has new entries to Units of

Assessment in Allied Health, Engineering, Philosophy, and Social Policy & Social Work (including Law).

Royal Holloway's research responds to today's inter-connected world, and our research strategy and working methods are motivated by challenging inequalities, articulated in today's terms as, for example, decolonising research in different geographic regions; supporting industrial growth; addressing the global challenges of food security, water and climate change; protecting citizens and businesses online; extending cultural and political participation; using digital technologies to develop the creative industries, and improving health and wellbeing. A well-supported academic community is central to excellent research, and we have created new opportunities for professional development and research leadership underpinned by our equitable principles.

## 2 Strategy

Royal Holloway's research and impact strategy was overhauled during the period 2013-2020. *The Royal Holloway Strategic Plan 2013-2020* defined our core principles as Creativity, Excellence, Collaboration, Fairness and Freedom, and set the following objectives:

People:

- Create a sector-leading approach to support early career and established researchers;
- Support growth in postgraduate research students;
- Nurture a culture of inclusion and diversity.

Partnership and Impact:

- Build strategic research links and become a partner of choice, driving the research agenda;
- Engage with, influence and enhance local, regional, national and international social, economic and political agenda;
- Encourage and develop a culture of social responsibility focused on the local and regional community.

Infrastructure and investment

- Prioritise investment in areas of strength;
- Ensure policies and processes support research needs;
- Develop and maintain good quality research facilities.

Delivering our strategic objectives required step-change in our research environment and a three-phase delivery plan.

### **Phase One: Strategic Investment and Growth 2014-2017**

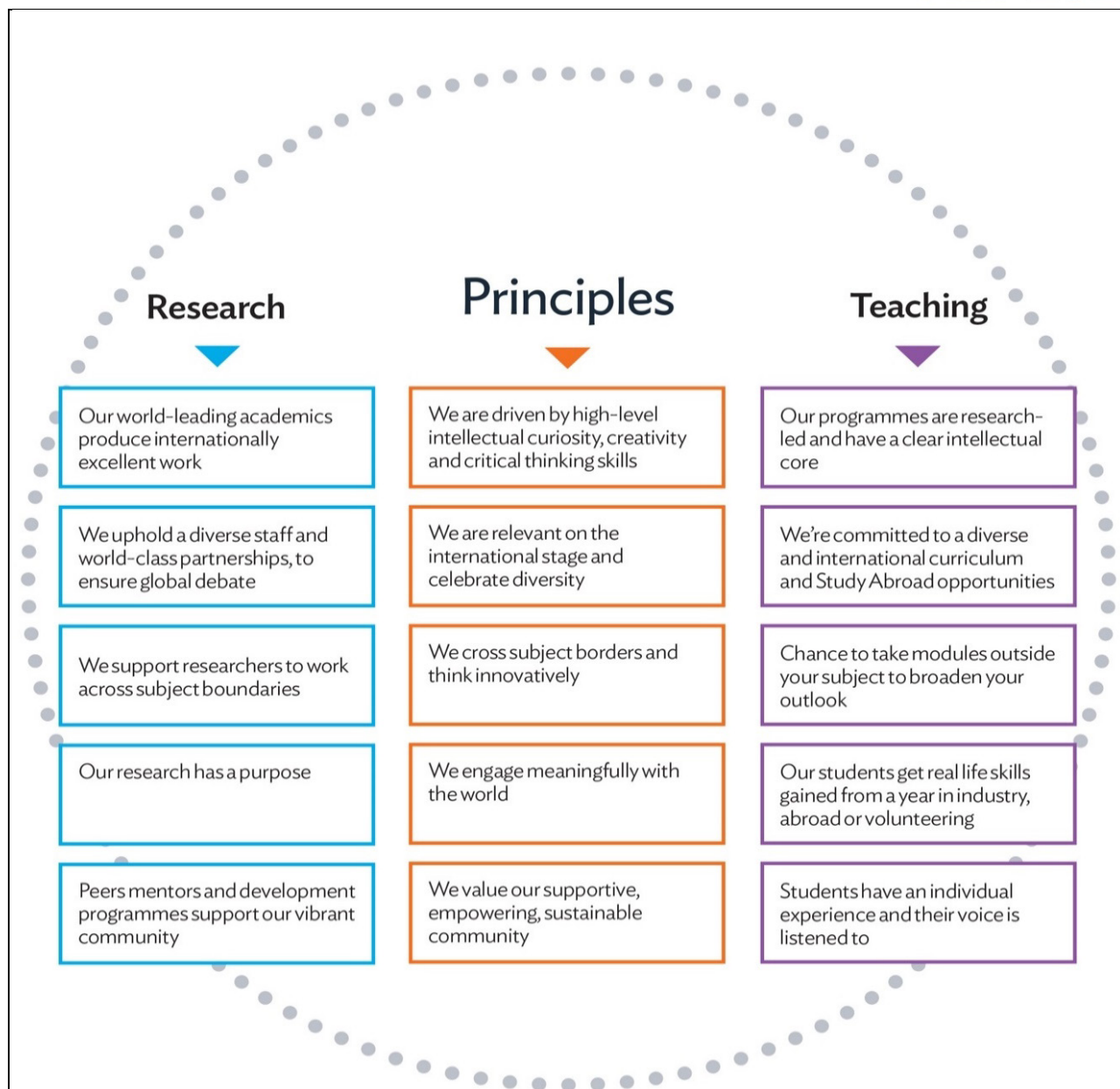
The first phase (2014-17) saw a period of investment in facilities, research infrastructure and academic staff growth from 653 to 716. This targeted investment in the expertise and facilities that are needed to deliver our strategic priorities - to advance knowledge, tackle regional, national, and global priorities, and deliver sustainable impact. New facilities provided the infrastructure for research, including a major new library and an interdisciplinary building that connects electronic engineering with digital creative economies. We grew our doctoral partnerships, and Royal

Holloway leads three consortia across a range of disciplines, funded by AHRC, Leverhulme and EPSRC.

All departments refreshed their research strategies, with new policies for research centres, institutes, and informal research groups. Research Centres and Institutes define areas of excellence, nurturing investigator-led research and curiosity-driven collaborations. Our Centres and Institutes were awarded funding with prestigious external partners including Kew (Geohumanities; Plant Molecular Sciences), The British Film Institute (History of Television Culture and Production), Museum of the Home (Centre for Material Cultures), and National Physical Laboratory (Quantum Technologies). Our proximity to Runnymede and contribution to Magna Carta 800-year celebrations led to *Royal Holloway's Citizens: 800 project*, launched in 2017 with £500k from the Heritage Lottery Fund to work with Parliament and museums across the south of England.

### **Phase Two: Integrated Academic Strategy 2017-2019**

The second phase introduced the Integrated Academic Strategy, formally adopted in 2017. With strategic leadership provided by the Deputy Principal (Academic) and two newly appointed Vice Principals in Regional Development, and Research Impact & Interdisciplinarity, the Integrated Academic strategy fostered a holistic approach to research-informed teaching, impact and knowledge exchange, career development, and research excellence. It aimed to develop a well-connected interdisciplinary research community and agile responses to new research opportunities.



Royal Holloway’s strategic focus on regional development and interdisciplinary research enabled us to take full advantage of The Industrial Strategy published in 2017. An audit for the industry consortium Innovation South noted regional capacity in the digital sphere and this informed our strategic focus on cyber security, quantum technologies, and digital creativity. In 2018 Royal Holloway was awarded £6.9m to lead the AHRC Creative Cluster project, *StoryFutures*, a research and development programme led by Media Arts, with researchers in Drama, Business and Management, Electronic Engineering, Information Security, and Psychology and partners including Heathrow, the National Gallery and Discovery. In the first two years of operation, (2018-20) *StoryFutures* reached over 500 businesses, and attracted £1.2m investment from LEP Enterprise M3 in 2020. Royal Holloway was also awarded £2.8m to co-deliver *StoryFutures Academy: The National Centre for Immersive Storytelling* with the National Film and Television School, focusing on cutting-edge training to support the UK’s screen industries. Our work with industry was strengthened by an award of £2.7m to the Physics department for a world-leading Electron Beam Lithography system under the EPSRC Quantum Technology Capital Scheme.

Royal Holloway invested £3m in a 315 m2 Class 5 cleanroom dedicated to nano fabrication of superconducting quantum electronics, known as SuperFab, used by major industries including NPL and Oxford Quantum circuits.

Our Global Challenge Research Strategy was commended by Research England as one of their top ten. Building on our equality mission, we established Global Challenge Clusters in 1) Human Rights, 2) Sustainable Societies, 3) Sustainable Development and 4) Disability, Wellbeing and Sustainable Inclusion with convenors from Geography, Law, Management and Classics who curate activity across a range of disciplines. Royal Holloway's researchers work closely with partners in 34 DAC countries to tackle issues connected to world poverty, increasing research income for GCRF projects from £115k in 2016-17 to over £4m in 2018-20. Our award-winning global research continues to fight social injustice by co-production of knowledge with local and indigenous communities, including exposing the effects of climate change and modern slavery in Cambodia, the placement of refugees, the economics of water shortage in Africa, and post-conflict reconstruction in the Middle East.

Our commitment to staff development led to strategic use of QR funds for start-up interdisciplinary research networks. These networks seed-funded collaborations across disciplines, supported external partnerships and trained 64 academics to lead interdisciplinary teams. This led to successful funding applications, including an AHRC interdisciplinary network led by an ECR in History to investigate data science in museums, and research into intergenerational vulnerability to exploitation in cyber security, a collaboration between Psychology, Computer Science and Law. We continue to support interdisciplinary research via Research Institutes and Centres, including the world-leading Holocaust Institute, a new Gender Institute established in 2019 and a Centre for Refugees, all extending our equality agenda.

The Research & Innovation Department was restructured following the appointment of a new Director in 2018, and resources were directed towards delivery of the College's Integrated Academic Strategy. Organised into teams around Research Support and Development, Knowledge Exchange and Enterprise, Intellectual Property & Research Contracts, and REF Operations, the unit supports research income generation, collaborative research and industry-focused research partnerships. Between 1 August 2016 and 31 July 2020, Royal Holloway's academics successfully achieved 425 research awards from 140 funders.

Our Integrated Academic Strategy highlighted research with a purpose that impacts on a wide range of beneficiaries. For example, prisons have implemented Royal Holloway's research on sport; research on poverty-aware practices has improved child protection services; research on information leakages in the financial sector changed regulatory policies; museums and galleries mounted exhibitions inspired by our research; and the health sector introduced treatments for chronic conditions and degenerative diseases developed by Psychology and Biological Sciences. Businesses in the private sector benefit from research on Corporate Social Responsibility and barriers to elite professions, and major internet vendors including Apple, Google, Microsoft and Mozilla use our research on internet security.

**Phase Three: 2020-2024 Future Directions**

Royal Holloway's Strategy 2020-2024 builds on the Integrated Academic Strategy. Throughout 2019 Royal Holloway's community came together to debate our future. This process was accelerated in March 2020 in response to the global pandemic, when Schools' Directors of Research and Knowledge Exchange worked together to develop a College Research Strategy designed to build a resilient and sustainable research environment. Informed by principles of equality and inclusion, our strategy 2020-24 has tripartite structure:

1. Four **catalyst research and knowledge exchange hubs** to strengthen challenge-led research in areas where Royal Holloway is a recognised leader with significant external funding. Research impact will be expanded via strong external partnerships in areas where we have the infrastructure and capacity to grow. Catalysts are:
  - **Digital Futures in the Creative and Cultural industries.** Building on the success of StoryFutures, this catalyst aims to transform the creative industries for the post-Covid era through use of immersive and digital technologies and other innovative approaches to democratising cultural participation.
  - **Living Sustainably:** By extending our Global Challenge Clusters, this catalyst addresses the challenges of living sustainably in an era characterised by climate change, threats to biodiversity, food and energy security, infectious disease, inequalities in education, work and participation, political polarisation and resource consumption.
  - **Advanced Quantum Science and Technologies:** This catalyst will strengthen existing research on superconductivity, quantum technology, quantum materials and post-quantum cryptography. Our research will shape the second quantum revolution in which devices based on quantum rules are set to revolutionize information processing and sensing capabilities.
  - **Transformative Digital Technologies, Security and Society.** This catalyst builds on Royal Holloway's interdisciplinary strengths in cyber security. With a focus on AI/robotics and information/cyber security, it aims to understand the role of digital technology in daily life, on the economy, and workplace.
2. **Research Centres and Institutes** nurture partnership-led research by providing an environment for academics to work together and shape new intellectual agendas. Reviewed 2020-2021, they enable cutting-edge research and build strategic partnerships with other HEIs, industries, and the third sector. Their organisation within Schools supports rising talent, enabling established and emerging research leaders to respond to new opportunities.
3. **Researcher-led research and impact** is the bedrock of our research activity, supported by departments and Schools. Our discipline-led research allows for blue-skies and innovative research to produce excellent outputs in multiple forms and sustainable research impact.

Each stage in our strategic plan was based on evaluating our strengths, learning from experience, and defining a clear programme of strategic investment to ensure sustainability. We are now ready to face the opportunities and uncertainties of the next period, having transformed our research culture and placing Schools at the centre of decision-making.



**3 People**

*The Royal Holloway Strategic Plan 2013-2020* aimed to develop a ‘sector-leading approach to support early career and established researchers’ and to ‘promote and facilitate equality and diversity’. Four key strategic approaches facilitate this:

- i. building an inclusive academic community;
- ii. appointing and nurturing early career researchers;
- iii. defining research expectations, research leadership and protected time for research;
- iv. supporting researchers with refreshed policies and processes.

In July 2020 88% of academic staff were active researchers, with an additional 12% on teaching/practice contracts. 96.5 % of researchers have permanent contracts (10.5% part-time), and 3.2% have fixed-term contracts. A large proportion are professors (240, 38%), with 95 promoted during the assessment period. We also appointed 144 lecturers, 38 senior lecturers, 10 readers and 30 professors. 100% of staff on Teaching and Research contracts (538) are submitted to REF2021, reflecting our commitment to equality and inclusivity.

**i. Building an inclusive academic community**

At the beginning of the assessment period, data showed that our equality principles were not fully reflected in our staffing. To address this issue, we introduced a suite of initiatives in 2016, including overhauling our promotion and recruitment processes. Unconscious bias training became mandatory for interview panellists, and an equitable and consistent system of scoring applications for shortlisting was introduced. This led to equal proportions of men and women being offered academic roles.

The gender balance at lecturer, senior lecturer/reader and post-doctoral researcher is even, but in 2013 there was a significant gap at professorial level. To address this, A ‘Women’s Encouragement’ project was established in 2014, which won the Times Higher Education Leadership and Development award in 2016. This led to a higher than sector average women professoriate and an increase of women professors by 84% since 2014. We hold an institutional bronze Athena Swan Award (reaccredited April 2017), and three silver and two bronze departmental awards in our science departments. An open call for cluster leaders for our global challenge work led to the appointment of three women and one man, and the steering group includes 40% ECRs. 39% of people submitted to REF2021 are women, 61% men; we aim for greater equality in future.

Staff profile of women	2013-14		2019-20	
	Number	% of academy	Number	%
<b>Professors</b>	46	24%	73	31%
<b>Readers</b>	21	34%	21	32%
<b>SL</b>	45	35%	63	52%
<b>Lecturer</b>	42	44%	83	39%
<b>Total</b>	<b>152</b>	<b>32%</b>	<b>206</b>	<b>39%</b>

The proportion of black and global majority (BGM, also known as BAME) professors was 6.6% in 2013. This doubled by 2020, increasing to 8.9%, and 50% of our Heads of School, appointed in 2019, identify as BGM/BAME. We were one of the first 8 institutions to receive the Race Equality Charter Mark in 2015 (reaccredited 2019), but we know we can do more to combat racial injustice in the academy. Our Athena Swan toolkit has been used across College to deepen understanding of inequalities and, in 2018, we launched the MANDALA programme to provide career development and support for promotion for BGM academics.

Staff Profile of Black & Global Majority	2013-14		2019-20	
	Number	%	Number	%
<b>Professors</b>	12	6%	24	10%
<b>Readers</b>	6	15%	8	12%
<b>SL</b>	17	12%	35	21%
<b>Lecturer</b>	26	13%	35	23%
<b>Total</b>	<b>64</b>	<b>13 %</b>	<b>102</b>	<b>16%</b>

New networks for people identifying as LGBTQ+, black and global majority researchers, people with disabilities, and women, helped address inequalities and erode barriers to success. In 2019 we ranked 200th on the Stonewall Index out of 503 public sector organisations, an improvement from 2014 when we were 349/369. We are members of the Disability Confident Employer scheme (Level 2, 2017, renewed 2020-23) and our recruitment practices ensure that all disabled applicants who meet core criteria for posts are interviewed. Our Employee Assistance Programme, available to all staff at Royal Holloway, provides disability-related advice, and the Estates Department ensures that the campus is adjusted to meet staff needs.

Our Equality and Diversity Scheme 2018-2021 articulates our ambition to create a community of researchers equally enabled to succeed. We hold the HR Excellence in Research (2020) and are signatories to DORA.

**ii. Appointing and nurturing Early Career Researchers**

In July 2020, our research community included 97 early career researchers, including 17 fellowships. All ECRs benefit from structured programmes to develop their careers, including a probationary period, usually three years. For ECRs on teaching and research contracts, teaching hours are reduced, and all are assigned mentors who help set research goals, oversee workload and offer support. Probationary training for both mentors and ECRs is given by the Deputy Principal (Academic), and Heads of School meet ECRs regularly to discuss progress.

The ‘Advance’ Programme (previously ‘On Track’) is a key part of our development for ECRs and represents our commitment to the *Concordat for the Career Development of Researchers*. It offers bespoke courses, online learning and workshops for ECRs and probationers (reaching 149 staff in the period). The programme addresses a broad range of research skills, including collaborative research and mandatory sessions on research integrity and ethics.

This framework of mentoring, monitoring and development ensures that ECRs are given support throughout this critical stage in their careers. Our 2019 CROS survey showed that 90% of early career respondents felt encouraged to participate in career development programmes within and beyond probation. Since 2019, we have prioritised research leadership, providing programmes



for early and mid-career academics to build skills in leading research projects with academics and external partners.

### iii. Research expectations, research leadership and protected time for research

A culture of supportive leadership is key to sustaining our disciplinary and interdisciplinary research environment. Each School has a Director of Research and Knowledge Exchange who serves on the College Research Committee and leads School research strategies. The development and management of researchers sit at departmental level, ensuring that our strong disciplinary research thrives. Each researcher has a three- to five-year plan that addresses research development, publication, impact and external engagement, and an annual meeting with departmental research leads supports this process.

Our strong collegial environment sets clear expectations for researchers. *Guidelines for Research Expectations*, agreed by Academic Board in 2015, encourage our researchers to aim high in their research outputs, impact and grant applications, and to contribute to the research culture with integrity. Protected research time (through sabbatical and workload arrangements) allows staff to spend a high proportion of their time on research and research support (47% in 2013-14; 48% in 2016-17; 42% in 2019-20 – TRAC data), and formal monitoring is offered through departmental peer review and appraisal (70% uptake 2014, 79% in 2019).

Our sabbatical policy has been reviewed during this assessment period. It offers one term of sabbatical after 9 terms of service (3 years). From 2015, sabbaticals for Arts and Humanities offered longer periods to work on monographs, with two terms after 12 terms of service (4 years). Maternity sabbaticals were introduced for bench scientists in 2015 and rolled out across all disciplines from 2018.

### iv. Supporting researchers

This period has seen the introduction of family-friendly policies and refreshed policies around recruitment, probation, promotion, annual review, development and sabbaticals. These have been crucial in creating a caring environment that enables colleagues to fulfil their potential.

Our promotion pathways were reviewed in 2017, introducing three routes for promotion: i) research and teaching; ii) teaching and scholarship; iii) professional practice. All CVs are considered by a departmental review panel before applications pass to School and College processes. Research metrics are not used in the review process; promotions are considered anonymously and assessed against a criteria matrix under four headings: Research/ Scholarship; Teaching; External Engagement; and Leadership and Enhancement. We run an annual reward scheme whereby incremental advancements are awarded for exceptional performance.

The College recognises that research careers can be emotionally challenging. To support wellbeing, we signed the *Time to Change Employer* pledge in 2019 to tackle stigma attached to mental health, and developed a free Employee Assistance Programme as well as walking challenges, carers events, Mindfulness Mondays, yoga and complementary therapy sessions. Staff wellbeing was a major priority during the global pandemic in 2020, with additional resources to support health and wellbeing available online.

**v. Research Students**

Postgraduate students are an important part of our community, and in this assessment period our PhD numbers have grown from 440.5 to 523, an increase of 18.6%. We spend 3% of our annual turnover on PhD studentships, and hold collaborative funding arrangements with a range of partners, including the Leverhulme Magna Carta Doctoral Centre for Freedom and Rights of the Individual in the Digital Age (2014 – 2019, £1,050,000) which supported 31 PhD studentships (15 funded by Leverhulme and 16 by RHUL), and the National Physical Laboratory. Our international scholarships are bolstered by arrangements with the Pakistan Higher Education Commission, providing 10 PhD studentships since 2015. We lead two UKRI DTPs, the AHRC-funded *technē*, led on behalf of eight other institutions with approximately 60 studentships per year, and the EPSRC Information Security Centre for Doctoral Training (79 students in the assessment period). We are partners in the following: BBSRC LiDO and The London NERC DTP (both led by UCL); BBSRC DTP (Imperial); ESRC DTP SeNSS (University of Essex); NERC Oil & Gas CDT and the GeoNetZero CDT (both Heriot Watt University). We are members of the South-East network for excellence in Physics (SEPnet) and the NERC ARIES consortium managed by the University of East Anglia.

A Code of Practice governs PhD supervision. All students are interviewed and placed in a supervisory team with at least two supervisors. The frequency of meetings is monitored, and a training needs analysis is undertaken each year. Annual reviews are attended by a third person, with upgrades from MPhil undertaken within 20 months of full-time study or the equivalent. Students appreciate the quality of supervision, which scored 87% in PRES 2020.

A revitalised Doctoral School was created in 2019 to bring this research community together. Led by the Deputy Principal (Academic), it provides training, administrative support and social activity for PGR students. Core training aims to equip all students to achieve high intellectual standards and a portfolio of complementary skills and capabilities. We have increased opportunities for research outside the academy with external partners. Focused skills-training addressing disciplinary research and collaborations is offered by departments, Schools and DTPs. The School Directors of Post Graduate Research serve as important members of the Doctoral School and the Research Degree Programme Committee, which is also attended by student representatives and the Student Union's Vice President (Education). Induction events, termly social gatherings and an annual research symposium are regular features of the research community.

**4 Income, infrastructure and facilities**

Royal Holloway's strategic priorities have driven a changed approach towards income-generation, infrastructure and facilities for research. All areas of the College have benefitted from improvements in three areas: first, new buildings and refurbished research facilities on both our main campus in Egham and our central London home in Bloomsbury; second, a Research & Innovation Department that supports grant-capture, research impact and research management; third, an overhauled digital infrastructure. These investments bring new opportunities for research impact and knowledge exchange as industry partnerships are increasingly embedded in research at an early stage, enabled by access to specialist facilities designed for mutual benefit.

**Facilities:** The Emily Wilding Davison Building was opened in 2018, designed by Associated Architects at a cost of £59m. It includes a state-of-the-art library, increased space for archival research and designated facilities for postgraduate research students. A new exhibition space encourages public engagement in research, and it is curated to reflect our commitment to social justice and cutting-edge interdisciplinary research. Exhibitions since 2018 include a digital forest arising from collaborations between artists and psychologists; a display of Royal Holloway’s suffrage archive; the history of computing, and a photographic exhibition of contemporary Cuba. The library provides 1,350 bespoke PGR study spaces, and a refurbished reading room in our historic Founders’ Building opened in 2019 provides an additional 100 spaces for staff and PGRs to meet and study. Scholarly infrastructure includes investment of £2.5m per annum in library provision and digital resources including reference databases, e-journals, digitised newspapers, Box of Broadcasts and Kanopy services, the largest distributors of educational video and television material. All researchers have unlimited access to inter-library loans, and are members of Senate House Library, which offers specialist books, journals, and digital resources. In 2015, Royal Holloway joined Research Libraries UK, a strategic move to strengthen our special collections. Royal Holloway’s libraries are overseen by designated information consultants who ensure that research needs are met in each department. Our central London spaces in Bedford Square were refurbished for £3.5m in 2016 with support from our Bedford College alumni and are well-used as a high-quality meeting place for policy-focused events and research with external partners. The increased capacity in Senate House also facilitates our academics’ connections with research communities in central London.

**Investment in specialist research facilities**

We prioritised investment in areas of growth for a sustainable future. The former Bedford Library has been refurbished as a high-tech centre for Mathematics, Information Security and Computer Science, representing a £5.9m investment. A new digital innovation laboratory is now housed in the School of Business and Management, who have worked closely with Ricoh, a global technology organisation, to create the £30k facility and this supports their partnership with Heathrow. New glasshouses for plant and seed technology (£1m) provide state-of-the-art control of plant growth for Biological Sciences, and the refurbishment of the seed science laboratory brings benefits to the seed industry and responds to global challenges. The mass spectrometry suite was upgraded at a cost of £1m for metabolomics and proteomics, and a nano-indentation device (£115k) supports biomaterial research. Royal Holloway’s researchers in the creative and performing arts benefit from The Caryl Churchill Theatre (£3.5m) and The Boilerhouse Auditorium (opened in 2014) serves practice-based research. In addition, Academic Capital Equipment Funding was as follows:

2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
£945,247	£1,273,207	£784,984	£457,050	£1,595,249	£2,035,750	£1,167,207

**Operational Support:** Our Research & Innovation Department offers support for income generation across Royal Holloway’s research community. During this period, key policies and processes were updated, including Ethics, Governance & Research Integrity, Intellectual Property & research commercialisation, and a new Concordat to Support Research Integrity. We invested

in a research funding and intelligence database, a new dashboard for research grants that provides data related to equality measures and a suite of on-line toolkits for researchers. A specialist research support and development team was appointed in 2019, along with a Global Strategy Manager and Head of Business Development. Our focus on larger grants has seen success, for example we were awarded £2.4m EPSRC grant for the Physics Quantum clean room, EU Consolidator grants to research neuropsychology (£1.7m) and underground geographies (1.95m Euros), and a £900,000 GCRF grant to develop food security. An EPSRC award of £2.2m for a Zeiss ORION Helium ion microscope/Neon Focussed ion beam tool completed a suite of infrastructure requirements to establish the UK as a key player in the race for a superconducting quantum computer.

**Digital Infrastructure:** Our IT infrastructure required investment to support our strategic priorities on digital technologies and outward-facing research. £1m investment in our website included updating the staff intranet to provide information for academics on research opportunities. Driven by £525,450 Research Data Management project, the College has implemented four services: DMP Online; Dropbox for Business; Figshare for Institutions; Almetrics, and updated Pure. Research Data Management is supported by designated roles in the Library, IT Services, and Research & Innovation, and an advocacy programme embeds it into research processes.

Our strategic focus on **interdisciplinary research** for digital futures is served by the new Beatrice Shilling Building, opened in 2018, representing £18m investment from College and £5m from HEFCE. This high-quality, technology-led space is home to the Catalyst Digital Futures in the Creative and Cultural industries, providing state-of the arts facilities in immersive technologies and audio laboratories for industry partners to experience how our research might be integrated into their businesses. The newly established Electronic Engineering department is also housed here, where it has a laboratory to research quantum communications using photonics, with specialist equipment donated by Leonardo (£500,000).

Our commitment to **open research, reproducibility, and research impact** was strengthened by appointments in professional services. A senior appointment in 2015 to monitor our Open Access and Research Data Management policies and provide institutional guidance was followed by two new posts in the library and dedicated funds for open access publication. Our researchers actively support open research and reproducibility as part of an equitable vision to increase access to excellent research. Good practice is shared in Schools; in History, for example, members of executive committees of learned societies have engaged in wider consultation on how to progress towards a full Open Access environment in Humanities, and Psychology is a member of the UK Reproducibility Network, which offers training and disseminates best practice in Science. Two impact managers were appointed in 2017 in the Research & Innovation Department, reflecting our commitment to research that benefits society. Their work was targeted on generating measurable impact in policy, business, and third sectors, and in culture, education and heritage.

Our strategies, infrastructure, and programme of investment are designed to deliver our vision of a world-leading environment for research and impact, enabling researchers across College to reach their potential, and together build a sustainable future based on our shared values.