

<b>Institution:</b> University of Leeds
<b>1. Context and mission</b>

The University of Leeds is one of the largest higher education institutions in the UK, employing over 8,700 staff, with over 38,000 students, including 10,000 postgraduate students. Our campus is truly international, with staff from over 100 countries and around one-quarter of our students from overseas, encompassing 170 different countries.

The central tenet of the University’s 2015-2020 strategy was ‘investing in knowledge and opportunity’. The REF period saw an unparalleled period of investment, including £520M in campus development and £100M in people, building critical mass at all levels to provide research leadership and succession planning: 110 Anniversary PGR scholarships; 200 University Academic Fellows (UAFs); 261 professorial-level positions.

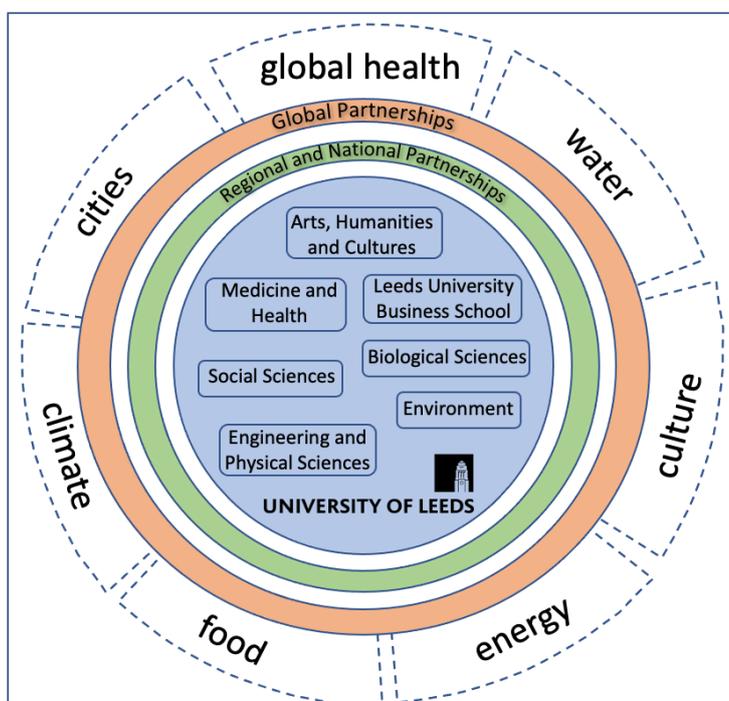
The successful implementation of this strategic plan is reflected in our top 100 world university ranking (QS world rankings), which has increased from 97<sup>th</sup> (2014) to 93<sup>rd</sup> (2020). Our global outlook is reflected by being ranked the 35<sup>th</sup> most international university in the world (THE World Rankings 2020), while the positive impact of the University is reflected in the University ranking 11<sup>th</sup> in the world (3<sup>rd</sup> in the UK) for addressing the UN Sustainable Development Goals (THE Impact awards 2020).

The University is organised across seven faculties: Arts, Humanities and Cultures; Biological Sciences; Engineering and Physical Sciences; Environment; Leeds University Business School; Medicine and Health; and Social Sciences. Our research strategy encourages interdisciplinarity to deliver novel approaches to critical problems. The University partners with selected organisations at a range of scales to enable stakeholder engagement and translation of our challenge-led

research (Figure 1).

We are members of consortia that represent research intensive universities at *local* (White Rose University Consortium), *regional* (N8), *national* (Russell Group) and *international* (Worldwide Universities Network) levels.

The University is a partner in a number of *national institutes* representing excellence in specific disciplines: the Turing institute for data science and artificial intelligence, where we lead on urban analytics; the Henry Royce Institute for advanced materials, where we lead atoms to devices; the Rosalind Franklin Institute for life sciences, where we lead next generation chemistry; the National Centre for Atmospheric Science, hosted at the University; and a joint Postgraduate Researcher (PGR) programme with the Francis Crick Institute for Biomedical Research; and, the UK Met Office



**Figure 1. Research Structures:** Through strategic regional, national and global networks, researchers across seven faculties are able to address fundamental and challenge-led questions across important research themes.

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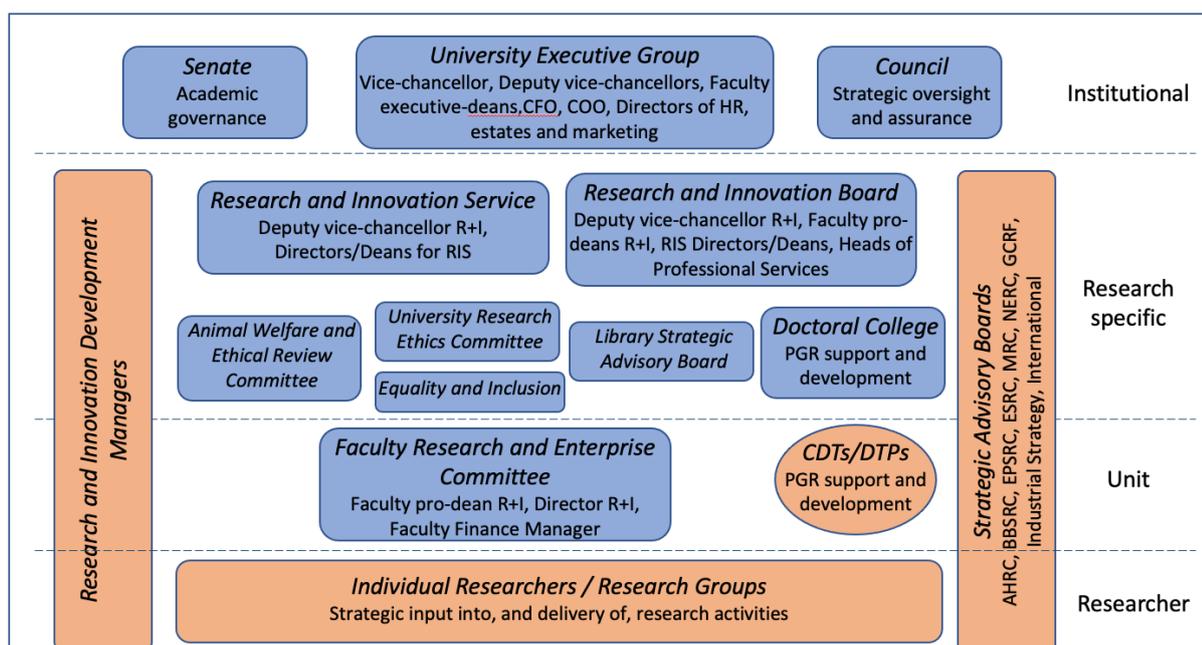
We have developed *international partnerships*, including: a joint school with Southwest Jiaotong University (SWJTU) to deliver world-class research and teaching in areas of engineering, computer sciences and transport; strategic partnerships with the Karlsruhe Institute of Technology, Max Planck Institute, Kyoto University, Shanghai JiaoTong University, Zhejiang University, and the African Research Universities Alliance (ARUA)

The University ranks in the top ten for UKRI, GCRF and Newton awards, allowing us to support a broad and deep research and innovation base that delivers transformational curiosity-driven fundamental and applied research. This research base is complemented by a strong history of innovation and entrepreneurship. Over the period, this has been strengthened by Nexus, a £40M innovation hub, and leading the Leeds City Region participation in the Massachusetts Institute of Technology Regional Entrepreneurship Acceleration Programme (MIT-REAP), a prestigious programme to foster regional economic growth and social progress. The University was ranked 5<sup>th</sup> in the 2019 Octopus Ventures Entrepreneurial Impact Ranking.

Our commitment to first class, research-led, education has been recognised through the award of 26 National Teaching Fellowships, more than any other institution in the UK. The University was named the Times/Sunday Times' University of the Year 2017 and has held a Teaching Excellence Framework (TEF) gold award since 2017.

## 2. Strategy

Delivery of the University research strategy is led by the Deputy Vice-Chancellor: Research and Innovation (R+I), supported by a senior management team within the central R+I Service and the faculty pro-deans R+I; together, these form the core of the University R+I Board. Heads of School are supported in the implementation of local research strategy by Directors for R+I, plus school and faculty-level research offices and 22 area-specific R+I Development Managers (RIDMs). Research strategy advisory boards aligned to major funders, interdisciplinary research and global research strategy provide research intelligence (Figure 2).



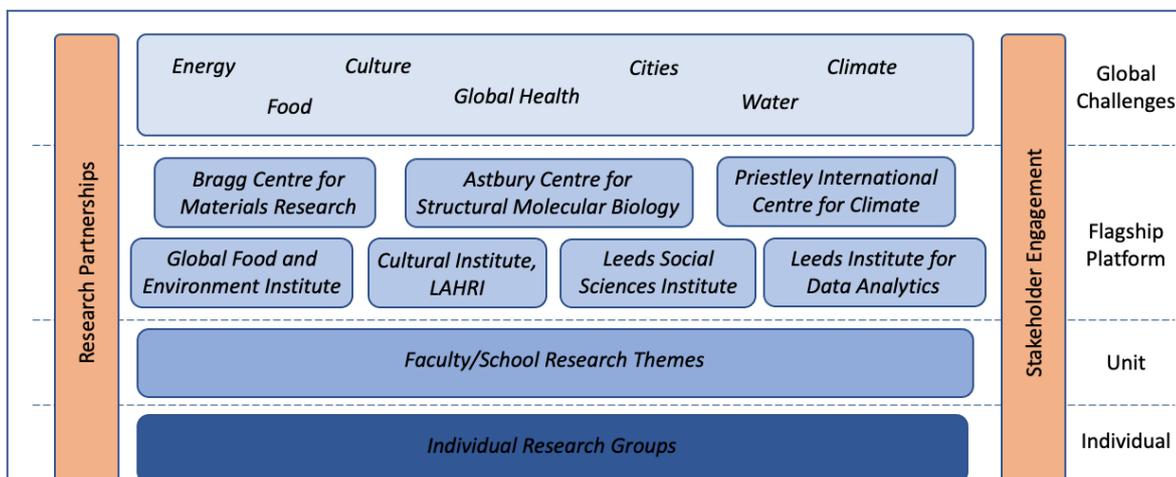
**Figure 2. Research Governance:** Area-specific boards provide intelligence to the University Research and Innovation Board for consideration/action. Research Governance then flows both to the institutional-level governance structures (Council, University Executive Group, and Council) and down to Unit-level structures, ensuring good practice is shared across the University.

Our 2015-2020 strategy was co-created with staff to develop a clear set of R+I objectives that will deliver our shared ambition of an inclusive research community that supports research excellence across the University:

*Objective 1: to ensure that the research we undertake supports delivery of the highest quality outputs.* A focus on academic excellence and partnership was supported by the appointment of a Dean of Research Quality and Impact (2017). Over the period, research awards have increased from £130.5M (2013/14) to £196M (2019/20), including a 37% increase in new awards and a 70% increase in awards over £1M in the last four years. This has driven an increase in research quality, with outputs in the top 10% citation percentile increasing from 20.7% (2014; 860 outputs) to 22.0% (2018; 1160 outputs), while internationally co-authored outputs increased from 47.4% (2014) to 58% (2019).

The University champions the responsible use of research metrics, being a signatory to DORA and an advocate for the Leiden Manifesto; this is supported through a joint academic/service research metrics working group, including the Library’s Research Support Service bibliometrician. The University developed open access policies for outputs (2014), requiring open access publication within 90 days of acceptance, and data (2017), and mandates an ORCID for all researchers, including PGRs. Together, these actions have supported an increase in both number and downloads of outputs within the White Rose Research Online (WRRO) open access repository. Prior to 2013/14 WRRO contained 2,125 outputs, with 664,100 downloads; by July 2020 these figures had increased 1738% and 1210%, respectively, to 39,072 outputs and 8,703,736 downloads. Ethesis deposits increased four-fold from 1,489 (2013/14) to 6,143 (2018/19).

*Objective 2: to promote a vibrant PhD and postdoctoral community.* To deliver the research leaders of tomorrow, we have invested in our PGR cohort, including 110 Leeds Anniversary Research Scholarships, and hosting 11 Centres for Doctoral Training and Doctoral Training Programmes. This led to an increase in PGRs from 2090 (2013/14) to 2445 (2017/18). In 2017, the University launched the Doctoral College, led by the Dean of Doctoral Studies, to continuously improve all aspects of our PGRs experience. To complement the Doctoral College, the Leeds Doctorate was launched in 2020 to support PGRs in their studies.



**Figure 3. Embedding Interdisciplinary Research.** Individual research groups connect to global challenges through Faculty/School level research themes and University flagship platforms. Together these facilitate stakeholder engagement and the formation of productive research partnerships to undertake fundamental and translational research that delivers regional, national and global solutions

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*Objective 3: to exploit the distinctive research potential of Leeds to address major global challenges.* The 2015-2020 strategy outlined thematic areas addressing global challenges (see 'Context' and Figure 3). This has been supported through our success in schemes such as GCRF, NIHR Global, Newton *etc.*, which allows us to work with 40 countries around the globe. As of May 2020, we have been awarded 84 projects through these routes, with a total value of £46.8M. For GCRF awards, we are second and third in the UK for value and number of awards, respectively. To support both individual/unit-level research groups and global challenge themes, we have developed flagship interdisciplinary research platforms, supported by £500k *p.a.* pump priming. Each is co-directed by senior leaders from different faculties, embedding academic excellence and interdisciplinarity in their missions:

the *Leeds Arts and Humanities Research Institute* and the *Cultural Institute* work together to foster interdisciplinary research and productive research collaborations with external partners in the creative and cultural industries. They directly supported successful grant applications totalling £8.1M in 2019-20, contributing significantly to Leeds' status as the highest performing University in AHRC income for the period 2015-2020 (£22.4M);

the *Leeds Social Sciences Institute* supports the social sciences in framing novel interdisciplinary and cross-institutional research collaborations. It has over 650 members and houses the ESRC £1.3M IAA;

the *Priestley International Centre for Climate* opened in 2016 following a £10M University investment in response to the global challenge of climate change, bringing together world leading expertise in climate change research. It comprises over 350 members across all career stages with an active research portfolio of £75M, including 20 grants worth >£1M (2020);

the *Leeds Institute for Data Analytics (LIDA)* was established in 2014 to bring together applied research groups and data scientists to understand health and human behaviour, casting light on the action required to tackle a wide range of social and environmental problems. LIDA has a community of 280 researchers, including 25 Turing Fellows, with 156 of these physically co-located, and a £61M active research portfolio (2019). It operates an ISO27001 Trusted Research Environment and hosts the ESRC Consumer Data Research Centre and Heath Data Research North;

the *Astbury Centre for Structural Molecular Biology* brings together researchers with the goal of understanding life in atomic detail. It encompasses 76 academic staff and over 300 researchers, with a £107M portfolio of research (2019). It is one of only 19 Instruct-ERIC facilities, the pan-European distributed research infrastructure, supported through a £2.9M investment in state-of-the-art electron microscopy facilities;

the *Bragg Centre for Materials Research* is housed in the £96M Sir William Henry Bragg building. As a founding member of the Henry Royce Institute, it aims to discover, create, and design new materials by bringing together scientists and engineers across a wide range of disciplines. It comprises over 210 members across all career stages with an active research portfolio of £82M (2019)

the *Global Food and Environment Institute* is an interdisciplinary research community develop enduring solutions that help bring about transformative change to create a food system that is socially-just, climate-smart and goes beyond sustainability. It comprises over 344 members across all career stages with an active research portfolio of £57M (2019).

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The University's focus on addressing global challenges was reflected by our ranking 11<sup>th</sup> in the world (3<sup>rd</sup> in the UK) in the THE World Impact Rankings 2020. (Figure 4).



*Objective 4: to utilise externally focused interdisciplinary research networks with the expertise, range and reputation to address funding and impact priorities.*

To support our ambitions in this area, we appointed a Dean of Interdisciplinary Research (IDR) in 2016. Supported by a Head of IDR and the 22 R+1

Development Managers across the University, the led an increased focus on challenge-led research, including two-day 'Crucible' workshops for academics at different career stages, and targeted stakeholder engagement opportunities. These have led to an increase in high quality IDR activity, e.g. the facilitation/integration of cross-University activity around antimicrobial research led to two significant awards worth >£4.2M in 2020; the £5.4M UKRI-funded Future Fashion Factory is an interdisciplinary international partnership between the University and industry to create a sustainable textile supply chain.

Our interdisciplinary activity is also supported through membership of the N8 Research Partnership between eight of the UK's top 30 universities across the North of England. Major research programmes include the £16M N8 AgriFood Resilience Programme; the £7.5M N8 Policing Research Partnership working with 11 police forces; the £1.25M DecarboN8, accelerating the adoption of low carbon transport solutions; and the £1.6M N8 Industry Innovation Forums connecting leading businesses with N8 universities.

*Objective 5: to develop and support our existing academic staff and appoint new world-class researchers to deliver research priorities and aspirations.* The University has invested significantly in its research staff over the REF period (see 'People' for full details), developing critical mass in areas of excellence. This includes new development opportunities for all staff, as well as the recruitment of present/future research leaders, e.g. 200 University Academic Fellows, 21 leadership chairs, and 17 top performer chairs.

Academic integrity is supported through the principles of honesty, rigour, transparency and open communication, and care and respect for all participants in research. The University fully complies with the Concordat to Support Research Integrity and has its own Policy on Research Integrity. Research is subject to ethics committee review at local, Faculty and University level. In addition, we work toward compliance for all partners, e.g., clinical trials research is reviewed by University and NHS ethics committees. Training and support for research integrity are provided both in person and through dedicated webpages, alongside robust policies on professional integrity, whistleblowing, research misconduct, harassment, and bullying.

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*Objective 6: to grow our knowledge exchange activity and income by achieving greater collaboration with key industry partners and innovative companies with high growth potential.*

Through the Directors of Research and Innovation Development, and of Commercialisation the University has grown its knowledge exchange (KE) portfolio across the REF period: HEIF allocation weighted income increased from £75.4M (2013/14) to £98M (2018/19). This includes increases in spin-out activity, with turnover and FTEs employed in spin-outs increasing from £26.4M and 426 (2013/14) to £70.6M and 1,255 (2018/19), respectively. Income from SMEs increased 68%, from £2.5M (2013/14) to £4.2M (2018/19), while income from IP increased 30% from £0.76M to £1M.

The Nexus innovation hub co-locates a community of innovators with the University R+I Service, including a dedicated team who work with businesses to create effective partnerships. Since its opening in 2019, Nexus member businesses have raised £10.8M in collaborative funding awards with the University; created over 115 new jobs, including 23 for University of Leeds graduates; hosted 74 University of Leeds students on internships or placements; and, put on events that over 7,000 people have attended.

The University plays an active role in driving innovation and entrepreneurship at the regional level. We led the Leeds City region participation in MIT-REAP (2017-2020), an entrepreneurship programme supporting research translation into regional economic good, with the DVC: R+I one of two champions for the programme. The programme has led to two initiatives, LEAP and BUILD, actively supporting 100 local entrepreneurs, including through Nexus community membership.

Student innovation and entrepreneurship is supported through SPARK, also located in Nexus. SPARK engages 1,500 current students and recent graduates p.a., creating 80 new businesses. Over the REF period, SPARK-supported businesses generated over £19.6m, created 513 jobs and secured external investment of £7.1m. In 2015, we received the THE Entrepreneurial University of the Year, the Guardian award for Enterprise at a University, and the Lloyds Bank award for University Entrepreneurship, while the Head of SPARK received the UK National Enterprise Champion Award. To support ECR entrepreneurship, the University launched the Michael Beverley Fellowship scheme in 2020, supported through a significant alumnus donation. This five-year programme provides intensive training, support and mentoring for 60 ECRs to develop the skills to capitalise on their entrepreneurial aspirations.

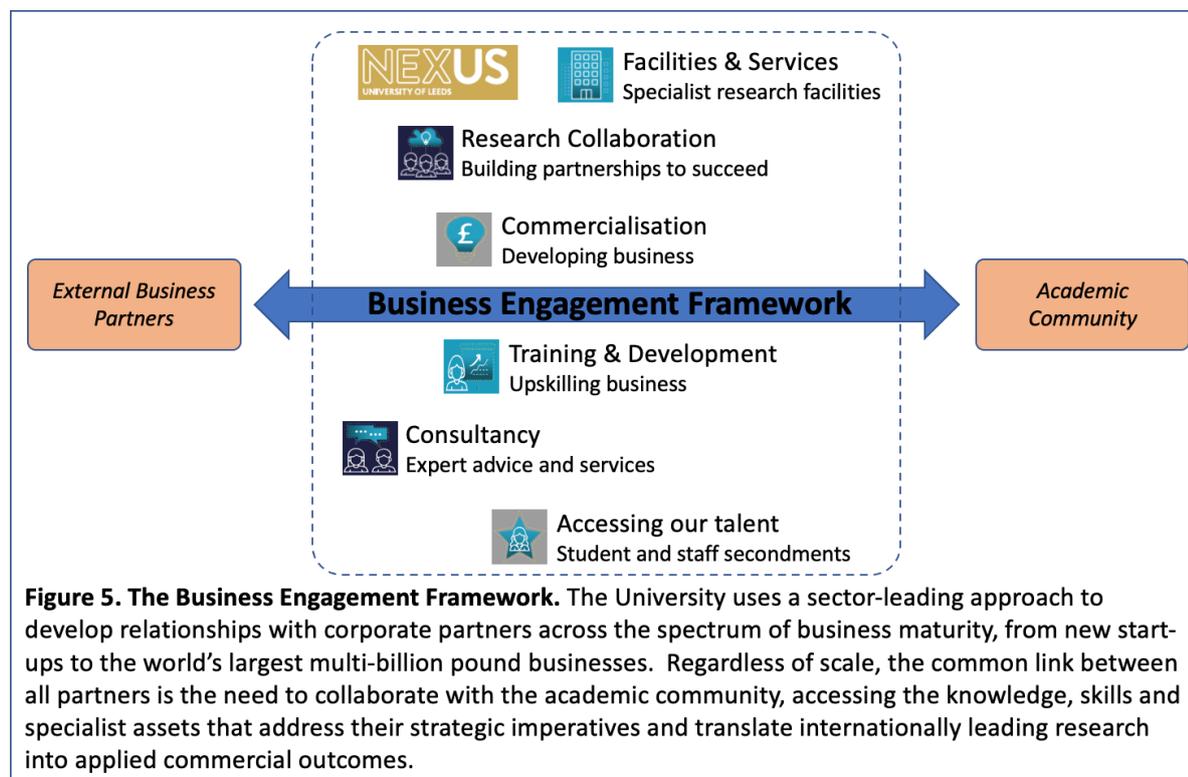
To further grow our KE activities, a Director for Research Integration and Advancement was appointed in 2016. They lead a corporate relationships team that works at board-level with £1Bn+ annual turnover businesses, and a major initiatives team who support large-scale strategic research investments. Together, these teams enable stakeholder engagement, forming interdisciplinary teams including both internal and external partners to address major challenges. Examples include the Institute for High-Speed Rail and Systems Integration, a £75M collaboration between the University, West Yorkshire combined authority, Government, and industry scheduled to open in 2021 prior to covid-related delays.

Ensuring a clear professional framework for business collaborations is fundamental to success. The Business Engagement Framework was developed in 2019 to address this, seamlessly linking external partners with appropriate academic teams to address their challenges (Figure 5).

A Public Engagement (PE) team was formed in 2014, moving into R+I Services in 2019 reflecting our commitment to public communication of research. We signed the Manifesto for Public Engagement in 2015, renewing in 2018. Since 2014, 34 PE Fellowship have been supported by the University, with 10 fellows subsequently taking on PE leadership roles. Three fellows have

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been finalists in the national Engage Awards, with one winner. To further recognise the importance of PE and outreach, they activities were added to promotion criteria in 2016; 35% of all academic promotion applications included PE in 2019. In 2015, 'Be Curious' was launched; an annual event linking the public with the University's research and impact activities with over 1,000 attendees p.a.



Translation of research outputs to impact has been overseen by the Dean for Research Quality and Impact, through the creation of a University Impact Group, local impact champions and managers, and a centrally supported University impact strategy. Funds to support research translation include over £270k p.a. innovation funding across the Faculties, 6 IAA awards worth £382k p.a., plus access to central strategic development funds for larger initiatives.

### 3. People

People sit at the heart of our Strategy. We are committed to a fully diverse, equal opportunity workplace supporting and developing staff to their full potential. This was recognised in 2011 through a Vitae institutional HR Excellence in Research Award. This award was successfully retained in 2019, with the review commending our '*commitment to continuous enhancement of policies, practices, and development provision for researchers*'.

Staff recruitment is planned through the annual Integrated Planning Exercise, providing an opportunity for Schools and flagship research platforms to feed into strategy. Over the REF period, our recruitment strategy included targeted schemes to build critical mass in areas of research excellence (e.g. 17 top performer and 21 leadership chairs), and develop future research leaders for succession planning (e.g. 200 UAFs).

Over the REF period, our academic T+R staff cohort has increased by 16%, from 1430FTE (2013/14) to 1665FTE (2017/18).

We actively encourage and support staff, present and future, to apply for fellowships to support their research development. Over the REF period, University staff have been awarded 11 UKRI

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Future Leaders Fellowships (£12.3M), 106 UKRI-funded fellowships across all career stages (£50.1M), 18 ERC fellowships (£32.8M) and 86 Marie-Sklodowska-Curie Fellowships (£14.8M).

To develop a diverse researcher community, the University Equality and Inclusion unit oversaw the development, delivery and monitoring of an E+I Strategy to “*attract and retain excellent people from across the world to enable the University and the people within it to fulfil their potential*”.

Commitment to this strategy was demonstrated through development of the University’s first E+I Framework in 2014, supported through complementary University policies, including: Dignity and Mutual Respect; Equality and Inclusion Policy; Building Disability Confidence; Trans Equality Policy Statement; Policy on Support for Pregnant Students and Students with very young children; Policy on Support for Students who are Parents or Carers

The University’s ‘Leeds Gender Framework’ is our strategic approach to gender equality. An Athena SWAN employer, we offer development programmes and services designed to support female staff across our University: our Women Rising Programme supports 20 female PGRs and PDRAs *p.a.* across engineering and physical sciences, addressing career development challenges for female ECRs; Springboard is a three-month personal development programme for women in the workplace; Aurora is a leadership development programme run by Advance HE to support mid-career women in academic and professional roles - since 2016, 76 staff members have undertaken this programme.

The University holds a bronze Athena Swan award, with administrative units holding individual awards, including the first gold award for a School of Medicine. Developmental and support groups for women underpin this work and include the Women@Leeds Network; Women of Achievement Awards; Aurora; Leeds Female Leaders Network; Women Rising Programme; and Women in Leadership Roles Forum.

The University’s REF preparations were undertaken in accordance with our E+I principles, as set out in our REF2021 Code of Practice. Processes and policies are common to all staff involved, with no Faculty- or School-specific variations. All University staff undertake E+I training as part of their staff development, with individuals involved in REF2021 decision making undertaking additional training. Equality impact assessments at periodic stages confirm that our processes did not introduce any bias in the way individuals/groups were treated, and that the submission reflects the diversity of the eligible staff community.

### *Staff Development*

All new staff attend a University Induction day, to welcome and orientate themselves in their new role and workplace. They are supported *to work in the manner that best suits them*, through schemes including *study leave; flexible and/or remote working; support for staff with caring responsibilities, ill-health, or other equality-related circumstances*. These have been particularly important to support staff through covid-19.

Organisational Development and Professional Learning (ODPL) support staff development. In 2016, the University launched its Leadership Excellence Behaviours, a programme of career-stage specific courses supporting leadership development. Since 2016, over 2,200 attendees have benefited from this programme (Figure 6).

Our alumni and donor community actively support staff development through both philanthropy and sharing skills and experience. Since 2010, the Making a World of Difference Campaign has received over £107M in contributions, supporting initiatives including 156 enterprise scholarships

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for student businesses; 67 PGR scholarships; 34 Beaumont awards for students whose work has the potential to help others; 10 members of the academy of cultural fellows to spend time at Leeds; 34 Cheney Fellowships to enable talented international researchers to spend time at the university.



*Technical Staff:* The University is a Member of the Science Council's Employer Champions Programme and signatory to the Technician's Commitment, supporting skills and career development of the 400+ technicians across the University. Activities include appointment of 5 Technician Champions; a film to promote the role technicians play in University life; and multiple networking events. HEaTED Membership (2019), provides access to technician-specific training courses, with an initial cohort of eight technicians supported for professional registration. In 2020, the university became an official Partner Affiliate with the National Technician Development Centre.

*Early career researchers:* ECRs are a vital part of the University R+I community and our future research leaders. As such, over the REF period we have developed a range support and development opportunities to create an inclusive, vibrant community for this vital part of our researchers (Figure 7).

The Laidlaw scholarships scheme provided leadership development for 131 undergraduates during the REF period. Final year undergraduates undertake a research project, and there is the opportunity for research internships to put into practice their research skills. Student entrepreneurship is supported through the SPARK team within Nexus, allowing students access to members' enterprise and innovation expertise (see 'Strategy' section).

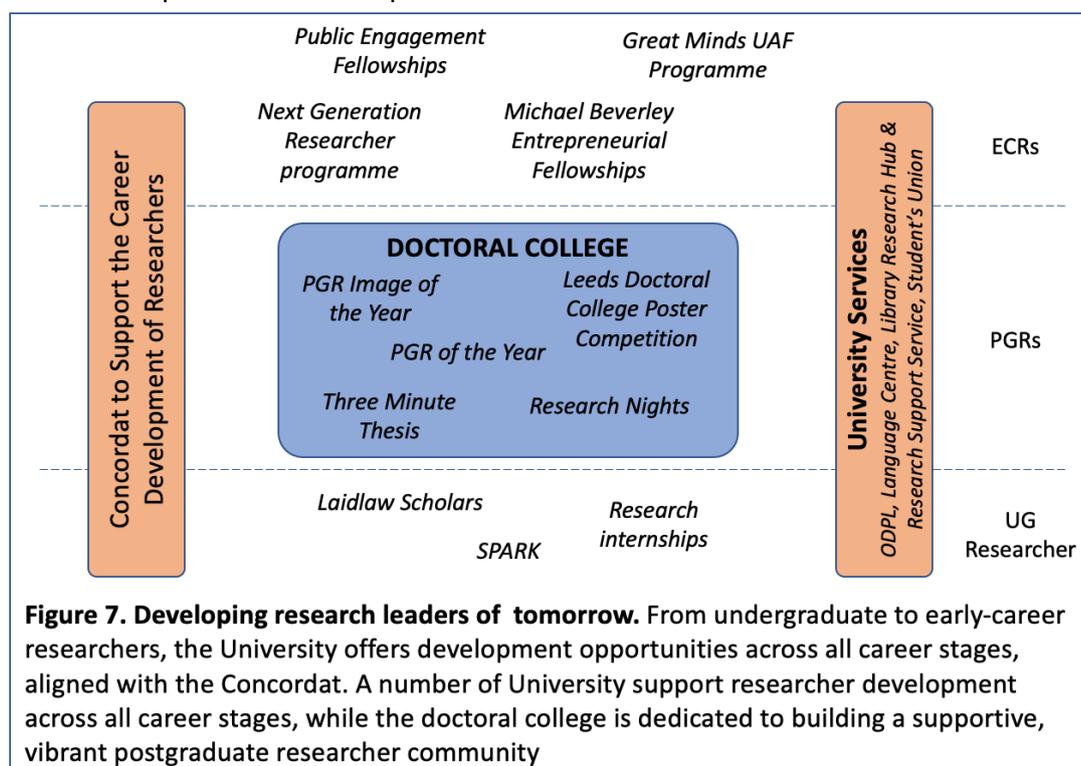
Our PGR cohort has increased by 15% over the REF period, from 2090 (2013/14) to 2445 (2017/18), including 110 Leeds anniversary PGR scholarships. In 2019/20, the PGR cohort came from 106 countries, with 35% of PGRs from overseas. To further develop and support PGRs, the University launched the Doctoral College in 2017 and the Leeds Doctorate in 2020. Together, they ensure a consistent, high-quality experience for all our PGRs, supporting them to develop their future careers. The 2016 refurbishment of the Edward Boyle Library created a dedicated Research Hub and Researcher Support Service.

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ODPL supports ECRs through courses on mentoring, attracting research income, applying for funding schemes, partnership with industry, leadership, commercialisation, and the University's 'Next Generation Researcher' programme. From 2019 all ECRs have 10 days protected for participation in development activities as well as an assigned academic mentor.

The 'Great Minds' programme launched in 2014 recruited 200 University Academic Fellows (UAFs) who follow a five-year development programme leading to a permanent Associate Professor position. UAF recruitment is targeted to support strategic investments (e.g. flagship interdisciplinary research platforms), and membership of national institutes. Forty-four UAFs have graduated early, moving directly into senior academic positions, including one as full professor.

We proactively support all ECRs, including UAFs, to apply for independent fellowships helping them to develop their independent research careers. Between 2014-2020, 180 ECRs have been awarded independent fellowships.



### Implementation of the Concordat to Support the Career Development of Researchers

The University implemented both the 2008 Concordat's seven principles and the 2019 Concordat's three principles, listed below. Our Concordat implementation plan was developed through open meetings between researchers and senior staff and is championed by the University Executive through a researcher-centric Researcher Development Steering Group, including ECR representation. This provides continuous review and evaluation, including external assurance through our Vitae HR Excellence Award.

*Principle 1: Excellent research requires a supportive and inclusive research culture.* The Equality Policy Unit oversees development and implementation of E+I policies. This work has led to gender balancing of interview panels, an increase in international research staff etc, and was recognised by a bronze Athena Swan award at the institutional level, with individual units holding one gold, five silver and two bronze awards.

*Principle 2: Researchers are recruited, employed and managed under conditions that recognise and value their contributions.* Our 'Guidance for employing research staff' informs recruitment,

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selection, development, and recognition practices. It has delivered, e.g., research representation on University and Faculty level groups; increased recognition of researcher contributions through named researcher status.

The University promotion process was re-developed in 2016, resulting in a clearer, more expansive articulation of the behaviours required at each level. This included inclusion of criteria around PE, impact, commercialisation, and internationalisation. In addition, a Professorial-level pathway recognising academic leadership was introduced: since its introduction, 20% of Professorial level promotions (37/186) have taken this route.

*Principle 3: Professional and career development are integral to enabling researchers to develop their full potential.* Researcher development is supported through the staff review and development scheme (SRDS) and annual academic meetings (AAMs), as appropriate. The University introduced protected 'development time' for all staff, plus resources including peer-support groups; dedicated consultants and coaches; support for fellowship applications; the opportunity to contribute to University and Faculty level groups; funding workshops; leadership training. The Career Architect programme was launched in 2015, supporting career development for fixed term staff, including support for personal development planning. Over 80% of attendees have moved on from postdoctoral research roles into other careers within research.

### 4. Income, infrastructure and facilities

Our 2015-2020 strategy set out to achieve '*significant increases in research quality, income and impact*'. To support this, the University invested in researchers (see 'People'), flagship interdisciplinary platforms, and the professional support service staff to support delivery (see 'Strategy').

Through active staff development and expectation setting, as well as investment in infrastructure and facilities, we have achieved a substantial increase in research income over the REF period. Research grants and contract research awards increased by 33%, from £130.5M (2013/14) to £196M (2019/20). We undertake substantial contract research, averaging over £55M p.a. Over the same period, awards over £1M have increased by 70%, reflecting our ambition and leadership of large programmes

The central R+I Service (RIS) and Faculty-based R+I Offices work together to support R+I across the University. Overseen by the Deputy Vice-Chancellor: R+I, RIS activity is led through four directors and three institution-level Deans, each tasked with an aspect of our R+I portfolio: R+I Development; Commercialisation; Nexus; Research Integration and Advancement; Research Quality and Impact; Interdisciplinary Research; and the Leeds Doctoral College. The RIS senior management team are members of the R+I Board, chaired by the DVC R+I, alongside faculty pro-deans R+I and appropriate heads of professional services. The R+I Board provides a forum for strategic R+I discussions, ensuring academic input into strategy, objective setting and delivering success.

Integrated teams support development of areas of research excellence, linking central and local services. This includes specialised advice on particular research areas/funders; corporate relationship managers who develop the breadth and depth of our partnerships with major corporates (£1Bn turnover p.a.); the major research initiative team who support development of large-scale research projects, such as the Institute of High-Speed Rail and Systems Integrations; an interdisciplinary research team who support the generation of novel interdisciplinary collaborations, leveraging the breadth and depth of research expertise to address global

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challenges such as Net Zero. Translation of research outputs to impact and communication with stakeholder groups is supported through dedicated teams for commercialisation; intellectual property; public engagement; policy engagement; and knowledge transfer. Finally, regulatory and legal requirements are met through the quality and policy, and contracts teams.

Research bidding is handled through our bespoke grants management system KRISTAL, while research outputs and professional activities are logged through Symplectic. Consistent with our open access policy, outputs and data are then made publicly available online through White Rose Research online, ensuring our work reaches those most likely to benefit from it. These data, alongside impact and HR information, are brought together through our bespoke Institutional Research and Impact System (IRIS).

## Infrastructure and facilities supporting research and enabling impact across the institution

The University Estate comprises over 300 academic and residential buildings. Over the REF period the University invested significantly in its research environment, including over £367M in infrastructure and facilities to support research. Major investments include the £96M Sir William Henry Bragg building, a home for our engineering and physical sciences research, and the £40M Nexus innovation hub. Other significant investments include: £6.4M for an IT data centre and network infrastructure; £32M for refurbishment of Biological Sciences buildings; £36M for refurbishment of Medical Sciences buildings; £10M for the Priestley International Centre for Climate; £4M for the Institute of Transport Studies. To complement our infrastructure investment, the University has invested in equipment, including electron microscopy within the Astbury centre (£2.9M); pre-clinical and clinical MRI scanners within medical sciences (£2M). In addition, the Henry Royce Institute has supported x-ray spectroscopy (£2M) and the Royce deposition system (£2M), both located within the Bragg Centre for Materials Research. Working through the N8, the University ensures optimal sharing of publicly funded research assets, ranging from the new Centre of Excellence in Computationally Intensive Research (N8CIR), to the 4000+ entries in the N8 equipment database.

The University has four libraries on its main site, plus a Clinical Sciences library at St James' University Hospital. Over the REF period, these libraries have seen over £50M investment, including the opening of the Laidlaw Library (2015), and a refurbishment of the Edward Boyle Library (2017). The latter included creation of a dedicated Research Support Service and Research Hub to encourage and facilitate interdisciplinary research.

Together, the library buildings provide access to over 2.7M physical volumes and 0.5M ebooks. Over the REF period, library visits have increased from 1.8M (2014/15) to 2.8M (2018/19). The library houses several special collections, providing a rich resource for staff, students, and the wider research community through our Special Collections Network. Five of our special collections are designated by Arts Council England for their international research significance. In 2018/19 there were over 2,100 visits to the Special Collections Research Centre. The Brotherton Fellowships support researchers immediately post-PhD to work with the collections, with the explicit aim of leading to successful larger research grant applications.

In 2015, a £2M investment saw the creation of Treasures of the Brotherton Gallery, which alongside the Stanley & Audrey Burton Gallery, are free, public galleries that provide access to our exceptional collections of fine art, artefacts, rare books and manuscripts. The galleries receive more than 20,000 visitors per year and are a key part of our PE strategy, including as part of the 'BeCurious' festival.

## Institutional level environment template (REF5a)

The University libraries are part of the White Rose Libraries consortium, formed between the libraries of the Universities of Leeds, Sheffield and York, creating a shared institutional research repository to advance the agendas of the three institutions. In 2018, White Rose Libraries was the winner of Times Higher “THELMA” for Outstanding Library Team. The consortium is also the governing body for White Rose University Press, an open access digital publisher of peer-reviewed academic journals and books. Since its creation in 2016, 8 books and 5 journals have been published through White Rose University Press, achieving view/download rates averaging over 20-times the dissemination expected through the traditional print run model.

Beyond the main site, the University has invested significantly in theme-specific research sites: Spen Farm, Leeds Innovation and Infrastructure Park (IIP), and the Wolfson Centre for Applied Health Research are all large-scale investments within the REF period providing world-leading research facilities. Development at Spen Farm supports our biological and environmental research, including an £11.4M investment in the centre for innovation excellence in livestock, a collaboration between twelve of the UK’s leading livestock research institutions and industry partners spanning the food supply chain. The IIP is a £23M development of a large-scale industrial research facility in the south-east of Leeds. Once completed, it will house our Institute for High-Speed Rail and Systems Integration (IHSRSI, £50M), the Centre for Infrastructure Materials (£12.2M), and the EPSRC National Facility for Innovative Robotics Systems (£5.5M). IHSRSI will be supported through £29M of industry co-investment, £11M from government *via* UKRPIF, and £13M from the West Yorkshire Combined Authority. The Wolfson Centre for Applied Health Research is a £3M joint venture between the Universities of Leeds and Bradford, and the Bradford Institute for Health Research, a unique research partnership between the primary and secondary care NHS Trusts in Bradford and Airedale.

The University’s investment in research infrastructure has led to a significant increase in external users. HE-BCI data for income from equipment and facilities increased from £2.39M (2013/14) to £18.78M (2018/19), placing the University 1<sup>st</sup> in the HE-BCI ranking for this category.

In line with our commitment to a fully diverse, equal opportunity workplace, the University has actively worked to create a research environment that is equal to all. Over the REF period we have invested £6.8M in physical adjustments to our estate, enhancing access to our research facilities. In addition to physical adjustments, the Research and Innovation Board monitors research activity against protected characteristics. Working groups have been established to improve gender equality in research, as well as the overall research culture.