

<b>Institution:</b> Newcastle University
<b>Unit of Assessment:</b> UOA 13: Architecture, Built Environment and Planning
<p><b>1. Unit context and structure, research and impact strategy</b></p> <p><b>1.1 Overview, Structure and Context</b></p> <p>Research in this UoA explores how urban and rural environments are imagined, planned, designed, governed, modelled, constructed, cultivated, inhabited, and conserved. We examine the allocation, consumption and generation of cultural, social, economic and natural resources within these diverse environmental contexts. And we investigate how they produce communities, cultures, ideologies, and inequalities. Our UoA is renowned for its globally-significant interdisciplinary research which overcomes habitual disconnections between fields, and their differing vocabularies and values. The work combines sophisticated, critical and rigorous scholarship that bridges: engaged architectural methods and practices; interventions in planning and governance; applied social science research for public policy; and practice-led work in the arts and creative practice. We have a strong focus on social justice and equality. Diversity and inclusion are not only the subject of research but integral to all our research processes. Our work illustrates Newcastle University's status as, simultaneously, a globally recognised research-intensive organisation <i>and</i> an anchor institution in the North East of England (ILES1.1).</p> <p>All colleagues in the UoA work within or across three groups whose researchers have collaborated for more than two decades, and were previously returned together in REF2014 and RAE2008, namely: Architecture Research Collaborative (<b>ARC</b>); Global Urban Research Unit (<b>GURU</b>), both based in the School of Architecture, Planning and Landscape (SAPL), Faculty of Humanities and Social Sciences (HaSS); and Centre for Rural Economy (<b>CRE</b>), in the School of Natural and Environmental Sciences (SNES), Faculty of Science, Agriculture and Engineering (SAGe) (CRE researchers at the interface of rural economy, social science and planning are returned to this UoA, with other CRE staff returned to UoA6). There is vibrant cross-participation, joint publication and PhD supervision between these groups with researchers often holding dual affiliations and several staff, over time, moving between.</p> <p><b>CRE</b> was formed in 1992 specialising in interdisciplinary social science and applied policy research, foregrounding knowledge about the rural economy in national and international debates concerning policy and practice. CRE includes one of the most significant groupings of rural social scientists in Europe, recognised in 2013 by the award of the Queen's Anniversary Prize for Higher and Further Education. The origins of <b>GURU</b> date back to 1993, since when it has contributed theoretical advancements in planning, governance and urban studies, engaging with societal challenges, public policy, community development and professional practices. With its core focus in urban planning, GURU's work reaches into diverse disciplinary fields and has a strong tradition</p>

of working in Europe and the Global South. **ARC** was formed in 2012 by combining separate architectural research groupings with the strategic aim of cutting across traditional thematics and connecting researchers with diverse expertise to stimulate innovation and bear collectively on the complexity demanded by architectural, cultural and societal questions. Researchers from the UoA lead the development of Newcastle University **Centres of Research Excellence** (NUCoREs), the flagship programme of the University's Research Strategy, in **Heritage** (2019) and **Cities** (2020) with others in development (ILES2.2.1).

Each of the research groups has received **significant and sustained strategic investment** in people and infrastructure, at university, faculty and school levels (s2.1, s3.5), producing **substantial growth in researcher numbers and facilities available** in this REF-period. We have directed this growth mindful of our UoA research strategy which focuses on 'three "i"s', **interdisciplinarity**, **internationalisation** and **impact** (s1.2), emphasising the vitality and sustainability of our supportive research culture (s2). This growth resulted in major initiatives developed from the UoA, and unit staff leading strategic University programmes. These frequently emerged from iterative investments, making a major contribution to long-term success and succession-planning, by researchers who have built their careers in Newcastle (s2.1). Key examples include:

- Investment in **experimental architecture** and **biodesign** research (**ARC**), developing into the UKRI £8m Hub for Biotechnology in the Built Environment (HBBE, 2019), the largest grant ever awarded to the discipline of Architecture in the UK (s1.3).
- Sustained investment in pioneering research into the **rural economy and society** (**CRE**) which led to the award of the UKRI £6.2m National Innovation Centre for Rural Enterprise (NICRE, 2020-2023) (s4.1).
- Success and investment in **ageing** research (**GURU**), linking with the National Innovation Centre Ageing (NICA, 2014-) leading, for example, to the £20m Future Homes project (s4.1; ICS13-3\_Tewdwr-Jones).
- Investment in **cities** research (**GURU**), leading to: the UKRI Newcastle City Futures (NCF) urban living partnership, (ICS13-3\_Tewdwr-Jones); a leading role in the University's Spatial Analytics and Modelling initiative (SAM), and; working with computing science and others, funded programmes in digital civics (s1.3).
- **GURU** researchers play leading roles in two Global Challenge Research Fund (GCRF) Research Hubs awarded to Newcastle (2019): Living Deltas (NERC, £15.3m), and; Water Security and Sustainable Development (ESRC, £17.8m) (s3.2).
- A programme of **co-produced community projects** drawing from creative practice methods (**ARC**, **CRE**, **GURU**) (s4.1), including the Testing Ground programme (ICS13-4\_Farmer), and catalytical participatory visual and performing arts work (ICS13-5\_Gkartzios+Cowie).

- Investment in **research infrastructure (ARC, CRE, GURU)**, including the creation of the £4.8m Farrell Centre for Architecture and Cities, an exciting new gallery and public engagement space (s4.1).

**Our UoA has grown more than 50%** from 2014, notably in the submission from ARC, up from 14 to 33 colleagues. This represents a high degree of continuity and career progression, linked to significant growth across the spectrum of academic career stages (s2). Early Career Researchers (ECRs) are integral to our research environment and our aim is to create opportunities for ECRs to build their careers at Newcastle (s2), related to the UoA's strong commitment to equality, diversity and inclusion. The University holds an Athena SWAN (AS) Silver award (2016), and both SAPL (2019) and SNES (2018) hold AS Bronze. SAPL have appointed a Director of EDI (**Button**), part of the School Management Team who leads the EDI Committee, with a budget and representatives from all job families, PGRs, and taught students (s2.4.3). Alongside our focus on equality, we are committed to ethical practice. All UoA research, regardless of funding source or whether PGR or staff-initiated, must follow University ethical approval procedures (ILES2.3.2) as part of our commitment to **research integrity**. Our Schools have an Ethics Convenor (SAPL, **Kamara**; SNES, **Gkartzios**) and more complex ethical approvals are completed at Faculty-level following iterative discussions with a nominated Convenor from Faculty Ethics Committee. Safeguarding training is introduced where appropriate. The UoA is committed to **open research** and our researchers use the resources available via the University e-print repository, agreements and funding sources for open access publishing (ILES2.3.3). New data sets are deposited in searchable archives and made available for re-use by other researchers on the principle of 'open as possible, closed as necessary'.

During this REF-cycle the UoA has achieved:

- A publication portfolio of **over 1000 outputs** including: 37 (co-)authored books; nearly 450 refereed journal articles; 38 edited books; 250 book chapters; over 40 built works and exhibitions; over 100 reports; and a similar number of contributions to refereed conference proceedings. Over 200 of these publications were produced with international co-authors. UoA researchers have published in 7 languages other than English and outputs are translated into 13 languages.
- Research and innovation **funding to a total of £6.9m**, on an upward trajectory through the REF-period, with a series of large awards in the latter part of the period ensuring the UoA's continuing sustainability.
- A cohort of **high calibre PhD students**, strongly international in nature. A characteristic of this REF-period has been the alignment of PGR intake with strategic research priorities through participation in UKRI-funded DTCs/DTPs.

**1.2 Research strategy: Internationalisation, interdisciplinarity and impact**

The University's *Vision and Strategy* provides the overall context for research in the UoA, academic schools play an operational planning role, and each of the groups regularly updates its thematically-organised research strategy. Our UoA-level strategy supports and extends overarching themes identified in our RAE2008 and REF2014 submissions concerning:

**Interdisciplinarity**, establishing new collaborations across the University and leading new interdisciplinary fields of research, e.g.: 2014 plans to develop work on biodesign (leading to HBBE) and creative practice; the GCRF hubs; interdisciplinary initiatives such as SAM with engineering, computing, and geography; plus participation in digital civics with Computing.

**Internationalisation**, developing 2014 plans, we have taken a leading role in the two Newcastle-based GCRF hubs, continued extensive involvement in European-level projects, and invested in east Asian research with the appointment of a leading scholar on Chinese architecture to a Chair (**Zhu**). At REF-census, UoA researchers were working on funded projects with researchers in 36 countries across the globe.

To these two themes, we added a third in 2014, developing from user-focused research to an explicit orientation towards challenge-led research with **impact**, co-ordinated by an Impact Champion (**Gilroy**). The UoA's strategy for **impact** is based on the following guiding principles:

- **Co-producing our research** through many of our impact activities, underpinned by our commitment to sustainable and ethical engagement (s4.1).
- **Engaging methodologies**, drawn from the arts, humanities and creative practice e.g. theatre performance (ICS13-5\_Gkartzios+Cowie), and live community co-build projects (ICS13-4\_Farmer), enabling effective community collaboration with material outcomes.
- **Influencing policy**, extending a long tradition of urban and rural policy work (e.g. ICS13-1\_Townshend, ICS13-2\_Phillipson+Cowie).
- **Influencing beyond policy**, to place renewed emphasis on working at community level and in partnerships (e.g. s4.1.1, ICS13-3\_Tewdwr-Jones).
- Alignment with the University's place-based agenda as a civic institution, where much of our **research impact started locally** in the north-east of England is **developed at national and international scales**.

Irrespective of contract type, colleagues are all actively encouraged and supported to undertake impact and engagement activities (s2). This has been supported by 13 ESRC Impact Accelerator Awards and internal funding streams (s3.3). KTPs have been undertaken with national housing group Anchor Hanover (**Gilroy**) (s4.1), and Bussey & Armstrong towards public art in the Westpark development, Darlington (**Thompson**).

### 1.3 Investing in research

The UoA has been extremely successful in securing University investment in people and research infrastructure (s2.1/2.2; s3.5), including £658K through the University's Research Excellence Academy for postdoctoral research fellowships (s2.2). In turn, this led to sustained success in attracting external funding, achieving the highest quality outputs and delivering impactful work.

**HBBE** provides an exemplary case, where initial investments by SAPL, and prioritisation of experimental architecture in strategic case-making with the University, facilitated the scaling-up of activity leading to major grants. In 2012 SAPL identified a strategic opportunity for ARC to lead in the development of a new type of building science and funded support for **Dade-Robertson's** development through 2 PhD studentships (**Ramirez-Figueroa, Hernan**). University funding was gained for appointing a leading scholar in the field to a Chair (**Armstrong, 2014**), and in parallel **Dade-Robertson** was funded through fees and sabbatical leave to undertake the University's MSc in Synthetic Biology (2016). Further investment was achieved through the University's competitive **Research Investment Fund (RIF)** (2015-2020, £363K). This enabled the construction of laboratory facilities and postdoctoral research appointments (**Ferracina, Hughes**). These investments provided the platform for winning the EU LIAR project (EUR3.2m, **Armstrong**) and the EPSRC award Computational Colloids (£240K) and follow-on Thinking Soils (£800K, both **Dade-Robertson**). In turn, these provided the platform for HBBE (£8m, **Dade-Robertson, Armstrong, Bridgens, Morrow**), awarded through Research England's Expanding Excellence in England programme, intended to grow new disciplines and upscale demonstrable excellence. Linking architecture at Newcastle and biotechnology at Northumbria University, HBBE has recruited over 30 new members of staff, and is projected to grow to a group of more than 80 researchers by the end of 2022/23. HBBE is leading to further projects (e.g. Principles for a Microbial 3D Printer, EPSRC, £243K, **Dade-Robertson**, 2021-23; Fibre Highways: Translocation of the Microbiome for Pollutant Bioremediation, BBSRC/EPSRC/NIBB, £97K, **Scott**, 2020-21), and has continued the UoA's original vision of developing a new type of building science.

GURU's foci on **cities, ageing and emerging digital practices** have similarly been supported through a series of interlocking investments and subsequent successes, underpinning the **Cities NUCoRE**:

- A strategic case for institutional investment in **cities research** with the Centre for Urban and Regional Development Studies (CURDS) led to the appointment of a new Chair in Cities (**Burrows, 2016**) plus a postdoctoral fellow (**Smith**) and PhD student (**Day**), to work alongside **Graham**.
- RIF (£2m) supported the development of **Spatial Analytics and Modelling (SAM)**, led by CURDS with GURU. SAM's vision is to forge a connected and trans-disciplinary spatial science to enable the management of complex social, economic, engineering and

technical phenomena in time and space. **Crampton** was appointed as Professor of Urban Data Analysis in GURU (2018), with three further interdisciplinary chairs across the University, and is now Co-I for the EPSRC-funded Geospatial Systems Doctoral Training Centre (£6.7m, 2019-2027, 50 PhD students).

- Support was obtained from RIF (£354K) to develop existing strengths in **ageing** and the city, specifically the work of **Gilroy**, linking with NICA, the NHS Campus for Ageing and Vitality, and NCF. A SL appointment was made (**Lewis**), plus postdoctoral researcher (**Aitken**). This investment underpinned the development of the £20m Future Homes project (s4.1; ICS13-3\_Tewdwr-Jones).
- The University resourced the secondment of **Tewdwr-Jones to NCF** (ICS13-3\_Tewdwr-Jones), which leveraged external support (e.g. Urban Living Partnership, EPSRC, £400K, 2016-18).
- Notable successes around digital civics have included: the creation of a lectureship (**Weise**); GURU researchers undertaking leading roles in: the EPSRC Digital Economy Research Centre (£10.4m, 25 postdoctoral researchers, 2 in GURU, **Shakeri, Heitlinger/Wilson**, 2014-2022); the EPSRC Centre for Doctoral Training in Digital Civics (£4.7m, 60 PhDs, 2014-2022) (both **Vigar, Tewdwr-Jones**) to support research into digital planning and digital community engagement (with the first SAPL graduate obtaining an ESRC postdoctoral fellowship, **Wilson**), and; the EPSRC Research Centre for Digital Citizens (£9m, **Burrows**, 2020-2025).

#### 1.4 Future Plans

We seek to further our commitments to disciplinary-based research, and internationalisation, interdisciplinarity and impact. We will enable all researchers to fulfil their potential and make a strong contribution to University research environment and culture. Our work will be diverse, celebrating colleagues' intellectual freedom, while we attend to the following areas:

- Sustaining excellent research into **rural economy and society**, emphasising the untapped potential of rural economies across the UK, through NICRE.
- Developing our novel interdisciplinary work on **biodesign**, recognising HBBE's capacity to significantly extend this area, through external competitively funded 'centre' status and internally through prospective NUCoRE status and the progression of NUAcT Fellows (s2.2).
- Continuing to lead interdisciplinary work concerning: **cities** and **heritage** through the respective NUCoREs (**Davoudi, Pendlebury**); **digital civics** through UKRI Digital Economy and Digital Citizen awards; **living well in place** developing work around ageing in place, and housing and home, exemplified by Future Homes, and wider planning and design interventions in the built environment for health and wellbeing, responding to



challenges of (post-)pandemic living (linked to NUCoREs in **Ageing & Inequalities** and **Healthy Living**).

- Furthering our commitment to support the achievement of UN Sustainable Development Goals (specifically 6 and 13) through research on **water security**, reflected by our core contribution to the GCRF Water Security Hub and leadership in establishing an interdisciplinary Water NUCoRE (**Button**).
- Extending **design-led research and creative activism** through visual arts and performance-based research practices (**ARC, CRE, GURU**), with the Farrell Centre as an important locus of these activities.
- Developing **critical landscape studies**, following investments in a new lecturer and postdoctoral fellow, and an interdisciplinary Landscape NUCoRE (**Roe**), building out of landscape work integral to GCRF Living Deltas.

## 2. People

### 2.1 Introduction

We seek to offer a supportive and inclusive research culture and to support the career development of colleagues. As Table 1 shows, our submission has grown more than 50% (notwithstanding that 92% of category A staff were returned in 2014):

- We have high rates of retention: Of 42 staff from ARC/CRE/GURU returned in 2014, 35 are returned again, 4 have retired, 1 left academia and only 2 have taken more senior positions at other academic institutions.
- 26 of the 52 colleagues (not already at or appointed at professorial level) returned here have received promotion in this REF period, including 19 of 26 staff returned in 2014, 8 of whom were promoted to Chair (3F, 5M).
- 18% (12/68) of the staff in this return are classified as ECRs, 90% are on open-ended contracts and 10% on fixed term.
- In addition to the independent researchers returned, our research community, at census, consisted of 16 further research staff (15.7 FTE, 10F, 6M).
- The UoA's research is further underpinned by the wider academic community, including Teaching & Scholarship (s2.4.1), Professional Services and Technician colleagues (s3.4).

Table 1: Staff data 2020 and 2014

		REF2020	REF2014
Overall staff return		68(63.65-FTE)	44(41.8-FTE)
Staff categories	Professor	24(9F, 15M)	10(1F, 8M)
	Reader	5(2F, 3M)	4(2F, 2M)
	SL	17(6F, 11M)	15(6F, 9M)
	L	11(3F, 8M)	11(4F, 11M)
	R&I	11(9F, 2M)	4(3F, 1M)
Gender overall		41%F, 59%M	36%F, 64%M

We remain committed to fostering aspirational attitudes to promotions and enabling existing colleagues to develop their careers. While success rates are similar, men are more likely to put themselves forward for promotion, and part-time staff particularly unlikely to do so. We will do more to actively support women and part-time colleagues to apply for promotion and further emphasise the value of diverse contributions to promotion criteria (e.g. including academic 'citizenship' or impact work). We have sought to use academic appointments to achieve a better gender balance in this REF-period. 20 T&R appointments were made (9F, 11M), 8 at professorial level (5F, 3M). All appointment panel members are trained in unconscious bias. We have long sought gender-balance, with a commitment now to at least two women and a range of career stages represented on panels, and accessible and inclusive job advertisements (**AS-action**).

## 2.2 Staffing Strategy

Decisions on staff appointments are made through annual planning processes conducted between schools and faculties. This has been supplemented by strategic investments introduced in Section 1. A significantly expanded community of researchers has resulted, strengthening established areas of research activity whilst developing our strategies regarding interdisciplinarity, internationalisation and impact. Succession planning occurs through all these processes: standard recruitment cycles, enabling colleagues to flourish and progress; and through strategic investment.

Specific initiatives have enabled appointments in experimental architecture (**Armstrong**, 2014), biological architecture (**Morrow**, 2020), cities (**Burrows**, 2016), urban data analysis (**Crampton**, 2018), digital civics (**Weise**, 2018), and ageing (**Lewis**, 2019). Annual cycles have been used strategically to enhance research fields in design practice and pedagogy (**Chiles**, 2014, **RParnell**, 2019), east Asian architecture (**Zhu**, 2019), and architectural technology (**Bridgens**, 2018, **Burford**, 2017). Appointments have reinforced existing areas of strength in rural economy (**Shortall**, 2016), planning and urban studies (**Abdulai**, 2018, **Garcia-Mejuto**, 2017, **Varna**, 2017,



**Raynor**, 2019) and architectural history and theory (**Garcia-Fuentes**, 12/2013, **Kakalis**, 2016, **Odgers**, 2017, **SParnell**, 2015).

Substantial investment was achieved through the University's **Research Excellence Academy** (£658K, 2016-2023) investing in a new generation of researchers, awarding 6 three-year Research Fellowships across ARC, GURU and CRE (**Gould**, **Heslop**, **Machen**, **Raynor**, **Tiwasing**, **Veal**). CRE received further internal funding for a five-year Fellowship (**Cowie**). More recently, the **NUAcT Fellowship scheme** is a major University programme funding five-year Fellowships each with an associated PhD studentship, cash support, and a Fellowship development programme, leading to an open-ended position (ILES3.2.4). 2 NUAcs in the UoA thus far (**McLeod**, **Scott**) advance our interdisciplinary research and creative practice agendas respectively, associated with HBBE. The UoA also hosted a NU Humanities Research Institute Fellowship (**Cheatle**), Leverhulme Fellowship (**Brigden**) and ESRC Future Cities Catapult Fellowship (**Cowie**), and now 2 ESRC postdoctoral fellows (**Merrell**, **Wilson**).

### 2.3 Research students

The UoA has a substantial, thriving and diverse research student community, thoroughly integrated with our research environment and culture. We had 79FTE registered students at census, recruited based on EDI good practice. Our doctoral researchers are highly interdisciplinary: students are commonly co-supervised across the three groups; 22 of our students are co-supervised with colleagues from other UoAs (e.g. sociology, computer science, fine art, geography, archaeology, engineering) with our researchers contributing to other disciplines in turn; and 5 have external supervisors. Over the census period, the cohort has been generally gender-balanced (**AS-data**) and highly international (from 29 countries at census). The UoA supports international visiting students with 23 received from 10 countries in this REF-period.

PGR numbers rose through the REF-period, with significant steps-up in funded studentships associated with HBBE (7 at census, a number that will grow) and the EPSRC Digital Civics CDT. The UoA also has students from the ESRC (NINE) and AHRC (Northern Bridge) DTP/DTCs, and 2 doctoral candidates associated with the EU-ITN project Heriland. The unit has 1 student from the first intake of the EPSRC Geospatial CDT. 9 students have graduated from NINE in the REF-period (**Merrell**, after a period as a researcher, has been awarded an ESRC postdoctoral fellowship in CRE), with 8 more continuing at census. 1 student has graduated from Northern Bridge and 2 are continuing (1 from an Industrial Strategy Partnership). Support for students has come through externally funded bursaries, including the Mary and David Forshaw bequest specifically for female doctoral candidates (starting 2019, 3 awards to date). SAPL has funded 14 new PhD scholarships in strategic areas (e.g. biodesign, and ageing) and support has come from RIF and NUAcs Fellowships and research groups. Many students are sponsored by their home

country, e.g. China Scholarship Council. A successful aim in the REF-period has been to achieve greater diversity and better distribution of research students across the UoA, with more based in ARC aided by the development of the Creative Practice PhD route (11 current students, 10 graduations) becoming one of the largest such cohorts nationally. Senior appointments underpin this sphere of activity (**Chiles, R Parnell**).

PGR researchers are closely integrated with, consolidating and extending, key initiatives in the UoA and the three groups. For example:

- 6 current digital civics students and 1 graduating student are based in GURU (with colleagues co-supervising three more). 4 trained as planners in SAPL, providing an important inter-disciplinary connection between digital technology, planning and urban governance. The first graduating student (**Wilson**, 2019) obtained an ESRC postdoctoral fellowship.
- SAPL's Design Office has since 2011 developed a unique model where practice-based fee income is used to support PhD scholarships, with students working on live projects, integrating these with their PhDs by Creative Practice, and co-publishing design research with staff. This approach supports the sustainability and diversity of the discipline and gives CV-enriching real-life project experience (s4.3).

Doctoral students drive forward our research culture, e.g.: four students were involved in forming the GURU Food Group drawing together staff and students with food-related research interests (2014-2017); five students obtained GURU funding to run an urban film series aimed at staff-student engagement (2018-2020); ARC and GURU students work with ECR colleagues to run the weekly SAPL Research Seminar series, chairing discussions with internal and external speakers; CRE students organise a student-led symposium involving researchers from Newcastle and Northumbria Universities to develop cultures of academic writing and publication, including peer review and critique of research papers; ARC and GURU students host research biography discussions where researchers (of all career stages) are invited to discuss their interests and career development.

We actively support the academic development and visibility of our students, providing financial support (£800 per student as baseline with further support by groups) for training events, conference attendance, exhibitions, and image rights for publication. 82% of our students have presented at national and international conferences (**AS data**) with over 70 attendances funded by the UoA. Academic and industrial placements are supported as part of doctoral study e.g.: Canadian Centre for Architecture; Engagement Lab, Emerson College, Boston, USA; RMIT, Australia; Food Standards Agency; DCMS; Shadow Minister for Industrial Strategy's Office; Open Plan, and; Cultura Trust.

All students have a minimum of two supervisors, and supervisors undertake regular training sessions. All students participate in research training programmes, organised at faculty level (UoA staff make significant contributions: **Garcia-Mejuto, Lewis, Powe, Shucksmith, Speak, Veal**) and across faculties following the formation of a new Doctoral College. Students must provide a project proposal within 3 months of registering and undergo an annual progress review with a panel of two academic staff. This includes a formal presentation in stage 1 and an interview in stage 3. In addition to a faculty-wide first year conference, students are strongly encouraged to present their work in SAPL and CRE seminar series.

The physical environment for ARC and GURU research students has been renewed through the refurbishment of the Henry Daysh Building (s3.5). Students were represented in consultation processes and their preferred model adopted of small, shared rooms with dedicated meeting and exhibition spaces, and a Creative Practice studio. HBBE's new lab and workshop facilities were also co-created with PGR students (s3.5). Staff participate in wider PGR research environment initiatives, including improvements to training, regulations, and paid work (**Donaldson**, SAPL PG Director) and a faculty wide EDI Audit, improving representation and communication (**Roe**, HASS PGR Dean).

Research students have been supported through COVID-19 by the University's PGR Resilience Framework which, working closely with student representatives, allows e.g. for free extensions of study, COVID impact statements for progression and examination, COVID scholarships, IT equipment provision, access to wellbeing services, and supervisory contingency planning.

## 2.4 Inclusive and Vibrant Research Culture

The UoA is committed to providing a supportive, open, accessible and kind workplace culture that nurtures inclusivity, through basic measures such as restricting meetings to core 'family-friendly' hours, and broader plans to address structural challenges such as gender inequality and wellbeing (ILES3.3.1). We facilitate flexible working of various kinds, based on personal need, to support colleagues with caring responsibilities and work-life balance. This includes e.g.: contract variations such as tapering towards retirement (6 in the REF-period); increasing and decreasing FTE (9); fractional contracts around school holidays (1); semester-on-semester-off (1); alongside promoting applications to the University's Returners Programme (1 application so far) and the (voluntary) programme of 'keep in touch' days for colleagues on parental leave. A Mental Health and Wellbeing Group in SAPL organises sessions open to all colleagues and PGR students, and recommendations for change are routinely implemented.

As part of a rich, inclusive and vibrant research culture the UoA welcomes visiting scholars from across the globe, providing dedicated space and facilities. Visitors have included academics and practitioners across career stages, from a few days to 12 months, with 66 visitors from 21 countries across 6 continents. 17 have been visiting professorships, including academics (e.g. Julieanna Preston), practitioners including architects and developers (e.g. Sir Terry Farrell, Neil Murphy) and independent researchers and writers (e.g. Anna Minton). The recently launched Alison and Peter Smithson Visiting Professorship will be taken-up, first by Rafael Moneo, and second by Kazuyo Sejima, with visits to take place when travel rules allow.

#### **2.4.1 Staff development and achieving equity**

The workload of Teaching & Research staff, and Teaching & Scholarship staff with no contractual requirement for research, is considered through an annual Workload Model. At a minimum, c.40% is allocated for research (T&R), or c.20%+ for scholarship (T&S), with higher allocations in certain circumstances e.g. sabbatical leave, significant research project management responsibilities, stepping down from a major administrative responsibility, or seeking to move from T&S to T&R. There is a broad expectation of one semester sabbatical leave following six semesters of service and T&S staff have equal access to sabbatical leave. 57 periods of sabbatical leave have been taken in this REF-period. Sabbatical plans are developed to suit colleagues' career stage and goals, without standardised expectations (e.g. in terms of funding bids or outputs) and a mutually agreeable mentor is identified to provide support. T&S colleagues participate actively in the research environment (e.g. through research events) and numerous T&S colleagues are active in impact and engagement activities, and professional practice.

Research support is considered proactively as part of two annual review processes. First, it forms part of the holistic annual Personal Development Review (PDR) for T&R, T&S and R&I colleagues. Second, specific research support occurs through annual Personal Research Plan (PRP) meetings (feeding into PDR) conducted by senior researchers, reviewing each staff member's ideas, plans, goals, and needs. The University's MyImpact system compiles data about research publications, income generation and PhD student supervision for all staff, providing tools for self-management and unit level data for overall mentoring and monitoring. PRP is not obligatory for T&S staff but is available to any colleague who seeks a research career. PhDs are supported for T&S and T&R staff (4 in progress, 1 awarded in the REF-period) including fee bursaries.

An extensive range of development opportunities are available to all staff. In addition to support for the transition to research independence for NUAcTs, and the transition to leadership for new chairs (ILES3.2.5), colleagues have benefited from leadership training tailored to career stage (10 staff), PI development (6 staff), grant getting (2 staff), social media in research (4 staff), and bespoke coaching for individuals (12 staff). Training supporting EDI, academic culture and

processes have also been undertaken e.g. unconscious bias (22 staff) and active bystander (senior managers) training and 'Getting the most from your PDR' (18 staff). We encourage new appointees to take up the offer of a mentor and make mentoring available to all staff.

#### **2.4.2 The Academic Precariat**

All T&R colleagues in the UoA are on open-ended contracts. However, the growth of our research community has entailed the employment numerous colleagues on fixed-term research contracts, either on funded projects or fellowships. The University is a signatory to the Concordat to Support the Career Development of Researchers. At UoA level, we are acutely conscious of our responsibilities and the problems of precarious employment in the sector. We seek to support colleagues' career development through access to appropriate skills training and other opportunities aligned to development, teaching experience, and (at least) equal access to all research support resources (e.g. school/group financial support). All those working on projects have time allocated to pursue their own research agendas. 21 fixed-term research staff have left the unit during the research period. Of these 11 went directly into lectureships/senior lectureships (2 in Newcastle), 7 into further research roles (3 in Newcastle), and 3 into senior practice roles. Nevertheless, we recognise the need to do more and SAPL appointed an ECR champion (**Shakeri**) (**AS-actions**).

#### **2.4.3 EDI**

We pursue equal opportunity for every colleague and student – whatever their gender, sexuality, ethnicity, class, faith or socioeconomic background, and with regard to disability – and seek to identify and overcome conscious or unconscious bias stemming from difference.

We have sought to make this an inclusive REF-submission and the principal staff involved in its preparation have had specific EDI training. 54 of 68 colleagues have two or more outputs submitted and ECRs have returned an average of 2.25 outputs. Of researchers returned, 26.35FTE are female and 37.3FTE male (41/ 59%). The 146 outputs from current staff that form part of this submission have 169 'authorships' from the UoA (counting co-authors). 43% of these were authored by women and 57% by men (72/ 97 authorships). We have sought an inclusive process in writing this Environment Statement, with representation across the UoA including the ECR community. Colleagues were encouraged to declare circumstances to the REF for output reduction, in appropriate circumstances, through an arms-length anonymous process. The University's EDI team reviewed the NU REF2021 Code of Practice and is involved in its implementation (ILES3.4.1).

Actions from Athena SWAN Bronze awards in SAPL (2019) and SNES (2018) are ongoing. The SAPL EDI Director and Committee is systemising, focusing and extending previous actions. In

addition to issues of gender, SAPL's AS focused on mental health, LGBT+ issues and moving contingent teaching staff to open-ended contracts. The EDI Committee has sectoral champions for women, disability, BAME, LGBT+, mental health, and beliefs and spirituality. SAPL and SNES are focusing on balanced public lecture and seminar programmes (gender, ethnicity), new processes for appointing School directorships (with greater transparency) to increase diversity in senior management and connecting with University commitments to the Race Equality charter and Stonewall. School-EDI fits into a University and Faculty structure of EDI governance (ILES3.4.2) and UoA staff have been leading participants in University networks e.g. NU Women, Rainbow@Ncl.

#### **2.4.4 Researching in 2020**

Despite major challenges presented by COVID-19, we have actively sought to sustain research culture and support for researchers at all levels, in the face of unprecedented workload and personal pressures which are known to impact differentially (ILESCOVID-annex). Initially we focused on mentoring and personal support, alongside collective mechanisms (e.g. 'Quiet Fridays'). This was followed by supplementary online research events taking the form of informal conversations, sometimes led from within the UoA, sometimes by invitees from across the globe. In 2020-2021, the emphasis has been partly on 'business as usual' (e.g. research sabbaticals are proceeding, Faculty and School funds remain for research support), while using the move online to enhance key activities (e.g. additional seminars, public lectures and podcasts with international and national inputs) and additional mechanisms of support, including online research socials specifically targeted at ECRs, and a virtual 'writer's room'.

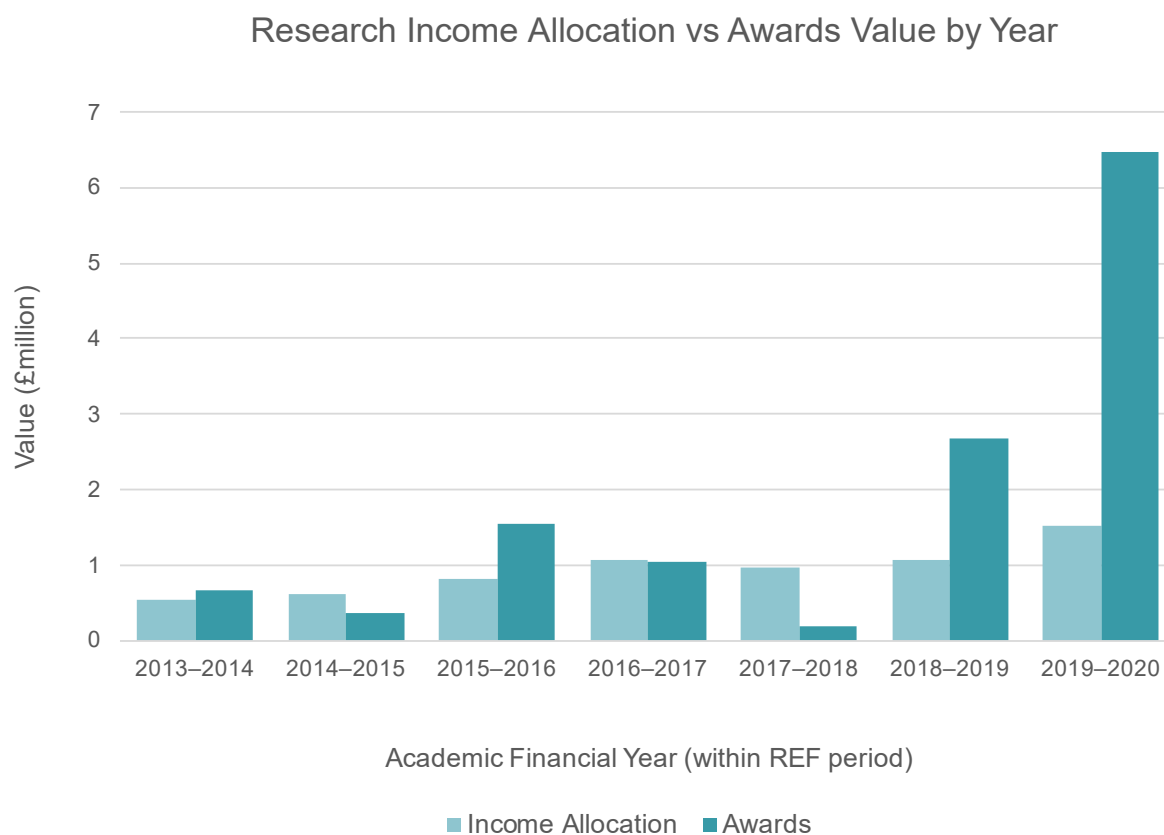
### **3. Income, infrastructure and facilities**

The UoA seeks external research funding to enable world-leading research and to convene teams to tackle intractable real-world problems. Equally, we believe that excellent research is not necessarily contingent on external funding, and that world-leading scholarship can occur independently of this, especially but not exclusively in the humanities.



## 3.1. External funding profile in the REF-period

Figure 1: Research income allocation and award data



The UoA has sustained high-level performance with research and innovation funding of £6.9m (award-value £13m). Research income is on an upward trajectory, with a series of large awards secured recently, evident in the spike of income allocation in 2019/20 coming fully on onstream after the REF-census date. Awards in the REF-period have been led by 36 PIs. 17 awards were active at the beginning of the REF-period and up to the census date 109 new awards were made, across the career spectrum. Funding sources are notably diverse:

**Table 2: Sources of Research Funding**

UKRI	Research England, AHRC, EPSRC, ESRC, NERC
European-level	EU, European Commission, INTEREG, ERDF, ESPON, Research Council Norway, Academy of Finland
Government department and related	Government Office for Science, Department for Business, Innovation and Skills, Department for Environment, Food and Rural Affairs, British Council, Public Health England, Energy Systems Catapult, Innovate UK, Scottish Government, Heritage Lottery Fund, various local authorities
Charitable	Wellcome, Paul Mellon, Carnegie, Leverhulme, The Street Foundation
Learned societies	Regional Studies Association, Institute of Local Government, RTPi
Industry	Multiple including: Churchill Retirement Living, Bussey and Armstrong, Hanover Housing, Morris Leslie Ltd.

### 3.2 Funding supporting fields of inquiry

This section illustrates significant clusters of funded-project activity that are not discussed elsewhere which reflect our strategic research groupings and our output profile, evidencing how UoA staff have built international and national consortia to develop and sustain research.

A series of projects have been undertaken concerning disciplinary knowledges. In **architecture** (ARC), these include projects led by **Lloyd-Thomas**: The Architect as Shopper (Leverhulme Trust/Paul Mellon, £41k, 2019) examining the ‘proprietary turn’ underpinning the development and marketing of building products in the 1930s, formalising the architect’s role in their distribution; and, developing from *Industries of Architecture* (s4.2), the recently-awarded project Translating Ferro/Transforming Knowledges of Architecture: Design and Labour for the New Field of Production Studies (AHRC/FAESP, £913K, 2020-2024), which brings together Newcastle and São Paulo academics to develop the new inter-disciplinary, cross-cultural field of Production Studies, extending works of the Brazilian architectural historian and theorist Sergio Ferro.

Significant projects in **rural economy** include: The Centre for the Evaluation of Complexity Across the Nexus (ESRC, £3m, **Phillipson**, 2019-22), transforming the practice of policy evaluation across food, energy, water and environmental domains for a complex world, achieved through pioneering, testing and promoting innovative policy evaluation approaches with UK Government departments; INNOGROW linking to Regional policies for innovation-driven competitiveness and growth of rural small businesses (EU Interreg, EUR1.5m, **Phillipson**, 2016-20), with partners in 8 countries; RuralGrowth supporting SME development and innovation in the rural economy (EU Interreg, EUR1.7m **Garrod**, 2016-20) with partners in 7 countries; FIELD exploring farm-level interdisciplinary approaches to endemic livestock disease (Wellcome Trust, £1.5m, **Proctor**,

2018-22) bringing together historians, social scientists, economists and epidemiological modellers to consider how understandings, practices and responses to endemic livestock disease change, and implications for post-Brexit animal health and welfare policy, and practice interventions; Curlew Contracts (DEFRA, £230K, **Garrod**, 2019-21) working collaboratively with practitioners in Northumberland National Park and local land managers on a Test and Trial project for DEFRA's new Environmental Land Management Scheme, and; Strength2Food (EU, EUR6.9m, **Phillipson**, 2016-21), identifying food quality for sustainability and health, with a 30-partner consortium representing 11 EU and 4 non-EU countries, combining leading academic, communication, SME and stakeholder organisations to ensure a multi-actor approach.

In **planning** (GURU): Working in the Public Interest (ESRC, £543k, **Vigar**, **Gunn**, 2017-20), investigates the increasing involvement of private companies in professional spatial planning work for local government; Resituating the Local in Cohesion and Territorial Development (EU, EUR4.9m, **Madanipour**, **Shucksmith**, 2016-2020) developed policy around greater sensitivity towards territorial specificities, more supportive of community-based development and the facilitation of greater civic participation, with partners in 12 European countries; Territories and Low Carbon Economies (EU, EUR687K, **Davoudi**, **Gazzola**, 2016-17) examined the role of regional governance in the transition to low carbon economies across Europe, with partners in 9 countries, and; the Making Provisions project (ESRC, £224k, **Donaldson**, **Midgley**, 2015-17) developed governance and management of risk futures in food supply infrastructures.

Researchers in the UoA have played leading roles in interdisciplinary expertise concerning **water** in the University. Projects including Towards Hydrocitizenship (AHRC, £1.2m, **Roe** 2014-17) and a GCRF preliminary project (EPSRC, £180K, **Roe**, **Button**, **Law**) comprised part of the platform for large consortia awards in 2019: the UKRI-GCRF Living Deltas Hub (£15.3m, **Roe**, **Button**, **Law**, 2019-24), led by Geography, to address disadvantaged communities that live in or near deltas, benefiting governments, community organisations, women and youth groups, SME businesses, and NGOs in India, Bangladesh and Vietnam; and the UKRI-GCRF Water Security and Sustainable Development Hub (£17.8m, **Button**, **Roe**, 2019-24), led by Engineering, to improve water security for a resilient future, and provide an inclusive space for stakeholders to meet on an equal basis to share ideas, formulate activities, and apply interventions according to development needs in Colombia, Ethiopia, India, and Malaysia.

The UoA has made major contributions to institutional research goals concerning demographic change, through a series of projects on **health, ageing, and issues of social justice** for all at each life stage, addressing the relationship between older people, their environments and wellbeing, working with external partners to drive change. Two large UKRI projects formed a substantial platform for this work: Co-design of the Built Environment for Mobility in Later Life

(EPSRC, £1.25m, **Gilroy**, 2013-2017), proposing options and tools to meet contrasting needs, support mobility and wellbeing, and; MyPLACE: Mobility & Place for the Age-friendly City (EPSRC £1.3m, **Gilroy**, **Townshend**, 2014-17), developing and testing a digital platform and toolkit enabling the public to engage with local councils in the research, planning and design of the urban environment in conjunction with Computing Science and Medical Schools. These have been accompanied by numerous impact-orientated smaller projects, including a PhD studentship (**Clark**) funded by Churchill Retirement Living (**Gilroy**, **Sharr**, £45K, 2013-16); the Reuniting Planning and Health: Tackling the Implementation Gaps in Evidence, Governance and Knowledge research network (ESRC, £30k, **Townshend**, 2014-17); as well as projects funded by Big Lottery Fund, Centre for Ageing Better, North Tyneside Council (**Gilroy**), North East Public Health Observatory, Public Health England, and NIHR (**Townshend**). Exploratory work by **Hamza** in conjunction with the Medical School (Wellcome Trust) considers behavioural impacts of internal environments on frail older people, including those with cognitive decline. A major culmination of this activity is the Future Homes project (s4.1).

A series of projects focused on **heritage**, the past and its role in making the future, considering issues of reuse, and planning and governance, in Europe and China (**Pendlebury+**): PUMAH (EU, EUR450K, 2012-16); Joint Programming Initiative (JPI) projects SHUC (AHRC, EUR150K, 2013-2015), leading into the JPI PICH project (Norwegian Research Council, EUR800K, **+Vigar** 2015-18); a Newton Fund project looking at Sustainable Green Markets in Egypt (AHRC £40k, **+Hamza**, **Speak** 2016-18), and; OpenHeritage (EU, EUR5m, **+Veldpaus**, 2018-22), researching, identifying and testing best practices of adaptive heritage re-use with partners in 11 countries. Other projects have focused on issues of culture, heritage and identity, including: Reconstructing Han Identities: The Hanfu Movement in Contemporary China (Leverhulme, £10K, **Law**, 2014-16); 'You Can't Move History: You Can Secure the Future': Engaging Youth in Cultural Heritage, focusing on contested proposals to alter the South Bank Centre in London (AHRC, £80K, **Webb**, 2014-16) and; Imaginaries of the Future: Historicising the Present Research Network (Leverhulme, £110K, **Coleman**, 2014-17), developing engaged strategies to conceptualise the future, with partners in 5 countries.

### 3.3 Financial resources to support research

The UoA ensures resources won for research are used to support research and allocated acknowledging EDI priorities, with support tailored to specific needs (e.g. disability, caring responsibilities) available. Funds to support research activities exist at faculty, school and group level and all academic staff have an individual Research Support Fund. Staff have an initial £500 allocation and a proportion of income generated from externally funded projects flows into this. Colleagues can carry money forward between University financial years. A major part of non-directly incurred costs from research projects flows into research groups to support collective

activities and to provide funds for researchers without their own resources. Each of the groups has tailor-made approaches to suit its specific context. Researchers can additionally apply for funds (e.g. for conference attendance or to kick-start research activities) from school research committees.

Numerous staff and research students have benefited from faculty and university internal funds to support research, including: Faculty Research Fund (up to £4K), and Pioneer Awards, both directed towards ECRs; ESRC Impact Accelerator Account funding; Faculty Impact Fund (up to £5K per project); Faculty Bid Preparation Fund (up to £10K); Direct Impact Fund, and; awards from the Institute of Social Science (formerly Newcastle Institute for Social Renewal), Humanities Research Institute, and Institute for Creative Arts Practice. 64 awards were made in the REF-period, ranging in scale from £400 to £10,124, leading to external awards or significant outcomes in their own right (s4.1).

### 3.4 Research support structures and personnel

A comprehensive research support framework is provided at group, school, faculty and university level:

- ARC and GURU are directly supported by a Research and Consultancy Manager (**McCartney**), a Finance and Operations Administrator (**Parker**), an Events and Engagement Manager (**Pattison**), a Marketing and Communications Manager (**Delap**), specific support for PGR (**Kyte**), technical support (**Chippington, Hudson, Mallen, Robinson**). CRE access an extensive team in SNES, with dedicated support (**Phillips**) plus further support in NICRE for Operations (**Crimmens**), Communications (**Curry**) and Business Development (**Thompson-Glen**). HBBE activities are supported by a dedicated project manager (**Heron**).
- University and Faculty support includes: Research Funding Development Managers; Impact Officers; Business Development Managers and enterprise support; Research Projects and Support Officers; Engagement Support; Research Data Managers and Open Access Managers; Library Research Service and Collections Staff; IT Staff (especially since COVID-19); Marketing and PR Staff.

### 3.5 Research infrastructure and facilities

Major investment in infrastructure and facilities has enabled innovative research projects and invigorated research culture, providing resources facilitating both new research and interaction intended to catalyse collaborative working.

New facilities have transformed **interdisciplinary** working in this REF period:

- NICRE received new collaborative workspace in the £44.4m **Catalyst building** constructed at Newcastle Helix, a city-centre site co-sponsored by Newcastle University and City Council bringing together academic and private sector research. NICRE's team are co-located with National Innovation Centres for Data and Ageing, embedding rural enterprise in the national innovation centre ecosystem (s4.1; ILES2.2.4).
- A £3.6m **new workshop and studio building for SAPL**, designed by SAPL's Design Office, was completed in 2017 with the latest digital fabrication equipment (enhanced 3D printing, laser cutting, and digital routing) plus metalwork facilities, enabling researchers to fabricate building components (ICS13-4\_Farmer), exhibition installations, and design outputs.
- Incremental stages of investment in **microbiology labs** have, uniquely in the UK, provided facilities for architectural researchers to collaborate 'hands-on' with microbiologists, material scientists, and engineers. An initial £16K wet fab lab was constructed as part of the SAPL workshop. This was supplemented by a share in an existing biotech lab (2018, £100K) co-located with the Centre for Bacterial Cell Biology in the SAgE Faculty to catalyse future collaborations. With the award of HBBE, the biotech lab was quadrupled in size (£342K), with an additional £800K HBBE lab adjacent to SAPL workshops specifically for prototyping the scaling-up of microbiological technologies to architectural size, including a state-of-the-art, Instron Universal Materials Testing System (£81K), Shima Seiki SSR12 Knit Design System (£50K), Memmert HPP410 Constant Climate Chamber (£29K), and DMRS Cordless device (£13K).
- Facilities for GURU have been entirely renewed with a £19m investment as part of the £48m **Henry Daysh Building refurbishment**, locating the Planning discipline within the University's refreshed social sciences hub. This includes new staff offices, PGR Suite (GURU and ARC), and interactive spaces to catalyse research, plus consideration for staff and student wellbeing through provision of an expressing room and calm room (s2.3).

A significant investment in facilities is underway to make an unparalleled contribution to **interdisciplinary knowledge** and the **internationalisation** of research led from the UoA and cities research across Newcastle University, facilitated by a major £1m donation from SAPL Visiting Professor and alumnus Sir Terry Farrell, accompanied by the donation of his archive to the University. Two infrastructure projects have resulted:

- The new £4.8m **Farrell Centre**, revitalising a disused Grade 2-listed building (s4.1).
- Working with Library/archive staff, a £600K extension to the University's **archive store** for architectural materials. Farrell's collection is initially being supplemented by the archive of Avery Associates (theatre architects, whose work connects with theatrical archives in English); and of eccentric post-modern architect John Outram.



#### 4. Collaboration and contribution to the research base, economy and society

##### 4.1 Developing platforms for collaboration, engagement and impact

Most research in the UoA involves collaboration, with other HEIs nationally and internationally (s3.2) and/or with a myriad of social actors. Since 2014 we have developed new platforms to undertake engagement and to ensure impactful research, shaped partly by our experience of running the ESRC/BBSRC/NERC £25m Rural Economy Land Use programme (2004-13). NCF is a paradigmatic example interacting with 190 organisations and 145,000 members of the public on 70 demonstrator projects (ICS\_13-3Tewdwr-Jones).

NCF and Newcastle Age Friendly City inspired The Future Homes Alliance (NU, Elders' Council, Sustainable Communities Initiative, Karbon Homes) which fuses concerns with ageing, cities, health, energy, and digital technologies (**Gilroy**). The £20m **Future Homes** project will construct 66 homes in central Newcastle, including 5 research 'demonstrators', working in a 'quadruple helix' approach involving the university, industry, third sector partners, and the municipality. Co-located with NICA, the homes are prototypes for sustainable technologies, designed to accommodate their residents' progress through the life-course (facilitated by an Innovate UK KTP with Anchor Hanover/**Gilroy**, £78K 2018-20). This aligns with NICA's values and, fusing innovation in product design with innovation in processes, establishes new models of working. In September 2020, Legal and General invested £2m in Future Homes to enhance the innovation of the project in pioneering post-COVID approaches to multigenerational housing.

**NICRE** is a Research England-funded platform led by CRE (UKRI, £3.8m/ £6.2m total, **Phillipson**, 2020-23 with Warwick, Gloucestershire and Royal Agricultural Universities) which acknowledges that the UK rural economy equates to the combined economies of its ten largest cities outside London. It draws methodologically from NCF and is working with Future Homes to develop rural exemplars. NICRE supports enterprise, resilience and innovation among rural firms to unlock untapped potential in rural economies. It undertakes research projects (in conjunction with BiS, LEPs, and the devolved administrations), offers 'living labs' to pilot solutions for complex placed-based issues, and undertakes policy and evidence work. It builds from long-standing collaborative research projects with rural communities e.g. Landbridge (**Proctor**), a knowledge exchange network for researchers and rural professionals advising farming and land businesses. As an example of NICRE's potential, **Shortall's** work on gender equality in agriculture has led to the Scottish Government committing £300K p.a. to introduce measures decreasing inequality in the industry, and work for the European Court of Auditors enhancing EU gender mainstreaming.

A key platform emerging from HBBE is the world's first experimental biological house, '**The OME**' (£1.1m), due to complete in July 2021 (delayed by COVID). The OME is adjacent to, and will

operate as part of, the Great North Museum. Alongside an apartment for testing new biotechnologies at domestic scale and a demonstration lab, the OME provides both public interaction space with biotechnologies in the built environment and a site for industrial collaborations. It has been designed so new biomaterials and processes can be applied and tested, externally and internally, by HBBE researchers with industry and academic partners. The OME offers unparalleled opportunities for exciting public and professional research dissemination and impact.

**Figure 2: Visualisation of The OME interior** (credit: Assia Stefanova)



The new £4.8m new public gallery and Urban Room, **the Farrell Centre**, will exhibit the latest research in architecture and cities, located as a major cultural venue on campus and in the city of Newcastle, hosting exhibition programmes aimed at international, national and local audiences, both public and professional. The Farrell will provide an opportunity to creatively curate the UoA's and University's latest research in architecture and cities for audiences, linked-in to a global network of urban rooms and architecture centres. Due to open in 2022 (COVID-delayed), **Hopkins** has been appointed as Farrell Centre Director (2019), joining with a substantial track record of research-informed curation, public engagement and educational work from Sir John Soane's Museum in London.



**Figure 3: Visualisation of Farrell Centre interior** (credit: Space Architects)

#### 4.1.1 Creative community co-production platforms

Co-produced creative processes are at the heart of **Pocket Parks (Mallo, Tardiveau)**, part-funded by MHCLG Pocket Park initiative 2016, and an ESRC-IAA award, using participatory design methods and activism to make spatial interventions triggering change through co-production of the public realm, creating small community parks in the west end of Newcastle. The first project opened in 2016 as an oasis of gardens, seats and raised beds for community events and much-needed green space. The park has been cited by UKRI and Government as a best practice example for redesigning streets in the wake of COVID-19. **Protohome (Heslop)** worked with the national homeless charity Crisis and a local architecture practice to build a participatory self-build dwelling used as a meeting space for awareness-raising about homelessness. **Testing Ground (ICS13-4\_Farmer)** and **Revitalising Rural (ICS13-5\_Gkartzios+Cowie)** draw similarly on creative practice methods, the latter including CRE's artist-in-residence programme, working with researchers, leading to a regular exhibition in Berwick Art Gallery.

Other projects with artists include **Meanwhile Spaces (Wainwright)**, a collaboration between the University and NewBridge Project (funded by ESRC-IAA) to explore long term models for creative

practitioners in the city, including options for new creative spaces. As a result, Newcastle City Council is exploring the establishment of a Creative Enterprise Zone in the city. **‘Our Sunderland’ (Raynor)**, explores Northern Imaginaries in times of uncertainty (ESRC-IAA funded), working with artists across the North East of England and engaging with over 2000 participants in an alternative public consultation exploring how place-based spatial imaginaries are lived and felt, and how they shape everyday politics of possibility in the region. The project led to exhibitions at three community spaces and a curated online exhibition. Following this, **Raynor** has developed the University-funded Faculty Performance Network, to commission interventions.

Projects focused on young people include: the AHRC-funded **‘You Can’t Move History’ (Webb)**, examining young people’s use of London’s South Bank Centre undercroft, which received the best film award at the 2016 AHRC Research in Film awards; working with children on their experiences of space and their contributions to the design process, including co-producing the **Oxford Online Bibliography of Children, Young People and Architecture (RParnell)**, and; **YES Planning (Strachan)** a research and engagement project linking planning students with local schools.

#### 4.2 Advancing disciplinary agendas through research and publication

Our researchers have significant influence through publication, reflected in the portfolio of over 1000 outputs from which this submission draws. The 37 books authored and 38 collections developed by UoA colleagues represent an important contribution to the research base. Major monographs influencing **planning** and **urban studies** scholarship include: *Vertical: The City from Satellites to Bunkers* (**Graham**, Verso, 2016), making the case for a radical volumetric reconceptualisation of the politics of cities and geography (book of the week in *The Guardian* and *Financial Times*, book of the year in *The Observer*, featured on BBC Radio 4’s *Thinking Allowed*), and; *The Predictive Postcode: The Geodemographic Classification of British Society* (co-author **Burrows**, Sage, 2018) (featured too on *Thinking Allowed*), innovatively examines the application of neighbourhood classification methods from the classic work of Booth through to new big data spatial analytics using mobile phone data. A significant contribution to literature on **urban design and public space** is made by *Cities in Time: Temporary Urbanism and the Future of the City* (**Madanipour**, Bloomsbury, 2017) which offers the first critical evaluation of temporary urbanism and its implications for the present and future of cities.

Significant contributions to architecture scholarship include works defining a new field of experimental architecture in relation to **biodesign**, establishing agendas for HBBE. These include *Living Construction* (**Dade-Robertson**, Routledge, 2020) bridging design speculation, scientific practices, contemporary design thinking, and the traditional engineering approaches that currently dominate biotechnologies, and works by **Armstrong** including *Soft Living Architecture: An Alternative View of Bioinformed Practice* (Bloomsbury, 2020), uniquely intersecting two fast-

developing disciplines: biomimicry and biodesign in architecture and bioinformatics and natural computing in the natural sciences; plus *Vibrant Architecture: Matter as a CoDesigner of Living Structures* (DeGruyter, 2015), exploring how lively materials may be incorporated into our buildings to confer on them properties of living things like movement, growth, sensitivity and self-repair, and; *Experimental Architecture: Designing the Unknown* (Routledge, 2019) the first substantial overview of the theory and practice of experimental architecture. **Armstrong's** work has featured in *National Geographic*, *Wired*, *The Conversation*, *Four Thought* and *The Museum of Curiosity* (BBC Radio 4), *Another Giant Leap* (BBC Radio 3), and was the subject of an invited presentation to NASA.

In **architectural theory and culture**: *Building Modern Turkey: State, Space, and Ideology in the Early Republic* (**Kezer**, University of Pittsburgh Press, 2015) shows how the built environment mediated Turkey's transition from a pluralistic empire into a modern, homogenized nation-state following the collapse of the Ottoman Empire; *Materials and Meaning in Architecture: Essays on the Bodily Experience of Buildings* (**Coleman**, Bloomsbury, 2020), and *Architecture and Silence* (**Kakalis**, Routledge, 2019) offer rich sensory explorations in an age when architectural thinking seems preoccupied with image and visual representation. *From the Shadows: The Architecture and Afterlife of Nicholas Hawksmoor* (**Hopkins**, Reaktion, 2015), offers fresh interpretations of historic works.

Agenda setting edited collections have developed out of collaborative endeavours in ARC and GURU, including *Industries of Architecture* (**Lloyd-Thomas**, Routledge, 2016), the culmination of a five-year ARC project involving conferences and journal special issues, engendering a new discourse around the intersection of architecture, techniques and technologies, economies and the labour of production, also introducing into English the work of Sergio Ferro (now the subject of a major project, s3.2). Similarly, *Mountains and Megastructures: Neo-geologic Landscapes of Human Endeavour* (**Beattie, Kakalis, Ozga-Lawn**, Palgrave Macmillan, 2020) consolidated a sustained series of symposia, events and exhibitions over six years by ARC/GURU members (including **Armstrong, Ballantyne, Burford, Chiles, Blom, Farmer, Garcia-Fuentes, Graham, Kezer, Lloyd-Thomas, Sharr, Thompson**), exploring the shared qualities of mountains as naturally-formed landscapes, and of megastructures as manmade landscapes, unravelling how each can be understood as complex network relationships. GURU researchers, staff and PGR students produced *Justice and Fairness in the City* (**Davoudi**, Policy Press, 2016), examining the theory and practice of justice in and of the city (including **Brooks, Coulson, Gilroy, Midgley, Peacock, Speak, Strachan, Vigar, Webb**). In *Hope under Neo-Liberal Austerity* (**Davoudi, Shucksmith**, Policy Press, 2021), authors have co-written chapters with practitioners and research collaborators from third and public sectors in North East England to theorise and explore

actions of hope and inspiration for communities (GURU/ARC contributions: **Aitken, Brooks, Gilroy, Healey, Mallo, Midgley, Pendlebury, Tardiveau, Webb**).

Unit authors have been responsible for a series of companions and reference works establishing the contours of their fields, including Routledge Handbooks and Companions for: *Planning Theory* (**Madanipour**, 2018); *Rural Studies* (**Shucksmith**, 2016); *Rural Planning* (**Gkartzios**, 2019); *Environmental Planning* (**Davoudi**, 2019); *Landscape Studies* (**Thompson**, 2<sup>nd</sup> edition, 2019), and, forthcoming; *Chinese Architecture* (**Zhu**, 2021). **Madanipour** edited a monumental four volume reading compendium on *Planning Theory* (2015). Further distillations of scholarship, consolidating and rethinking their fields come through Oxford's best-selling *Very Short Introductions* series: *Modern Architecture* (**Sharr**, 2018) and *Landscape Architecture* (**Thompson**, 2014), plus *Lefebvre for Architects* in the *Thinkers for Architects* series (**Coleman**, Routledge, 2015). Field-defining books produced by the UoA include *Urban and Regional Planning 6<sup>th</sup> edition* (**Tewdwr-Jones**, Routledge, 2020); *Town and Country Planning in the UK 15<sup>th</sup> edition* (**Davoudi, Pendlebury, Vigar, Webb, Townshend**, Routledge, 2014), and *Landscape Impact Assessment in Planning Processes* (**Gazzola**, DeGruyter, 2018).

#### 4.3. Developing creative practice

Members of the UoA bring their expertise to bear on economic and societal issues through research-led design practice. This includes (alongside Testing Ground, ICS13-4\_Farmer), the work of CE+CA Architects (**Chiles**) on creative re-use (RIBA Awards in 2014, 2015, 2017, 2018, 2019); Harper Perry (**Harper**) also on creative re-use, and housing; and **Burford** on zero-energy self-sufficiency, as at the Botany project, Dundee. For the first time we have returned 4 creative practice outputs. Creative practice methods are making important contributions to other forms of research, specifically co-produced community engagement (s4.1.1.), generating impact (ICS13-4\_Farmer; ICS13-5\_Gkartzios+Cowie; 4.1).

Design Office (led by **Sharr, Connolly**) has, since 2011, been significant in creative practice research in the unit and has produced 11 research-led architectural projects with a combined contract value of £29m, including: a £25m refurbishment of Newcastle University's Armstrong Building (2011-2018) engaging conservation research and the critical appraisal of contemporary architectural values, (shortlisted 2018 RIBA Awards); and a £140K conversion of a derelict store in Gateshead into studios for arts organization Newbridge Project, 2018, contributing to the regional economy and exploring creative re-use. The success of this model and the quality of work produced was recognised by the *Architects' Journal's* 40 under 40 listing (2020) 'celebrating the UK's most exciting emerging architectural talent' (s2.3).



**4.4 International academic collaboration**

Our research is highly international with further internationalisation remaining one of the UoA's over-arching priorities. Staff across the unit actively pursue international collaborations, setting new agendas for global audiences and creating new pathways for joint research initiatives. These collaborations are global, with researchers across 5 continents (with partners on funded projects in 36 countries at census, over 200 publications co-authored with international collaborators in the period).

**Table 3: Research collaborations**

Memoranda of Understanding	Cornell, and Pittsburgh (USA), Sydney, and Monash (Australia), Xiamen University (China), National University of Singapore, SPA Delhi (India), Tokyo University (Japan), KTH Royal Institute of Technology (Sweden), Politecnico di Torino (Italy), Grenoble (France), Aachen (Germany), Groningen (Netherlands), SPBGASU Saint Petersburg (Russia).
Visiting professorships include	<b>Zhu</b> , Southeast University, and China Academy of Arts, (China); <b>Garcia-Fuentes</b> , Politecnico di Milano (Italy); <b>Davoudi</b> , RMIT (Australia), Tampere (Finland), <b>Tewdwr-Jones</b> , University of Hong Kong, TUWien (Austria), <b>Hughes</b> , Estonian Academy of Arts, <b>Shucksmith</b> NTNU (Norway), <b>Morrow</b> , Iceland University of the Arts.
Funded fellowships include	<b>Kezer</b> , Dumbarton Oaks and MIT (USA), <b>Lloyd-Thomas</b> , Canadian Centre for Architecture, <b>Pendlebury</b> Norway, HUMEVAL-funding.

Fruits of such collaborations include funded projects such as an ESRC AHRC UK-Japan social sciences, arts and humanities connectors grant (**Gkartzios**) for research on Contemporary Arts in Rural Development based at Tokyo University, resulting in a second, year-long, visit and three Tokyo PGR students visiting Newcastle. Newcastle and Cornell are founder members of the Trans-Atlantic Rural Research Network and the UoA has hosted key researchers as visiting professors (e.g. Brown, Cornell; de Roo, Groningen). SPA Delhi is a partner in the GCRF Water Hub and **Button** has served as Visiting Faculty (2016). **Law** is Coordinator of the University's Xiamen Academic Advisory Group. A small sample of multiple other collaborations includes: Network co-ordination (e.g. Newton Fund Research Networks with Brazil, **Machen**, and Chile, **Gkartzios**); showcasing Newcastle work (e.g. NCF by **Tewdwr-Jones** and **Cowie** at specially-convened sessions, with the University of New South Wales, and the New South Wales

Government, Commission for Greater Sydney, the University of Hong Kong and the Hong Kong Government SAR *Future Cities, City Futures: Hong Kong and the World* event); serving on advisory boards (e.g. Interdisciplinary Centre for Urban Culture and Public Space at the Technical University Vienna, and the Centre for the Future of Places at KTH Royal University of Technology, Sweden, **Madanipour**).

#### 4.5 Contribution to the research base

Researchers in the UoA are active in the broader research community making substantial contributions to the international, national and regional research base. Colleagues are encouraged to take on such activities and, in turn, to contribute emerging ideas back into the University, with major roles facilitated through workload allocations.

26 staff have **advised research councils and international equivalents**:

**Table 4: Research Council contributions**

Research council roles	<b>Burrows, Davoudi</b> : UKRI Future Leaders Fellowship panels
	ESRC roles include: the Strategic Advisory Network, representative on the JPI Climate Working Group on Societal Transformation (2013-16), Europe-China commissioning panel (2014), and assessment panel for the UKRI Responses to COVID-19 call (all <b>Davoudi</b> ); Data Infrastructure Strategic Advisory Committee ( <b>Burrows</b> 2014-17).
	Further roles include: Panel member for BBSRC et.al. Resilience of the UK Food System Programme (2016-17), ESRC/BBSRC/NERC Tree Health Initiative (all <b>Phillipson</b> ); Chair of the Connected Places Catapult Research Panel ( <b>Tewdwr-Jones</b> , 2018-20); AHRC-consultee on the JPI Cultural Heritage Strategic R&I agenda ( <b>Pendlebury</b> , 2020).
Research council grant proposals reviews	AHRC, BBSRC, EPSRC, ESRC, GCRF, MRC, NERC
Agenda-setting, chairing, reviewing for equivalent organisations internationally	National: Belgium/Flanders, Canada, Czech Republic, Denmark, Finland, Hong Kong, Ireland, Israel, Italy, Netherlands, Norway, Poland, Romania, South Africa, Sweden, Switzerland, USA. International organisations/co-operations: ESRC/AHRC/CASS, HERA, Nordforsk, NWO/IST, NWO/NSFC, UNESCO, a range of national/international research foundations.

Two of the leading architecture journals (*arq: Architectural Research Quarterly* and *Journal of Architecture*) and a leading planning journal (*Journal of Environment and Planning Management*) are based in the UoA. In the REF-period, 26 researchers held editorial board memberships on 45 journals:

**Table 5: Journal editorships**

<i>arq: Architectural Research Quarterly</i>	<b>Sharr, Austin, Beattie, Burford, Farmer, Lloyd-Thomas, Odgers</b>
<i>Journal of Architecture</i>	<b>SParnell</b>
<i>Journal of Environment and Planning Management</i>	<b>Powe</b>
<i>Journal of International Real Estate and Construction Studies</i>	<b>Abdulai</b> , until 2018
<i>Dialogues in Human Geography</i>	<b>Crampton</b>
<i>Landscape Research</i>	<b>Roe</b>
<i>Habitat International</i>	<b>Gkartzios</b>
<i>Platform</i>	<b>Kezer</b>

Recognising our contribution to the research base, colleagues achieved significant roles in **leading scholarly networks and learned societies**, including:

- President of the European Society for Rural Sociology (2015-19), the first Deputy Vice-President of the International Rural Sociology Association (2016), and currently President-Elect (**Shortall**);
- Chair and Trustee of the Regional Studies Association (2017-20) (**Tewdwr-Jones**).
- Further Board memberships include: Society of Architectural Historians (**Kezer**, 2013-25); Architectural Humanities Research Association (**Odgers**); RGS Digital Geographies Research Group (**Crampton**); RGS Participatory Geographies (**Raynor**); Landscape Research Group (**Roe**); International Planning History Society (**Pendlebury**).

UoA staff have contributed **research advice and evidence to government** and policy audiences in the UK. This includes:

- Membership of the Government's Economic Recovery Taskforce on 'levelling up' (2020, **Phillipson**).
- Foresight exercises for the Government Office of Science (**Shucksmith**) and the Department for Business, Innovation and Skills (**Tewdwr-Jones, Vigar**).

- Specialist advisor to the House of Lords Select Committee on Rural Economy 2018-19 and to the Lords' Select Committee on the Natural Environment and Rural Communities Act 2017-18 (**Shucksmith**); DEFRA Rural Academic Panel from 2018 and oral and written evidence to the House of Lords Select Committee in July 2018 on rural business needs and implications for Industrial Strategy, policies for rural growth and Local Enterprise Partnerships (**Phillipson, Shortall**); evidence on new sources of housing supply to the All Party Parliamentary Group for Housing and Planning, National Housing Taskforce (**Heslop**); expert witness to the International Longevity Centre Inquiry on the Built Environment and Later Life at the House of Lords in 2018 (**Gilroy**); evidence to and appearance at House of Lords Built Environment Select Committee National Planning Policy hearings in 2015 (**Tewdwr-Jones**).
- DEFRA Social Science Expert Group (2016-19) and the DEFRA-DECC Social Science Expert Panel (to 2016, **Davoudi**), Social Science Expert Panel and Rural Academic Panel (**Phillipson**).
- Roles in UK devolved administrations include membership of Scottish Government Rural Economy Action Group (**Phillipson**), the Scottish Women in Agriculture Task Force advising the Scottish Government on policy and a member of the Northern Ireland Rural Stakeholder Brexit Advisory Group; (**Shortall**); external reviewer for the Scottish Government Strategic Rural Research Programme 2016-2021 (**Cowie**).
- Roles for government agencies include service on Natural England's Science Advisory Committee and Landscape Advisory Group (**Roe**).
- Fellowship in the European Parliament MEP-Scientist Pairing Scheme (**Calderon** working with MEP Merja Kyllönen on Energy Policy, 2015).

In this REF period, colleagues have disseminated research and expertise to **diverse public audiences** through hundreds of media interactions:

**Table 6: Dissemination activities**

Newspapers/ digital media, including	New York Times, Wall Street Journal, Washington Post, South China Morning Post, Sydney Morning Herald, The Financial Times, The Guardian, Observer, The Times, Daily Telegraph, Daily Mail, London Evening Standard, Yorkshire Post, Newcastle Chronicle, Ara (Catalan), La Voz de Galicia, Reddit
Periodicals, including	National Geographic, New Scientist, The Conversation, El Temps, North East Times, British Theatre Guide
BBC channels/ programmes including:	BBCTV News, Newsnight, Countryfile, This Farming Life, Look North, Radios 3 and 4 (A Giant Leap, Museum of Curiosity, Thinking Allowed, Farming Today, World at One), Scotland, London, Yorkshire, BBC Persia
Other television, including	ITV News, Reuters, Channel 4 (Ugly House to Lovely House), ARTE (Europe), ARD (Germany), CNA (Singapore), NZZ (Switzerland).

#### 4.6 Responding to COVID-19 and future research

The UoA has responded actively to the national and international challenges of COVID-19 for the built environment, economy and society. This work includes UKRI projects: At Home with Children: Liveable Space for the COVID-19 challenge (£434K, **RParnell**, 2020-2022), and Routes of Infection, Routes to Safety: Creative Mapping of Human-Viral Behaviours on the Bus to Understand Infection Prevention Practices, (£208K, **Veal**, 2020-21). CRE is undertaking work on Local Perspectives on COVID (DEFRA, £360K, **Cowie**, 2020-21) with **Cowie** contributing to BBC's Farming Today (August and October 2020) and working with Countryfile on rural economy implications. NICRE is leading the academic contribution into DEFRA's roundtable informing pandemic policy development and support for rural businesses. **Shortall** led research on the impact of COVID-19 on women's mental health on farms, to be published in the *Handbook of Gender and Agriculture*, and is UK-PI on The UK and Ireland Rural Futures Network: Preparing for Social and Economic Transitions post-Brexit and COVID-19 (ESRC/IRC, £20K, 2021-22). On the Margins is a project informing evidence-based policy on rural poverty in post-COVID Britain

(QR-SPF, £16K, **Shucksmith**, 2020-21). Academic commentaries include pieces by **Davoudi** and **Varna & Oswell** in a special issue of *Town Planning Review*.

The significant growth of our UoA in this REF period – in the number, seniority and diversity of researchers, in new facilities and resources, in creative interdisciplinarity, in international and national profile, in public and academic impact, in reach and influence, indeed also in self-confidence – positions us well for the future through and beyond the COVID emergency. We are excited about the significant contributions we can make to urban and rural environments, and the culture and society, of the post-COVID world.