

Unit-level environment template (REF5b)

Institution: Durham University
Unit of assessment: 33 Music, Drama, Dance, Performing Arts, Film and Screen Studies
Section 1. Unit context and structure, research and impact strategy <i>1.1. Overview</i> Research in the Music Department is distinguished by: <ul style="list-style-type: none">• Cultural, historical and disciplinary breadth, with strengths in historical musicology and analysis; psychology, empirical musicology and ethnomusicology; performance and composition (both acoustic and electronic)• Leadership in interdisciplinary methods• Extensive international collaborations• Specialist infrastructure supporting electronic music, ethnographic, empirical, psychological and practice-led research Music is one of seven departments in the Faculty of Arts and Humanities. As of 31 July 2020, it comprised 18 Category A staff (16.95 FTE), 2 Category C post-doctoral researchers, and 37 PhD students. Over the census period we have continued a strategic transformation which was initiated in the previous REF cycle, growing incrementally in staff numbers but dramatically in terms of external grant funding and research degree completions. Our research is underpinned by shared values of intellectual rigour, ambition and social responsibility: expansion in personnel and grant income has enabled us to increase its scope and to achieve greater academic and social impact. <i>1.2. Research strategy</i> The vitality of our research environment depends not only on the quality of our outputs, but also on our contributions to international networks, our impact on other researchers and wider society, and the researchers we attract to work with us. Our strategy for research and enabling impact helps us to sustain excellence in all of these aspects. We have pursued a consistent but evolving strategy since 2010-11, at which point we identified particular strengths in the Department, including a record of strong interdisciplinary collaboration. Since 2014 we have developed staffing and infrastructure to enhance that profile while improving support for project development, research students, international collaboration and impact across all subject areas. Our priorities stated in REF2014 were: <ul style="list-style-type: none">• to expand our research base through staff and student recruitment and more grant-funded projects, including postdoctoral fellowships;• to expand international collaborations;• to generate impact more systematically; and• to further upgrade our research facilities. These aims have been met as follows. In staffing, the census period has seen strengthening in historical musicology (Hambridge, Johnson-Williams) and composition (Weeks), as well as significant expansion in music psychology (Jakubowski, Taruffi). This represents a steady expansion of the Department from 14.9 to 16.95 FTE, and a significant improvement in our gender balance. PhD completions have increased sharply thanks to improved support processes, while we

have attracted several independent researchers as postdoctoral fellows (seven over the period, none were reported in 2014). Grant income has increased sharply, with several projects based on international collaborations, while our research facilities have been allocated investment of over £600,000 (§3.2). We have systematically pursued opportunities to facilitate research impact, developing projects with the help of internal and external funding. See **Table 1** for a comparison of research environment metrics between this and the previous REF submission.

	REF2014	REF2021	Change
Cat A Staff FTE	14.9	16.95	14%
Female Cat A Staff FTE	1 (6.7%)	4.75 (28%)	375%
Total research grant spend/ FTE	£29,931	£99,358	232%
Average annual grant spend/ FTE	£5,986	£14,193	137%
Research degree completions/ FTE	1.09	2.47	126%
Annual research degree completions/ FTE	0.22	0.35	59%

Table 1. Key environment indicators in REF2014 and REF2021 (Nb. 100% submission of eligible staff in both)

Our strategic priorities for the next 5 years are to:

- i. Strengthen the sustainability of all our subject areas, while remaining responsive to opportunities to further diversify and enrich our research.
- ii. Enhance the diversity and inclusivity of our researchers and promote research that addresses equality and diversity issues and which supports increased social engagement.
- iii. Maintain and enhance the quality and utility of our research infrastructure, including studios, labs and performance facilities.
- iv. Increase research capacity by further enhancing project grant, postdoctoral and postgraduate research funding.
- v. Maintain active and strategic support for demonstrable research impact across all subject areas.

While maintaining a supportive environment for individual researchers, we will encourage collaborative activities that address these priorities – for example through project development – using funds returned to the Department as grant incentivisation (§2.1.2). Research strategy will also be an important consideration in staff recruitment. Covid-19 and Brexit will doubtless have effects both foreseen and unforeseen: we anticipate that embracing new ways of working will be key to delivering these objectives and building resilience. As of the census date we had not revised our strategic priorities, which remain robust.

1.3. Research structure and scope

We conceptualise our research as comprising three overlapping clusters defined by the nature of their predominant methods: (i) historical and analytical; (ii) psychological, ethnographic and empirical; and (iii) practice-led (composition and performance). Defining clusters in this way enables us to ensure that resources are allocated equitably and responsively. These clusters do

not capture all the ways in which individuals' research interests overlap however, and in practice we collaborate freely across the Department, with other Durham departments, research centres and institutes, and across the world. Our Research Committee (RC) (§3.2.1) facilitates these interactions and ensures that appropriate support is in place.

Our weekly Research Forum brings all of our researchers together to engage with current work within and beyond the Department; other events such as seminars to discuss draft publications or project plans are also attended by a wide cross-section of staff. Intradepartmental structures have developed naturally to enrich work in particular areas. The Music and Science Lab (MSL, led by Eerola & Jakubowski), which runs its own fortnightly meetings and annual research symposium, supports psychological and empirical research through thematic discussion and sharing of best practice. Composition and performance research are enriched by close interaction with two leading European new music groups led by Department staff, EXAUDI (Weeks) and the Ives Ensemble (Snijders), as well as by our KLANG concert series. Staff and PGR reading groups support work in several areas (e.g., analysis, music and empire).

Our collaborative research involves, within the Faculty, the departments of English, History, Modern Languages and Cultures, Philosophy, and Theology and Religion; and beyond, those of Anthropology, Biosciences, Computer Science, Geography and Psychology. These connections are nurtured by University-funded research institutes and centres (see Fig. 1). The Institute of Advanced Study (IAS) brings leading researchers to Durham and promotes thematic research events. The Institute of Medieval and Early Modern Studies (IMEMS), Institute for Medical Humanities (IMH), and Institute for Data Science (IDS) create opportunities for interdisciplinary music research, as do the Centre for Nineteenth Century Studies (CNCS) and CNCS International (directed by Zon), Centre for Visual Arts and Culture (CVAC) and Learning and Memory Processes Centre (LAMP). The Advanced Research Computing (ARC) unit (REF5a/4.3) feeds technical expertise into music projects.

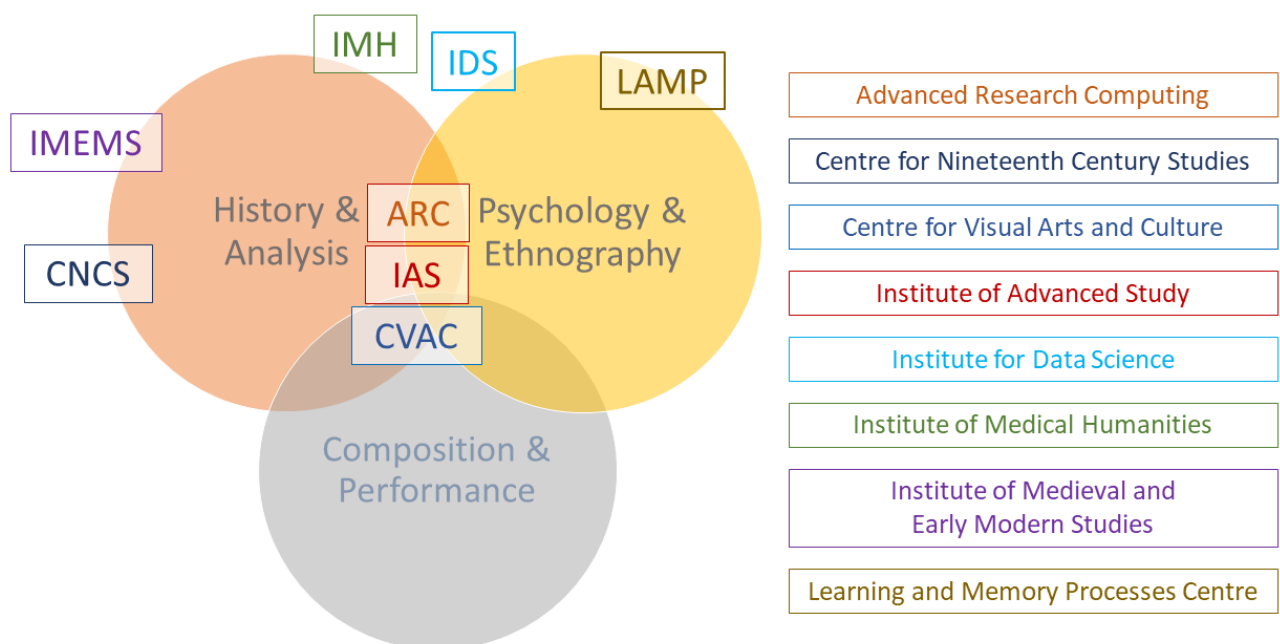


Figure 1. Our research is enhanced by University-wide structures

1.4. Enabling research impact

Sustainable impact depends on long-term strategic support, identifying potential partners and areas of activity and ensuring that all parties benefit from collaborations. Initiatives flow from staff members, while our Impact Officer (IO) and the Faculty's Senior Impact and Engagement Manager (IEM) help to maximise their success. Consistent with the Concordat for Engaging the Public with Research, recognition of impact and engagement work is demonstrated through workload allowances and consideration of these activities in the promotion and progression committee (§2.1.2).

The IEM assists with strategic partnerships and advises on obtaining internal and external funds to maximise public engagement and enable impact. Our case study on Parry and Stanford has benefitted from internal funding to cover travel and administration, while Khyal attracted both internal and external funding and was enhanced by the IEM's expertise. Continuing this strategic approach assures the vitality and sustainability of our impact: we are already investing strategically in the next tranche of major impact-enabling projects – we will support at least one from each research cluster – including work in contemporary music and in music and science.

1.5. Supporting interdisciplinary research

We foster interdisciplinary research by facilitating deep engagement between experts from different disciplines, tackling issues of common interest and exploring the disjunctions between their approaches. Strategic support, including funding for visiting staff and research meetings, flows through University Institutes and Centres. CNCS events, for example, discuss topics such as the role of music in death and grief, or in relation to religion within imperial contexts (§4.3).

Hambridge's collaboration with English literature and theatre scholars, Zuk's work relating music history to psychotherapy, and Sequera's collaborations with colleagues in English and History on the contextual reconstruction of early music performance have all benefited from Institute or Centre support.

The Department has established a unique profile at the intersection of music cognition and ethnomusicology. We develop novel research questions in cross-cultural music cognition through in-depth discussions between ethnomusicologists and psychologists, for example at Music & Science Lab events. This process has led to significant external grant funding (e.g., 'Interpersonal Entrainment in Music Performance') and thence to interdisciplinary publications.

1.6. Developing an open research environment

The Department aims to lead open science developments in music, contributing to debates and practice in order to advance research quality and reproducibility. Aligned with the Concordat on Open Research Data, we share data as widely as possible while respecting the rights of the musicians we record, and our technicians help to ensure excellent data management. We contribute to public discussions of open research (<https://musicscience.net/2018/05/25/open-data-in-music-and-science/>), and share data collections on platforms such as Open Science Framework, Harvard Dataverse, UK Data Service and Github (<https://musicscience.net/resources/collections/>). We maximise use of our institutional repository Durham Research Online, exceeding REF open access requirements by expecting staff to also deposit book chapters, and we encourage open access publication: two-thirds of the articles submitted to this exercise are full open access.

1.7. Research integrity and ethics

Research integrity and ethics are ensured by University policies renewed in light of the Research Integrity Concordat (REF5a/2.3). All research projects involving work with human participants must receive approval in line with these policies from our departmental Ethics Committee (EC). An online ethical approval form guides colleagues through the process, which includes review of consent forms, surveys, questionnaires and information sheets: a robust review process results in more than half of all applications being revised and resubmitted before approval. EC is periodically audited by the Faculty Ethics Sub-Committee, and the University Ethics Advisory Committee provides the governance framework.

Section 2. People

2.1 Staffing strategy and staff development

Our research and impact strategy relies on robust staffing processes, from recruitment to progression, which help us to deliver excellent support equitably at all career levels, as much for fixed-term or research staff as for those on permanent academic contracts. Over the next five years our succession planning priorities will be to increase staff diversity (including, but not only, further improving gender balance) and to recruit early career researchers who combine disciplinary expertise with willingness to reimagine the future of music research.

2.1.1 Staffing strategy

Our recruitment strategy is to hire staff with the potential to produce world-leading research and impact, while enhancing the diversity of the Department and building sustainability in all sub-disciplines. This strategy has been effective in each of these areas. Shortlisting involving robust assessment of the quality and potential of candidates' research ensures that we hire excellent researchers. We have moved from 7% to 28% female staff and are improving sustainability by reducing reliance on individual academics in particular subject areas: we recruited additional staff in psychology, while a new post in analysis was postponed to 2021 due to Covid-19.

All candidates are asked to evidence their commitment to EDI in applications and at interview. Long-listing and short-listing panels read and evaluate publications, and all academic staff participate in the selection of new staff. Unconscious bias training is mandatory for all colleagues, advertisements are worded appropriately, and panels take care that long and short lists are diverse, particularly regarding gender. (We halted a recruitment process in 2019/20 and re-advertised because female applicants fell below the sector benchmark.) During the census period we actively encouraged female scholars to apply for posts: this has resulted in 4 new appointments (Hambridge, Jakubowski, Johnson-Williams, Taruffi).

Our staff is increasingly diverse in national origin, with 7 nationalities represented. We have a significantly higher proportion of EU (25% vs 15%) and overseas (30% vs 15%) staff than the sector averages. BAME representation is low but in line with our comparators (5%). We still have a lower representation of women (30% vs 40% across the Russell Group; all figures from HESA data rounded to 5%). Our current demographic profile therefore represents a transitional stage in a strategic process of diversification. Our objective over the next five years is to achieve an appropriate gender balance at all seniority levels, and to further increase diversity in other respects.

Staff are only appointed on fixed-term contracts as temporary cover for leave or secondment, or as postdoctoral fellows (REF5a/3.4). This currently applies to two of our 18 Category A staff. Where we are not able to extend contracts, the Director of Research (DOR) advises researchers in

preparing for the next stage in their careers, continuing to support their research planning, and duties are agreed with future employability in mind.

2.1.2 Staff development

Excellent staff development for all is key to creating a positive working environment. We achieve this through training and mentoring opportunities, research leave, and incentivising and rewarding impact activity. In accordance with the Researcher Development Concordat (REF5a/3.4), training and progression opportunities are fully supported for those on research contracts. We also discuss and advise on research plans of teaching track staff, who contribute extensively to the research environment. Fixed-term research staff are treated equally in access to funding, training and professional development, mentoring, leave, and progression, and are represented on our RC.

Our submission features two ECR Category A researchers (Jakubowski, Taruffi), and two Category C postdocs (Glatthorn, Lahdelma). The 6 outputs listed against the ECRs evidence their importance to our research environment: they are fully integrated into the research culture, collaborating with colleagues, and contributing to events and impact-generating activities. We offer ECR staff reduced teaching loads (85%, 90% and 95% respectively over the first three years), early access to research leave, training including induction meetings with Research and Innovation Services (RIS), Faculty and the DOR, and advice on research grant applications.

All new staff agree with the Head of Department (HOD) a formal probation document setting out expectations for their first year in post, which includes demonstrating the capacity to produce research at an internationally excellent level, to contribute to research impact where possible, and to engage fully in the research environment. The HOD meets regularly with new staff to assess progress towards these targets. They are not required to fulfil major administrative roles during this period.

Under the revised University system all academic staff are appraised annually by the Department Progression and Promotion Committee (DPPC), which prepares reports on research outputs and other research and impact criteria (REF5a/3.2). CVs are rigorously matched to research and impact benchmarks, contextual factors such as periods of parental leave are considered, and all staff are provided with detailed feedback. The promotions and career development processes are thus fully joined-up. Where the promotion criteria are met, colleagues are nominated for consideration by a Faculty committee; there is also a self-nomination route. One of the main aims of this system is to remove discrepancies in promotion according to gender and other protected characteristics: over the first three cycles of the new system, 1/3 of those promoted were female staff (in line with our staff demographics).

Our mentoring system (REF5a/3.3), covers all career stages including fixed-term staff and is geared to confidential career-development support. Review of annual Personal Research Plans from all staff by RC provides a complementary source of advice. All staff members are expected to take up appropriate training opportunities, including University courses such as our Leading Research Programme (REF5a/3.3). Staff also attend grant application workshops coordinated by RIS, and the Department has benefitted from the University's subscription to AdvanceHE's Aurora programme, which offers leadership training to female academic staff.

All staff, including fixed-term and part-time, are entitled to apply for one term's research leave in seven, with special arrangements following major roles such as HOD; those returning from maternity, adoption, or shared parental leave may apply for an additional term's research leave. We have supported staff by awarding research leave in these circumstances, and also to those on fixed-term contracts to help their career progression.

Staff are encouraged and assisted to build strategic connections with outside bodies, including arts promoters, museums and galleries, broadcasters and music societies, in order to enrich their research and enable impact. Amongst our contributions to the arts sector are Leante's service as Chair of the Advisory Board of GemArts, Dibble's as President of the Stanford Society, and Egan's as board member of the Norwegian composer group NMK.

Staff rewards for impact and research take the form of workload allowances, progression, discretionary awards (REF5a/3.2) and additional research funds. Four staff members received discretionary awards for exceptional research performance. Grant applications are incentivised by the University, with 10% of net overheads made available to investigators and a further 10% to the Department (REF5a/3.3). For staff members most actively engaged in impact-enabling activities – e.g., case study leads – this work is recognised by our workload model. Impact and research form part of the promotion matrix and are rewarded accordingly: research excellence is a mandatory promotion criterion, and impact activity is an optional criterion. Achievement in research and impact is celebrated and acknowledged within the Department, Faculty and University, for example in annual Celebrating Arts and Humanities Research events.

2.2 Research students

PGRs play a vital role in our research environment, contributing to seminar debates, projects, publications and performances. The 2019 PRES survey suggests a high level of satisfaction with the support they receive (92%, survey completion rate 31%), with particularly high scores under Supervision and Research Skills.

Recruitment is based on the iterative refinement of proposals and on interviewing. The University is part of the AHRC's Northern Bridge Consortium Doctoral Training Partnership and 10 NBCDTP studentships were awarded to candidates registering during the assessment period (5 female). We have diversified funding of PhDs: a further six starters were awarded Durham Doctoral Studentships (DDS), one an AHRC Collaborative Doctoral Award, one a Faculty studentship, and one a CVAC DTP studentship funded by the Leverhulme Trust, while two students are supported by smaller charitable trusts.

We value the increasing diversity of our research students: the proportion of female PGRs rose from 30% to 46%, and the proportion describing themselves in other categories than 'White' increased from 14% to 37%. Starters came from 16 different nations apart from the UK. While we are attentive to EDI issues in recruitment and review, these changes likely reflect the increasing diversity of our staff and their research.

All PGRs benefit from an annual review in which work samples and research plans are read by two members of staff who are not their supervisors (this exceeds the University's baseline expectation). Reviewers make recommendations for the student and supervisory team (e.g., for further training). After this system was introduced in 2013, research degree completions improved dramatically (§1.2). (Factors including early submission and deferral due to personal circumstances explain the ups and downs from year to year; six PhD students were under examination on the census date.) Since 2019/20 our review process focuses increasingly on offering support for those with protected characteristics or managing disability or caring responsibilities.

Supervisory teams comprise at least two academics to enhance intellectual diversity and resilience, and often include staff from more than one department. All PGRs complete a Development Needs Analysis in their first year and are encouraged to take up appropriate training opportunities; this is also discussed in the annual review. The University's Researcher Development Programme

comprises a suite of training courses for PGRs (REF5a/3.5); this is complemented by Department provision (e.g., weekly postgraduate seminar, audio-visual recording skills, and c.5 annual composition workshops with visiting ensembles). The NBDTP organises three annual consortium training sessions as well as thematic events on topics proposed by students or supervisors, open to all PGRs in the Department. Aggregated NBDTP funds of c. £9,000 per studentship may be used to meet individual training and research needs. Funding for travel for conferences, fieldwork, international exchanges and archival research trips, and expenses related to empirical research, is available from DTP training grants, Faculty, Department and College schemes. PGRs also raised funds from subject associations for events including RMA Study Days, an SMA TAGS Day, and an international conference on musical form. AHRC and CVAC students take advantage of placement opportunities, for example at the Moscow Earth Science Museum (audio-visual archive) and the Pompidou Centre, Paris.

Another career development opportunity afforded to PGRs is work as Graduate Teaching Assistants (GTA). All GTAs complete a University training course (6 paid hours), are briefed and mentored by academic staff, and encouraged to apply for the University's HEA-accredited teaching award. One HEA Fellowship and eight Associate Fellowships were awarded to GTAs in the census period.

Durham PhD graduates have a strong record of academic employment, including appointments at Kingston, Newcastle, Staffordshire, Leuven, Royal Academy of Music, Max Planck Institute for Empirical Aesthetics (Frankfurt), Technological Educational Institute of Crete, Naresuan University (Thailand), and at Durham as a PDRA. Non-academic appointments include Education Officer for the Suzhou Symphony Orchestra (China) and Co-ordinator of the BBC Proms. Supervisors and reviewers advise on career development and support conference presentation, journal publication and prize entry. Amongst PGR publication successes are articles in *Music Analysis*, *Psychology of Music* and *Frontiers in Psychology - Auditory Cognitive Neuroscience*. Prizes won by students include the TAGS Prize and Musurgia 25th Anniversary Prize (both in analysis) and the William Mathias Composition Prize.

2.3 Equality and diversity

The importance we accord equality and diversity is evidenced by significant progress towards gender balance noted in §2.1.1; from 2020 our new EDI committee will energetically address gender equality and other challenges. We are preparing an application for an Athena Swan (AS) Bronze Award, a process supported by the University's Diversity and Equality Advisory Group. Our AS questionnaires and focus groups evidence good practice in areas such as funding application support, access to funds, recruitment to research-related leadership roles, conference attendance, sabbaticals and training. This data-gathering process has also prompted us to reflect on areas such as support for those with caring responsibilities and the visibility of female researchers at events and on project teams. We are already implementing our draft AS Action Plan: amongst the changes effected to date we now ensure that contributors to our weekly Research Forum are gender-balanced, and we support those with caring responsibilities by running all decision-making meetings between 10am and 4pm. Activities publicising our commitment include an annual research event to coincide with International Women's Day. The AS process has also encouraged us to address issues related to protected characteristics such as race (engaging with the Race Equality Charter and decolonisation debates), disability, sexual orientation and gender reassignment, and beyond this statutory list in terms of social class. Our PGRs benefit from the support of the University's First Generation Scholars Network, developed for those who are the first

in their family to attend university, while University networks provide support and mentoring for BAME, LGBT+, women, and disabled staff and students.

The importance of EDI in recruitment and progression processes is described above (§2.1.1); promotion for externally-funded research staff is also supported by the University. The research leave policy (§2.1.2) is applied equally across the department, including to part-time and fixed-term staff, and the 1 in 7 benchmark is met for both male and female staff. The University operates two systems for flexibility in working arrangements: (1) staff may request permanent or temporary reductions in the proportion of FTE worked, and (2) a Teaching Availability Request Policy allows staff to request certain times not be considered teaching hours. Our staff have benefited from both systems (c. 3 p.a. in the latter case).

As noted above, fixed-term staff are treated equally to those on permanent contracts and their long-term career development is prioritised. We have not appointed to part-time contracts, although staff may request a move to part-time working. The full range of support and internal funding opportunities is offered to all members of staff, including those on part-time or fixed-term contracts. Flexible travel funding policies are used to support those with disabilities or health issues.

We monitor protected characteristics in our provision for PGRs, starting with induction procedures. We run training sessions for research students on progression from PhD to academic posts, which include discussions of work-life balance. As with staff, students sometimes alter their work patterns in response to life changes such as new caring responsibilities (two students have moved to PT study for this reason). The annual review form prompts student and reviewers to discuss issues that may impede progress (such as ill health or caring responsibilities) and ways of addressing them.

For individuals returning from leave or managing illness or caring responsibilities, we have used the University's systems to offer research leave on return from significant parental leave (see above) as well as phased return arrangements. In addition to standard policies for staff with disabilities, such as providing special parking permits, customised office furniture and equipment, our annual review and mentoring systems allow us to actively monitor the wellbeing of staff, and we support research-related travel flexibly. Social gatherings such as lunches for academic and administrative staff, and events to celebrate success (§2.1) reinforce collegiality and informality.

In preparation for this submission in accordance with the University's Code of Practice, HOD, DOR, and Impact Officer took REF-specific EDI training. We selected the strongest profile from outputs suggested by all eligible staff, based on anonymous grading by academic peers (two internal readers and one external). Post-selection analysis of the representation of staff against the overall distribution of staff under various criteria, including gender and ECR status, and in terms of disciplinary clusters, assured us that we are not under-representing particular groups of staff: the only category diverging significantly from an average of 2.5/FTE is ECRs with 3/FTE. All staff had opportunities to read and comment on drafts of this document.

Section 3. Income, infrastructure and facilities

3.1 Research funding

In achieving our strategic objectives we have more than doubled our annual external research income (§1.2). This has been possible thanks to Department, Faculty and RIS staff working closely together, matching bottom-up development of research plans to knowledge of funding opportunities, maximising the benefit of internal resources and supporting high-quality applications

to external funding bodies. In 2014-20, Faculty allocated just over £1.1m to support individual research and strategic research initiatives.

Internal funding sources include:

- The University research allowance (currently £1,000 p.a.) for members of academic staff, which can be topped up from grant incentivisation money (§2.1).
- Awards from the Faculty Research Fund totalling more than £47,000.
- University Seedcorn funds: seven grants totalling £33,000 have assisted preparation of successful external grant applications.
- IAS Fellowships (REF5a/2.2) awarded to both Department (Zon, Clayton) and Visiting staff (Bill Thompson and Andrea Halpern).
- Funds awarded to University Institutes, used to support Sequera’s early music performance research (IMEMS) and Zuk’s work on music and trauma (IMH).
- International Office travel grants to develop research collaborations (e.g., IIT Bombay).
- Three internal impact funds (awards totalling over £22,000).

External grant applications in development are discussed in Department seminars, and in ‘pitch to peers’ sessions facilitated by the Faculty’s AHRC Liaison Group. All external grant applications above £10,000 are reviewed by a Faculty panel.

The larger part of our increasingly diverse external grant funding comes from UK research councils, with significant amounts from the EU (Future and Emerging Technologies and COFUND) and from charitable sources including the Leverhulme and Wellcome Trusts. Projects enabling impact were supported by AHRC, ESRC and private trusts. **Table 2** lists selected funding awards. Particularly noteworthy in terms of size are the AHRC projects Interpersonal Entrainment in Music Performance (IEMP; £522,00) and Musically Intelligent Machines Interacting Creatively (£249,000 for Durham’s contribution to a consortium). An AHRC Follow-on for Impact and Engagement grant (Khyal, £100,000) built on our Indian music research. Funded projects generate high quality outputs, some of which are included in this submission (e.g., three from IEMP and one from Large-scale Corpus Analysis of Historical Electronic Music, part of Transforming Musicology).

Composition research is often funded through commissions, which are not captured in HESA data; ours has been supported by the BBC, Arts Council England, Royal Concertgebouw Orchestra and Quatuor Bozzini; the Performing Arts Fund NL supported commissions by numerous Netherlands ensembles, and new work has also been commissioned in Austria, Chile, the Faroe Islands, Germany, Norway and Spain. Overseas grants (see §4.1) are also omitted from HESA data: both of these forms of funding have contributed to submitted outputs.

Title	Sponsor	Collaborators
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Everyday Temple Chant in South Korean Chogyae Sect Buddhism	Academy of Korean Studies	
Three Generations of Ritual Rhythms: The Changing Faces of Korea's East Coast Shaman Music	Academy of Korean Studies	
Musically Intelligent Machines Interacting Creatively (MIMIC)	AHRC	Goldsmiths, Sussex
Interpersonal Entrainment in Music Performance (IEMP)	AHRC	Western Sydney, Genoa, Montevideo, MPI Frankfurt, Tufts
Khyal: Music and Imagination	AHRC	
Large-scale Corpus Analysis of Historical Electronic Music	AHRC	Goldsmiths, Lancaster, Oxford
The Breath of Music: Investigating Respiration in Indian Music Performance	British Academy	
Tagging Online Music Contents For Emotion	ESRC	Innsbruck
EnTimeMent	European Commission (FET)	Genoa, IIT (Italy), UCL, Montpellier, KTH, Maastricht, Waterloo; Qualysis
DIFeREnS fellowships	European Commission (COFUND)	
Rhythm, Interaction and Embodiment in Gagaku Performance	GB Sasakawa Foundation	Tokyo, J.F. Oberlin University
Prevalence, Features and Retrieval of Music-Evoked Autobiographical Memories	Leverhulme Trust	
Audible Incarceration: Singing Communal Religion in Colonial Concentration Camps	Leverhulme Trust	
Rethinking Classical Music: Music Theatre, The Holy Roman Empire and the Musical Canon, 1775-1806	Royal Society	
Representations of Trauma in the Modernist Musical Artwork	Wellcome Trust	
Automatic Musical Theatre Song Generator	Wingspan Productions	Sky Arts ('Computer Says Show')

Table 2. Selected funding awards

3.2 Infrastructure supporting research and impact

3.2.1 Organisational infrastructure

A Research Committee (RC) oversees the Department's research, which reports to its Faculty counterpart. RC is led by the DOR, Clayton, who works closely with the Faculty's Deputy Executive Dean (Research) to agree priorities in the light of University strategy. The DOR works collaboratively with RIS and the Faculty's Research Development Manager to support project development and manage resources, and is supported by a Senior Research Administrator embedded in a Faculty Research Hub. Support for enabling and facilitating impact runs in parallel, with the Impact Officer (IO, Leante) sitting on RC and working closely with the IEM. RC also functions as the Ethics Committee, includes our Ethics Officer (Taruffi), and refers matters to our

Postgraduate and Infrastructure committees as appropriate. Department research objectives are articulated in an annual planning round, through which investment needs are raised and objectives agreed: this process led to the award of significant funds for the upgrade of infrastructure (§3.2.2).

3.2.2 Operational and scholarly infrastructure, including specialist facilities

Our World Heritage site estate houses state-of-the-art infrastructure that offers a flexible underpinning for our research and has facilitated several externally-funded projects. ADAL is a distinctive facility for audio-visual recording (in both field and studio) and analysis; MSL and our electronic music studios enable a range of psychology and composition research. We continue to adapt and upgrade these facilities to meet changing research needs.

Our facilities have been enhanced by significant investment over the assessment period. Start-up grants for Eerola and Jakubowski enabled the establishment of MSL (c. £100,000); the University's Research Equipment Group (REF5a/4.3) supported upgrades to ADAL and other music studio equipment, and, with further support from University capital funding, facilitates significant enhancement to our Concert Room's utility for performance research, in a project worth over £520,000 (2018/21; completion delayed due to Covid-19). This investment evidences the University's confidence in our clearly articulated strategic priorities. Specialist research infrastructure is summarised in **Table 3**.

Facility	Supports	Features (selected)
Audio-visual Documentation and Analysis Lab (ADAL)	Ethnomusicological fieldwork, empirical performance analysis, corpus research	Professional audio and video recording and editing, EVO shared storage server (48TB)
Concert Room	Performance research	Performance space, professional lighting, integrated AV and surround sound system, tie-lines to recording facilities, instrument collection
Electroacoustic Studio	Electronic and computer music research and composition, music recording	Music playback and recording, historic equipment such as VCS3 synthesizers and tape machines. Up to 8.1 surround monitoring
Music and Science Lab (MSL)	Behavioural and experimental research, empirical performance analysis	Physiological measures (EEG, ECG/EMG, respiration), accelerometers, video analysis
Music Technology Laboratory	Computer music analysis and composition	Audio workstations
Music Technology Studio	Electronic and computer music research and composition, recorded music	Music playback and editing facilities. Up to 5.1 surround monitoring
Music Technology Workshop	Music computing, recording, empirical and experimental research	Experimental set-ups, custom equipment design and maintenance.
Recording Studio	Performance research, empirical performance analysis, electronic and computer music analysis and composition	Acoustically isolated live room, master control room. Up to 5.1 surround monitoring

Table 3. Music research infrastructure

Our research capability is enhanced by two full-time technical staff, who support project planning and delivery, and train staff and PGRs. Their expertise is vital to many areas involving data collection, audio-visual materials and electronic music performance: our support for the Technician Commitment initiative is highly visible in the University (<https://www.dur.ac.uk/technician.commitment/>). Specialist departmental infrastructure is integrated with University provision including extensive data storage options (with allocations for our labs and studios), secure backup, networking and high-performance computing facilities (REF5a/4.3); ARC staff provide technical training, consultation and project support.

All individuals are offered the same support in the development of their research plans, and individual arrangements are put in place – e.g., facilitation of home working – to ensure staff are not hampered in their access to facilities due to disability or other factors. Where a member of staff has specific needs in terms of facilities these are addressed, as in the case of Jakubowski who received research lab start-up funding on appointment to her permanent position.

University collections and archives are managed by specialist Museum and Library staff, and we have drawn on these extensively to deliver research and enable impact. Archives housed in Durham include the Stainer Archive, Pratt Green Hymnology Collection, and Allegri Quartet Archive, as well as the archives of Ushaw College and Durham Cathedral (now linked through the Durham Residential Research Library). The Ushaw Collection, one of the most important archives pertaining to English Catholic history, contains significant musical material: a reconstructed Missa Cantata based on an Ushaw manuscript was celebrated at a CNCS event. The Durham Cathedral Music Collection contains unique examples of music by English composers such as Tye, Byrd, Tallis, Morley, Gibbons, Hooper, Parsons and Tomkins: Sequera has used these materials for the Records of Early English Drama North East (REED-NE) project based in English. The IAS and Colleges provide facilities for visiting scholars and events; College spaces are invaluable for performance, and Colleges host their own research events.

3.2.3 Infrastructure for impact activities

A wide range of resources is deployed to enable impact. For example, our Khyal case study relied on our technicians and studio facilities for the preparation of media and an app development brief, as well as on sustained collaboration with Durham's Museum and Library staff. Apart from hosting one iteration of the Khyal exhibition, museum staff advised and assisted with the presentation, transportation and storage of artwork, hosted workshops for the general public and worked on contractual arrangements with Legal Office support. Other facilities supporting impact include:

- Our University-funded professional concert series Musicon enables public engagement and impact relating to new music, Victorian British composers, Korean and Indian repertoires – in the latter case allowing us to attract new audiences (such as families to attend morning concerts). Musicon collaborates with GemArts on Indian music performances, with the Durham Vocal Festival in presenting EXAUDI concerts, and with the Dutch and Norwegian arts councils.
- We contribute annually to the Durham Schools' Science Festival, a three-day event attended by >850 local school pupils each year, with session topics including entrainment and music and emotion.
- The University's media suite facilitates broadcast appearances: e.g., BBC Radio 5 Live invited listeners to call in to discuss favourite sad songs, inspired by Eerola's research.

3.3 Collaborative use of research infrastructure

Collaborative research employs facilities housed in other departments – such as the Vicon motion capture system in Psychology – and at our partner institutions. Durham has a formal collaboration agreement with Fondazione Giorgio Cini in Venice which funds exchange visits (two in 2019/20). We have collaborated with Cini in presenting online events (<https://www.cini.it/en/events/zoom-in-on-masters-iismc-online-conversations>) and benefitted from their infrastructure to make audio-visual recordings. Research grants awarded overseas also indirectly support our research work: Eerola's Academy of Finland-funded project 'Sweet sorrow' uses University of Jyväskylä facilities, and an Indian government grant facilitates joint research in music computing at the Indian Institute of Technology Bombay.

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

4.1 Research collaborations

Collaboration with regional, national and international partners amplifies our contribution to academic disciplines and society while enriching our research with new ideas, perspectives and expertise. Staff are supported in developing such relationships through advice for project planning and support from University Seedcorn, International Office and IAS funds for networking activities. The Northern Network for Empirical Music Research (NEMuR) builds on our regional connections in psychological and empirical research. National collaborators in research projects include Goldsmiths and Sussex (MIMIC), Lancaster and Oxford (Large-scale Corpus Analysis). International research collaborations involving the USA, Canada, Australia, Uruguay, Chile, India, Italy, Germany, Austria, Finland, Norway, Spain and France, have similarly fostered funded projects (see **Tables 2 & 4**) and research outputs. CNCS International, founded as a collaboration with Sorbonne, Monash and Aarhus Universities, aims to facilitate interaction between a larger global consortium of universities, museums and professional societies. Collaborations with performing groups, venues and broadcasters are equally crucial to composers and performers. About half of the outputs in this submission benefitted from international collaborations.

Title	Sponsor	Collaborators	Support
Sweet Sorrow: Testing the Empathy-Related Mechanisms Involved in Enjoyment of Music-Induced Sadness	Academy of Finland	Jyväskylä	Research funded in Finland (€575,873)
Composition (music and gesture)	Arts Council Norway	Ny Musikk Kompositörgrupp	Commission fees (£32,000)
Social Cohesion and Resilience Through Intercultural Music Engagement	Australian Research Council	Melbourne, Macquarie, Exeter	Travel, research expenses
Theorizing Sonata Form in European Concert Music, 1815–1914	SSHRC (Canada)	Toronto, Edinburgh	Travel, corpus preparation
Research visit of Dr Ranjani Ramachandran	Charles Wallace Trust India		Visitor's expenses
Computational Musicology and Study of Instruments in Indian Music Traditions	Government of India	IITB (Mumbai), IIT Chennai, IIT Dharwad, McGill, UPF Barcelona	Travel, research expenses
Cross-Cultural Research into Consonance	Huttunen Foundation/ Ehrnrooth Foundation		Fellowship costs

Table 4. Selected overseas grant awards

4.2 Engagement with research users and wider contributions to the economy and society

Our research achieves impact by enhancing public engagement with scientific research and public awareness and appreciation of neglected musics, through contributions to education, and by bringing economic benefits to performers, venues and record companies. Such impacts depend on partnership with other stakeholders such as museums and archives, music venues, promoters, schools and arts organisations. Summarised below are some ways – other than those featured in Music’s case studies – in which we have engaged with users and beneficiaries of our research. These interactions feed into our research and enrich the environment in various ways: directly, as in a study commissioned by BBC Radio 3 that enhanced IEMP

(<https://musicscience.net/2018/03/10/inside-a-string-quartet/>), or indirectly, through the new perspectives they engender in researchers.

Schools and the general public

- Sequera’s music is an integral part of public re-enactments of historical ritual and performance events produced by Records of Early English Drama North East (REED-NE; see http://community.dur.ac.uk/reed.ne/?page_id=577). This contribution features in Durham’s UoA 27 Impact Case Study ‘Cultural Heritage of North-East England’, which evidences the fact that many individuals have become active participants in these musical and dramatic productions.
- We present sessions annually at the Durham Schools’ Science Festival (§3.2), and our research featured in the Genoa and Sydney science festivals. RCUK funding supported sessions for primary school groups on rhythm and interaction (‘Together in Time’, Jakubowski, ESRC IAA), and Creative Coding in North East Schools (AHRC), and we delivered Indian music workshops for GCSE groups (Leante and Clayton).
- Contemporary Music for All (CoMA) encourages amateur musicians to perform contemporary music: Weeks contributes as workshop leader and artistic director of their *partsongs* project.

Music venues, promoters, ensembles and record companies

- Our research relies on extensive collaboration benefitting ensembles (including the Royal Concertgebouw Orchestra – where Rijnvos held a residency – Telemark Chamber Orchestra, Fretwork and Stile Antico, and the Royal Northern Sinfonia for whom Hambridge recorded educational videos), venues (such as the Sage Gateshead and Royal Opera House), and festivals (Collins’ artificially intelligent critic ‘CritAlc’ curated concerts at the 2019 Donaueschingen Festival).
- Composers and performers work closely with record labels including RCO Horizon, Winter & Winter, Hat Hut, Chandos, RTF Classical/ Nimbus, Métier, Confront, Another Timbre and Fabra, in many cases achieving excellent reviews and significant sales, with some CDs rereleased due to high demand (e.g., Snijders, ‘Morton Feldman’).
- At Music in the Round (Sheffield) and the Wigmore Hall (London), Horton has run workshops applying analytical techniques to work on repertoire (also including a round table with BBC Radio 3 and the Proms).

Museums and galleries

- Hambridge works to build public engagement with Napoleonic repertoire as part of a University partnership with the Bowes Museum in Barnard Castle, and at the Victoria and Albert Museum.
- CNCS International (§4.1) is also working with the V&A as part of a network involving several UK and European museums.
- Jakubowski's work on earworms had the widest reach of any research across the University in 2016/17, featuring in over 490 outlets and 70 TV and radio broadcasts. Other projects to receive significant media exposure include Eerola's project on enjoyment of sad music, Leante's on bhangra and Clayton's on entrainment. Collins' algorithmic composition work was featured in the Sky Arts programme 'Computer Says Show.'

Where possible these activities engage with diverse communities. Our work with local Arts Council National Portfolio Organisation, GemArts (tagline: 'Creating and profiling diverse arts') is a good example of this: Gem work with a very diverse range of schools – including those in deprived areas of North-East England – and groups such as refugee organisations. Our collaboration was featured as a case study by the AHRC-funded 'Common Cause' project exploring relationships between university research and BME communities (<https://www.commoncauseresearch.com/case-studies/>).

Our impact case studies exemplify this strategic approach. In Khyal we built on strong long-term relationships with GemArts and Durham's Oriental Museum, developing further collaborations with art galleries, London-based promoter Sama Arts, local SME Komodo Digital, and local schools, by means of which we reached at least 50,000 visitors and app users in 34 countries. Dibble's work on Parry and Stanford, showcased in our other case study, has generated impact through a long-standing relationship with the BBC and collaborations with record companies (including Hyperion and Chandos), venues (Wexford Festival, Royal Festival Hall), and performers, through which he has reached audiences nationally and in Europe, North America and Asia. Both projects secured external funds (AHRC for Khyal, The Covell Frydenlund Charitable Fund for Stanford) as well as internal support.

4.3 Contributions to the sustainability of the discipline

Our commitment to the sustainability of the wider research environment is seen both in extensive collaboration with researchers around the world and in leading open science initiatives in music (§1.6). We also support the development of the discipline by responding to national initiatives: Hambridge and Johnson-Williams both serve on working groups of the Equality, Diversity and Inclusion in Music Studies network, while the Khyal ICS and our approaches to impact and EDI are influenced by the 2015 Warwick Report, *Enriching Britain: Culture, Creativity and Growth*. We also contribute to the vitality of the discipline by committing resources to hosting research events, many of which support our interdisciplinary agenda (**Table 5**).

Event	Sponsor
‘Musical Bodies’	European Seminar in Ethnomusicology
‘Trauma Studies in the Medical Humanities’	IMH/ Music Department
‘The Psychology of Live Music Performance’	British Society of Aesthetics/ Humboldt University Berlin
‘Music, Media and Technologies’	RMA/ Geography Department
‘Words and Music in the Nineteenth Century’, ‘Music, Empire and Religion’, ‘The English Musical Renaissance and the Church’, ‘Music, Death and Grief in the Long Nineteenth Century’, ‘The Melodramatic Moment’	CNCS
‘Music & Lifetime Memories’, ‘Research Methods in Music & Emotion’, ‘Cross-cultural Research in Music Cognition’	MSL
‘Theory and Analysis Graduate Students (TAGS) Conference’	Society for Music Analysis (SMA)

Table 5. Durham-hosted research events

Music staff serve on numerous professional bodies. Horton was President of the Society for Music Analysis (2014-2019), and Leante was Secretary General of the European Seminar in Ethnomusicology (2014-2020). Hambridge and Horton serve on the council of the RMA (whose conference we will host in 2022), Zuk is a convener of the Russian and Eastern European Music Group (British Association of Slavonic and Eastern European Studies), and Sequera a board member of the Lute Society.

We work to strengthen the position of Music as a school subject, and of certain musical genres with restricted public profiles. Examples noted above are Weeks’ contributions to contemporary music, Sequera’s to early music performance, Dibble’s to Victorian and Edwardian music, and Clayton and Leante’s to Indian music. Horton’s contributions to the SMA’s Music Literacy Project included commissioning surveys of music teaching in schools, while Hambridge arranged school visits through ‘Inspiring the Future.’

4.4 Indicators of wider influence and recognition

Music staff contribute to journal editorship, as Editor (*Nineteenth-Century Music Review*, Zon) or in other roles (at least 26 journals and book series); this influence is felt across numerous fields. Zon also edits the Routledge book series *Music in Nineteenth-Century Britain*.

Our contribution to grants committees extends beyond the UK research councils (Horton and Zon serve as members of the AHRC Peer Review College) and Leverhulme Trust to the European Commission and ERC, and to national and regional funding boards in eleven countries, and the Italian national committees for research assessment (MIUR) and academic appointments (ASN).

Clayton was elected a Fellow of the British Academy (2020), while Weeks won two prestigious composition prizes (the British Composer Award, Chamber category, 2018 and the Ivors Academy Composer Award, Small Chamber category, 2019). Hambridge was awarded the Jerome Roche Prize by the RMA for a distinguished article by a scholar in the early stages of their career (2016). Our staff have contributed 13 keynote papers and numerous invited conference papers, and had works performed in Austria, Brazil, Canada, Chile, Faroe Islands, Finland, France, Germany, Netherlands, Norway, Portugal, South Korea, Spain, Sweden, Switzerland, and the USA.

We have contributed to chairing conferences including ESEM, Analytical Approaches to World Music, and the International Conference of Students of Systematic Musicology (SysMus), and to numerous programme committees across our subject areas. Our expertise was called on for appointment and tenure reviews at 14 universities in the UK, Europe, North America and Australia, while Horton served as the Netherlands & Flanders Music Theorist in Residence. We contribute to reviewing books and articles for all major publishers of music monographs, and over 60 journals across all of our musical specialisms as well as anthropology, biology, geography, history, psychology, signal processing, theatre, and film studies.

Zuk is Durham's Academic Director of Northern Bridge Doctoral Training Partnership, which runs the AHRC's annual studentship competition in the North East and Northern Ireland and its associated training programme. Input to doctoral programmes and training elsewhere includes contributions to student conferences (SysMus, BFE-RMA) and study days, mid-term PhD reviews (Oslo), and examining at numerous UK institutions as well as in Canada, Australia, Norway and Ireland.

4.5 Category C staff

Two postdoctoral fellows are listed as Category C: both combine their individual research with collaborations and contributions to events such as Research Forum. Glatthorn is a Newton International Fellow (one of only three such awards in Music in the years 2014-19). He won the Centenary Prize competition for his *Music & Letters* article and the Marjorie Weston Emerson Award of the Mozart Society of America. Lahdelma is funded by Finnish foundations: his recent work is published in *Musicae Scientiae* and *Scientific Reports*.