

**Institution:** University of Edinburgh

**Unit of Assessment:** 33 Music, Drama, Dance, Performing Arts, Film and Screen Studies

### 1. Unit context and structure, research and impact strategy

The study of Music and Film at the University of Edinburgh (UoE) is a wide-ranging exploration of sound and the moving image, from historical and critical approaches through to scientific inquiry, technological innovation and creative practice. Our 22.9 FTE staff search for new ways in which music and film can be made, shared, understood, and used socially, culturally and politically. We capitalise on Edinburgh's presence as a technology hub and global cultural centre to develop new work, from software to films and compositions, and harness the unique ability of music and film to enrich lives through screenings, performances, outreach programmes, and new technology for artists and industry.

#### **Research strategy**

Building on plans set out in REF2014, our strategy is geared towards **extending the breadth** of the work in our unit. As a large part of our research is interdisciplinary or emerging, we have striven to **cultivate a vibrant, inclusive research culture**, and to support all colleagues in taking risks to extend their horizons. Finally, we have sought to extend the range of our influence outside the academy by **building relationships with new audiences and stakeholders**, and through the **fostering of an entrepreneurial culture**.

We have executed our strategy by:

*I) Capitalising on our strengths in securing external research funding from diverse sources that reflect the breadth of activity in the unit.*

Total research grant expenditure was £3.54M for the unit, more than doubling the £1.67M from REF2014. Three large EU projects (two ERC and one HERA) held or awarded this cycle reflect the breadth of our unit, covering topics from virtual musical instruments to queer studies, film and music. Funding for technology-driven projects has been awarded this cycle by the AHRC and EPSRC, supporting innovations in virtual architectural acoustics and graphene-based cochlear microphones. Six fellowships from the Leverhulme Trust, British Academy and Royal Society have been held or awarded this cycle, covering topics from the history of electronic music to music and diplomacy during the Cold War.

*II) Engaging directly with wider publics, communities, and industries.*

Our research engages with a wide range of external stakeholders. Major film releases through the Scottish Documentary Institute reach audiences worldwide and spur dialogue on pertinent topics such as palliative care and the environment. Our research in music psychology addresses health and wellbeing among disadvantaged populations in Scotland and abroad, and we have developed new technology for musicians and architects, resulting in industrial start-ups. Such impact-focused work has been supported by the AHRC, the Royal Society of Edinburgh, the UK central government, the Carnegie Trust, and the ERC.

*III) Investing in people, including PGR students and new staff appointed strategically to build capacity across our research groupings.*

We have made ten new permanent appointments this cycle (seven in Music and three in Film) including two early career researchers (ECRs). Four staff members appointed during this or the previous cycle through the UoE's prestigious 5-year tenure track Chancellor's Fellow scheme, awarded for outstanding research, successfully converted their posts to open-ended lectureships in this cycle. We have seen a significant increase in the number of doctoral degrees awarded

(90 this cycle vs 36 in 2014); 61 doctoral students have been supported by scholarships, compared with 31 in REF2014.

*IV) Developing the strength of our major research areas through enhancements to infrastructure.*

Research in the UoA has been supported by large investments in infrastructure. These include large estates redevelopments (£40.2M total), and a major renovation of our historic St Cecilia's Musical Instrument Museum (£6.5M). Alongside this, the greater environment has been strengthened enormously by the £1.3B Edinburgh City Region Deal, which saw a total of £237M investment in Data Driven Innovation from the UK and Scottish Governments to UoE, enabling the establishment of the £6.5M AHRC Creative Informatics programme that has supported entrepreneurial technology ventures led by this UoA.

### **Research Themes**

Our research addresses three themes:

- **science and technology**, encompassing acoustics, music technology, and music psychology;
- **creative practice**, including music composition and filmmaking; and
- **critical approaches**, including film theory and musicology.

These themes build upon those proposed in UoA35 (Music) in 2014, now significantly enriched by the inclusion and integration of film theory and filmmaking, and serve as a strategic basis for funding bids as well as new appointments.

Of our 26 staff, 25 work in the Edinburgh College of Art (ECA), and one in the School of Literatures Languages and Cultures (LLC). Both ECA and LLC are Schools within the larger College of Arts, Humanities and Social Sciences (CAHSS). Staff member names in **bold** below are REF1a; others mentioned are former staff or on extended leave.

#### **1. Science and Technology (5.5FTE)**

Research in the **Acoustics and Audio Group (AAG)** is highly mathematical and experimental, and research topics range from musical, architectural and computational acoustics to the auditory sciences. The AAG was a partner in the £3.18M 'Basic Acoustics Training' FP7 Marie Skłodowska-Curie Initial Training Network (2013-17, UoE share £240K), connecting it to 18 academic and industrial partners throughout Europe, and has an increasing engagement with industry—see Section 4.

The 'Next Generation Sound Synthesis' (NESS) project (**Bilbao**, ERC, 2012-16, £1.14M), with the majority of its activity and expenditure in the current REF period, was concerned with very large-scale physics-based audio rendering and sound synthesis, with a staff of ten PhD students and PDRAs within Music and the Edinburgh Parallel Computing Centre (EPCC). 84 peer-reviewed publications have resulted, and the world's first large-scale physics-based sound synthesis system is now used by musicians worldwide. The NESS project was complemented by a further ERC Proof of Concept grant, 'Wave-based Room Acoustics Modelling' (**Bilbao**, ERC, 2016-18, £107K), with the goal of developing the world's first wave-based architectural acoustics simulation system, now operational. The NESS project yielded two spinout companies.

**Ducceschi** joined the AAG as a Newton International Fellow (Royal Society/British Academy, 2015-17, £99K), and later a Leverhulme Early Career Fellow (2017-20, £90K). He has broadened the scope of physics-based instrument emulation to include historical musical instruments, through a partnership with St Cecilia's Hall, which holds one of the world's finest instrument collections—see Section 3. His ERC-funded NEMUS Project (£1.35M) was awarded in July 2020. **Newton** was made a permanent lecturer (2016) as a strategic decision to expand

the research range of the AAG. The GMAAT project (Cheung, **Newton** et al., EPSRC, 2015-17, £631K), with the School of Engineering, pioneered the use of micromechanical graphene-based microphones in the quest for miniaturized cochlear implants.

The **Music in Human and Social Development (MHSD) Research Group** was formed to further our understanding of music as a means of improving health and wellbeing across marginalised or disadvantaged populations. The group led the Scottish Music and Health Network (**MacDonald** and **Overy**, Carnegie Trust, 2014-16, £32K), which brought together experts in music education, music therapy and community music across Scotland.

The use of music interventions targeted towards individuals with specific disabilities has been explored extensively by **Overy**, including through interactive music programmes for individuals with dementia (**Overy** and Wilson, UK central government, 2016, £23K). A new collaborative project addresses musical experience and ageing (Okely, **Overy** and Deary, ESRC, 2019-22, total award £235K). The funded projects 'Community Music Workshops for Social Integration among Individuals with Impairments' and 'Music as Social Innovation' (**MacDonald**, UK Central Government, 2017-19, £188K total) both involve extensive engagement with marginalised communities in Scotland and music charities such as Limelight. A major monograph has resulted (*The Art of Becoming: How Group Improvisation Works*, **MacDonald** and Wilson, OUP, 2020). **Moran** and **MacDonald** have taken psychological approaches to the study of interactions among performers and artists and group improvisation (Wilson and **MacDonald**, 'Concurrent', Royal Society of Edinburgh, 2015-17, £20K).

Scientific and technological work is closely integrated with the other research themes. The MHSD group intersects with creative practice through **Isaacs**, a composer with extensive experience in community music projects in Scotland, the Gambia and with the refugee community in Greece, and **MacDonald**, strategically appointed in the last cycle as Chair of Improvisation and Music Psychology. The NESS project was aimed at developing new virtual musical instruments for creative practitioners. Technological approaches to early music research have been led by **Cook**, through two AHRC grants to develop virtual reality emulations of historical sites (£116K total).

## 2. Creative Practice (7.1FTE)

Filmmaking is a major strength of the UoA, and led by the **Scottish Documentary Institute (SDI)**, founded by **Mendelle** in 2004. SDI has 17 staff members and academic collaborators drawn from the UoE and the larger community of filmmakers in Edinburgh, of which four (**Davie**, **Hardie**, **Jansen**, **Mendelle**) are submitted in this UoA. It has two primary objectives: to undertake research into documentary narrative approaches through the production of feature-length documentary films; and to nurture the development of filmmakers, locally and internationally, through its diverse training programmes. These programmes have produced short film series such as **Mendelle's** *Bridging the Gap* (screened in 40 countries), *This is Scotland* for STV, *Right Here* for the BBC, the *Stories* project, and the annual *Edinburgh Pitch* filmmaker networking event.

SDI's feature films have garnered international attention for their explorations of documentary narrative form. *Seven Songs for a Long Life* (**Hardie**, BBC/Creative Scotland, 2015, £305K) documents the evolution of a musical collaboration with hospice patients. The film played on the BBC, nationally on PBS in the USA (1402 broadcasts), and has screened at 27 international festivals, such as SXSW and DOXA. *Becoming Animal* (**Davie**, Swiss Films/Creative Scotland, 2018, £443K) is a feature-length nature documentary that has been nominated for awards at international festivals (CPH DOX, Munich Film Festival). **Jansen's** practice straddles fiction and documentary; her film *In Times of Rain* (CONACULTA, 2018), a drama about family fragmentation caused by migration from an Indigenous community to Mexico City, has won five international awards, including at the Oaxaca FilmFest in 2018. See Figure 1.

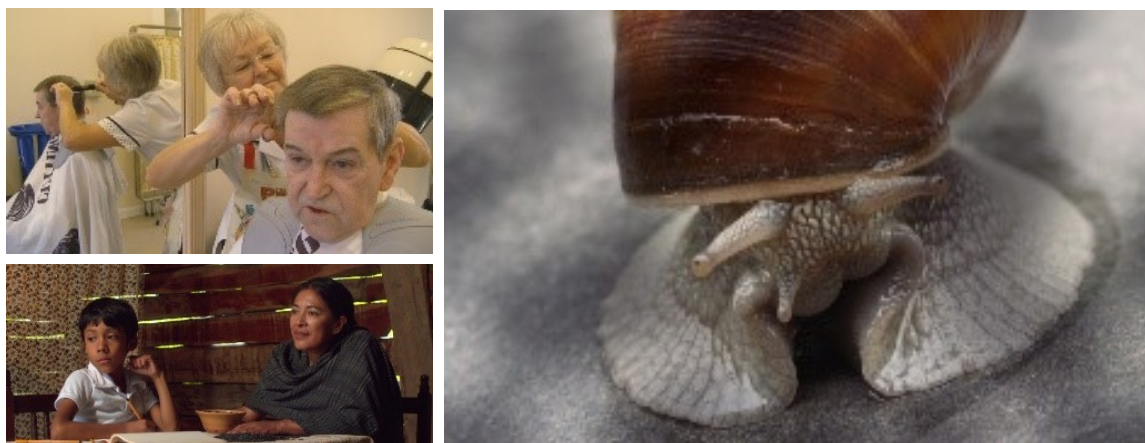


Figure 1. Clockwise from top left: Still photographs from Hardie's *Seven Songs for a Long Life*, Davie's *Becoming Animal* and Jansen's *In Times of Rain*.

Composition at UoE has a long tradition of engagement with cutting-edge technology. **Parker** has introduced a dimension of live performance and sound design to the UoA; major performances include *Scripts* for computer and ensemble premiered in Montreal in 2017. The NESS project included ten funded residencies for visiting composers. **Mudd** was appointed in 2019 to a permanent lectureship in computer music systems, as a practising composer researching questions surrounding electronic compositional processes.

There is also a strong outreach dimension to composition at UoE. Community music projects led by **Isaacs** integrate work local to communities in Edinburgh and travel as far as the Gambia, where her compositions engage students and staff in vibrant musical exchange. **Isaacs** has also responded influentially to the refugee crisis, working in Athens since 2016 to train aid workers in



Figure 2. Scene from *306 Trilogy*, Gareth Williams, 2018. Photograph: Marilyn Kingwill.

her community music and composition practices. **Isaacs** was nominated for a British Composer Award in 2018 for her reimagining of *The Rime of the Ancient Mariner*. **Williams's** appointment in 2014 as a Chancellor's Fellow expanded our range to include opera and musical theatre, while maintaining the strong tradition of composition as a means of increasing social awareness and outreach. Now a permanent member of staff, he has obtained a number of major commissions, including for the large-scale work *306 Trilogy* (National Theatre of Scotland), written in commemoration of the centenary of the First World War, with 72 performances to an audience of over 6,000. See Figure 2.

### 3. Critical Approaches (10.3FTE)

Our research in film theory and musicology extends outwards to include technology, music and screen, queer studies, politics, popular music, and sociology. It has been complemented by six new permanent appointments in this cycle. In addition, two new appointments were made near the end of the last cycle, both as Chancellor's Fellows who became permanent (**Brennan** and **Davis**).

Film theory staff have been augmented by the appointment of film philosopher **Sorfa** and in 2018 **Chambers**, an early-career theorist. Major outputs include monographs from **Murray** (*The*

*New Scottish Cinema*, I. B. Taurus, 2015), and Yacavone (*Film Worlds: A Philosophical Aesthetics of Cinema*, Columbia University Press, 2014). Yacavone was awarded two visiting fellowships (Netherlands Institute for Advanced Study, 2020, and Freie Universität Berlin, 2020). A large project in this area is **Davis's** CRUSEV: 'Cruising the 1970s: Unearthing Pre-HIV/AIDS Queer Sexual Cultures' (EC-HERA, 2016-19, total award £1.05M, UoE share £435K) and evolved from **Davis's** research as a historian and theorist of queer visual culture. 47 events, including workshops, exhibitions, conferences and film screenings took place. CRUSEV links UoE with four other HEIs and 18 museums, galleries, NGOs and activist groups throughout Europe.

Critical approaches to music and film intersect in many ways. Musicologists **Davison** and **Cook** (convener of the *Representations of Early Music on Stage and Screen* network) work with the history and aesthetics of music on screen, including film, television, and video games, and linking with film theorists. Work in film theory often engages with the importance of sound and music in cinema, especially in **Chambers's** concentration on folk cinema. **Davis** and **Murray** have organised three popular music symposia concentrating on pop singers and the moving image.

The UoA has continued its rich tradition of musicological research in this cycle, spanning a diverse range of areas from music analysis through the politics of music to popular music and jazz. Significant fellowships have been awarded to **Desler** ('Opera Performed: Nicola Gramaldi: Singer, Actor, Director, Promoter', Leverhulme Research Fellowship, 2018-19, £43K), **Kelly** ('Musical Diplomacy at the Peripheries: East Germany and the Postcolonial World', Leverhulme Major Research Fellowship, 2020-23, £152K) and **Taylor** ('Music and Subjectivity: Hearing the Self in 19th-Century Music', Berlin Institute for Advanced Study fellowship, 2019-20, £43K). Major monographs have been written by Brennan (*When Genres Collide*, Bloomsbury Academic, 2017), **Cook** (*The Early Mass Cycle in England and Europe*, RMA Monographs, 2019), **Jago** (*Jazz in the Cellar*, University of British Columbia Press, 2019), **Kelly** (*Composing the Canon in the German Democratic Republic*, OUP, 2014), and **Taylor** (*The Melody of Time: Music and Temporality in the Romantic Era*, OUP, 2016, *Towards a Harmonic Grammar of Grieg's Late Piano Music*, RMA Monographs, 2017, and *Arthur Sullivan: A Musical Reappraisal*, Routledge, 2017).

Popular music studies is a particularly high-impact area in this cluster. Brennan was PI in a succession of impact-focused AHRC grants, all concerned with timely sociological, environmental and policy questions surrounding live music and festivals: 'The Cultural Value of Live Music' (£38K, 2013-14); 'From Pub to Stadium' (£49K, 2014); 'Fields of Green' (£55K, 2015-16); 'The Great British Live Music Census' (£231K, 2016-18); and 'New Directions in Music and Sustainability Research' (£144K, 2017-18).

In addition, there is a body of work devoted to the critical and historical study of electroacoustic music, technology, and performance practice. Sean Williams held a Leverhulme Early Career Fellowship ('Documenting the Recent History of Electronic Music Performance Practice', 2012-15, £60K) and **Valiquet** holds a British Academy Postdoctoral Fellowship ('Phonopolis: The Ontological Politics of Experimental Music Research, 1958-1995', 2017-20, £290K). A further new direction is the 'Space, Place, Sound, and Memory' project led by **Cook** (AHRC, 2018, £76K), which examines the virtual emulation of historical performance spaces for the study of early music. **Cook** received follow-on funding for impact-generating activities including public installations ('Hearing History', AHRC, 2019, £40K).

### **Facilitating Impact**

Music and Film at UoE are outward-facing; our work is meant to be seen, heard and used. This is true of creative practice, where we excel in the production of socially relevant wide-release documentary films, and in engaging audiences with musical works and performances. It is also true of scientific and technological work centred around the development and commercialisation

of new tools for musicians and architects, and new musical intervention techniques for disadvantaged communities.

UoE has developed a range of new infrastructures to foster the generation of impact from research at all levels in the institutional hierarchy. For successful external funding bids involving a high degree of knowledge exchange/IP generation/impact (such as **Cook's** AHRC grants, and **Bilbao's** ERC Proof of Concept grant), Edinburgh Innovation, the UoE's commercialisation wing, takes an active role in clarifying IP positions and in fostering future commercial developments.

Our staff have taken advantage of several internal impact-focused funding schemes:

- Knowledge Exchange and Impact (KEI) awards (up to £5K) target engagement with policy, practice, industry or community audiences to increase the impact of research through mutual exchange. 11 staff members have benefited from such awards over the current cycle, totalling £36K. Examples include **Isaacs's** *Big Boat* project, exploring music and language development in West Africa, and **Williams's** *Breath Cycle*, investigating the use of singing as a form of therapy for people living with cystic fibrosis. Some projects enhance major ongoing research efforts, including **Davis's** *Cruising Ground* (extending the reach of the CRUSEV project).
- **Overy** was awarded an internal ESRC Impact Accelerator Account award (£15K) geared towards the development of musical activities for children with dyslexia.
- The £6.5M Creative Informatics project (2019-24), led by ECA, funded resident entrepreneurs (£24K total) for recent PhD graduates in Music to establish two new technology-focused companies.
- The UoE has a new Rapid Response Impact Funding scheme available (as of 2020) supporting new challenges under COVID-19 restrictions; **Davie** was awarded £5K to develop a new method of filming her documentary *Black, Black Oil*.

The authors of our impact case studies in this UoA have benefited from these and other such pump-priming funds (see 'Supporting Interdisciplinary Research' below and Section 3). They work with widely differing groups of beneficiaries, reflecting the breadth of research in the UoA, in line with our strategy:

- *Seven Songs for a Long Life: Using Documentary Film as Palliative Care* (**Hardie**) is concerned with palliative care through music and film, and its impact on hospice care workers, policy, and the general public.
- *Musical Improvisation for Improving Health and Wellbeing* (**MacDonald**) demonstrates the application of theoretical work in music improvisation to improve the health and wellbeing of various disadvantaged cohorts.
- *Physics-based Audio in Music Composition and Virtual Acoustics* (**Bilbao, Ducceschi**) is concerned with physics-based sound synthesis and acoustics rendering, and its impact upon creative practice.

### **Supporting Interdisciplinary Research**

A large proportion of the work in this UoA is interdisciplinary. Notable examples are work linking music with neuroscience, the physical sciences and engineering. Other intra-humanities links also feature strongly, including music and film studies, and music and the social sciences.

The UoE has long taken a positive and unified approach to supporting such work, transcending any administrative boundaries. Grants from the CAHSS Challenge Investment Fund (up to £15K) engage with the institutional strategic objective to exploit existing synergies and cross-disciplinary expertise across the UoE. In the current cycle, £58K total was awarded to five UoA staff, including Brennan, to support an interdisciplinary musical instrument research network, and **Jansen**, for a project geared towards improving inclusivity and diversity in film production for the hearing or visually impaired.

### **Research Ethics and Open Research**

Good ethical practice is the foundation of all our research activity and a mark of our commitment to professionalism and duty of care to our researchers. This is particularly the case for research in sensitive areas involving human subjects (in, e.g., music psychology, through **MacDonald's** work with disabled and disadvantaged groups, as well as documentary filmmaking through **Hardie's** research into palliative care). The School has developed a three-tiered system for the ethical review of all research activities, compulsory for staff and students submitting research grant applications. The Director of Ethics (a newly created post in 2018) and School-level Research Ethics Committees are responsible for ensuring the adoption, implementation and review of ethical procedures, as well as raising awareness of ethical issues in research. These procedures have been developed in line with the CAHSS Ethics Working Party and Research Ethics Framework, and take into account the constraints of external collaborators and funders. All research staff and students undergo training in GDPR and good practice in the use, storage and security of research data.

We have developed new approaches to supporting open research targeted at music and film research, and our staff have taken advantage of a wide range of possibilities for training in open research/open access, including a suite of online resources, workshops and one-to-one meetings. School-level Research Offices have staff members dedicated to monitoring open access for all research outputs, and providing advice on best practice with regard to open research for practice-based outputs. The open access compliance rate across our two Schools is greater than 97%. All external funding bids must be accompanied by a Data Management Plan.

UoE has invested in developing specialised frameworks for supporting open research. These include the UoE's open data sharing service DataShare (e.g., for **Moran's** motion-capture datasets on improvisatory gesture, as well as audio and documentation for **Parker's Sonikebana** installation), alongside the School's hosting of a GitLab repository for publicly sharing computer code, and collaborative development (with EPCC) of a bespoke system allowing musicians worldwide free use of the NESS sound synthesis system running locally on three GPU servers.

The University encourages new staff-led OA and open research initiatives. For example, **Sorfa**, with Edinburgh University Press, raised funds (£35K) to enable Platinum Open Access publication of the journal *Film-Philosophy* from 2016 to 2025. Within the AAG, research-related events such as seminars and conference keynote addresses have been professionally filmed and edited, and posted online. ECA funded (£5K) the professional production of eight 10-minute videos covering all aspects of the NESS project.

### **Future Strategy**

Our plans for the future build on our great successes this cycle in increasing the volume, range and prestige of research funding we have obtained, reaching and influencing new audiences and stakeholders, and in building the wider research environment through our large international presence (see Section 4) and greatly increased number of PhD students and graduates (see Section 2). We will harness resources such as SGSAH, which received continuation AHRC funding in 2019 for a further four years, and the Chancellor's Fellowships, through which we will appoint new staff to the UoA.

We seek to integrate film and music further, through both theory- and practice-based research; this will be aided enormously by our Estates plans, which see Music relocated to the central ECA campus, alongside film and SDI staff, in the medium term. We will also increasingly exploit unique research resources at UoE such as St Cecilia's Musical Instrument Museum and the high-performance computing expertise at EPCC.

COVID-19 has forced changes to some of our outward-facing research activities. We will build on our recent experience in engaging research stakeholders (through, e.g., the Medieval and Renaissance Music Conference, run by **Cook** virtually in July 2020 with a record attendance of 475). Our practice-based research activities are necessarily pivoting as well; for example, the *Dialogues* festival of electronic music will run its inaugural hybrid edition in February 2021.

The conjunction of technological research in the UoA and the surrounding industrial network we have helped to create, particularly within the context of the City Region Deal and Creative Informatics, will serve as the springboard for larger collaborative UKRI funding bids, and well as co-funded PhD studentships. We also seek further expansion into the larger international arena, in particular through international co-funding of documentary film productions, and through the expansion of our work in music therapy.

## 2. People

### Staff

Our vibrant, inclusive and well-supported research environment has led to great success in retaining staff and attracting new staff. Our approach to staffing follows naturally from our general research strategy: we appoint staff to expand the breadth of research across our three themes. To maintain vitality, nine of our ten new permanent appointments this cycle were made at an early career stage across all research areas. Two of our new permanent appointments are currently classified as ECRs, and their posts have been strategically positioned to enhance links between themes: **Mudd**'s research bridges the creative practice and science/technology areas, and **Chambers** is both a filmmaker and film theorist.

Of 26 staff submitted, 18 are in Music, and eight (increased from five in REF2014) work in Film. The current staff profile of the UoA includes four professors, three readers, ten senior lecturers, seven lecturers, and two postdoctoral fellows. The small minority of advanced-career staff (three) means that we expect fully to realise our ambitions without disruption. The retention rate for the UoA is high; we have seen three retirements and two relocations, both on an upward trajectory: Edwards to a Chair at the University of Essen, and Brennan to a Readership at Glasgow.

Our new appointments and postdoctoral fellows represent more than 50% of our submission by FTE. They have played a leading role in securing external funding (e.g. **Ducceschi**'s ERC award, **Desler**'s Leverhulme fellowship and **Cook**'s two AHRC grants), in bringing our work to wider audiences (e.g., **Williams**'s major international commissions, and **Jansen**'s award-winning films), leading large research events (**Valiquet** co-organised the international conference 'Recursions: Music and Cybernetics in Historical Perspective') and producing world-leading research (e.g. **Taylor**'s three monographs produced during the current cycle).

Underpinning this success has been our approach to embedding new appointments and postdoctoral fellows as formal members within established research groupings, alongside senior researchers: **Ducceschi**, **Mudd** and **Newton** in the AAG, and **Chambers** and **Jansen** in SDI. New appointments are offered generous support, particularly through the Chancellor's Fellow scheme, through which four staff became permanent in this cycle. New junior appointments are encouraged to join PhD supervisory teams, with first supervision permitted after a successful completion. Alongside research staff submitted here, we have employed 12 contracted postdoctoral researchers/software developers assigned to internally- and externally-funded projects. All have access to the same mentoring/training/development schemes as permanent appointments, reflecting UoE's commitment to the Concordat to Support the Career Development of Researchers.



All staff benefit from an annual review, during which line managers raise issues around career development and training needs, supporting the aspirations of established, early career and contracted researchers alike. The academic promotions process is explicitly discussed in annual reviews, as well as at UoE-wide targeted events; since 2014, for the staff submitted here, there have been four promotions (two to Senior Lecturer, one to Reader and one to Professor). New junior appointments are mentored by senior staff, and staff at all career stages have access to a wide range of career development courses and seminars run through the UoE's Institute for Academic Development (IAD), as well as additional mentoring through UoE-wide schemes such as 'Mentoring Connections'.

Sabbatical leave is encouraged for all research-active staff, at a rate of one semester for each six of service. Sabbatical leave is not an automatic entitlement, and applications are rigorously reviewed by School committees with regard to the quality of proposed outputs, and a formal research report is required upon completion of the sabbatical. The members of this UoA have benefitted from 15 such periods of sabbatical leave over the current cycle. Speculative projects, or those expected to bear fruit over a long time period are encouraged. For example, two Leverhulme Fellowships (**Desler, Kelly**) followed directly from groundwork undertaken during sabbaticals.

Staff are eligible to receive up to £1K p/a in research funding support, subject to successful review of a yearly individual research plan by the relevant School Research Committee. Larger projects are funded competitively up to £2,500 (and prioritised according to early-career status); ECA has made more than 50 such awards to members of this UoA in the current cycle totalling £77K. In addition, there are various schemes operating through CAHSS, funding even larger projects (up to £15K), often of an impact-focussed or interdisciplinary character. See Section 1: 'Facilitating Impact' and 'Supporting Interdisciplinary Research'.

### **Research Students**

We have seen a substantial increase in the number of PhD graduates this cycle. Across the UoA, 90 doctoral degrees were awarded in the reporting period (73 Music, 17 Film), compared with 36 in REF2014 (34 Music, two Film). Beyond this increase in numbers, research students in Music and Film play an increasingly vital role in the UoA, in initiating their own conferences and concert series, and through direct embedding in externally-funded research projects and established research groups. We have sought to support them through increased opportunities for funding, career development, interdisciplinary initiatives, and specialised PhD programmes driven by staff research expertise, including the PhD in Music Composition (6 graduations) and PhD in Creative Music Practice (15 graduations).

61 doctoral students have been supported by scholarships this cycle, compared with 31 in the previous cycle. Partly driving this increase in studentships has been the AHRC-funded Scottish Graduate School of Arts and Humanities (SGSAH) Doctoral Training Partnership, founded in 2014, which funded 13 PhD students over the current cycle (7 students were funded under the preceding AHRC block grant in REF2014). Other students (26) have received funding either through internal School-level and College Research Awards, or UoE-wide funding schemes such as the Edinburgh Global Research Scholarship and Principal's Career Development Scholarship. Further students have been supported by dedicated EU research project funding (six), and endowments (15).

Each student is assigned two supervisors in accordance with UoE postgraduate supervision practice. In addition, seven students (five graduated) were co-supervised with foreign HEIs during this REF period, including Aalto University of Technology, the University of Melbourne, and Université Paris-Saclay. Rigorous annual reviews are carried out with two members of staff, including a reader not on the supervision team. We are committed to enhancing the future career prospects of our graduates with research degrees. Beyond the wide variety of opportunities for training provided centrally by the IAD, SGSAH offers extensive PhD training

and career development programmes tailored for research students. We believe students are best served by being given the same academic status and freedom as permanent members of staff. As such, they may apply for travel funds for research visits and to present at conferences. Students at UoE own the rights to their intellectual property by default.

PhD students have played a leading role in the organisation of various concert series, including the long-running yearly *Dialogues* festival, supported in 2018 by a UoE Student Experience grant (£2,440). Postgraduate students in Music run their own annual conference, and have co-organised events such as *Gender Thing*, which explored gender-related topics in the academic world. An ECA-wide research group (*SiREN*) was cofounded by Music PhD students in 2016, and led workshops centred on music and interdisciplinarity, including international invited speakers. Five PhD students from the AAG formed the core of the organisational team for the 20<sup>th</sup> International Conference on Digital Audio Effects in 2017, including the editing and production of a 511-page SCOPUS-indexed printed proceedings.

Students who graduated this cycle have gone on to great successes across all research areas. Charlotte Desvages (PhD Music, 2018) won the Audio Engineering Society's Emil Torick Fellowship, awarded to one student worldwide per year, with a bursary of US\$10000). Michelle Devereaux (PhD Film Studies, 2017) was awarded a Leverhulme Early Career Fellowship (2020). Mei-Ling McNamara (PhD Film Studies, 2018) was Assistant Professor at University of Colorado before moving recently to Auburn University, Alabama, USA. Kirsteen Davidson Kelly (PhD Music, 2014) is the Creative Director of the Scottish Chamber Orchestra. PhD students who graduated in the current cycle have formed two start-up companies based on their own research (see Section 4).

### **Equality, Diversity and Inclusion**

We are committed to empowering all staff to realise fully their research ambitions. Beyond administrative measures detailed below, this commitment to EDI principles is deeply embedded in all three research themes, particularly in our extensive outreach activities that engage directly with diverse communities. For more detail, see Section 4: 'Wider Engagement with the Economy and Society' and 'Engagement with Diverse Communities and Publics'.

The constituent Schools for this submission have achieved Athena Swan Bronze certification during the current REF cycle, and both have appointed Equality and Diversity Directors who lead respective EDI Committees and work with staff to embed equality and diversity considerations across all administrative areas, including research management. All staff, whether full- or part-time, male, female or non-binary, however differently abled, are supported to the same level in developing research proposals, grant submissions or other research, KE and consultancy activities. Beyond their administrative role, the EDI committees actively promote awareness of EDI issues. For example, ECA's EDI Committee oversees various working groups to which our UoA staff contribute, including the 'Decolonising the Curriculum and Anti-Racism Working Group' (**Davis, Murray** and co-chaired by **Jago**) in partnership with BAME students and staff.

The composition of returned staff in this UoA reflects our ongoing commitment to improving staff gender balance. Staff in Film are exactly balanced at 50%/50%, and in Music the ratio has increased to 39%/61% F/M from 26%/74% F/M in REF2014. More striking in Music is the balance across senior-level staff, which is 50%/50% F/M, a significant change from REF2014, when the balance was 25%/75% F/M. Across the UoA as a whole, 47% of senior staff are female. This rebalancing has occurred partly through academic promotions; of the returned staff promoted in the current cycle, 50% were female, which is in line with the gender balance of the UoA as a whole. Eight staff out of 26 submitted are from outside the UK, and our PhD graduates this cycle are in majority international, with 62% from 29 foreign countries.

Two staff members in the UoA took parental leave during this cycle, and both were granted a subsequent sabbatical. Staff returning from leave can request a phased return, a reduced

teaching load to increase their opportunities for development and research, and temporary or permanent changes to their working hours (availed of by one returnee). The UoE's 'Caring for Carers' policy allows flexible working arrangements for staff with childcare or caring responsibilities. All ECA staff are entitled to apply for 'Additional Caring Costs' (up to £300) to cover costs involved in caring for dependants during travel for research purposes.

Following the UoE's REF2021 Code of Practice, we have adopted an inclusive approach to defining 'independent researcher', and have embraced the decision to return 100% of eligible academic staff. The output selection process took full account of EDI considerations and staff special circumstances, building in unconscious bias and EDI training. An independent oversight group reviewed the distribution of outputs across staff by gender and career stage (though we were unable to access accurate data on other protected characteristics because of the voluntary nature of this information). Special consideration was given to the disciplinary differences in modes/rates of research output in this submission that integrates Music and Film research.

### 3. Income, infrastructure and facilities

#### Research Income

Total grant expenditure over the REF period was £3.54M for the UoA, compared with £1.67M for all Music and Film staff in REF2014. The funding portfolio for this UoA has widened considerably since 2014, building on our experience, and reflecting the different modes of work of creative practitioners, scientists, and critical theorists, and our commitment to core research alongside new impact-generating initiatives.

We have targeted funding from the European Commission, and supported staff to design large interdisciplinary 'blue skies' research projects: the major HERA-funded 'CRUSEV' project was initiated and led by **Davis** during a Chancellor's Fellowship. We have also built on and shared our expertise in order to multiply our success. The ERC-funded NESS project (**Bilbao**) led, through mentorship within the AAG, to the ERC-funded NEMUS project (**Ducceschi**). This widening of horizons carries over to personal fellowships. In the previous cycle, three fellowships were awarded in the UoA in total (all Leverhulme Early Career). In this cycle, we have again been awarded three Leverhulme fellowships, now including a Major Research Fellowship; and alongside these we have been awarded a BA Fellowship, a Newton International Fellowship, and a Berlin Institute for Advanced Study Fellowship.

A new development this cycle has been a significant reorientation towards applied projects associated with knowledge exchange and impact generation. This was largely absent in the 2014 submission, and our approach has been successful. Brennan was PI in a series of five impact-focused AHRC grants over the cycle, covering many dimensions of live music and festivals, totalling £517K. Edwards leveraged his extensive expertise in electronic composition to lead mNap (AHRC, £25K), a project focused on the use of noise abatement pods in India. Other grants have resulted from the extensive work in digital audio technology in the UoA—these include two AHRC projects led by **Cook** (£116K total) as well as an ERC Proof of Concept grant geared towards pre-commercialisation activities (**Bilbao**, £107K). Others have resulted from the outreach dimension of our work in music psychology (**MacDonald**, UK Central Government, £188K total).

Beyond research funding bodies, numerous other sources have supported our research. SDI, which operates both as a production company and a research institute in the UoE, has raised £6.2M in this cycle to support filmmaking initiatives led by members of the UoA and the wider community of filmmakers in Edinburgh and abroad. Income comes through broadcasters, grants and charities, and is awarded through a rigorous period of development and pitching at international markets for feature documentaries. Commissions made to **Williams** totalled £73K

(BBC, National Theatre of Scotland, Scottish Opera and others). Industrial sponsorship funded a 1-year PDRA in the AAG.

### **Research Management and Infrastructure**

Our funding success has been enabled by an expansion in specialised support. At School level, all aspects of the development of funding proposals are handled by the School Research Offices (ROs) and KEI officers, including the management of internal peer review by at least two academic staff members. The size of ECA's RO has increased significantly since the last REF period, from 2.8FTE to 6.9FTE. New team members have dedicated roles, including the monitoring of open access compliance and the facilitation of knowledge exchange/impact. Additionally, 2.4FTE of dedicated professional service support is available for large-scale research centres and projects. Large grant applications are afforded additional support through the University-wide Edinburgh Research Office (ERO), which manages a large database of successful grant applications, and has a dedicated EU funding team.

To share good research practice, staff participate in ECA-level monthly 'Research Success' forums that focus on case studies and strategies for public and industry engagement, publishing, applying for grants, data management and ethics. The 'Funding Application Coaching Scheme' matches academics with staff who have experience of engaging research users in policy, practice and industry. 'Aftercare' for unsuccessful grant applications is provided via 'Upcycling Unsuccessful Grants 1-1' sessions. The 'Research Development' programme has supported the development of several funded projects, including Brennan's AHRC Leadership Fellowship and **Desler's** Leverhulme Fellowship.

More widely in the University, the CAHSS KEI, Challenge Investment Fund and ESRC Impact Acceleration Grants provide additional resources targeted towards interdisciplinary work and impact generation (see Section 1 for examples). Innovative and in-depth media training programmes offered by UoE press teams assist with public engagement.

### **Facilities**

St Cecilia's Hall, the UK's second-oldest concert hall, is the public face of the University's world-renowned Musical Instrument Collection, comprising some 6,000 objects. The Collection benefits from a specialist Curator, a full-time Conservator and the wider Museums Engagement team, supporting the scientific study of musical instruments through, e.g., **Ducceschi's** Leverhulme project and PhD research projects supervised by Music staff (**Kelly, Desler, Newton**). St Cecilia's Hall underwent a £6.5M redevelopment partly funded by the Heritage Lottery this cycle and reopened in 2017. It is used as a public engagement space and as a venue for electroacoustic performances (including our yearly festival *Dialogues*). Several other large building works projects have either been completed or approved as part of the University Estates Strategy within the current reporting period. 50 George Square, housing Film staff, was refurbished and reopened in 2014 (£15M), including a specialist HD/surround film screening room seating 80 and a PGR suite. There is also a major ongoing redevelopment of the Lauriston Place campus, which houses SDI and film theory staff, Alison House, housing Music staff, and the Reid Concert Hall (£25.2M total).

Music is supported by the large and well-stocked University library with a large number of academic texts (hard copy and electronic access). Various online databases are available, including the Naxos Music Library and the Entertainment Industry Magazine Archive. Alongside online streamable sources, the library stocks a large number of CDs, as well as 5,000 LPs and cassettes. Special collections include the Weiss Collection of Beethoven literature, the Scottish Jazz Archive, the Tovey Music Library, the Kenneth Leighton Archive, and a number of unique manuscript and print sources, such as the Wode Partbooks. There is a specialist film library including 9,000 titles on DVD/Blu-Ray, as well as a streaming service that now hosts over 2,000

films. In addition, the UoE's Scottish Studies archive, including many music and film artefacts, underwent a £2M refurbishment in this cycle.

A wide range of specialist technical facilities support diverse research strands within the UoA.

Six studios are operated in Alison House, which houses Music, alongside a newly designed 14-channel multimedia 'virtual reality' space (2018). A full recording studio is operated from the Reid Concert Hall and used to support and document various research projects in Music, including improvisation workshops led by **MacDonald**. Music is supported by a full-time studio manager and, for the last five years, by yearly paid internship posts reserved for recent postgraduates. In 2019, Music invested £431K in a set of 27 new Steinway pianos to become an 'all Steinway School'. AAG research facilities include an anechoic chamber, reverberation chamber, a new musical acoustics research laboratory and a 16-channel listening space, suitable for residencies for visiting composers and spatial audio research. Three GPU-based supercomputers are maintained by ECA Computing Services and support a sound synthesis service for musicians worldwide. In addition, time on the UK supercomputer ARCHER, managed by EPCC, was made available for acoustics research using a Directors' Time allocation.

SDI office space can accommodate up to eight people. It benefits from access to the recently installed Cinemaspace, a custom-built screening room with the ability to connect to a Da Vinci grading suite. Avid Edit suites, including the Cinemaspace, are supported by a full-time technician. The Resource Centre at 50 George Square also has video, audio and editing equipment.

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

##### **Research Collaborations**

Collaboration with other HEIs is a strong dimension of this UoA; over the REF period, staff have produced research outputs in conjunction with 79 researchers from 46 HEIs and industrial partners from 18 countries. We are well-equipped to accommodate visitors, with additional office space available. In addition to the many visits supported by large EU projects, staff in the UoA have hosted staff and student research visits on a further 24 occasions. Research funds can be used to cover costs of research visits by staff or return visits.

Major international collaborations follow from wide-ranging projects funded by the European Commission. **Davis**'s HERA-funded project CRUSEV had research teams in Germany, Poland, Spain and the UK, with 19 researchers in total, and 18 associated partners (including galleries, NGOs, and activist groups). **Davis** also secured a Royal Society of Edinburgh visiting fellowship for Prof. Agnieszka Kościńska, from the University of Warsaw (2017, £5K). The ERC-funded NESS project included co-supervision of PhDs in France and Finland, and collaborations with ten UK/international artists, including Hong Kong composer Samson Young, whose resulting work became an installation at the Guggenheim Museum in New York (2018), and the Talbot Rice Gallery at UoE (2019). See Figure 3.



Figure 3. *Possible Music #2*, Samson Young, 2019.

Photograph: Talbot Rice Gallery.

Other international collaborations include: the 'Modelling of a Virtual Violin' project with the Sibelius Academy (**Newton**); **Overy's** visiting professorship at Western University, Canada; the 'Culture in the Cold War' Institute funded by the National Endowment for the Humanities in the USA (**Kelly**); the Leverhulme-funded international network 'Phantom on Film' (**Davison**); and the 'Theorizing Sonata Form in European Concert Music' project funded by the Social Sciences and Humanities Research Council of Canada (**Taylor, Co-I**). Collaborations with UK HEIs include the Scottish Music and Health Network, led by **MacDonald** and **Overy**, with Glasgow Caledonian. Eight edited volumes have been produced by

members of the UoA in collaboration with researchers in the UK and abroad.

### **Wider Engagement with the Economy and Society**

Our general strategy exploits the range of our work in the creative arts, technology and the social sciences, extending our engagement naturally outwards to industry, the creative industries and to media exposure. For the impact of our work in music, health and wellbeing (**MacDonald**), and documentary film as palliative care (**Hardie**), see the accompanying case studies.

Our staff have founded various outward-facing arts organisations: 'Noise Opera' was founded by **Williams** jointly with the University of East Anglia. The opera company has won awards from Arts and Business Scotland, and a recent production was nominated for the Sunday Herald Culture Awards; it has been commissioned by Scottish Opera, the National Theatre of Scotland, the BBC Scottish Symphony Orchestra, and Tapestry, based in Toronto. **MacDonald** founded the 'GIObabies' yearly event with the Glasgow Improviser's Orchestra, and 'Jazz for Toddlers' with the London Jazz Festival; both explore music improvisation for young children. **Chambers** is the founder and director of the annual 'Folk Film Gathering Festival', in partnership with the Filmhouse Edinburgh.

The intersection of Science, Technology and Creative Practice in Music has generated a number of Edinburgh-based technology-focused spinout companies in the area of electronic music, sound effects, virtual/augmented reality and building acoustics. **Skoogmusic** followed from a joint research effort (NESTA, £195K) between the MHS group and the AAG in 2006. **Krotos**, led by a postgraduate in Sound Design was founded in 2013, and is a leading developer of sound effects, used most recently in 'The Lion King' and 'Game of Thrones'. **Two Big Ears**, led by postgraduate students in the UoA was acquired by Facebook in 2016. **Physical Audio** and **Roomerical**, both founded by PhD graduates this cycle, are start-up companies that emerged from the ERC-funded NESS project. Roomerical's virtual architectural acoustics system won an award from Scottish Edge. This entrepreneurial culture is sustainable, particularly through the additional regional support of the £6.5M AHRC-funded Creative Informatics hub that funded Physical Audio and Roomerical in 2019-20 (£24K total). Large industry networking events run by the AAG include the 20<sup>th</sup> International Conference on Digital Audio Effects in 2017, with 80 industrial delegates and sponsored by 14 companies including Oculus and Yamaha.

Our staff participate widely in major public-facing events. These include public talks at the V+A Museum through the Leverhulme-funded 'Phantom on Film' network (**Davison**), and various lectures and showcases led by the AAG (Audio Engineering Society Scotland and the Edinburgh Science Festival). **Murray** co-organised the second annual Scottish Film Summit with

Edinburgh's Centre for the Moving Image, with 100 attendees across the wider Scottish film community. **Cook's** working VR system was demonstrated on 12 occasions, including at South-by-Southwest (Austin, Texas) and The Manchester Science Festival. Our staff have appeared widely on national and international media to discuss research-related topics and to give expert opinions. These include **Jago's** numerous appearances on BBC Radio Scotland (including a discussion of 'Coronavirus music' in 2020), **Nelson** on BBC Radio Scotland, **Overy** on BBC News Online and the BBC World Service, **Sorfa** in the Radio 4 programme 'Film and Existentialism', and interviews on foreign radio and television broadcasts (**Taylor**, TVR2, Romania, **Kelly**, SWR2, Germany, and **Overy**, CBC Radio, Canada). **Parker** has showcased his music on national media (Hear and Now, Radio 3). Our staff also contribute to national debate through authored opinion pieces (**Davis**, Sunday Times, **Sorfa**, The Scotsman, **MacDonald**, The Herald).

### **Engagement with Diverse Communities and Publics**

Our work engages directly with diverse communities, locally and worldwide. **Davis's** large international CRUSEV project involved close work with a number of activist groups in Europe, including the Berlin-based Deutsche AIDS-Hilfe, an organisation supporting people affected by HIV/AIDS and the Warsaw-based Trans-Fuzja, a grassroots organisation dedicated to trans and nonbinary politics. **Davis** and **Murray** ran the 'Grace Jones' conference in 2017, which focused on non-normative forms of black culture and identity, androgyny, sexuality and performativity within popular music. The practice-based community music work of **Isaacs** and **MacDonald** (see the accompanying case study) is aimed at improving health and wellbeing in many diverse groups from children to refugee communities to the socially disadvantaged. Our students engage with the wider debate on questions of inclusivity through, e.g., the *Decolonising the Musical University* conference (total attendance 479), co-organised by a recently graduated PhD student in Music in 2020 as a virtual event in response to the COVID-19 pandemic.

SDI's mission is to 'explore the different ways in which originality and diversity can be achieved through restructuring – or "decentring" – production and distribution processes'. Films address palliative care (**Hardie**, *Seven Songs for a Long Life*; see the accompanying case study) and indigenous communities in Mexico (**Jansen**, *Kii Nche Ndutsa*). Larger filmmaking initiatives are led by **Mendelle**, who has collaborated with the British Council to develop the far-reaching short-film series *Stories*. Within this project, she conceived and produced a series of short films set in Libya and directed by Libyan filmmakers, and worked with the British Council and to help vulnerable and disabled filmmakers in Jordan, Syria, Yemen, Vietnam, Indonesia, China (£243K, 2018-19). SDI launched the 50:50+ campaign (2019) to address gender imbalance in documentary filmmaking. A mentorship scheme *New Voices* (£49K, Edinburgh City Council & partners) was launched to support BAME women filmmakers. *Phenomenal Women* is a scheme that promotes female directors at the Edinburgh International Film Festival, and ran in online format in 2020 in response to the COVID-19 pandemic.

### **Contribution to the Discipline and Research Base**

Members of the UoA serve in senior editorial positions for 23 international journals, including as editor-in-chief/general editor for *Contemporary Music Review* (**Nelson**), *Film-Philosophy* (**Sorfa**), *Jazz Perspectives* (**Jago**), the *Journal of Musicology* (**Kelly**), *Music & Letters* (**Taylor**), *Visual Culture in Britain* (**Murray**), and the *Film Education Journal* (**Chambers**, also founder). They have edited special issues of journals including *19<sup>th</sup> Century Music*, *Animation Journal* and *Third Text*.

Staff play a leading role in research stewardship worldwide. **Davis**, **Davison**, **Kelly** and **Nelson** were members of the AHRC Peer Review College in this cycle. **Kelly** was appointed vice president of the Royal Musical Association in 2019, was a panel member for the ERC in 2020, and an expert panel member of the AHRC/Deutsche Forschungsgemeinschaft funding scheme. **Bilbao** was elected as a Senior Member of the IEEE in 2015. Staff members have served on the

boards of many international conferences and festivals, including DOXBOX, the European Music Analysis Conference, the Sound and Music Computing Conference, and on juries for Music Nova, the Africa in Motion Film Festival and BAFTA Scotland. **Davie** and **Mendelle** were elected to the Academy of Motion Pictures Arts and Sciences (AMPAS) in this cycle.

Staff have won a number of international prizes and awards for their research in this cycle, across all areas of the UoA. **Jansen** won best film awards on five occasions, including at Oaxaca FilmFest (2018), **Mendelle** at the Parnu International Film Festival (2017), and **Williams** won five Dora awards for *Rocking Horse Winner* in Toronto (2017). **Bilbao** has won three best paper awards at international conferences, including at the Sound and Music Computing Conference (2017).

Staff in the UoA have given major keynote lectures at conferences, festivals and symposia on 33 occasions, including: the International Computer Music Conference (**Nelson**, Athens, Greece, 2014), Sound and Music Computing Conference (**Bilbao**, Maynooth, Ireland, 2015), GDR Today IV (**Kelly**, Newcastle, 2018), and the Philosophical Film Festival (**Sorfa**, Skopje, Macedonia, 2019). An additional 376 lectures and talks have been invited at conferences, symposia, festivals and HEIs. Conference presentations include: the Conference on World Affairs (**Parker**, Boulder, USA, 2015), Media in the Arts (**Valiquet**, Birmingham, 2018), the Eleventh Music Theory and Analysis Conference, (**Taylor**, Belgrade, Serbia, 2015), and the NHS Research Scotland Conference (**Overy**, Perth, 2017). Talks at HEIs include: King's College London, University of Oxford, University of Surrey, University of Cambridge, Harvard University, Aalto University, and Aalborg University Copenhagen.

Members of the UoA serve as peer reviewers for a wide range of journals (58), including the *Journal of the Royal Musical Association*, the *Proceedings of the Royal Society A*, and *Screen*. They also review full conference proceedings articles for many international conferences, including the IEEE International Conference on Acoustics, Speech and Signal Processing, and the International Computer Music Conference. Members review book proposals for 12 academic publishers, including Cambridge University Press, Oxford University Press, and Ashgate. In addition, members review grant proposals through UKRI (EPSRC and AHRC), the ERC, and numerous foreign funding bodies including the Social Sciences and Humanities Research Council of Canada, DAAD, the Austrian Academy of Sciences and the Israel Science Foundation.

Staff in the UoA have served as PhD external examiners on 46 occasions, including at: Royal Holloway, UCL, the Université de Paris VI, the University of Valencia and the University of Melbourne. Through the FP7-funded Marie Curie ITN BATWOMAN (2013-2017), AAG staff provided training in acoustics for PhD students at 11 HEIs across Europe.