Unit of Assessment: 30: Philosophy



Institution: University of Bristol

1. Unit context and structure, research and impact strategy

The Department of Philosophy (hereafter "the Department") is a dynamic and flourishing unit, with an international reputation for its research excellence. The Department's members have diverse philosophical interests, clustered into four main groups:

- (i) Philosophy of science, epistemology and metaphysics
- (ii) Logic and philosophy of mathematics
- (iii) Value theory, including ethics, aesthetics and political philosophy
- (iv) History of philosophy

These groupings are informal, and many staff members straddle them. Thanks to the Department's inclusive ethos, members of all four research groupings interact and collaborate. The Department hosts a weekly seminar series with external speakers and an internal work-in-progress seminar, both well-attended by staff and PhD students. The Department also hosts a large number of academic and public engagement events each year.

In REF 2014, the Department identified three future research objectives: (i) to consolidate our world-leading position in the philosophy of science, logic and mathematics; (ii) to develop medical humanities; and (iii) to enhance our strength in value theory. All three objectives have been met. Objective (i) was achieved by hiring six early career researchers (ECRs) (Thébault, Campbell-Moore, Konek, Zuchowski, Tho, Stern), and by the ongoing research achievements and grant capture of existing staff members. Objective (ii) was achieved by co-hosting (with Durham) the award-winning Life of Breath research project from 2014-20, funded by a Wellcome Trust Senior Investigator Award to Carel; by strengthening our links with the medical faculties; by setting up the Centre for Health, Humanities and Science, and by successfully applying for and running a Medical Humanities research strand within the University's Elizabeth Blackwell Institute (EBI) for Health Research. Objective (iii) was achieved by hiring two ECRs (Wilson, Sticker) who work in value theory.

Our overarching aim for the next five years is to build on our existing research strengths, to continue to produce high-quality and impactful research, to increase our cohort of PhD students, and to continue our success at winning research grants. One specific objective is to support our new early career colleagues (of whom eight have been appointed in the last five years) to develop their careers further and become research leaders. We will achieve this through ongoing mentoring, supportive line management and targeted allocation of research leave. A second objective is to make replacement hires in political philosophy, logic, and philosophy of biology / medicine, to preserve our existing research strength in these areas. A third objective is to adjust to the new research grant environment in which we find ourselves post-Brexit.

The Department has fostered strong links with research groups around Europe, facilitated in part by the large number of staff members who are EU nationals, and / or have studied or worked in the EU. Over the last seven years we have hosted a series of joint biennial workshops with the Munich Centre for Mathematical Philosophy; and a similar series of joint workshops with the University of Groningen. In the current assessment cycle, one staff member (**Pettigrew**) has been involved in a



successful Leverhulme Trust International Network Grant bid, bringing together researchers from Bristol, Munich, Groningen, Tilburg, Lund and Pittsburgh. Further afield, we have recently established a research connection with Kyoto University in Japan. One staff member (**Okasha**) has an ongoing collaboration with researchers from Kyoto University, which has led to bilateral research visits; a recently departed staff member (**Leon Horsten**, who left in Sep 2019) spent an extended sabbatical period in the Philosophy department at Kyoto, building up research links.

The Department is home to a substantial volume of inter-disciplinary research activity; this is one of its standout features. Many staff members have training in a discipline in addition to philosophy, and a number of these publish regularly in the professional literature of another discipline. (For example, **Thébault** has published in *Physics Letters B* and in *Classical and Quantum Gravity*; **Ladyman** has published in *Foundations of Physics, Entropy* and *Minds and Machines*; **Okasha** has published in *Journal of Theoretical Biology, Journal of Evolutionary Biology*, and *Philosophical Transactions of the Royal Society B*; **Carel** has published in the *British Medical Journal* and, jointly with **Pettigrew**, in *The Lancet*; and **Fujimoto** and **Pettigrew** have both published in *Annals of Pure and Applied Logic*.) We enjoy strong links with other departments at Bristol, including Medicine, Psychology, Physics, Economics, Politics, Sociology and Biology, and routinely host joint research events with them. We have particularly strong links with the Bristol School of Mathematics: one staff member (**Fujimoto**) has a joint appointment in the School of Mathematics, and three further staff members (**Ladyman**, **Pettigrew** and **Campbell-Moore**) work closely with members of this School.

In the last seven years, our inter-disciplinary activities have received a significant impetus thanks to the establishment of four new Faculty Research Centres, all with significant involvement from Department members. The Centre for Health, Humanities and Science was set up by Carel in 2016 and has become a hub for medical humanities research at the University. This has helped to establish research connections between the Philosophy, English, and History departments and our Medical Schools, and with the University's EBI for Health Research. Migration and Mobility Bristol, of which former staff member Chris Bertram (retired in Sep 2020) was a founder member, was set up in 2016 to provide a focal point for research on the movement of people around the globe, furthering links between Philosophy, Law and Social Science. The Centre for Science and Philosophy, directed by Ladyman, was set up in 2014 and provides a focal point for much of the philosophy-of-science related research and public engagement in the Department. The Centre for Black Humanities, co-founded in 2016 by Burch-Brown in collaboration with colleagues in the Faculty of Arts, provides a hub for work on African history, philosophy and arts. Each of these research centres hosts regular seminar series and workshops, welcoming a stream of distinguished visitors from the UK and abroad. Thanks to the activities of these centres, staff and students in the Department enjoy an outstanding level of exposure to inter-disciplinary work.

The success of our current research strategy is evident from our research grant capture, graduate student placement record, international reputation, thriving research culture, and the exceptional productiveness of staff members. Our REF submission includes no fewer than ten monographs, which is striking given the high proportion of ECRs in the department. Evidence of the department's international reputation comes from the 2017-18 Philosophical Gourmet Report, in which the Department was ranked 9th overall in the UK, but 1st for Mathematical Logic, 1st for Philosophy of Biology, joint 1st for General Philosophy of Science, 2nd for Decision, Rational Choice and Game Theory, joint 2nd for Philosophy of Mathematics, 3rd for Philosophy of Social Sciences, 4th for Philosophy of Physics, and 4th for Philosophical Logic.



During the current REF cycle, individual department members have held several major research grants; see section 3 for details.

The Department has enthusiastically embraced the impact agenda and has developed a multipronged strategy to achieve impact. Firstly, the Head of Subject seeks to identify research that has impact potential at an early stage, as part of the annual research review process. Where such potential is detected, the university's dedicated impact team (who are part of Research, Enterprise and Development (RED)), work with the staff member in question. The RED team provide detailed advice on how to maximize research impact. Other dedicated university bodies, including Policy Bristol and the public engagement team, also support impact work. Secondly, as part of the Faculty's grant writing feedback scheme, senior staff members offer advice to junior staff, at an early stage of grant writing, to help them identify the impact potential of their work. Thirdly, the department has a dedicated Impact Coordinator, who works with the Head of Subject to identify possible Impact Case Studies, and to provide guidance to staff working on these case studies.

The net effect of our impact strategy is that the Department's research has steadily increased its impact over the assessment period. Our three submitted Impact Case Studies owe their success to the strategy outlined above, having received support from the earliest stages at both department and university levels. **Ladyman** was awarded internal funding by RED in both 2018-19 and 2019-20 to help develop impact from his "Philosophy of Science in Science Education" project, which works in partnership with teachers and teacher-trainers to use philosophy of science to inform science teaching. **Burch-Brown** received considerable assistance from the RED team for her case study on contested heritage and slavery in 2019-20, with collecting evidence and organization of the material. **Carel's** work on the role of philosophy in medical practice was identified as having impact potential over a decade ago. **Carel** has received extensive internal support in developing the impact of her research, including support from RED for her successful bid to the Wellcome Trust for the multi-year Life of Breath research project, in which impact played a large part; this project was awarded the Arts and Humanities Research Council (AHRC)-Wellcome Health Humanities Medal: Inspiration Award (2018), for its public engagement program.

The Department is fully supportive of the open research environment, and staff have been proactive in their contributions to promoting open access publishing. **Okasha**, in his capacity as President of the European Philosophy of Science Association (EPSA), has been involved in extensive discussions with Springer (who publish EPSA's journal, The European Journal for the Philosophy of Science) about the move to open access, and about the suitability of Springer's concept of "transformative journals" for the philosophy discipline. **Okasha** has also been involved in enlisting EPSA's support for a multi-national initiative to start an open access book series in the philosophy of science. **Pettigrew** is an associate editor at *Ergo*, a general open access philosophy journal; and he recently co-edited the *Open Handbook of Formal Epistemology*, the first open access handbook in this area, published through *PhilPapers*. He is also on the editorial board for an open access book series in philosophy of science published by the University of Calgary Press. **Carel** assisted in setting up the first open access philosophy of medicine journal, *Philosophy of Medicine*, and was a subject editor in it.



2. People

1. Staffing Strategy and Development

The department currently has 17.5 permanent staff members. We have four professors (Havi Carel, James Ladyman, Samir Okasha, Richard Pettigrew); one reader (Tuomas Tahko); six senior lecturers (Anthony Everett, Seiriol Morgan, Giles Pearson, Karim Thébault, Jason Konek, Joanna Burch-Brown); six lecturers (Catrin Campbell-Moore, Tzuchien Tho, Alan Wilson, Lena Zuchowski, Martin Sticker, Kentaro Fujimoto); and one research fellow who will become a permanent lecturer from 2023 (Johannes Stern).

All of the above are 100% FTE staff on Pathway 1 (with research and teaching contracts, hence Category A), apart from **Fujimoto** who is a 50:50 joint appointment with the School of Mathematics. The department does not have any Category A staff on short-term contracts. We currently have one permanent lecturer (Max Jones) and one fixed-term lecturer (Jonathan Grose) on Pathway 3 (teaching only contracts, hence not Category A). In addition, several honorary staff members contribute significantly to departmental life: Ken Binmore (emeritus professor of economics); Chris Bertram, Finn Spicer, Andrew Pyle and Andrew Woodfield (retired department members); and Alexander Bird (a former staff member).

The composition of the Department has changed considerably over the assessment period, as has the seniority profile. Five senior staff members have left the Department. Three junior staff were hired but left within a few years for positions at other institutions. Eight members of the existing permanent staff were hired during the assessment period, seven at lecturer level and one as reader; two of the lecturers (**Thébault** and **Konek**) have since been promoted to senior lecturer. All new staff members have been successfully integrated into the department. These hires resulted from strategic job searches, for which we advertised in particular sub-fields of philosophy, with the aim of maintaining / increasing our research strength in those sub-fields. In each of the eight cases, we were able to hire promising junior staff, with outstanding research achievements and excellent publication records. Three of our recent appointees (**Stern**, **Tahko** and **Konek**) have already won prestigious European Research Council (ERC) grants.

In addition to the permanent staff and teaching fellows, the Department hosts a number of post-doctoral researchers each year, who make an invaluable contribution to our research environment. These are funded either by research grants held by staff members, or by grants won in internal or external competition. We currently have six postdoctoral researchers in post: Robert Chapman (University of Bristol Vice-Chancellor's Fellow 2019-2021); Toby Friend (2019-22, ERC funded); Vanessa Seifert (2018-21, ERC funded); Samuel Kimpton-Nye (2020-22, ERC funded); Thomas Schindler (2020-23, ERC funded); Dan Degerman (Leverhulme Early Career Fellowship 2020-23). Over the assessment cycle, a further fourteen postdoctoral researchers were hosted by the Department, funded by grants from the ERC, British Academy, AHRC, Leverhulme Trust, Wellcome Trust, and the Social Sciences and Humanities Research Council of Canada.

The Department has long attracted visits by leading international researchers, for both short and long-term stays. The University's Benjamin Meaker Fellowship scheme provides funds for visiting academics to spend up to 3 months in Bristol, with the requirement that they offer a public lecture. Under this scheme, the department has hosted visitors from Monash, Michigan, Duke, St. Petersburg, Chicago and Pitesti among others. Other academic visitors, mostly funded by research



projects, have come from Oxford, Carnegie-Mellon, Three Gorges (China), Macquarie, Austin-Texas and others.

We have an excellent track record of helping our fixed-term teaching fellows and post-doctoral researchers develop their careers and move on to other academic positions. During the assessment period, the following fixed-term lecturers and postdoctoral researchers have held positions in the Department and then secured a position at another institution: Mark Pinder (2017-8, now a lecturer at the Open University); Giulia Terzian (2015-17, moved to a post-doc at the University of Campinas, Brazil); Ana-Maria Cretu (2017-18, moved to a post-doc at the University of Edinburgh); Jason Konek (2014-17, moved to Kansas University, now permanent at Bristol); Bengt Autzen (2015-17, now a permanent lecturer at UCC, Ireland); Ben Levinstein (2014-17, now an assistant professor at University of Illinois-Urbana); Ryan Sammaroo (2014-6, now a post-doc at Oxford); Johannes Martens (2014-17, now permanent at Paris-Sorbonne); Sean Gryb (2017-8, now doing a second PhD at University of Groningen); David Crawford (2014-17, moved to a lectureship at Cambridge HPS); Jonathan Grose (2015-17, moved to a postdoc at Southampton University); Katherine Puddifoot (2013-15, now a lecturer at Durham University); Patricia Rich (2015-16, now a lecturer at Hamburg University); Alfred Archer (2015-16, now an assistant professor at Tilburg University); Alexander Franklin (2019-20, now permanent at Kings College London (KCL.)

In accordance with the Concordat to Support the Career Development of Researchers, staff are fully supported at all stages of their careers, thanks to the following institutional arrangements:

- (i) Annual Research Review. This review, conducted by the Head of Subject, involves discussing with staff members their plans for research, publication, grant applications, and impact activities.
- (ii) *Mentoring of Junior Staff*. All new staff members are assigned a mentor, who is a senior departmental member, not their line manager, and provides ongoing advice.
- (iii) Workload Credits for Research. All staff members receive an annual allocation of workload credits for research. Newly appointed lecturers receive an enhanced allocation.
- (iv) Feedback on First Drafts. We have recently instigated a scheme whereby senior staff members offer feedback to junior members on first drafts of their work, including offering advice about suitable publication outlets.
- (v) *Initial Service Review*. All new staff have a probationary "initial service" period of 12 months, during which they have regular meetings with their line manager to discuss performance, including research
- (vi) *Staff Training*. All staff are offered training in grant writing, public engagement, and developing impact, organized by the University's Research, Enterprise and Development (RED) division.
- (vii) Regular Research Leave. All permanent staff members receive one semester of research leave in seven, with the opportunity to extend this either by applying for externally-funded leave, or for a University Research Fellowship, an internal scheme that offers a matching semester of leave. (viii) Grant Writing Feedback. All grant applications by staff members are read by two senior staff prior to submission, who offer detailed advice, ensuring that our in-house expertise in grant writing is transmitted to our early career colleagues.
- (ix) *Impact Support*. Considerable support is provided to assist staff members develop the impact of their research, as described in Section 1. Staff members preparing an Impact Case Study are awarded workload credits, as is the Impact Coordinator.



(x) Returning Carer's Scheme. Staff returning from a period of parental leave can apply for teaching relief in their first year back. Several staff members have successfully applied during the assessment period.

2. Research Students

The Department has a strong cohort of research students (M Phil and PhD) – about 40-50 in a typical year – many of whom have external funding, studying both part-time and full-time. Over the assessment period, 48 doctoral awards have been made. In line with the Department's growing reputation, demand has increased markedly over the last decade, so we now receive many more applications for doctoral study than we can accept. We host research students from the UK, EU and elsewhere, including China, India, Latin America, and Australasia, which creates a diverse and cosmopolitan atmosphere. Research students play an active role in the Department's life and are strongly encouraged to attend departmental research events. The research students run their own weekly work-in-progress seminar, designed to give them experience at presenting their research in a supportive environment. Every year, the research students organize a series of reading groups in the Department.

Recruitment of research students is carefully managed, overseen by the Head of Subject. A dedicated staff member ensures that our website is up to date. Queries from prospective research students are answered promptly. The postgraduate admissions officer ensures that applications are turned around within three weeks. Particular attention is paid to equality and diversity issues. As a result, our intake of research students has been diverse in respect of age, gender, nationality, race, and disability, resulting in a culturally diverse and inclusive environment.

The Department places great emphasis on the supervision, training and monitoring of its research students. All research students are assigned two supervisors. The expectation is that students meet with one or other supervisor every 2-3 weeks. Records of all meetings are kept. All research students undergo a rigorous and supportive annual progress monitoring (APM) procedure. For research students moving from first to second year, this involves submitting a complete chapter and dissertation outline, followed by an oral examination with two staff members who are not their supervisors. This process provides invaluable feedback to research students and helps ensure consistency in standards. In subsequent years, annual progress monitoring is a lighter-touch process, but is still rigorous and properly documented. Overall, our monitoring process succeeds in identifying and ironing out any problems at any early stage, as evidenced by our low drop-out rate and high rate of completion.

The Bristol Doctoral College provides centralized support for research students at the University, with a focus on personal and professional development. A wide range of training courses, workshops, and online resources are provided, targeted to the needs of the individual research student. Annual events organized by the Doctoral College include a research student inauguration event, and a flagship festival of postgraduate research. In addition, the Department provides its own training to research students who teach undergraduate seminars, and provides extracurricular seminars to help research students intending to continue with philosophy to prepare for academic careers, including sessions on publishing, CV writing, and navigating the job market.

The University of Bristol led the successful bid for the AHRC South West and Wales Doctoral Training Partnership (SWWDTP) scheme, which was then renewed as SWWDTP2. Our students have been highly successful at securing funding from SWWDTP and SWWDTP2, with a total of



twelve awards during the assessment period. Other research students have been funded by awards from the Darwin Trust, the British Society for the Philosophy of Science Doctoral Scholarship, and the National Institute for Health Research. In addition, four students funded by our ERC and Wellcome research projects have been awarded PhDs during the assessment period. The department currently hosts three PhD students funded by the three ERC projects currently underway. Finally, over the assessment period the department has hosted international research students with funding from their home countries, including Mexico, Chile, Australia, China, Portugal and Taiwan.

We encourage our research students to start thinking about their future academic careers from an early stage, and to start publishing as soon as they have developed suitable material. The department provides dedicated training sessions for its research students to assist them with publishing, job applications and professionalization. This has proved highly successful, evidenced by the large number of PhD students who have managed to publish their work during the assessment period, including in the following journals: *Biology and Philosophy, British Journal for the Philosophy of Science, Ethical Theory and Moral Practice, Philosophical Studies, Erkenntnis, Journal of Medical Ethics* and *Philosophical Psychology*.

The department has been highly successful in helping our research students secure academic positions upon graduation. Over the assessment period, the following Bristol students have been awarded PhDs and then gone on to secure academic positions elsewhere: Mark Pinder (PhD 2014, Lecturer (tenured), Open University, 2017-); Katie Monk (PhD 2014, Teaching Fellow in Philosophy, Edinburgh University, 2017-); Benjamin Eva (PhD 2015, Humboldt Postdoctoral Research Fellow, University of Konstanz, 2017-2020; Assistant Professor, Duke University 2020; Oliver Lean (PhD 2016, Postdoctoral Research Associate, University of Calgary, 2016-18); Christopher Burr (PhD 2016, Postdoctoral Researcher, Oxford Internet Institute, 2018-); Jonas Waechter (PhD 2017, Postdoctoral Fellow, University of Geneva, 2019-); Niall Patterson (PhD 2018, Postdoctoral Researcher, University of Helsinki, 2019-); Max Jones (PhD 2015, Postdoctoral Researcher, University of Leeds, 2016-18); Megan Blomfeld (PhD 2014, Assistant Professor, University of Sheffield, 2018-); Pavel Janda (PhD 2018, Postdoctoral Researcher, University of Gdńsk, 2018-); Benedict Easthaugh (PhD 2015, Postdoctoral Researcher, University of Aberdeen 2015-18; Postdoctoral Fellow, Munich Centre for Mathematical Philosophy, LMU Munich, 2018-); Vincenzo Politi (PhD 2015, Postdoctoral Researcher, Institute for Philosophical Research, National University of Mexico, 2016-18); Geoff Keeling (PhD 2020, Interdisciplinary Ethics Fellow, Stanford University, 2020-22).

In addition, a further twelve former Bristol research students, who completed their PhDs earlier than 2014, went on to secure academic positions at institutions including Cambridge, Durham, LMU Munich, Leeds, Erasmus University, University of California Davis, and University of Sao Paolo.

Our research students are highly active in the profession. Geoff Keeling (PhD 2020) was elected President of the British Postgraduate Philosophy Association (BPPA) in 2018; Sorana Vieru (PhD candidate 2016-19) served as Vice-President (Higher Education) of the NUS from 2015-17; James Wilson (PhD 2020) serves as webmaster for the European Philosophy of Science Association (2018-22); and Lucienne Spencer (PhD candidate 2018-21) is currently the postgraduate representative for the Society for Women in Philosophy (SWIP). Our research students have also been active in conference organization at Bristol over the assessment period. Events include the



postgraduate "Gender and Autonomy" conference in June 2017; the annual conference of the International Society for Philosophy of Chemistry in July 2017; the Metaphors and Analogies in Evolutionary Biology workshop, June 2014; the Bristol-LSE Graduate Formal Epistemology Workshop in June 2016; the Epistemic Utility Theory conference in June 2016. Finally, from 2018-2020 two of our PhD students organized a series of "Women in Philosophy" talks (see below) and a feminist philosophy reading group.

3. Equality, Diversity and Inclusion

The University of Bristol has a proactive and well-developed Equality, Diversity and Inclusion policy, which is fully implemented at faculty, school and departmental levels. Particular attention is paid to promoting inclusion, ensuring fairness in recruitment, addressing the gender imbalance especially in relation to promotion, supporting disabled staff, implementing policies to help staff with caring responsibilities, and supporting staff of all backgrounds to develop their careers. The University has been awarded an Athena SWAN Bronze Award in recognition of its efforts to address workplace inequality.

The University encourages its staff to apply for flexible working arrangements when necessary, including remote working, and flexible working. These arrangements are available to all staff, however they particularly facilitate staff with caring responsibilities, and staff with disabilities, to continue their academic careers. The University is committed to enabling staff members with protected characteristics, such as disabilities, to pursue their research careers. Adjustments and additional support, including moving lectures to more accessible locations, providing disabled parking spaces, and providing suitable office furniture, are agreed on and implemented on an individual basis.

The University has recently taken concrete steps to support staff and research students with caring responsibilities to travel to conferences and to attend training events. In January 2019 the University's Travel and Expenses policy was amended to allow claims for childcare while engaged in work-related travel. Several university-wide schemes provide tailored support for staff returning from periods of leave or ill health; these include the Returning Carer's Scheme; the Maternity and Paternity Coaching Service, which provides career advice and support; and the Parent and Carer's Staff Network.

The Department has worked hard to promote equality, diversity and inclusion, both by implementing university-wide directives and through its own initiatives. The Department follows the Good Practice Guidelines designed by the British Philosophical Association and the Society for Women in Philosophy, which addresses gender bias in relation to conferences and seminars, sexual harassment, and staff-student relationships. Every five years, we conduct an audit in which a staff member is invited to meet with students and staff to discuss the climate in the department, and to prepare a report with recommendations. The Department holds regular "women in philosophy" sessions in which visiting speakers talk to our graduate students about career development and overcoming obstacles for women in the profession. The Department is a member of Minorities and Philosophy (MAP), a student-run worldwide network. In both 2017 and 2019, Bristol hosted a MAP student conference, with departmental support, entitled "Gender and Autonomy" and "Postcolonial and Decolonial Reception of European Thought" respectively. In March 2019, the Department hosted a Women in Philosophy postgraduate conference (to coincide with International Women's Day 2019), featuring a range of internal and external speakers.



The Department provides regular training sessions for staff and students on implicit bias, "chilly climate" and stereotyping. Departmental staff have developed a set of Active Bystander Training materials presented annually in a seminar for staff and postgraduates. Two staff members (**Carel** and **Pettigrew**) have been particularly active in this area, offering EDI training to the Department and across the university. **Carel** and **Pettigrew** developed a set of inclusion guidelines that have been formally adopted by the Arts Faculty. In recognition of the lead taken by the Philosophy Department in addressing implicit bias, **Carel** was seconded to the University's Equality, Diversity and Inclusion Steering Group (2018-20) to help promote good practice around the University.

The Philosophy UoA has paid full regard to equality and diversity in the construction of its REF submission. In accordance with the University of Bristol's REF2021 Code of Practice, the output portfolio has been selected in a fair and rigorous way. All eligible staff were given equal opportunity to propose their strongest outputs for consideration. The members of the UoA Committee undertook training in equality, diversity and inclusion, provided by the University's Research and Enterprise Policy Team and its Diversity and Inclusion Team. **Carel** was a member of the University's REF Extenuating Circumstances Committee.

3. Income, infrastructure and facilities

1. Income

The Department has achieved considerable success in generating research income. All research-active staff are encouraged to submit bids to funding bodies. All staff are supported in preparing research grant applications by the Head of Subject, the School and Faculty Research Directors, and the University's Research and Development (RED) team. This organizational infrastructure works extremely well, as evidenced by our success at winning large-scale research grants in a competitive environment. During the assessment cycle, the department's per-annum research income was £610,000, averaged over the whole cycle. This represents a substantial increase over the previous REF cycle (where our annual income averaged £425,000.) Staff members were Principal Investigators (PIs) on the following research grants during the assessment period:

Havi Carel: "Life of Breath: Breathing in Cultural, Clinical and Lived Experience", Wellcome Trust Senior Investigator Award, £770,357, 2014-21; Wellcome Trust Medical Humanities Small Grant, £6400, 2015-16; "Social Ethical and Phenomenological Aspects of FASD", £6000, Seed Funding, Sociology of Health and Illness Foundation, 2016-18. Leverhulme Early Career Fellowship (for Dan Degerman) £93,000, 2020-23.

Samir Okasha: "Darwinism and the Theory of Rational Choice", ERC Advanced Investigator Grant, €960,000 euros, 2012-17; "Unifying Statistics: a Philosophical Analysis", British Academy Postdoctoral Fellowship (for Bengt Autzen) £238,976, 2014-17.

James Ladyman: "Applying Homotopy Type Theory in Logic, Metaphysics, and Philosophy of Physics", Leverhulme Trust Research Grant, £380,000, 2013-16.

Karim Thébault: "Analogue Simulation in Modern Physics", AHRC Early Career Grant, £197,894, 2017-19.



Leon Horsten (staff member until Sep 2019); "Formal Truth in Epistemic Languages, Marie Sklodowska-Curie Individual Fellowship (for Johannes Stern), €183,454, 2016-18.

Richard Pettigrew: "The Scientific Approach to Epistemology", Leverhulme International Network Grant, £77,554, 2015-18; "Choosing for Changing Selves", Leverhulme Research Fellowship, £22,537, 2017-19; "Epistemic Utility Theory", ERC Starting Grant, €950,000, 2013-17.

Johannes Stern: "Truth and Semantics", ERC Starting Grant, €1,457,105, 2018-23.

Tuomas Tahko: "The Metaphysical Unity of Science", ERC Consolidator Grant, €1,995,304, 2018-23.

Catrin Campbell-Moore: "Undermining Beliefs and Imprecise Probabilities", Leverhulme Research Fellowship, £33,566, 2019-20.

Jason Konek: "Epistemic Utility for Imprecise Probability", ERC Starting Grant, €1,490,433, 2020-2025.

These research grants led to fourteen post-doctoral researchers joining the department for periods of up to three years during the assessment cycle, and provided funding for seven PhD studentships, all of whom completed. The research grants have facilitated a considerable body of research outputs and research impact. Seven of the monographs that we have submitted for REF2021 arose directly from the research grants listed above (2 by Pettigrew and 1 each by **Okasha**, **Carel**, **Ladyman**, **Stern**, **Horsten**). In addition, two of our Impact Case Studies (**Carel** and **Ladyman**) are directly related to research that was funded by the grants listed above.

2. Infrastructure and Facilities

The University of Bristol has an extensive organizational infrastructure supporting research and impact. The University's Research and Enterprise Development team (RED) provide dedicated support to staff members in preparing research grant applications, managing research projects, and maximizing impact from research. This includes offering written feedback on draft grant applications, coordinating an internal peer review process of draft grant applications, and providing up-to-date information on funding opportunities. The RED team are fully conscious of equality and diversity issues, particularly in relation to ECRs who may lack the confidence necessary to engage with the research funding agenda. A number of junior staff members in the Philosophy department (including **Konek**, **Campbell-Moore** and **Stern**) have been assisted by RED to make successful research grant applications during the assessment cycle. Additional research support is provided by the School of Arts Research Director and the Faculty Research Director, both of whom liaise closely with the RED team, and who administer pots of "seed" funding for the strategic development of grant applications and pilot research projects.

The University has four major research institutes, designed to consolidate areas of research strength across the university and to promote inter-disciplinary activity. These are: (i) the Brigstow Institute, focusing on arts, humanities and social sciences; (ii) the EBI, focusing on health; (iii) the Jean Golding Institute, focusing on big data research; (iv) the Cabot Institute, focusing on the environment. Philosophy staff are involved in all four of these centres, particularly (ii) and (iv); for example, **Carel** is on the Steering group of the EBI, and directs the medical humanities strand. In addition, the University has specialist research institutes with a more specialized focus. These



institutes offer research support, fund workshops and conferences, and help bring Philosophy into contact with the wider university.

Another important source of research support at the university level is the Institute for Advanced Studies (IAS). This Institute funds internal research fellowships, organizes the Benjamin Meaker visiting fellowship scheme, and promotes inter-disciplinary dialogue across the University's faculties. During the assessment period, two current Philosophy staff members (**Thébault** and **Pearson**) and one recently departed member (**Horsten**) have been recipients of the University Research Fellowships that the IAS awards, which provide an additional semester of leave to complement existing research leave.

At Faculty level, research infrastructure is similarly well-developed. Between 2013 and 2020, the Faculty of Arts reviewed its research activities as part of the broader "Arts2020" project. This led to the creation of six Faculty Research Centres to consolidate and expand existing research strengths. Three of these have been directed or led by members of the Philosophy department: the Centre for Science and Philosophy, currently directed by **Ladyman**; the Centre for Health, Humanities and Science, set up and originally directed by **Carel**; and the Centre for Black Humanities, co-founded by **Burch-Brown**. These centres are important fulcrums for interdisciplinary research activity, serving as foci for numerous visiting speakers, and helping to develop impact. Indeed, our three impact case studies (developed by **Ladyman**, **Carel** and **Burch-Brown**) correspond directly to work done under the auspices of these centres.

In addition to the centres, the Faculty sponsors several Faculty Research Clusters, which provide funding for networking, training events and workshops. The Department has been awarded two such clusters: a Medical Humanities Research Cluster that ran from 2014-16, led by **Carel**, which integrated our work in the philosophy of medicine with the broader medical humanities network in the University; and the ongoing Foundational Studies Bristol Research Cluster, which involves five staff Philosophy staff members (**Pettigrew**, **Fujimoto**, **Campbell-Moore**, **Ladyman** and **Stern**), and provides a focus for our work in logic and philosophy of mathematics.

The Faculty enjoys the support of two dedicated Research Development Managers, one Research Development Associate, and one Research Development Officer. They help to identify potential funding streams, help academic staff develop bids, and provide extensive feedback on grant applications as they are being written. A dedicated team within the Finance department provide pre- and post-award support to research grant holders. The Philosophy department's success at winning large research awards is attributable, in part, to our working closely with the Faculty Research Development Managers.

In 2018, the Faculty Research Office was set up to nurture and embed a culture of impact across the Faculty. This office employs a dedicated Impact and Knowledge Exchange Manager and a Research Impact Administrator, who advises on impact statements and helps academics maximize the impact potential of their research. The Research Office staff work closely with the Unit of Assessment Impact Coordinators, to monitor progress and provide guidance on impact case studies. In particular, the Research Impact Administrator helps individual researchers capture and record evidence of their impact and maintains a central repository for evidence of impact. In late 2018, the Faculty launched an Impact fund to provide additional resources to help staff to develop impact from their research. Three Philosophy staff (Ladyman, Carel and Burch-Brown) have



received support from the Impact fund to help them prepare their case studies and collect evidence for impact.

Turning to physical infrastructure, the department is based in Cotham House, a magnificent 19th century detached villa on the edge of the University precinct. All permanent staff, teaching fellows, and post-doctoral fellows have offices in Cotham House. In addition, there is a large common room, two seminar rooms, a well-stocked library, and two kitchens. Students and faculty run a vegetable garden known as the 'Kierkegaarden', with a pond and pergola for relaxation, yoga and occasional seminars. Most of the Department's research activities, and much of the postgraduate teaching, takes place in Cotham House, in fully accessible spaces. The physical infrastructure of the wider university also helps to facilitate our research. The Faculty has recently opened a new Humanities building, which will provide additional office space. A new University Arts and Social Sciences Library is currently being built, which will in addition offer bespoke reading rooms and dedicated spaces for research students.

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

1. Research collaboration, networks and partnerships

The Department benefits from extensive research collaborations, networks and partnerships, at both the individual and institutional level. Staff members collaborate with researchers from other institutions, in many cases as part of an inter-disciplinary endeavour. For example, Carel's Life of Breath Wellcome research project was co-hosted by Durham University, which facilitated regular bilateral visits from 2014-20. Carel has an ongoing research collaboration with Ian Kidd of Nottingham University, with whom she has co-authored several articles, and with Catherine Mills of Monash University, with whom she has co-run a research grant. Thébault has an ongoing collaboration with the physicist Sean Gryb, of Groningen University, with whom he is writing a book, under contract for Oxford University Press (OUP). Okasha has an ongoing collaboration with Jun Otsuka of Kyoto University, Japan, which led to bilateral research visits in 2017-18, and a coauthored article in Proceedings of the Royal Society B, 2019. Ladyman has ongoing research collaborations with three senior Bristol scientists: Nello Christianini (Engineering); Stephan Lewandowsky (Psychology); and Karoline Wiesner (Mathematics) with whom he wrote a book published by Yale University Press in 2020. Horsten (staff member until Sep 2019) had a long collaboration with Philip Welch, of the Bristol School of Mathematics, with whom he has edited an OUP book and organized joint research events.

At the institutional level, the Department has an ongoing collaboration with the LMU in Munich, based around a biennial Bristol-Munich joint workshop, and a similar arrangement with Groningen. Departmental members involved in these collaborations, which have led to reciprocal visits by staff and students, include **Pettigrew**, **Konek**, **Thébault**, **Stern**, **Okasha**, **Ladyman** and **Campbell-Moore**. Bristol was the pivotal node in the Scientific Approach to Epistemology research network, funded by a Leverhulme Network Grant to Pettigrew (2015-18), which links Bristol with five other institutions: Tilburg, Carnegie-Mellon, Groningen, Lund and LMU Munich. The Department also has an ongoing collaboration with Kyoto University, Japan, arising from the connections that **Okasha** and **Horsten** have with two Kyoto-based researchers (Jun Otsuka and Yasuo Deguchi).

Further evidence of the department's effectiveness at forging research connections comes from the large number of invited and keynote lectures that Department members have given at other



institutions (see below); and from their taking up visiting positions at other institutions. Over the assessment period, the following staff have held visiting positions at other institutions: **Okasha**, Visiting Professor at Nanjing University, China, April 2016; **Campbell-Moore**, Visiting Research Fellow at Australian National University, July-August 2018; **Horsten**, Visiting Professor at Kyoto University, Japan, Sep 2017-June 2018; **Ladyman**, Visiting Professor, University of York, 2013-. Conversely, we have welcomed a large number of visiting researchers to Bristol, as detailed in Section 1.

There is considerable institutional support for our collaborative research efforts. The University's Institute for Advanced Studies provides funds to bring visiting researchers to Bristol, which includes finding office space and arranging accommodation. The Faculty of Arts has a generous Conference and Research Fund, which provides funds for hosting workshops at Bristol, and for travelling to conferences elsewhere, both of which facilitate research collaborations. To facilitate staff with caring and childcare responsibilities, the Conference and Research Fund meets childcare costs incurred while attending conferences. Finally, the University infrastructure that supports research grant applications, described in Section 3, also facilitates research collaboration, since many of our collaborations arise through externally-funded research projects.

2. Impact, Knowledge Exchange, and Wider Contributions to Society

Over the assessment period, the Department has become increasingly adept at developing impact from its research. This impact goes considerably beyond what is recorded in our three Impact Case Studies, the contents of which are not repeated here.

Bertram (who retired in September 2020) has done research on migration and human rights that has led to considerable public engagement activity. Bertram is a member of the Democracy Forum panel at the House of Commons; is a trustee for Bristol Refuges Rights; spoke on the refugee crisis for Ujima Radio in 2015; has given talks on migrants' rights at public events; recorded a podcast in 2018 for Clara Sandelin's Talking Migration Series; and has participated in a number of events at the Refugee Studies Centre, Oxford. **Bertram's** 2018 book *Do States Have the Right to Exclude Immigrants?* (Polity Press), generated considerable media interest. **Bertram** was an International Observer at the Consejo Nacional Electoral, Colombia in 2016.

Pettigrew has done extensive work on the value of universities to society, culminating in his 2018 co-authored book *What are Universities For?* (Bristol University Press). The book launch was attended by the Chief Executive of the Office for Students, among others. This book has contributed to the ongoing national conversation about the role of universities in society, as evidenced by **Pettigrew's** article in *The Independent*, 27/09/2018. The book has received much attention in the blogosphere, on the WonkHEblog, and the blog of The Council for the Defence of British Universities. **Ladyman** has also contributed to the national conversation on higher education policy over the assessment period. He has published letters in *The Observer* and in *Nature*; has participated in a House of Lords debate on higher education; has written two submissions to Select Committees of Parliament in 2018; and currently serves on the executive committee of the Council for the Defence of British Universities.

Further evidence of the Department's commitment to, and success at, developing impact from its research is found in the three Impact Case Studies we have submitted to REF2021: **Carel's** work on the role of philosophy in medical practice, **Ladyman's** work on the role of philosophy of science



in secondary school science education, and **Burch-Brown's** work on slavery and contested heritage. Please see our Impact Case Studies for full details.

Department members regularly write and record podcasts and lectures for a wider audience. Carel has published numerous pieces in medical journals including The Lancet and The British Medical Journal and writes for The Conversation, The Philosopher's Magazine and was recently interviewed for a BBC documentary The Disability Paradox. Ladyman has written for the Philosopher's Magazine 2012 and 2015, and contributed podcasts for Rationally Speaking and Preposterous Universe. Okasha has written two introductory books for Oxford University Press's VSI series: Philosophy of Science: a very short introduction (2nd edition 2016) and Philosophy of Biology: a very short introduction (2019); the first of these has sold over 100,000 copies. Okasha has also recorded podcasts about his work, aimed at a broad audience, for the YouTube channel The Dissenter in 2019, and the New Books Network in 2019. Pettigrew has written a number of blog posts on OUPBlog on popular philosophical issues, in addition to his work on the value of universities mentioned above. Burch-Brown has published an article in the Bristol Evening Post 2017, discussing the removal of statues of slave-traders. **Burch-Brown** has been interviewed about her work on contested heritage and slavery by The Spectator, July 2017; by Historic England's report on contested heritage, May 2017; and by the *Philosopher's Magazine*, May 2017. Thébault has been interviewed for Quanta Magazine in 2016. Tahko has written for The Philosopher's Magazine in 2016, and for Areiopagi, a Finnish magazine, in 2016.

Department members have given numerous public lectures, including talks at well-known science and philosophy festivals, during the assessment period. These include: **Carel** at Medicine Unboxed, 2018; **Ladyman**, **Burch-Brown**, and **Carel** at How the Light Gets In, Hay-on-Wye, 2015, 2016, 2018, 2019 and 2020; **Ladyman** at the New Scientist Instant Expert Day in 2017, and Boomtown Festival 2018; **Bertram** at the Afrika Eye Film Festival, Bristol, in 2015; and at the Democracy Forum panel, House of Commons, April 2014. **Thébault** at the Forum for Philosophy event on Black Holes, 2018; **Tahko** at The Science Forum, Oulu 2017, and at A Night of Philosophy, Helsinki 2016; **Wilson** at the Lothian Science Festival in 2014, **Burch-Brown** at the Oxford Global Priorities Institute, 2019.

Since 2013, the department has worked closely with IDEAL community action, a charity that supports adults from backgrounds of addiction and chaos. Another notable contribution to society is the Bristol Philosophy Exchange, which has been running since 2013. Set up by and overseen by Departmental staff, this programme trains Philosophy undergraduates to introduce philosophical ideas to primary-school age pupils, using the Philosophy for Children (P4C) approach. The programme focuses on primary schools in deprived areas of Bristol. To date, over 1,000 pupils in local schools have benefited from this programme. An initiative aimed at secondary school pupils was set up in 2018. Entitled "Insights into Philosophy", this after-school course is taught by student ambassadors from the Department of Philosophy, trained by Philosophy staff members.

In October 2018, the Department hosted a Mauritian artist-in-residence, Krishna Luchoomun, of the Mahatma Gandhi Institute of Arts. This was a joint venture with Black Artists on the Move and marked the 50th anniversary of independence for Mauritius. The residency tied in with Burch-Brown's work on colonialism and contested heritage. Luchoomun's residency culminated in an installation on reparative justice for people exiled from the Chagos Islands and received considerable media coverage in Mauritius.



3. Contribution to the Discipline

The Department has made a substantial contribution to the discipline, both through the individual activities of its staff members, detailed below, and through the generations of successful research students who we have trained, details of which are given in section 2.

4. Journal Editing

Over the assessment period Department members have played an active role in editing journals in their field. **Okasha** served as associate editor for *Philosophy of Science* from 2014-17, and currently serves on the editorial board of *Biology and Philosophy*, *Philosophy of Science*, and *Philosophy and Theory in Biology*. **Ladyman** serves as co-editor of *Studies in History and Philosophy of Modern Physics*, and is on the editorial board of Palgrave's New Directions in Philosophy of Science book series. **Carel** is on the editorial board of *Philosophy of Medicine* and of the *Journal of the British Society for Phenomenology*. **Pettigrew** served on the editorial board for *Philosophia Mathematica* (2012-17), is currently on the editorial board of *Ergo*, and is subject area editor (epistemology) for the *Stanford Encyclopedia in Philosophy*. **Konek** is an area editor for *Analysis*. **Tahko** currently serves on the editorial panel of *Thought*, and on the editorial board for *Metaphysics* and *Ajatus*.

5. Fellowships and Prizes

Carel was awarded the prestigious Health Humanities Medal 2018: Inspiration Award and was short-listed for the Heath Humanities Medal 2018: Best Research Award, by the AHRC and Wellcome Trust, for her Life of Breath Research Project. **Konek** won the Young Epistemologist Prize in 2015 for his paper "Epistemic Conservativity and Imprecise Credence", *Philosophy and Phenomenological Research* (forthcoming); and was runner-up in the Saunders Prize in Epistemology competition in 2017 with his essay "The Art of Learning", *Oxford Studies in Epistemology* (forthcoming). **Okasha** was elected a Fellow of the British Academy in 2018.

6. Professional Service

Department members have been fully involved in the profession at national and international levels. Ladyman is on the REF2021 panel and was a panel member for the Italian Research Assessment exercise. Thébault was Secretary of the British Society for the Philosophy of Science from 2016-18. Okasha is President of the European Philosophy of Science Association from 2017-21; and was an Aristotelian Society Committee Member, 2012-15. Tahko is President-elect of the Society for the Metaphysics of Science and serves on three AHRC Peer Review Colleges (Academic, Strategic and International). Carel is a Scientific Committee Member, Philosophy of Medicine Roundtable, 2008-, and is a member of the Advisory Board for the International Health Humanities Network, 2018-. Pettigrew was on the Committee of the British Society for the Philosophy of Science, 2013-16, and the Analysis Trust Committee, 2015- present. Sticker serves as Treasurer of the UK Kant Society, 2019-.

7. Exemplars of Interdisciplinary Research

The Department has been at the forefront of inter-disciplinary philosophical research in the UK, thanks in part to its concentration of philosophers of science (including logic and mathematics). As detailed in section 1, staff members have published in leading learned journals of other disciplines, have been invited to speak at numerous science festivals, have forged effective research links with other departments at Bristol, and have co-authored books and papers with researchers from other disciplines. In addition, several of the research projects that the Department has hosted over the assessment period have had a strong inter-disciplinary component. For example, **Carel's**



Wellcome-funded Life of Breath project involved working closely with clinicians, artists, and medical anthropologists; **Okasha's** ERC-funded Darwinism and the Theory of Rational Choice project involved collaborations with economists and biologists; **Ladyman's** Leverhulme-funded Homotopy Type Theory project involved collaborations with computer scientists and mathematicians; **Stern's** (ongoing) ERC-funded Truth and Semantics project has connections to linguistics, while **Konek's** (ongoing) ERC-funded Epistemic Utility for Imprecise Probability project involves collaborators from statistics.

8. Refereeing and Grant Evaluation

All Department members are involved in refereeing articles for academic journals, across a wide range of sub-fields of philosophy. Staff members have been involved in research grant evaluation, for the ERC, AHRC, Economic and Social Research Council (ESRC), European Science Foundation, Leverhulme Trust, Templeton Foundation, Wellcome Trust, British Academy, US National Science Foundation, Netherlands Organization for Scientific Research, Irish Research Council, Israel Science Foundation, and Royal Society. **Tahko** has served as Vice-Chair for the Marie-Sklodowska-Curie Actions ECO_SOC panel; while **Okasha** is the current Philosophy Section Organizer of the British Academy Mid-Career Fellowship scheme.

9. Invited and Keynote Lectures

Members of the Department have delivered too many invited and keynote lectures over the assessment period to document exhaustively; a partial list is as follows.

Okasha gave the 2020 Bar-Hillel lectures in Tel-Aviv and Jerusalem, and gave keynote lectures at: ONSW Conference, Groningen 2016; First Principles in Science Conference, LMU Munich, 2016; British Society for Philosophy of Science Annual Conference 2016; Spanish Society for Logic, Methodology and Philosophy of Science 2016. **Stern** gave invited lectures at the Axiomatizing Metatheory conference, Salzburg, 2018; Metaphysics Sans Phrase, Geneva 2017; The Sky is the Limit, Munich 2017; Intensionality and Truth, Amsterdam 2016. Pettigrew gave keynote lectures at the Yale Workshop on Experience and Transformation 2018; Recent Debates in Formal Epistemology, Cologne 2018; Epistemic Utility Theory Masterclass, KCL 2017; Formal Epistemology Workshop, Groningen 2016; Joint Session of the Mind Association and Aristotelian Society 2015. Burch-Brown gave a keynote lecture at Honour and Admiration after War and Conflict, Stockholm 2019; and invited lectures at Descartes Lectures on Social Punishment, Tilburg 2018; Museum Association's Conference on Dissent, Belfast, Nov 2018. Ladyman gave keynote talks at the Structure and Modality conference, Hong Kong 2019; the Emergence conference, Amsterdam 2019; the Individuality in Physics workshop, Bonn 2018; the All You Need is Science conference, Vrije Universiteit Amsterdam 2014; the Society for Experimental Biology Annual Conference, Prague 2015; and the Identity, Indistinguishability and Non-Locality in Quantum Physics International Workshop, Buenos Aires, Jun 2017. Everett gave invited talks at a workshop on his book (The Nonexistent, OUP 2013), Gottingen 2015; at the Fiction and Intentionality conference, Turin 2015; and at the Fiction conference, Prague 2017. Campbell-Moore gave invited talks at the ANU Philosophy Seminar, Canberra 2018; at the Experience and Updating workshop, Bochum 2017; at the Probabilistic Knowledge workshop, Hamburg 2017; at the Truth and Modality workshop, Munich 2017; at the University of Michigan Philosophy Seminar 2018. Carel gave keynote talks at the International Human Science conference, Molde, Norway 2019; the Health Humanities conference, Nottingham 2019; the Health and Culture conference, Aarhus, Denmark 2018; the Translation in Medicine conference, Vienna 2018; the Joint Session of the Aristotelian Society and the Mind Association, Cardiff, 2016; and at the Phenomenology and



Health inaugural conference, Oxford, March 2015. Thébault gave keynote talks at Philosophical Foundations of Quantum Gravity, Geneva 2017 and the German Physical Society Annual Meeting 2015; and invited talks at The Physics of Society conference, Munich 2016; at The Hole Shebang, LSE 2016; at the Why Trust a Theory conference, Munich 2015; and at the Royal Society conference The Next Generation of Analogue Gravity Experiments, London 2019. Tahko gave keynote talks at Modal Metaphysics, Bratislava 2014; at the Workshop on Grounding and Reduction, Paris 2018; at the 3rd Belgrade Graduate Conference in Philosophy, Belgrade 2018; and at the 13th Italian Society for Analytic Philosophy conference, Novara 2019. Pearson gave invited talks at Boston Area Colloquium in Ancient Philosophy, Worcester MA, No 2018; at the inaugural session of the Plato Commentary Project, Spetses, Greece 2015; at the Aristotelian Society 2015; at the Fact-Value Distinction and Contemporary Philosophy conference, Kent 2015. Wilson gave an invited talk at the Interdisciplinary Summer Seminar, Wake Forest University 2018; and at the University of Edinburgh research seminar 2018. Sticker gave a keynote talk at a conference on Parfit's On What Matters, Frankfurt 2015, and invited talks at the Evil After Kant conference, Southampton 2016; the Norwegian Kant Society seminar, Oslo 2017; and the Kant, Normativity and Religion conference, Istanbul 2018.