



University of  
**Nottingham**

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# Our Research Vision

One year on

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# Welcome

It's one year since we launched our ambitious vision for research at the University of Nottingham.

Our Research Vision, one of the most concentrated and comprehensive programmes in the University's history, is supporting our mission of delivering exceptional research that transforms lives in our community, the UK and across the world.

It is based on extensive analysis of our capabilities and potential mapped against the changing UK and international research funding and policy landscape.

At its heart are six Beacons of Excellence, world-leading areas of transdisciplinary research that each address UN Sustainable Development Goals. The beacons are one of eight areas of focus that comprise the Research Vision, the others being:

- People: world-class researchers and Nottingham fellows
- World-class physical and digital environment
- Industrial collaboration and commercialisation
- Research Excellence Framework (REF)
- Transdisciplinary research capabilities in our Research Priority Areas (RPAs)
- The Institute for Policy and Engagement
- International collaboration

In this first year we've had some significant successes: the recruitment of outstanding fellows and world-class researchers, significant awards and accolades, and an increase in our research funding.

But to deliver our vision for research, maximise the impact of our investment and transform many more lives, we must work together in new ways.

By better directing our resources and enhancing the support we offer, we will create the conditions to

encourage researchers to come together in multi-disciplinary teams and forge partnerships to better align our responses to global challenges.

Our renewed focus and support for research will:

- Deliver a research environment without barriers where excellent research can flourish
- Attract and retain world-class research talent
- Allow you the time, support and space to deliver research with excellence
- Focus on quality research outputs

This guide shares how far we've come with our Research Vision, acknowledging the challenges we've overcome along the way, due to a rapidly evolving external policy and funding landscape.

I've been fortunate to speak to many of you at research roadshows and faculty drop-in sessions. It's always inspiring to spend time with colleagues who are working in a variety of ways to transform the world around us through discovery and innovation. I've enjoyed listening to your input to ensure our vision remains agile, responsive and fully supportive of our world-class researchers.

Themes raised at the roadshows and drop-in sessions helped inform our responses to how we can best support the delivery of exceptional research.

Time pressure is a recurring issue: preparing for REF, balancing the demands of teaching and research, responding to funding calls and grant management – as well as making all our exceptional people feel included in our Research Vision.

In response to these helpful comments, we are:

- working hard with schools and units of assessment to provide guidance on REF, running workshops and

making expert guidance available. We are addressing this strategically, while empowering units of assessment at local level, and stepping up and honing our communications around REF, Open Access and support on producing impact studies

- rolling out a £3.7m investment in digital research to help you deliver improved outputs and work in innovative ways, as showcased in the inaugural Digital Research Week
- better aligning our research with UK and global strategic priorities, as exemplified by the Beacons of Excellence
- improving support for managing funding bids, plus impact and knowledge exchange activities. Streamlining these processes will free up your time for core responsibilities, improve grant success rates and increase impact. The Nottingham Impact Accelerator, launched in March, and Research Accelerator (launching in September) form part of this concerted effort to support and amplify your research
- continuing to support all areas of research excellence across the University and promote opportunities for interdisciplinary working in a rich research ecosystem

I continue to be excited by the opportunities that lie ahead for research here at Nottingham, as we build upon the foundations of the past and look firmly to the future. A future made possible by your continued support and dedication to extraordinary research.

Thank you.

**Professor Dame Jessica Corner**  
Pro-Vice-Chancellor for Research and Knowledge Exchange





# 1<sup>st</sup>

Digital Research Week  
(23-27 April) showed how  
our investment in digital is  
better empowering your  
research

# 7<sup>th</sup>

for total R&D  
income  
(HEBCIS 2016/17)

# £8m

secured from the sale  
of shares in spin-outs  
in the year to date

# £980k

under the MRC's Confidence  
in Concept

BBSRC funding portfolio of  

# £71m

moving the University up  
to third in the UK behind  
Cambridge and Manchester

Nottingham Impact  
Accelerator awarded  

# £2.5m

to 75 projects across  
the University

# 18

researchers  
and their teams  
with plus-£1m  
awards

# 30

Research Fellows of  
outstanding quality  
expected to be  
appointed

# £450k

from BBSRC's Impact  
Accelerator Accounts

# 4<sup>th</sup>

in the UK  
for Knowledge Transfer  
Partnerships

# 80

projects funded since  
the International  
Collaboration Fund  
was launched

# 65

projects funded via  
the 2017 RPA open  
call, with £1.2m  
allocated since it was  
introduced

# £3<sup>plus</sup>m

strategic equipment funding  
from EPSRC for the first time

# £4.4m

from the Bill and Melinda  
Gates Foundation to reduce  
'hidden hunger' in Ethiopia  
and Malawi

# 3<sup>rd</sup>

for collaborative  
R&D income from  
Innovate UK

# £1m

EPSRC award to Dr Frankie  
Rawson, a Research Fellow in  
the School of Pharmacy, for  
his research in the field  
of bioelectronics

# £5m

via the government's  
Connecting Capability Fund  
with Midlands Innovation  
universities

## A snapshot of our achievements





# Research leaders of tomorrow

We expect to appoint almost 30 Nottingham Research Fellows funded through our Research Vision, which is excellent progress towards our target of 100 recruits.

In our latest recruitment round, 16 astonishing individuals have accepted Nottingham Research Fellowships or Anne McLaren Fellowships.

In addition, a beacon fellowship recruitment round has taken place, with offers made to five additional candidates. This is a very exciting time for our outstanding fellowships programme, and we look forward to welcoming our new colleagues later this year.

Among those offered fellowships, 12 work in other institutions and, in joining the University, will make an active contribution to our REF return. Eight are European nationals and others are from as far afield as Korea and the US. One extraordinary woman astrophysicist, who studied as an undergraduate at Nottingham, wishes to bring with her a five-year Rutherford-funded project from Cambridge.

We are offering fellowships to exceptional individuals including those working at MIT, Harvard, University of Loyola, Manchester, Oxford, Cambridge, Warwick, Bath, Sheffield, the OU, and the University of Chichester.

We asked them all: why Nottingham? Our world-class research facilities, the opportunity to work

alongside renowned academics and our strengths in interdisciplinary research, as embodied in our Research Priority Areas, all featured in their responses.

We have also had great success with externally funded fellowships: James Cuthbertson from Chemistry and Alex Saywell from Physics have been awarded Royal University Research Fellowships; Silke Weinfurter, a current Nottingham Research Fellow and Royal Society URF holder, has been awarded a three-year extension to her grant; Lee Johnson, a Nottingham Research Fellow in the Propulsion Futures Beacon, has been awarded an EPSRC UKRI Innovation Fellowship.

We continue to develop our pipeline of external fellowship opportunities.

The University has selected 15 candidates, including five current fellows at Nottingham, for the UKRI Future Leaders Fellowships, and we have submitted four applications to the Academy of Medical Sciences Springboard, two of whom are Anne McLaren Fellows and one is a Nottingham Research Fellow.

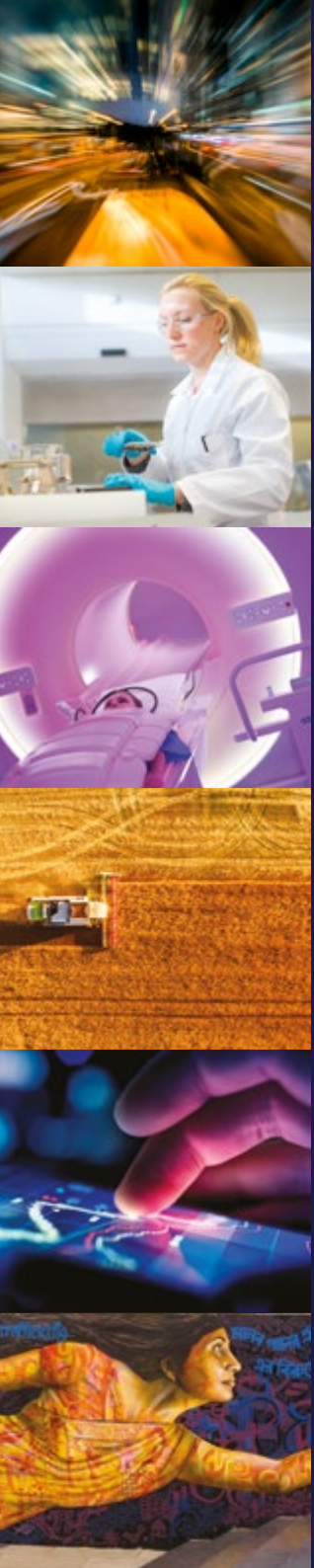


**“It’s an honour in itself to hold a fellowship that promotes women in STEM fields. The fellowship considers the hurdles that we women face.**

**Nesma Aboulkhair** (left), Anne McLaren Fellow, Centre for Additive Manufacturing







# Transdisciplinary research

**Our Research Vision builds on our reputation for encouraging and supporting transdisciplinary research: by bringing exceptional individuals from across disciplines together, we are better equipped to deliver responses to complex challenges.**

Our Beacons of Excellence and Research Priority Areas (RPAs) embody our cross-disciplinary strengths. They are embedded in a diverse research ecosystem, which is further enriched by groups working in centres and institutes and across schools and faculties. By working across disciplines, our discoveries have greater impact, giving our Research Vision greater depth and reach, and enhancing its potential to accomplish great things.

## Research Priority Areas

Our RPAs promote transdisciplinary research. A refresh of our RPA portfolio ensured our focus remains aligned to external priorities as well as synergies with our Beacons of Excellence. It is worth noting that 60% of our academics have engaged with an RPA.

RPAs are funded via an open funding call, which promotes transparency and allows agile responses to pump priming and engagement opportunities. Researchers can use this to build solid research partnerships with colleagues from other departments, and attract international and industrial collaborators in order to secure external funding. Some 65 projects have been funded through the open call, with more than £1.2m allocated since the scheme was introduced.

At an interview by a Fellowship candidate, the University's RPA network and reputation for bringing together researchers from across disciplines was cited as a key motivation for joining Nottingham.

## Beacons of Excellence

Our transdisciplinary Beacons of Excellence are mission-driven scientific programmes aimed at using our key research strengths to address critically important global challenges such as food security, ending modern day slavery, greener transport, securing low-carbon economies, a revolution in smart industry and products, and transforming healthcare with pioneering imaging.

The Rights Lab, Future Food, Precision Imaging, Propulsion Futures, Green Chemicals and Smart Industrial Systems have made significant progress since their launch in June 2017, making appointments, winning external grants and developing new partnerships.

We continually work with key funders and partners to ensure the beacons align with strategic research priorities and funding opportunities.

The beacons are having a positive impact on the full breadth of University activity. As well as raising our reputation for delivering world-class research and attracting exceptional people, the beacons support recruitment of talented undergraduates drawn to the opportunities of a research-rich environment.

Work is under way to demonstrate the ongoing impact of the beacons, how they enrich our research ecosystem, and the synergies they encourage.



## Advanced Molecular Materials: a RPA case study

Advanced Molecular Materials, a Research Priority Area, has secured five EPSRC grants – totalling £4.9m – funding projects to:

- catalyse nanomaterials research through equipment and expertise sharing
- develop electrochemical-based wireless technology to avoid invasive surgery and treat diseases such as cancer

- 3D-OrbiSIMS equipment for label-free chemical imaging of materials, cells and tissues with cryo-capability

This included a £1.05m Established Career EPSRC Fellowship for RPA Lead Professor Andrei Khlobystov's research into transforming Transmission Electron Microscopy into a new imaging and analytical tool at single-molecule level.

AMM has also launched an EPSRC Doctoral Thematic Programme in Low-Dimensional Materials and Interfaces, with eight PhD projects in 2017.

Professor Khlobystov said: "The RPA's biggest achievement is the Nanoscale and Microscale Research Centre, which offers a unique set of 20 major pieces of instrumentation for materials characterisation and analysis (total cost over £12.5m)

supported by a team of 13 staff. The centre engages all faculties, with more than 700 registered University users, collaboration with 27 external institutions and around 40 industrial partners, plus produced 65 publications in peer-reviewed international journals in its first 18 months."

A further two EPSRC grants and a £1m Leverhulme Trust application are already in progress.



# A world-class research environment

We continue to invest in our world-class facilities, infrastructure and digital research systems.

The Research Vision is committed to a digital research environment that empowers our researchers and enhances our capacity to derive value from data.

Alison Clarke, Director of Digital Research, said: “The digital world offers researchers unparalleled opportunities to collaborate and share knowledge. Our research is world-leading, and our growing team of digital research specialists are supporting the delivery of these outputs in equally innovative and exciting ways.”

Over the last year we have focused on:

## Research data management

Researchers are supported to more effectively create, harvest, share and gain access to data; to comply with funder requirements and General Data Protection Regulations (GDPR). A customised web platform will help with data management plans. Tools include personal and team workspaces in Microsoft Office 365 to enable global collaboration. High-performance data acquisition, storage and encryption options will be available.

## Compute and analytics

A computing facility that has three to four times the current capacity, capable of directing traffic to the public cloud to meet demand, will be delivered in July 2018. A cloud compute service is also being built. Training will be available when the services come online in August.

## Communication and collaboration

Research is collaborative and flexible. We are providing tools and guidance to allow you to get the most out of Office 365 and collaborate with external colleagues. Its workspaces are accessible anywhere via a range of devices, while the ability to encrypt data enables researchers to store and process sensitive information.

## Further support

### Digital Research Service

By sharing expertise in data analysis and software engineering, this new service will have a strong impact on improving research quality. We are building on the success of Research Software Engineers and the Advanced Data Analysis Centre. Additional staff are being recruited as the service is promoted across the University in the 2018/19 academic year.

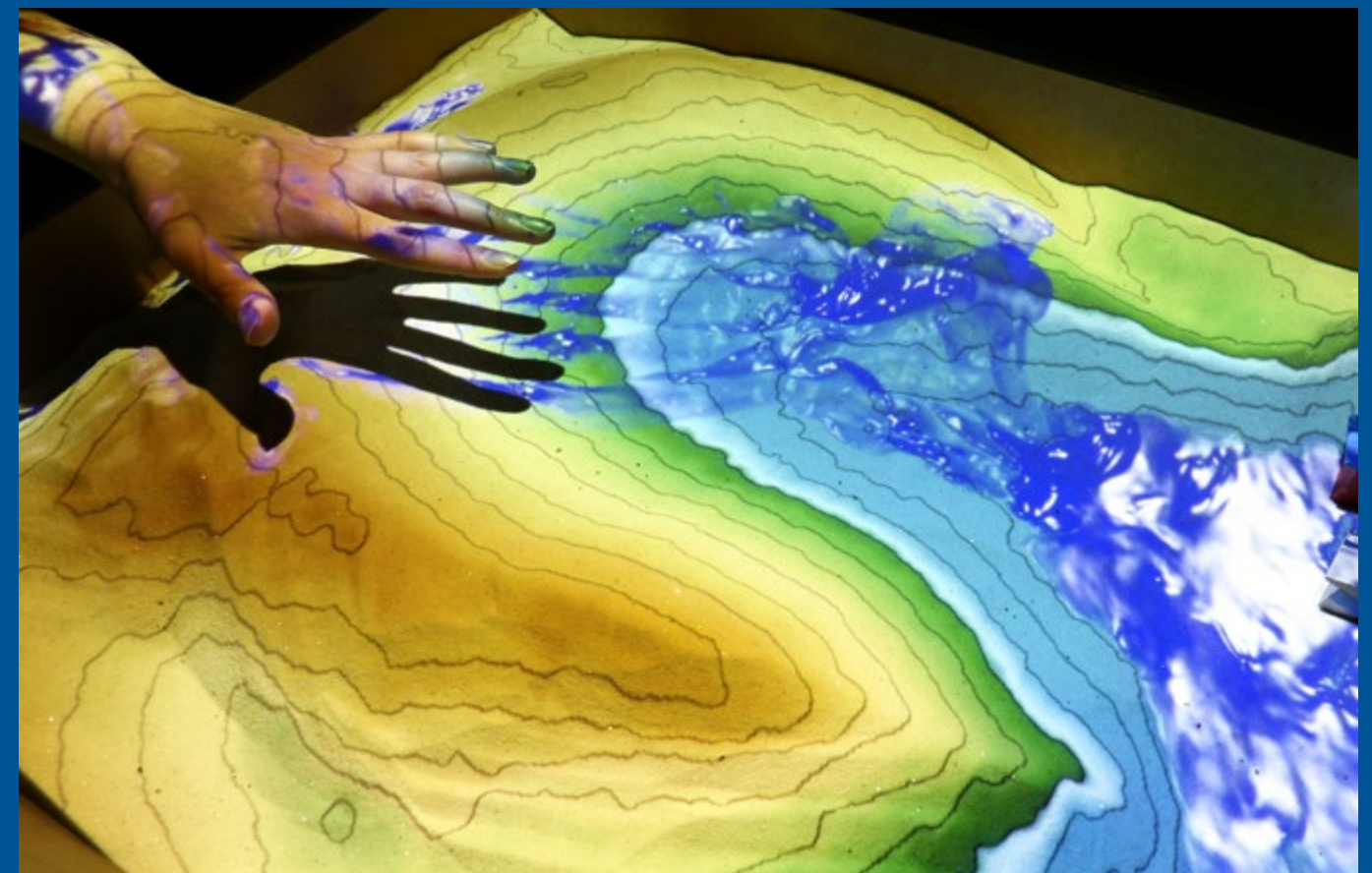
### Research Information Service

There are 1,800 funding opportunities currently listed in the Research Information System (RIS), which was rolled out a year ago. More than 3,700 grant applications have now been made through RIS. Peer reviews of funding bids can be requested through RIS and an ethics checklist will further improve the quality and success rates of grant applications. RIS is also supporting our beacons and generating funding information at school, faculty and University level. Next, researchers will be able to deposit papers and manage their outputs and impact via RIS, which will support the 2018 REF Readiness Reviews.

### Digital Research Week

“Our inaugural week showcased how the University is engaging our researchers and exploring new digital research tools and services,” said Alison Clarke. Events included seminars, clinics, tours, demonstrations and workshops, with keynote talks from industry experts, all supporting our researchers in tackling the biggest problems and achieving the highest-quality outcomes.

Digital initiatives are innovative and experimental, with the aim of engaging researchers in new ways of working and/or exploring digital research tools and services.



## The problem

Researchers in computational geography have directly informed the development of the new Research Software Engineering (RSE) service.

The researchers, who conduct computationally intensive research, were not aware of, nor able to realise, the full potential of their work due to the perceived technical and analytical barriers to accessing the RSE service.

## The solution

A software engineer expert worked with the team to restructure their code and data; this code optimisation enabled them to exploit the University's high-performance computing facility.

The researchers also realised the potential of cloud computing, and are now taking part in a trial of a specialised service that may further reduce the perceived barriers to accessing the RSE service.

## The impact

The findings showed the research value of a software engineer expert, and defined the principles on which the RSE service is based. Not only could the researchers do what they originally wanted to quicker, they could also increase simulations without the need for extra resources. They can now run larger models, increasing the accuracy and scale of their outputs; they can model the world, instead of a few islands.



# Globally connected

The University of Nottingham is not alone in sharing its mission for delivering transformative research or recognising that complex global problems cannot be solved in isolation. We are proud to be recognised as a global institution, with campuses in China and Malaysia that are pioneering hubs of research as well as centres of world-class education.

We fully recognise that international collaboration is vital in the delivery of globally significant research, and we have a network of research partnerships throughout the world, which draw together the exceptional to deliver world-leading research aligned to global priorities. To ensure such international collaborations are initiated, strengthened and broadened, we must continue to

build our global connections, and seek world-leading collaborators and partners to amplify the impact of our research.

## International Collaboration Fund

The International Collaboration Fund (ICF) has an annual budget of £200,000 to support international mobility

which underpins the establishment and development of high-profile research collaborations with international partners.

This benefits you as you secure further research funding and high-quality research publications, while enhancing the University's reputation and catalysing international research excellence.

Applications can be made for up to £5,000 to pump-prime the development of international research collaborations.

In 2017, a total of 40 awards were made, with a value of £135,667, with 80 made since the launch of our Research Vision.

The ICF is generating significant returns. In 2017 against a spend of just under £136,000, the ICF contributed to:

- £6.7m in awards
- £16.8m in applications
- Two Memorandums of Understanding
- 22 papers
- Two REF impact case studies

Researchers from across all three of the University's international campuses are eligible for ICF funding.

To find out more visit: [nottingham.ac.uk/go/icf](https://nottingham.ac.uk/go/icf)



# Institute for Policy and Engagement

We have created the University of Nottingham Institute for Policy and Engagement to support the reach, impact and reputation of our research.

The institute has three initial pillars, which will:

- provide specialist support for global policy impact and engagement
- provide the University with a hub to better support public engagement with our research
- provide a platform and space for research-driven thought-leadership for those across all of our campuses that are not only exceptional researchers, but also exceptional research communicators.

The Institute for Policy and Engagement will maximise the impact of research outcomes through engagement with government and other policy-makers by providing a managed link between policy-makers, funders, industry and the University's academic community.

A permanent director has been appointed to start at the beginning of the new academic year.

The institute will have a home in Highfield House on University Park and will formally launch in autumn 2018.



# Working with industry

We have an exceptional record of working with industry and commerce, with companies of all sizes, and for sparking innovation and enterprise – with more than 100 invention disclosures a year with the potential to become innovative products and processes.

We are:

- 1st** for the number of Innovate UK-funded projects
- 3rd** for collaborative R&D income from Innovate UK
- 4th** in the UK for Knowledge Transfer Partnerships
- 5th** for income from sale of shares in spin-outs (HEBCIS 2016/17)
- 7th** for total collaborative research and development income (HEBCIS 2016/17)

Part of our investment focuses on ensuring that we continue to remain at the forefront of UK innovation. Our beacons are directly linked to driving innovation-led economic growth with industrial partners across the Midlands Engine. They also are aligned with priority sectors outlined in the government's Industrial Strategy Green Paper.

## Nottingham Impact Accelerator (NIA)

NIA's annual budget is around £2.5m, covering every discipline across the University and funding a range of projects, from travel to engage with business through to seed investments in spin-out companies.

To date, NIA has awarded £2.47m to a total of 75 projects across the University.

A further £5m has been secured under the government's Connecting Capability Fund with the Midlands Innovation universities; £450,000 under BBSRC's IAA; and £980,000 under the MRC's Confidence in Concept: these will significantly augment the funds available under NIA in 2018/19. To find out more please visit [nottingham.ac.uk/gp/impactaccelerator](http://nottingham.ac.uk/gp/impactaccelerator)

## Nottingham Innovation Investment Fund

A £5m fund to be co-invested in our spin-out portfolio to increase the number and value of exits. The fund has invested a total of £400,000 across spin-outs Nuvision Biotherapies and Surepulse and graduate enterprise One Third Stories. This levered external co-investment of £1.7m to support the growth of these companies.

## Nottingham Technology Ventures Ltd

Attracting the best talent to support a step-change in spin-out company success, so far, NTV has supported the creation of two spin-outs, helped secure external investment of £6m, and led on the sale of shares in our spin-outs amounting to just over £8m.



# Research Excellence Framework

We are navigating a changing REF landscape and greater expectations for delivering world-class portfolios.

As we progress with our preparations towards the Research Excellence Framework exercise, it is heartening to note that we already have more 4\* submissions in place for REF2021 than for the 2014 REF exercise.

However, as we approach a critical phase of REF planning, your continued support in submitting research outputs of exceptional quality is required to drive the University's commitment to making a step-change in our REF submission and performance.

There have been a number of key decisions for REF2021 which have already been communicated and further information will emerge as we progress through the planning period.

One of the key changes for REF2021 is that each unit will be assessed on a portfolio of work against the criteria to be developed by the sub-panel for that unit with the requirement, for Nottingham, that 100% of eligible research active staff will be submitted. The next REF Readiness Review 2018 will take this into account. Planning for this starts now. There are implications for all academic staff which we set out in terms of our expectations:

a. There is a minimum expectation that every member of academic staff must have a 3\* output within the REF period, with most academics aiming to contribute at least three 4\* and 3\* outputs which can be considered for inclusion in REF.

b. At the unit of assessment level, there is a minimum expectation that there will be enough 3\* and 4\* outputs (taking into account the expectation in (a) above) to meet the REF return requirements for 2.5 outputs per FTE. Individuals are expected to contribute to this total, making every effort to maximise 4\* outputs.

c. There is an expectation that each impact case study will be led by an individual, with team support, aiming to develop each case study to realise its potential to be assessed as 4\*, with no case studies being at risk of being assessed at less than 3\*.

d. Responsibility for managing this and delivering these minimum expectations is at school and faculty level. Every effort should be made to exceed these minimum expectations.

We are working carefully to ensure that the configuration of Nottingham's submission is optimised across all units of assessment.

The landscape of REF is new, and we must respond to the revised criteria and greater expectations by focusing our efforts. This will allow us to continue to make great progress and surpass expectations, as we work together to deliver world-class portfolios to REF.

Further information is available from your REF co-ordinator.

**“ I do appreciate your dedication as we work together to deliver world-class portfolios to REF. The landscape of REF is new and we must respond to revised criteria and greater expectations. I strongly believe that by focusing our efforts we will continue to make great progress and surpass these expectations. ”**

**Professor Dame Jessica Corner**  
Pro-Vice-Chancellor for Research and Knowledge Exchange







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