

# MPS

## Strategic Planning Workbook (Part A)

**PART A: Vision, Strategic Priorities, Targets**

**PART B: Integration to Planning Process (Finances/Student Nos/Staffing)**

*[please note that PART B will be issued at the end of September 2018]*

### Supporting Documents

- [Strategic Framework](#)
- [University-level KPI/Ts](#)
- [School-level Dashboards](#) (to follow)

## Timetable

Schools issued Part A of Strategic Planning Workbook (and associated documentation)	w/c 13 August 2018
Schools complete first draft of Part A of workbook (in consultation with their staff and stakeholders)	August & September 2018
UEG finalise key organisational parameters to strategy (size, shape, form etc.)	12-13 September 2018
ULT consideration of financial context for strategy	17 September 2018
SPRC review four University-level strategies (Learning, Research, Engagement and Professional Services)	21 September 2018
Draft University-level strategies shared with Schools	w/c 24 September 2018
ULT consider financial and other scenarios	15 October 2018
Schools revise draft strategies within Part A of workbooks in light of University direction, in consultation with their staff and stakeholders	October 2018
Heads of School provide first clean draft to share with other HoS	26 October 2018
Heads of Schools review draft strategies with DVC at Away Day	1 November 2018
Full ULT review of headline School/PS strategies	14-15 November 2018
Council approval to University-level strategies	27 November 2018
2019/20 Financial envelopes for Schools set	December 2018
Schools finalise Parts A and B of the Strategic Planning Workbook (with Planning & Finance support)	November 2018 – February 2019
School Strategies approved by UEG	February 2019
2019/20 Budgets finalised	April 2019

# PART A

## Strategy to 2025 (and beyond)

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### Vision

*A short (100-150 word) vision statement for your School through to 2025.*

*A Vision statement should be an aspirational description of what your School intends to achieve or accomplish in the mid-term or long-term future and should serve as a clear guide for choosing current and future courses of action.*

*Please reference within your Vision statement what will be the defining/distinctive characteristic(s) of the School that will also serve to attract great students and staff.*

We are a research-intensive School that simultaneously delivers outstanding teaching to our students. As such we aim to be consistently recognised as truly world leading in key areas of our science, by extending the international excellence, impact and visibility of our research. We aim to be within the top 10-15 UK universities in our discipline areas, attracting high-quality students at both undergraduate and postgraduate levels. We will establish a reputation as having a particularly open, stimulating, collaborative and supportive working environment for both staff and students, enabling the best possible outcomes for research, teaching and learning. We will further enhance our links with non-academic actors on local, national and international scales, and will maximize the impact of our work.

### Priorities

*Referring to your Vision statement above, please list the 5 key priorities for the School for the period of this strategy, identifying one overriding priority (“main effort”) and four other key priorities (“secondary priorities”).*

### Main Effort

- Excellence across all areas of our research and teaching: developing our strong international collaborations and publications; significantly increasing our interdisciplinary research with an aim to enhance socio-economic impact; accelerating our increasing research engagement with business; being more strategic about our public engagement; and consequently, delivering an increase in research income and REF ratings. At the same time, we aim to achieve subject TEF Gold for both Departments. We will critically review our performance and further develop our reputation for an outstanding learning environment, while enjoying growth in many key areas such as Data Science, Financial Mathematics and Quantum Technology.

### Secondary priorities

- Further enhance the School’s strong sense of community and internal identity, including strengthening bridges and improving communications between staff and students. We will ensure that we provide an inclusive, collegial and respectful

working environment, in which any kind of aggression, abuse, or prejudice are not tolerated. We will continue to follow the principles of initiatives such as Athena Swan and Project Juno. In these uncertain times, we will also focus on support and retention of our outstanding academic staff. It is our firm belief that such a positive working environment is essential for all staff to feel committed to delivering the best possible outcomes for the School.

- Further enhance our community engagement, including through outreach and WP. We will have international reach, promoting physical and mathematical sciences worldwide including in developing countries, with a particular focus on encouraging women to participate. This breadth of engagement will help us to draw in a diverse intake of students.
- Some recovery of physical space that we have lost in the past will allow us to improve our overall viability and public profile through strategic expansion, including growth in research capacity, business engagement, student numbers, international summer school, and a corresponding increase in faculty and professional-services support staff.

## Current position

Please reflect on the School as it is currently operating and consider its strengths (S) and weaknesses (W) across the following four dimensions of the Strategic Framework:

- *learn to transform*
  - S: Good reputational standing of both Departments, but P&A has been slipping and needs to recover
  - S: Academic “new blood”, with ever-increasing fraction having undertaken PGCertHE. Ultimately we wish to have HEA accreditation for *all* our faculty.
  - S: Excellent teaching laboratory facilities and support staff.
  - S: Doctoral training centre and exemplary PGR support through SEPnet/GradNet/MAGIC/TCC.
  - S: Embedded employment officer and careers sub-module
  - S: Student voice on executive committee
  - S: Outstanding specialist “Starting to Teach” AT training, and consequent AT contribution to teaching excellence and academic support
  - W: Poor performance in some aspects of NSS (often A&F).
  - W: Lack of study & social space, esp. for PGR
  - W: Not enough support given to faculty who have poor student feedback.
  - W: Need better to ensure that students know their feedback is listened to and acted upon.
  - W: SSRs very high in comparison with competitors.
- *research with impact*
  - S: World leadership in a number of research areas; excellent reputation
  - S: Research base is growing, particularly in impactful areas
  - S: University Research Centre and Programme in quantum technology
  - S: Substantial international engagement
  - S: High academic impact of research outputs (e.g. high field-weighted citation metric in P&A, good outputs in Mathematics)
  - S: PGR students make an enormous and essential contribution to our research performance, boosting our ability to generate high-quality outputs
  - S: PGR prolong and multiply our academic impact through their career progression: a substantial fraction move on to postdoctoral positions in UK and abroad
  - W: Lack of space
  - W: PGR studentship funding under serious threat, esp. for mathematics
  - W: Generating impact will take time, as our traditional strengths are in fundamental rather than applied research
  - W: Sensitivity of league table positions
  - W: Lab-based science is *expensive*, and not fully funded
  - W: Increasing importance of matched funding, but difficulty of financial planning beyond July each year.

- W: Significant reliance on key individuals
  - W: Insufficient investment in infrastructure, esp. computing
  - W: Insufficient administrative support
  - W: Insufficient PGR-oriented IT support and skill-transfer initiatives, especially regarding software development and maintenance
  - W: Insufficient research support: RQI under pressure/understaffed. Could usefully also complement with professional grant-writing support.
  - W: Insufficient recognition of time needed for impact case development, business engagement etc.
  - W: Limited interdisciplinary research collaboration
  - W: enthusiastic and high quality public engagement work insufficiently coordinated and limited link to research
- *engage for change*
- S: Outstanding and extensive outreach programme, involving both UG and PGR
  - S: Effective and efficient Innovations Partnership Fellow; growing business links
  - S: Excellent relationships with alumni and emeriti
  - S: Longstanding Foundation Year programme, for WP
  - S: Promotion of science in developing countries, especially for women
  - S: Increasing local skills base: 2 apprentices
  - S: Collaborative engagement with other institutions across southeast (SEPnet)
  - S: PGR population from gender, globally and ethnically diverse background
  - W: Gender balance out of kilter
  - W: Outreach focus tends to be on astro/particle physics, with rather less on quantum and less still on mathematics and on materials physics: need improved coordination to expand visibility in these other areas
- *building on strengths*
- S: Inclusivity. Working to close gender gap: first female professor in P&A in 2013 – now four; first in Mathematics in 2018. Appointment panels required to have gender balance, and all appointing staff have UB training. Meetings during family-friendly hours. Support for returners from caring. Substantial adjustments to support disabled staff.
  - S: Culture of respect by and of all staff, whether academic or PS: flat “hierarchy”.
  - S: Digitally aware community, with expertise in data science etc
  - S: Rising research contribution income, and ISS, to bolster the budget
  - S: Appraisal includes strong focus on career development
  - S: Outstanding staff profile including four ERC award holders, a RS URF (with another due in Jan 2019), RS Dorothy Hodgkin Fellow, Quantum Technology Fellow, and two RS Wolfson Research Merit Award holders.
  - S: We are engaging with initiatives such as the recent UKRI-Sussex study group with industry, to enhance opportunities to reach out to broader communities.

- W: 2016 staff survey showed only 61% “staff engagement”, with 15% saying that they have felt bullied/harrassed within the previous 12 months.
- W: Need more investment in administrative support
- W: Some areas at limit of viability, which itself poses a retention risk – need expansion in mathematics and in materials physics

### **1. What are the most successful parts of the School that should be grown/expanded/made even more of?**

Mathematics makes a surplus each year, and has demonstrated that it is capable of attracting absolutely outstanding talent from a wide international pool. The past few years have seen very substantial growth in both student numbers and research income. However, the faculty base remains small for the number of students, and we should try to bring the SSR down to levels more typical of other research-intensive institutions. There is obvious room for growth in a number of areas:

- Data science is proving to be extremely popular as an MSc, and financial mathematics has for many years attracted significant numbers of international students. This is related to statistics, where we have recently made new hires. Together they represent a key area that is ripe for growth, and that has potential both to generate impact and to attract students.
- The Department of Mathematics is one of the leading UK departments in the area of Partial Differential Equations (PDEs) and their applications. We have recently built capacity in Probability Theory. Highly dynamic areas (evidenced by several Fields Medal winners recently) are Stochastic Analysis and Stochastic PDEs. As resources allow, we should make new appointments at the interface of the existing groups of Analysis and PDEs, Numerical Analysis and Scientific Computing, and Probability Theory. This would promote intra-departmental and interdisciplinary collaboration across the School, University and beyond. Such appointments would also strengthen our offering in Mathematics applied to Biology and Financial Mathematics, and may lead to new impact cases.
- We could usefully add capacity in areas adjacent to our current research expertise that are not presently covered at all by the Department despite their importance. These might include e.g. large-scale optimisation, inverse problems, and mathematical aspects of signal and image processing.
- Joint projects and supervision of PGRs between MPS and Business, Engineering and Informatics, and Life Sciences already exist. We would like to expand such collaborations, perhaps aided by future appointment(s) in suitable area(s).

In Physics and Astronomy, the most pressing need for expansion is probably in Materials Physics, a new but very small group that is nonetheless proving successful in generating grant income, and which also has excellent potential for economic impact. This, along with quantum technology – in which we have a commanding position within the UK – will also require a modest expansion in lab space. In order to make the most of new opportunities e.g. in UK Industrial Strategy we aim to grow our interdisciplinary research. To this end we have set up the Sussex Quantum Research Programme to explore applications of quantum technology across the sciences. We also have extremely successful and world-leading research programmes in Astronomy and Particle Physics, but funding in those areas is unlikely to grow in the near future – however, these areas provide strength in data science and interdisciplinary research at that interface is promising to exploit opportunities for socio-economic impact through e.g. UK Industrial Strategy.

### **2. What is important/necessary to be kept “as-is”?**

Everything is, and should remain, under review, but an overview of our work suggests that in general incremental change is more appropriate than revolution, so most of our activity – both teaching and research – would probably fall under the heading “keep as is”.

### **3. What should the School reduce or even stop doing? (and why?)**

We are already responsive to our environment in this respect; we don't persist with activities that aren't worthwhile. An obvious example is our neutron EDM activity, for decades the absolute mainstay of Experimental Particle Physics at Sussex: our group has held the world sensitivity limit continuously since 1999. This kept the group alive and funded through difficult times, allowing breathing space for rebuilding and expansion in more mainstream areas of collider physics and neutrinos. STFC priorities have changed, and since 2015 EDM funding has almost (but not quite) disappeared, so we have during the last couple of years essentially closed down that activity, just keeping a foot in the door because of 4\* papers that will emerge. Similarly with teaching: when modules are not viable, we stop delivering them. There is little else that can obviously be cut without damaging our core activity. In terms of staffing, our teaching technical support was overmanned; we have allowed some natural wastage by not backfilling for retirees and reductions in hours, and we have introduced more flexibility between support for research and for teaching. We are also doing some rebalancing of academic roles: recently a faculty member made the transition from a T&R to a T&S contract, and conversely a Research Fellow has moved across to a regular T&R faculty contract.

One item that is under review is our involvement with the University's international summer school programme. At present the outlook appears positive, but if all else fails we can run it ourselves and keep the income that we generate.



## External Context

*Please provide a minimum of 500 words describing the backdrop to your strategy. Focus on the external environment – identifying specific opportunities and threats to your School and its portfolio of activity (be that education, research or engagement).*

*These might include (but not be limited to) societal or technological change in your areas, increasing/falling demand for certain subjects, a stated emphasis/priority from Research Councils/other funders etc.*

*There will be opportunity further into the strategy to explore internal (to the University) constraints and risks.*

Over the past few years the School of Mathematical and Physical Sciences has expanded very substantially, both in staff and student numbers. We have benefited from considerable investment, most recently in Probability Theory and its applications within the Department of Mathematics and, within Physics and Astronomy, in the very applied areas of Materials Physics (MP) and in Quantum Technology (QT). We now find ourselves in a strong position to deliver substantial world-leading research on a number of fronts. We have enjoyed considerable success in European funding, suggesting that our faculty can readily compete with the best talent internationally. We are working actively to increase our engagement with businesses, not least to grow REF impact.

As we consolidate our new recruits in the lead-up to the next REF, we find ourselves still faced with some serious challenges: in particular our very tight space constraints, which are having serious impacts upon teaching (including NSS), research and the working environment; and the recent sharp fall, now apparently halted, in the number of undergraduate applicants in Physics & Astronomy, which leaves our student-fee income something approaching £0.5M lower than might otherwise have been expected. This is compensated to some extent by steady growth in Mathematics numbers, as well as in PGT, but it still leaves little room for manoeuvre in the overall School budget. Potential growth areas for student intake (mainly at postgraduate level) are in Financial Mathematics, Data Science and QT. Physics and Astronomy has – in common with all departments nationwide in the field – a challenge over diversity and gender balance. We will do all that we can to improve the situation, so as to become sector-leading in this respect.

Research income is growing, and we anticipate further substantial growth from MP/QT. There are more fundamental areas that also look very promising – for example, ATLAS upgrades – but our traditional “paymasters” STFC and EPSRC seem to have less and less resource available. Another bright spot is the International Summer School (ISS), which has recently grown and which looks as though it has further room for growth: but at present Physics has barely been covering costs (we take home about £600 from the £2.3k fees). We are aware that this is under review, and are optimistic that a more reasonable settlement can be reached. Meanwhile, Mathematics has undertaken a highly successful pilot to deliver some summer teaching to students from Southwest University in China, and there is also some external interest in having us deliver some CPD modules.

Mathematics has a very high SSR, of around 18 (with typically 15 contact hours per week). This follows very substantial growth since 2014, with UG numbers having increased by 40% and PGT having doubled. Research income per FTE has more than doubled over this period, and there have been some recent examples of buyouts, which give grounds for optimism for future income generation. The poor SSR though is a distinct disadvantage in today’s highly

competitive marketplace, and – with the consequent heavy workload – has certainly contributed to the recent high faculty turnover. We therefore see as a priority the expansion of Mathematics as income growth allows.

Physics and Astronomy is expensive to teach, and typically makes a small loss because of the reduction in government subsidy for such subjects (or, almost equivalently, because of the inability of the RAM to account for real teaching costs). On paper its SSR looks very attractive, at about 11, but since about a quarter of faculty are on average bought out for research, and the 330 or so ISS students are not included in SSR, the effective number is, like Mathematics, in the high teens. For budgetary reasons a number of departing faculty have not been replaced, although there has been compensation from the SDF-funded growth areas. There will be additional strain on the budget in a couple of years as these SDF posts move onto the School budget, so it is essential both to increase research income and student intake.

According to the latest Guardian league tables, Mathematics is circa 50<sup>th</sup> out of 60 in terms of SSR. Physics is around 30<sup>th</sup> out of 44, but if it were adjusted to include the ISS students – other institutions don't have ISS activity in the way that we do – it would end up circa 40<sup>th</sup>.

## LEARN TO TRANSFORM

Please describe under the following headings (taken from the University's Strategic Framework) the School's **proposed contributions to the University's ambitions in this area**. As well as new initiatives, please do include activities/functions the School is already undertaking that make a positive/distinctive contribution.

Recognising that our Schools will contribute differentially to the University's success, please identify in the final box below those two items that you believe will **most add to the success/distinctiveness of the School going forwards** in this area.

### Distinctive (curricula and pedagogy)

How will the School contribute to the University's commitment to provide a distinctive curricula<sup>1</sup> and/or pedagogy which is transformational for students? Please **give particular consideration to opportunities for further (and re-imagined) interdisciplinarity** in your thinking around this area.

- Our longstanding (30 years+) Foundation Year has proven truly transformational for many from non-traditional or WP backgrounds. At the other end of the scale, our innovative Research Placement programme is similarly transformative in involving the brightest students in frontline research from the moment of their arrival at Sussex.
- SEPnet (in P&A) and MAGIC (maths) consortia provide extensive remote teaching opportunities that would not be viable to deliver in-house.
- We promote interdisciplinarity through our elective modules. Unfortunately, our accreditation requirements allow essentially no space for electives for our own students – although we are looking for ways to free up room for this
- We have exemplary support for employability. We have an in-house employer engagement officer, with links (via SEPnet) to circa 200 employers; we deliver an assessed careers sub-module; we support placements in industry.
- We are looking at the possibility of introducing a tutorial-type system for y1 (and possibly y2), although this would be somewhat resource-intensive.
- Our curricula evolve to reflect modern times: quantum technology, data science. We should expand this to the undergraduate curriculum: for example, there is likely to be a market for degrees such as Mathematics with Data Science.
- We investigate innovative pedagogical approaches, including technological approaches such as PeerGrade and PollEverywhere.
- We are looking into the possibility of freeing up an elective pathway (nb this is extremely challenging, with so much core material specified by professional accreditation bodies)
- We are open to discussion about innovative delivery methods, such as online distance learning (ODL) and trans-national education (TNE).

### Student-Centred

How will the School embed meaningful student participation in everything that they do?

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<sup>1</sup> Should be either "a distinctive curriculum" or "distinctive curricula"

- We have appointed a student rep to our executive committee; they already participate in Departmental meetings. We also have very strong and vibrant student-staff committees to discuss topics of common interest and concern.
- We encourage students to study within the School by providing free tea and coffee. NB our alumni were very happy to fund this through the Sussex Fund, but new rules were introduced to prevent this – a mistake in our view.
- Faculty have an open-door policy, and the vicinity of our study spaces – plus social events such as the annual balls – encourages student/staff interaction.
- Use mid-term feedback in modules, so that students can see (and benefit from) changes that they have suggested.
- We have an active outreach programme involving many of our students (for which we pay them).

### Digitally Advanced

*How will the School use technology to enhance student learning and facilitate knowledge creation?*

- We will **not** stop using blackboards; this would be immensely unpopular. However, we encourage the integration of PowerPoint, interactive smartboards, smart plinths, PollEverywhere and similar within lectures.
- Embed programming skills more deeply into all our courses.
- We engage fully with the SEPnet and MAGIC consortia, to provide and to benefit from remote teaching of specialist topics that would otherwise be unavailable to our and other institutions' students.
- We will press for the introduction of some automated system to record student presence at lectures. This would free a lot of wasted faculty time spent entering attendance records.
- Our research is knowledge creation, almost by definition, and a great deal of advanced technology (including HPC) is invaluable to this end. We are already providing 1 FTE of specialist computer technician time in support of teaching, since ITS seems unable to provide it.

### Enhanced (curricula, opportunity, experience)

*How will the School build creative opportunities that help students extend their skills, confidence, competencies and networks?*

- Involvement with outreach activities in schools
- International summer-school AT work
- Research placement programme
- Industrial placements
- Student-run seminars etc.
- In-house employability training embedded within the curriculum
- Supporting undergraduate societies

### **(World) Citizens**

*How will the School help their students become more connected, civically and politically engaged, entrepreneurial and creative?*

- Through our outreach activities
- By helping them to obtain placements
- By helping and supporting the development of spin-outs from our research activity
- Through teaching-focused final-year projects, “Communicating STEM”, via the Education Department, as a pipeline to PGCEs and the delivery to the nation of more STEM-trained teachers.
- We will consider the possibility of introducing programmes such as “Physics for Society” and “Mathematics for Society” that will include broader curriculum elements such as ethics, environment and so on. (This may also assist with gender balance.)

### **Research (engaged) Students**

*What can the School do to engage their students in the pressing research questions and challenges of our time, relevant to their course of study?*

- Our innovative Research Placement programme engages the brightest students with frontline research throughout their degrees.
- All students have the opportunity to carry out research-based final-year projects, with supervision either 1:1 (Integrated Masters) or in small groups (BSc)
- Specialist module options linked to world-leading research. And, for the broader University community, our elective module Quarks to Cosmos.
- Faculty give popular lectures (often requested/arranged by students)

**Of the above, the two key contributions to the success/distinctiveness of the School in delivering a transformational education will be...**

- **Our employability programme**
- **Research placements, and other activities to integrate research into teaching**
- **If we’re allowed to put in a third one: Increasing the diversity of our student population**

## Measuring Success

Using the institutional KPTs, please consider appropriate annual targets for the School in each of the areas identified below. Please use the second table to add any further indicators (and targets) you believe would be helpful for the School to track towards achieving its ambitions in this dimension of the University's strategy.

Key Performance Indicators	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Subject-level TEF	Gold	Gold	Gold	Gold	Gold	Gold
% Overall Satisfaction in National Student Survey	90%	90%	92%	92%	92%	92%
Employability ( <i>metric to be finalised</i> )	95%	95%	95%	95%	95%	95%
% of students who value educative innovations in their teaching/learning	? <sup>2</sup>	?	?	?	?	?

  

Others (school-specific) Indicators	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Staff survey: employee engagement score	75%	76%	77%	78%	79%	80%

<sup>2</sup> Note: our students are wary of “educative initiatives” and will be furious if somebody tries to replace blackboards with whizzy hi-tech VR gadgets. High-quality teaching is not necessarily synonymous with entertainment. Also, I don’t understand the point of this KPI: should it instead be something like “% of students who feel that they have experienced an innovative education at Sussex”?


## RESEARCH WITH IMPACT

Please describe under the following headings (taken from the University's Strategic Framework) the School's **proposed contributions to the University's ambitions in this area**. As well as new initiatives, please do include activities/functions the School is already undertaking that make a positive/distinctive contribution.

Recognising that our Schools will contribute differentially to the University's success, please identify in the final box below those two items that you believe will **most add to the success/distinctiveness of the School going forwards** in this area.

### Research Excellence

*How will the School support and develop its researchers to recognise and deliver excellence at all times?*

- As budget permits we will do all possible to provide adequate research capacity including by funding of essential PGR studentships, especially for new faculty and for those in areas (e.g. Mathematics) where it is almost impossible to obtain external support because of current UKRI policies that favour subsidising large institutions; occasionally provide matching support for grant bids; and so on.
- Employing grant-writing support, if resource can be found within budget
- Press for adequate space for all of our researchers to do their work
- Researchers are associated with research groups of typically 6-12 faculty. Peer support is primarily through these groups. Groups will continue to have a voice at departmental research strategy committees.
- We will continue our flexible and responsive technical support (computing/mechanical/electronic) and ensure that this is at an adequate level, allowing movement between research and teaching support to help to deal with capacity problems.
- Improving and expanding our mentoring activities both within and across research groups and engaging with appropriate external training. We will ensure in particular that early-career researchers have adequate support.
- Appropriately recognise through our work allocation models the efforts required on both academic research and socio-economic impact (including public engagement)

### Experimental

*How can the School champion new ways to generate knowledge that challenges conventional wisdom?*

- Continuing to support involvement in major collaborative international research projects
- Interdisciplinary work, e.g. through Sussex Programme for Quantum Technology, and by developing our links with other areas such as Chemistry and the Business School
- In general, continue to invest in and support our top-quality researchers who are already generating knowledge that challenges conventional wisdom...

### Our Strengths

*What areas of your research are we/should we recognise for world-leading enquiry and/or impact?*

- Quantum technology with world leading research and growing and good potential for extremely high future impact
- World-leading research in particle physics and astronomy and cosmology through large-scale international projects.
- One of the very few mathematics departments in the UK to focus on modern treatment of Ordinary and Partial Differential Equations from both a theoretical and an applied perspective.

### Interdisciplinarity

*What opportunities exist for the School to further push the boundaries of interdisciplinary research and engagement?*

- Quantum technology offers many new opportunities e.g. through new materials or new sensors and this will be explored via our newly established Sussex Quantum Research Programme.
- Data science. We have extensive experience in handling big data and applying mathematical and computational analysis to creatively solve scientific questions. This experience readily translates to other research questions. We will support this through the new Research Centre in Data Intensive Science Centre at University of Sussex (DISCUS).
- Collaborations exist between Materials Physics and Chemistry, investigating novel nanomaterials for energy applications. The Biomedical applications for Materials Physics are being exploited through a collaboration with Biochemistry and the Genome Damage and Stability Centre. Both of these are high impact areas, with the potential for funding capture outside the normal channels, Cancer Research UK, BBSRC, etc. Other groups, including in Mathematics, are interested in establishing links with Chemistry.
- We will continue to encourage individuals and groups to explore productive interdisciplinary research with other Schools and internally within the school. For example, within the School there is significant room to strengthen and expand the area of Mathematical Physics that lies at the interface between the two Departments. This Mathematical Physics group already collaborates with the Business School.

### Grant Capture

*How can the School support its researchers to maximise their success in grant capture?*



- In order to make some grant bids successful we are often more or less forced to provide matched funding, sometimes significant. Within budgetary constraints we will do all we can to support such bids where it is in our strategic interest and where they are likely to provide further opportunity for income generation and for the production of high-quality outputs.
- Employ professional grant-writing support, subject to available resource.
- Continued professional support e.g. in our business development fellow(s)
- Enhanced carefully targeted peer support

### International Repute

*How will the School increase the number and quality of its international research collaborations, partnerships and co-authorships?*

- Several of our groups are already members of large international research collaborations. We will continue to encourage them and to celebrate their successes.
- We will encourage groups to share good practice on how to join and participate successfully in such projects, and will invest accordingly in line with our strategic interests and business plans.

**Of the above, the two key contributions to the success/distinctiveness of the School in delivering world-leading Research with Impact will be...**

- Leadership in large-scale international research projects
- Creative interdisciplinary links, particularly within Sussex Programme for Quantum Research and Data Science
- A third item, if permitted: PGR studentships, which provide vital front-line support to our entire research effort

### Measuring Success

*Using the institutional KPTs, please consider appropriate annual targets for the School in each of the areas identified below. Please use the second table to add any further indicators (and targets) you believe would be helpful for the School to track towards achieving its ambitions in this dimension of the University's strategy.*

Key Performance Indicators	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Field-weighted citation impact	P&A: 3.5	P&A: 3.5	P&A: 3.5	P&A: 3.5	P&A: 3.5	P&A: 3.5
	M: 1.3	M: 1.4	M: 1.5	M: 1.5	M: 1.5	M: 1.5
% of outputs 3*/4*	95	95	95	95	95	95
Grant capture (£ per FTE)	P&A:125k	P&A:127k	P&A:130k	P&A:133k	P&A:136k	P&A:140k
	M:22k	M:23k	M:24k	M:26k	M:28k	M:30k
% of publications internationally co-authored (rolling 5-year average)	P&A: 80	80	80	80	80	80
	M: 60	60	60	60	60	60

Others (school-specific) Indicators	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25

## ENGAGE FOR CHANGE

Please describe under the following headings (taken from the University's Strategic Framework) the School's **proposed contributions to the University's ambitions in this area**. As well as new initiatives, please do include activities/functions the School is already undertaking that make a positive/distinctive contribution.

Recognising that our Schools will contribute differentially to the University's success, please identify in the final box below those two items that you believe will **most add to the success/distinctiveness of the School going forwards** in this area.

### Ethos and Practice

*How can the School embed an ethos and practice of external engagement across its activities?*

- We have an excellent outreach programme, particularly around areas of astronomy and particle physics. We need to broaden this to include other areas more fully.
- We have engagement across the region on a number of fronts through SEPnet.
- We have an Employability Advisor embedded within the School, who has links with numerous employers across the region as well as with our alumni.
- One of our faculty is founder and coordinator of a major international physics outreach programme for developing countries. By highlighting her success we can encourage others to promote their own research through outreach.
- Our Data Intensive Science Centre DISCUS tackles real social and economic challenges from public and private sector organisations by applying data interpretation techniques developed by our teams.
- We will employ a business engagement officer, complementing our Innovation Partnerships Fellow, to build links with the business community.
- We can work more closely with the press office to publicise our research achievements. The conceptual difficulty of some of the content sometimes represents a challenge to propagation to broader audiences.
- We have an enthusiasm for external engagement and research communication but are somewhat lacking in strategy and coordination. We are now developing a faculty role for Research Communication and Public Engagement coordination.

### Community

*How can the School better listen and act in the local and regional interest, to mutual benefit?*

- We can increase our involvement in the Community Day that takes place each June.
- Continue and improve our outreach programme, which is engaged in particular with local WP schools. We run a "schools lab", where groups of pupils are able to come and carry out experiments with equipment not available to them within their schools, and where they can hear inspirational talks by our faculty. With one local school, pupils are able to work with us on an international project to study cosmic rays via a detector on their roof.
- We aim to become sector-leading in the diversity of our student body, in terms of gender, ethnic minority and other underrepresented groups.

- We will explore possible links with Chemistry, with regard to materials physics or possible new activity in chemical physics.
- Through SEPnet we are supporting collaboration in physics and astronomy across the Southeast.
- We have two technician apprentices that we are training to develop their specialist mechanical and electronics skills.

### Alumni

*What opportunities exist for the School to create greater opportunities for, and through, its alumni?*

- We ask our alumni to come in and give talks about their career experiences to our undergraduates, as part of the careers sub-module. We can broaden this initiative.
- Our alumni in the past have been very positive about contributing to funds to provide free tea/coffee for our students, via the Sussex Fund, as they themselves recognised and appreciated its value when they were undergraduates. Unfortunately Sussex Fund rules no longer allow this; but there is a clear opportunity here for the University to review and revert to the original policy.
- We are in touch with an extensive network of our alumni via, for example, social media. Perhaps they could be invited back for occasional social events? A small number like to come to our annual student/staff balls for a year or two after they have left.

### Business

*How can the School better embed business engagement, innovation and enterprise into its core activities?*

- See above: employing a business engagement officer.
- We are developing and building our “applied” research, and our links with local industries are growing and deepening rapidly.
- We are developing spin-off activities from our research.
- We support our students’ participation in industrial placements
- Our employability advisor has extensive links, via SEPnet, with employers.
- Some of our MPhys final-year projects have been co-supervised by local finance companies. There is room for expansion on this front.

### International

*What can the School do to enhance the international mobility and experience of its staff and students?*

- Continue to support involvement in major international experiments
- Smooth the process of grant writing for research projects – particularly large international ones
- A small step: simplify the business of obtaining travel insurance, and take it online!
- Promote our exchange programmes – and press harder for revision of the appallingly iniquitous “marks translation” system that unfairly penalises our brightest students for going abroad.

Of the above, the two key contributions to the success/distinctiveness of the School in achieving meaningful engagement for change will be...

- Increase and better coordinate our outreach activities, with particular focus on WP schools and addressing gender imbalance
- Employing business engagement officer to complement work of our innovations partnership fellow and our employability advisor.

### Measuring Success

*Institutional KPIs in this dimension are targeted at whole University outcomes and do not lend themselves to direct disaggregation at School-level. Please consider, against the proposed activity, what might be appropriate School-level indicators and targets to demonstrate progress/delivery.*

School-specific Indicators	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
Number of pupils contacted by our outreach programme	12,000	13,000	14,000	15,000	15,000	16,000
Innovate UK funding	£100k	£120k	£140k	£160k	£180k	£200k

PhD students on 3-month industrial placements	5	6	7	8	9	10

## **Equality, Diversity and Inclusion**

*What will the School do to contribute to the University's four EDI goals? (please refer to the University's Equality, Diversity and Inclusion Strategy – Inclusive Sussex).*

### **Equal**

- All staff on recruitment panels, including for PhD students, must have UB training. All recruitment panels must include both male and female members.
- Appraisal to include clear focus on career progression, not simply performance management
- Appointment of E&D “champions” for those who do not wish to raise concerns via regular line management
- Inclusion of E&D Chair on MPS Executive Committee
- Working towards proper career progression and appropriate reward for our PS staff

### **Diverse**

- Encourage female role models in outreach activities to schools and community
- Promote gender (and, if realistic, race etc) balance in seminar speaker invitations
- Zero tolerance approach to bullying and harassment; promotion of dignity and respect for all
- Improved support for students with Aspergers/autism

### **Accessible**

- Staff returning from caring responsibilities have reduced workload in first term, equivalent to removal of one module's teaching
- All official meetings to be held within family-friendly hours of 10 am to 4 pm
- Disability support: e.g. ensuring wheelchair access (including emergency egress), dedicated disabled parking spaces with barriers (we have one), lecture notes in non-serif font for ease of reading by dyslexics, light box for SAD, adjustable-height desks for those with back pain, special keyboards for arthritis sufferers etc.
- Working with stakeholders across campus to ensure views of disabled are heard and listened to e.g. in terms of access requirements.
- Financial support for childcare for essential out-of-hours or away-from-home meetings

### **Flexible**

- All requests for flexible and part-time working to be agreed by default, unless there is a clear business case against it

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**Thank you for completing Part A of the Strategic Planning Workbook.**

**Part B will be issued to Schools at the end of September 2018.**

**Please refer to Page 2 for the Timeline as to what happens next.**