

# Annual Review

# 2020

# Contents

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# President's Report

## President's Report

In January 2020, the invisible enemy Coronavirus was working its way towards the UK and from March delivered a devastating impact on the health, economy and citizens of our country. Healthcare professionals were hard hit, working extended shifts, often learning new skills to be deployed to other areas and even moving to work at the NHS Nightingale and Louisa Jordan hospitals which had been rapidly set up.



Our own professional groups, clinical/biomedical engineers, medical physicists, technologists, academics and industrialists all played a crucial role in supporting the national response to the pandemic. These groups have all been 'mentioned in dispatches' from the Office of the Chief Scientific Officer, Medicines and Healthcare Products Regulatory Agency and the Department for Health and Social Care. IPEM too played its part in tackling the pandemic, identifying local, regional and national links for professional groups and facilitating some of these meetings. IPEM issued ten Covid-19 related guidance documents and supported many more from our partner organisations.

## President's Report



Phil Morgan



Eva McClean



Jemimah Eve



Steve Mattin

We are very grateful to the staff for adapting so well to this change and keeping the national office operational, albeit remotely.

I am pleased to report that IPEM has had an extremely successful year. Philip Morgan joined IPEM in January 2020 as Chief Executive Officer, unaware that he would have a whole list of Covid-19 related tasks to keep him occupied on top of those he would have expected. Activities turned to Covid-19 in March when Fairmount House was closed in a timely manner before the national lockdown. IPEM staff reverted to home working and, after a few teething troubles, everyone settled into it. We are very grateful to the staff for adapting so well to this change and keeping the national office fully operational, albeit remotely.

Changes were made to the national office team during the year. Jemimah Eve, Workforce Intelligence Unit Manager, was promoted to the Senior Management Team and added training to her portfolio. A new Membership & Development Manager, Steve Mattin, was recruited, followed at the end of the year by Paul Barrett as Senior Communications Manager. Meanwhile Eva McClean took on a new role as Equality, Diversity and Inclusivity and Member Networks Manager.

## President's Report

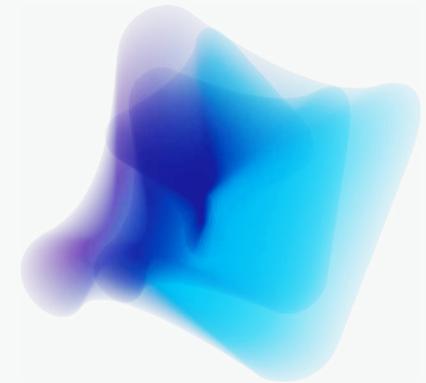
Major items for consideration by IPEM included a review of our strategy, our branding, and the tackling the need for a new website. The strategic review has been completed, driven by Philip Morgan. Our new branding was approved just before Christmas and is now being rolled out. These have been mammoth tasks which have been completed on time despite the disruption throughout the year. The website project is now underway after being delayed by approximately six months due to the pandemic.

We managed four live events, together with thirteen outreach events, prior to lockdown. Our annual conference MPEC moved entirely online and took place over a period of two weeks in September. The MR Expert task and finish group successfully completed its work and the programme was approved by the Professional and Standards Committee. The first exam is expected to take place in September 2021.

There was concern expressed by members during 2020 relating to the lack of SIGs for Clinical Engineering and Clinical Informatics. These will be reintroduced in a slightly different way to the current SIGs, with the aim of actively developing a community of practice within a specific area of science or engineering, including, but not limited to, active management of the relevant Communities of Interest and regular networking opportunities for group members. The progress of these two new groups will be carefully assessed.

The key elements within the new IPEM brand are:

### 1. Living device



### 2. Logo

**IPEM**  
Institute of Physics and  
Engineering in Medicine

### 3. Typeface

**This is Moderat**

## President's Report

Our IPEM international scholar, Eduardo Florian, is now in the second year of his MSc in Medical Physics at the University of Trieste in Italy and is looking for a PhD project in the UK. Professor Dan Clark OBE is working with low and middle income countries to see how we can support an expansion of training, qualified staff and services. There is a very interesting project in Nigeria trying to get off the ground to inform engineering students of the possibilities of careers within our professional specialties through a block of lectures as well as practical work, some of which will be directed from the UK.



Eduardo Florian

IPEM has remained in excellent financial health despite the turbulence in the financial markets in 2020. Expenditure has been low given that all meetings were virtual from mid-March and continue to be so. The strategic changes have required funding and a budget was proposed for additional staff together with

consultants for the rebranding of IPEM and our website. A negative budget was proposed by the Finance and Business Planning Committee in September and approved by Trustees in October, with a return to a balanced budget anticipated by 2024.

IPEM forged a link with the Worshipful Company of Scientific Instrument Makers, a Livery Company of the City of London and a charity. A joint essay prize was established and webinars shared across both organisations. A memorandum of understanding was signed between IPEM and the School of Mathematics, Computer Science and Engineering at City, University of London, to jointly organise a series of four webinars in 2021.

Many congratulations to Professors Joe Barbanel, Stephen Keevil, Slavik Tabakov, Peter H. S. Smith Leandro Pecchia and John Mallard\* on becoming inaugural Fellows of the International Union for Physical and Engineering Sciences in Medicine in recognition of their outstanding work for our profession on the international stage.

\*Sadly, Professor Mallard passed away in February 2021



Left to right: Professor Slavik Tabakov, Professor Joe Barbanel, Professor Leandro Pecchia, Professor John Mallard

## President's Report

Until 2020, there was no way of recognising members who had given exceptional service to IPEM. I therefore gained approval to introduce the President's Gold Medal for this purpose. No more than three can be awarded in any one year. The inaugural winners of this medal were Dr Anna Barnes from University College Hospital, London, Dr Richard Black, from Bioengineering at the University of Strathclyde, and Justin McCarthy, a consultant clinical engineer from Cardiff. We were very pleased to hear from each of the winners at MPEC about the volunteer work that they have carried out for IPEM and what it has meant to them.

Congratulations go to IPEM members Dr Heather Williams, who was awarded an MBE in the New Year's Honours list for diversity and inclusion in science, and Professor Dan Clark, who received an OBE for his work in clinical engineering, particularly during Covid-19.



Dr Heather Williams MBE



Professor Dan Clark OBE

Finally, I would like to thank all our volunteers who have given of their time so unselfishly, as Trustees, on Councils, Committees, SIGs, Working Parties, Task and Finish Groups, as Registrars, Editors, Mentors or writing guidance documents and reports. Without all of this volunteer effort, IPEM could not be the charity, professional body and learned society that it is, widely respected both nationally and internationally.

## Professor Stephen A. O'Connor DSc, FIPEM



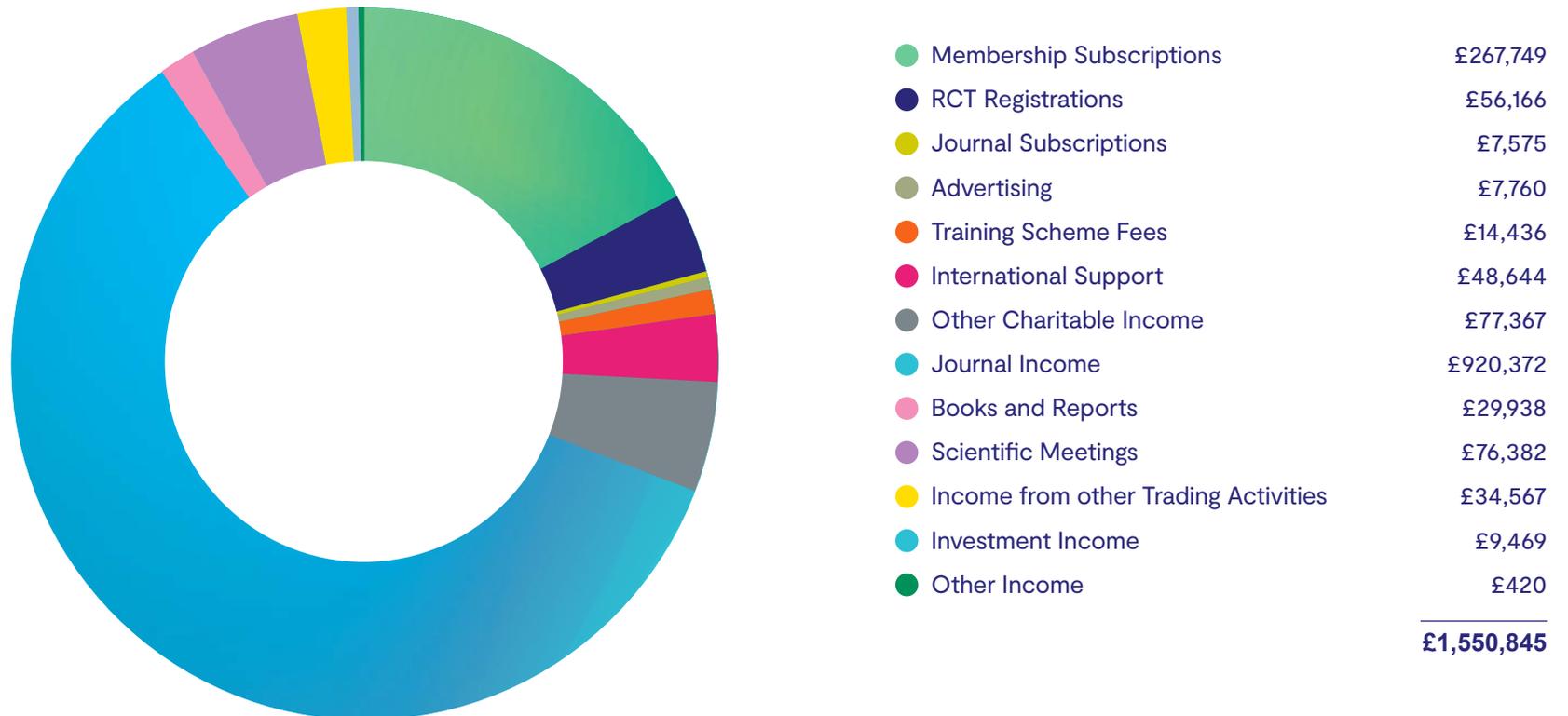
Professor Stephen O'Connor  
President, IPEM

# Finance

## IPEM Consolidated statement of financial activities for the year ended 31 December 2020 (incorporating the income and expenditure account)

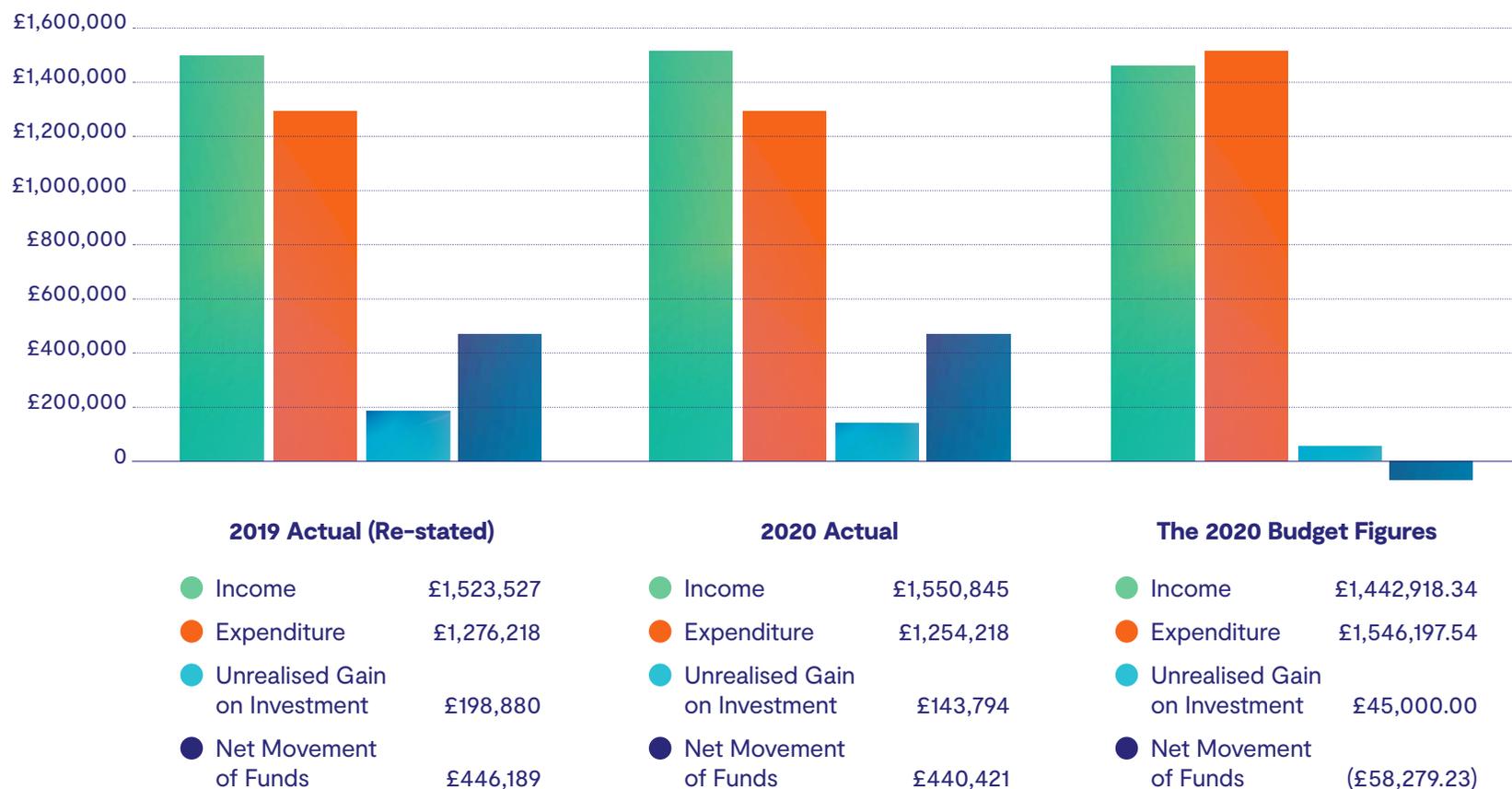
### Finance

#### IPEM Consolidated Income 2020



## Consolidated Statement of Financial Activity 2020

### Finance



**Finance****Honorary Treasurer's Report**

Whilst 2020 was an unusual year and the pandemic had a material impact on how we worked and how we delivered on our charitable objectives, the financial position of IPEM has remained strong. The outturn for 2020 was a surplus of £440,421 compared to £446,189 in 2019 and a planned deficit of £58,279.

The cancellation of all physical meetings from the end of February onwards resulted in conference income being severely impacted and (where possible) events being moved online; however, the costs of running the digital programme were considerably lower and in net terms fully compensated for the shortfall in income. Significant savings in travel and accommodation (ca. £90,000) were achieved as a simple consequence of holding all internal meetings remotely. The recruitment process for new positions was also slowed down by the pandemic and resulted in savings against budget. Membership subscription and registration income was broadly in line with the prior year. Income from our journals reached its highest level yet, £920,372 against the prior year level of £768,740, an increase of £151,632. Whilst this performance is highly satisfactory the Finance and Business Planning Committee remains concerned about the long-term impact of the growth of Open Access publishing and was pleased to sanction the development of our first open access journal, IPEM-Translation in anticipation of this trend.

Our investment in the CCLA Charity fund suffered with the onset of the pandemic and fell in value during the first quarter but the fund was well positioned to take full advantage of the recovery over the remainder of the year. For 2020 (as a whole) it generated an uplift of £143,794 or just under 10% of the value at the beginning of the year.

The Group's cumulative surplus stood at £3,723,133 on 31 December 2020. Of this £272,307 is restricted; £3,450,826 is unrestricted, of which £406,100 is currently financing tangible fixed assets, leaving free reserves of £3,044,726

The free reserve requirement has remained unchanged at £2,500,000, consisting of a Target Operating Reserve of £750,000 and a Designated Reserve of £1,750,000. At present IPEM is comfortably above this level.

We enter 2021 with a robust balance sheet, and with reserves well in excess of levels required. Although Covid-19 continues to impact all aspects of our operations into 2021 we remain confident in our ability to withstand this financially over the medium term horizon.

**John Turner**  
Honorary Treasurer

# Honorary Secretary's Report

## Honorary Secretary's Report

**Our new Chief Executive Officer, Philip Morgan, joined in January 2020 and had barely begun at Fairmount House when he had to oversee the closure of the national office due to the Covid-19 pandemic. IPEM staff began working from home whilst keeping the national office operational and continuing to support members, during these exceptional and challenging times.**



Chelsea Roche



Professor Mark Tooley

From April onwards Trustees also met remotely due to the pandemic. We welcomed Chelsea Roche as a new Independent Trustee and said farewell to retiring Trustees Professor Mark Tooley (Immediate Past President), Dr Roger Staff (Director of the Science, Research and Innovation Council), and Professor Bernard Conway (Member Trustee). We thank each of them for their valued contribution to IPEM's Board.

Continued Covid related restrictions through 2020 meant that IPEM held its first-ever online MPEC conference and Annual General Meeting in September. We were delighted to have Professor Jim Al-Khalili OBE FRS, well known broadcaster and physicist, as our informative and thought-provoking keynote speaker at MPEC, whilst at the AGM we welcomed the election of Dr Robert Farley as our new President Elect. A number of changes to IPEM's Articles of Association were agreed at the AGM, including provision for voting and future AGMs to take place online.

A new training plan for 2021 to cover the corporate, legal and EDI responsibilities of the Trustee Board, was introduced for all Trustees, along with informal "open forum meetings" with the Institute's Senior Management Team.

## Honorary Secretary's Report

During the course of 2020 governance improvements saw the introduction of two new Board sub-committees. A Policy Sub-Committee was introduced to review and update IPEM's operational policies, and a Governance Sub-Committee was introduced to review the scope of the role of the IPEM President.

During the year SCOPE, our highly-popular members' magazine, was re-launched with new publishers Redactive, and I am delighted to report that it has been shortlisted for a prestigious Memcom Award.

As always, IPEM relies on members' activities on committees, Special Interest Groups and working groups to achieve its charitable objectives. We are very grateful to all our members and volunteers for giving their time and expertise. The list of contributing members is hosted on the IPEM website and you can see it at [www.ipem.ac.uk/Members/CommitteesGroups.aspx](http://www.ipem.ac.uk/Members/CommitteesGroups.aspx)

**Danielle Ross**  
Honorary Secretary



Danielle Ross  
Honorary Secretary

# Covid-19 Impact

As the world changed almost overnight and so many aspects of our day-to-day lives were disrupted during the coronavirus pandemic, IPEM members continued to play a vital role during the crisis.

#### Covid-19 Impact



A new Covid-19 hub was created on the IPEM website, to share a wealth of information, guidance and advice on the developing situation and the efforts being made to tackle the outbreak. This became an invaluable resource and was updated almost daily with new information from members and also from other organisations and bodies, including the Department of Health, NHS England, the Health and Safety Executive and a number of manufacturers.

One particular area in which members played a crucial role was in developing advice and guidance on ventilators, from converting anaesthesia machines for use in intensive care to considerations that needed to be taken into account when hospitals received an offer of donated equipment.

## Covid-19 Impact

The clinical engineering community really came to the fore on the various ventilator initiatives. Many individual members were involved in this, with Professor Stephen O'Connor, IPEM's President, Professor Mark Tooley, Immediate Past President, Dr George Dempsey, Vice President Engineering, and Dr Keith Ison OBE, IPEM Past President, really leading on the response to this call.

Member Chris Ramsden, as co-lead for healthcare of the Chartered Institute of Ergonomics and Human Factors, was involved in producing a guide for human factors issues to help the many design and engineering companies who were pressed into action to develop ventilators for the first time.

For his part in establishing a national technical due diligence team to evaluate non-standard ventilators and infusion devices during the pandemic, Professor Dan Clark was awarded the OBE for services to clinical engineering. He worked tirelessly with the Cabinet Office, the RAF, NHS England and Improvement, and the Department of Health and Social Care to evaluate the thousands of pieces of equipment that were rapidly brought in to support the NHS Covid-19 patient surge.

IPEM also hosted a video call for the Heads of Medical Physics and Radiation Protection Advisers for them to share experiences and knowledge gained of the radiation protection issues around expansion of intensive care unit capacity and field hospitals.



## Covid-19 Impact

Many sectors of the healthcare science workforce were asked to volunteer their services in a variety of different ways during the Covid-19 crisis, especially at the new NHS Nightingale hospitals, and IPEM brought these opportunities to the attention of members.

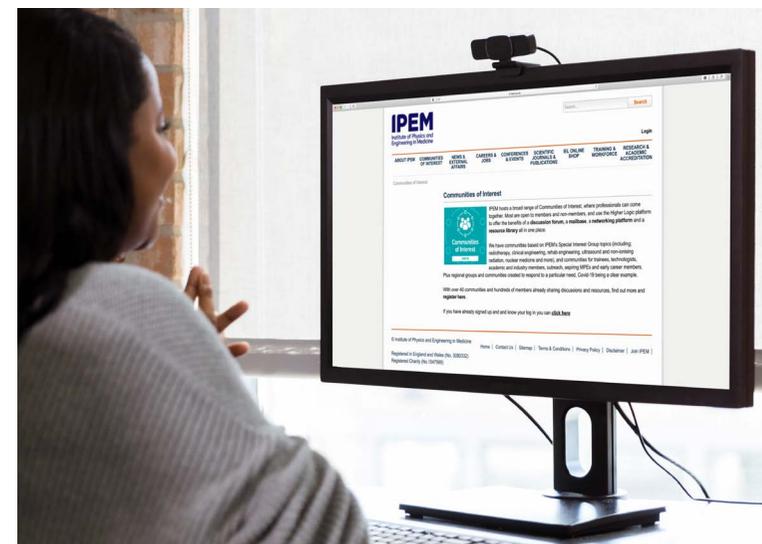
The Institute contacted recently retired members after the Health and Care Professions Council created a temporary Covid-19 register for those who had deregistered within the last three years and who wanted to return to work. This also applied to third year STP students who had completed all of their clinical practice placements.

IPEM produced and shared guidance for members to help protect their mental health during the pandemic, offering information, support and advice. The Institute's Trustees also made themselves available as a resource to be used in this regard by members.

**IPEM produced and shared guidance for members to help protect their mental health during the pandemic, which offered information, support and advice.**

At the same time, IPEM took the decision to open up the Communities of Interest (CoI) to non-members to help share best practice in response to the crisis and to help provide professional, expert advice to those that needed it.

The CoIs really came into their own at this time, with a wealth of information, advice and guidance being shared and many valuable conversations and discussions taking place across the forums.



# Policy and Consultation

**IPEM members and officers were active throughout the year on a wide range of policy and consultation matters.**

### **Policy and Consultation**

**A change to the job codes used to classify medical physicists and clinical engineers was achieved thanks to lobbying by IPEM.**



Led by IPEM, the presidents of six Royal Colleges, learned societies and professional bodies wrote to HM Government seeking clarification about the NHS Health and Care Visa scheme.

Professor Stephen O'Connor, IPEM's President, wrote and orchestrated the letter to Home Secretary Priti Patel MP which was endorsed by several other learned societies, professional bodies and Royal Colleges. It sought clarification that allied healthcare professionals within the scheme would include medical physicists, clinical and biomedical engineers as well as diagnostic and therapeutic radiographers.

A change to the job codes used to classify medical physicists and clinical engineers was achieved thanks to concerted lobbying by IPEM. The Office for National Statistics (ONS) launched the Standard Occupation Classification (SOC) extension project, the UK's universal system for classifying occupations, and it is reviewed and updated every ten years.

## Policy and Consultation



Lobbying by Dr Jemimah Eve, IPEM's Workforce Intelligence Unit Manager, and Professor O'Connor, led the ONS to change the SOC for the 2020 edition for medical physicists and clinical engineers.

Dr Eve also provided a detailed response to the latest consultation by the Migration Advisory Committee on the National Shortage Occupation List (NSOL). The response outlined some of the main reasons why there is a chronic shortage of Clinical Scientists and Clinical Technologists. The response emphasised that IPEM has carried out a variety of measures, including workforce surveys, to highlight the shortfalls to Health Education England, the Chief Scientific Officer, and NHS Education Scotland.

Before normal life was turned on its head by the Covid-19 pandemic, Nicky Whilde, Head of Radiotherapy Physics at Northampton General Hospital, represented IPEM at a Radiotherapy4Life event at the House of Commons – a drop-in session for MPs to understand more about the campaign to increase funding for, and better organisation of radiotherapy.

Dr George Dempsey, IPEM's then Vice President Engineering, and Professor O'Connor, together with members of IPEM's Engineering Policy and Standards Panel, submitted written evidence to the House of Commons Public Bill Committee's scrutiny of the Medicines and Medical Devices Bill.

## Policy and Consultation

Together with the Royal College of Radiologists (RCR) and the Society and College of Radiographers (SCoR), IPEM responded to a call for evidence from the House of Commons Select Health and Social Care Committee inquiry into ‘Delivering Core NHS and Care Services during the pandemic and beyond’. The evidence from IPEM, the RCR and SCoR focused on a response to comments made by the National Cancer Director to the inquiry about medical imaging services, who stated “we have the available workforce and now have the available kit”, contrary to the data and experience of the three professional bodies. The response laid bare the continuing shortages of staff and equipment that could threaten patient safety.

Dr Geoffrey Charles-Edwards, Consultant Clinical Scientist at Guy’s and St Thomas’ NHS Foundation Trust, represented IPEM at a Westminster Health Forum. The online policy conference was on “Next steps for the regulation of medicines, medical devices and clinical trials”.

Members of the Nuclear Medicine Special Interest Group responded to two separate, but linked, consultations from the Welsh Health Specialised Services Committee on PET-CT commissioning policy and service specification.

**The response laid bare the continuing shortages of staff and equipment that could threaten patient safety.**

In the autumn, the Government launched its Comprehensive Spending Review and IPEM submitted a response calling for action to address workforce shortages, investment in equipment such as linacs, MRI and CT scanners and other medical devices, and renewal of the IT infrastructure of the NHS. The main points IPEM made in the submission were:

- Asking the Government to redress the deficit in the MPCE workforce in terms of funding shortfalls and workforce shortages. This was calculated to require investment of £37m for the radiotherapy physics workforce, and approximately £22m for other MPCE workforces
- Investment in equipment to include £140m to replace out-of-date linear accelerator machines which are more than 10 years old. There are other equipment needs and requirements including MRI, CT and other medical equipment, which need to be addressed in order to optimally support future healthcare needs including the Covid-19 pandemic.

IPEM also joined forces with the RCR and SCoR in making a joint submission on the spending review.

# Journals

## Journals



## Physics in Medicine & Biology

Submissions:	1,602
Publications:	529
Issues:	24
Impact Factor:	2.883
Downloads:	705,256
Ranking:	
– 34/87 (Q2) Engineering, Biomedical	
– 46/134 (Q2) Radiology, Nuclear Medicine & Medical Imaging	

Physics in Medicine and Biology enjoyed an excellent year of growth in submissions with a 14% increase on last year. Two new initiatives were launched during the year – the first being a focus collection dedicated to early career researchers in physics in medicine and biology, and the second being the publication of the first two Roadmap articles, and corresponding editorial. At the end of the year a fond farewell was said to Editor-in-Chief Simon Cherry who stepped down after several years in the role, and Katia Parodi was welcomed into the post at the start of 2021.

## Journals

## Physiological Measurement

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Submissions:	540
Publications:	164
Issues:	12
Impact Factor:	2.309
Downloads:	225,304
Ranking:	
– 39/71 (Q3) Biophysics	
– 49/87 (Q3) Engineering, Biomedical	
– 43/81 (Q3) Physiology	

Physiological Measurement welcomed Xiao Hu as Editor-in-Chief at the beginning of the year, who oversaw the recruitment of two new early career researchers to the Editorial board. There was an increase in Impact Factor to 2.309 – the highest the journal has ever seen – and published articles across eight different focus collections. In 2020 there were more submissions of topical reviews than ever before, and we published ten of them throughout the year.

## Medical Engineering and Physics

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Submissions:	727
Published articles: (comprising 120 Full Length Articles and 45 Technical Notes or Short Communications)	165
Issues:	12
Impact Factor (2019):	1.737
Downloads of full text articles (from the ScienceDirect platform):	318,620
Ranking:	
– 62/87 in Engineering, Biomedical	

2020 marked Dr Richard Black's final year as Editor-in-Chief of Medical Engineering and Physics, a role he held for three consecutive three-year terms. Richard will remain very much involved with IPEM's publishing programme, however, as Editor-in-Chief of their new open access title, *IPEM-Translation*.

## **IPEM Translation**

IPEM *Translation* launched in November 2020 and provides a forum for the publication and sharing of best practice among all those involved in the research and development of technologies for use in the diagnosis and treatment of disease and the rehabilitation of patients.

## **Journals**

In addition to traditional clinical engineering, biomedical computing, instrumentation, medical imaging technology and rehabilitation practice, its scope extends to more translational research and development leading to the adoption of new medical devices and procedures, including potentially disruptive technology and the implications that their introduction may have for healthcare service provision.

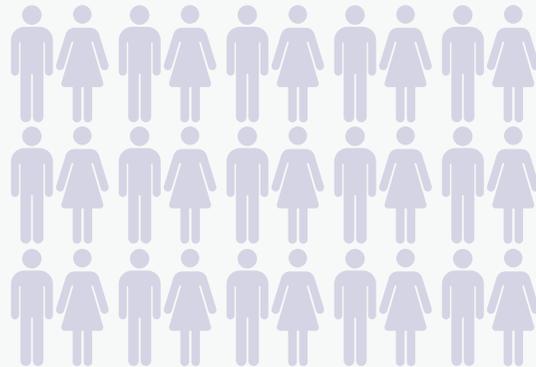
IPEM members and their colleagues may submit articles here: <https://www.editorialmanager.com/IPEMT>, and you can read more about the journal here: <https://www.journals.elsevier.com/ipem-translation>



# Year in Numbers

## Number of members

# 4,942



Full Members	2,452
Affiliate Members	1,137
Associate Members	1,062
Fellows	281
Professional Affiliate Members	10

## Year in Numbers

7

Contributed to **seven policy consultations**

8

**Eight webinars**, with **MPEC 2020** being held online

2

Attended **two Westminster events** (one in person, one online)

147

**Supported 147 members** on national, European and international standards groups

6

Published **six new ebooks** to help members keep up to date with current thinking and developments in their fields

4

Organised **four live scientific meetings and events** before the national lockdown

5

Held **five one-day events** online

**1.24 million**

There were **1.24 million downloads** from IPEM journals

## Year in Numbers

# £59,859

## Total grants, awards and prizes



Grants and awards totalling

**£56,259**

Prizes totalling

**£3,600**

[ipem.ac.uk](http://ipem.ac.uk)

