

Annual Review

UCL Institute of
Ophthalmology – IoO

Oct
2020 – Sept
2021



We are the UCL Institute of Ophthalmology (IoO). We deliver research and education in vision and eye disease to benefit sight and society in the UK and worldwide. We work to bring out our translational research to generate better therapies, diagnostics, and knowledge of eye care.



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From IoO Director, Professor Andrew D Dick



This was another challenging year for everyone, especially for those who have lost dear ones or have had to deal with the health consequences of COVID-19.

At the IoO we have worked closely with our faculty and the rest of UCL to help each other as a community get through these challenging times. I want to thank all colleagues for their hard work and send a special

thank you to all our key workers who have been helping tirelessly throughout lockdown and as we increased activity on site.

We continue to strive to balance the differing needs of a wonderfully

diverse community and I'm grateful that, when planning events, we can now think of a variety of ways to interact, both online and face-to-face, making the most of our options and listening to the needs of others.

Thanks to the work of our Equality Challenge Team, this year we achieved an [Athena Swan Silver Award](#). Embedding culture change requires engagement on an everyday basis across our entire

community and we can take this award as proof that our community desires change and is willing to work for it.

This year, we were again awarded Gold for both Green Impact and LEAF Awards for sustainable laboratories at [UCL's 2021 Sustainability Awards](#).

In a year when economic conditions were tough, I am proud of our grant success.

We received over £11 million in grants supporting research, from fundamental discovery through to clinical trials. Such success is the result of tremendous work on the part of staff and students. These collective efforts contribute to the overall strategy and mission of the institute and every attempt at gaining funding helps create a vibrant and interesting environment in which to work, learn and teach. The output of our community continues to feature in leading scientific and medical journals, social media, and the press.

In 2020-2021 we introduced a fourth principal research theme, Population and Data Science, and welcomed new Research Theme Leads and Deputy Theme Leads to refresh our strategic objectives in line with one arm of our [research mission](#), "to bring out our translational research to generate better therapies, diagnostics and knowledge of eye care." Their leadership is essential to the direction and future strategy of the institute, both within UCL, and with our main partners Moorfields Eye Hospital and Moorfields Eye Charity.

In July, we had a very constructive PI Away Day and follow-up meetings where we discussed support for wellbeing, return to work, connectivity through social and academic interactions, web presence and more. The energy and commitment were exhilarating. With our strategic European partner at the International Center for Translational Research, Poland, our first IoO/ICTER online mini symposium was a great opportunity to interact with our new colleagues and hear all about the latest research trends in functions,

disease etiology, therapeutics and imaging of the human eye.

We were thrilled to welcome [Professor Marinko Sarunic](#) as Moorfields Eye Charity Chair in Advanced Ocular Imaging, an exciting new role created in partnership with UCL Department of Medical Physics & Biomedical Engineering. We were delighted to announce the new UCL Institute of Ophthalmology/Moorfields Eye Hospital Joint Director of Education [Professor Michele Russell](#) who started in September.

This year we had the pleasure of having Professor Constance Cepko from Harvard Medical School and the Howard Hughes Medical Institute deliver the [2021 IoO annual lecture](#) online, followed by our own awards ceremony celebrating the talent and incredible resources available in our community of researchers and academics. We were pleased to be able to hold the fourth Annual ECR Symposium in person at the Francis Crick Institute, with the option to join the event online.

Our educational offer goes from strength to strength, capitalising on the unforeseen opportunities presented by online teaching and course development. Through our vibrant partnerships with other global institutions, companies, and organisations, we are expanding our research collaborations and educational offers.

Finally, I am proud and honoured to have been given the opportunity to serve a second term as Director of this institute. It is a privilege to work with such excellent staff and students and to continue to develop what is already a very inspiring community.

At a glance

Over 400 research papers published in the last academic year in journals such as:



Nature	Regenerative Medicine
Science	Ophthalmology
Elife	Communications Biology
Lancet Digital Health	Stem Cell Reports
Lancet Global Health	Investigative Ophthalmology and Visual Science
Proceedings of the National Academy of Sciences	Medical Image Analysis
American Journal of Human Genetics	Journal of Neuroscience Research
New England Journal of Medicine	Journal of Developmental Biology
Current Biology	International Journal of Molecular Sciences
Science Translational Medicine	Eye
Scientific Reports	American Journal of Ophthalmology
Retina	British Journal of Ophthalmology

Financial data



Income from Education:

£2,276,513

Operating costs:

£20,018,040

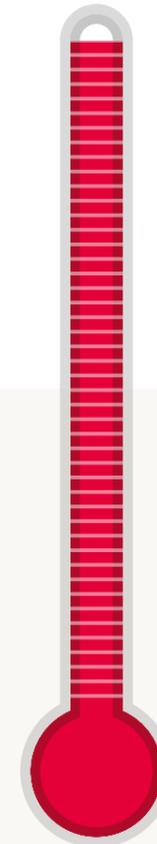
Equipment costs:

£1,492,012

Grants received

Total number of grants received:

45



Total amount awarded

£11,414,803.47

Funding bodies

Bayer PLC

BBSRC Biotechnology and Biological Sciences Research Council

Beefutures France

Censo Biotechnologies

EC H2020 European Commission Horizon 2020

ESRC Economic and Social Research Council

Fight for Sight

Macular Disease Society

Moorfields Eye Charity

MRC Medical Research Council

NIHR BRC MEH National Institute for Health Research Biomedical Research Centre at Moorfields Eye Hospital NHS Foundation Trust and UCL Institute of Ophthalmology

NIHR BRC UCLH National Institute for Health Research University College London Hospitals Biomedical Research Centre

NIHR National Institute for Health Research

PTC Therapeutics Inc

Rosetrees Trust

Royal College of Ophthalmologists

UCLTF UCL Technology Fund

UCLTF UCL Technology Fund

UKRI UK Research and Innovation

HR Data

New staff starters

61

(including 15 honorary staff)

Staff leavers

59

(including 11 honorary staff)

Number of promotions

13

(including 5 honorary staff)

Early Career Promotions (effective 1 Oct 2021)

3 staff promoted to Senior Research Fellow – Federico L Rossi, Andrew Peters and Nikolas Pontikos

Professional and Support Staff Regrading

2 staff promoted - Yaiza Yuste Herranz, Richard Cable

Senior Promotions (effective from 1 Oct 2021)

1 staff promoted to Professor – Dr Jacqui Van Der Spuy

2 staff promoted to Clinical Professor – Associate Professor Pearse Keane and Dr Omar Mahroo

1 staff promoted to Associate Professor – Dr Alice Davidson

2 staff from Moorfields Eye Hospital promoted to Clinical Professor – Associate Professors Keith Barton and Carlos Pavesio

1 staff from Moorfields Eye Hospital promoted to Clinical Associate Professor – Dr Konstantinos Balaskas

1 staff from Moorfields Eye Hospital promoted to Associate Professorial Teaching Fellow – Ms Rashmi Matthew

IoO staff number:

215

Academic staff:

44

PIs:

56

PGT student numbers:

208

PGR student numbers:

73

Emeritus professors:

10



From IoO Deputy Directors



Professor Alison Hardcastle, Deputy Institute Director and Deputy Director for Research

It has been a challenging year for research due to the pandemic leading to disruption and delays. Nevertheless, we have navigated through laboratory closures and re-opening, diversified our ways of

working and research priorities, and embraced opportunities. Through extraordinary effort, we have submitted a huge number of grant applications with many successes; published seminal research papers

and maximised the opportunity to meet colleagues to strategically discuss research priorities. We are delighted to be fully operational and implementing all our activities and ideas.



Professor Marcus Fruttiger, Deputy Director for Education

By the time the academic year 2020-2021 started, we were well aware that the pandemic would pose real challenges to our education programmes, but at the same time there were also reasons to be positive. We had managed to increase our PGT student numbers and based on that were able to substantially strengthen our education team. This proved to be a key element for the successful delivery of our programmes. The other crucial factor was the commitment and resilience shown by the module and programme leads, who went above and beyond in their efforts to deliver good student experiences and learning outcomes despite the challenging circumstances.

The Equality Challenge Team has had a successful year in securing an [Athena Swan Silver award](#) for the institute. This brought us to the happy position of having five years to initiate an ambitious set of actions. As a positive beginning, we have recruited many new members to the team, and we have begun to make changes across a range of matters. Among the challenges we face in the near future, one is to recruit academics and researchers to the team, and another is to maximise the success of the return to onsite working for staff.



Professor Tim Levine, Deputy Director for Equality, Diversity, and Inclusion



Professor Shin-Ichi Ohnuma, Deputy Director for International Relations

Our international activity was relatively quiet this year due to COVID-19. I hope that COVID-19 will be solved and our international interaction with global universities, industries and organisations will return to normal in 2022. Despite the pandemic, we have set-up several international partnerships such as with Osaka University, Tohoku University, University of Sydney and SERI Singapore. We renewed our five years Santen SenSyT PhD studentship. We started the second term this year. During this year, we have been actively discussing strategic collaboration with Santen. We hope to announce new collaboration programmes next year. We are actively discussing further international partnership opportunities, which include universities, industries, and global organisations.

Professor John Marshall, Deputy Director for Innovation and Enterprise

The past year has been an extremely difficult one both for academia and industry. Research projects have been delayed and commercial investments postponed or cancelled. Nevertheless progress has been made reviewing structures for combining the research endeavours between our institution and the hospital thereby enlarging and harmonising their commercial potential. There is now significant commercial interest in the future development and commercialisation of projects involving gene therapy and artificial intelligence together with those involving advanced optical devices.



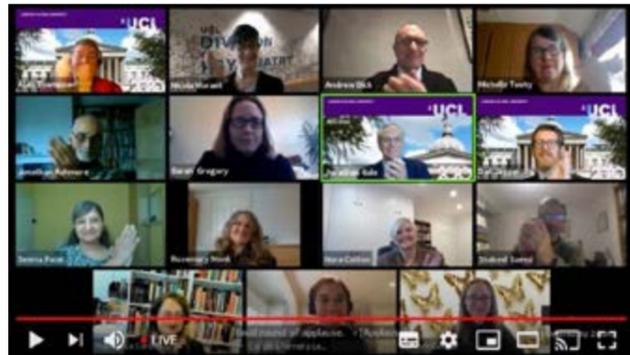
A selection of success stories from our institute



A new study led by Professor Alison Hardcastle is published in the *American Journal of Human Genetics*, presenting a [new cause of dominant Retinitis Pigmentosa](#) in 22 families with over 300 affected individuals.



First ever virtual graduation in a joint ceremony with our Faculty. In a ceremony unlike any before, roughly 1,500 students graduated from the Faculty of Brain Sciences.



First-ever virtual graduation



Professor Paul Foster, Dr Sharon Chua, Dr Anthony Khawaja, Professor Pearse Keane, Professor Sir Peng Khaw, Mr Praveen Patel and co-authors are featured on the cover of *Brain*, for their paper "[Retinal asymmetry in multiple sclerosis](#)".



Our Director Professor Andrew D Dick is reappointed in his role for another five years.

It is an honour to have had conferred a further five years as Director of IoO and to continue to be able to work with the amazing and innovative faculty and students at the institute, wider UCL and our partners at Moorfields Eye Hospital. Building on the collegial and individual successes of the past five years, we will continue to develop our research, education, and enterprise programmes. Culminating in the move to Oriel, I am confident these will bring us as yet untapped opportunities for all.

After publication in the *British Journal of Ophthalmology*, a [long term study](#) led by Professor Paul Foster and Sharon Chua, on AMS and air pollution, "Association of ambient air pollution with age-related macular degeneration and retinal thickness in UK biobank", received front page coverage in the *Guardian* and the *Times* and was featured on *BBC World Service's* Health Check programme, as well as more than 40 other international periodicals.



Illustration by Jon Brett (Eye Research Group, Oxford) for the January 2021 edition of *Brain*.



Professor Jugnoo Rahi is selected as one of 15 role models of [women in academic medicine](#).



World's largest genome-wide association study for [keratoconus](#) uncovers risk factors.



A [new study](#) led by Dr Anthony P Khawaja and authored by Dr Sharon Chua makes the news in the *Times*, the *Guardian*, the *Daily Mail*, among others, pointing to a lower risk of surgery for cataracts among those who consume a low to moderate amount of alcohol.



IoO MSc Orthoptics receives approval from the Health and Care Professions Council (HCPC).



The Eye2Gene Phase 2 project led by Dr Nikolas Pontikos receives an [Artificial Intelligence in Health and Care Award](#), one of the NHS AI Lab programmes to accelerate the testing and evaluation of artificial intelligence technologies which meet the aims set out in the NHS Long Term Plan.



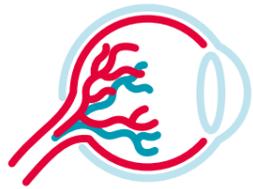
A new study led by IoO's Professor Francesca Cordeiro and published in *Progress in Retinal Eye Research* shows that [DARC technology](#) can identify eyes with rapidly enlarging atrophy up to 36 months in advance.



Research

Our research themes

This year we launched a new theme. Research activity at the IoO is now organised into four interrelated themes, each represented by a Theme Lead and a Deputy Theme Lead:



Development, Ageing and Disease

Investigating the biological pathways involved in vision loss caused by ageing and disease. Led by Professor Clare Futter and Dr Ryan MacDonald.



Rescue, Repair and Regeneration

Aiming to protect and improve vision using regenerative medicine to develop new effective therapies. Led by Professor Pete Coffey and Dr Amanda Carr.



Visual Neuroscience and Function

Combining epidemiology, genetics, imaging, and data science to investigate new ways to assess vision. Led by Professor Andrew Stockman and Dr Tessa Dekker.



Population and Data Sciences

This new theme leverages expertise around collection, curation, analysis, and interpretation of ophthalmic big data. Led by Professor Paul Foster and Dr Adam Dubis.

Professor Clare Futter

Development, Aging and Disease Theme Lead



I am the new Theme Lead of the Development, Aging and Disease (DAD) theme, with Ryan Macdonald as the newly appointed deputy. We are a large and diverse group of basic and clinician scientists aiming to understand the cells and tissues that make up the visual system and identify mechanisms of ocular disease, including inherited and age-related retinal degenerations, inflammatory diseases, corneal diseases, and glaucoma. DAD theme members have developed in silico, stem cell-derived, ex vivo and in vivo models of disease and use multiple genetic, imaging, transcriptomic and proteomic approaches. One aim of the DAD theme is to share knowledge and expertise and to identify areas for collaboration by, for example, working with the other themes to promote an external seminar series and research network meetings. One common theme interest is in mitochondrial biology/disease in the eye, which has led to a planned mitochondrial workshop. Wet lab science has of course been hit by the loss of time at the bench over the last 12 months, just one of the many challenges of the pandemic, which has also brought opportunities like improved online meeting technology/expertise. I look forward to working with Ryan and the fantastic scientists in DAD to build on our many strengths and promote interaction with the other themes, the wider UCL community, Moorfields and the BRC.

Professor Andrew Stockman

Visual Neuroscience and Function Theme Lead



In 2020-2021 our theme was renamed "Visual Neuroscience and Function" and Tessa Dekker was appointed as deputy lead. Integrative Epidemiology, which was previously part of this theme, is now integrated in the recently launched fourth theme. This past year was particularly challenging because of the lack of laboratory time, especially the lack of human testing on which much of our research depends. Nevertheless, between online meetings, we were able to write up past work and write new grant proposals and had the extra time to write review papers. Now, with the easing of restrictions, our labs are reopening, and there are plans for regular theme talks and virtual and/or in-person theme coffee mornings. Planning for our new home, the "Dry Labs" in the Oriel building, is now complete. The future looks bright.

IoO's Deputy Research Theme Leads: in their own words

Dr Amanda Carr

Rescue, Repair, and Regeneration

I have always had an interest in the RRR theme and since moving to the IoO, I've been involved in regenerative medicine approaches to treat macular disease. My current research focuses on using induced pluripotent stem cells to model disease in a dish and develop novel advanced therapeutics to rescue vision loss. COVID-19 and social distancing made last year rather difficult, but it also uncovered new online opportunities to keep in touch with colleagues. Also, as a new lecturer in 2020-2021, I've been excited to be involved in the new Research Pathways and Advanced Therapeutics MSc course, and the development of the Stem Cells and Eye Repair module.



Dr Adam Dubis

Population and Data Science

I want to translate my experiences and ideas about how to link the amazing resources and talent present at the IoO with resources within the wider UCL community and Moorfields Eye Hospital to continue our growth as world leader in population health and data science. I have built up a dense network across the IoO, UCL, Moorfields and industry and continually share ideas and best practices among them. I recently helped build a consortium that successfully obtained a UKRI Innovation Scholars grant (£1million initial funding from UKRI plus additional industry support). The 'Bioscience IDEAS - Images, Data structures, gEnetics and Analytical Strategies' aims to bring together academic and industry partners to provide data science training content to bioscience researchers. Current experience at these other centres and the UCL Bioscience IDEAS project have opened several industry investment opportunities that I hope to bring to the IoO through theme leadership. I recently developed a new module on Digital Opportunities for the new Bioscience Entrepreneurship MSc course. This module is focused on methods of leveraging big data and AI technologies for science and medical enterprise.



Dr Tessa Dekker

Visual Neuroscience and Function

What draws me to the Visual Function and Neuroscience theme, headed by Andrew Stockman, is that it sits at the intersection of clinical translation and fundamental research, and takes a multidisciplinary approach to studying the eye in the context of the rest of the brain. I got involved in this research by teaming up with imaging physicists, visual psychologists, and clinician ophthalmologists to investigate mechanisms of vision loss and recovery in patients. A highlight in the last year was the PI Away Day where we discovered converging interests from different scientific backgrounds, and exciting scope for collaborations across the themes.

Dr Ryan MacDonald

Development, Ageing and Disease

I'm very excited to work with Professor Clare Futter as Deputy Theme Lead for Development, Ageing and Disease. My research focuses largely on the development of the retina but have an emerging interest in the ageing eye. I look forward to co-organising the seminar series and to supporting aspiring PIs on the fellowship committee.





Building research infrastructure...

...to enable new investigations of eye health and disease

This year we acquired two new Confocal Microscopes. These essential pieces of equipment were funded by Moorfields Eye Charity.

Confocal Microscopes

The **Stellaris 5** is a 'work-horse' confocal for looking at slides. It has a fully programmable stage and can generate multicolour 3D images of fluorescent specimens. It is augmented with an easy-to-use deconvolution package. This algorithm allows you to observe 3D

data and work out the 'true' sources of the light within it, removing background noise, reflections, and refractions.

The **Stellaris 8** is a top-of-the-range confocal that can do all the same as the Stellaris 5, but it has a broad spectrum white-light,

pulsed laser. It is fitted with some specialised detectors too. Together, these allow us to look at a huge range of colours of fluorescent material from short wavelengths out into the near infra-red. It also allows FLIM microscopy (Fluorescence life-time imaging) which not only captures the colour of the fluorescent light, but also how long it persists. This tells us information about the environment of the fluorescent thing. It is a technique that can be used to remove noise and autofluorescent signals from samples and give you information about bio-physical properties of the specimen.

For more information on these please contact Matt Hayes and the Microscopy team in the [IoO Microscopy Unit](#)

Our partnership with NIHR Biomedical Research Centre (BRC)

The **NIHR Biomedical Research Centre (BRC)** at Moorfields Eye Hospital NHS Foundation Trust is a hospital-academic partnership and has continued to demonstrate strength and leadership across ophthalmology and vision sciences. Its support of key studies in the field has been vital and has impacted the diagnosis and treatment of the ophthalmic main disease areas.

The NIHR BRC has also been essential in increasing results from research into some of the rarer eye conditions. One highlight for the BRC has been its work with the HDR UK INSIGHT Data Hub. The BRC has led a comprehensive patient and public involvement and engagement programme and continues to shape the hub with this work.

Our BRC said farewell to its

manager Karen Bonstein and a huge thank you for 27 years of service between UCL and Moorfields and 13 years as manager of the BRC. She was a passionate, knowledgeable, and thoroughly valued member of the institute and across the research space at Moorfields. We wish her the very best. Dr Aadil Kazi was welcomed as the new manager in June and brings with him a wealth of experience. He comes from Imperial College BRC where he led several research themes as Research Programmes Manager.

Research Focus

Professor Marinko Sarunic Moorfields Eye Charity Chair in Advanced Ocular Imaging

What does your work involve?

My research focuses on visualizing changes in the retina that occur at the early stages of diseases causing blindness and in response to therapy. My work is to expand the capabilities of ocular imaging instruments, pushing the physics and engineering limits to image a wider field of view with higher resolution, and to develop methods that will reveal the underlying physiology. My work involves creating the 'hardware', designing, and building complete imaging systems from lasers, lens, and detectors, and developing the 'software' that links everything into a functional and translatable instrument.

Your role is a joint post between different institutions: the UCL's Faculties of Brain and Engineering Sciences, the UCL Institute of Healthcare Engineering and Moorfields Eye Hospital. Could you explain in what ways you interact with each of these institutions?

The motivations for my work are in vision and ophthalmology applications, but my skills are in 'high-tech' with a foundation in physics and engineering. Hence, my research is very interdisciplinary, and does not fit into a single category. Spending half of my time at the UCL Institute of Ophthalmology means that I can interact with the broad community who are working on similar research questions around understanding the mechanisms of

vision loss and developing therapies. The other half of my time is at the Department of Medical Physics and Biomedical Engineering, where I am recruiting a team to innovate and then build the new and enabling technologies to study the living eye with cellular resolution. Being integrated with Moorfields Eye Hospital is especially important to me, providing the opportunity to immediately translate novel instrumentation into the clinical research facility. That underpins my whole research programme at UCL, to try to help identify biomarkers that will assist clinicians with determining treatment plans, and to improve the delivery of therapies to patients with vision robbing diseases.

What have been the greatest challenges and achievements in your career to date?

The greatest challenges and the greatest achievements in my research are one and the same, which is training the next generation of researchers. Finding the creative spark and imagination in a junior researcher and then introducing them to my niche area of research takes more than luck alone. Mentoring and guiding graduate students and junior post-doctoral researchers toward finding their own path is by far the most rewarding part of my career. I consider the team of people in my lab, past and present, as my greatest achievement. My role was to inspire through my own dedication, to provide the guidance

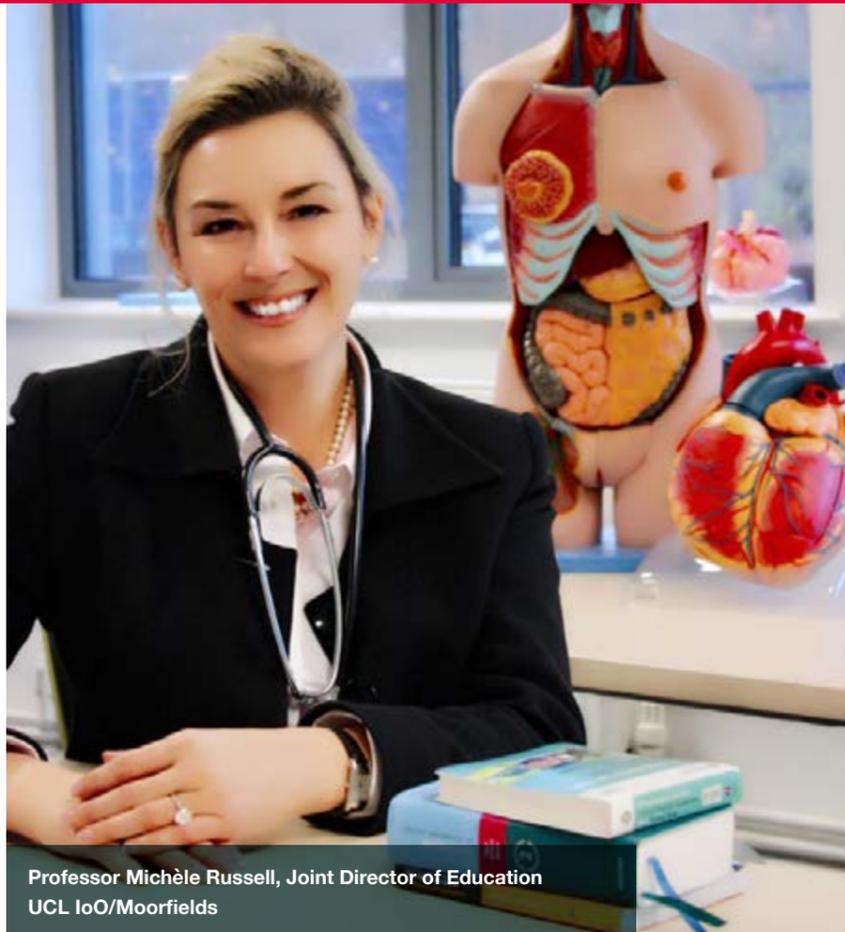


– the metaphorical 'glue' to bind the team together – and to create the opportunities for them to reach their potential. I am impressed by each of their personal technical and translational contributions, and so proud of the team working together to accomplish so much more than anyone of us could have achieved independently.

You've only recently come into your new role. What are your first impressions of working at UCL?

The environment at UCL is inspiring, and everyone has been very friendly and encouraging. I am continually impressed by the combination of breadth of research areas and the depth of expertise at the Institute of Ophthalmology and the Department of Medical Physics and Biomedical Engineering. I have a feeling that anything is possible here.

Education and student experience



Professor Michèle Russell, Joint Director of Education
UCL IoO/Moorfields

▀ The pandemic forced educational institutions to think of innovative ways to continue providing the entire student experience.

Colleagues and teams across the IoO and wider UCL have worked very hard to make the experience as 'normal' as possible for students. Education has been at the forefront of our strategy to deliver the best during these very challenging times. This includes taking advantage of new technologies to move all teaching online and to run webinars to engage potential applicants. Over the past 12 months we have held 24 virtual events. We also launched a [student-focused podcast](#) in collaboration with the new UCL Ophthalmology & Vision Sciences

Society students' union.

Our excellent PGR programme, where students can work with internationally renowned experts in their field, went from strength to strength despite access to labs being restricted for parts of the year. We have had a successful launch of our new Bioscience Entrepreneurship MSc despite the pandemic-related challenges. We launched a teaching assistant scheme for our PhD students and postdocs to help us with the delivery of this MSc. Their support was outstanding and made a key

contribution to the success of our first year. As we have now started with the second cohort, we aim to evolve and improve the course to ensure it is of real value for the students and their future careers, and to become a fully integrated element of our educational offer. We also launched a PG Cert Telemedicine which has provided a clinical technology-focused addition to the portfolio which will be subsumed into the MSc Bioscience Entrepreneurship for academic year 22-23. On our clinical programmes in partnership with Moorfields (MSc Ophthalmology, MSc in Clinical Ophthalmic Practice, MSc Advanced Clinical Optometry and Ophthalmology and MSc Advanced Practice in Ophthalmology Degree Apprenticeship), almost all our students and all academics are NHS staff many of whom were re-deployed during the pandemic affecting teaching, learning and assessment. Adaptation was the name of the game with timetable changes and assessing innovatively online. In the latter part of the academic year, COVID-19 recovery has seen our students and staff working long hours to catch up with patient backlogs. Throughout this, academics and students showed incredible resilience keeping in touch using MS Teams. Individual module feedback provided very positive comments about the high levels of support offered in extremis. The MSc in Clinical Ophthalmic Practice for nurses saw its first cohort of six gaining their degrees, in addition to 12 PGDip and 33 PGCert successes.

Our application numbers have gone from strength to strength as

70%

More applications

80%

Enrolment rate

95%

Would recommend UCL IoO

90%

feel intellectually stimulated

we received almost **70% more applications than in the previous academic year**. We have achieved an **enrolment rate of almost 80%**. The most recent student surveys show that **95% of students would recommend studying at UCL IoO and over 90% feel their programme is intellectually stimulating**.

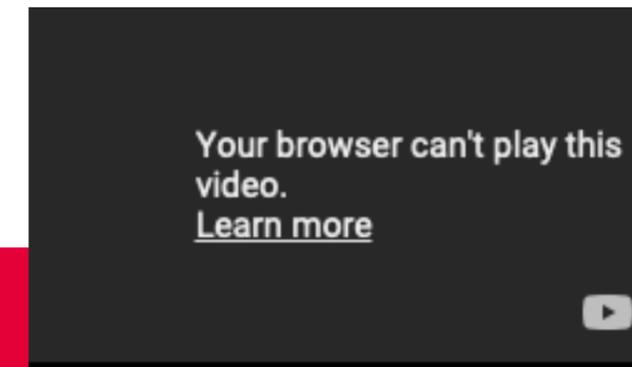
All in all, we have a great deal to be proud of. The UCL/Moorfields partnership firmly positions the IoO as number one in the global rankings to study ophthalmology,

however we cannot be complacent. The pandemic has provided both opportunities and created operational, student recruitment and clinical workforce challenges which have made it increasingly important to forge ahead with our education strategy. As the new Joint Director for Education, I will build on the work of my predecessor by creating workstreams in four broad areas to further our education ambitions.

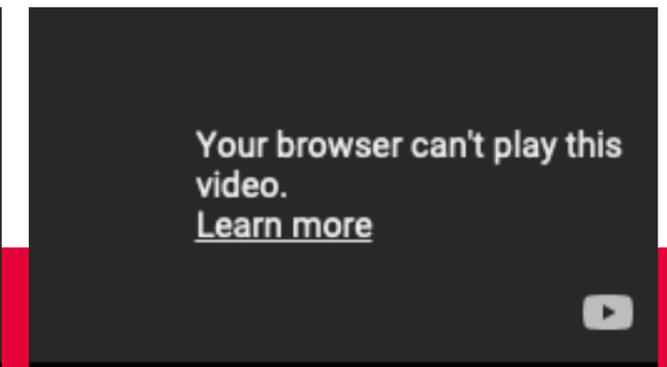
In summary, Education at the IoO has adapted to the 'new normal' and we have led on new styles of

teaching involving virtual and hybrid systems. We are keen to capitalise on this, as students increasingly request more flexible forms of teaching to meet their lifestyles. I would also like to reiterate the resilience and agility of the teaching staff across all programmes to have made this year, despite the challenges, a great success. We are looking forward to the new academic year and building on the achievements made in 2020-2021: there is a lot to do but great opportunities for creativity and innovation.

Student testimonials



Sandy, MSc Ophthalmology



Yuan, MSc Ophthalmology

▀ The online style of the modules is great for being able to fit studying around work and home life. As the online lectures vary in size/duration, an indicated time to complete each lecture is given, which I find really useful for planning my day. Due to the ongoing COVID-19 situation, the university has been able to make adjustments for us to carry out group projects and live lecture days virtually, so the social element of the course has been maintained. The module tutors are easily accessible throughout the duration of the course by email and usually reply to any queries promptly. A forum is also available for each module to enable group discussions.

Sejal Mistry, Optometrist

▀ I have done all glaucoma modules at Moorfields/UCL, and they have been brilliant. The courses are very well structured, the lectures follow a logical order, and the course is very flexible, which is great when you have a busy working life. Moreover, the course is provided by recognised experts in the field, which are always very approachable and provide invaluable tips and advice... I feel like this course has made me a better professional and I would completely recommend it.

Sergio Bordajandi-Tur, Optometrist

More testimonials: www.ucl.ac.uk/ioo/study/student-testimonials



Postgraduate Taught Experience Survey (PTES) Results

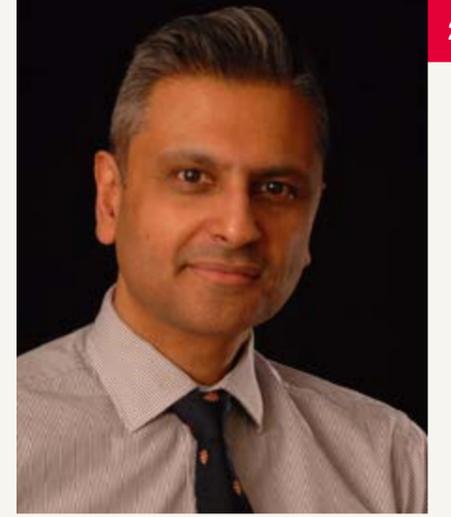
	Department results 2021	Department results 2020
Overall, I am satisfied with the quality of the course	78.6%	83.6%
Would you recommend UCL to prospective students thinking of studying here?*	94.0%	95.9%
Teaching and Learning	83.4%	83.2%
Student Engagement	77.0%	79.7%
Assessment and feedback	68.9%	54.9%
Organisation and Management	69.3%	62.8%
Support*	69.0%	N/A
Skills development	81.3%	77.7%
Covid-19 Pandemic*	81.3%	N/A
Communications from my institution in relation to the Covid-19 pandemic were appropriate and clear*	84.0%	N/A
I have received the support I need from my institution in relation to the Covid-19 pandemic*	80.0%	N/A
My institution has worked to ensure the quality of my academic experience during the Covid-19 pandemic*	79.8%	N/A
Response rate	60.4%	80.4%
Population	197	92
Responses	119	74

* new for 2021

Teaching Focus

Professor Mandeep S. Sagoo MSc Ophthalmology Programme Director

Mandeep Sagoo is Professor of Ophthalmology and Ocular Oncology at our institute and Consultant Ophthalmic Surgeon at the London Ocular Oncology Service at Moorfields Eye Hospital and the London Retinoblastoma Service at Royal London Hospital.



What were the challenges of the last year in delivering the Ophthalmology course?

This course is taught by clinicians. The pandemic posed great challenges as some of the teaching staff were redeployed to deal with the pandemic, some of them were ill themselves, some had family or friends who were taken ill, so everybody was badly affected. But we still managed to teach the whole course online. We had to change the way we do assessments: instead of students giving presentations in the classroom we had them do it on Zoom. The dissertation module, which I lead, also had to be moved online, and so were the supervision and feedback. This allowed people to attend the course from different parts of the world. For example, we had a student who was stuck in Azerbaijan, and couldn't travel back to London. He did the whole course online while he was there.

We adapted very well to the new environment and had very successful dissertations which proved that the students took to it very well. There were lots of Merits and Distinctions. Students coped under the worst circumstances, doing really well. We even tried to do practical sessions online. We sent about 20 surgical kits to wherever the students were in the world so that we could teach them through Zoom how to do suturing, for example.

Because of the time difference, it was challenging to organize tutorials at a time suitable for everyone. Plus, if a student's Wi-Fi connection dropped, we had to do separate tutorials with them. This happened with some students in Egypt for example. It was a lot of work but despite the personal difficulties everybody came together and delivered a very good course. And of course, there are lessons to be learnt. So, this year we have hybrid courses, but there's the possibility of extending the course to make it online fully so that more people from around the world can join.

The biggest challenge with online teaching?

The biggest challenge was looking after everybody, both staff and students. One of the things we did to look after the students was starting a "Tea with the tutors" session. Once a month, me and the Deputy Programme Director, Naz Raoof, would be on Zoom and the students could come and go, ask us questions, or have a chat. Now it's moved to a face-to-face occurrence, but that's something that's come out of the challenges of teaching online, out of the need to keep the students engaged and motivated and to look after them, to make them feel part of the institute. It also served us to engage and motivate the teaching staff.

Why is this course important?

The whole philosophy of the course is not just to pass the exam and get the MSc. We're trying to equip the students for their professional life. This way if they become clinicians, when they see patients, they are equipped to identifying what the problem is, how they can look things up, how they appraise the literature, and they can identify the gaps in the literature, where the research hasn't been done. What are the gaps where I could do the research? That clinical academic training is what we're trying to nurture in this course. That's my main message to the students: your whole professional life could be based around how we teach you this course.

Why is it important to study ophthalmology?

If you look at what loss of sight means, it is probably the most feared thing. In my discipline it's slightly different because I deal with cancer and so people are worried about losing their life as well because they have a cancer in their eye. But generally speaking, if you've got a cataract, or you've got glaucoma, any of the major eye diseases, you're worried about going blind. There are many interventions in ophthalmology where you can stop people from going blind. So... there's a lot of satisfaction in doing that job.

Teaching Focus

Associate Professorial Teaching Fellow Rashmi Mathew

MSc Advanced Clinical Practice in Ophthalmology and MSc Advanced Practice in Optometry and Ophthalmology Programme Co-Director

Rashmi Mathew is Consultant Ophthalmologist with a special interest in Glaucoma at Moorfields Eye Hospital.

What are your areas of specialisms and how do they fit into the work you do at the IoO and at Moorfields?

I have two areas of specialism: Glaucoma and Medical Education. Education underpins everything we do: treating patients, teaching students, training residents, working with allied health professionals. Excellent education drives excellence in patient care. There is huge crossover in what I do in my roles. I want to see a culture change in the NHS where learning, sharing knowledge and feedback is the norm and takes place in nearly all our interactions.

What was the biggest challenge of teaching online over the last year?

I received a UCL Changemaker grant, for my education research project "EyeBelong", which looks at what

connects our students to UCL IoO. This is what our students were voicing: when the going got tough and they were facing challenges from the uncertainty of the pandemic, talking to their peers helped them stay steady, humour made their work more enjoyable, they looked out for each other when they felt homesick, and felt comfortable to go to tutors for advice. If I was to sum all of that together then belongingness is what underpins that.

This past year my modules had to be taught entirely online and I worried about how I was going to create that sense of belongingness. I tried to emulate what I would ordinarily do in class, using icebreakers to get to know my students, logging in early or staying a little late in case students had questions they didn't feel comfortable asking in a larger group, and thinking deeply about how I was going to teach, utilizing group

work, encouraging students to keep their cameras on, utilizing education technology to keep engagement, building in opportunities for feedback. What really touched me this year was that a few of my students wrote back after my module and said: "We can see that you really care about us and our learning, even though we have only met remotely."

What was an unexpected outcome of remote teaching?

Collaboration is a fundamental life skill and one that I try to foster amongst my students. An unexpected outcome this last year was the fact that having access to online platforms such as MS Teams and Zoom fostered a lot of collaboration, so we have done more creative assignments. One of these has been the infographics project, where my students were asked to work collaboratively to create infographics on landmark glaucoma trials, to learn about these trials.

The infographics produced were of such high standard that we submitted them for publication. It's a proud moment for me as an educator, as all my students in a single cohort have their names on a [publication](#)  – it really meant a lot to my students.



Teaching Focus

Dr Dipesh Patel

MSc Orthoptics Programme Co-Director

Dipesh Patel holds an NIHR Advanced Fellowship at UCL Great Ormond Street Institute of Child Health and an Honorary Clinical Research Fellow post at Moorfields Eye Hospital (MEH).



How does your role at the IoO relate to your work at UCL Institute of Child Health?

My research at ICH informs both my clinical practice at MEH and teaching at IoO. I was very fortunate to be able to work with a hugely talented team of clinicians and academics to develop a novel programme (the Orthoptics MSc) to train a future generation of Health and Care Professions Council (HCPC) accredited clinicians.

What is the most important lesson students of Ophthalmology should learn?

I am a huge advocate of learning generic skills that apply to many situations. Primarily, I try to encourage students to develop critical thinking skills, which informs multiple behaviours, including communication and clinical decision making.

How have you found remote working/teaching in the last year?

I think there are relative strengths and weaknesses to remote teaching. For example, it has enabled me to reach a much wider audience for a whole host of events, from public engagement at the Bloomsbury Festival, to teaching nationally – drawing in people who would otherwise be unable to attend.

Your audience can be hundreds of people, and it's so difficult to 'read the room' in a remote setting vs. a lecture theatre/conference room. On the other hand, familiarisation with remote teaching has given me a whole new toolkit for increasing engagement that I can now use in other settings. It has been a steep learning curve, but extremely valuable.

Degree Ceremonies

In December 2020, our first-ever virtual graduation took place in a joint ceremony with our Faculty, gathering roughly 1,500 students graduating from across the Faculty of Brain Sciences.



As a Faculty, we champion 'research embedded' education and provide opportunities for students to network and communicate the output of their research. We aim to prepare our students not only to succeed but to become the next generation of experts in brain sciences.



Faculty Dean, Professor Alan Thompson

First-ever virtual graduation

PGR activity

PGR students at UCL IoO are supported by three Departmental Graduate Tutors: Professor Jacqueline van der Spuy, Professor Virginia Calder, and Professor Karl Matter. They are represented by three Student Representatives: Bledi Petriti, Joshua Harvey and Jack Hopkins, who have been instrumental in driving initiatives to sustain engagement and networking amongst the student body during

recent challenging times. Some of these initiatives include social events, a termly PGR Newsletter and a WhatsApp group for communication and networking opportunities.

Currently, there are 73 Postgraduate Research (PGR) Students enrolled. 72% of them recently participated in the annual Postgraduate Research Survey (PRES). 97% of respondents felt their research skills in critically analysing

and evaluating findings and results had developed during their programme, 88% felt their ability to manage projects developed, and 82% felt better prepared for their future career as a result of their research degree programme.

The PGR students at the IoO are also fully represented by the Early Careers Research Committee, a highlight of which is the annual IoO ECR Symposium.

Early Career Researchers' activity



The ECR committee has been active this year offering a wide range of webinars, including those focused on careers and research insights.

A first series of talks, led by Dr Ryan MacDonald, ran once a month from August 2020 to February 2021 and focused on sharing stories from junior PIs at the institute. We ran a second series, from April to July 2021, focusing on careers outside of academia, with speakers from different fields. The ECR IoO Lates, aimed at giving ECRs the chance

to present their own research in lay terms in a fun social format, returned to in-person events from July 2021. Our annual ECR symposium, supported by Moorfields Eye Charity, the NIHR BRC and the IoO, was the highlight of the summer. It was the fourth meeting of its kind organised by the ECR committee and was held at the Francis

Crick Institute in London with live streaming for those who could not join in person. There were over 60 people attending on site and up to 30 people who joined us virtually. We were joined by Clinician-Scientist Sonia Gandhi, Professor of Neurology, as the keynote speaker who shared her inspirational yet personal career story along with her research achievements. Nine ECRs were awarded first, second and third prizes for the best talks, posters, and lay abstracts.

Our ECR prize winners this year were:

Phillipa Harding First place	Oral Presentation	Silvia Dragoni Second Place	Poster
Nihar Bhattacharyya Second Place	Oral Presentation	Ana Alonso Third Place	Poster
Bledi Petriti Third Place	Oral Presentation	Victoria Tovell First Place	Lay-abstract
Victoria Tovell First Place	Poster	Hannah Dunbar and Emma Burton Joint Second Place	Lay-abstract

Operations support



▲ A big thank you to all operations staff for supporting the institute and ensuring all operations continued as smoothly as possible in another unprecedented year.
Dr Wing-Chau Tung, IoO Institute Manager

Some operations staff worked on site to provide support to our research laboratories and facilities. All remaining staff in our team continued to work from home and started to transition to return on site on a part-time basis since UCL reopened to all staff and students in July 2021.

Over the past year, we have reviewed the duties and responsibilities of some operations teams and made changes, where necessary, to improve the structure and efficiencies of the core institute support including:

Finance and Research Team – Team expanded from two to five members with two Finance and Research Administrator posts and the Clinical Study and Adaptive Optics Scanning Laser Ophthalmoscopes (AOSLO) Manager

HR Team – Team rearranged so there is one HR Manager, one Senior HR Administrator and one HR Administrator post

Education Team – Recruited an Education Manager and new administrators for all PGT programmes. The team expanded from two to eight

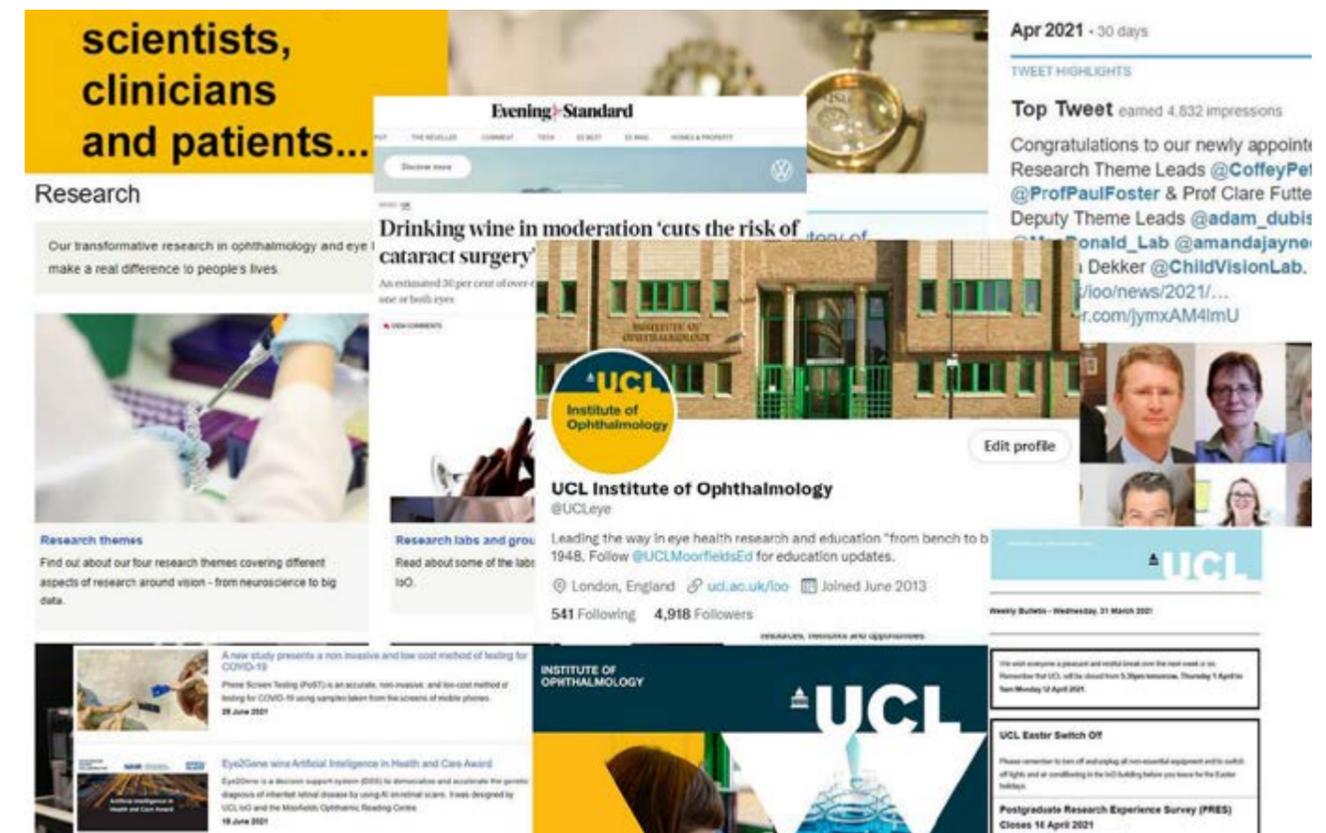
Communications Team – Recruited a Communications Officer and Administrator

A new Project Manager post was created to support the research themes, and a new Administrative Assistant post to support day-to-day operations at the institute

We have also continued a number of activities including the career advice surgeries, 'meet the directors', and career talks to support the career development of Professional Services and Technical staff at the institute.

Communications at the IoO

Communications at the IoO range from a weekly bulletin to a Monthly Update, website, intranet, social media activity, news updates, press releases, annual reviews and more. Among other things our new Communications Officer and Administrator coordinates the organisation and running of online and in-person events and meetings at the institute.



Some highlights from this year's activity include:

Launched first UCL IoO's Annual Review



Promoted and supported IoO Annual Lecture and IoO Day with 120 people attending: a slight increase from previous year

Recruited a Communications Officer and Administrator

Monthly newsletter changed into Monthly Institute Update from senior management

Set up regular meetings with communications colleagues from our partner institutions to consolidate relationship and transparency

Achieved 23% increase in whole website visits

Coordinated all logistics for a successful PI Away Day in the summer

Achieved 36% increase of web traffic to News section

Enhanced consistency of IoO branding across organisational documents

Increased Twitter followers (from 4100 in January to 4860 in November)

Created and launched a new PGR Newsletter

Trained colleagues in the HR team on the use of MS Teams functionalities and other events/meetings tools

Environment, Safety & Sustainability

Thanks to our Sustainability team, one of our major achievements this year was to receive Gold for both Green Impact office award, and LEAF Award for sustainable laboratories at UCL's 2021 Sustainability Awards.

Estates & Refurbishments

Refurbishment of two large labs in Cayton St for Professor Mariya Moosajee and Professor Shin-Ichi Ohnuma's groups

Refurbishment of two labs for 2-photon microscopy equipment for Dr Jennifer Sun, Dr Kate Powell & Dr Matteo Rizzi

Refurbishment of 315 to create a shared tissue culture lab

Redecoration of lab 118 for Dr Emily Eden

Redecoration of numerous offices

Improvements to lighting on third floor Wolfson staircase and link to Cayton Street

New roller blinds in the OHRI

Assisted IoO management and lab management team with the relocation of Ali/Pearson groups and reallocation of space on first floor

Sustainability & wellbeing

Gold award for LEAF (Laboratories)

Gold award for Green Impact (Offices)

Set up sustainability page on IoO intranet

Arranged IoO Wellbeing week including receiving a grant from UCL wellbeing for a faculty 5-a-side football match

Safety

Achieved T100 baseline (UCL programme for continuous safety improvement)

Arranged phased reopening of IoO following COVID lockdown

Undertook COVID safety inductions, recording of mandatory safety training and monitoring access



EDI at the IoO



The IoO Equality Challenge Team

Thanks to our Equality Challenge team, another major achievement this year was to receive an Athena Swan Silver award in April.

Other highlights include:

Ran Appraisals and Promotions Workshop for ECRs in March

Five applicants for Junior Promotion supported by Junior Promotions Committee, for second year of running after being set up by ECR action in 2020

Initiated IoO Race Action Group, and held 'Let's Talk about Race' event in conjunction with Ash Talwar, UCL EDI Manager

Took part in 'Whiteness and White Fragility' training

Conducted survey of furloughed staff to determine benefits and challenges

Hosted online 'Lunch & Learn' events

Surveyed staff preparing to return to work to find out positives and negatives

Recruited five new members into the EDI team, including two new students (one PGR and one PGT – a first, as per plan)

Hosted 'Career Talk: Pathway to Managing Facilities and Clinical Trials,' open to staff and student across UCL

Held career surgeries for both Professional Services and Technical staff



2021 IoO Annual Lecture and Awards



The IoO Annual Award Lecture is part of the IoO Day, when awards are also given to IoO and Moorfields/IoO-associated staff to recognise academic, teaching and collegiality activities.

This year we had the pleasure of hosting Professor Constance Cepko from Harvard Medical School and the Howard Hughes Medical Institute to deliver the 2021 lecture online.

2021 IoO Awards winners

Research Excellence:

Federico Rossi

Peter Andrew

Directors' Award:

Dr Karen Eastlake

Professor Jacqui van der Spuy

Collegiality:

Naheed Kanuga

Teaching:

Associate Professor Rashmi Mathew

NIHR Moorfields BRC Public and Patient Involvement and Engagement (PPIE):

MyEyeSite team:

Laura & Alessia Fietta (parent and patient)

Professor Andrew Webster

Nick Nettleton

Dr Rose Gilbert and Dr Jocelyn Cammack

Professor Mariya Moosajee

Public Engagement

Bloomsbury Festival, October 2020

Professor Andrew Stockman produced four films on classic visual illusions entitled "Illusions of Colour", "Illusions of Brightness and Lightness", "Geometric Illusions" and "Illusions of Depth and Shape".

The films ask the viewer to consider for a moment if what they see is real or an illusion, and why their eyes and brain play tricks on them. They were shown at festival venues and were made available online.

Beacon Bursary for Red, Green, Blue, East (July 2021)

The Beacon Bursary funding scheme supports UCL's Public Engagement Strategy which aims to embed public engagement as a normal, valued activity for UCL staff and students. IoO Research

Fellow Dr Emily Patterson and Jo Guile from UCL's Slade School of Fine Art, in collaboration with their community partners from **Four Corners**, designed a series of workshops exploring the science,

art, and experience of colour within Tower Hamlets. The project was developed through a collaboration that was formed during the UCL's Trellis programme, and culminated in a public exhibition.



Oriel

Co-design and feedback at the heart of progressing plans for our new centre for eye-care, research, and education.



Oriel is a joint initiative between UCL Institute of Ophthalmology (IoO), Moorfields Eye Hospital NHS Foundation Trust (Moorfields), and Moorfields Eye Charity that would see services move from the current location near Old Street, Islington to the St Pancras Hospital Site in Camden. It is an opportunity to create a world-leading centre for advancing eye health that will attract, inspire, and retain the most talented clinicians, researchers, and educators, enabling the speedier delivery of new treatments and therapies for patients.

The 2020-2021 academic year was

a busy one for the programme, with a focus on developing the internal designs of the new centre through various virtual and in-person events. Staff, students, and patients were able to work directly with the Oriel architects to provide vital feedback and information to co-develop the design of the new centre.

Work also commenced to identify a development partner for the Bath Street and City Road site, a key process to secure funding for the new centre. Ongoing partnership working with Camden & Islington Foundation Trust continued to ensure access to the new St

Pancras site remains on schedule.

In June, Camden Council made a unanimous decision for a resolution to grant planning permission for the centre. Subject to the approval by the Greater London Authority (GLA), this means that the IoO and Moorfields will be able to continue to develop detailed plans for the design of the new building next year.

Going into 2021-2022, the UCL governing council will consider the Final Business Case for Oriel. Subject to approval, the partners will appoint a main contractor to build the centre, thus enabling works on the St Pancras site to commence.

For more information on the Oriel programme, please visit the website: oriel-london.org.uk





**INSTITUTE OF
OPHTHALMOLOGY**

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