

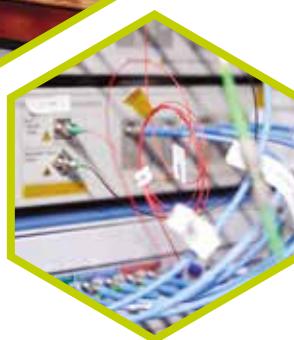


Aston University

BIRMINGHAM UK

ASTON INSTITUTE OF PHOTONIC TECHNOLOGIES

POSTGRADUATE OPPORTUNITIES



2019-2020



Welcome to AiPT

Here you will work with outstanding faculty members with strong expertise across various areas of photonics and numerous real world photonics related applications. I hope that you will find a stimulating environment and friendly atmosphere that will help you to develop your skills and receive new knowledge, and that your time in AiPT will be critically important to your future career in industry or academia.



Sergei K. Turitsyn
Director of AiPT

Who are we?

AiPT is one of the largest photonics research centres in the UK, with 90+ staff and current grant funding amounting to £32M in 64 national and international, research and industrial projects.

What makes us stand out?

AiPT is a centre of excellence in photonics, with global international visibility, reputation as a trailblazer in research and innovation, strong industrial links and knowledge transfer, several strategic industrial partnerships, and a beacon of photonic learning and public outreach activities, ranked among the top academic photonic centres in the world.

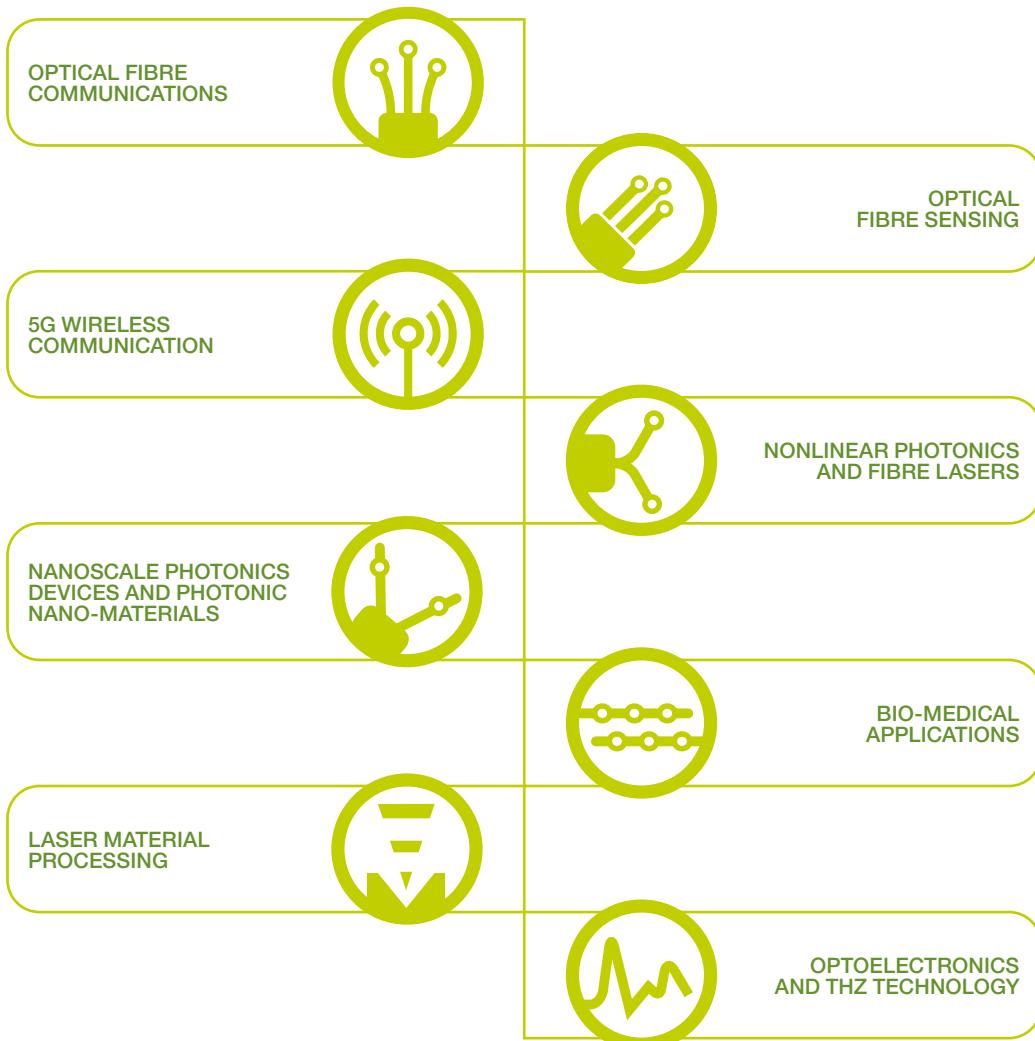
AiPT Mission

The mission of the Aston Institute of Photonic Technologies is through research integrated with education to generate and advance knowledge and innovation in photonics and translate the scientific breakthroughs into technology making industrial, economic and societal impact.

The Aston Institute of Photonic Technologies will be developing guided by the four interconnected strategic goals: research, post-graduate education, translational activities and public outreach.



Key Areas of Research



Institute website
www.aston.ac.uk/photonics

Key research facilities, infrastructure and equipment

AiPT provides outstanding facilities and infrastructure for its key research and training activities, with extensive theoretical and computational support. Now housed in a complex developed in 2018, AiPT benefits from 30 laboratories covering 1500 square metres. Facilities include Gbit/s to multi Tbit/s communications testbeds, UV and fs laser system for optical device fabrication, a Class 10,000 (locally 1000) cleanroom, environmental test chambers, and a range of other equipment for laser and sensing system development.



School of Engineering & Applied Science

AiPT is part of the School of Engineering & Applied Science. The school has a long tradition of quality teaching, and a reputation for internationally known, cutting-edge research.

The School of Engineering and Applied Science focuses on research that is significant to the current and future needs of our society. The research is recognised internationally: over half our research funding comes from international sources. We also receive support from UK Government, research councils and charities. Our research projects tackle strategic priorities such as energy, information and communication technologies (ICT), and healthcare technologies



The School of Engineering & Applied Science has received the Athena SWAN Silver Award. This prestigious award recognises our progress in, and commitment to, addressing gender and other inequalities in academia.

Many of our courses are accredited by world-leading organisational bodies such as the Institution of Mechanical Engineers (IMechE), Institution of Engineering and Technology (IET), and the Chartered Management Institute (CMI).



Aston University

Founded in 1895 and a university since 1966, Aston University is a long-established research-led University known for its world-class teaching quality and strong links to industry, government and commerce.



Aston University has been awarded five star status by global education ranking specialists QS.

Teaching, employability, innovation, facilities, inclusiveness, and internationalisation.



Over the last 20 years, Aston has consistently been ranked as a top university for graduate employability: 51st in the World and 10th in the UK according QS Graduate Employability Rankings (Ref.2012).

AiPT postgraduate programmes & funding mechanisms available

- AiPT offers extensive postgraduate educational opportunities to students
- Programmes cover **PhDs** and **Masters** level courses
- **MSc by research** is a newly introduced course
- **Fully funded** or **self-funded** routes are available

For full details of entry requirements for each course please visit the course page on our website:

[www. aston.ac.uk/eas](http://www aston.ac.uk/eas)



MSc programmes

Electrical, Electronic & Power Engineering (EEPE)

The Electrical Electronic and Power Engineering (EEPE) Subject Group in the School of Engineering & Applied Science has a high reputation for preparing master students to gain essential knowledge and skills for their future careers.

We currently offer a 12-month, full-time MSc programme relating to telecommunications, Internet and data network technologies commencing annually in October. Our course aims to make you into professional engineers through enhancing your ability in understanding and dealing with challenges presented in communication systems and networks.

Our MSc programme has been designed in partnership with the UK's leading telecommunications organisations, and has the full support of the Engineering and Physical Sciences Research Council (EPSRC) and the Federation of the Electronics Industry (FEI) Telecommunications and Radio Council.

A part-time study option is also available for our MSc programme.

For full details of entry requirements for each course please visit the course page on our website:

www aston.ac.uk/eas

SELF-FUNDED MSc

If you want to enrol into a master programme in this area and you have the finances to self-fund your MSc, please contact us by email photronics@aston.ac.uk to discuss your proposal or find out more about current opportunities.



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MSc Communication Systems and Wireless Networking

Course overview

This course is designed to address the rapidly increasing demand for qualified engineers with well-equipped knowledge in modern communication systems and wireless networks. You will focus on a wide range of subjects from fundamental information and communications technology (ICT) to contemporary developments in the wireless and mobile industries. You will get the essential knowledge to understand the latest technologies for advanced communication systems such as current 4G and forthcoming 5G. You will also develop transferable skills in applying these technologies to the 5G-enabled use cases such as mobile broadband services, connected and autonomous vehicles, industrial IoT and smart cities.

Course details

The programme covers a wide range of topics in communication systems and wireless networks and provides options from outside the core specialism. You will study core modules covering advanced specialist topics, plus optional modules allowing you to specialise in your chosen area, along with an individual research project – which is sometimes undertaken in collaboration with industry.

Why study this course at Aston?

Postgraduate study with Electrical and Electronic Engineering at Aston is a chance to learn from world leaders in their fields. This guarantees you a first-class learning experience, leading to a qualification that is

respected over the world and making you an attractive prospect in a very competitive job market.

You will access the facilities of a world-renowned research institute, AiPT, and study and work alongside internationally recognised researchers in areas such as high-speed communications, signal processing, photonic technologies and sensing.

Career prospects

Communication engineering is in demand in a number of sectors, meaning that communication engineers may find themselves working in industry, the commercial arena, engaging in scientific research or being employed by the military. This course will equip you for a rewarding career in this dynamic field. Companies in both developed and rapidly growing economies are keen to secure professionals with specialist knowledge of the underlying principles and advanced applications of telecommunication networks and wireless information technologies, meaning that upon graduation your career prospects will be excellent.

Contacts

Dr. Sonia Boscolo

 s.a.boscolo@aston.ac.uk

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MSc Smart Telecom and Sensing Networks (SMARTNET)

Programme overview

SMARTNET is a unique two-year Erasmus Mundus Joint Master Degree programme supported by European Union funding. You will receive training in the interdisciplinary fields of photonics and 5G wireless technologies for data communication, sensing and data processing. Offered jointly by three universities (Aston, TPT and UoA), you will benefit from distinctive and complementary academic qualities, and strong educational and research environments. You will study a range of subjects highly relevant to both industry and society, and critical subjects for the global future of information and communication technologies.

Core modules

As a student of the collaborative SMARTNET programme, you will be able to choose to follow one of six pathways that include study in two different European universities.

Why choose this course?

Study one of engineering's key multidisciplinary areas of the future. Develop the skills and knowledge to contribute to the development of a 5G network infrastructure. As part of the Erasmus Mundus programme, graduate with two full MSc qualifications. Benefit from close relationships with 17 industrial partners.



From Islamabad to Birmingham

“ Studying at Aston University has been a very good experience. The best thing was the chance to interact and learn about different cultures. Also, the program made me realize more about the importance of the field I am studying. The learning environment at Aston is excellent. I would definitely recommend the programme to future students. The program provides a great opportunity to enhance skills. It allows you to travel around the world, learn about different cultures and helps you to grow as a person. And, of course, at the end of it, you'll have a degree in a very significant field of study.”

Rana A. B. Khalid
SMARTNET Scholarship Holder

Contacts

- smartnet.astonphotonics.uk
- www.facebook.com/SMARTNETmaster, www.facebook.com/groups/SMARTNETgroup
- aipt_smartnet@aston.ac.uk



MSc Photonic Integrated Circuits, Sensors and Networks (PIXNET)

Programme overview

PIXNET is a two-year Erasmus Mundus Joint Master Degree programme supported by European Union funding. You will receive high-quality training in photonic integration for communication, sensing and switching. Offered by a consortium of universities, you will benefit from distinctive and complementary academic qualities, and strong educational and research environments. The Erasmus programme is an interdisciplinary, multinational initiative to train telecommunication and electrical engineers to investigate the adoption of Photonic Integrated Circuits (PIC) as the central element in the evolution of information and communication devices.

Core modules

As a student of the collaborative PIXNET programme, you will be able to from six different pathways that will include study in two or three programme universities.

Why choose this course?

Receive high-quality training, specialising in photonic integration for communication, sensing and switching. As part of the Erasmus Mundus programme, graduate with two full MSc qualifications. The strong involvement of industrial partners in the programme will offer you the opportunity to bridge the gap between your academic knowledge and practical application. You will be encouraged to carry out a number of industrial visits to enhance your MSc project.

Contacts

- smartnet.astonphotonics.uk
- www.facebook.com/PIXNETmaster
- aipt.pixnet@aston.ac.uk

SMARTNET and PIXNET

Additional entry requirements

A bachelor's degree in telecommunications, electronics, electrical engineering, computer science, physics, mathematics or similar.

Career prospects

Both programmes will equip you not only with the theoretical knowledge but also the transferable skills in related disciplines that will give you the potential to play a leading role in the evolution of integrated photonics as a key technology for the future development of many modern industries, including ICT, biomedical industries, sensing and the aerospace industry. Graduates from similar previous programmes have gone into senior level roles in industry or onto PhD study in European institutions.



SMARTNET and PIXNET programmes have received funding from Erasmus+ Programme of the European Union.



Self-funded options:

- SMARTNET and PIXNET Erasmus Mundus Joint Master's Degree (EMJMD) 2 years self-funded programme.
- Non-Erasmus, SMARTNET and PIXNET training pathway at Aston University is only 1-year programme that gives standard MSc qualification (180 credits).



Erasmus Master on Innovative Microwave Electronics and Optics (EMIMEO)

Course overview

Starting from September 2019, EMIMEO is a two-year Erasmus Mundus Joint Master Degree programme supported by European Union funding. EMIMEO offers a programme centred on microwave engineering and photonic technologies, ensuring that students acquire advanced and cross-disciplinary expertise. Offered jointly by four universities (University of Limoges, Aston University, University of Brescia, and University of the Basque Country), you will benefit from distinctive and complementary academic qualities, and strong educational and research environments. Together with the industrial partners including SMEs and big companies, the EMIMEO Consortium aims at building the best training offer for future engineers and researchers in microwave electronics and photonics.

Course details

As a student of the collaborative EMIMEO programme, you will be able to choose from four different pathways that will include study in two or three programme universities. The EMIMEO Consortium releases multiple degrees and recognises any teaching module attended in other institutions of the Consortium. You will receive the diploma from each institution in which you will have spent at least 1 semester of study. Aston will issue the MSc degree in Communication Systems and Wireless Networking.



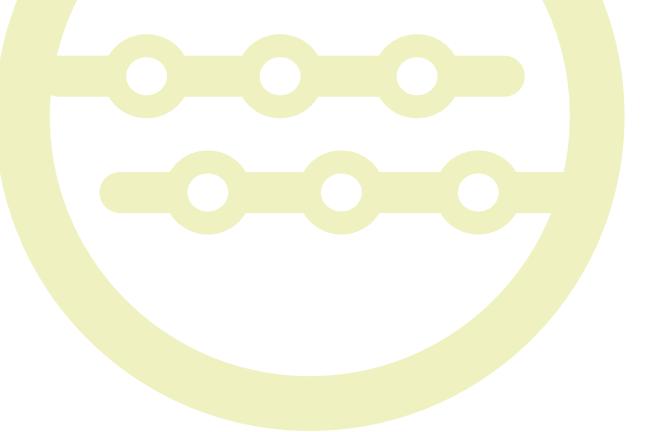
MIMEO is CO-funded by the Erasmus+ Programme of the European Union

Why choose this course?

Receive cutting-edge training in the key fields of microwave engineering, specialised microwave electronics and photonics technologies. As part of the Erasmus Mundus programme, graduate with two or three full MSc qualifications. Benefit from close relationships with 15 industrial partners.

Contacts

- 🌐 <http://www.erasmus-master.emimeo.eu>
- FACEBOOK <https://www.facebook.com/EMIMEO.EU>
- EMAIL emimeo-consortium@unilim.fr



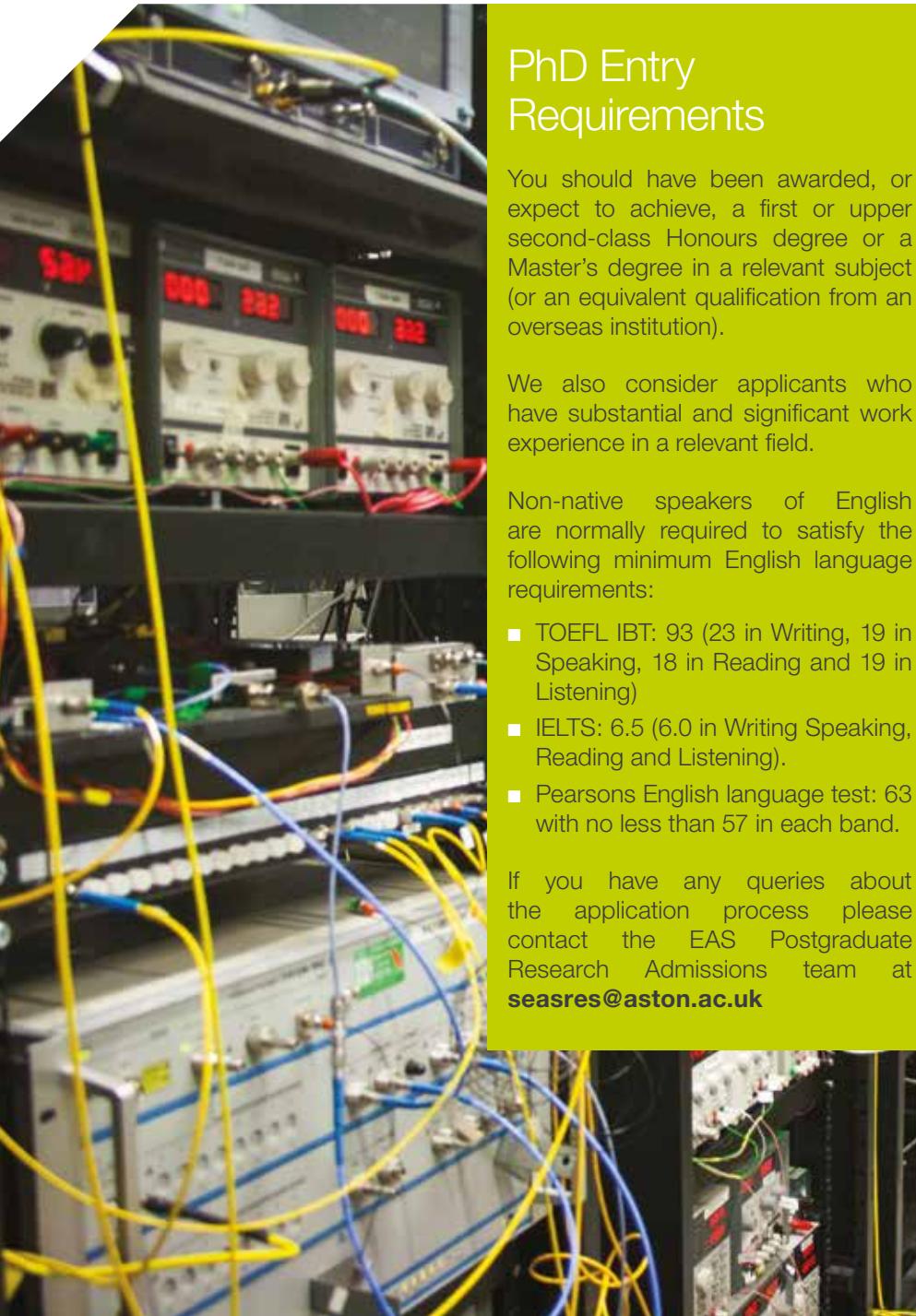
PhD Programme overview

Our PhD programme is designed to train Doctoral students who aspire to become future academics or professional industry researchers.



Though pursing a PhD is always challenging, nice colleagues at AiPT have made my PhD life easier. They have helped me a lot from advanced signal processing algorithms to hands-on training on the available state-of-the-art equipment. This has significantly accelerated my research, enriched my knowledge and fulfilled my experience. Besides, the constant flux of invited talks given by distinguished scientific visitors from all over the world also broaden my horizon and provide me great opportunity to set up potential cooperation. If giving me the second chance to choose where to do PhD, I will make the same decision.

Zhang, Tingting
PhD graduate 2019



PhD Entry Requirements

You should have been awarded, or expect to achieve, a first or upper second-class Honours degree or a Master's degree in a relevant subject (or an equivalent qualification from an overseas institution).

We also consider applicants who have substantial and significant work experience in a relevant field.

Non-native speakers of English are normally required to satisfy the following minimum English language requirements:

- TOEFL IBT: 93 (23 in Writing, 19 in Speaking, 18 in Reading and 19 in Listening)
- IELTS: 6.5 (6.0 in Writing Speaking, Reading and Listening).
- Pearson English language test: 63 with no less than 57 in each band.

If you have any queries about the application process please contact the EAS Postgraduate Research Admissions team at seasres@aston.ac.uk

Some of the PhD positions available 2019/2020



■ Ellipsometric dual comb LIDAR (ELIDAR)

AIPT in collaboration with ASTUTE

Applications are invited for a studentship in the Aston Institute of Urban Technology and the Environment (ASTUTE), funded by the School of Engineering and Applied Science. The successful applicant will join a cohort of graduate students working on projects across the broader Smart Cities field, and as part of the PhD will receive training and experience in collaborative research, relevant to industry and Smart City planners. The studentship is offered in collaboration with Highways England and RDM group.

Unlocking the texture's signature is a key issue towards scene objects recognition especially recognising humans against a background of objects of the same size or clutter. To address the challenge, the ELIDAR is targeting development of an ellipsometric distance ranging based on the mode-locked fibre laser with the dynamically evolving states of polarisation.

■ Riemann-Hilbert problem and algebro-geometric approach in optical communications (Leverhulme Trust Project)

The successful applicant will join for three years an established theoretical/experimental group working on the applications of the nonlinear Fourier transform (inverse scattering method) and the Riemann-Hilbert problem-based signal processing methods, for the sake of fibre nonlinearity mitigation in optical transmission systems and the investigation of paradigm-shifting approach for the next generation extra-high-capacity optical networks.

■ Transforming networks – building an intelligent optical infrastructure (TRANSNET)

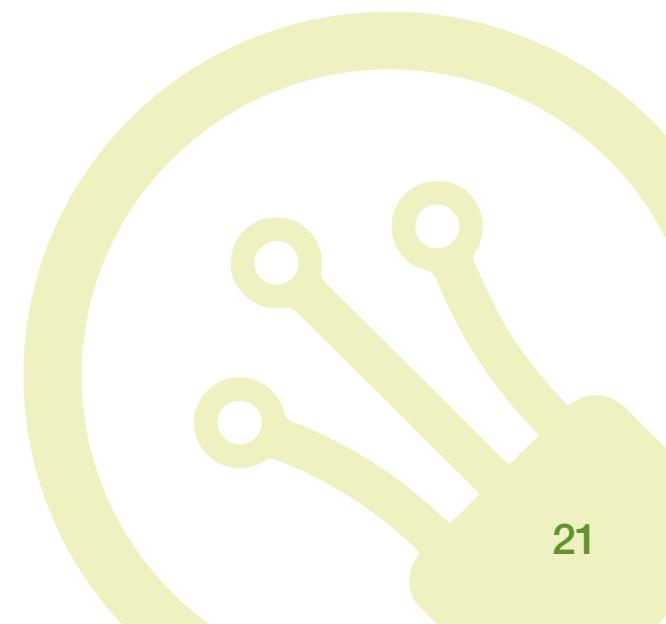
The aim of TRANSNET is to address this challenge by creating an adaptive intelligent optical network that is able to dynamically provide capacity where and when it is needed - the backbone of the next-generation digital infrastructure. We propose to reduce the complexity of network design to allow self-learned network intelligence and adaptation through a combination of machine learning and probabilistic techniques. This will lead to the creation of computationally efficient approaches to deal with the complexity of the emerging nonlinear systems with memory and noise, for networks that operate dynamically on different time- and length-scales.

■ Optical Phase Conjugation Based Optical Networks (1 position)

■ Optical Phase Conjugation Based Transmission Systems (1 position)

Two fully funded 3-year PhD studentships are designed to provide outstanding graduates to undertake research, leading to a PhD, within the context of a mutually beneficial research collaboration between Aston University, the Optoelectronics Research Centre at the University of Southampton, and British Telecom (BT).

In this project, the successful applicants will develop a novel optical device capable of substantially increasing the capacity of an optical transmission link. They will develop a device with a novel nonlinear optical design, understand the underlying impairments to be compensated, demonstrate substantial improvement in performance and finally trial the solution in a real world environment.



Prestigious Innovative Training Networks (ITN) for doctoral studies at AiPT

Being an active member of a range of European funding schemes, AiPT is currently coordinating six Horizon 2020 Innovative Training Network projects, which bring together universities and companies from different countries to train new generation of doctoral-level researchers.



All programmes listed in "PhD training network at AiPT" have received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Actions Grant agreement No 860360, 814276, 813144, 814147, 766155, 861152, 860755.



POST DIGITAL – ETN

Training Early Stage Researchers – 15 positions (from mid-2020)

Goal: To exploit the potential speed and energy advantages of computing with light and to mobilise the advantage that analogue neuromorphic computing offers over digital computing based on parallel processing and adaptive intelligence of biological brains. POST-DIGITAL aims to develop solutions to the physical ceiling imposed by the end of Moore's law and will achieve this by investigating non-conventional nature-inspired solutions.

s.k.turitsyn@aston.ac.uk

General Information ITN

- Funded by the EU under Marie Skłodowska-Curie Actions
- Both European Training Network (ETN) and European Industrial Doctorate (EID) available for Early Career Researchers ECR, i.e. within their first 4 years of research experience but without a PhD
- Fully funded PhDs (fees paid by projects)
- Exceptionally high salaries while studying
- Meaningful industrial exposure
- Trans-national mobility required
- Bespoke training and secondment schedule



WON – ETN

Wideband Optical Networks (WON) – 14 positions

Goal: Design, development, prototyping and test of transceivers, components, network management and modelling techniques for future wideband optical networks.

t.kilina@aston.ac.uk

<https://won-astonphotonics.uk>



REAL-NET – EID

REAL-time monitoring and mitigation of nonlinear effects in optical NETworks (REAL-NET) – 6 positions

Goal: Realistic implementation of DSP algorithm to compensate nonlinear effects in fiber with and without machine-learning-based algorithms.

Applicants will spend 18 months (50%) with an industrial partner Orange or Infinera

m.pasini@aston.ac.uk

<https://real-net astonphotonics.uk>

FONTE

FONTE - EID

Fibre Optic Nonlinear TEchnologies (FONTE) – 4 positions

Goal: develop communication and coding methods suitable for the nonlinear optical fiber, in order to increase the data rates of the future communication systems

Applicants will spend 18 months (50%) with industrial partner Nokia Bell Lab

 c.doering-saad@aston.ac.uk

 <https://fonte astonphotonics.uk>



MEFISTA – ETN

Multi-scale fibre-based optical frequency combs: science, technology and applications (MEFISTA) – 6 positions

Goal: Development and trial tests of mode locked femtosecond lasers in the context of autonomous driving (car-object distance ranging, object recognition, moving objects speed tracing: Doppler LIDAR) that will be supported by RDM autonomous driving expertise and facilities.

 s.sergeyev@aston.ac.uk

MOCCA

MOCCA – EID

Multiscale Optical Frequency Combs:
Advanced Technologies and Applications (MOCCA) – 4 positions

Goal: developing a new generation of optical frequency comb (OFC) techniques

Applicants will spend 18 months (50%) with industrial partner AMO GmbH, THALES and III-V Labs

 f.tramontana@aston.ac.uk

 <https://mocca astonphotonics.uk>

MONPLAS

MONPLAS – ETN

The training of early stage researchers for the development of technologies to MONitor concentrations of micro and nanoPLAStics in water for their presence, uptake and threat to animal and human life – 14 positions

Goal: Improve our ability to detect micro and nanoplastics for their presence, uptake and threat to animal and human life through the combination of research and development in various scientific areas including microfluidics (asymmetric field-flow fractionation...), photonics (FTIR spectroscopy, photoluminescence, SERS, microRaman,...), other analytical techniques (pyrolysis-gas chromatography - mass spectrometry) and toxicity.

 d.hill2@aston.ac.uk

AiPT is open for collaboration through different schemes such as mentoring MSc projects, participation in cohort research programmes, cutting-edge technology and bespoke events and workshops, Knowledge Transfer Partnership grants, and project partnership.

Knowledge Transfer Partnerships (KTP)

KTP is a world-leading programme that helps businesses succeed by connecting them to the UK's rich academic resources. It is a partnership between the business seeking expertise, Aston University and a recently qualified graduate – known as a KTP Associate. Working on a KTP will give you access to the University's facilities including state-of-the-art laboratories, library services and range of free professional development courses. Aston also offers support for ambitious KTP Associates who wish to undertake a higher degree during their project.



**To find out more
about KTP**

call **0121 204 4253**
email **ktp@aston.ac.uk**
or **photronics@aston.ac.uk**



SELF-FUNDED PhD

AiPT is always open to applications from students to projects other than listed below. The online application form, reference forms and details of entry requirements, including English language are available at <http://www1 aston.ac.uk/eas/research/prospective-research-students/how-to-apply>.

Such applications must also be accompanied by a research proposal giving an overview of the main themes of research, and explaining how your knowledge and experience will benefit the project. Details of how to write your project proposal are also included in the How to Apply section.

For any queries, please contact our central team **photronics@aston.ac.uk**



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