The Centre for Industrial and Engineering Optics is one of the longest-standing of DIT’s designated Research Centres and is associated with the FOCAS Research Institute and with the School of Physics and Clinical and Optometric Sciences. The Centre has over 20 years of experience in Holography and Optics and specialises in holographic, interferometric techniques and ultrasound. It has developed novel technologies with applications in product authentication, measurement, sensing, tissue mimics, vibration measurement and optical device fabrication. The IEO centre has graduated over 30 MSc, MPhil and PhD research students in these research areas, holds 6 granted patents and has spun out one company. Key areas of expertise for the IEO centre are high resolution photosensitive materials, interferometric systems for surface measurement, medical ultrasound and holographic devices.

The list below highlights the research outputs of the IEO team in 2017.
Contributors for 2017:

IEO members:
Andrew Malone          Sabad-e-Gul            Jacinta Browne          Dennis Bade
Tatsiana Mikulchyk     Izabela Naydenova      Kevin Murphy           Sanjay Keshri
Suzanne Martin         Andrea Doyle           Dervil Cody            Monika Zawadzka
Vincent Toal           Muhammad Irfan

Undergraduate students
Patrick Coyle          Brian Rogers           George Osei Mensa       Finbar Nicholl
(Final year project)   (Industrial placement) (Final year project) (Final year project)
Khadija Al-Rasbi       (Final year project)

Internal (DIT) collaborators:
John Cassidy           Dana Mackey            George Amarandei        Luke O’Neill
Paul O’Reilly

External Academic Collaborators:
Svetlana Mintova       Tsvetanka Babeva        Giuseppe Coppola        Vincent de Waele
Ali K. Yetisen         Matjaz Humar           Seok Hyun Yun           Nan Jiang
Silvin Knight          Yunuen Montelongo      Haider Butt            Rajib Ahmed
Jim F Meaney           David S Smith          Andrew Fagan            Christopher Barrett
Hussein Awala          Loi`c Saint-Marcel     Guillaume Clet           Richard Retoux
Igor Pušnik            Julien Grand           David Fleming           Dubhaltach MacLochlainn
Awards and prizes 2017:

Dr. Suzanne Martin, Prof. Izabela Naydenova, Prof. Vincent Toal, Researcher Impact award, Hothouse, DIT, 2017.

Sanjay Keshri - 1st Place Poster Award at Photonics Ireland on September 15, 2017 for the poster titled “Shorter Focal Length Holographic Lenses for LED Applications”

Andrea Doyle - Dublin Institute of Technology 8th Graduate Research Symposium Travel Bursary Award 2017

Andrea Doyle - Irish Association of Physicists in Medicine Young Investigators Award 2018

Monika Zawadska, Awarded 2 year Fellowship at Science Foundation Ireland (funding agency experience).
Outputs 2017

IEO Viva/theses

Dr. Paul O'Reilly, "Mathematical modelling of hybrid polymer systems" 2012- 2017 supervisors Dr Dana Mackey , Prof. Izabela Naydenova (IEO)

Transfer exams


Peer-reviewed Journal papers


**Book chapters**


**Published Conference Abstracts**


Conference outputs


3. Rabell-Montiel A, Browne JE, Pye SD, Anderson TA, Moran CM, Measurement of the acoustical properties of tissue mimicking samples from 4.5 - 50 MHz – a comparison of two measurement techniques, IPEM conference The physics and technology of medical ultrasound, York, 4th April 2017

4. Rabell-Montiel A, Browne JE, Pye SD, Anderson TA, Moran CM, Measurement of the acoustical properties of tissue mimicking samples from 4.5 - 50 MHz – a comparison of two different measurement techniques, Edinburgh, Scottish Ultrasound Meeting, 8th March 2017


30. M. Zawadzka, I. Naydenova 'Surface holograms for sensing application', NANOP, Barcelona, Spain, 13-15 Sept 2017 (poster)


Invention disclosures

(1) Jacinta Browne and Andrea Doyle - Submitted December 2017

(2) Izabela Naydenova, Dervil Cody, Tatsiana Mikulchyk, Sabad-e-Gul, Kevin Murphy, Jacinta Browne, Suzanne Martin, submitted December 2017

Patent applications


Invited talks

3. Prof. Chris Dainty, Feb 2017, OSA Travelling Lecturer, Image Science and Mobile Phone Cameras

Final year research projects and interns

Research outputs 2017 - Centre for Industrial and Engineering Optics – Dublin Institute of Technology
3) Lukas Gokas, “Quantitative evaluation of three susceptibility-weighted MRI imaging sequences via direct measurement on a custom-designed phantom device” 12/2016-04/2017. supervisor: Andrew Fagan and Jacinta Browne
5) Nathan Payne, “Development of Experimental System and Program to Determine Ultrasound Backscatter” 12/2016-04/2017. supervisor: Jacinta Browne
6) Dean Walsh, “Development of a system to determine the propagation of ultrasound in liquids” 12/2016-04/2017. supervisor: Jacinta Browne
9) George Osei Mensa, HOLOGRAPHIC PROPERTIES OF PHOTOPOLYMER LAYERS DOPED WITH ZEOLITE NANOPARTICLES”, 12/2016-04/2017., supervisor Izabela Naydenova
10) Patrick Coyle, “Instability Development in Photopolymers as Induced by Holographic Patterning”, 12/2016-04/2017., supervisors, George Amarandei, Izabela Naydenova

European projects progress review and applications evaluation

Prof. Izabela Naydenova - member of the evaluation panel of MSC-IF Programme

Involvement in organisation of conferences and members of editorial boards

Prof. Izabela Naydenova - Photonics Ireland 2017, member of the organising committee
Prof. Izabela Naydenova member of InTech Publishing
Prof. Izabela Naydenova - member of the editorial board of JOSA A
Reviewer for scientific journals

3) Dervil Cody: Applied Optics, Optics Express, Optik.
4) Tatsiana Mikulchyk: Optics Express, OSA Publishing.

Outreach, visits and communication activities

Workshop for transition year students by the members of the OSA and SPIE DIT chapters.
First Transition Year Workshop - 28 February, 2017
Second Transition Year Workshop - 28 November, 2017

Monika Zawadska, Scientific visit to Laboratory of Infrared and Raman Spectrochemistry at University of Lille 1, France (Vincent De Waele), 11 and 12th September 2017

OSA & SPIE student chapters

DIT OSA-SPIE Student Chapters was established in August 2016 by postgraduate students of IEO, Photonics, and DEL group of DIT. Special thanks to Prof. Izabela Naydenova and Dr. Kevin Murphy for their assistance and support. It is a student organization which consists of several post-graduate and undergraduate students working on various topics in the Dublin Institute of Technology. They are officially affiliated as a student chapter of SPIE and The Optical Society of America (OSA), two professional societies which provide them with funding and resources that allow them to engage in many activities related to the exploration and promotion of science especially in the field of optics and photonics.

The benefits of this chapter include:
- Representation of DIT in student leadership meeting in USA
- Visiting Lecturer Program
- Outreach programs in DIT
- Visiting other University’s Lab in Ireland

Contributors - Prof. Izabela Naydenova, Dr. Kevin Murphy, James Walshe, Sabad-e-Gul, Sanjay Keshri