



IPIC

BRINGING PHOTONICS TO LIFE

A World
Leading SFI
Research
Centre

Science
Foundation
Ireland **sfi**
For what's next

Building the future with talent and technology

HOST INSTITUTION

 **Tyndall**
National Institute
Institiúid Náisiúnta

PARTNER INSTITUTIONS

 **CORK
INSTITUTE OF
TECHNOLOGY**
INSTITIÚID TEICNEOLAÍOCHTA CHORCAI

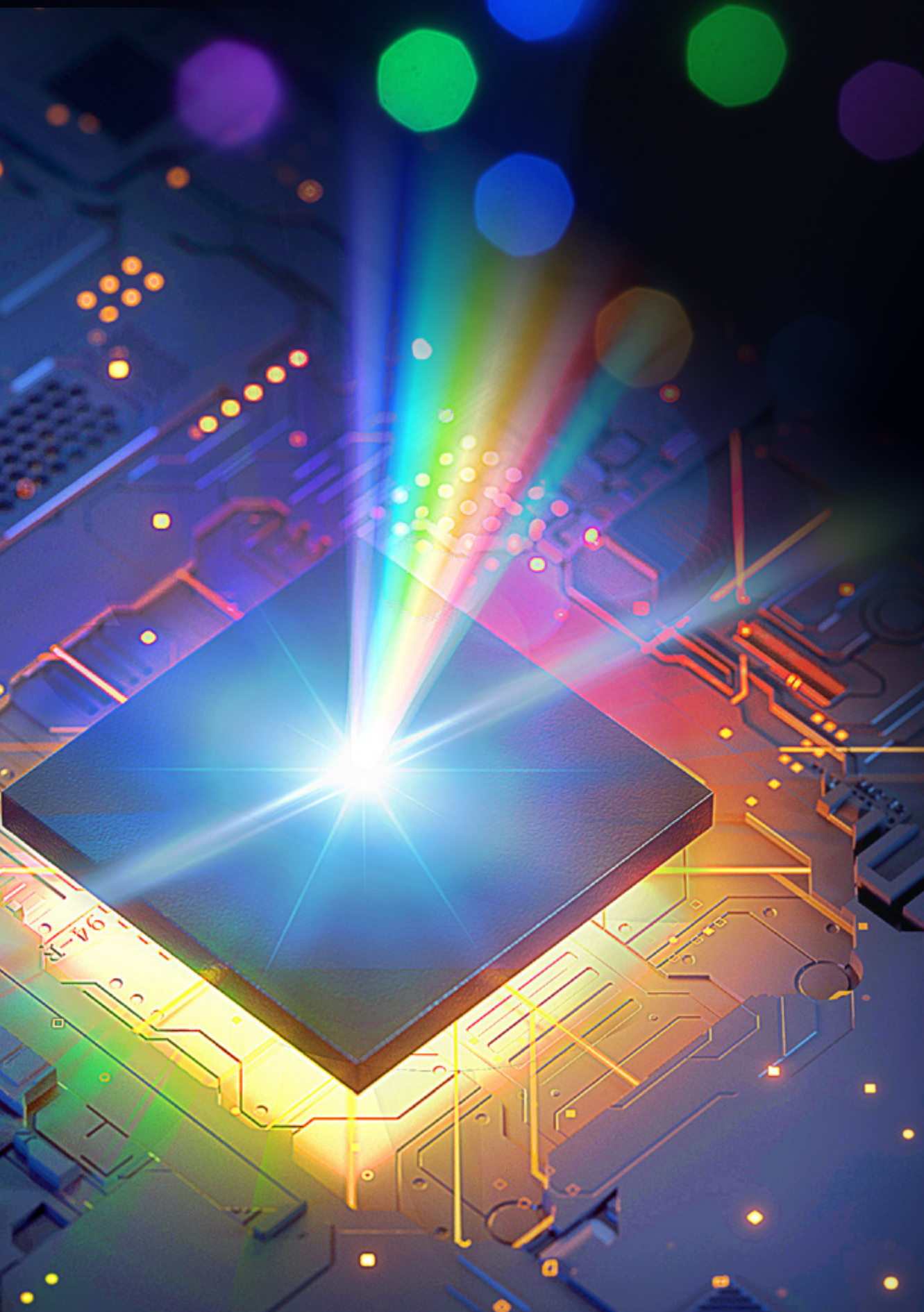
 **DCU**



NUI Galway
OÉ Gaillimh

 **Trinity
College
Dublin**
The University of Dublin

 **UCC**
University College Cork, Ireland
Coláiste na hOllscoile Corcaigh



IPIC - from atoms to systems

What is it?

The Irish Photonic Integration Centre (IPIC), is Ireland's centre of excellence for research, innovation and PhD training in photonics, the science and application of light, which today represents a \$0.5 Trillion global industry.

Photonic integration technology is the focus of our research, spanning areas from photonics theory right through to device and system development and fabrication, enabled through our in-house

laboratories and semiconductor fabrication facilities at Tyndall National Institute.

We work closely with over 30 industry partners to develop their next-generation products, across Ireland's high-growth technology sectors of ICT and MedTech, supporting their attraction to and growth in Ireland. In addition, we commercialise our disruptive technologies through start-up companies and co-ordinate the Photonics Ireland National Technology Platform.



Developing Technology to **Advanced Manufacturing**

IPIC's integrated research team of 200 researchers have experts spanning the building blocks needed to develop miniaturised optoelectronic-based devices and systems. We accelerate the transfer from laboratory to market through our advanced fabrication and packaging facilities, developing concepts and delivering low-volume manufacturing prototypes.

Our core Platform Research Programme represents an investment of over €20M, and is focused on four inter-disciplinary Research Themes that combine the

expertise and knowledge from our 17 research groups.

- Monolithic and Heterogeneous Integration
- Packaging and Hybrid Integration
- Optical Communications
- BioMedical

These technologies are integrated into devices for a wide range of applications, including AR/VR displays, data centres, environmental sensing, medical devices, self-driving cars and portable diagnostic systems.



Basic Phenomena

Photonics Theory O'Reilly, Schulz

Electronic structure & properties, III-V materials & devices

Biophotonics Anderson-Engels, Keyes, Papkovsky

Light-tissue interactions, molecular spectroscopy

Quantum Information Pelucchi

Single & entangled photon sources

Material Epitaxy

III-V Materials Pelucchi

Optoelectronic device structure, quantum wells, wires, dots

III-Nitride Parbrook

Optoelectronic device structures, nanostructured epitaxy

Thermal Materials Razeeb

Thermoelectric & thermal interface materials

Devices

Device Fabrication Corbett

Visible, near-IR & UV lasers, micro LEDs, modulators, detectors

Silicon & Nano photonics Bradley, Whelan-Curtin

Photonic crystals, hybrid lasers, coupling interfaces

Microelectronics Townsend

Driver and receiver integrated circuits

Integration

Photonics Integration Peters

High-speed integrated optoelectronic devices

Assembly & Packaging O'Brien

Packaging & hybrid integration

Transfer Printing Corbett

Micro-transfer printing of integrated electronic & photonic circuits

Systems

Communication Townsend, Barry, Ruffini, Gunning

Optical fibre comms, digital signal processing, software defined networks, quantum key distribution

Manufacturing O'Connor

Laser based micro and nano-scale fabrication

Biomedical Andersson-Engels, Bradley, Papkovsky, Keyes

Smart surgical instruments & wearable devices

Why it works?

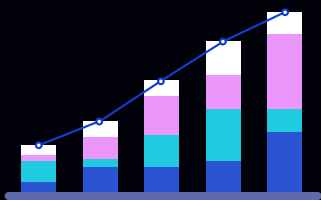


210 researchers



>100 publications
per year

€19m



Turnover per year



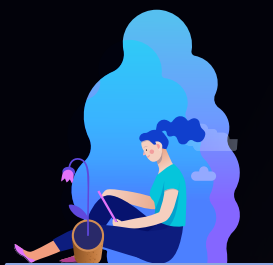
>€24m funding
secured from H2020



30 PhD level
trainees per year



60% of trainees
depart to industry



40% of publications in
the **top 10%** journals



Industry contracts
valued **€3.4m** per year

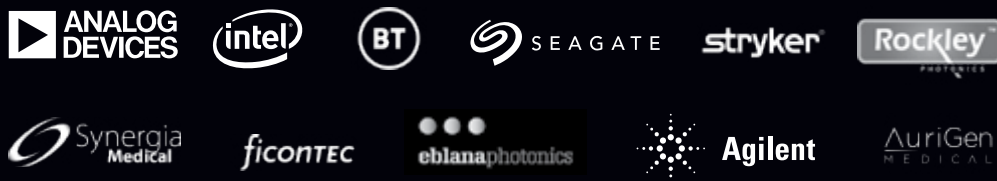
Partners

Collaborate with leading institutions



Our clients

IPIC works closely with fast growing SMEs to the world's largest technology companies from across the globe, through collaboration models tailored to the companies needs. These partnerships are designed to convert breakthrough ideas from the lab into competitive market leading products.



IPIC hosts the Photonics Ireland National Technology Platform, which brings Ireland's photonics community together under one umbrella for international engagement and to drive growth in Ireland's high impact sectors.



Education

The IPIC Academy

One of our key objectives is to train future photonics research leaders.

- Partner in the PIADS Centre for Doctoral (PhD) Training
- Host of the Sparkle MSCA Fellowship training programme
- Advanced training courses for industry employees, from 1 week upwards.

IPIC's Education and Public Engagement (EPE) programme works to attract higher numbers of students, in particular female students, to study STEM subjects such as physics and electrical engineering.

Build a career with IPIC

We have a young dynamic team with researchers from over 20 countries and positions available throughout the year, from PhD opportunities, to staff research leaders, to senior academic posts. IPIC offers world class facilities, to build your career. For details of current vacancies see our website www.ipic.ie

Diversity of thought and diversity of people are at the heart of the Centre's culture.



Our impact

**Driving integration
of the digital and
optical worlds** on the
nm to cm scale


**Delivering
technology that
drives fascinating
applications** from the
backbone of the internet, to medical
devices that see into the body, to
LIDAR for autonomous vehicles,
to micro LED displays for AR/VR.

**IPIC is at the heart of this world,
developing technology for the future
in partnership with the world's leading
technology companies and training the
future research leaders.**

If you are interested in collaborating
with us please contact:

Prof Paul Townsend **Director**
Dr Patrick Morrissey
Centre Manager



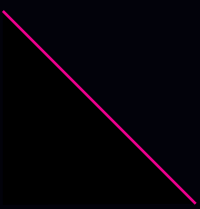


“ Working with a world-class Irish Research Centre such as IPIC has ensured that intel remains at the forefront of photonics”

Bernard Capraro, **Research Manager, Silicon Technology, Intel Ireland**

“The research work that Tyndall is carrying out for Eblana in the area of photonics is vital to the creation of our next generation products”

Jim Somers, **CEO, Eblana**



IPIC

Tyndall National Institute
Lee Maltings
Dyke Parade
Cork
Ireland

Call + 353 21 4904177

Visit www.ipic.ie



Rialtas
na hÉireann
Government
of Ireland

Thionscadal Éireann
Project Ireland
2040



Ireland's European Structural and
Investment Funds Programmes
2014-2020
Co-funded by the Irish Government
and the European Union



European Union
European Regional
Development Fund