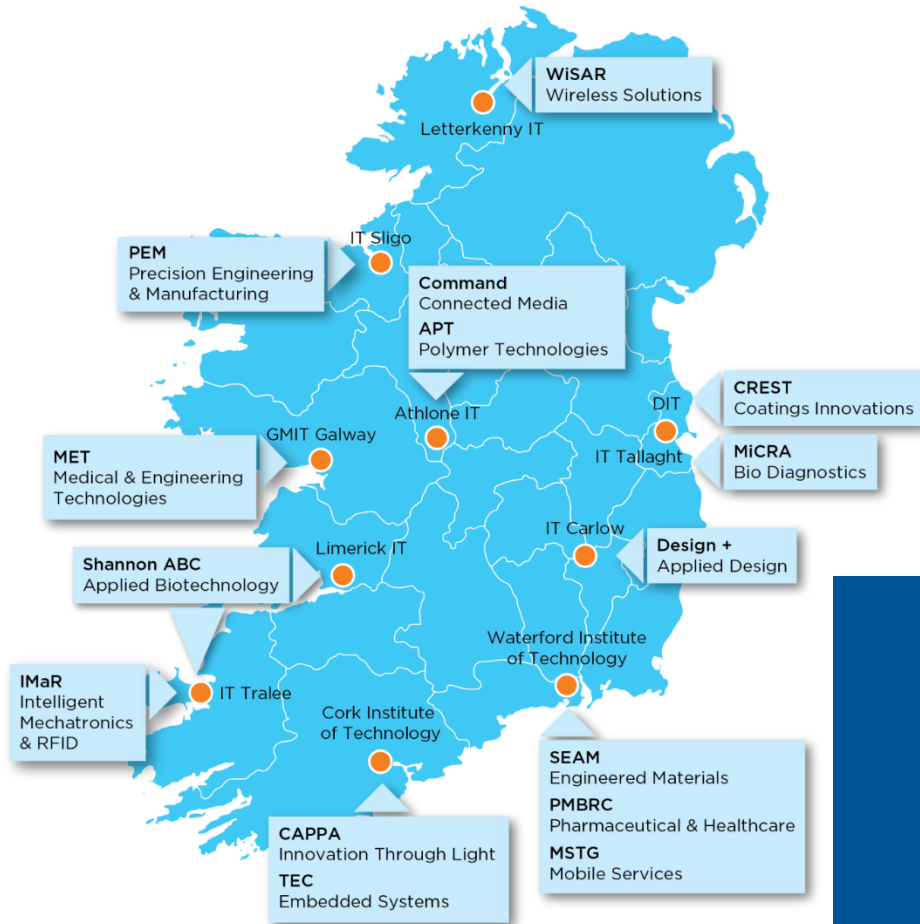


Optical System Prototyping

William Whelan-Curtin

CAPPA: A Technology Gateway



- 15 Gateways
- Funded By Enterprise Ireland
- Deliver R & D Solutions to Industry

34 PEOPLE
23 RESEARCHERS
11 POSTGRADUATES



€10 MILLION
FUNDING AWARDED
IN LAST 5 YEARS

16 PROJECTS
GREATER THAN €100K
CURRENTLY ACTIVE



COLLABORATING WITH
11 OF THE
TOP 100
UNIVERSITIES WORLDWIDE

75 PAPERS
PUBLISHED IN PEER-REVIEWED
JOURNALS IN LAST 5 YEARS



ENGAGED WITH
>100 COMPANIES
IRISH AND INTERNATIONAL
IN THE LAST 5 YEARS

CAPPA: Where we are

- *Co-located in both CIT and Tyndall (through Memorandum of Understanding)*



- **CREATE Building**
- **4 Labs, ~180 m²**



- **Photonics Centre**
- **3 Labs, ~150 m²**

CAPPA: Areas of Company Engagements

It is a Key Enabling Technology for a wide range of applications

Industrial Manufacturing

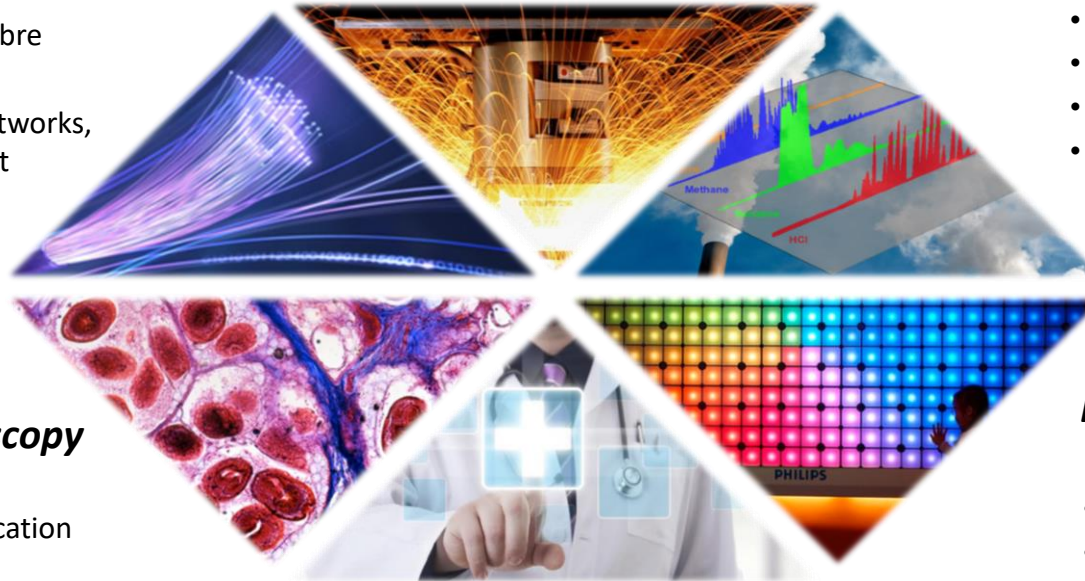
- Machine vision
- Laser cutting/welding
- In-line process monitoring

Sensing & Detection

- Environmental monitoring
- Water quality
- Soil analysis
- Road safety

Information & Communications

- High-speed optical fibre communications
- Internet, building networks, in-car entertainment



Imaging & Microscopy

- Medical imaging
- Contaminant identification
- Chemometrics

Lighting, Displays & Solar Cells

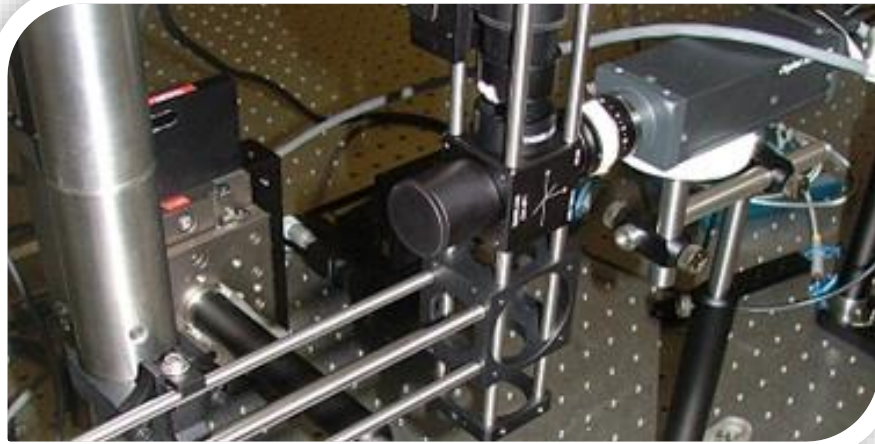
- TVs, cameras, phones
- Energy-efficient LEDs
- PV solar panels

Medical Devices & Technology

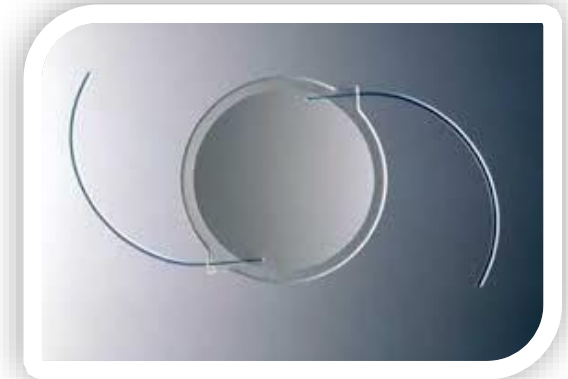
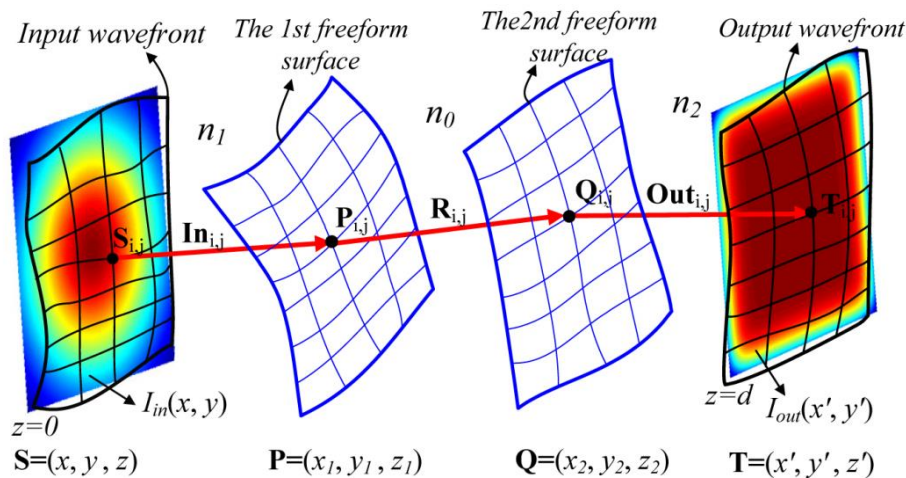
- Point-of-care diagnostics
- Cancer screening
- Health monitoring

Examples of industry projects

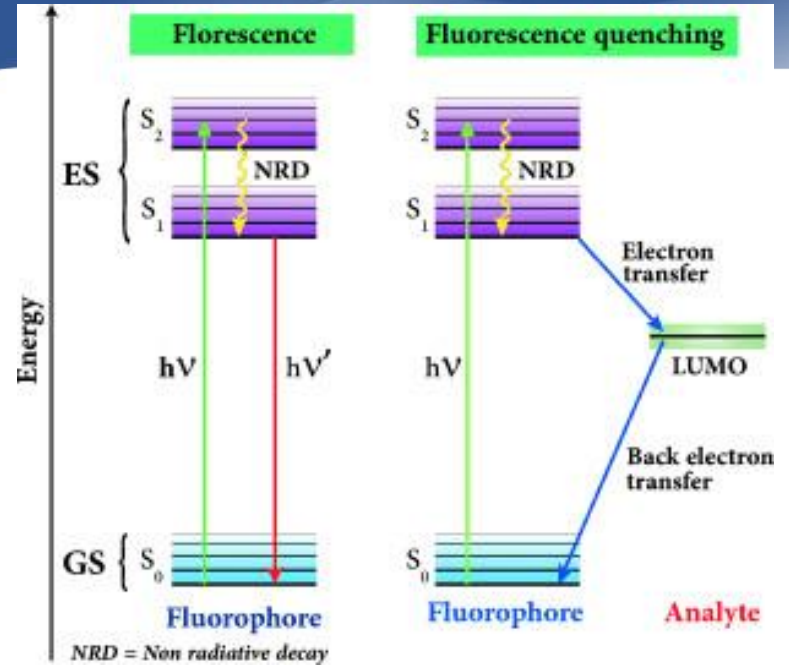
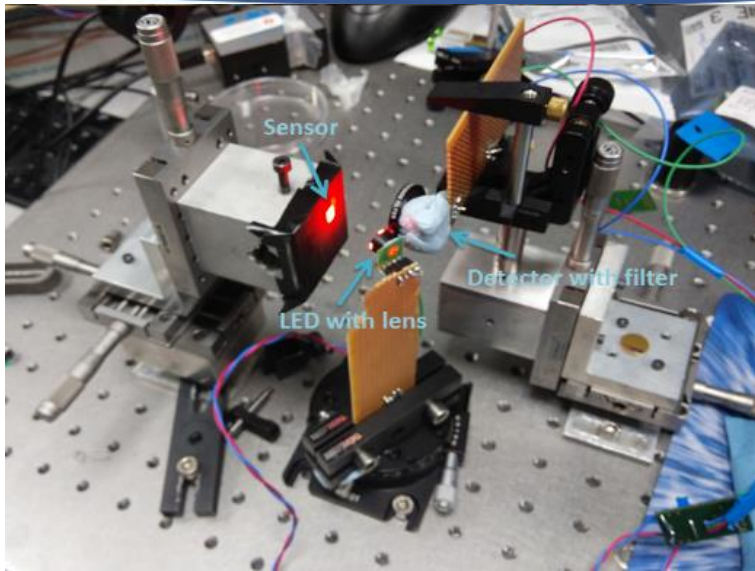
Innovation Partnerships



- Testing aberrations of
- Continuous operation
- High accuracy/repeatability
- Robust



Targeted Project- Remote Gas Sensing module (with Luxcel)

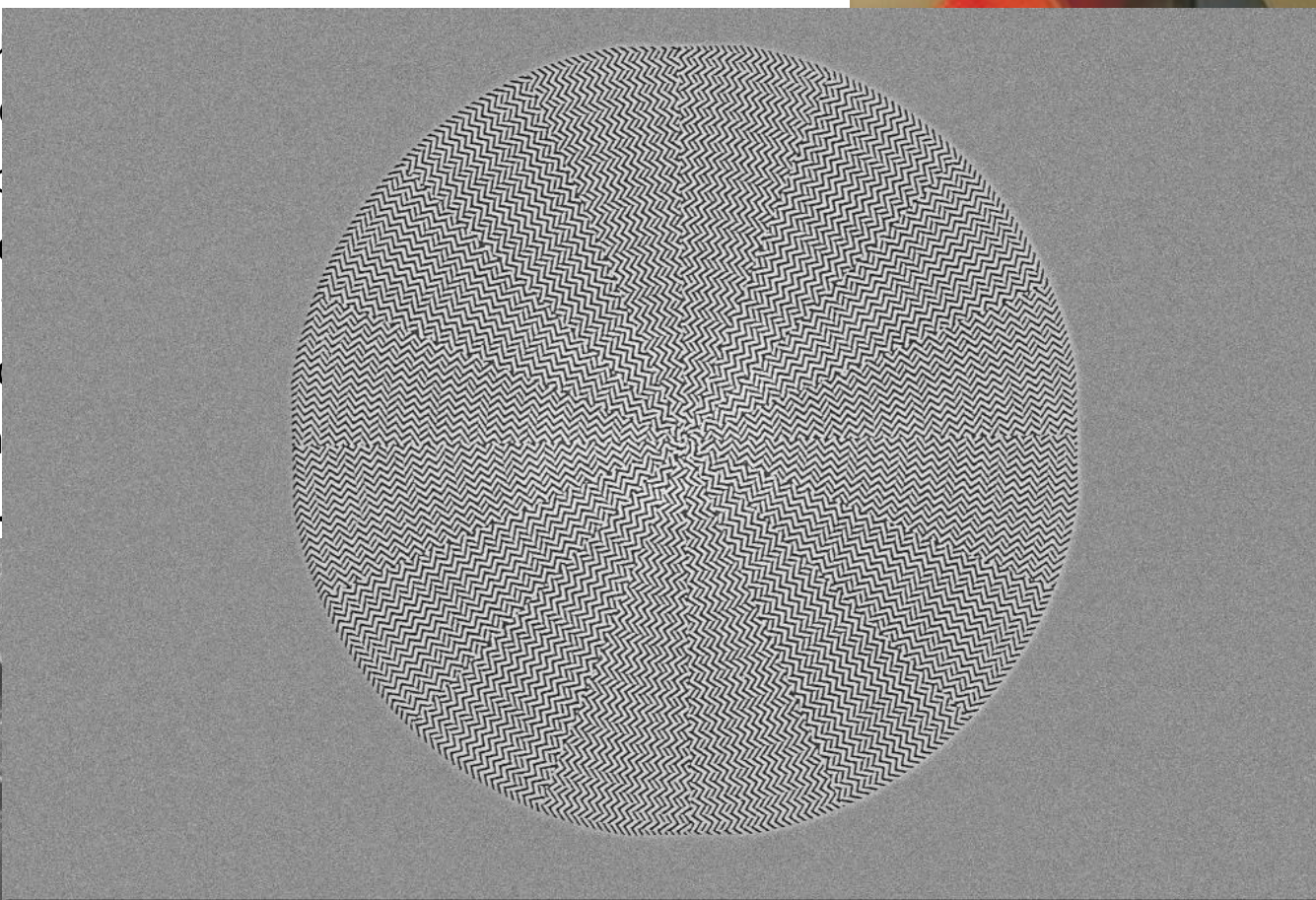
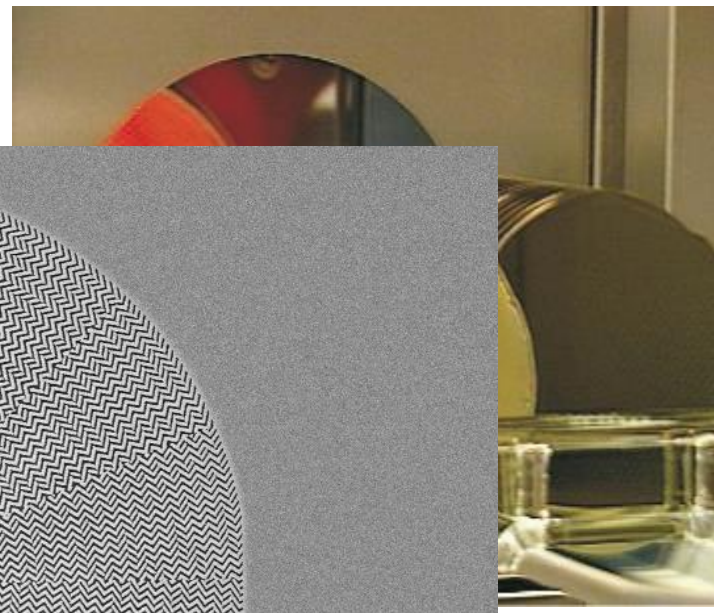


- FPGA based, battery powered, hand-held prototype has been developed.
- Optics head consists of LED, Photo-detector and filters
- Working distance up to 25 mm with Luxcel's standard sensor.
- Pressure sensor for calibration.
- User friendly keypad
 - Labelling, temperature input

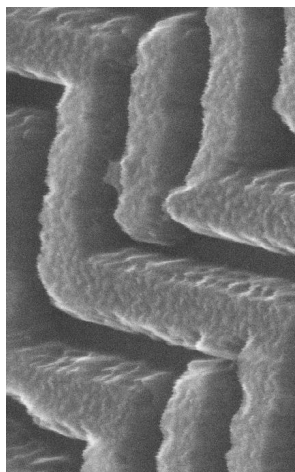


Metamaterial lenses

- Silicon Photonics
- Tools and processes of the silicon industry
 - High quality
 - Extreme
- CMOS comp
- Metasurface
 - art
 - thi
- Polarisation
- (FWHM = 0.



Raith 10 μm Mag = 2.26 K X WD = 10.7 mm SE2 EHT = 5.00 kV



Raith 200 nm Mag = 85.74 K X WD = 8.4 mm SE2 EHT = 30.00 kV

Raith 10 μm Mag = 2.26 K X WD = 10.7 mm SE2 EHT = 5.00 kV

CAPPA: Goals & Key Points

- *Provide industry with an experienced R&D platform*
- *Assist industry in accessing National and EU funding*
- *Provide access to specialised test equipment*
- *Develop the “next stage” of research in order that it is industry ready*

Photonics Solutions are applicable across a wide range of disciplines

Industry Understanding

+

Smart Research

=

Successful Business



Co-operation is Key ...