

# A warm welcome to Photon Science Open Day!

## Today's schedule

**14:00 WELCOME TO PHOTON SCIENCE OPEN DAY**

**14:05 PHOTONICS GROUP**

**14:05** Introduction to PHOT (Prof Mike Damzen, Head of Group)

**14:20** MSc Optics and Photonics (Dr Kenny Weir, Director of MSc)

**14:40** PhD opportunities

**15:10** Q&A

**15:30 QUANTUM OPTICS & LASER SCIENCE GROUP**

**15:30** Introduction to QOLS (Prof John Tisch, Head of Group)

**15:45** Research Activities and PhD opportunities

**16:15** Q&A

# PHOTON SCIENCE SECTION

*“World-leading centre for modern optics  
and atomic/molecular physics”*

100  
Years of Optics

1917 - 2017

## Quantum Optics & Laser Science Group (QOLS)

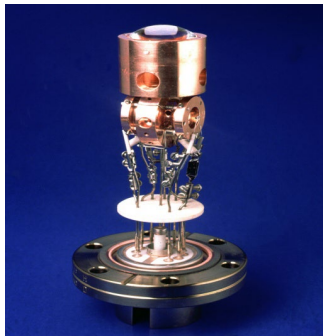
Head of group: Prof John Tisch

## Photonics Group (PHOT)

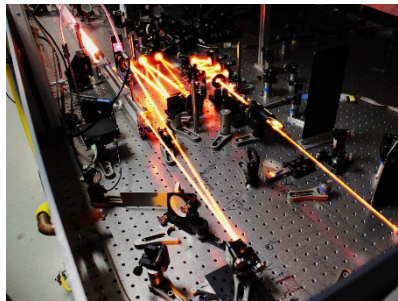
Head of group: Prof Mike Damzen



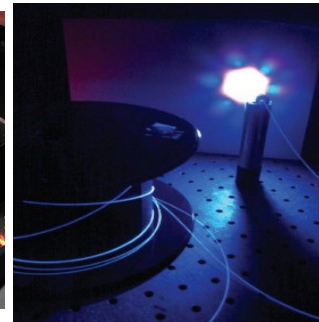
Single Photon  
Entangled State



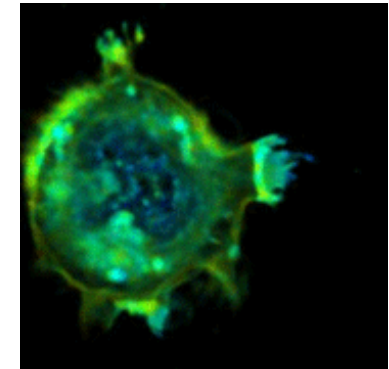
Single Ion  
Ultra-cold



Extreme light  
attosecond science



Laser  
Technology



Applied Light -  
Biophotonics

**Fundamental**



**Applied**

# Photonics Open Day

## **14:05 PHOTONICS GROUP**

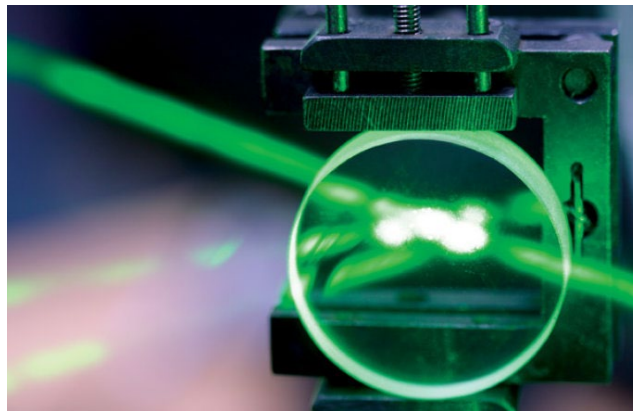
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## **15:30 QUANTUM OPTICS & LASER SCIENCE GROUP**

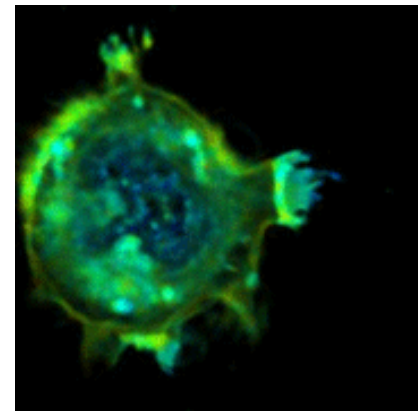


# Our PHOT Mission Statement

*“To conduct research into science underlying optical techniques & develop novel photonics technologies for real-world applications”*



**Applied  
Research**



# Photonics Group research

## Electromagnetic theory

*Nano-photonics*

*Nonlinear optics*

**Imaging science  
& technology**

**Laser physics  
& technology**

*Adaptive optics*

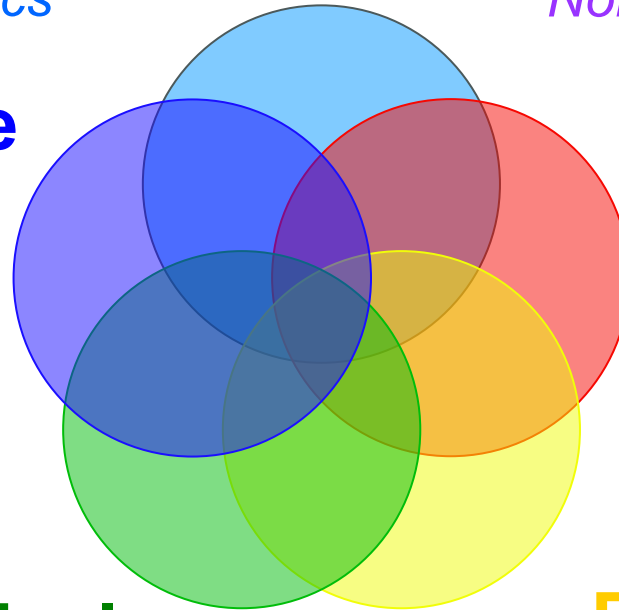
*Multi-dimensional  
fluorescence imaging*

*Ultrafast & high power  
diode-pumped laser  
technology*

**Biomedical  
optics**

*Remote  
sensing*

**Fibre  
technology**



# Academic Staff (inc. Research Fellows)

Laser  
Technology



Mike Damzen



Roy Taylor



Robbie Murray



Tim Runcorn



William  
Kerridge-Johns

Bio-  
Photonics



Paul French



Chris Dunsby



James McGinty



Mark Neil



Carl Paterson

EM  
Theory



Martin McCall



Matt Foreman

Photonics  
Systems  
(& MSc  
Director)

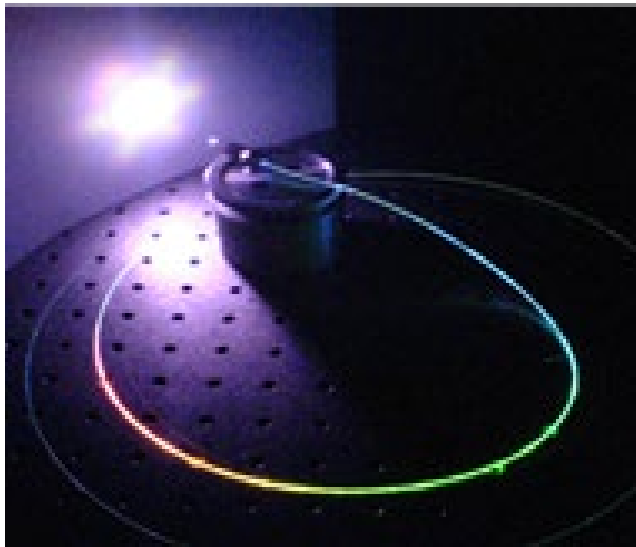


Kenny Weir

# Theme 1: Laser Technology

We conduct a world-class research activity on development of fibre and all-solid-state lasers for “real-world” applications e.g. remote sensing, medical, laser manufacturing.

## Fibre Lasers



Fibre Nonlinear Optics

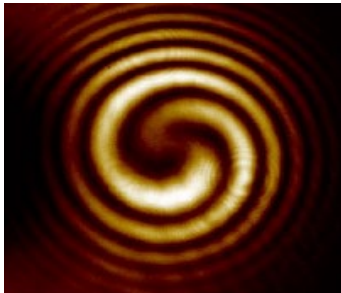
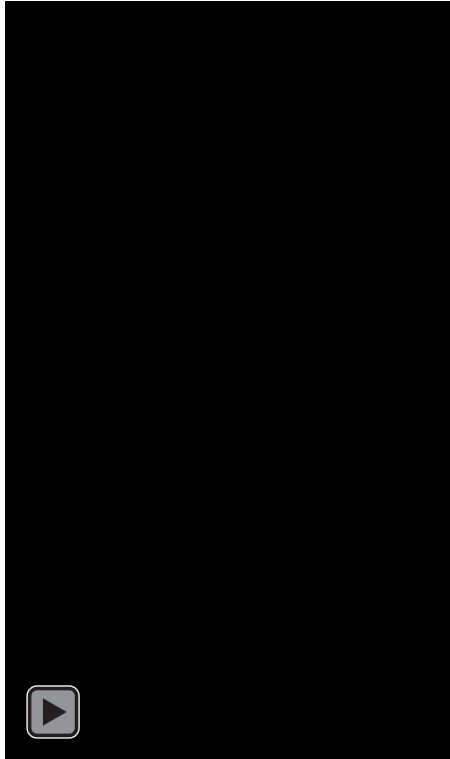
## Solid-State Lasers



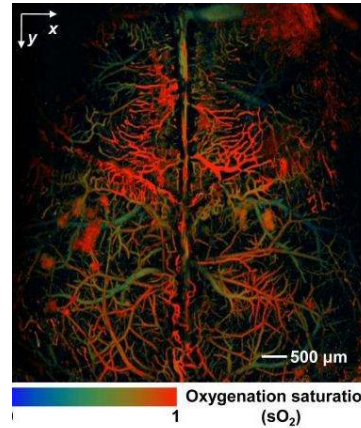
Nonlinear Optics

# Solid-State Laser Technology

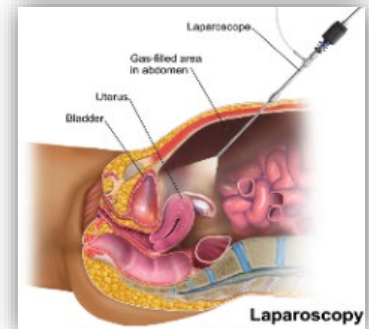
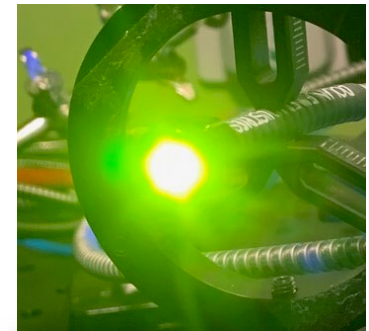
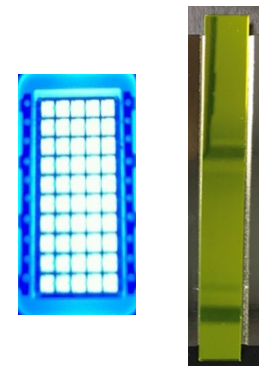
## Vortex Laser Light



## Space Lasers



## Ultra-Bright Light

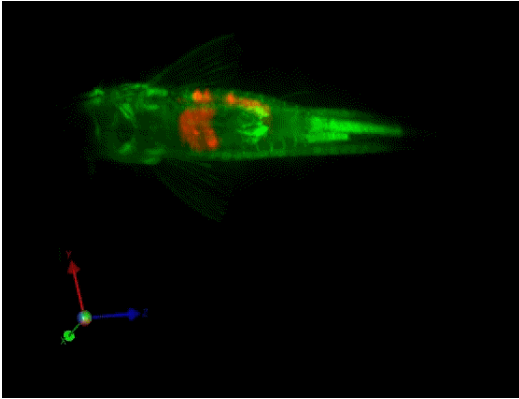




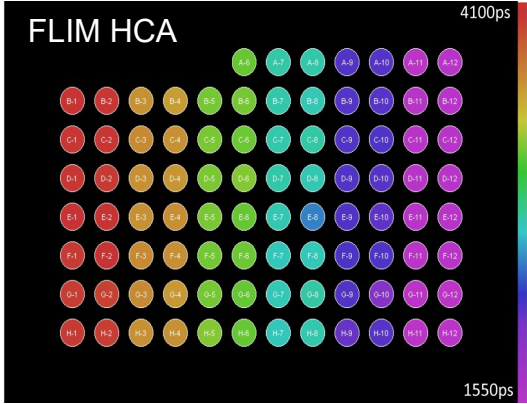
# Theme 2: Biophotonics

We have a world-class activity in optical imaging and laser-based microscopy, endoscopy and tomography for life-science applications, drug discovery and healthcare.

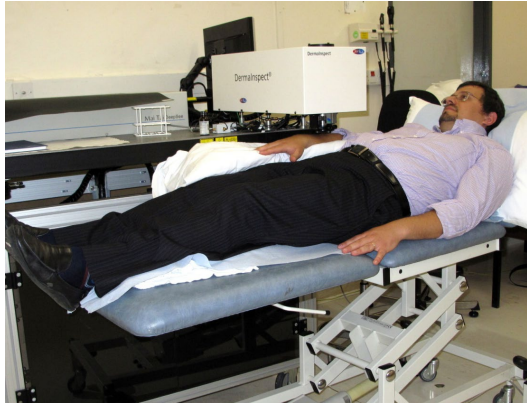
## Life Sciences



## Drug Discovery



## Healthcare



In-vivo 3-D imaging;  
super-resolution

Drug discovery;  
High content analysis

Biomedical  
optics

A detailed 3D illustration of cancer cells, showing various spherical and irregular shapes with protruding filaments and internal structures, set against a soft, glowing background.

# Cancer drug discovery technologies get a £4.5m boost

*“By developing technology to investigate more sophisticated 3D cancer models, which allow us to explore how drugs work on tumour cells interacting with their local environment, we could find new ways to overcome challenges like drug resistance.”*

***Professor Paul French***

[CRUK Convergence Science Centre](#),

a partnership between Imperial and the Institute of Cancer Research

# Theme 3: Photonic Structures & EM-theory

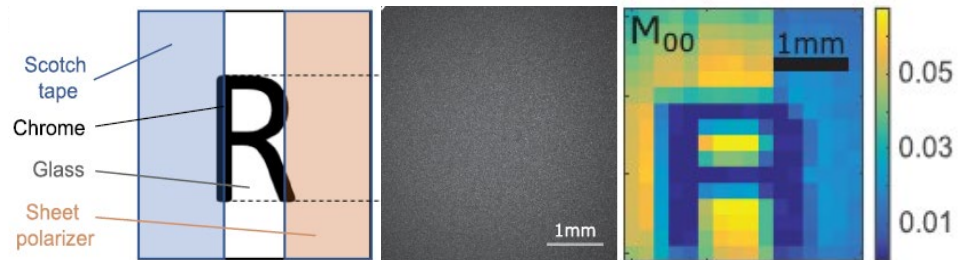
Rigorous electromagnetic theory and experimental analysis is applied to **photonic** and **nano-photonic structures** such as chiral media, metamaterials, plasmonics, bio-sensors.

## Photonic Structures



Chiral Media & Optics;  
Sensors

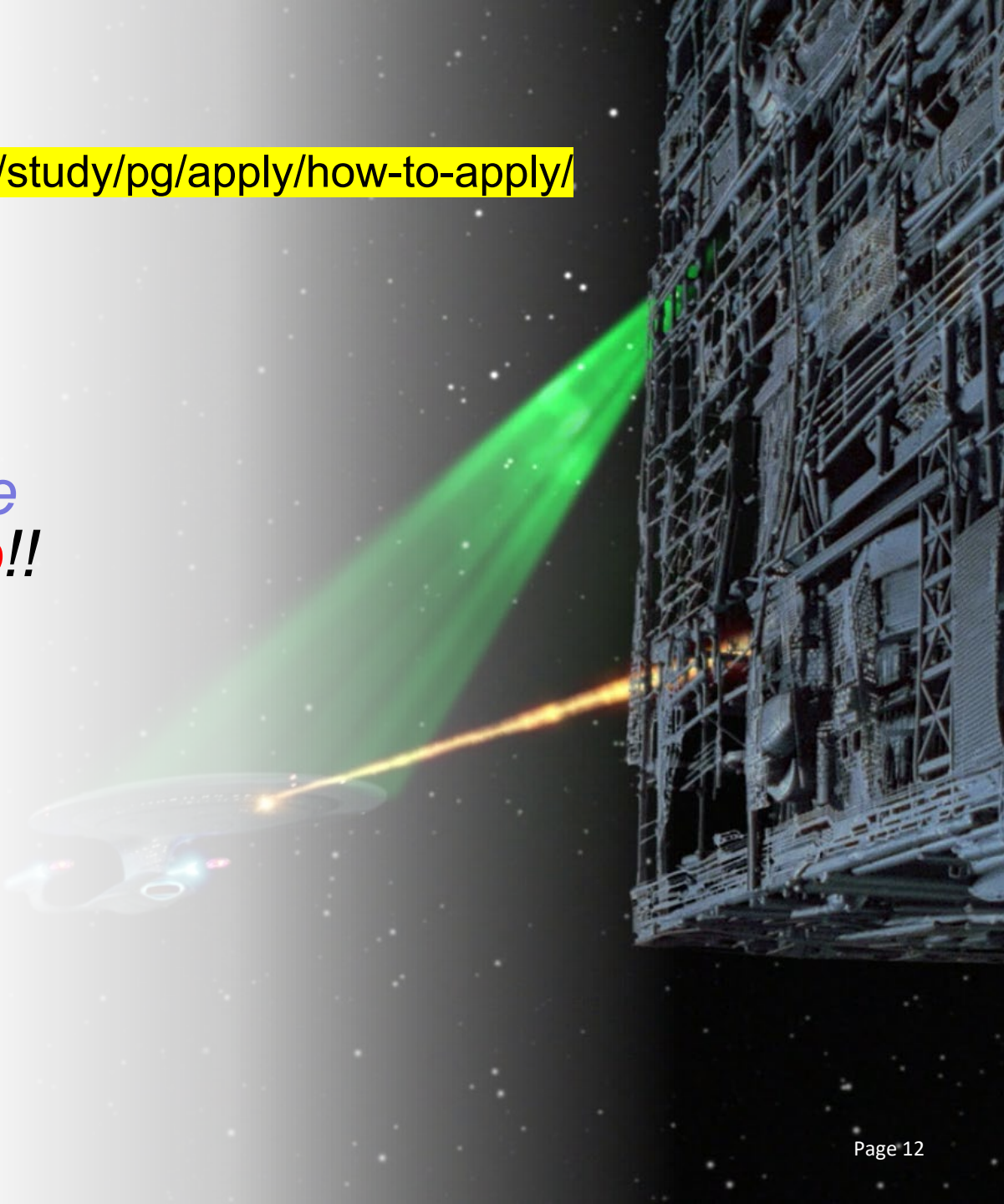
## EM-theory



Plasmonics;  
nano-photonics

<https://www.imperial.ac.uk/study/pg/apply/how-to-apply/>

*Please enquire &  
consider applying  
to do research on  
future light-based  
technologies in the  
**Photonics Group!!***



# PhD Studentships/Scholarships for 2022

- EPSRC Quota studentship
- Imperial College STRATiGRAD studentship\*
- (Crick, Pharmaceutical)
- President's PhD Scholarship (50)
- International Scholarship Collaborations (e.g. CSC)
- Self-funding

\*Medical Mid-IR fibre lasers: Dr Robbie Murray (PHOT); FoM; Industry

<https://www.imperial.ac.uk/study/pg/apply/how-to-apply/>