

Contact information

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Research interests

My research activities lie at the interface of fundamental and applied nonlinear optics, including: soliton formation and propagation; parametric processes; Raman amplification; frequency comb and supercontinuum generation. Exploiting such processes, my work targets the development of high-energy, ultrafast light sources covering regions of the UV, visible and mid-IR for applications ranging from super-resolution optical microscopy to electron spectroscopy. I also have a strong interest in the optical characterisation and application of low-dimensional nanomaterials for the development of advanced photonic and plasmonic devices, and the application of machine learning and AI in optics.

Previous posts held

2017 – present	Research Associate <i>Quantum Matter Institute, University of British Columbia, Canada</i>
2014 – present (sabbatical leave)	Research Associate (Royal Academy of Engineering Research Fellowship) <i>Department of Physics, Imperial College London, UK</i>
2014 – 2015	Research Fellow (NSFC International Young Scientist) <i>School of Electronic Science and Engineering, Nanjing University, China</i>
2013 – 2014	Research Associate (EPSRC Pathways to Impact Award) <i>Department of Physics, Imperial College London, UK</i>
2012 – 2013	Research Assistant/Associate (EPSRC Doctoral Prize Fellowship) <i>Department of Physics, Imperial College London, UK</i>
2009	Visiting Researcher <i>Network Technology Research Centre, NTU, Singapore</i>

Education

2008 – 2012	PhD, Physics <i>Imperial College London</i>
2007 – 2008	MSc, Photonics and Optoelectronic Devices (Distinction) <i>University of St Andrews and Heriot-Watt University</i>
2004 – 2007	BEng, Electronic Engineering (First Class Honours) <i>University of Warwick</i>

Total research income

£635,900 (as principal investigator)

Honours & awards

2015	The Paterson medal and prize – “for distinguished research in applied physics” <i>Institute of Physics, UK</i> [<u>youngest recipient</u>]
2014	Research Fellowship for International Young Scientists <i>National Natural Science Foundation of China, hosted by Nanjing University</i>
2013	Research Fellowship <i>Royal Academy of Engineering, UK</i> [<u>7 awarded annually, global competition</u>] Junior Research Fellowship <i>Imperial College London, UK</i> [<u>15 awarded annually, global competition</u>]
2012	Doctoral Prize Fellowship <i>Engineering and Physical Sciences Research Council, UK</i>
2010	Best Paper Award <i>Photonics Global Conference, Singapore</i> Young Scientists Outstanding Paper Prize <i>The Rank Prize Funds Symposium on Ultrafast Biophotonics, UK</i> Royal Academy of Engineering ERA Foundation Entrepreneurs Award <i>Runner-up with the University of Cambridge – London, UK</i>
2008	Doctoral Training Award <i>Engineering and Physical Sciences Research Council, UK</i>

Citation metrics

h-index | 21 i10-index | 31 Total citations | 1665

Research grants

2014 – 2018	“Next-generation short-pulse lasers for the visible and ultraviolet” <i>RAE Fellowship, UK (£542,658)</i> [<u>salary, consumables & travel</u>]
2014 – 2016	“Ultrafast mid-IR fibre sources for probing new quantum materials” <i>Royal Society, UK (£12,000)</i> [<u>consumables & travel</u>]
2014 – 2015	“Graphene Functionalized plasmonic nanostructures for ultrafast nonlinear optics” <i>National Natural Science Foundation, China (£20,000)</i> [<u>consumables & travel</u>]
2013 – 2014	“Raman mode-locked short-pulse fibre lasers” <i>EPSRC, UK (£49,242)</i> [<u>salary, consumables & travel</u>]
2012	“Nanomaterial composites for short-pulse lasers” <i>EPSRC, UK (£12,000)</i> [<u>consumables & travel</u>]

Professional activities

- Guest-editor, e.g. SPIE Optical Engineering Special Issue (2D Materials for Optics & Photonics)
- Technical-track co-chair at international conferences, e.g. CLEO-PR, OECC, PGC
- External PhD thesis examiner, e.g. University of Cambridge
- Reviewer for international journals, e.g. Nature Comms., Opt. Lett., Opt. Express

Teaching activities

2014 – present	Lecture course: “Fundamentals of nonlinear optics and ultrafast photonics” <i>Centre for Doctoral Training in Nanotechnology, University of Cambridge</i>
2016 – present	Computing lab (undergraduate) <i>Imperial College London</i>
2008 – 2016	Electromagnetism and optics lab (undergraduate) <i>Imperial College London</i>
2008 – 2015	Optics lab and design project supervision (postgraduate) <i>Imperial College London</i>

Graduate supervision

2014 – present	1 PhD student (co-supervised), 1 MSc student (co-supervised) <i>Department of Physics, Imperial College London</i> <i>School of Electronic Science and Engineering, Nanjing Univeristy, China</i> <i>School of Physics and Electronics, Hunan University, China</i>
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Outreach & impact

September 2013	Exploring Photonics Workshop <i>Coordinator</i>
May 2012	Inaugural Imperial Festival <i>Department of Physics representative</i>

Refereed journal publications

Contributed | 45 Invited | 4

Selected list

1. “Dark solitons in laser radiation build-up dynamics”
R. I. Woodward and **E. J. R. Kelleher**
[Phys. Rev. E **93**, 032221 \(2016\)](#)
2. “Few-layer MoS₂ SAs for short-pulse laser technology: current status and future perspectives”
R. I Woodward, R. C. T. Howe, G. Hu, F. Torrisi, M. Zhang, T. Hasan and **E. J. R. Kelleher**
[Photonics Research **3**, A30 \(2015\)](#) [Invited]
3. “The role of pump coherence in the evolution of CW supercontinuum generation initiated by MI”
E. J. R. Kelleher, J. C. Travers, S. V. Popov and J. R. Taylor
[J. Opt. Soc. Am. B **29**, 502 \(2012\)](#) – *selected for Spotlight on Optics*

Refereed conference publications

Contributed | 33 Invited | 10