

## JONATHAN NESBITT COLEMAN

Erasmus Smith's Professor of Natural and Experimental Philosophy (1724),  
Head of School of Physics and

Principal Investigator, CRANN Institute and AMBER Research Centre,  
Trinity College Dublin (TCD), Ireland

Born: 22 January 1973, Dublin.

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### EDUCATION

**1995 - 1999** Physics Dept, TCD, PhD in Physics

**1991 - 1995** Physics Dept, TCD. BA in Physics (Hons) Class: 1 and Gold Medal, First in year.

### ACADEMIC POSITIONS

**2022** Erasmus Smith's Professor of Natural and Experimental Philosophy, TCD

**2011** Chair of Chemical Physics, Trinity College Dublin

**2007** Associate Professor in Physics, Trinity College Dublin

**2006** Senior Lecturer in Physics, Principal Investigator in CRANN Research Institute TCD

**2005** Elected to Fellowship of Trinity College Dublin

**2001** Lecturer in Physics, Trinity College Dublin

### INSTITUTIONAL RESPONSIBILITIES

Over the past 20 years, institutional responsibilities at Trinity College Dublin have included:

2022- Faculty Representative, University Council

2020 - Head of School of Physics,

2020 - CRANN Institute, Member of Executive Committee.

2016 - AMBER Research Centre, Member of Executive Committee.

2016 – 2020 Member of TCD Dean of Research Advisory Group,

2009 – 2010 Director of Postgrad Studies, School of Physics.

### PhD SUPERVISION

35 PhDs graduated since 2001. Current Research Group – 11 PhD students and 8 Post-doctoral Research Assistants.

### BIBLIOMETRICS

Co-author of 352 peer reviewed papers in international journals including *Nature*, *Science*, *Nature Nanoscience*, *Nature Materials*, *Nature Energy*, *Nature Communications* These journal papers have been cited >114,000 times; ~8,000 times in 2023. *h*-index is 124. (Google scholar)

### MEMBERSHIP OF SCIENTIFIC SOCIETIES

2023 Member of the Academia Europaea (MAE)

2022 Member of the European Academy of Sciences (EURASC)

2015 Member of the Royal Irish Academy (MRIA)

2005 Fellow of the Institute of Physics (FInstP)

## RECOGNITION, PRIZES AND AWARDS

- 2023 Royal Irish Academy Gold Medal in the Physical and Mathematical Sciences
- 2022 Tabor Medal, Institute of Physics
- 2022 Inducted into Advanced Materials Hall of Fame
- 2019 TUBALL Award 2019 (awarded annually by OCSiAl Company for best application of nanotubes)
- 2019 Ranked<sup>1</sup> at 1690 among all 7 million research scientists worldwide.
- 2018 ACS Nano Award Lecture, American Chemical Society
- 2016 The License to Market Award, Enterprise Ireland
- 2014-2024, Clarivate (Thompson Reuters) lists of highly cited researchers.<sup>2</sup>
- 2012 Kroll Medal, Institute of Materials, Minerals and Mining
- 2011 Researcher of the Year, Science Foundation Ireland
- 2011 Named among the top 100 Materials Scientists by Thompson Reuters.

## SERVICE TO DISCIPLINE

- 2017- Member of the Editorial Board for the journals *Carbon*, *ACS nano*
- 2013- EU Graphene Flagship; Deputy Leader, Materials Workpackage (2013-2023), Internal Reviewer (2018, 2021), EU Graphene Flagship, Leader, 2D-PRINTABLES Consortium (2023-)
2018. Co-organiser “Liquid Phase Exfoliation”, ~100 participants, Dublin Ireland
2014. Co-organiser “Flatlands beyond Graphene”, ~300 participants, Dublin, Ireland
2006. Co-chair “International Conference on Synthetic Metals” ~1000 participants, Dublin, Ireland
2005. Session organiser, British Association for the Advancement of Science Meeting, “Science on the Nanoscale” session, Dublin, Ireland

## PLENARY/KEYNOTE PRESENTATIONS

- Solution processing and LPE: From graphite to moondust*. NanoteC23, Brighton, August 2023 (Keynote)
- Mapping the structure and properties of printed nanosheet networks*. Graphene Week, Munich, September 2022 (Keynote)
- Exfoliation and Applications of 2D Materials*, Tencent Jilin University Global Lectures, Online, November 2021
- Electrical properties of printed nanosheet networks*. Graphene Week, Online, September 2021 (Plenary)
- Electrical and electrochemical applications of liquid exfoliated nanosheets* Graphene and 2DM, Online, April 2021 (Keynote)
- Are nanotube networks the key to high performance batteries?* NAUM19, Kyoto, Nov, 2019 (Plenary)
- Ten years of liquid phase exfoliation: Making nanosheets for applications in energy, sensing and electronics* ACS Meeting, Boston, August 2018 (ACS Nano Laureate presentation)
- Production of 2D nanosheets by liquid phase exfoliation* Carbonhagen conference, Copenhagen August 2017 (Keynote)
- Liquid exfoliation of layered compounds* Flatlands conference, Bar Ilan University, Israel, July 2015 (Plenary)
- Liquid exfoliation of layered compounds* Graphene Week, University of Manchester, July 2015 (Plenary)
- Liquid exfoliation of 2D materials: From applications to scaleup*. Erwin Schrödinger Symposium, Vienna, Nov 2014 (Keynote)

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<sup>1</sup> A standardized citation metrics author database annotated for scientific field. PLoS Biol 17(8): e3000384.

<sup>2</sup> <https://clarivate.com/webofsciencegroup/solutions/researcher-recognition/>

*Liquid exfoliation of layered compounds V* International Workshop on Layered Materials, Mulhouse, France, August 2014 (Plenary)

*Liquid exfoliation of layered compounds Carbon* 2014, Jeju Island, Korea, July 2014 (Plenary)

*Liquid exfoliation of layered compounds 15ACC*, Singapore, Aug 2013 (Keynote)

## **OUTREACH & PUBLIC ENGAGEMENT**

Coleman's work has been featured 40 times in national and international print media including The Scientific American, The Times, The Independent and The Irish Times. He has talked about his research on radio (Newstalk, BBC Inside Science, National Public Radio), and he has appeared on television news and documentary programs, including RTE's The Science Squad. One interview in 2014 on Fox News reached a coast to coast audience in the USA of more than a million viewers. He contributed to "Nano in my life", a DVD used in Irish Secondary schools for 15-16 year olds studying science and featured in a short video produced by the AAAS about one of his papers published in *Science*:

Popular talks for the general public include:

*Kitchen Physics: Nanoscience using household stuff*, Erasmus Smith's Chair Inaugural Lecture, April 2024

*Liquid processing of 2D materials for device applications*, Jacobus van 't Hoff Lecture, TU Delft, June 2022

*Kitchen Physics: Nanoscience using household stuff*, AAAS meeting, Austin, February 2018

*Kitchen Physics: Using the power of nano to turn pencils into electronic devices using only things found at home*, Irons Lecture, Rutgers University, April 2017

*Kitchen Physics: Production of 2D nanosheets by liquid phase exfoliation*, New Scientist Live, London, September 2016

*Kitchen Physics: Using physics to produce state of the art nanomaterials with household implements*, EuroScience Open Forum, Manchester, July 2016

*Don't try this at home: How the magic of nano materials connects kitchen blenders, printers and rubber bands*, TED-X, Brussels, December 2014 [<https://www.youtube.com/watch?v=SZfBIQIKz9Q>]

*Tiny but mighty: How today's nano-materials will lead to tomorrow's technologies*, EuroScience Open Forum, Dublin, July 2012

*Tiny but Mighty: Are nanotubes the material of tomorrow?* British Association for the Advancement of Science Meeting, Dublin, September 2005

## **FUNDING, INDUSTRY ENGAGEMENT, COMMERCIALISATION AND INTELLECTUAL PROPERTY**

Over the last decade, Coleman has had two PI awards from Science Foundation Ireland, three ERC Awards, various other EU grants, and he has been involved in all phases of the graphene flagship including the latest competitive phase. He is a PI in the TCD AMBER centre. Altogether, this represents well over €10M (£9M) in research funding for his group.

He has been active in industry engagement through the TCD industry-facing nanoscience institute, CRANN, and the related AMBER centre. His industry-academic research projects with the companies Hewlett-Packard, Thomas Swan, SAB Miller and Nokia-Bell Labs have attracted a further €4.5M of research funding.

Coleman has filed 26 patents across 10 separate technologies. To date, eight have been granted. Liquid phase exfoliation, which began as a research project in his group, has become one of the pillar production methods for graphene and other two-dimensional materials. The spinout from the lab began with an industry/academic project with the chemical firm Thomas Swan; the process was upscaled to the 500 L scale before transferring the technology to Thomas Swan under licence. A license for commercial use is also being agreed with Samsung. Thomas Swan have built a plant to produce various products based on graphene, BN and MoS<sub>2</sub> made by methods developed by Coleman's group, and commercial products using these materials are now on sale. The broad family of direct exfoliation techniques which are descended from liquid phase exfoliation now account for over 60% of the global graphene production of more than 1000 tonnes per annum.