

# Dr Eva-Maria Graefe

## University Appointments

NOVEMBER 2016 – PRESENT Senior Lecturer, Department of Mathematics, Imperial College London

APRIL 2015 – PRESENT Royal Society University Research Fellow (Research Fellowship: *Development of semiclassical methods for non-Hermitian quantum systems*), Department of Mathematics, Imperial College London (Maternity leave December 2016 – April 2017)

AUGUST 2013 – MARCH 2015 Junior Research Fellow in Mathematics (independent research and teaching), Department of Mathematics, Imperial College London (Maternity leave September – December 2013)

AUGUST 2010 – JULY 2013 Imperial College Junior Research Fellow (Research Fellowship: *Towards a semiclassical framework for non-Hermitian quantum theories*), Department of Mathematics, Imperial College London

APRIL 2009 – JULY 2010 Research and Teaching Assistant (EPSRC grant: *Semiclassical asymptotics for open chaotic systems*; and undergraduate teaching), Department of Mathematics, University of Bristol

## Research Expertise

Mathematical and theoretical physics, with a focus on:

- Quantum dynamics
- Quantum-classical correspondence and semiclassical methods
- Non-Hermitian quantum theories
- Cold atoms and Bose-Einstein condensates

## Qualifications

OCTOBER 2005 – MAY 2009 PhD in Theoretical Physics (with distinction), *Quantum-classical correspondence for a Bose-Hubbard dimer and its non-Hermitian generalisation*, TU Kaiserslautern, Germany

OCTOBER 2001 – AUGUST 2005 German Diplom in Physics, *Selected linear and nonlinear Landau-Zener scenarios*, TU Kaiserslautern, Germany

## Fellowships, Awards, and Grants

FROM FEBRUARY 2018 ERC Starting Grant (€1,293,023)

APRIL 2016 Imperial College Faculty of Natural Sciences Prize for Excellence in Teaching

SINCE APRIL 2015 Royal Society University Research Fellowship

SEPTEMBER 2014 – SEPTEMBER 2017 LMS joint research group, *New mathematical methods for open quantum systems*, with Dr Sven Gnutzmann (University of Nottingham), and Dr Roman Schubert (University of Bristol)

SEPTEMBER 2014 – AUGUST 2015 L'Oréal UNESCO for Women in Science Fellowship 2014

AUGUST 2010 – JULY 2013 Imperial College Junior Research Fellowship

JUNE 2010 Award of the "Freundeskreis der TU Kaiserslautern" 2010 for an outstanding PhD thesis

## Project Supervision

OCTOBER 2015–PRESENT Mr Bradley Longstaff, PhD project: *Many-particle and mean-field correspondence for cold atoms in leaky lattices*, Department of Mathematics, Imperial College

JANUARY 2015–PRESENT Mr Steve Mudute-Ndumbe, PhD project: *Split-complex and split-quaternionic random matrices*, Department of Mathematics, Imperial College

OCTOBER 2013–PRESENT Ms Chiara Liverani, PhD project: *Quantum effects in hydrogen embrittlement*, CDT Theory and Simulation of Materials, Department of Physics, Imperial College (co-supervisor: Prof Mike Finnis)

OCTOBER 2012–AUGUST 2016 Mr Alexander Rush, PhD project: *Phase space methods for non-Hermitian quantum systems*, Department of Mathematics, Imperial College

2011–PRESENT Seven MSc and five MSci projects. Topics include: *Quantum effects in hydrogen embrittlement*, *Atom-molecule conversion in Bose-Einstein condensates*, *Classical limit of open quantum systems*, *Signatures of coalescing eigenvalues*, *Quantum brachistochrone problem*, *Random matrix theory*, *Geometric quantum mechanics*, Department of Mathematics, Imperial College

## Teaching (\* including course development)

SPRING 2013, 2014, AND 2015 Third and fourth year and MSc lecture course: *Quantum Mechanics\**, Department of Mathematics, Imperial College

AUTUMN 2011 Undergraduate lecture course: *Quantum Mechanics\**, Department of Mathematics, Imperial College

SPRING 2011 MSc in Applied Mathematics and Mathematical Physics, lecture course: *Introduction to Quantum Dynamics\**, Department of Mathematics, Imperial College

AUTUMN 2010 Undergraduate lecture course: *Random Matrix Theory*, Department of Mathematics, University of Bristol

## Outreach and Media Coverage

- Outreach activities: interview on the Watson forum (2016), Institute of Mathematics and its Applications careers profile (2016), speaker for several high school events (since 2015), participation in SET for Britain poster exhibition in the House of Commons (2013)
- Research featured in cover article of New Scientist, September 2013
- Author of Viewpoint in Physics on quantum chaos (2013)

## Professional Services and Administration

- Main-organiser (jointly with Prof G Wunner, University of Stuttgart) of the 17th international workshop on PT-symmetric quantum mechanics (70-80 participants expected), in the framework of the 642. WE-Heraeus Seminar, Bad Honnef, Germany (€39,000)
- Member of the Advisory Panel of Journal of Physics A
- Referee for Journal of Physics A, Journal of Physics B, Physical Review Letters, Physical Review A, Physics Letters A, Modern Physics Letters B, International Journal of Modern Physics C, Light: Science & Applications, Proceedings of the Royal Society A, Physica A, Scientific Reports
- Member of the Athena Committee, Department of Mathematics, Imperial College London, since 2016
- Organisation of four one-day workshops on *New mathematical methods for open quantum systems*, in Bristol, Nottingham, and at Imperial, in the context of an LMS joint research group, in 2015 and 2016
- Organisation of the Mathematical Physics Seminar series at Imperial College, January 2012 - July 2015
- Organisation of a *Quantum Dynamics* minisymposium, BAMC 2012, University College London
- Department of Mathematics Postdoc Representative, 2012 – 2013

## Membership of Professional Bodies

Institute of Physics, London Mathematical Society, German Physical Society