

# CURRICULUM VITAE

Carla Figueira de Morisson Faria

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## Further and Higher Education

- 1984-1986      High school  
Institution: Curso de 2º. Grau do Núcleo Pedagógico Integrado,  
Universidade Federal do Pará – Belém - PA-Brazil  
Emphasis: Ciências Exatas (Physics and Mathematics)
- 1987-1989      Undergraduate Studies  
Institution: Departamento de Física, Universidade Federal do Pará – Belém-  
PA-Brazil
- 1990-1991      Undergraduate Studies  
Institution: Instituto de Física de São Carlos, Universidade de São Paulo –  
São Carlos-SP-Brazil  
(transferred from the Universidade Federal do Pará)  
Degree: Bachelor of Science  
Date of award: 20<sup>th</sup> of December, 1991  
(final grade: 8.86 out of 10).
- 1992-1994      Postgraduate Studies  
Institution: Instituto de Física de São Carlos, Universidade de São Paulo –  
São Carlos -SP- Brazil  
Degree: Master of Science  
Date of award: 25<sup>th</sup> of January, 1994  
(equivalent to the German “Dipl. Phys. ”)  
Thesis title: *"Spatial Configurations for a Two-Level Atom in Magneto-  
Optical Traps: Ring Shaped Structures"*  
(final grade: 10 with distinction out of 10 with distinction)  
Supervisor: Prof. Dr. V.S. Bagnato
- 1995-1999      Doctoral Studies  
Institution: Technische Universität Berlin/Max Born Institut für nichtlineare

Optik und Kurzzeitspektroskopie, Berlin, Germany  
Degree: Dr. rer. nat. („Doctor rerum naturalis“)  
Thesis title: *"Interaction of Atoms with Intense Laser Fields and Ultrashort Pulses"*  
Financial support: Deutscher Akademischer Austauschdienst (DAAD)  
Date of award: 19<sup>th</sup> of May, 1999  
Final grade: "sehr gut" (more than 90%)  
Supervisor: Prof. Dr. Wolfgang Sandner, Dr. Martin Dörr

### **Postdoctoral Experience**

June 1999 – December 2001 Max Planck Institut für Physik komplexer Systeme, Dresden, Germany  
Fellowship from the Max-Planck Society

January 2002 – May 2003 Max Born Institut für nichtlineare Optik und Kurzzeitspektroskopie, Berlin, Germany  
Bat-IIA-Ost Research Contract from the Deutsche Forschungsgemeinschaft

June 2002 – October 2002 Technische Universität Wien, Vienna, Austria  
Teaching and research assistant (C1 position; equivalent of a tenure track)

June 2003 – December 2004 Universität Hannover, Hanover, Germany  
Fellowship from the Deutsche Forschungsgemeinschaft  
(European Graduate College „Interference and Quantum Applications“)

October – December 2004 Visiting Research Fellow, Centre for Mathematical Science, City University

March 2004 – March 2007 Visiting Research Fellow, Optics Section, Imperial College

January 2005 – September 2006 University Research Fellow, Centre for Mathematical Science, City University

### **Tenured positions**

October 2006 – March 2007 Lecturer in Mathematics and EPSRC Advanced Fellow, City University

April 2007 – October 2011 Lecturer and EPSRC Advanced Fellow, AMOPP group,  
Dept. of Physics and Astronomy, University College London

November 2011 – September 2013 Lecturer, AMOPP group,  
Dept. of Physics and Astronomy, University College London

October 2013 – September 2018 Reader in Physics  
Department of Physics and Astronomy, University College London

October 2018 - Professor of Physics  
Department of Physics and Astronomy, University College London

## Publications

(reverse  
chronological  
order)

**h = 20 (ISI Web of Knowledge); 21 (Scopus); 26 (Google Scholar), 22 (ResearchGate)**

- 2020 [81] A. S. Maxwell, G. S. J. Armstrong, M. F. Ciappina, E. Pisanty, Y. Kang, A. C. Brown, M. Lewenstein, and C. Figueira de Morisson Faria, “*Manipulating Twisted Electrons in Strong-Field Ionization*”, Faraday Discussions, accepted
- [80] D. Kufel, H. Chomet, C. Figueira de Morisson Faria, “*Alternative quantisation condition for wavepacket dynamics in a hyperbolic double well*”, J. Phys. A **54**, 035304 (arXiv:2009.08737)
- [79] A. S. Maxwell, A. Serafini, S. Bose, C. Figueira de Morisson Faria, “*Quantum Estimation in Strong Fields: in situ ponderomotive sensing*”, arXiv:2008.10070 (submitted to Phys Rev X)
- [78] Andrew S Maxwell, XuanYang Lai, RenPing Sun, XiaoJun Liu, Carla Figueira de Morisson Faria, “*Spiral-like Holographic Structures: Unwinding Interference Carpets of Coulomb-Distorted Orbits in Strong-Field Ionization*”, Phys. Rev. A **102**, 033111 (arXiv:2003.02239)
- [77] HuiPeng Kang, Andrew S. Maxwell, Daniel Trabert, XuanYang Lai, Sebastian Eckart, Maksim Kunitski, Markus Schoffler, Till Jahnke, XueBin Bian, Reinhard Dörner, Carla Figueira de Morisson Faria, “*Holographic detection of parity in atomic and molecular orbitals*”, Phys. Rev. A **102**, 013109 (arXiv:1908.03860)
- [76] C. Figueira de Morisson Faria and A. S. Maxwell, “*It is all about phases: ultrafast holographic photoelectron imaging*”, Phys., Rep. Prog. Phys. **83** 034401
- 2019 [75] H. Chomet, D. Sarkar, C. Figueira de Morisson Faria, “*Quantum bridges in phase space: Interference and nonclassicality in strong-field enhanced ionisation*”, New J. Phys. **21**, 123004
- [74] Kasra Amini, Jens Biegert, Francesca Calegari, Alexis Chacón, Marcelo F. Ciappina, Alexandre Dauphin, Dmitry K. Efimov, Carla Figueira de Morisson Faria, Krzysztof Giergiel, Piotr Gniewek, Alexandra S. Landsman, Michał Lesiuk, Michał Mandrysz, Andrew S. Maxwell, Robert Moszyński, Lisa Ortmann, Jose Antonio Pérez-Hernández, Antonio Picón, Emilio Pisanty, Jakub Prauzner-Bechcicki, Krzysztof Sacha, Noslen Suárez, Amelle Zaïr, Jakub Zakrzewski, Maciej Lewenstein, “*Symphony on Strong-Field Approximation*”, Rep. Prog. Phys. **82**, 116001
- 2018 [73] A. S. Maxwell, S. V. Popruzhenko and C. Figueira de Morisson Faria,

*“Treating branch cuts in quantum-trajectory models for photoelectron holography”*, Phys. Rev. A **98**, 063423

[72] A. S. Maxwell and C. Figueira de Morisson Faria, *“Coulomb-free and Coulomb-distorted recolliding orbits in photoelectron holography”*, J. Phys. B **51**, 124001

[71] A. S. Maxwell, A. Al-Jawahiry, X. Lai, and C. Figueira de Morisson Faria, *“Analytic quantum-interference conditions in Coulomb corrected photoelectron holography”*, J. Phys. B **51**, 044004

2017 [70] A. S. Maxwell, A. Al-Jawahiry, T. Das, and C. Figueira de Morisson Faria, *“Coulomb-corrected quantum interference in above-threshold ionization: Working towards multitrajectory electron holography”*, Phys. Rev. A **96**, 023420

[69] Xuanyang Lai, ShaoGang Yu, YiYi Huang, LinQiang Hua, Cheng Gong, Wei Quan, C. Figueira de Morisson Faria, and XiaoJun Liu, *“Near-threshold photoelectron holography beyond the strong-field approximation”*, Phys. Rev. A **96**, 013414

2016 [68] A. S. Maxwell and C. Figueira de Morisson Faria, *“Controlling Below-Threshold Nonsequential Double Ionization via Quantum Interference”*, Phys. Rev. Lett. **116**, 143001

[67] C. Zagoya, M. Bonner, H. Chomet, E. Slade, C. Figueira de Morisson Faria, *“Different time scales in plasmonically enhanced high-order harmonic generation”*, Phys. Rev. A **93**, 053419

[66] T. Das and C. Figueira de Morisson Faria, *“Shifting nodal-plane suppressions in high-order harmonic spectra from diatomic molecules in orthogonally polarized driving fields”*, Phys. Rev. A **94**, 023406

2015 [65] C. Symonds, J. Wu, M. Ronto, C. Zagoya, C. Figueira de Morisson Faria, and D. V. Shalashilin, *“Coupled coherent state approach for high-order harmonic generation”*, Phys. Rev. A **91**, 023427

[64] A. S. Maxwell and C. Figueira de Morisson Faria, *“Quantum interference in time-delayed nonsequential double ionization”*, Phys. Rev. A **92**, 023421

[63] T. Das, B. B. Augstein, C. Figueira de Morisson Faria, L. E. Chipperfield, D. J. Hoffmann, J. P. Marangos, *“Extracting an electron's angle of return from shifted interference patterns in macroscopic high-harmonic spectra of diatomic molecules”*, Phys. Rev. A **92**, 023406

[62] X. Lai, C. Poli, H. Schomerus and C. Figueira de Morisson Faria, *“Influence of the Coulomb potential on above-threshold ionization: a quantum-orbit analysis beyond the strong-field approximation”*, Phys. Rev.

A **92**, 043407

[61] A. S. Maxwell and C. Figueira de Morisson Faria, "*Quantum interference in time-delayed nonsequential double ionization*", Phys. Rev. A **92**, 023421

[60] A. S. Maxwell, and C. Figueira de Morisson Faria, "*A Systematic Study of Interference Effects in Non-Sequential Double Ionisation*", Journal of Physics: Conference Series **635**, 092136, doi:10.1088/1742-6596/635/9/092136.

2014 [59] B.B. Augstein, J. Wu, T. Shaaran and C. Figueira de Morisson Faria, "*High-harmonic generation and nonsequential double ionization in atoms and molecules: quantum interference, causality, excitation and the role of multiple orbitals*", in "*Advances in Laser Physics and Technology*", p. 4-25 (Cambridge University Press, India, 2014).

[58] C. Zagoya, J. Wu, M. Ronto, D. V. Shalashilin, C. Figueira de Morisson Faria, "*Quantum and semiclassical phase-space dynamics of a wave packet in strong fields using initial-value representations*", New J. Phys. **16**, 103040

2013 [57] J. Wu, B. B. Augstein and C. Figueira de Morisson Faria, "*Bohmian-trajectory analysis of high-order harmonic generation: Ensemble averages, nonlocality and quantitative aspects*", Phys. Rev. A **88**, 063416 (arXiv:1301.1916 [atom.ph]).

[56] T. Das, B. B. Augstein and C. Figueira de Morisson Faria, "*High-order harmonic generation from diatomic molecules in elliptically polarized driving fields: a generalized interference condition*", Phys. Rev. A **88**, 023404 (arXiv:1305.4556 [atom.ph])

[55] Xuanyang Lai and C. Figueira de Morisson Faria, "*Temporal and spatial interference in molecular above-threshold ionization with elliptically polarized fields*", Phys. Rev. A **88**, 013406 (arXiv:1304.3298 [atom.ph])

[54] J. Wu, B. B. Augstein and C. Figueira de Morisson Faria, "*Local dynamics of high-order harmonic generation using Bohmian trajectories*", Phys. Rev. A **88**, 023415 (arXiv:1205.5298 [quant-ph])

2012 [53] C. Figueira de Morisson Faria, T. Shaaran and M. T. Nygren, "*Time-delayed nonsequential double ionization with few-cycle laser pulses: importance of the carrier-envelope phase*", Phys. Rev. A **86**, 053405 (arXiv:1206.5185 [atom-ph])

[52] B. Augstein and C. Figueira de Morisson Faria, "*High-order harmonic generation in diatomic molecules: quantum interference, nodal structures and multiple orbitals*", Modern Physics Letters B **26**, 1130002 (brief

review)

[51] T. Shaaran, C. Figueira de Morisson Faria and H. Schomerus, "*Causality and quantum interference in time-delayed laser-induced nonsequential double ionization*", Phys. Rev. A **85**, 023423

2011

[50] C. Figueira de Morisson Faria and J. Biegert, Introduction to the Special Issue on Advances on Strong Field and Attosecond Physics, J. Mod. Opt. **58**, 1074

[49] T. Shaaran, B.B. Augstein and C. Figueira de Morisson Faria, "*Excitation, two-center interference and the orbital geometry in laser-induced nonsequential double ionization of diatomic molecules*", Phys. Rev. A **84**, 013429

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[47] B.B. Augstein and C. Figueira de Morisson Faria, "*Influence of asymmetry and nodal structures on high-harmonic generation in heteronuclear molecules*", J. Phys. B **44**, 055601 (arXiv:1009.0503)

[46] C. Figueira de Morisson Faria and X. Liu, "*Electron-electron correlation in strong laser fields*", J. Mod. Opt. **58**, 1076 (invited topical review)

[45] B.B. Augstein and C. Figueira de Morisson Faria, "*Multielectron corrections in molecular high-order harmonic generation for different formulations of the strong-field approximation*", J. Mod. Opt. **58**, 1173 (arXiv:1007.2135)

2010

[44] T. Shaaran, M. T. Nygren and C. Figueira de Morisson Faria, "*Laser-induced nonsequential double ionization at and above the recollision-excitation-tunneling threshold*", Phys. Rev. A **81**, 063413

[43] C. Figueira de Morisson Faria and B.B. Augstein, "*Molecular high-order harmonic generation with more than one active orbital: quantum-interference effects*", Phys. Rev. A **81**, 043409

[42] T. Shaaran and C. Figueira de Morisson Faria, "*Laser-induced nonsequential double ionization: kinematic constraints for the recollision-excitation-tunneling mechanism*", J. Mod. Opt. **57**, 984

2009

[41] W. Quan, X. Liu and C. Figueira de Morisson Faria, "*Non-sequential double ionization with polarization-gated pulses*", J Phys B **42**, 134008

[40] C. Figueira de Morisson Faria, "*One and two-center processes in high-order harmonic generation in diatomic molecules: influence of the internuclear separation*", Laser Phys. **19**, 797

- [39] C. Figueira de Morisson Faria, “*Laser-induced nonsequential double ionization in diatomic molecules: one and two-center rescattering scenarios*”, J. Phys. B: At. Mol. Opt. Phys. **42**, 105602
- 2008 [38] C. Figueira de Morisson Faria, T. Shaaran, X. Liu and W. Yang, “*Quantum interference in laser-induced nonsequential double ionization in diatomic molecules: the role of alignment and orbital symmetry*”, Phys. Rev. A **78**, 043407
- [37] X. Liu, C. Figueira de Morisson Faria and W. Becker, “*Attosecond electron thermalization in laser-induced nonsequential multiple ionization: hard versus glancing collisions*”, New J. Phys **10**, 025010
- 2007 [36] C. Figueira de Morisson Faria, “*High-harmonic generation in diatomic molecules: a quantum orbit analysis of the interference patterns*”, Phys. Rev. A **76**, 043407
- [35] H. Hetzheim, C. Figueira de Morisson Faria and W. Becker, “*Interference effects in above-threshold ionization from diatomic molecules: determining the internuclear separation*”, Phys. Rev. A **76**, 023418
- [34] C. Figueira de Morisson Faria and P. Salieres, “*High-Harmonic generation with a strong laser field and an attosecond-pulse train: the Dirac-Delta comb and monochromatic limits*”, Laser Phys. **17**, 390
- [33] C. Figueira de Morisson Faria and A. Fring, “*Non-Hermitian Hamiltonians with real eigenvalues coupled to an electric field: from the time-independent to the time-dependent formulation*”, Laser Phys. **17**, 424
- [32] C. Figueira de Morisson Faria and X. Liu, “*Speed-up and slow-down collisions in laser-induced nonsequential multiple ionization*”, J. Mod. Opt. **54**, 1107
- [31] C. Figueira de Morisson Faria, X. Liu and W. Becker, “*S-Matrix theory of nonsequential double ionisation*”, Progress in Ultrafast Laser Science II, Chapter 4, K. Yamanouchi, S.L. Chin, P. Agostini, G. Ferrante (Eds.) (Springer, Berlin, Heidelberg, New York, 2007)

- 2006 [30] C. Figueira de Morisson Faria and A. Fring, "*Isospectral Hamiltonians from Moyal Products*", Czech. J. Phys. **56**, 899
- [29] C. Figueira de Morisson Faria, P. Salieres, P. Villain and M. Lewenstein, "*Controlling high-harmonic generation and above-threshold ionisation with an attosecond-pulse train*", Phys. Rev. A **74**, 053416
- [28] C. Figueira de Morisson Faria and A. Fring, "*Time evolution of non-Hermitian Hamiltonian systems*", J. Phys. A **39**, 9269
- [27] X. Liu, C. Figueira de Morisson Faria, W. Becker and P.B. Corkum, "*Attosecond thermalization by laser-induced electron recollisions in atoms*", J. Phys. B **39**, L305
- [26] C. Figueira de Morisson Faria, X. Liu and W. Becker, "*Classical aspects of laser-induced nonsequential double ionisation at and below the threshold*", J. Mod. Opt. **53**, 193
- 2005 [25] C. Figueira de Morisson Faria and M. Lewenstein, "*Bound-state corrections in laser-induced nonsequential double ionisation*", J. Phys. B **38**, 3251
- 2004 [24] C. Figueira de Morisson Faria, X. Liu, A. Sanpera and M. Lewenstein, "*Classical and quantum-mechanical treatments of nonsequential double ionization with few-cycle laser pulses*", Phys. Rev. A **70**, 043406
- [23] C. Figueira de Morisson Faria, H. Schomerus, X. Liu, and W. Becker, "*Electron-electron dynamics in laser-induced nonsequential double ionization*", Phys. Rev. A **69**, 043405
- [22] X. Liu and C. Figueira de Morisson Faria, "*Nonsequential double ionization with few-cycle laser pulses*", Phys. Rev. Lett. **92**, 133006
- [21] C. Figueira de Morisson Faria, X. Liu, H. Schomerus and W. Becker, "*Coulomb repulsion and quantum-classical correspondence in laser-induced nonsequential double ionization*", Phys. Rev. A **69**, 021402(R)
- 2003 [20] C. Figueira de Morisson Faria and W. Becker, "*Quantum-orbit analysis of laser-induced non-sequential double ionization*", Laser Phys. **13**, 1196
- [19] C. Figueira de Morisson Faria and I. Rotter, "*High-harmonic generation in a driven two-level atom: an analogy with the three-step model*", Laser Phys. **13**, 985
- [18] O.A. Castro-Alvaredo, A. Fring and C. Figueira de Morisson Faria, "*Relativistic treatment of harmonics from impurity systems in quantum wires*", Phys. Rev. B **67**, 125405
- 2002 [17] C. Figueira de Morisson Faria, H. Schomerus, and W. Becker, "*High-order above-threshold ionization: the uniform approximation and the effect of the binding potential*", Phys. Rev. A **66**, 043413



- [16] C. Figueira de Morisson Faria and I. Rotter, "*High-harmonic generation in a driven two-level atom: periodic level crossings and three-step processes*", Phys. Rev. A **66**, 013402
- [15] C. Figueira de Morisson Faria, R. Kopold, W. Becker and J.M. Rost, "*Resonant enhancements of high-harmonic generation*", Phys. Rev. A **65**, 023404
- 2001 [14] C. Figueira de Morisson Faria and M.L. Du, "*Enhancement of bichromatic high-harmonic generation with a high-frequency field*", Phys. Rev. A **64**, 023415
- 2000 [13] C. Figueira de Morisson Faria, A. Fring and R. Schrader, "*Existence criteria for stabilization from the scaling behavior of ionization probabilities*", J. Phys. B **33**, 1675
- [12] C. Figueira de Morisson Faria and J.M. Rost, "*High-harmonic generation from a confined atom*", Phys. Rev. A **62**, 051402(R)
- [11] H. Steudel, C. Figueira de Morisson Faria, A. M. Kamchatnov and M. G. A. Paris, "*The inverse problem for second harmonic generation with amplitude-modulated pulses*", Phys. Lett. A **276**, 267
- [10] C. Figueira de Morisson Faria, D. B. Milošević and G.G. Paulus, "*Phase-dependent effects in bichromatic high-harmonic generation*", Phys. Rev. A **61**, 063415
- [9] C. Figueira de Morisson Faria, A. Fring and R. Schrader, "*Stabilization not for certain and the usefulness of bounds*", Proceedings of the VIII International Conference on Multiphoton Processes, p. 150
- [8] C. Figueira de Morisson Faria, M. Dörr and W. Sandner, "*Time-frequency analysis of high-harmonic generation*", Proceedings of the VIII International Conference on Multiphoton Processes, p. 349
- 1999 [7] C. Figueira de Morisson Faria, M. Dörr, W. Becker and W. Sandner, "*Time-frequency analysis of two-color high-harmonic generation*", Phys. Rev. A **60**, 1377
- [6] C. Figueira de Morisson Faria, W. Becker, M. Dörr and W. Sandner, "*Phase- and intensity dependence of the cutoffs in two-color high-harmonic generation*", Laser Phys. **9**, 388
- [5] C. Figueira de Morisson Faria, A. Fring and R. Schrader, "*Analytical treatment of stabilization*", Laser Phys. **9**, 379
- 1998 [4] C. Figueira de Morisson Faria, A. Fring and R. Schrader, "*On the influence of pulse shapes on ionization probability*", J. Phys. B **31**, 449
- [3] H. Steudel, C. Figueira de Morisson Faria, M.G.A. Paris, A.

Kamchatnov and O. Steuernagel, "Second harmonic generation: the solution for an amplitude-modulated initial pulse", Opt. Comm. **150**, 363

[2] C. Figueira de Morisson Faria, M. Dörr and W. Sandner, "Importance of excited bound states in harmonic generation", Phys. Rev. A **58**, 2990

1997 [1] C. Figueira de Morisson Faria, M. Dörr and W. Sandner, "Time profile of harmonic generation", Phys. Rev. A **55**(5), 3961

## Conference Organization

- July 2020 Chair  
CECAM Virtual Workshop  
„Quantum Battles in Attoscience“  
This was a meeting with over 300 participants from across the globe (over 34 countries), including the main leaders in the field, focused on areas of controversy in Strong-Field and Attosecond Physics. The conference involved supervising the organization of three panels discussions (the quantum battles), controlling the Twitter and YouTube outlets and liaising with the speakers and panellists.  
This conference was one of the highlights of 2020 in my field and is regarded as a key example of science communication.
- May 2020 Sub-committee member - "CG - High-Field Laser and Attosecond Science" Conference on Lasers & Electro-Optics / Europe and European Quantum Electronics Conference (CLEO® / Europe – EQEC) 2021  
The main duties of sub-committee members are as follows:  
1). Provide suggestions for invited speakers  
2). Read and score submitted papers in the relevant topic area  
3). Identify submitted papers for potential recategorization.  
4). Electronically submit the scores to the European Physical Society.  
5). Plan to attend the Technical Program Committee (TPC) Meeting in Munich on March 6 2021 to  
- Finalise the list of accepted oral and poster papers  
- Organise the oral papers into sessions  
- Nominate session chairs.  
6). Contribute to the postdeadline paper reading and scoring process.
- December 2018 International Advisory Committee,  
“Current Developments in Atomic, Molecular, Optical and Nano Physics” (CDAMOP) Meeting – Delhi – India  
This was a meeting with over 200 participants from across the globe
- June 2018 Scientific Coordination of the Annual Institute of Physics AMIG (Atomic and Molecular Interactions Group) Meeting (University College London, UK)  
  
Local Organizing Committee of the Annual Institute of Physics AMIG (Atomic and Molecular Interactions Group) Meeting (University College London, UK)

This was a conference with around 50 participants from the UK and abroad aimed at early career researchers

- December 2014 International Advisory Committee,  
“Current Developments in Atomic, Molecular, Optical and Nano Physics”  
(CDAMOP) Meeting – Delhi – India  
This was a meeting with over 200 participants from across the globe.
- June 2012 Scientific Coordination of the Annual Institute of Physics AMIG (Atomic  
And Molecular Interactions Group) Meeting (University College London,  
UK)  
Local Organizing Committee of the Annual Institute of Physics AMIG  
(Atomic And Molecular Interactions Group) Meeting (University College  
London, UK)  
This meeting was mainly focused at UK-Based early career researchers, and  
involved around 35 participants from the UK and abroad. It is an important  
outreach channel in this country.
- December 2011 International Advisory Committee—Strong-Field and Attosecond Physics  
Section,  
“*Current Developments in Atomic, Molecular, Optical and Nano Physics*”  
(CDAMOP) Meeting – Delhi – India  
This was a meeting with over 200 participants from across the globe.
- July 2010 Co-Chair of Seminar 2 (Strong-Field and Attosecond Physics): *19<sup>th</sup> International  
Workshop on Laser Physics*.  
This is one of the most important conference series in my research field.
- June 2010 Scientific Coordination, “*Advances in Strong Field and Attosecond Physics*”  
(University College London, UK).  
Local Organizing Committee, “*Advances in Strong Field and Attosecond Physics*”  
(University College London, UK).  
This was a high-profile international conference with over 100 participants from  
across the globe, including the main leaders in the field.
- June 2007 Local Organizing Committee, “*International Workshop on Non-Hermitian  
Hamiltonians in Quantum Physics*” (City University, London, UK)  
This is one of the most important conference series in this area, with over 100  
participants.
- June 2004 Local Organizing Committee, “*Annual European Graduate College Workshop:  
Interference and Quantum Applications*” (Universität Hannover, Germany).  
This is a meeting with around 40 participants, targeted at early career researchers in  
the nodes of the Graduate College Interference and Quantum Applications.

### Conference Participation

- 1991 (May) XIV Brazilian Meeting on Condensed Matter Physics  
(Caxambu, MG, Brazil)  
Poster: “A numerical simulation study for obtaining a monoenergetic laser  
beam”
- 1992 (May) XV Brazilian Meeting on Condensed Matter Physics

- (Caxambu, MG, Brazil)  
Poster: *"Study of transverse diffusion processes during an atomic beam cooling"*
- 1992 (October) V Symposium on Lasers and Applications of the State of São Paulo (São Paulo, SP, Brazil)  
Poster: *"Numerical studies of the transverse heating process and changes in the velocity distribution during an atomic beam cooling"*
- 1993 (May) XVI Brazilian Meeting on Condensed Matter Physics (Caxambu, MG, Brazil)  
Poster: *"Study of the influence of the intensity imbalance and asymmetrical misalignments on spatial configurations of neutral atoms in a magneto-optical trap"*
- 1996 (March) Spring Conference of the German Physical Society (Rostock, Germany)  
Oral presentation: *"Numerical simulations in 1D for laser-atom interactions"*
- 1996 (September) VII International Conference on Multiphoton Processes (Garmisch-Partenkirchen, Germany)  
Poster: *"When are harmonics generated?"*
- 1998 (March) Spring Conference of the German Physical Society (Konstanz, Germany)  
Oral presentation: *"Spectral and time-frequency analysis of the bound state and continuum contributions to harmonic generation"*  
Poster: *"Two-color high-harmonic generation"*
- 1998 (July) 7<sup>th</sup> International Laser Physics Workshop (Berlin, Germany)  
Invited talk: *"The general solution for non-stationary second harmonic generation with amplitude-modulated incident pulses"*  
Poster: *"Time-frequency analysis of two-color high-harmonic generation"*  
Poster: *"On the absence of stabilization"*
- 1999 (March) Spring Conference of the German Physical Society (Heidelberg, Germany)  
Oral presentation: *"Cutoff law for phase-dependent two-color high-harmonic generation"*
- 1999 (June) Applications of High Field and Short Wavelength Sources VIII (Potsdam, Germany)  
Poster: *"Phase-related effects in bichromatic high-harmonic generation"*
- 1999 (October) VIII International Conference on Multiphoton Processes (Monterey, California, U.S.A.)  
Poster: *"Spectral and time-frequency analysis of high-harmonic generation"*
- 2000 (March) International Conference on Atomic Systems in Extreme Fields (Dresden, Germany)  
Invited talk: *"Control of high-harmonic generation"*
- 2000 (April) Spring Conference of the German Physical Society (Bonn, Germany)  
Oral presentation: *"Phase-dependent effects in bichromatic high-harmonic"*

- generation"*  
Poster: *"High-harmonic generation from a confined atom"*
- 2000  
(December) International Workshop on Dynamical Approaches in Atomic and Cluster Physics  
(Dresden, Germany)  
Poster: *"Schemes for high-harmonic control"*
- 2001 (April) Spring Conference of the German Physical Society/ VII ECAMP  
(Berlin, Germany)  
Oral presentation: *"Resonance-like enhancements in high-harmonic generation"*
- 2002 (July) 11<sup>th</sup> International Laser Physics Workshop (Bratislava, Slovakia)  
Invited talk: *"High-harmonic generation in a driven two-level atom: periodic level crossings and three-step processes"*  
Poster: *"High-order above-threshold ionization: the uniform approximation and the effect of the binding potential"*
- 2002  
(December) International Workshop on Atomic Physics (Dresden, Germany)  
Invited talk: *"Quantum-orbit analysis of above-threshold ionization and nonsequential double ionization"*
- 2003 (March) Spring Conference of the German Physical Society (Hannover, Germany)  
Oral presentation: *"Quantum-orbit analysis of nonsequential double ionization"*
- 2003 (June) European Graduate College Meeting (Glasgow, Scotland)  
Oral presentation: *"High-harmonic generation in a driven two-level atom: periodic level crossings and three-step processes"*
- 2003 (August) 12<sup>th</sup> International Laser Physics Workshop (Hamburg, Germany)  
Poster: *"Laser-induced nonsequential double ionization with few-cycle pulses"*  
Invited talk: *" Nonsequential double ionization in the strong-field approximation: recent results"*
- 2004  
(February) Quantum Limited Atom Optics  
(Hannover, Germany)  
Poster: *„Laser-induced nonsequential double ionization with monochromatic fields and few-cycle pulses“*
- 2004 (March) Spring Conference of the German Physical Society (Munich, Germany)  
Oral presentation: *"Nonsequential double ionization with few-cycle laser pulses"*  
Oral presentation: *"Electron-electron dynamics in laser-induced nonsequential double ionization"*
- 2004 (June) European Graduate College Meeting (Harz, Germany)  
Oral presentation: *„Laser-induced nonsequential double ionization with monochromatic fields and few-cycle pulses“*

- 2004 (July) 13<sup>th</sup> International Laser Physics Workshop (Trieste, Italy)  
 Poster: *"Electron-electron dynamics in laser-induced nonsequential double ionization"*  
 Invited talk: *"Nonsequential double ionization with few-cycle laser pulses: quantum-classical correspondence"*
- 2004 (December) UK Theory Meeting (Durham, United Kingdom)
- 2005 (January) High-Field Attosecond Physics (Oberurg, Austria)  
 Invited talk: *"S-Matrix theory of laser-induced nonsequential double ionisation: from electron-electron dynamics to absolute-phase diagnostics"*
- 2006 (March) Spring Conference of the German Physical Society (Frankfurt, Germany)  
 Invited talk (Hauptvortrag): *"S-Matrix theory of laser-induced nonsequential double ionisation"*  
 Oral presentation: *"Controlling above-threshold ionisation and high-order harmonic generation with an attosecond-pulse train"*
- 2006 (April) Ultra-fast Dynamic Imaging of Matter (Imperial College London)  
 Poster: *"Controlling above-threshold ionisation and high-order harmonic generation with an attosecond-pulse train"*  
 Poster: *"Attosecond thermalization by laser-induced recollision of electrons"*
- 2006 (July) 15<sup>th</sup> International Laser Physics Workshop (Lausanne, Switzerland)  
 Invited Talk: *"Controlling high-harmonic generation and above-threshold ionisation with an attosecond-pulse train"*  
 Invited Talk: *"Attosecond thermalization by laser-induced electron recollisions with atoms"*  
 Poster: *"Time evolution of non-Hermitian Hamiltonian systems"*
- 2007 (May) International Workshop on Open Quantum Systems (ECT, Trento, Italy)  
 Panel discussion contribution: *"Non-Hermitian Hamiltonians with real eigenvalues"*  
 Invited Talk: *"Non-Hermitian Hamiltonian systems with real eigenvalues: from the time-independent to the time-dependent quantum-mechanical formulation"*
- 2007 (June) "Theoretical Approaches to the Dynamics of Many-electron systems in Strong Laser Fields"(STFC Network for Science with Advanced Light Sources)  
 Daresbury, United Kingdom  
 Talk: *"High-harmonic generation in diatomic molecules: a quantum-orbit analysis of the interference patterns"*
- 2007 (July) "Pseudo-Hermitian Hamiltonians in Quantum Physics" (Centre for Mathematical Science, City University, UK)
- 2007 (August) International Workshop on Attosecond Physics 2007  
 (Max Planck Institut for Physics of Complex Systems, Dresden)

- Poster: *“Interference effects in above-threshold ionization and high-order harmonic generation in diatomic molecules”*
- 2007 (September) QUAMP (University College London)  
Poster: *“Quantum-interference effect in high-order harmonic generation and above-threshold ionization from diatomic molecules”*
- 2007 (November) Symposium on Ultrafast Laser Physics (University College London)  
Talk: *“Quantum-interference effect in high-order harmonic generation from diatomic molecules”*
- 2008 (February) WE-Heraus International Seminar “Novel Light Sources and Applications” (Obergurgl, Austria)  
Invited Talk: *“Quantum-interference effects in high-order harmonic generation and above-threshold ionization: from attosecond pulses to diatomic molecules”*
- 2008 (June) 17<sup>th</sup> International Laser Physics Workshop (Trondheim, Norway)  
Invited Talk: *“Quantum interference in laser-induced non sequential double ionization in diatomic molecules: the role of alignment and orbital symmetry”*
- 2008 (September) XI International Conference on Multiphoton Processes (Heidelberg, Germany)  
Poster: *Laser-induced non sequential double ionization in diatomic molecules: the role of alignment, orbital symmetry and different scattering scenarios*
- 2008 (October) Research half day on Ultrafast Coherent Control (University College London)
- 2009 (March) Ultra-fast dynamic imaging (Ischia, Italy)  
Contributed talk: *: Laser-induced non sequential double ionization in diatomic molecules: one and two-center rescattering scenarios*
- 2009 (July) 18<sup>th</sup> International Laser Physics Workshop (Barcelona, Spain)  
Invited Talk: *“Nonsequential double ionization with polarization-gated pulses”*  
Poster: *Laser-induced non sequential double ionization in diatomic molecules: one and two-center rescattering scenarios*
- 2010 (January) Workshop on Ultra-fast Physics (Belfast, Northern Ireland, UK)
- 2010 (June) Advances in Strong-Field and Attosecond Physics (UCL, London, UK)  
Poster: *“Multielectron corrections in molecular high-order harmonic generation for different formulations of the strong-field approximation”*  
Poster: *“Laser-Induced nonsequential double ionization in diatomic molecules: the role of excitation”*  
Poster: *“Laser-induced nonsequential double ionization at and above the recollision-excitation-tunneling threshold”*  
Poster: *“Molecular high-order harmonic generation with more than one*

*active*  
*orbital: quantum-interference effects”*

- 2010  
(July) 19th International Laser Physics Workshop (Foz do Iguacu, Brazil)  
Invited Talk: “*Laser-induced nonsequential double ionization at and above the recollision-excitation-tunneling threshold*”  
Poster: “*Multielectron corrections in molecular high-order harmonic generation for different formulations of the strong-field approximation*”  
Poster: “*Laser-Induced nonsequential double ionization in diatomic molecules: the role of excitation*”
- 2010  
(August) ICONO/LAT (Kazan, Russia)  
Invited Talk: “*High-order harmonic generation and nonsequential double ionization in atoms and molecules: quantum-interference, excitation and the influence of multiple orbitals*”
- 2011  
(July) 20th International Laser Physics Workshop (Sarajevo, Bosnia)  
Invited Talk: “*The recollision-excitation tunneling pathway in laser-induced nonsequential double ionization: causality and quantum interference*”
- 2011  
(September) International Symposium on Attoscience and Ultrafast Quantum Control (Imperial College London, UK)  
Talk: “*Influence of asymmetry and nodal structures on high-harmonic generation in heteronuclear molecules*”
- 2011  
(December) CDAMOP (Delhi, India)  
Invited Talk: “*High-harmonic generation and nonsequential double ionization: quantum interference, causality, excitation and the role of multiple orbitals*”
- 2012  
(March) HILAS (Berlin, Germany)  
Talk: “*Quantum interference, excitation and multiple orbitals in atomic and molecular high-harmonic generation and nonsequential double ionization*”
- 2012  
(May) FINITE 2012 (Max Planck Institute for Physics of Complex Systems, Dresden, Germany)  
This meeting could only be attended by invitation  
Invited Talk: “*High-harmonic generation and nonsequential double ionization in atoms and molecules: quantum interference, causality, excitation and the role of multiple orbitals*”
- 2013  
(January 28-February 1) 523<sup>rd</sup> WE Heraeus Seminar, “High-Harmonic Spectroscopy Bad Honnef, Germany  
Invited Talk: “*Quantum interference, multiple orbitals and Bohmian-trajectory analysis of high-harmonic generation*”
- 2013  
(March 20 and IoP Atomic and Molecular Interactions Group (AMIG) Meeting National University of Ireland, Maynooth



- 21) Invited Talk: “*Quantum interference, multiple orbitals and Bohmian-trajectory analysis of high-harmonic generation*”
- 2013  
(8-10 May) IILuminyating 2013: Dynamical Perspectives on Molecular Processes  
University of Loughborough  
Invited Talk: „*Quantum interference and excitation in high-order harmonic generation and laser-induced nonsequential double ionization*“
- 2013  
(15- 19 July) 22nd International Laser Physics Workshop  
(Prag, Czech Republic)  
Invited Talk: “*Influence of the pulse shape, frequency and polarization on the electron dynamics in strong laser fields*”  
Other members of my team have also given the following talks:  
Talk: J. Wu, A.S. Sanz, B.B. Augstein, and C.F.M. Faria  
“*Bohmian-trajectory analysis of high-order harmonic generation: Probing the local dynamics*”  
Talk: B.B. Augstein, T. Das, and C.F.M. Faria  
“*High-order harmonic generation from diatomic molecules in elliptically polarized driving fields: a generalized interference condition*”  
Talk: X.Y. Lai and C.F.M. Faria, “*Temporal and spatial interference in molecular above-threshold ionization with elliptically polarized field*”
- 2014  
(14-18 July) 23rd International Laser Physics Workshop  
Sofia – Bulgaria  
Invited Talk: „*Strong-field dynamics in phase space using initial-value representations*“
- 2014  
(September) QUAMP (Durham- UK)  
Tutorial: “*Matter in Intense Laser Fields*”
- 2015  
(March) CDAMOP – Delhi, India  
Plenary Talk: “*Orbit-based approaches for matter in strong laser fields beyond the strong-field approximation and quantum-interference applications*“
- 2016  
(July) 25th Annual International Laser Physics Workshop  
(Yerevan, Armenia)  
Invited talk: “*Different time scales in plasmonically enhanced high-order harmonic generation*”  
**Please note:**  
Other members of my team have presented the following talks at this conference:  
Invited Talk (Andrew Maxwell): “*Quantum Interference in Below-Threshold Nonsequential Double Ionization*”  
Invited Talk (Toni Das): “*Shifted Interference patterns in high harmonic spectra of diatomic molecules in orthogonally polarised fields*”
- 2017 26th Annual International Laser Physics Workshop

- (July) (Kazan, Russia)  
Invited Talk: “*Coulomb-corrected quantum interference in above-threshold ionization: working towards multi-trajectory photoelectron holography*”
- 2018  
(June) Participation in the QUSET2018, Dresden, Germany
- 2018  
(June) Gordon Research Conference on Multiphoton Processes – Bryant University, Smithfield, USA  
Discussion Leader: High-harmonic Spectroscopy  
This involves a 20-min presentation of all the talks in the session and how this links to one’s own work, and chairing a three-hour discussion  
Poster: „*Coulomb-distorted trajectories in photoelectron holography*“
- 2018  
(July) 27th Annual International Laser Physics Workshop (Nottingham, UK)  
Invited talk: „*Recolliding Quantum Orbits in Photoelectron Holography Beyond the Strong-Field Approximation*“
- 2018  
There have been contributed talks and posters by other members of my group in: AMIG 2018 (two posters and one talk), ATTO-FEL 2018 (two posters and one talk), Gordon Research Conference (one poster), LPHYS 2018 (one talk)
- 2018  
(November) Atom 2018 – Dresden (Germany)  
Invited talk: „*Quantum Orbits in Photoelectron Holography Beyond the Strong-Field Approximation*“
- 2019  
(January) Summer School „La Parte y El Todo“ (Afunalhue, Villarrica, Chile)  
Invited talk: „*Unravelling the extreme: Matter in Intense Laser Fields and the Physics of Ultrashort Time Scales*”
- 2019  
(March) Womxn in Physics Meeting (Kings College, London, UK)  
Invited talk: „*Unravelling the extreme: Matter in Intense Laser Fields and the Physics of Ultrashort Time Scales*”
- 2019  
(September) IoP AMIG Annual Meeting (Birmingham, UK)  
Invited talk: „*Exploring quantum interference in strong-field ionization and attosecond imaging*“
- 2019  
(October) Physics Colloquium (University of Birmingham, UK)  
„*Exploring quantum interference in strong-field ionization and attosecond imaging*“
- 2019  
There have been contributed talks and posters by other members of my group in: AMIG 2019 (one poster and two talks), ICPEAC 2019 (three posters)

2020  
(July) Quantum Battles in Attoscience – Online Workshop  
There have been contributed talks and posters by other members of my group

**Scientific Visits** (these are only the visits including invited talks)

- 1997 Universidade Federal de Pernambuco (Recife, Brazil)  
Talk: *"Atoms in ultra-intense laser fields"*
- Universidade Federal da Paraíba (Joao Pessoa, Brazil)  
Talk: *"Atoms in ultra-intense laser fields"*
- Universidade Federal do Pará (Belém, Brazil)  
Talk: *"Atoms in ultra-intense laser fields"*
- 1999 Universität Potsdam (Potsdam, Germany)  
Talk: *"Atoms in ultra-intense laser fields"*
- Universität Hannover (Hanover, Germany)  
Talk: *"Atoms in ultra-intense laser fields"*
- 2001 Institute of Theoretical Physics, Beijing (Beijing, China)  
Talk: *"Control of high-harmonic generation"*
- Technische Universität Wien (Vienna, Austria)  
Talk: *"Control of high-harmonic generation"*
- 2005 University of Durham (Durham, UK)  
Talk: *"S-Matrix theory of laser-induced non-sequential double ionisation: from electron-electron dynamics to absolute-phase diagnosis"*
- Queen's University of Belfast (Belfast, UK)  
Talk: *"S-Matrix theory of laser-induced non-sequential double ionisation: from electron-electron dynamics to absolute-phase diagnosis"*
- 2006 Max Planck Institut für Kernphysik, Heidelberg (Heidelberg, Germany)  
**Bothe Colloquium: *"Laser-induced non-sequential double and multiple ionization: electron-electron dynamics, absolute-phase diagnosis and attosecond thermalization"***
- University College London (London, UK)  
AMOPP Seminar: *"Laser-induced non-sequential double and multiple ionization: electron-electron dynamics, absolute-phase diagnosis and attosecond thermalization"*
- 2007 University of Kent (Canterbury, UK)  
Mathematics Seminar: *"Non-Hermitian Hamiltonian systems: from the time-independent to the time-dependent quantum-mechanical"*

*formulation”*

University of Stellenbosch (Stellenbosch, South Africa)

Theoretical Physics Seminar: *“Non-Hermitian Hamiltonian systems: from the time-independent to the time-dependent quantum-mechanical formulation”*

Optics Seminar: *“Laser-induced non-sequential double and multiple ionization: electron-electron dynamics, absolute-phase diagnosis and attosecond thermalization”*

2008

Max Born Institute, Berlin (Division B)

Seminar: *“Quantum interference effects in high-order harmonic generation, above-threshold ionization and nonsequential double ionization: from attosecond pulses to diatomic molecules”*

ICFO Barcelona

Seminar: *“Quantum interference effects in strong laser fields: from attosecond pulses to diatomic molecules”*

2009

Daresbury Laboratory

Seminar: *“Quantum interference effects in strong laser fields: from attosecond pulses to diatomic molecules”*

2011

Imperial College London

Quantum Optics and Laser Science (QOLS) Seminar: *“High-order harmonic generation and nonsequential double ionization in atoms and molecules: quantum-interference, excitation and the influence of multiple orbitals”*

2012

Max Born Institute, Berlin

Seminar (Division B): *“High-harmonic generation and nonsequential double ionization in atoms and molecules: quantum interference, causality, excitation and the role of multiple orbitals”*

2014

Wuhan Institute of Physics and Mathematics,  
Chinese Academy of Sciences, Wuhan, China

Seminar: *“Quantum interference, electron-electron correlation and novel approaches in strong-field physics”*

2015

Physikalisch-Astronomische Fakultät, Friedrich Schiller University  
Jena

Seminar: *“Quantum interference, electron-electron correlation and alternative approaches in strong-field physics”*

## **Academic Supervision**

### **PhD students (first supervisor)**

October 2007 –

Mr Tahir Shaaran

- December 2010 University College London  
 Thesis title: “*A rigorous treatment of excitation and quantum interference in laser-induced nonsequential double ionization of atoms and molecules*”  
 Date of oral examination: 16<sup>th</sup> of February 2011  
 Winner of an UCL/EPSRC PhD+ Award 2010  
 Winner of the UCL Carey Foster Prize for Outstanding Postgraduate Research (AMOPP) (2011)
- October 2008 – December 2011 Mr Bradley Augstein  
 University College London  
 Thesis title: “*Orbit-based studies of quantum-interference effects in atomic and molecular high-order harmonic generation*”  
 Date of oral examination: 28<sup>th</sup> of February 2012  
 Winner of an EPSRC Doctoral Training Prize 2011  
 Winner of the UCL Carey Foster Prize for Outstanding Postgraduate Research (AMOPP) (2012)
- October 2010 – September 2014 Mr Jie Wu  
 University College London  
 Winner of an CSC/BIS China-UK Studentship for Excellence  
 Winner of a UCL Overseas Research Studentship  
 Thesis title: “*Novel orbit-based approaches for matter in strong laser fields*”  
 Date of oral examination: 30<sup>th</sup> of September 2014  
 Mr Wu has stayed in London and works at Amazon as a software developer.
- October 2012 – October 2016 Ms Toni Das  
 University College London  
 Thesis title: “*Quantum-orbit analysis of laser-matter interactions in intense orthogonally polarised fields*”  
 Date of oral examination: 27<sup>th</sup> of October 2016
- October 2014 – September 2018 Mr Andrew Maxwell  
 University College London  
 Thesis title: „Strong-Field Interference of Quantum Trajectories with Coulomb Distortion and Electron Correlation”  
 Winner of the Europhysical Journal (EPJ) Poster Prize at the International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC), Toledo, Spain  
 Runner-up talk at the 2016 IoP AMIG meeting, Dublin, Ireland  
 Runner-up poster Prize at the Extreme Light Infrastructure Summer School (ELISS), Romania  
 Date of oral examination: 12<sup>th</sup> of November 2018
- October 2017 -- present Ms Heloise Chomet  
 University College London  
 Topic: Novel approaches for matter in strong laser fields  
 Joint studentship with the Max Planck Institute for Complex Systems,

Dresden, Germany

Computational Prize at the CECAM School on New Computational Methods for Attosecond Molecular Processes (Zaragoza, Spain, 2019)

- October 2018 -- Ms Abbie Bray  
Topic: Photoelectron holography with tailored fields  
Runner up AMIG talk prize 2019  
Computational Prize at the CECAM School on New Computational Methods for Attosecond Molecular Processes (Zaragoza, Spain, 2019)
- October 2020 - Mr Thomas Rooke  
Topic: Photoelectron holography with tailored fields

### MSc students (first supervisor)

- January 2011 -- Ms Zhaohe Liang  
September 2012 University College London  
Topic: Nonsequential double ionization in N<sub>2</sub> with few-cycle laser pulses  
Project mark: 82/100  
**Please note:** Due to life-threatening circumstances, Ms Liang had to interrupt her studies from February to December 2011. She resumed her MSc in January 2012 and successfully completed it in September 2012. She is currently an analyst at the City of London.
- October 2011 -- Ms Toni Das  
September 2012 University College London  
Topic: High-order harmonic generation in molecules with elliptically polarized fields  
Project mark: 70/100  
Ms Das has stayed in my group at UCL for a PhD. She is currently a PDRA at the Max Planck Institute for Physics of Complex Systems, Dresden.
- October 2011 – Mr Mark Donnelly  
December 2011 University College London  
Mr Donnelly has interrupted his studies due to unforeseen circumstances.
- October 2015 – Mr Ahmed Al-Jawahiry  
September 2017 University College London (part-time)  
Topic: Interference effects in Coulomb-corrected photoelectron holography  
Project mark: 95/100  
Winner of the Harrie Massey Prize for best overall UCL Physics and Astronomy MSc student  
Dean's commendation (MAPs)  
He currently works at British Telecom (BT) as a software developer.
- October 2019 – Mr Yuxin Kang

September 2020 (supervision shared with Dr Andrew Maxwell)  
 Topic: Phase Vortices of electrons undergoing Strong-Field Ionization

October 2019 – Mr Edward Dowling  
 September 2020 Topic: Photoelectron Holography with Tailored Fields

October 2020 - Mr Constantin Nicolae  
 Topic: Non-classical effects in enhanced strong-field ionization

**MSci students (first supervisor)**

October 2014 – Mr Daniel Gradeci  
 March 2015 University College London  
 Topic: Quantum interference in below-threshold nonsequential double ionization  
 Project mark: 70/100

October 2015 -- Mr Matthew Bonner  
 March 2016 University College London  
 Topic: Plasmonically enhanced high-order harmonic generation  
 Project mark: 91/100  
 Winner of the best MSci talk 2016 – UCL Physics and Astronomy  
 Winner of the best poster competition prize at UCL & ICL Undergraduate Physics Conference (together with Heloise Chomet)  
 He is currently a PhD student at Imperial College London

October 2015 -- Ms Heloise Chomet  
 March 2016 University College London  
 Topic: Plasmonically enhanced high-order harmonic generation  
 Project mark: 79/100  
 Winner of the best poster competition prize at UCL & ICL Undergraduate Physics Conference (together with Matthew Bonner)  
 Ms Chomet has re-joined my group in the subsequent year in as a visitor and has been recently hired as a PhD student.

October 2015 – Mr Neerav Bhansali  
 March 2016 University College London  
 Topic: Nonsequential double ionization with few-cycle laser pulses  
 Project mark: 64/100

October 2015 -- Ms Yuhan Chai  
 March 2016 University College London  
 Topic: Coulomb-corrected photoelectron holography in elliptically polarized fields  
 Project mark: 62/100

October 2015 – Mr Mohamed (Hadi) Ali  
 December 2015 University College London  
 Topic: Coulomb-corrected photoelectron holography  
 Due to unforeseen circumstances Mr Hadi has interrupted his studies

October 2016 – December 2016	Mr Kevin Ngo Topic: Quantum Interference in below-threshold nonsequential double ionization Due to unforeseen circumstances Mr Ngo has interrupted his studies
October 2016 – March 2018	Ms Rebecca Tenney Topic: Quantum Interference in below-threshold nonsequential double ionization Project mark: 90%
October 2017 – March 2018	Mr Lewis Ling Topic: Quantum Interference in below-threshold nonsequential double ionization Project mark: 70%
October 2018 – March 2019	Mr Idris Sardary Topic: Photoelectron holography with tailored fields Project mark: 78%
October 2018 – March 2019	Mr Dhruva Sarkar Topic: Phase-space analysis of strong-field ionization Project mark: 82%
October 2019 – May 2020	Mr Tobin Holtmann Topic: Coulomb-corrected approaches for nonsequential double ionization
October 2019 – May 2020	Mr Gergely Eory Topic: Coulomb-corrected approaches for nonsequential double ionization
October 2020 -	Mr Abraham Jacob Topic: Coulomb-corrected approaches for nonsequential double ionization

### **Postdoctoral Research Associates (PDRAs)**

January 2011 – December 2011	Responsible for a Post-Doctoral Research Associate Dr Tahir Shaaran University College London Dr Shaaran has had a successful array of PDRAs at the ICFO – Barcelona, CEA Saclay and the Max Planck Institute for Nuclear Physics – Heidelberg. He is currently the Physics High Commissioner in Afghanistan and the President of the World Hazara Council.
January 2012 – February 2013	Responsible for a Post-Doctoral Research Associate Dr Brad Augstein University College London Dr Augstein was subsequently a PDRA at the University of Leeds. He now works in the City of London as a software developer.



- September 2012 – September 2013      Responsible for a Post-Doctoral Research Associate  
University College London  
Dr Xuanyang Lai (funded by the Chinese Academy of Sciences, Wuhan)  
Dr Lai has been permanently hired as the Head of Theory at the CAS – Wuhan.
- May 2013 – April 2016      Responsible for a Post-Doctoral Research Associate  
Dr Carlos Zagoya  
University College London  
Dr Zagoya was subsequently a PDRA at the Max Planck Institute for Physics of Complex Systems, Dresden. He currently works in Germany.
- October 2016 – December 2016      Responsible for a Post-Doctoral Research Associate  
Dr Toni Das  
University College London  
Dr Das was a PDRA at the Max Planck Institute for Physics of Complex Systems, Dresden, and currently works on artificial intelligence in Germany.
- October 2018 – October 2020      UCLQ Research Fellow  
Dr Andy Maxwell  
University College London  
This was a highly competitive fellowship to bring together attosecond physics and quantum information  
Dr Maxwell is now a PDRA at ICFO Barcelona.
- February 2020 -      Mobility Fellowship  
Swiss National Science Foundation  
Dr Cornelia Hofmann  
This is a self-funded and highly competitive fellowship

## Visitors

- October 2007 – December 2007      Junior scientific visitor (Dr Weifeng Yang)  
Chinese Academy of Sciences, Shanghai
- February 2012 – June 2012 and November 2012 – September 2013      Senior scientific visitor (Dr Angel S Sanz Ortiz)  
Investigador "Ramón y Cajal"  
Instituto de Física Fundamental  
Consejo Superior de Investigaciones Científicas  
Madrid, Spain
- March 2013 – May 2013      Senior scientific visitor (Prof Cherif Matta)  
Department of Chemistry  
Mount Saint Vincent University  
Halifax, Nova Scotia, Canada

- 2016 Senior scientific visitor (Dr Joseph Sanderson)  
Department of Physics and Astronomy  
University of Waterloo, Ontario, Canada
- 2016 Junior scientific visitor (Dr Maciej Spiewanowski)  
Topic: Propagation of high-order harmonic generation in a macroscopic medium
- October 2015 – March 2018 Junior scientific visitor (Ms Supriya Rai)  
(Lovely Professional University, Jalandhar, Punjab, India)  
Topic: Propagation of high-order harmonic generation in a macroscopic medium
- April 2017 – August 2017 Junior scientific visitor (Ms Heloise Chomet)  
Topic: Propagation of high-order harmonic generation in a macroscopic medium
- July 2018 – September 2018 Junior scientific visitor (Ms Abbie Bray)  
Topic: Photoelectron holography
- July 2018 Senior Scientific Visitor  
Dr Xuanyang Lai  
Chinese Academy of Sciences, Wuhan
- December 2018 Senior Scientific Visitor (Professor Sergey Popruzhenko)  
Prokhorov General Physics Institute,  
Moscow, Russia
- July 2019 Senior Scientific Visitor (Professor Diego Arbo)  
Universidad de Buenos Aires, Argentina

### **Summer students (first supervisor)**

- June 2009 – October 2009 Summer studentship (first supervisor)  
University College London  
Student: Mr Mikko Tuomas Nygren  
Topic: Path integral methods in laser-induced nonsequential double ionization  
Mr Nygren is a founder of the company KironTech.

**Please note:** Mr Nygren was a co-author in a long Physical Review A (T. Shaaran, M.T. Nygren and C. Figueira de Morisson Faria, "*Laser-induced nonsequential double ionization at and above the recollision-excitation-tunneling threshold*", Phys. Rev. A **81**, 063413 (2010)). This was highly unusual for a student at the above-stated career stage. He continues his collaboration with us, which led to a second publication

(C. Figueira de Morisson Faria, T. Shaaran and M. T. Nygren, "*Time-delayed nonsequential double ionization with few-cycle laser pulses: importance of the carrier-envelope phase*", Phys. Rev. A **86**, 053405 (2012)).

- July 2013 –  
September 2013 Ms Ruth Ayers  
Topic: Above-threshold ionization with elliptically polarized fields  
Winner of the 2015 Burhop Prize for the best performance in 4th year physics UCL  
Currently a MRes student at the Imperial College London
- July 2015 –  
September 2015 Ms Emma Slade  
Topic: Plasmonically enhanced high-order harmonic generation  
Winner of the 2015 UCL William Bragg Prize for best overall undergraduate  
She is currently a PhD student at the University of Oxford
- July 2015 –  
September 2015 Mr Matthew Bonner  
Topic: Plasmonically enhanced high-order harmonic generation  
Mr Bonner has subsequently stayed as an MSci student.
- July 2015 –  
September 2015 Mr Hoa Klinkesorn Nguyen  
Topic: Plasmonically enhanced high-order harmonic generation
- July 2016 –  
September 2016 Ms Rebecca Tenney  
Topic: Quantum Interference in below-threshold nonsequential double ionization  
Ms Tenney has subsequently stayed as an MSci student
- July 2017 –  
September 2017 Mr Benjamin Tan  
Topic: Quantum Interference in below-threshold nonsequential double ionization
- July 2017 –  
September 2017 Mr James Gray  
Topic: Phase matching maps in high-harmonic propagation
- July 2019 –  
September 2019 Mr Tobin Holtmann  
Topic: Laser-induced nonsequential double ionization  
Mr Holtmann has subsequently stayed as an MSci student
- July 2019 –  
September 2019 Mr Gergely Eory  
Topic: Laser-induced nonsequential double ionization  
Mr Eory has subsequently stayed as an MSci student
- July 2019 –  
September 2019 Ms Yuxing Bai  
Shanxi University, Taiyuan, China  
Topic: Laser-induced nonsequential double ionization

July 2019 –  
September 2019      Mr Gyeonghun Kim  
Seoul National University, South Korea  
Topic: Photoelectron holography with elliptical fields

### **Other supervision**

November 2008 –  
April 2009      Supervision of a part-time B. Sc. Student (first supervisor)  
University College London  
Student: Mr Mikko Tuomas Nygren  
Topic: Quantum interference effects in high-order harmonic generation  
Project mark: 73/100

October 2017 –  
May 2018      Supervision of a third year literature review  
University College London  
Student: Yurii Gorbunov  
Topic: "Laser-driven particle and ion acceleration"  
Project mark: 88/100

October 2019 – May  
2020      BSc student (first supervisor)  
Dominik Kufel  
Topic: Phase-space analysis of strong-field enhanced ionization  
Project mark: 85%

January 2003 –  
May 2003 (less  
intensive  
supervision:  
2005/2006)      Co-supervision of a diploma project (second supervisor)  
(together with Dr. Wilhelm Becker)  
Max Born Institute, Berlin  
Subject: Above-threshold ionization in molecules  
Student: Mr Henrik Hetzheim  
Mr Hetzheim completed his degree in two years. He was subsequently  
admitted as a PhD student at the Max Planck Institute for Nuclear  
Physics, Heidelberg.

2011 -2012      Co-supervision of an MPhil student (second supervisor)  
University College London  
Student: Dermot Madden

### **Awards**

1986      First prize at the 2<sup>nd</sup> Mathematics Olympiad of the State of Pará -  
Brazil

1996      DAAD PhD Studentship

1999      Third best poster at the VIII International Conference on Multiphoton

## Processes

- 2004 University Research Fellowship, City University  
(a single fellowship for over 30 applicants from all research areas)
- 2006 EPSRC Advanced Research Fellowship  
(30 fellowships/year for the whole of the UK)
- 2006 Highlight of the Year – Journal of Physics B  
*“Attosecond thermalization by laser-induced electron recollisions in atoms”* (together with W. Becker, X. Liu and P.B. Corkum)

## **Internal Examiner (University College London)**

- 2008 M. Sc. oral presentation (second examiner)  
Student: Mr David Reid
- 2008 Oral assessment test – Quantum Mechanics (second examiner)  
Student: Mr Rainer Engelken
- 2011 MPhil/PhD transfer viva  
Student: Mr Dermott Madden
- 2012 PhD viva – Internal Examiner  
Student: Mr Stephen Harrison
- 2012 MPhil/PhD transfer viva  
Student: Mr Edward O’Reilly
- 2012 MSc thesis and oral presentation (first examiner)  
Student: Ms Toni Das  
MSc thesis and oral presentation (first examiner)  
Student: Ms Zhaohe Liang
- 2015 MSci thesis and oral presentation (first examiner)  
Student: Mr Daniel Gradeci
- 2016 MSci thesis and oral presentation (first examiner)  
Student: Mr Neerav Bhansali  
MSci thesis and oral presentation (first examiner)  
Student: Mr Matthew Bonner  
MSci thesis and oral presentation (first examiner)  
Student: Ms Heloise Chomet  
MSci thesis and oral presentation (first examiner)  
Student: Ms Yuhan Chai
- 2017 MSc thesis and oral presentation (first examiner)  
Student: Mr Ahmed Al-Jawahiry

2018 PhD viva – internal examiner  
Student: Ms Jenelle Rajroop

2018 PhD viva – internal examiner  
Student: Ms Erika Aranas

2018 MSci thesis and oral presentation (first examiner)  
Student: Ms Rebecca Tenney  
MSci thesis and oral presentation (first examiner)  
Student: Mr Lewis Ling

2019 MSci thesis and oral presentation (first examiner)  
Student: Mr Idris Sardary  
MSci thesis and oral presentation (first examiner)  
Student: Mr Dhruva Sarkar

2019 PhD viva – internal examiner  
Student: Mr Daniel Darby Lewis

2019 PhD viva – internal examiner  
Student: Ms Valentina Notararigo

2020 MSci viva – internal examiner  
Student: Mr Tobin Holmann

2020 MSci viva – internal examiner  
Student: Mr Gergely Eory

2020 MSc viva – internal examiner  
Student: Mr Edward Dowling

2020 MSc viva – internal examiner  
Student: Mr Yuxin Kang

2020 BSc viva – internal examiner  
Student: Mr Dominik Kufel

**External  
Examiner**

2010 MPhil viva — Imperial College London  
Student: David Bartram

2013 PhD viva -- Georgia Institute of Technology/Aix-Marseille University  
Student: Adam Kamor

2015 PhD viva – Queen’s University Belfast  
Student: Hector Rey Pereira

- 2015 PhD viva – Imperial College London  
Student: Lukas Medisaukas
- 2017 PhD viva – Queen’s University Belfast  
Student: Sam Law
- 2019 PhD viva – Queen’s University Belfast  
Student: Kathryn Hamilton

## Membership

- 2011 –present Committee member of the Atomic and Molecular Interactions (AMIG) group of the Institute of Physics (IoP)  
The AMIG committee:
- provides advice for the IoP with regard to policies in this area
  - is involved in the organization of conferences such as the AMIG annual meeting and the Quantum Atomic, Molecular, and Plasma Physics Summer School (QUAMP). This includes proposing speakers, and giving talks and tutorials when appropriate
- 2012 – 2018 AMIG Group Officer  
The group officer:
- speaks on behalf of the AMIG group in Group Officers meeting twice a year when the AMIG chair cannot attend
  - takes notes and produces minutes of AMIG meetings twice a year
  - may be requested to attend other IoP meetings, but this should happen voluntarily
- 2012 – present Member of the DAAD “UK Network of German Academics” initiative
- 2015 –present Member of the UCL Latin American Regional Network
- 2015 – present Member of the Royal Society of Chemistry
- 2014 – 2017 Member of the COST XLIC (XUV/X-ray light and fast ions for ultrafast chemistry) action
- 2018 - Member of the UCL Doctoral Training Centre on Quantum Technologies
- 2019 - Member of the COST COST ACTION EU Attosecond Chemistry
- 2019 - Member of @TigerInSTEMM (The Inclusion Group for Equity in Research in STEMM (Science, Technology, Engineering,

Maths & Medicine)

<b>Languages</b>	Speaking ability	Writing ability	Reading ability
Portuguese	Native speaker	Native speaker	Native speaker
English	Fluent	Excellent	Excellent
French	Average	Good	Very good
German	Fluent	Very good	Excellent

## **Teaching**

- 1992  
Tutor for Quantum Mechanics II  
Task: Exercise classes for 4<sup>th</sup> year undergraduate students  
(Prof. Dr. J.F. Fontanari, USP, Brazil)  
Contact time: 2 hours/week for 12 weeks.
- 2003  
Universität Freiburg (Freiburg, Germany)  
Lecture Series: “Saddle-point treatment of nonsequential double ionization”  
(19.11.2003-21.11.2003; aimed at PhD students and post-docs)  
Contact time: 4 hours/day during four days  
This was a short course given by invitation to Dr Berndt Witzel’s research group.  
*I organized the course*
- 2004  
Universität Hannover (Hanover, Germany)  
Lecture Series: “Atoms in strong laser fields”  
(15.01.2004-15.02.2004; postgraduate level)  
Contact time: 3 hours/week during 4 weeks  
*I organized the course*
- 2005 and 2006  
City University (London, UK)  
Further Mathematics for Economists  
(January-April 2005, lecture and exercise classes; 1<sup>st</sup> year undergraduate level)  
(January-April 2006, lecture and exercise classes; 1<sup>st</sup> year undergraduate level)  
Contact time: 3 hours/week during 12 weeks  
*I organized the course*
- 2005  
City University (London, UK)  
Cass business school  
Foundations of Numerical Methods  
(October- December 2005, lecture and exercise classes; postgraduate level)  
Contact time: 3 hours/week during 12 weeks



*I organized the course*

2008 University College London (London-UK)  
3<sup>rd</sup>-Year Quantum Mechanics  
October—December 2008  
(lecture and exercise classes; 3<sup>rd</sup> year undergraduate level — evening course)  
Contact time: 3 hours/week during 12 weeks

2007 and 2008 Post-Graduate Certificate on Teaching and Learning in Higher Education: Module A  
(October 2007 — June 2008)  
University College London (London-UK)

2008 - present University College London (London-UK)  
Personal tutor and academic tutor

2009 and 2010 Tutor for “Developing Effective Communication”

2009 — 2013 University College London (London-UK)  
Atom-Photon Physics  
(October-December 2009; lecture; postgraduate level)  
(October-December 2010; lecture; postgraduate level)  
(October-December 2011; lecture; postgraduate level)  
(October-December 2012; lecture; postgraduate level)  
(October-December 2013; lecture; postgraduate level)  
Contact time: 3 hours/week during 12 weeks

*I organized the course*

**Please note:** I completely revitalized the course “Atom-Photon Physics” at UCL. The course has been made more formal and theory-oriented, and the part of the syllabus on Strong-Field and Attosecond Physics has been extended and updated. Even if this was a risky procedure in view of the heterogeneous background and level of ability of our MSc and MSci student cohort, the students’ success rate has risen substantially since I have taken up the course, and the average final mark has increased from slightly over 50% to between 67% and 78% in the past three years. This course has also proven very fruitful for recruiting MSc and PhD students, which is further evidence of success.

2011 and 2012 University College London  
Tutor — Practical Computing (first-year undergraduate course)  
This involves teaching and demonstrating practical knowledge of Excel, Matlab and Dreamweaver  
Contact time: 3.5 hours/week during 12 weeks

2013 University College London  
Tutor – Atomic and Molecular Physics (second-year undergraduate course)  
This involves discussing and solving exercise sheets for small groups

Contact time: 2 hours every second week during 12 weeks

- March 2013      Crash Course on Atoms in Strong Laser Fields  
University College London  
Doctoral Training Programme  
(postgraduate level)  
Contact time: 10am-4pm on 15/03/2013
- 2014 -- 2016      University College London  
Tutor – Quantum Physics (second-year undergraduate course)  
This involves discussing and solving exercise sheets for small groups  
Contact time: 2 hours every second week during 12 weeks
- 2014 -- 2018      University College London (London-UK)  
Theory of Dynamical Systems  
(October-December 2014; lecture; 3<sup>rd</sup> year undergraduate level)  
(October-December 2015; lecture; 3<sup>rd</sup> year undergraduate level)  
(October-December 2016; lecture; 3<sup>rd</sup> year undergraduate level)  
(October-December 2017; lecture; 3<sup>rd</sup> year undergraduate level)  
(October-December 2018; lecture; 3<sup>rd</sup> year undergraduate level)  
Contact time: 4 hours/week during 12 weeks  
*I organized the course*  
**Please note:** I have considerably changed the delivery of this course, discussing the mathematical tools in more depth and in a more rigorous way. Overall these changes were well received, with a good success rate among the students (around 2 failures out of a cohort of ca 40 students every year), and average final marks consistently in the range 65%-70%. This course has also been a very effective recruitment tool for summer students, MSci and PhD students.
- May 2017      IOP HE network meeting 2017  
**Annual joint network meeting - Directors of Teaching and Learning (or equivalent) and Admissions Tutors**  
Discussion topics: assessment, inclusive learning, accreditation and others.
- October 2019 -      University College London (London UK)  
Advanced Quantum Theory  
This is a fourth-year/postgraduate core course
- 2019 --      University College London  
Tutor – Quantum Physics (second-year undergraduate course)  
This involves discussing and solving exercise sheets for small groups  
Contact time: 2 hours every second week during 12 weeks
- Programming skills** Fortran 77, Fortran 90, Mathematica, maple, html, standard word-processing programs, notions of C++ and MatLab

## Research income

### Larger grants

- Engineering and Physical Sciences Research Council- UK (EPSRC) Advanced Research Fellowship: “*Alternative S-Matrix Approaches for Matter in Strong Laser Fields*” (October 2006 – September 2011; £425000; Principal Investigator (PI)).
- EPSRC Research Base Funding Grant: “*Orbit-Based Methods for Multielectron Systems in Strong Fields*”; (May 2013 — May 2016; £313,960; Principal Investigator (PI)). This grant is part of a multi-institutional, interdisciplinary collaboration involving Dr Dmitry Shalashilin (Quantum Chemistry, University of Leeds; £289,691), and Dr Henning Schomerus (Asymptotic Expansions, Lancaster University; £274,968); all nodes have submitted as independent PIs. In total, we have been awarded £878,619.
- EPSRC Research Base Funding Grant: (May 2020 - ): “*AQuA DIP: Advanced Quantum Approaches to Double Ionisation Processes*”; Co-I. This is an interdisciplinary effort involving UCL, the STFC Daresbury and Queen’s University Belfast. £388,202.00 for UCL, £865,857.00 in total.

### Postdoctoral Research Associates (PDRAs) and PhD studentships

- EPSRC PhD+ Award: “*Analytical treatment of the binding potential for matter in strong laser fields: fundamental concepts and attosecond-imaging applications*” (January 2011—December 2011; £25000 stipend + £2800 equipment + £2500 travel; PI; PDRA: Dr Tahir Shaaran). Previously, Dr Shaaran was a PhD student funded by the EPSRC Departmental Training Account (October 2007 – September 2010; £59790).
- EPSRC Doctoral Training Prize: “*Novel Orbit-Based Approaches for Multielectron Systems in Strong Fields*”, January 2012 — January 2013 ; £43445 including salary, travel and equipment; PI; PDRA: Dr Brad Augstein).
- EPSRC Collaborative Studentship with the Daresbury Laboratory. (October 2008 – September 2011; EPSRC contribution: £29895, Daresbury contribution: £17937; Departmental contribution: £11958; PI; student: Mr Brad Augstein)
- CSC China-UK Studentship for Excellence/UCL Overseas Research Studentship: “*Attosecond-pulse generation in multielectron targets*” (October 2010 – ; 30 studentships in the whole UK across all areas of knowledge, PI; student: Mr Jie Wu).
- IMPACT studentship: “*Novel strong-field approaches for nonsequential double ionization and attosecond imaging applications*” (October 2012 — September 2015, £32,534 funded by the central UCL administration, PI; £32,534 matched by the Physics Department; PI; student: Ms Toni Das; internal).
- EPSRC DTA studentship: “*Coulomb-corrected Approaches for Matter in Strong Laser Fields*” (October 2014 – September 2018; ca £95,000; PI; student: Mr Andrew Maxwell; external with internal allocation)
- IMPACT studentship: “*Novel approaches for Matter in Strong Laser Fields*” (October 2017 – April 2021; £41000 funded by the Physics Department; £41000 funded by the Max Planck Institute for Physics of Complex Systems, Dresden, Germany; PI; student: Ms Heloise Chomet; mixed external/internal).
- Departmental Studentship: “*Non-Born Type Orbits in Strong Laser Fields*” (October 2018 – April 2022; £82000 funded by the Physics Department; PI; Ms Abbie Bray)
- AMOPP DTP Studentship: “*Photoelectron Holography with Tailored Fields*” (October 2020 –; £82000; PI; Mr Thomas Rooke)

### **Related short-term funding**

(I was the PI in all the funding stated below; the EPSRC summer bursaries are external with UCL internal allocation)

- 2007: UCL Start Up Fund (£4500) (internal)
- 2008 and 2010: UCL Graduate School Minor Award (£250) and Major Award (£1250) in order to send Mr Tahir Shaaran to a high-profile conference and fund a one-month stay at the ICFO-Barcelona. (internal)
- 2009: EPSRC Summer Bursary (£2200) in order to hire Mr Tuomas Nygren as a summer student for two months.
- 2010: Centre Europeen de Calcul Atomique et Moleculaire (CECAM) funding (£9000), which was used to organize the high-profile conference “Advances in Strong-Field and Attosecond Physics” at UCL in June 2010, together with Dr Paul Durham (Daresbury) (external).
- 2010: Collaborative Computational Project 2 (CCP2) funding, which was used to organize the high-profile conference “Advances in Strong-Field and Attosecond Physics” at UCL in June 2010 (£1500; 2010; external).
- 2012: Institute of Physics (IoP) funding (£1700) in order to organize the Atomic, Molecular Interaction Group (AMIG) meeting at UCL (June 2012; external).
- 2012: Collaborative Computational Project Q (CCPQ) funding (£1500) in order to organize the Atomic, Molecular Interaction Group (AMIG) meeting at UCL (June 2012; external).
- 2013: EPSRC Summer Bursary (£2,060) to fund Ms Ruth Ayers as a summer student for 8 weeks.
- 2015: EPSRC Summer Bursary (£3,270.00) to fund Ms Emma Slade as a summer student for 11 weeks.
- 2015: EPSRC Summer Bursary (£3,270.00) to fund Ms Emma Slade as a summer student for 11 weeks.
- 2018: CCPQ funding (£1000) and IoP funding (£1000) in order to organize the Atomic, Molecular Interaction Group (AMIG) meeting at UCL (June 2018)
- 2019: CCPQ funding (£5000) and IoP funding (£1000) in order to organize the international Workshop “*Quantum Battles in Attoscience*”
- 2019: CECAM funding (EUR10,000) for a flagship workshop “*Quantum Battles in Attoscience*”

### **Funding prior to my appointment at UCL**

- 2006: City University Pump Prime Grant (£10000; PI)
- 2004: City University Research Fellowship (over £50000; PI)
- 1996: DAAD PhD studentship (included subsistence, travel and equipment; co-PI; together with Prof. Dr. Wolfgang Sandner, Dr. Martin Dörr)

### **Editorial work**

- Referee for Journal of the Optical Society of America B (2003 -- present), Optics Letters (2004 -- present), Journal of Modern Optics (2005 -- present), Optics Communications (2005 -- present), Physical Review A (2009 --present), Physical

Review Letters (2008—present), J. Phys. B (2009 -- present), New J. Phys. (2010 -- present), Journal of Nonlinear Mathematical Physics (2008 -- present), Optics Express (2011 — present), Nature Communications (2012 — present), Science (2015 -- present); International Journal of Modern Physics B (2015 -- present, Laser Physics Letters (2014 – present), Molecular Physics (2016 – present), Computer Physics Communications (2016 – present), Physics Letters A (2016 – present), The European Physical Journal D (2016 – present)

- Member of the EPSRC Peer Review College (2006 — present)
- Reviewer for the Deutsche Forschungsgemeinschaft (2010 — present)
- Guest Editor, Journal of Modern Optics Special Issue: “Advances in Strong-Field and Attosecond Physics”(2010/11)
- Editorial-board member of the journal “Conference Papers in Science” (2012 — 2015)
- Reviewer for the Israeli Science Foundation (2017— present)
- 2018: Pre-Selection and Selection Panel for Graduate and Post-Graduate Studentships -- Deutscher Akademischer Austauschdienst

## Outreach

### Articles aimed at a non-specialist audience

- 2010** Article in the 2010/2010/11 UCL Annual Review (p18-20 therein).
- 2016** Headline Research article in the 2016/17 UCL Annual Review (p. 3 therein)
- 2019** Twitter takeover at @chalkdustmag (Chalk Dust Magazine) for Black Mathematician Month about my research (<https://twitter.com/chalkdustmag/status/1185142015442456577>) and myself (<https://twitter.com/chalkdustmag/status/1185217818796662784>)
- 2020** Twitter takeover at @TIGERinSTEMM about my trajectory as a scientist and myself <https://twitter.com/tigerinstemm/status/1299337413635051521>
- 2020** Interview for Nature Careers – The time tax put on scientists of colour <https://www.nature.com/articles/d41586-020-01920-6>
- 2020** Interview for UCL Mathematical and Physical Sciences spotlight: <https://www.ucl.ac.uk/mathematical-physical-sciences/spotlight-prof-dr-carla-figueira-de-morisson-faria>
- 2020** Opinion article in Physicsworld: „Fostering Academic Debate in an Online World“ <https://physicsworld.com/a/fostering-academic-debate-in-an-online-world/>

### YouTube videos

- 2014** Video abstract about our research article C Zagoya et al, New J. Phys. **16**, 103040, ‘*Quantum and semiclassical phase-space dynamics of a wave packet in strong fields using initial-value representations*’

<https://www.youtube.com/watch?v=jGynHjS7jDo>); around 400 views

**2019** UCL Department of Physics & Astronomy: Open day talks for offer holder international students

[https://www.youtube.com/watch?time\\_continue=4&v=MheKGDkKCgo&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=4&v=MheKGDkKCgo&feature=emb_logo); over 1000 views

**2019** „Unravelling the extreme: Matter in Intense Laser Fields and the Physics of Ultrashort Time Scales”

UCL Physics Inaugural Lecture disseminated by:

UCL media central: <https://mediacentral.ucl.ac.uk/Play/17393> (70 views)

UCL Quantum Science and Technology Institute YouTube channel:

[https://www.youtube.com/watch?time\\_continue=11&v=2y\\_oAZTY-Ac&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=11&v=2y_oAZTY-Ac&feature=emb_logo)

(146 views)

**2019** Video abstract about our research article H. Chomet et al, New J. Phys. **21**, 123004, ‘Quantum bridges in phase space: interference and nonclassicality in strong-field enhanced ionisation’

[https://www.youtube.com/watch?v=mF84PWKI2rU&feature=emb\\_logo](https://www.youtube.com/watch?v=mF84PWKI2rU&feature=emb_logo)); 44 views

**2020** Youtube channel for the conference Quantum Battles in Attoscience with conference videos and contributed clips

### Outreach talks and mentoring events

- |  |   |
|--|---|
| 2016<br>(24 <sup>th</sup> of November) | Café Scientifique, the King and Queen Pub, London<br>(event organized by the UCL Physics Society)<br>Talk: “Matter in Extreme Fields and the Physics of Ultrashort Time Scales”   |
| 2017<br>(31 <sup>st</sup> of March)    | Womxn in Physics, London (King’s College London; event organized by the KCL Women in STEM Society) – ‘Speed dating’   |
| 2017<br>(21 <sup>st</sup> of June)     | Conference for Astronomy and Physics Students (CAPS'17), (University College London) -- 'Physicist's Speed Dating'  |
| 2017<br>(July/August)                  | In2science: Speaking on behalf of UCL in physics outreach programmes targeted at outstanding students from underprivileged backgrounds.   |
| 2018<br>(February)                     | Outreach event organized by the charity TechGirls/UCLQuantum: “Matter in Extreme Fields and the Physics of Ultrashort Time Scales”<br><a href="#">I gave a talk about my research for GCSE female students aimed at getting more girls into science and programming</a> |
| 2018<br>(10 <sup>th</sup> of March)    | Keynote Speaker & Round Table Panellist, Brazilian Association of Postgraduate Students and Researchers in the  |

- United Kingdom (Abep-UK) 2018 Meeting. Topic: Working Globally.  
This is a conference organized by the Brazilian Association of Postgraduate Students and Researchers in the United Kingdom
- 2018  
(25<sup>th</sup> of June) Chair: Power Hour – Gordon Research Conference on Multiphoton Processes, Bryan University, Smithville, USA.  
This was a one-hour discussion on how to improve the conditions for Women in Science involving researchers from across the globe
- 2018  
(July/August) In2science: Speaking on behalf of UCL in physics outreach programmes targeted at outstanding students from underprivileged backgrounds.
- 2018  
(September) Taster Lecture, UCL Doctoral training Center in Quantum Technologies  
„Quantum Effects in Strong-Field and Attosecond Physics“
- 2018  
(November) Outreach event organized by the charity TechGirls/UCLQuantum: “Matter in Extreme Fields and the Physics of Ultrashort Time Scales”  
I gave a talk about my research for GCSE female students aimed at getting more girls into science and programming
- 2019  
(27<sup>th</sup> of February) Physics Inaugural Lecture  
„Unravelling the extreme: Matter in Intense Laser Fields and the Physics of Ultrashort Time Scales“
- 2019  
(November) Outreach event organized by the charity TechGirls/UCLQuantum: “Matter in Extreme Fields and the Physics of Ultrashort Time Scales”  
I gave a talk about my research for GCSE female students aimed at getting more girls into science and programming
- 2020  
(February) Womxn in Physics Conference – King’s College London  
Panellist: “the representation of women and non-binary people in physics”
- 2020  
(February) Invited Speaker – “Black role models in STEM”: “Matter in Extreme Fields and Ultrashort time Scales: The World Adventures of an Afrobeige Attoscientist”  
  
This was an event aimed at the Black community/Black STEM postgraduate students.
- 2020 (April) BQIT2020 – Virtual Conference  
Panellist: Equality and Diversity Panel  
  
This was an international conference with over 200 participants

2020 (May) Quantum Lunches – UCL Quantum Centre

Informal presentation about my work for members of the UCL Centre for Quantum Technologies

2020 (October) Panellist and invited speaker: “Black Other – race in the UK”  
Event organized by UoN BAME Staff Network for Black history month

### Open days

- 2007— present: Participation in the UCL Postgraduate Open Day – Atomic, Molecular, Optical and Positron Physics (AMOPP) Group, with several posters and talks every year.
- 2016 – 2018: UCL undergraduate open days (around three a year). This includes:
  1. Giving presentations targeted at prospective students and parents for around 200 people.
  2. Coordinating drop in sessions with undergraduate students and support staff
- 2016 – 2019: UCAS offer holder days (around 10 a year for an audience of ca 40 people). This includes:
  1. Giving presentations targeted at prospective students
  2. Chairing faculty sessions
  3. Giving lab demonstrations

### IOP Gallery – Inaugural Exhibition: Time-themed gallery show at the Institute of Physics (2017/2018)

I have provided scientific advice for an art installation to be placed at the new headquarters of the Institute of Physics on the topic of “Time”. This included:

- 30<sup>th</sup> of March 2017: Workshop on Time in Physics. This workshop brought together curators, artists and physicists working on several areas, and revolved around the question 'What is the most interesting contemporary research being conducted with regards to the physics of time and which a non-specialist audience would equally find engaging?' Its main objectives were to build a consensus amongst the IOP community regarding the starting point for the artist commission on the theme of time, and serve as a starting point for a science-art collaboration.
- Ranking and/or assessing the short-listed artists and their projects.
- Providing a long list of scientists interested in participating, across as many physics areas as possible.

### Other

- 2007 – : Maintenance of the website <http://www.homepages.ucl.ac.uk/~ucapcfi/>, in which the work of my research group is publicized.
- 2017 – : Maintenance of the Twitter page @CarlaFMFaria, in which I publicize the work of my research group, promote women and minorities in science and make political statements.



- 2020 – Maintenance of the Twitter page @quantumbattles associated with the conference Quantum Battles in Attoscience

## **Administrative roles**

### **Undergraduate Admissions Tutor – Physics and Astronomy -- University College London**

(October 2016 – September 2019)

**Please note:** An income of £ 9,174,747 stems from undergraduate admissions. This corresponds to 35% of the total income of the Physics Department.

#### **Job description:**

The undergraduate admissions tutor must:

- Review and maintain the application scoring template used by the UCL central admissions office for the initial processing of applications.
- Liaise with the office for the setting of thresholds for automatic offers and rejections.
- Manage the applications in the “gathered field” (i.e. not automatically rejected or made offers), keeping an eye on overall offer numbers and recommending offers in good time to populate departmental UCAS Open Days and complying with UCL and UCAS deadlines for the processing of applications.
- Work with the departmental admissions administrator regarding the format and timing of the departmental UCAS Open Days.
- Lead the departmental UCAS Open Days including presentations & demonstrations (around 10 open days from November to March).
- Handle special-case applications such as underage applicants and overseas applicants requesting a one-to-one discussion by phone (a few calls a week and a few e-mails a day).
- Keep the departmental admissions statistics up to date; use these to cross-check faculty offer targets and projected intake.
- Be present at UCL during A-level confirmation week in August, keeping a close eye on numbers, ranking near-miss candidates and deciding how many to accept.
- Respond to queries from potential applicants including visit requests, where these cannot be dealt with by the central UCL admissions office or the departmental admissions administrator (a few e-mails a day and around 10 live visits a year).
- Review and update where necessary the UCL offer conditions.
- Review and update where necessary the Physics & Astronomy entries in the UCL prospectus and other publicity material.
- Attend regular MAPS faculty admissions meetings, reporting on the performance of Physics & Astronomy.
- Report on undergraduate admissions matters to the DTC and departmental Staff Meetings.
- Represent UCL Physics & Astronomy at UCL-wide and University of London Open Days (around 4 a year during the summer).
- Coordinate where necessary with the outreach activities of the department.

#### **Please note:**

- 2016 was a particularly difficult and unpredictable year in terms of admissions due to Brexit and the UCL central admissions team being understaffed. Regardless, we

have been quite successful in terms of recruitment, with a final intake of ca 186 students from around 1200 applications.

- During this admissions cycle, I have introduced the following changes:
  - The admissions ranking was shifted away from the Personal Statement and References towards Qualifications. The previous criteria allocated 8/20 to qualifications and 12/20 to personal statements and references, while the new criteria give 16/23 to qualifications and 7/23 to personal statements and references. This was done closely with Central UCL Admissions and the Departmental Teaching Committee and included the use of studies and statistics such as those in the study “*Effect of A-level Further Maths grade on first year undergraduate performance*” by Dr Louise Dash.
  - The non-standard cases have been classified within specific patterns, so that I no longer need to assess them case-by-case. These patterns have been passed on to the UCL central admissions team in order to accelerate the processing of applications.

**Member of the UCL Departmental Teaching Committee** (October 2016 – September 2019)

For more information see <https://www.ucl.ac.uk/srs/academic-manual/policy-az/teaching-committees/dtcs>

**Member of the UCL Physics and Astronomy Equality & Diversity Committee**  
(October 2016 – September 2019)

**Chair of the UCL Women in Physics group**

(October 2019 – present)

The group is run by PhD students and PDRAs. My key responsibility is to oversee the group’s activities and budget. Ms Abbie Bray is the main coordinator.

## **Other**

### **Administrative Tasks**

<b>2003 – 2004</b>	Maintenance of the European Graduate College Homepage (Universität Hannover, Germany)
<b>2006</b>	Organization of the Mathematics Research Seminar Series (City University, London, UK)
<b>2008 – 2009</b>	Organization of the Atomic Physics Seminar Series (University College London, UK)
<b>2010</b>	Responsible for space allocation (AMOPP group – UCL)
<b>2008—present</b>	Interviewer of prospective PhD students and PDRA candidates University College London
<b>2013</b>	AMOPP seminar and colloquia organizer (University College London, UK)