

Guillermo Rein, PhD
Professor of Fire Science

September 2023

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1. Overview

I am Professor of Fire Science at the Department of Mechanical Engineering of Imperial College London, and Editor-in-Chief of the journal *Fire Technology*. I am Fellow of the Combustion Institute.

My research is centred in fire, heat transfer and combustion. My purpose of is to reduce the worldwide burden of accidental fires and protect people, their property, and the environment.

I created and continue leading the research group Imperial Hazelab where I have supervised 16 postdocs and graduated 24 PhD students, 11 of whom have become academics. I have been prolific at publishing my work in more than 200 journal papers (Google h-index 62) collecting over 11k citations.

I have been successful at winning competitive funding to support my research (>£6m), including a £1.7m Consolidator Grant from European Research Council. My work has been recognised internationally with a number of prizes (e.g. 2020 Research Excellence Award from the Combustion Institute, 2018 SFPE Guise Medal, 2016 Early Career Award from the International Wildland Fire Association). My research and scientific views have been featured in international media including *The Economist*, *Financial Times*, BBC, *New York Times*, *The Guardian*, and *Wired*.

2. Education

2003-2005 ... Ph.D. in Mechanical Engineering, University of California at Berkeley:
Computational Model of Forward and Opposed Smoldering Combustion with Improved Chemical Kinetics. Supervised by Prof Carlos Fernandez-Pello.
Sponsored by NASA Space Flight Program.
Thesis: <http://repositories.cdlib.org/cpl/fs/ReinPhD05>

2001-2003 ... M.Sc. in Mechanical Engineering, University of California at Berkeley.

1992-1999 ... *Ingeniero Industrial* in Mechanical Engineering, ICAI Universidad Pontificia Comillas, Madrid (Spain).

3. Professional Career

2017-present .. Professor of Fire Science, Department of Mechanical Engineering, Imperial College London.

2013-present ... Editor-in-Chief of *Fire Technology*, scientific journal by Springer Nature, NFPA and SFPE.

2023-present .. Visiting Professor, Department of Engineering, Kings College London.

2015-2017 ... Reader, Department of Mechanical Engineering, Imperial College London.

2012-2015.... Senior Lecturer, Department of Mechanical Engineering, Imperial College London.

2011-2012 ... Senior Lecturer in Mechanical Engineering, University of Edinburgh.

2010-2011 ... Senior Research Fellow of Royal Academy of Engineering and Leverhulme Trust, Institute of Infrastructure and Environment, University of Edinburgh.

2006-2011 ... Lecturer in Mechanical Engineering, University of Edinburgh.

2006..... Research Fellow, Institute of Infrastructure and Environment, University of Edinburgh.

- 1999-2001 ... Junior Research Fellow, Instituto de Investigación Tecnológica, ICAI Universidad Pontificia Comillas, Madrid.
- 1998-1999 ... Visiting student at the Department of Mechanical Engineering, University of Texas at Austin.
- 1996-1997 ... Engineering Intern at firms HEYMO Ingenieria, and Ericsson Spain.

4. Research

4.1 Overview of Funding

I have won in excess of £6 million in funds for my research from a range of scientific and industrial sponsors, including ERC EU (2015 Consolidator Grant), EPSRC UK, Arup UK, Leverhulme Trust UK, Innovate UK, Marie Skłodowska-Curie H2020 EU, HORIZON EU, RAEng UK, BASF Germany, NIST USA, NRC Canada, Research Council of Norway, CSC China, CERIB France, FM Global USA, BSEF Belgium, SFPE USA, NFPA USA, BRE UK and Met Office UK. Details are available upon request.

4.2 Most Important Career Recognitions

- 2022 **President's Awards for Excellence in Research**, Imperial College London.
- 2021 **Fellow of the Combustion Institute**. This lifetime honorific title is for members of the international combustion community elected by their peers as distinguished for outstanding contributions to research. The Combustion Institute is the largest international scientific society on combustion (over 5,200 members).
- 2020 **CI Research Excellence Award** for published excellent research papers that have had a major impact on the field of combustion science. Awarded by The Combustion Institute, the largest international scientific society on combustion (over 5,200 members).
- 2019 **FORUM Mid-Career Researcher Award** for exceptional achievement and demonstrated leadership in the fields of fire safety science and fire protection engineering. Awarded by FORUM, the group of directors of fire research organizations throughout the world.
- 2018 **SFPE Guise Medal** for eminent achievement in the advancement of the science and technology of fire protection engineering. Awarded by the Society of Fire Protection Engineers, the largest professional society representing fire engineers worldwide (over 5,000 members).
- 2017 **Collaborate to Innovate Prize** in the Built Environment for research with Arup on the structural fire-safe design of the Scalpel in London. Awarded by The Engineer, the UK technical magazine for engineers founded in 1856 covering the latest developments and business news.
- 2016 **IAWF Early Career Award for Excellence in Wildland Fire** for demonstrated outstanding ability in the field of wildfire science. Awarded by the International Association of Wildland Fire, the largest scientific and professional society on wildfires worldwide.
- 2016 **SFPE Peter Lund Award** for significant contributions to the advancement of the professional recognition of the fire protection engineer. Awarded by the Society of Fire Protection Engineers, the largest professional society representing fire engineers worldwide (over 5,000 members).
- 2009 **CI Hinshelwood Prize** for meritorious work in combustion by a younger scientist. Awarded by The British Section of The Combustion Institute, the best known British scientific society on combustion (over 120 British members).

4.3 Best Paper Awards and Best Project Awards

- 2022 **SFPE Best Fire Research Project** for a series of timber fire experiments with Arup, by the UK Chapter of Society of Fire Protection Engineering.

- 2021 **IOP Ricardo Award** for best UK paper contributing to the advancement of understanding of combustion at a fundamental level. Awarded by the Institute of Physics (IOP), the learned society for physics in the UK and Ireland (over 50,000 members). Paper: <https://doi.org/10.1071/WF16198>.
- 2018 **NFPA Research Foundation Medal** for the research project that best exemplifies the NFPA Foundation's fire safety mission, technical challenges overcome, and collaborative approach. Awarded by the *National Fire Protection Association*.
- 2017 **CI Sudgen Award** for the most significant UK paper in combustion. Awarded by The British Section of The Combustion Institute, the largest international scientific society on combustion (over 120 British members).
- 2015 **SFPE Best Fire Research Project** for work on travelling fires methodology for the structural design of modern buildings by the UK Chapter of Society of Fire Protection Engineering.
- 2013 **CI Distinguished Paper Award on Fire Research** at the 34th International Symposium on Combustion for our research paper on smouldering combustion. Awarded by The Combustion Institute, the largest international scientific society on combustion (over 5,200 members).
- 2011 **Lloyd's Science of Risk Prize in Technology** for the paper *The Influence of Travelling Fires on a Concrete Frame*.
- 2010 **Lloyd's Science of Risk Prize in Technology** for the paper *A Novel Multiscale Methodology for Simulating Tunnel Ventilation Flows during Fires*.
- 2009 **CI Distinguished Paper Award on Fire Research** at the 32nd International Symposium on Combustion for our paper the carbon emissions from peat fires. Awarded by The Combustion Institute, the largest international scientific society on combustion (over 5,200 members).
- 2007 **Bodycote Warrington Fire Research Prize** for best paper, The Institution of Fire Engineers for our paper on the Dalmarnock fire experiments.
- 2007 **FM Global Award** for best paper presented at the 5th International Seminar on Fire and Explosion Hazards for our paper on a-priori modelling predictions of the large-scale Dalmarnock fire experiments.

4.4 Other Prizes

- 2021 **Selected by IJWF Editors** as one of the 15 best reviews published in the past 12 years in the journal *International Journal of Wildland Fire*. Paper: <https://doi.org/10.1071/WF17084>.
- 2016 **Cover article** in journal *Bioresource Technology*, volume 207, issue May 2016 (for paper #72 in list of paper below).
- 2016 **Sentinels of Science Award** from Publons for being among the top 10% of peer reviewers worldwide.
- 2015 **SFPE Burns Memorial Research Grant** from Society of Fire Protection Engineering (USA) for *Fire Navigator - Forecasting fire dynamics in smart buildings*
- 2014 **IAFSS Best Photo Award** at the 11th Symposium on Fire Safety Science for Fire Watch Constellation.
- 2009 **15th Lord Ezra Award** for outstanding achievement in the study of combustion engineering, Combustion Engineering Association for developing the STAR smouldering technology for remediation of contaminated soils.

4.5 Overview of Publications

Together with my research group and collaborators, I have published 6 book chapters, 2 edited books, 200 journal papers and more than 250 conference communications. According to Google Scholar, my current h-index is 62 and citation count is over 11k. See detailed list of publications in [Google Scholar](#). ORCID publication account [0000-0001-7207-2685](https://orcid.org/0000-0001-7207-2685).

4.6 Most Important Contributions to Books (top 3)

- **Smouldering Combustion**, by G Rein, Chapter 19 in: SFPE Handbook of Fire Protection Engineering, 5th Edition, pp 581-603, Springer, 2016. doi: 10.1007/978-1-4939-2565-0_19. <http://hdl.handle.net/10044/1/41594>
- **Smouldering Fires and Natural Fuels**, by G Rein, Chapter 2 in: Fire Phenomena in the Earth System – An Interdisciplinary Approach to Fire Science, pp. 15–34, Belcher (editor). Wiley and Sons, 2013. ISBN 9780470657485. DOI: 10.1002/9781118529539.ch2. <http://hdl.handle.net/10044/1/28419>
- **The Dalmarnock Fire Tests: Experiments and Modelling**, Editors: Rein, Abecassis-Empis and Carvel, 221 pages, University of Edinburgh, 2007. ISBN 978-0955749704. <http://hdl.handle.net/1842/2037>

4.7 Most important Journal Papers (top 20 up to 2019)

- H Yuan, F Restuccia, F Richter, G Rein, A computational model to simulate self-heating ignition across scales, configurations, and coal origins, **Fuel** 236, pp. 1100-1109, 2019. <https://doi.org/10.1016/j.fuel.2018.09.065>
- F Richter, A Atreya, P Kotsovinos, The effect of chemical composition on the charring of wood across scales, **Proceedings of the Combustion Institute** 37 (3), 4053-4061, 2018. <https://doi.org/10.1016/j.proci.2018.06.080>
- Y Hu, N Fernandez-Anez, TEL Smith, G Rein, Review of emissions from smouldering peat fires and their contribution to regional haze episodes, **International Journal of Wildland Fire** 27(5), pp. 293-312, 2018. <https://doi.org/10.1071/WF17084>
- N Roenner, K Hutheesing, A Fergusson, G Rein, Simultaneous improvements in flammability and mechanical toughening of epoxy resins through nano-silica addition, *Fire Safety Journal* 91, pp. 200-207, 2017. doi:10.1016/j.firesaf.2017.03.010. <https://doi.org/10.1016/j.firesaf.2017.03.010>
- X. Huang, F Restuccia, M Gramola, G Rein, Experimental Study of the Formation and Collapse of an Overhang in the Surface Spread of Smouldering Peat Fires, **Combustion and Flame** 168, pp. 393-402, 2016. Winner of the 2017 **Sudgen Award**. <http://dx.doi.org/10.1016/j.combustflame.2016.01.017>
- I Vermesi, N Roenner, P Pironi, R Hadden, G Rein, Pyrolysis and Ignition of a Polymer by Transient Irradiation, **Combustion and Flame** 163, pp. 31-41, 2016. <http://dx.doi.org/doi:10.1016/j.combustflame.2015.08.006>
- E Rackauskaite, C Hamel, A Law, G Rein, Improved formulation of travelling fires and application to concrete and steel structures, **Structures** 3, pp. 250-260, 2015. doi: 10.1016/j.istruc.2015.06.001 <http://dx.doi.org/10.1016/j.istruc.2015.06.001>
- M Turetsky, B Benscoter, S Page, G Rein, GR van der Werf, A Watts, Global vulnerability of peatlands to fire and carbon loss, (invited progress paper), **Nature Geoscience** 8 (1), pp. 11-14, 2015. doi:10.1038/NGEO2325. <http://dx.doi.org/10.1038/NGEO2325>
- N Bal, G Rein, On the effect of inverse modelling and compensation effects in computational pyrolysis for fire scenarios, *Fire Safety Journal* 72, pp. 68-76, 2015. doi:10.1016/j.firesaf.2015.02.012. <http://dx.doi.org/10.1016/j.firesaf.2015.02.012>
- X Huang, G Rein, H Chen, Computational Smouldering Combustion: Predicting the Roles of Moisture and Inert Contents in Peat Wildfires, **Proceedings of the Combustion Institute** 35, pp. 2673-2681, 2015. doi:10.1016/j.proci.2014.05.048. <http://dx.doi.org/10.1016/j.proci.2014.05.048>
- R Hadden, G Rein, C Belcher, Study of the competing chemical reactions in the initiation and spread of smouldering combustion in peat, **Proceedings of the Combustion Institute** 34, pp. 2547-2553, 2013. doi:10.1016/j.proci.2012.05.060. (*Distinguished Paper Award on Fire Research*). <http://dx.doi.org/10.1016/j.proci.2012.05.060>
- J Stern-Gottfried, G Rein, Travelling Fires for Structural Design. Part II: Design Methodology, **Fire Safety Journal** 54, pp. 96-112, 2012. doi:10.1016/j.firesaf.2012.06.011. <http://dx.doi.org/10.1016/j.firesaf.2012.06.011>
- W Jahn, G Rein, JL Torero, Forecasting fire dynamics using inverse Computational Fluid Dynamics and Tangent Linearisation, **Advances in Engineering Software** 47 (2012) 114-126, 2011. doi:10.1016/j.advengsoft.2011.12.005. <http://dx.doi.org/10.1016/j.advengsoft.2011.12.005>
- N Bal, G Rein, Numerical Investigation of the Ignition Delay Time of a Translucent Solid at High Radiant Heat Fluxes, **Combustion and Flame** 158, pp. 1109-1116, 2011. doi:10.1016/j.combustflame.2010.10.014. <http://dx.doi.org/10.1016/j.combustflame.2010.10.014>

- G Rein, Smouldering Combustion Phenomena in Science and Technology, **International Review of Chemical Engineering** 1 (1), pp. 3-18, 2009. <http://hdl.handle.net/1842/2678>
- G Rein, JL Torero, W Jahn, J Stern-Gottfried, NL Ryder, S Desanghere, M Lazaro, F Mowrer, A Coles, D Joyeux, D Alvear, JA Capote, A Jowsey, C Abecassis-Empis, P Reszka, Round-Robin Study of a priori Modelling Predictions of The Dalmarnock Fire Test One, **Fire Safety Journal** 44 (4), pp. 590-602, 2009. doi: 10.1016/j.firesaf.2008.12.008 (*FM Global Award for Best Paper*). <http://hdl.handle.net/1842/2704>
- G Rein, S Cohen, A Simeoni, Carbon Emissions from Smouldering Peat in Shallow and Strong Fronts, Proceedings of the Combustion Institute 32 (2), pp. 2489-2496, 2009. doi:10.1016/j.proci.2008.07.008 (Distinguished Paper Award on Fire Research). <http://dx.doi.org/10.1016/j.proci.2008.07.008>
- G Rein, N Cleaver, C Ashton, P Pironi, JL Torero, The Severity of Smouldering Peat Fires and Damage to the Forest Soil, *Catena* 74 (3), pp. 304-309, 2008. doi:10.1016/j.catena.2008.05.008. <http://hdl.handle.net/1842/2480>
- G Rein, C Lautenberger, AC Fernandez-Pello, JL Torero, DL Urban, Application of Genetic Algorithms and Thermogravimetry to Determine the Kinetics of Polyurethane Foam in Smoldering Combustion, **Combustion and Flame** 146 (1-2), pp 95-108, 2006. doi:10.1016/j.combustflame.2006.04.013. <http://hdl.handle.net/1842/894>
- C Lautenberger, G Rein, AC Fernandez-Pello, The application of a genetic algorithm to estimate material properties for fire modeling from bench-scale fire test data, **Fire Safety Journal** 41 (3), pp. 204-214, 2006. doi:10.1016/j.firesaf.2005.12.004. <http://hdl.handle.net/1842/1778>

4.8 Patents

International Patent Cooperation Treaty Application, *Method and Apparatus for Remediating Contaminated Land by a Combustible Material* by JI Gerhard, JL Torero, P Pironi, C Switzer and G Rein, 2006. Ref. PCT/GB2006/004591 (Priority Date 10/12/2005). Issued patent US8132987 (Mar 13, 2012): <http://www.google.com/patents/US8132987>. Commercial license since 2010 to Geosyntec Consultants Inc.

4.9 Supervision of Students and Postdocs

I have supervised 16 postdocs and graduated 24 PhD students. Of all these researchers under his supervision, 11 have become academics.

PhD degree

- May 2010 **Wolfram Jahn**, Inverse modelling to forecast enclosure fire dynamics, University of Edinburgh. Funded by EU Alban Scholarship and BRE Trust. I was 1st supervisor. He is now Lecturer at Pontificia Universidad Católica de Chile. <http://hdl.handle.net/1842/3418>
- May 2010 **Francesco Colella**, Multiscale modelling of tunnel ventilation flows and fires, Politecnico di Torino. I was co-supervisor and had major contributions. Winner of 2014 ITA COSUF Award on safety of underground facilities and 2010 Lloyd's Science of Risk Prize in Technology. He is now Associate at Exponent Inc (USA). <http://hdl.handle.net/1842/3528>
- Jul 2011 **Jamie Stern-Gottfried**, Travelling fires in building design, University of Edinburgh. Funded by Arup. I was 1st supervisor. Recipient of the 2010 David B. Gratz Scholarship from NFPA. He is now Director of Brand Safety at InterContinental Hotels Group, Berlin. <http://hdl.handle.net/1842/5244>
- Oct 2011 **Rory Hadden**, Smouldering and self-sustaining reactions in solids, University of Edinburgh. Funded by EPSRC and IFiC. I was 1st supervisor. Winner of Distinguished Paper Award on Fire Research at the 34th International Symposium on Combustion. He is now Lecturer at the University of Edinburgh. <http://hdl.handle.net/1842/5587>
- Aug 2012 **Freddy Jervis**, Fire calorimetry and flammability of cellulosic materials: Pine needles, tree leaves and chipboard, University of Edinburgh. Funded by BRE

Trust. I was 1st supervisor. He is now Lecturer at the Universidad San Francisco de Quito (Ecuador).

<http://hdl.handle.net/1842/6406>

- Nov 2012 **Nicolas Bal**, Uncertainty and complexity in pyrolysis modelling, University of Edinburgh. Funded by BRE Trust. I was 1st supervisor. He is now Senior Engineer at Technip, Paris.
<http://hdl.handle.net/1842/6511>
- Dec 2015 **Xinyan Huang**, Fundamental study of smouldering combustion of peat in wildfires, Imperial College London. Funded by Exceptional Overseas Scholarship. I was 1st supervisor. Winner of the 2014 Qatar Petroleum Medal in Clean Fossil Fuels (Department of Chemical Engineering), and the 2016 Katopodis Prize (best thermofluids thesis in Mechanical Engineering). He is now Assistant Professor in Hong Kong Polytechnic University, China.
<http://hdl.handle.net/10044/1/30789>
- Oct 2017 **Egle Rackauskaite**, iTFM: improved travelling fires methodology for structural design and the effects on steel framed buildings, Imperial College London. Funded by EPSRC, Arup and SFPE. Winner of Best Fire Research Project by UK Chapter SFPE. I was 1st supervisor. She is now a fire engineer in Arup, London.
<http://hdl.handle.net/10044/1/52917>
- Feb 2018 **Francesco Restuccia**, Self-heating ignition of natural reactive porous media, Imperial College London. Funded by EPSRC. I was 1st supervisor. He is now a Lecturer in Engineering at Kings College London.
<http://hdl.handle.net/10044/1/58013>
- Mar 2018 **Izabella Vermesi**, Computational study of material fire behaviour under transient irradiation, Imperial College London. Funded by FM Global. I was 1st supervisor. She is now a fire engineer at Bureau Veritas, London.
<http://hdl.handle.net/10044/1/59140>
- Apr 2018 **Nils Roenner**, Heat Transfer Effects in Polymer Flame Retardancy, Imperial College London. Funded by BASF. I was 1st supervisor. He is now an engineer at BASF, Germany.
<http://hdl.handle.net/10044/1/69779>
- Sept 2019 ... **Yuqi Hu**, Experimental investigation of peat fire emissions and haze phenomena, Imperial College London. Funded by China Scholarship Council and ERC grant. I was 1st supervisor. Winner of the 2019 Katopodis Prize for best thermofluids thesis in Mechanical Engineering. He is now a senior fire scientist, China.
<http://hdl.handle.net/10044/1/74570>
- Dec 2019 **Franz Richter**, Computational pyrolysis of timber in fire, Imperial College London. Funded by EPSRC and Arup. I was 1st supervisor. Winner of the 2018 El-Shanawany Memorial Prize for best PhD student in Mechanical Engineering. He is now a postdoc at University of California, Berkeley.
- Dec 2020 **Eirik Christiansen**, Ignition of wildfires in permafrost soil, Imperial College London. Funded by ERC grant HAZE. I am 1st supervisor. Winner of the 2020 El-Shanawany Memorial Prize for best PhD student in Mechanical Engineering. He is now an engineer at Arup London.
- Dec 2020 **Han Yuan**, Computational Study of Self-heating Ignition and Smouldering Combustion of Carbon-rich Porous Media, Imperial College London. Funded by the President's Scholarship and ERC grant HAZE. I am 1st supervisor. He is now a postdoc in the Department of Mechanical Engineering.
- Feb 2021 **Matthew Bonner**, Fire safety optimisation of building façades, Imperial College London. Funded by EPSRC and Arup. I am 1st supervisor. Winner of the 2020 Student Scholar Prize for best student of fire engineering by Society of Fire Protection Engineers. He is a fire engineer at Trigon Fire Safety, London, UK.

- Feb 2021 **M Agung Santoso**, Smouldering combustion of peat and the transition to flaming, Imperial College London. Funded by scholarship from Indonesian Government. I was 1st supervisor. He is now an Assistant Professor at Universitas Indonesia.
- May 2021 **Mohammad Heidari**, Probabilistic methods and travelling fires in the structural design of buildings, Imperial College London. Funded by CERIB. I was 1st supervisor. He is an engineer at CERIB.
- Nov 2021 **Zhenwen Hu**, Computational study of the chemical pathways in self-heating ignition of large ensembles of Lithium-ion batteries, Imperial College London. Funded by China Scholarship Council. I was 1st supervisor. He is now an engineer at GM Research Labs in Shanghai, China.
- Nov 2021 **Xuanze He**, Computational and Experimental study of self-heating ignition of Lithium-ion batteries, Imperial College London. Funded by China Scholarship Council. I was 1st supervisor. He is now an research engineer at Apple Shanghai, China.
- May 2022 **Dwi J Purnomo**, Cellular automaton simulations of peat fires at the field scale, Imperial College London. Funded by department scholarship to best MSc student and Indonesian Government. I was 1st supervisor. He is now a postdoc at University of California Berkeley, USA.
- Oct 2022 **Benjamin Khoo**, Computational study of façade fires and cavities, Imperial College London. Funded by EPSRC and Arup. I was 1st supervisor. He is now a fire engineers at Arup London, UK.
- Oct 2022 **Wuquan Cui**, Experimental investigation of peat fire emissions, Imperial College London. Funded by ERC grant HAZE. I was 1st supervisor. He is now a postdoc at University of California Berkeley, USA.
- Oct 2023 **Simona Dossi**, Vulnerability of European rural houses to wildfires, Imperial College London. Funded by Horizon 2020 ITN Pyrolife. I was 1st supervisor. She is now a postoc at Universitat Politecnica de Catalunya, Spain.
- 2022(exp) ... **Edmund Ang**, Tunnel fires and the throttling effect, Imperial College London. Self-funded. I am 1st supervisor. He is an engineer at AECOM Sydney.
- 2023(exp) ... **Francesca Lugaresi**, Mechanical design of facades against fire, Imperial College London. Funded by EPSRC and Arup. I am 1st supervisor.
- 2023(exp) ... **Harry Mitchell**, Fire behaviour of exposed timber in large compartments, Imperial College London. Funded by EPSRC and Arup. I am 1st supervisor.
- 2024(exp) ... **Rikesh Amin**, Simulation of fire dynamics in timber buildings aided by artificial intelligence, Imperial College London. Funded by EPSRC and Arup. I am 1st supervisor.
- 2025(exp) ... **Nikolaos Kalogeropoulos**, Probabilistic Simulations of Wildfires for the Sate Evacuation of Rural Communities, Imperial College London. Funded by EPSRC. I am 1st supervisor.
- 2026(exp) ... **Alexander Castagna**, Multiscale Simulation of Timer Structures in Fire, Imperial College London. Funded by EPSRC and Arup. I am 1st supervisor.

Postdoctoral staff

- 2011-2012 ... **Dr Claire Belcher**, Postdoctoral staff at University of Edinburgh under my co-supervision. She was funded by her own Marie Currie Fellowship. She is now Professor at University of Exeter.
- 2012..... **Dr Rory Hadden**, Postdoctoral staff at Imperial College London under my supervision. He was funded by a Doctoral Prize Fellowship from EPSRC. He is now Senior Lecturer at University of Edinburgh.
- 2015-2016 ... **Dr Virginia Alonso**, Postdoctoral staff at Imperial College London under my supervision. She was funded by BSEF grant. She is now an engineer at AECOM Madrid.

- 2016-2018 ... **Dr Nieves Fernandez**, Postdoctoral staff at Imperial College London under co-supervision myself. She was funded by our grant from Research Council of Norway (EMRIS). She is now Associate Professor at Western Norway University of Applied Sciences.
- 2017-2018 ... **Dr Egle Rackauskaite**, Postdoctoral staff at Imperial College London under my supervision. She was funded by a Doctoral Prize Fellowship from EPSRC. She is now a fire engineer in Arup, London.
- 2017-2019 ... **Dr Francesco Restuccia**, Postdoctoral staff at Imperial College London under my supervision. He was funded by ERC grant. He is now a Lecturer in Engineering at Kings College London.
- 2018-2019 ... **Dr Guoxiang Zhao**, Postdoctoral staff at Imperial College London under my supervision. He is funded by ERC. He is now a fire engineer at Fire Surgery, London.
- 2018-2020 ... **Dr H Fahid Amin**, Postdoctoral staff at Imperial College London under my supervision. He is funded by ERC. He is now a lecturer in Mechanical Engineering at Teesside University, UK.
- 2019-2020 ... **Dr Franz Richter**, Postdoctoral staff at Imperial College London under my supervision. He is funded by Doctoral Prize Fellowship from EPSRC. He is now a postdoc at University of California Berkeley, USA.
- 2019-2020 ... **Dr Yuqi Hu**, Postdoctoral staff at Imperial College London under my supervision. He is funded by ERC. He is now a senior fire scientist, China.
- 2020-2021 ... **Dr Tatenda Nyazika**, Postdoctoral staff at Imperial College London under my supervision. He was funded by Innovate UK and Berkeley Group.
- 2020-2022 ... **Dr Matt Bonner**, Postdoctoral staff at Imperial College London under my supervision. He was funded by Berkeley Group.
- 2021-2022 ... **Dr M Agung Santoso**, Postdoctoral staff at Imperial College London under my supervision. He was funded by Leverhulme Centre for Wildfires, Environment and Society.
- 2023-2025 ... **Dr Carlos Walker-Ravena**, Postdoctoral staff at Imperial College London under my supervision. He is funded by Leverhulme Centre for Wildfires, Environment and Society.
- 2023-2025 ... **Dr Hafizha Mulyasih**, Postdoctoral staff at Imperial College London under my supervision. She is funded by Leverhulme Centre for Wildfires, Environment and Society.

5. Teaching

I am a motivated lecturer, enthusiastic about the education of the next generation of engineers. I have taught on a wide range of mechanical engineering topics from design and statics to energy, heat transfer, combustion, and fire science. My lectures have consistently received very good feedback in student satisfaction surveys in four institutions Imperial College London (ME and CE departments), University of Edinburgh, University of California at Berkeley and ETH Zurich.

I am committed to teaching through research. I have led two dozen undergraduate students to publish journal papers and present at international conferences.

I have substantial experience in academic tutoring and pastoral care as tutor of more than 115 undergraduate students and MSc students. I have coached undergraduate students and help them prepared to win important leadership awards from RAEng and BP.

5.1 Teaching Experience

2023-present .. Course leader of 4th year and MSc-level course **Combustion Safety and Fire Dynamics (IDX)**, Department of Mechanical Engineering, Imperial College London.

- 2020-present ... Lecturer of MSc-level course **Heat Transfer in Fire Engineering**, MAS Fire Safety Engineering, ETH Zurich.
- 2013-2022 ... Course leader of 2nd year course **Heat Transfer**, Department of Mechanical Engineering, Imperial College London.
- 2013-2022 ... Course leader of 4th year and MSc-level course **Combustion Science (IDX)**, Department of Mechanical Engineering, Imperial College London.
- 2015-2019 ... Co-course leader] and lecturer of MSc course **Structural Fire Engineering** in the Department of Civil Engineering, Imperial College London.
- 2014 Course leader and Lecturer of Summer course **Introduction to Combustion Science** for BSc and MSc students in Power Engineering at Beihang University, China.
- 2011-2012 ... Course leader and Lecturer of 4th year **Fire Dynamics**, Civil Engineering, University of Edinburgh.
- 2011-2012 ... Course leader and Lecturer of 2nd year **Thermodynamics**, Mechanical Engineering, University of Edinburgh.
- 2011-2012 ... Lecturer of 1st year **Energy Systems**, Mechanical Engineering, University of Edinburgh.
- 2007-2010 ... Course leader and Lecturer of 2nd year **Mechanical Engineering Design**, Mechanical Engineering, University of Edinburgh.
- 2007-2010 ... Lecturer of 2nd year **Introduction to Matlab** and 1st year **Introduction to Mechanical Engineering**, Mechanical Engineering, University of Edinburgh.
- 2002-2005 ... University of California at Berkeley, Department of Mechanical Engineering, Teaching Assistant of the undergraduate course ME140 **Combustion Processes**.

5.2 Guest Lecturer

- 2019 Lecture on fire dynamics, Combustion Summer School, University of Cambridge, UK.
- 2013 Lecture on smouldering combustion for MSc in Fire Protection Engineering at Ghent University, Belgium.
- 2012 Series of lectures on fire dynamics for MSc in Fire Protection Engineering at Universidad Pontificia de Comillas ICAI, Spain.
- 2011 1-week course on fire modelling for MSc students at Universitat Politècnica de Catalunya, Spain.

Lectures on fire dynamics at Training Schools for Young Researchers on fire and structures at 2013 COST Action TU0904 Naples, 2012 COST Action FP1404 Edinburgh and 2012 COST Action TU0904 Malta.

5.3 Excellence in Teaching

- 2015 to 2020 Excellent feedback (4.5 out of 5) from UG and MSc students for modules on heat transfer and on combustion at Imperial College London.
- 2020 Excellent feedback from MSc engineering students (4.5 out of 5) at ETH Zurich.
- 2019 Winner of President's Awards for Excellence in Research Supervision, Imperial College London.
- 2017 Award for *Best Lecturer* in ME 2nd year by the Mechanical Engineering Society.
- 2016 to 2021 Nominated for *Student Academic Choice Award* for Best Teaching by Imperial College Union.
- 2015 to 2016 Nominated for *Best Lecturer Award* by the Mechanical Engineering Society.
- 2009 to 2012 Nominated for Teaching Awards for *Best Director of Studies* (2011), *Best Lecturer* (2012, 2009) and *Best Course* (2012 and 2009) by the *Edinburgh University*

Students' Association. I was top 8 most nominated academic out of 100 at the School of Engineering of the University of Edinburgh.

2004 *Outstanding Graduate Student Instructor Award* at the University of California at Berkeley.

5.4 Outreach and Public Engagement

Organizer of the fire science booths at *Imperial Festival 2017*, *Imperial Festival 2018*, *New Scientist Live London 2018*, *Great Exhibition Road Festival 2019*, and *New Scientist Live London 2019*.

Speaker of Mechanical Engineering and Fire Engineering topics for Open Days, Summer Schools and Secondary Schools. For example, I was invited to talk at 2016 *Pint of Science London*, *Imperial Festival 2018* and 2019, 2019 Friends of Imperial, and *New Scientist Live 2019 London*.

Ambassador for the Queen Elizabeth Prize for Engineering, since 2017.

Founder and Chairman of the Media Committee at the School of Engineering, University of Edinburgh, 2012.

Dozens of appearances in international media (TV, print, radio and online) explaining wildfires and building fires to a very broad audience. See detailed list at the end of this document.

6. Departmental Administration Duties

2019-present. Founder and first Chairman of the Outreach and Societal Engagement Committee of the Department of Mechanical Engineering at Imperial College London.

2015-present. Academic Liaison of *Whitelaw Laboratories* in the City and Guilds Building (multiuser combustion labs).

2014-present. Member of the Management Board of the Grantham Institute for Climate Change and the Environment, and Departmental co-ordinator for the Science and Solutions for a Changing Planet (SSCP) Doctoral Training Partnership (NERC and Grantham Institute).

2014-2020. Year Organizer for ME2 undergraduate studies in Mechanical Engineering. This role gave me membership to the Course Committee; Student-Staff Liaison Committee; Special Circumstances Committee; and Pre-Board-of-Examiners.

7. Consultancy for Industry

Expert in fire accidents, fire technology and combustion science. I have been involved in more than 40 consultancies to industry in UK, France, Italy, Belgium and USA. For example, work included study of fire phenomena in residential settings (2017 Grenfell Tower Fire Inquiry), warehouses (2009 UK clothing retailer), car parks (2007 Lloydstraat in Rotterdam), airports (2006 Brussels Airport hangar) and oil & gas (passive thermal protection). Some of my industrial clients have been Jacobs Engineering, The Carbon Company, COWI, CERIB, Irish Fire and Rescue Service, Barlow Lyde & Gilbert, Kennedys, IFiC and BilCo.

I have also taught a dozen of short Professional Development Courses to engineers, architects, fire and rescue services, and forensic investigators.

8. External Professional Service

Current Editorial Positions

Editor-in-Chief of *Fire Technology* since 2013. This is the peer-reviewed journal of the *National Fire Protection Association* (NFPA) and the *Society of Fire Protection Engineering* (SFPE) published by Springer Nature.

Associate Editor of *Proceedings of the Combustion Institute*, 2013-2023.

Editorial Board member of *Safety Science*, since 2017.

Current Committee Memberships

Building Regulations Advisory Committee (BRAC, co-opted expert), UK Ministry of Housing, Communities and Local Government, since 2021.

Subcommittee on Research & Innovation of the Society of Fire Protection Engineers (SFPE), since 2016.

Science Advisory Council of North American Flame Retardant Alliance, American Chemistry Council, since 2015.

Previous Editorial Positions

Associate Editor of *Thermal and Mass Transport* section of *Frontiers in Mechanical Engineering*, 2016-2019.

Associate Editor of *Fire Technology*, 2010-2012.

Guest Editor of *Proceedings of the National Academy of Sciences* (PNAS), 2016.

Guest Editor of *Science of the Total Environment*, 2015-2016.

Guest Editor of *Journal of Loss Prevention in the Process Industries*, 2015-2016.

Guest Editor of *Fire Technology*, 2009-2010.

Editorial Board member of *Fire Safety Journal*, 2014-2017.

Editorial Board member of *Fire Technology*, 2009-2010.

Previous Committee Memberships

International Association for Fire Safety Science, 2011-2021.

British Standards Institution (BSI) revision panels for PD7974-1 and PD7974-3 "Application of fire safety engineering principles to the design of buildings", 2019.

Research Advisory Committee of the Fire Protection Research Foundation, National Fire Protection Association (NFPA), 2016-2020.

International Association of Wildland Fire, Board of Directors, 2014-2019.

British Section of the Combustion Institute, 2008 to 2014.

Institute of Physics, Combustion Group, 2009 to 2015.

Technical Panel to the review of the UK Furniture & Furnishings Regulations, Department for Business, Innovation and Skills, UK, 2016.

Fire Modelling Special Interest Group, Institution of Fire Engineers, 2011-2017.

European Network COST TU0604 "Integrated Fire Engineering and Response". Chairman of Fire Dynamics Working Group, 2011 to 2014. Previously (2010-2011), Vice-chairman.

Most Important Conference Committees

Chairman of Track 'Material Behavior in Fires', 9th *International Seminar on Fire and Explosion Hazards*, April 2019 in Saint-Petersburg.

Co-chairman of Colloquia Fire Research, *International Symposium on Combustion* by The Combustion Institute, for the editions 37th (Aug 2018 in Dublin) 36th (Aug 2014 in Seoul) and 35th (Aug 2014 in San Francisco).

Chairman of Track 'Material Behavior in Fires', 12th *International Symposium on Fire Safety Science* by IAFSS, July 2017 in Lund.

Organizer of the 5th *International Meeting of Fire Effects on Soil Properties*, July 2015 in Dublin.

Program Committee of SUPDET 2015 19th *Suppression, Detection and Signaling Research and Applications Symposium*, March 2015 in Orlando.

Programme Committee of *International Conference on Forest Fire Research*, Coimbra, for the editions 8th (Nov 2017), 7th (Nov 2014) and 6th (Nov 2010).

Co-chairman of Track 'Ignition and Flame Spread', 11th *International Symposium on Fire Safety Science* by IAFSS, Feb 2014 in New Zealand.

Organizing Committee of 13th *UK Heat Transfer Conference*, Sept 2013, London.

Organizer of Meeting of the *Combustion Group at the Institute of Physics*, "Emerging Combustion Technologies", Sep 2010 in Edinburgh.

Organizer of Spring meeting of *Combustion Institute British Section*, "Combustion Phenomena in Fire Science", April 2010 in Edinburgh.

Organizer of Mathematical Problems in Fire Safety Engineering, International Centre for Mathematical Sciences, Oct 2008 in Edinburgh.

Organizing Committee of *5th International Seminar on Fire and Explosion Hazards*, May 2007 in Edinburgh.

External Reviewer for Academic Promotions

University of Edinburgh, UK (x2)
University of Maryland, USA.
University of Michigan at Ann Arbor, USA.
Technical University of Denmark (DTU), Denmark.

9. External Ph.D. Examiner

2022 J Christensen, University of Edinburgh (UK).
2022 J Mejias, Politecnico di Milano (Italy).
2021 P Grasso, Coventry University (UK).
2019 Q Zhang, University of Manchester (UK).
2017 J McGonigal, Glasgow Caledonian University (UK).
2016 F Hewitt, University of Central Lancashire (UK).
2015 P Ayala, ICAI Universidad Pontificia de Comillas (Spain).
2014 D Pau, University of Canterbury (New Zealand).
2013 C Riera, Institut National des Sciences Appliquées de Rouen (France).
2013 A Gomez Moreno, Universidad de Jaen (Spain).
2012 P Giraldo, Universitat Politecnica de Catalunya (Spain).
2012 A Witkoski, University of Central Lancashire (UK).
2011 P Bartoli, Università di Corsica Pasquale Paoli (France).
2011 C Stoof, Wageningen University (Netherlands).
2011 P Caine, University of Leeds (UK).
2010 P Pereira, Universitat de Barcelona (Spain).
2010 Y Perez Ramirez, Universitat Politecnica de Catalunya (Spain).
2010 S Wasan, Ghent University (Belgium).
2009 C Gomez-Montes, Universidad Politecnica de Cartagena (Spain).
2009 P Espinosa Santos, Universidad de Cantabria (Spain).
2008 M Martins, (*rapporteur*) Universite de Toulouse (France).
2008 M Lazaro Urrutia, Universidad de Cantabria (Spain).
2007 A Ronza, Universitat Politecnica de Catalunya (Spain).

I have served as Internal Examiner for 16 PhD theses at Imperial College London and 8 PhD theses at the University of Edinburgh.

10. Current Membership in Professional Societies

Combustion Institute since 2001 (formerly Committee member of British Section).
Society of Fire Protection Engineers since 2006.
International Association of Fire Safety Science, lifetime member since 2005 (formerly elected Committee member).
International Association of Wildland Fire since 2008 (formerly member of Board of Directors).
European Geosciences Union, lifetime member, since 2008.

11. Keynote and Plenary Lectures (most important)

- 2019 *Forecasting Fire Dynamics* at 13th Conference on Performance-Based Codes and Fire Safety Design Methods, by Society Fire Protection Engineers, Malaga, May.
- 2018 *Smouldering Combustion in Science and Technology*, 3rd European Symposium of Fire Safety Science, Nancy, Sept.
- 2017 *Travelling Fires for Structural Design of Buildings*, at 2nd International Fire Safety Symposium, Naples, May
- 2017 *Fire Science and Engineering: Challenges of today and tomorrow* - Society Fire Protection Engineers Middle East Conference, Dubai, March.
- 2016 *Travelling Fires for Structural Design of Buildings* at 11th Conference on Performance-Based Codes and Fire Safety Design Methods, by Society Fire Protection Engineers, Warsaw, May.
- 2013 *Fate of Organic Matter and Pyrogenic Char in Smouldering Fires: when the soil burns to ash* - 4th International Meeting of Fire Effects on Soil Properties, Vilnius, July.
- 2012 *Numerical forecasting of fire dynamics: tomorrow's infrastructure protection* - Young Investigators Conference of the European Community on Computational Methods in Applied Sciences (ECCOMAS), Aveiro, April.
- 2010 *Smouldering fires in the Earth System* - 15th International Humic Substances Society Meeting, Tenerife, June.

12. Scientific Peer-Review

Reviewer of research proposals for funding agencies: EPSRC Engineering and Physical Sciences Research Council UK; NERC Natural Environment Research Council UK; Research Council of Norway; ANR French National Research Agency; Research Programme at Ghent University; CONICYT National Council for Scientific Research and Technology of Chile; MINECO Ministry of Economy and Finance of Spain.

Regular Peer reviewer of manuscripts (selected journals): Combustion and Flame; Proceedings of the Combustion Institute; Fuel; Fire Safety Journal; Fire and Materials; International Journal of Wildland Fire; Combustion Science and Technology; International Journal of Thermal Sciences; Experimental Thermal and Fluid Science; Applied Thermal Engineering; Thermal Science Journal; Philosophical Transactions of the Royal Society; Environmental Science and Technology.

13. Featured in Media (last updated in 2020)

I think that science outreach to citizens and communicating with them via mass media are important aspects of my role as scholar. My views and research have been featured dozens of times in international media (TV, print, radio and online) where I explain wildfires and building fires to a very broad audience.

Most Important Media Appearances: *The Economist* (2019), *Financial Times* (2020, 2019, 2014), *New York Times* (2019 x2, 2017, 2010), *Wired* (2020, 2019, 2013), *The Guardian* (2020, 2019, 2018), *The Times* (2020, 2019), *National Geographics* (2020), *BBC News* (2019, 2017), *New Scientist* (2019), *Scientific American* (2016), *Engineering-News Record* (2013).

TV: BBC Two Newsnight (2017); Channel 5 "The Great Fire of London: In Real Time" (2017), Channel 4 USA "Titanic: The New Evidence" (2017), Sky News (2015).

Radio: BBC Somerset (2020), BBC Radio 4 *Inside Science* (2019, 2014), BBC Wales (2019, 2011), BBC World Service *Click* (2016), BBC Wales (2016), BBC Radio 4 *Material World* (2013), LBC 97.3 London (2011 x2), BBC Scotland (2010), *Radio Forth 2* (2010), *Radio Exterior de España* (2010) and *Cadena SER Ciudad Real* (2010).

Book: *Titanic: why she collided, why she sank, why she should never have sailed* by Senan Molony (2019), *The Science of Game of Thrones* by Helen Keen (2016).

Other Media: *CBC Canada* (2020), *Deutsche Welle* (2020), *EOS* (2020), *Mother Jones* (2020), *EU Hozizon* (2019), *La Vanguardia* (2019, 2017), *Glasgow Live* (2019), *E&T Magazine* (2019), *Manchester Evening News* (2018), *The Londonist* (2018), *The Telegraph* (2018), *New Statesman* (2018), *Smithsonian Channel* (2017), *Evening Standard* (2017), *The Engineer* (2017, 2014, 2010), *BBC Mundo* (2017), *ENSIA* (2016), *FiveThirtyEight* (2016), *Daily Mail* (2015, 2014), *Imperial Podcast* (2015 x2), *iflscience.com* (2015) (>27,200 likes, 900 comments), *news.sciencemag.org* (2014), *Daily Telegraph* (2014), *Institute of Mechanical Engineers* (2014), *Chemical and Engineering News* (2013), *The Herald* (2013, 2010), *American Geophysical Union* (2013), *European Geoscience Union Geolog* (2012), *Science et Vie* (2011), *The Scotsman* (2011, 2010x2), *El Pais* (2010 and 2007), *Associate Press* (2010), *Metro* (2010), *DotEarth NYT.com* (2010), *The Independent* (2010), *Xinhuanet* (2010), *Physorg.com* (2010), *sciencedaily.com* (2010), *Nature Geoscience* (2010), *The International Herald Tribune* (2010), *Agencia EFE* (2010, 2009x3), *Lanza* (2010), *Edinburgh University Science Magazine* (2009), *El Mundo* (2007 x2), *Lloyd's List* (2007).