

## Dr Antonis (Antony) Vamvakarios

Address: 15 Church Lane, Oxford, OX3 0NZ, United Kingdom. Email: antonyvam@gmail.com

My research focuses on the development of computational tools and deep learning algorithms to process multi-dimensional and multi-modal data from functional materials and devices, like catalysts and batteries (*in situ/ operando* experiments). I developed the open source [nDTomo](#) software for handling chemical imaging data as well as deep learning approaches for [ultra-fast analysis of large diffraction datasets](#), [CT image reconstruction](#) and [CT artefact reduction](#). I created the [Battery Imaging Library](#), the first open access multi-modal multi-length scale imaging database. I have co-authored ca. 40 publications (h index 27) in peer reviewed journals and 2 book chapters, including >25 being either first (10), second (13), corresponding (16) or last author (5). My development work on X-ray diffraction computed tomography has played a pivotal role in our team winning the prestigious Royal Society of Chemistry Analytical Science Horizon Prize 2023 (Sir George Stokes Prize): "[The XRD-CT Pioneers](#)". Much of my research has been highlighted by the ESRF and DESY synchrotrons.

## WORK EXPERIENCE

- Nov 2022 - present: **Royal Society Industry Fellow, Dyson School of Design Engineering, Imperial College London**
  - Developing novel deep learning methods for accelerating chemical imaging and tomography
  - Guest lecturer delivering “Engineering Mathematics” undergraduate module at the Dyson School of Design Engineering
  - Guest lecturer delivering “Multi-scale 3D analysis” at the Institute for Molecular Science and Engineering for Master’s students
  - Supervising PhD and 4th year MEng undergraduate students
- Feb 2021 - present: **Research & Development Lead Scientist, Finden Ltd.**  
May 2017 - Feb 2021: **Research Scientist, Finden Ltd.**
  - R&D solutions for clients: Delivering materials characterisation and machine learning solutions for industry and UK government agencies
  - Inhouse R&D: Development of algorithms and machine learning approaches for applications in imaging and spectroscopy/ diffraction
  - Leading Finden’s scientific computing and AI team
  - Main lecturer and designer of Finden’s “Chemical Imaging and Tomography” training course for industry and academia
  - Leading research grant applications as well as performing the technical work and delivering research and development projects, including the following awarded projects: 5x UKRI [A4I](#) (£469,000), 4x UKRI [Harwell Cross-Cluster Proof of Concept](#) (£302,000), 1x [AI3SD](#) (£43,000)
- Jan 2019 - Jan 2021: **Honorary Research Fellow, Dept. of Chemistry, University College London**
  - Development of a new chemical tomography reconstruction algorithm, termed [Direct Least-Squares Reconstruction](#) algorithm, that overcomes the parallax problem in diffraction/scattering tomography data. I used this algorithm to analyse experimental data of industry-relevant samples, such as [PEM fuel cells](#) and [Li-ion batteries](#).
- May 2017-Jan 2019: **Postdoctoral Scientist, European Synchrotron Radiation Facility (ESRF)**
  - Development of the [nDTomo](#) software for tomographic image reconstruction and real-time visualisation of chemical tomography data
  - Materials characterisation scientific consultant for [Memere](#) (5.5M€ EU Horizon 2020 project)

## EDUCATION

- 2013-2017: **Doctor of Philosophy (PhD) in Chemistry**, University College London, United Kingdom  
Thesis: “Operando chemical tomography of packed bed and membrane reactors for methane processing”.
- 2012-2013: **Master of Science (MSc) in Chemical Process Engineering**, University College London, United Kingdom (Distinction)  
Thesis: “Measuring tortuosity in porous media used in fuel cells”.
- 2006-2012: **Master of Engineering (MEng) in Chemical Engineering**, University of Patras, Greece  
Thesis: “Catalytic steam reforming of diesel for the production of hydrogen”.

## RESEARCH GRANTS

In the past five years, I have secured ca. **£815,000** in UKRI funding through competitive, peer-reviewed grant proposals, in addition to **£100,000** from a four-year Royal Society Industry Fellowship, supporting my research at the intersection of machine learning and chemical imaging:

- Principal investigator and technical lead of an awarded UKRI A4I proposal (ca. £50,000) on addressing beam hardening and photon starvation in micro-computed tomography (July - September 2025 project)
- Principal investigator and technical lead of an awarded UKRI proposal (ca. £95,000) from Harwell and Sci-Tech Daresbury Campus Cross-Cluster for data fusion of multi-modal imaging data using generative AI (January - March 2025 project)
- Principal investigator and technical lead of an awarded UKRI proposal (ca. £85,000) from Harwell and Sci-Tech Daresbury Campus Cross-Cluster for quantum computing for X-ray diffraction data (January - April 2024 project)
- Principal investigator and technical lead of an awarded UKRI A4I proposal (ca. £50,000) on denoising of chemical imaging and tomography data (January - April 2023 project)
- Royal Society Industry Fellowship (ca. £100,000) on developing novel machine learning methods for accelerating chemical imaging methods
- Principal investigator and technical lead of an awarded proposal (ca. £62,000) from Harwell and Sci-Tech Daresbury Campus Cross-Cluster for accelerating neutron tomography data with applied deep learning approaches (January - April 2022 project)
- Principal investigator and technical lead of an awarded UKRI A4I proposal (ca. £50,000) for chemical image segmentation (January - April 2022 project)
- Co-investigator and technical lead of an awarded proposal (£60,000) from Harwell and Sci-Tech Daresbury Campus Cross-Cluster for developing super-resolution neural networks for neutron tomography data (January - April 2021 project)
- Co-investigator and technical lead of two awarded UKRI A4I proposals, one on phase identification in chemical imaging using artificial intelligence (£125K) and one on enabling chemical tomography of large objects (£142K) (March 2020 - April 2021 projects) and a UKRI continuity grant (£52,000) for these two projects
- Co-investigator and technical lead of an awarded AI3SD proposal (£43,000 project) on the development of neural networks for super-resolution in chemical tomography data (March - November 2020 project)
- Co-author on >20 proposals awarded beamtime at synchrotron facilities
- My academic work was integral to the successful application for a 5.5 Million Euro Horizon 2020 project (duration: 2015-2020): *Memere – Methane activation via integrated membrane reactors*

## HONOURS & AWARDS

- Royal Society of Chemistry 2023 Analytical Science Horizon Prize: [Sir George Stokes Prize](#) - "The XRD-CT Pioneers":  
<https://www.rsc.org/prizes-funding/prizes/2023-winners/the-xrd-ct-pioneers/>
- Best poster prize at the Heterogeneous Catalysts for Sustainable Industry event, Royal Society of Chemistry (2019)
- [Clark Prize](#) for best PhD presentation in Inorganic Chemistry, Department of Chemistry, UCL (2016)
- Best oral presentation at the 12<sup>th</sup> International Conference on Catalysis in Membrane Reactors (2015)

## SUPERVISION

- November 2022 - November 2026: Second supervisor to PhD student Ronan Docherty (Dyson School of Design Engineering, Imperial College London)
- January 2024 - December 2025: Synchrotron experiments supervisor to PhD students Sam Riley and John Morley (Dyson School of Design Engineering, Imperial College London)
- January 2020 - November 2023 (completed): Industrial and day-to-day supervisor to PhD student Hongyang Dong (Department of Chemistry , University College London)
- November 2022 - May 2023: Second supervisor to MEng student George Gunn (Dyson School of Design Engineering, Imperial College London)
- June - September 2022: Supervisor to undergraduate student Kenan Dokonon (Imperial College London) during his Faraday Institution FUSE internship at Finden Ltd
- July - September 2020: Industrial supervisor to undergraduate student Robert Emberson (Department of Mathematics & Statistics, Lancaster University) during his summer internship at Finden Ltd

## DIGITAL CHEMISTRY PUBLISHED CODE & SOFTWARE

- [nDTomo](#): Python scripts and GUIs for handling and analysing X-ray chemical tomography data.
- [BIL](#): Python notebooks for handling multi-modal data present in the Battery Imaging Library.
- [SAMBA](#): Deep learning based trainable segmentation tool for materials science.
- [HR-Dv2](#): Extracting high-resolution DINOv2 features for materials segmentation.
- [Vulture](#): Convolutional feature upsampling for materials micrograph segmentation.
- [SD2I](#): The Single Digit to Image (SD2I) tensorflow-based CT image reconstruction tool.
- [super-resolution-ml](#): Neural networks to reconstruct and enhance X-ray tomographic data.

## RESEARCH HIGHLIGHTED BY SYNCHROTRONS:

1. "[Artificial intelligence for self-supervised tomographic image reconstruction](#)", DESY Photon Science 2023 - Highlights and Annual Report
2. "[Revealing lithium distribution heterogeneities in a commercial 18650 NCA Li-ion battery during early cycling with X-ray diffraction tomography](#)", ESRF Highlights 2022
3. "[Mapping heterogeneous ageing inside operational hydrogen fuel cells](#)", ESRF Highlights 2021
4. "[Revealing the impact of high temperature pre-treatment on catalyst performance with operando XRD-CT](#)", ESRF Highlights 2021
5. "[Mapping heterogeneous ageing inside operational hydrogen fuel cells](#)", ESRF Spotlight on Science, 2021

6. “[Spatially quantifying crystallographic heterogeneities in operating Li-ion electrodes](#)”, ESRF Spotlight on Science, 2020
7. “[Characterisation of next-generation shaped porous materials](#)”, ESRF Highlights 2020
8. “[CO<sub>2</sub> adsorption by 3D printed metal organic framework](#)”, Catalysis and Chemistry, ESRF Industry Application and Case Studies, 2020
9. “[Spatially resolving lithiation in lithium-ion composite electrodes](#)”, ESRF Highlights 2019
10. “[Operando imaging of a methane-reforming catalyst bed](#)”, ESRF Highlights 2019
11. “[Real-time characterisation of ceramic fuel cells using xrd-ct](#)”, ESRF Highlights 2019
12. “[Spatially resolving the state of charge in Li-ion electrodes](#)”, ESRF Spotlight on Science, 2019
13. “[Real-time characterisation of a new miniature-honeycomb fuel cell shows its outstanding properties](#)”, ESRF General News, 02/04/2019
14. “[Real-time characterisation of a solid oxide fuel cell](#)”, Renewable energy and energy storage, ESRF Industry Application and Case Studies, 2019
15. “[Operando imaging of a methane-reforming catalyst bed](#)”, ESRF Spotlight on Science, 2019
16. “Catching catalysis in action”, A. Vamvakeros and S. D. M. Jacques, ESRF News, No. 72, 2016

## SCIENCE DISSEMINATION ACTIVITIES

- Founding member of the Greek Synchrotron User Network (2022) and member of the core team of Greek scientists and academics leading a national effort to make Greece an ESRF member country:
  - Leading the communications between the network and Greek industry; responsible for acquiring support letters from Greek companies and relevant organisations
  - Promoting the network's initiative and synchrotron-related scientific research in social media (Twitter, Linkedin and Facebook)
  - Developing and updating the dedicated website for this initiative: <https://www.esrf.gr/>
- Invited talk “From catalysis to deep learning: Journey of a chemical engineer” for undergraduate and postgraduate students during the Careers & Employability Conference, organised by the Chemical & Biological Engineering Department at the University of Sheffield (October 2021)
  - 1-1 appointments with undergraduate students acting as a mentor from industry

## PUBLICATIONS

Underlined when corresponding author (\* equally contributing first author):

1. “Upsampling DINOv2 features for unsupervised vision tasks and weakly supervised materials segmentation”, **Advanced Intelligence Systems**, R. Docherty, A. Vamvakeros and S. J. Cooper, 2025
2. “nDTomo: A Modular Python Toolkit for X-ray Chemical Imaging and Tomography”, A. Vamvakeros et al., **RSC Digital Discovery**, 4, 2579-2592, 2025
3. “Rationalising deactivation behaviour in pyrochlore-type CeO<sub>2</sub>-ZrO<sub>2</sub> oxygen storage catalysts using multimodal nano XRF-CT, XRD-CT and S3DXRD”, Y. Odarchenko, A. Vamvakeros *et al.*, **Chemistry-Methods**, 2025

4. "Obtaining parallax-free X-ray powder diffraction computed tomography data with a self-supervised neural network", H. Dong, ... A. Vamvakeros, **npj Computational Materials**, 10 (1), 201, 2024
5. "SAMBA: A Trainable Segmentation Web-App with Smart Labelling", R. Docherty *et al.*, **Journal of Open Source Software**, 9 (98), 6159, 2024
6. "Chemical Imaging of Carbide Formation and Its Effect on Alcohol Selectivity in Fischer Tropsch Synthesis on Mn-Doped Co/TiO<sub>2</sub> Pellets", D. Farooq *et al.*, **ACS Catalysis**, 14, 12269-12281, 2024
7. "A scalable neural network architecture for self-supervised tomographic image reconstruction", H. Dong, ... A. Vamvakeros, **RSC Digital Discovery**, 2 (4), 967-980, 2023
8. "A multi-scale study of 3D printed Co-Al<sub>2</sub>O<sub>3</sub> catalyst monoliths versus spheres", C. Jacquot, A. Vamvakeros *et al.*, **Chemical Engineering Journal Advances**, 16, 100538, 2023
9. "Recent developments in X-ray diffraction/scattering computed tomography for materials science", N.E. Omori, A.D. Bobitan, A. Vamvakeros *et al.*, **Philosophical Transactions of the Royal Society A**, 381 (2259), 20220350, 2023
10. "Emerging chemical heterogeneities in a commercial 18650 NCA Li-ion battery during early cycling revealed by synchrotron X-ray diffraction tomography", D. Matras, ... A. Vamvakeros, **Journal of Power Sources**, 539, 231589, 2022
11. "μ-CT Investigation into the Impact of a Fuel-Borne Catalyst Additive on the Filtration Efficiency and Backpressure of Gasoline Particulate Filters", S.W.T. Price, A Vamvakeros *et al.*, **SAE International Journal of Fuels and Lubricants**, 15 (04-15-02-0006), 121-136, 2022
12. "Cycling Rate-Induced Spatially-Resolved Heterogeneities in Commercial Cylindrical Li-Ion Batteries", A. Vamvakeros *et al.*, **Small Methods**, 2100512, 2021
13. "Imaging heterogeneous electrocatalyst stability and decoupling degradation mechanisms in operating hydrogen fuel cells", I. Martens, A. Vamvakeros *et al.*, **ACS Energy Letters**, 6 (8), 2742-2749, 2021
14. "A deep convolutional neural network for real-time full profile analysis of big powder diffraction data", H. Dong ... A. Vamvakeros, **Nature (NPJ) Computational Materials**, 2021
15. "Multi-length Scale 5D Diffraction Imaging of Ni-Pd/CeO<sub>2</sub>-ZrO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> Catalyst during Partial Oxidation of Methane", D. Matras, A. Vamvakeros *et al.*, **Journal of Materials Chemistry A**, 9, 11331-11346, 2021
16. "Multi-Scale Studies of 3D Printed Mn–Na–W/SiO<sub>2</sub> Catalyst for Oxidative Coupling of Methane", T. Karsten *et al.*, **Catalysts**, 11 (3), 290, 2021
17. "Real-time multi-length scale chemical tomography of fixed bed reactors during the oxidative coupling of methane reaction", A. Vamvakeros *et al.*, **Journal of Catalysis**, 386, 39-52, 2020
18. "DLSR: a solution to the parallax artefact in X-ray diffraction computed tomography data", A. Vamvakeros *et al.*, **Journal of Applied Crystallography**, 53, 1531-1541, 2020

19. "Spatial quantification of dynamic inter and intra particle crystallographic heterogeneities within operating lithium ion electrodes", D.P. Finegan, A. Vamvakeros\* *et al.*, **Nature Communications**, 11 (1), 1-11, 2020
20. "Real-time tomographic diffraction imaging of catalytic membrane reactors for the oxidative coupling of methane", A. Vamvakeros *et al.*, **Catalysis Today**, 2020
21. "The Detection of Monoclinic Zirconia and Non-Uniform 3D Crystallographic Strain in a Re-Oxidized Ni-YSZ Solid Oxide Fuel Cell Anode", T.M.M. Heenan, A. Vamvakeros *et al.*, **Crystals**, 10 (10), 941, 2020
22. "Exploring Cycling Induced Crystallographic Change in NMC with X-ray Diffraction Computed Tomography", S. R. Daemi, C. Tan, A. Vamvakeros *et al.*, **Physical Chemistry Chemical Physics**, 22 (32), 17814-1782, 2020
23. "In situ X-ray diffraction computed tomography studies examining the thermal and chemical stabilities of working Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>0.8</sub>Fe<sub>0.2</sub>O<sub>3-δ</sub> membranes during oxidative coupling of methane", D. Matras, A. Vamvakeros *et al.*, **Physical Chemistry Chemical Physics** 22 (34), 18964-18975, 2020
24. "Effect of thermal treatment on the activity of Na-Mn-W/SiO<sub>2</sub> Catalyst for the Oxidative Coupling of Methane", D. Matras, A. Vamvakeros *et al.*, **Faraday Discussions**, 2020
25. "ID15A at the ESRF, a beamline for high speed operando X-ray diffraction, diffraction tomography, and total scattering", G. B. M. Vaughan *et al.*, **Journal of Synchrotron Radiation**, 27 (2), 2020
26. "Multiscale investigation of adsorption properties of novel 3D printed UTSA-16 structures", C.A. Grande *et al.*, **Chemical Engineering Journal**, 402, 126166, 2020
27. "Design of next-generation ceramic fuel cells and real-time characterization with synchrotron X-ray diffraction computed tomography" T. Li, ... A. Vamvakeros and K. Li, **Nature Communications**, 10, 1497, 2019
28. "X-ray transparent proton-exchange membrane fuel cell design for in situ wide and small angle scattering tomography", I. Martens, A. Vamvakeros *et al.*, **Journal of Power Sources**, 437, 226906, 2019
29. "3D printed Ni/Al<sub>2</sub>O<sub>3</sub> based catalysts for CO<sub>2</sub> methanation - a comparative and operando XRD-CT study", V. Middelkoop, A. Vamvakeros *et al.*, **Journal of CO<sub>2</sub> Utilization**, 33, 478-487, 2019
30. "Sustainable iron-based oxygen carriers for hydrogen production – Real-time operando investigation", Y. De Vos, A. Vamvakeros *et al.*, **International Journal of Greenhouse Gas Control**, 88, 393-402, 2019
31. "Spatially Resolving Lithiation in Silicon–Graphite Composite Electrodes via in Situ High-Energy X-ray Diffraction Computed Tomography", D. P. Finegan, A. Vamvakeros *et al.*, **Nano Letters**, 19, 3811-3820, 2019
32. "Operando and Postreaction Diffraction Imaging of the La–Sr/CaO Catalyst in the Oxidative

- Coupling of Methane Reaction" D. Matras *et al.*, **Journal of Physical Chemistry C**, 123, 1751-1760, 2019
- 33. "5D operando tomographic diffraction imaging of a catalyst bed" A. Vamvakeros et al., **Nature Communications**, 9, 4751, 2018
  - 34. "X-ray physico-chemical imaging during activation of cobalt-based Fischer–Tropsch synthesis catalysts", A. M. Beale *et al.*, **Philosophical Transactions of the Royal Society A**, 376, 2018.
  - 35. "Chemical imaging of Fischer-Tropsch catalysts under operating conditions", S. W. T. Price *et al.*, **Science Advances**, 49, 2017
  - 36. "Real-Time Scattering-Contrast Imaging of a Supported Cobalt-Based Catalyst Body during Activation and Fischer–Tropsch Synthesis Revealing Spatial Dependence of Particle Size and Phase on Catalytic Properties", P. Senecal *et al.*, **ACS Catalysis**, 7, 2284–2293, 2017
  - 37. "Interlaced X-ray diffraction computed tomography", A. Vamvakeros *et al.*, **Journal of Applied Crystallography**, 49, 485-496, 2016
  - 38. "Removing multiple outliers and single-crystal artefacts from X-ray diffraction computed tomography data", A. Vamvakeros et al., **Journal of Applied Crystallography**, 48, 1943-1955, 2015
  - 39. "Real time chemical imaging of a working catalytic membrane reactor during oxidative coupling of methane", A. Vamvakeros *et al.*, **Chemical Communications**, 51, 12752-12755, 2015

## BOOK CHAPTERS

- 1. D. Matras, A. Vamvakeros, S. D. M. Jacques, A. M. Beale, "Case Studies: Mapping Using X-Ray Absorption Spectroscopy (XAS) and Scattering Methods" chapter in "Springer Handbook of Advanced Catalyst Characterization", Publisher: Springer, 05/2023
- 2. D. Matras, J. Pritchard, A. Vamvakeros, S. D. M. Jacques, A. M. Beale, "Tomography in catalysts design" chapter in "Heterogeneous Catalysts: Emerging Techniques for Design, Characterization and Applications", Publisher: Wiley-VCH, 16/12/2020

## PREPRINTS

- 1. "Battery Imaging Library: Multi-length scale and multi-modal synchrotron and laboratory battery imaging data for all", R. Docherty,... A. Vamvakeros, chemrxiv, 2025
- 2. "Maybe you don't need a U-Net: convolutional feature upsampling for materials micrograph segmentation", R. Docherty, A. Vamvakeros and S. J. Cooper, arXiv:2508.21529, 2025
- 3. "BeamStop: A software for analysing chemical imaging and tomography data", H. Dong,... A. Vamvakeros, DOI: 10.26434/chemrxiv-2025-m1v5v, 2025

## UNDER REVIEW

1. "Maybe you don't need a U-Net: convolutional feature upsampling for materials micrograph segmentation", R. Docherty, A. Vamvakeros and S. J. Cooper
2. "Mn-Promoted Co/TiO<sub>2</sub> Catalysts: Quantitative Analysis of Cobalt Polymorphs and Stacking Faults and its Effect on Fischer–Tropsch Synthesis Performance", D. Farooq *et al.*
3. "3D Printed Bimetallic Electrodes for Optimized Electrochemical Oxidation from Batch to Flow cell: Multiscale Study", A. Massaro *et al.*
4. "Shaping up: probing electrochemical performance dependence on particle alignment and packing in Ni-rich cathodes", N. N. Anthonisamy *et al.*
5. "Acute Deformation Characteristics of both Standard and Mechanically Flexible Li ion Battery Electrodes", S. Riley, A. Vamvakeros *et al.*
6. "A Fit of Peak: The Dangers of Using Generative Methods when Processing Scientific Data", R. Song *et al.*
7. "Operando state-of-charge and phase mapping within an NMC811 electrode taken to high voltage", T.M.M. Heenan *et al.*
8. "An X-ray diffraction computed tomography study determining failure mechanisms in industrial Cu/ZnO/Al<sub>2</sub>O<sub>3</sub>(-Cs<sub>2</sub>O) Water-Gas Shift catalysts", S. Stockenhuber *et al.*

## CONFERENCES & SEMINARS

### Invited speaker

1. Opportunities and Challenges of FAIR Data at Photon and Neutron Facilities (10/2025, Physikzentrum of the German Physical Society, Bad Honnef, Germany)
2. ESRF membership: Catalyzing Greek Scientific Excellence, ESRF & Greek Synchrotron Users Network (03/2024, Athens, Greece)
3. "[Advanced Battery Characterisation with Unconventional X-ray Tomography](#)", Battery Pub (Volta Foundation) (01/2024) (online)
4. Analytics for Battery Technologies & Recycling Industry satellite meeting, DESY Photon Science Users' Meeting 2024, (01/2024, Hamburg, Germany)
5. International workshop on "Combining X-ray imaging and diffraction for materials characterisations" (02/2023, Stockholm, Sweden)
6. DESY Photon Science Users' Meeting 2023, High Energy X-ray Diffraction for Physics and Chemistry Meeting, (01/2023, Hamburg, Germany)
7. DESY Photon Science Users' Meeting 2022, Industry Satellite Meeting, (01/2022) (online)
8. Webinar at CNRS NEEL Institut (France): "[Chemical Tomography and Neural Networks](#)" (05/2021)
9. Seminar at BASF: "X-ray chemical tomography: Investigating working heterogeneous solid catalysts, fuel cells and Li-ion batteries" (04/2021)
10. Seminar at the Scientific Machine Learning Group (SciML) of STFC's Scientific Computing Department (SCD): "Machine Learning for X-ray Tomography" (01/2021)
11. Webinar at DECTRIS (Switzerland): "[XRD-CT: The Technique and Its Applications for Real-time Characterization of Functional Materials](#)" (07/2020)
12. STFC Batteries Annual Meeting (07/2019, Abingdon, United Kingdom)
13. Synergi – Synchrotron & Neutron Research Go Industrial (04/2019, Lyon, France)

14. 24<sup>th</sup> Congress of the International Union of Crystallography (08/2017, Hyderabad, India)
15. 65<sup>th</sup> Annual Conference on Applications of X-ray Analysis (08/2016, Chicago, USA)
16. Sino-German Workshop on "In situ Spectroscopy on Catalysts and Membranes" (08/2015, Karlsruhe Institute of Technology, Germany)

#### **Speaker**

1. Dimensional X-ray Computed Tomography Conference (06/2024, Harwell, United Kingdom)
2. 14<sup>th</sup> International Conference on Catalysis in Membrane Reactors (07/2019, Eindhoven, Netherlands)
3. 12<sup>th</sup> Greek National Conference on Chemical Engineering (05/2019, Athens, Greece)
4. ESRF UM2017, Operando structural studies in Materials Science (02/2017, Grenoble, France)
5. 16<sup>th</sup> International Congress on Catalysis (07/2016, Beijing, China)
6. 12<sup>th</sup> International Conference on Catalysis in Membrane Reactors (06/15, Szczecin, Poland)
7. 5<sup>th</sup> International Conference on Operando Spectroscopy (05/2015, Deauville, France)
8. UK Catalysis Conference 2015 (01/2015, Loughborough, United Kingdom)

#### **Posters**

1. 6<sup>th</sup> Dimensional X-ray Computed Tomography Conference (06/2022, Manchester, United Kingdom)
2. UCL Medical image computing summer school (MedICSS) 2022 (06/2022, London, United Kingdom)
3. 17<sup>th</sup> European Powder Diffraction Conference (06/2022, Šibenik, Croatia)
4. Heterogeneous Catalysts for Sustainable Industry (11/2019, Royal Society of Chemistry, London, United Kingdom)
5. Euromat 2017 (09/2017, Thessaloniki, Greece)

#### **REVIEWER**

- UKRI Funding as invited expert reviewer - EPSRC Strategic infrastructure for engineering and physical sciences 2024 (ca. £650,000)
- European Research Council Consolidator Grant 2021 (2,000,000 €)
- ACS Energy Letters, Advanced Energy Materials, Materials Today, npj Computational Materials, RSC Digital Discovery, Catalysis Today, Journal of Applied Crystallography, Energy Technology, IUCrJ, Science Advances, Nature Communications