

Gareth S. Parkinson

Date of Birth: 02 / 06 / 1981

Place of Birth: Darlington, UK

[Web Site](#) / [Google Scholar Profile](#)

• EDUCATION

- 2016 Habilitation in Experimental Physics
Department of Physics, Vienna University of Technology, Vienna, Austria
- 2007 PhD – Surface Studies Using Medium Energy Ion Scattering
(Advisor D. P. Woodruff)
Department of Physics, University of Warwick, UK
- 2004 Masters Degree in Physics (MPhys)
Department of Physics, University of Warwick, UK

• LANGUAGES

English (Native speaker), German (Level B1)

• POSITIONS HELD

- 2017 - Associate Professor
Institute for Applied Physics/ Vienna University of Technology, Austria
- 2015 – 2017 Assistant Professor (Laufbahnstelle)
Institute for Applied Physics/ Vienna University of Technology, Austria
- 2010 – 2015 University Assistant
Institute for Applied Physics/ Vienna University of Technology, Austria
- 2009 – 2010 Postdoctoral Researcher (supervisor U. Diebold)
Department of Physics, Tulane University, New Orleans LA, USA
- 2007 – 2009 Postdoctoral Researcher (supervisor B.D. Kay)
Pacific Northwest National Laboratory (PNNL), Richland WA, USA

RESEARCH INTERESTS

Since my appointment at the TU Vienna in 2010, my research group has utilized a multi-technique approach to understand the atomic-scale processes underlying chemistry on metal-oxide surfaces. My aim is to combine my expertise in surface structure determination (gained in my PhD studies), with the experience in spectroscopy and scanning probe methods, gained during postdocs at PNNL and Tulane University, respectively.

The iron oxides are a major focus of my work because they are omnipresent in the natural environment and find widespread applications in technology. In 2012, I was awarded single investigator funding from the Austrian Science Fund to study Fe₃O₄ surface chemistry. The work has been highly successful including papers in *Science*, *Nature Materials*, *PNAS*; *Physical Review Letters*, *Angewandte Chemie*, *ACS Nano*, *JACS*, and the *Journal of Physical Chemistry*. The highlight was our discovery that the Fe₃O₄(001) surface stabilizes arrays of single metal adatoms (Au, Ag, Pd, Ni...) to high temperatures. In 2015 I was awarded the FWF START prize (€ 1.2M over 6 years) to study the mechanisms of single atom catalysis. This work has generated much interest, illustrated by the invitations I have received to international conferences and seminars. In 2016, I published a single author review of Iron Oxide Surfaces in surface science reports.

- **PUBLICATIONS**

54 articles in peer reviewed journals (h-index: 20) including:

13 first author, 13 senior author. 2 single author

Articles include: 1 Science, 3 PNAS, 2 Nature Materials, 2 Angewandte Chemie, 3

Physical Review Letters, 1 JACS, 2 ACS Nano, 1 ACS Catalysis

2 Book Chapters

- **AWARDS**

2018 Gaeda-Preis (DPG)

2017 Kardinal Innitzer Förderungspreis

2015 FWF START Prize (€1.2 million)

2013 Department of Energy Office of Science Postdoctoral Researcher Competition

- **FUNDING**

Title	Funding Agency	Amount	Duration	Role
FWF "START" Prize	Austrian Science Foundation	€1.2M	2015-2021	PI
Surface Science of Magnetite	Austrian Science Foundation – single investigator project	€152k	2013-2016	PI
TU-d Doctoral College	Vienna University of Technology	€76,5k (one PhD student)	2016-2019	Co-PI
SFB 'Functional Oxide Surfaces and Interfaces, FOXSI '	Austrian Science Foundation	€2M	2015-2019	Co-Applicant
An Artificial Leaf: a photo-electro-catalytic cell from earth-abundant materials for sustainable solar production of CO ₂ -based chemicals and fuels (participant)	H2020 (EU)	€7.98M; (€547,612€ to TU Wein)	2016-2019	Participant
An Apparatus for Investigating Organic Molecules on Oxide Surfaces	Vienna University of Technology	€141k	2012-2014	Co-Applicant

- **INVITED TALKS AT INTERNATIONAL CONFERENCES AND SUMMER SCHOOLS**

1. ACS Spring 2012 National Meeting and Exposition San Diego, March 25-29, 2012
2. Nature Conference "Frontiers in Electronic Materials", June 17-20, 2012, Aachen, Germany
3. SPIE Optics & Photonics San Diego, USA, August 12-16, 2012

4. IUPAC 8th International Conference on Novel Materials and their Synthesis (NMS-VIII), Xi'An, China, 14 to 19 October, 2012
5. 28th International Workshop on Novel Materials and superconductors, Planneralm, Austria, February 9 - 16, 2013
6. ACS Spring 2013 National Meeting and Exposition New Orleans, April 7-11, 2013
7. Austrian Physical Society (ÖPG) Meeting, Linz Austria, 3-6 September 2013
8. 3rd International Conference on Physics at Surfaces and Interfaces (PSI2014), Puri, India, Feb 24-28 2014
9. 79th DPG Annual Meeting and DPG Spring Meeting (DPG-Frühjahrstagung), Berlin (TU), 15-20 March 2015
10. Nanoforum 2015, June 8–9, 2015, University Linz
11. ACS Fall 2015 National Meeting and Exposition Boston, August 16-20, 2015
12. CRC 1109 Summer School, Berlin, Germany, 03.09.2015
13. International SFB FOXSI Symposium, TU Wien, 12.5.2015
14. AMISPEC Workshop, Central European Institute of Technology, March 8 2016
15. ACS Spring 2016 National Meeting and Exposition San Diego, March 13-17, 2016
16. IUVESTA 76 Workshop, Avilla, Spain, July 2016
17. **(Keynote Lecture)** International Symposium on Single-Atom Catalysis, Dalian, China, June 30-July 2, 2016
18. **(Keynote Lecture)** 20th International Vacuum Congress (IVC-20), Busan, Korea August 21 to 26, 2016.
19. ECOSS 32. Grenoble France, 28th August -2nd September 2016
20. Summer School of the Oldenburger LandesgraduiertenKolleg in Elstal, Germany. September 12-14, 2016.
21. Austrian Physical Society (ÖPG) Meeting, Vienna Austria, 3-6 September 2016
22. AVS 63rd International Symposium and Exhibition, Nashville November 6-11, 2016
23. 2016 Fall MRS Meeting, Boston, November 27- December 2, 2016
24. IUVESTA International Summer School on Physics at Nanoscale, June 10th-June 17th 2017, Devět Skal, Czech Republic
25. 5th International Conference on Chemical Bonding, ICCB, Kauai, Hawaii, June 22-26, 2017
26. E-MRS 2017 Fall Meeting, Warsaw Poland, September 18-21, 2017.
27. **(Plenary Lecture)** 82nd Annual Meeting of the German Physical Society (DPG-Frühjahrstagung), Berlin (TU), 11-16 March 2018
28. STINT workshop, Fort Myers, Florida, USA. 3-6 April 2018
29. **(Plenary Lecture)** 2nd International Symposium on Single Atom Catalysis, Beijing, China 15-18 July, 2018

Pending:

30. Telluride Workshop on Semiconductor Surface Chemistry, Telluride, Colorado July 2018
31. Deutsch-Brasilianischer Workshop, Bad Dürkheim Germany, 23.9 - 28.9 2018
32. Gordon Research Conference on „Chemical Reactions at Surfaces“ 17th February until Friday 22nd July 2019
33. IWSP Workshop, Wrocklaw Poland, 24-28 June 2019

• **INVITED SEMINARS AT UNIVERSITIES AND RESEARCH INSTITUTIONS**

1. University of Cambridge, UK (2007)
2. Pacific Northwest National Laboratory (2009)
3. Ludwig-Maximilians University, Munich (2010)
4. Louisiana State University (2012)
5. Georgia Institute of Technology (2012)
6. Max Plank Institute for Solid State Research Stuttgart (2013)
7. Vienna University of Technology, IAP Seminar (2013)
8. Max Plank Institute for Microstructure Physics, Halle Saale (2014)
9. Chemisch Physikalische Gesellschaft (July 2015)

10. TU Munich (November 2015)
11. TU Graz (May 2016)
12. York University (June 2016)
13. Tufts University (December 2016)
14. Harvard University (December 2016)
15. PNNL (June 2017)
14. Hamburg (April 2018)
15. Aarhus iNano centre (June 2018)
16. Institute of Theoretical Physics (June 2018)

- **TEACHING**

- 2016 - "Experimentelle Methoden der Oberflächenphysik" together with Prof. Schmid
- 2011 - Since 2011 I have co-organised the *Foundations of Physics* course for undergraduate students in semester I, II and III, and led a weekly examples class. This course covers the core physics curriculum including mechanics, thermodynamics, electro-magnetism, optics, and quantum physics. Student feedback is included at the end of this document
- 2011 - "Adsorption on oxide surfaces" lectures as part of Prof. U. Diebold's Surface Science course

- **PhD STUDENT SUPERVISION**

Ongoing: Florian Kraushofer, Zdenek Jakub and Jan Hulva.

Oscar Gamba, Institute of Applied Physics, TU Wien
(PhD defence November 2016)
"Surface Chemistry of Fe₃O₄(001)"

Roland Bliem, Institute of Applied Physics, TU Wien
(PhD defence July 2016, now a postdoc at MIT, Christian Doppler Award)
"Single Metal Adatoms at the Reconstructed Fe₃O₄(001) Surface"

Zdenek Novotny, Institute of Applied Physics, TU Wien
(PhD defence September 2013, now a postdoc at PNNL, USA. Winner of Loschmidt Prize)
"The Reconstructed Fe₃O₄(001) Surface as an Adsorption Template"

Note: Oscar, Roland and Zbynek were supervised jointly with U. Diebold because independent supervision requires a habilitation degree in Austria.

- **ADMINISTRATION AND PROFESSIONAL SERVICE**

- 2019 PhD examiner for Bjoern Arnt (Univ Hamburg) and Jakob Fester (Univ. Aarhus)
- 2018 Organiser of focus session "Chemistry at metal oxide surfaces" at the DPG Spring Meeting
- 2017 Elected to AVS surface science division executive board
- 2015 - Deputy speaker in the TU Wien Physics Faculty Council
- 2014 Co-organizer of ÖPG National Meeting
- 2011 - 2012 Member of Editorial Board, Energy Frontier Research Centre Newsletter

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Five Most Important papers:

1. Gareth S. Parkinson
"Iron Oxide Surfaces"
Surface Science Reports 71 (2016) 272
DOI: [10.1016/j.surfrep.2016.02.001](https://doi.org/10.1016/j.surfrep.2016.02.001)
2. Roland Bliem, Jessi van der Hoeven, Adam Zavodny, Oscar Gamba, Jiri Pavelec, Petra E de Jongh, Michael Schmid, Ulrike Diebold, Gareth S Parkinson
"Dual role of CO in the stability of sub-nano Pt clusters at the Fe₃O₄(001) surface"
PNAS 113, (2016) 8921
DOI: <http://dx.doi.org/10.1073/pnas.1605649113>
3. Roland Bliem, Jessi van der Hoeven, Adam Zavodny, Oscar Gamba, Jiri Pavelec, Petra E de Jongh, Michael Schmid, Ulrike Diebold, Gareth S Parkinson
"An Atomic-Scale View of CO and H₂ Oxidation on a Pt/Fe₃O₄ Model Catalyst"
Angewandte Chemie International Edition 54 (47), 13999-14002 (2016)
DOI: <http://dx.doi.org/10.1002/anie.201507368>
4. Roland Bliem, Eamon McDermott, Pascal Ferstl, Martin Setvin, Oscar Gamba, M. Alexander Schneider, Michael Schmid, Ulrike Diebold, Peter Blaha, Lutz Hammer, Gareth S. Parkinson
"Subsurface Cation Vacancy Stabilization of the Magnetite (001) Surface"
Science 346 (2014) 1215-1218.
DOI: <http://dx.doi.org/10.1126/science.1260556>
5. G. S. Parkinson, Z. Novotny, G. Argentero, M. Schmid, J. Pavelec, R. Kosak, P. Blaha, U. Diebold.
"CO Induced Adatom Sintering in a Pd/Fe₃O₄ Model Catalyst"
Nat. Mater., 12, 724 (2013)
DOI: <http://dx.doi.org/10.1038/nmat3667>