

Curriculum Vitae – Dr Moritz F. Kühnel

Current positions: Senior Lecturer, Swansea University and Head of Department, Fraunhofer IWES

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Homepage: <https://moritz-kuehnel.com/>

Academic Career and Education

Since 1/2021	Head of Department Hydrogen Labs and Field Tests, Fraunhofer IWES (link) <ul style="list-style-type: none">Leading the green hydrogen R&D activity across all IWES sites
12/2020–12/2021	Group Leader Hydrogen Technologies, Fraunhofer IMWS (link) <ul style="list-style-type: none">Development of industrial scale test facilities for Power-to-X processes
since 3/2020	Senior Lecturer in Chemistry, Swansea University (link) <ul style="list-style-type: none">Solar-driven conversion of water, waste and CO₂ into fuels and feedstock chemicals
12/2017–2/2020	Lecturer in Chemistry, Swansea University
0/2015–11/2017	Senior Postdoc, University of Cambridge (Prof. Erwin Reisner, link) <ul style="list-style-type: none">Functional nanomaterials for solar-driven syngas generation
8/2012–6/2015	Postdoc, University of Cambridge (Prof. Erwin Reisner) <ul style="list-style-type: none">Fellowships from <i>DFG</i> and <i>Isaac Newton Trust</i> (Trinity College)Earth-abundant molecular electrocatalysts for CO₂ reduction
2/2012–7/2012	Postdoc, Humboldt-Universität zu Berlin (Prof. Thomas Braun, link) <ul style="list-style-type: none">Activation of small molecules by transition metal complexes
10/2009–7/2012	Doctoral Training Centre ‘Fluorine as a Key Element’, Berlin (link) <ul style="list-style-type: none">Interdisciplinary training in fluorine chemistry
4/2007–12/2011	Doctorate, Freie Universität Berlin (Supervisor: Prof. Dieter Lentz, link) <ul style="list-style-type: none">Dr. rer. nat. ‘<i>summa cum laude</i>’ (highest)Awarded Schering Prize for the ‘<i>Best Chemistry Dissertation</i>’Homogeneous catalysis for C-F activation (link to dissertation)
10/2000–3/2007	Chemistry Undergraduate, Freie Universität Berlin <ul style="list-style-type: none">Chemistry Diplom ‘<i>very good</i>’ (highest)Thesis: Hydrometalation of Fluorinated Allenes (Supervisor: Prof. Lentz)

Awards and Honours

01/2022	Promotion of Head of Department, Fraunhofer IWES
05/2021	<i>Project acquisition of the Month</i> , Fraunhofer Society
12/2020	Fellow of the Higher Education Academy
03/2020	Promotion to Senior Lecturer
02/2020	Among top 5% reviewers for <i>Angewandte Chemie</i>
11/2019	Swansea University Research Award finalist
02/2018	Advisory board member of the UK Solar Fuels Network
01/2018	Session chair Gordon Research Seminar <i>Renewable Energy: Solar Fuels</i>
01/2017	EES Prize ‘ <i>Best Oral Presentation</i> ’ at the 5 th UK Solar Fuels Meeting
10/2016	Keynote lecture 1 st FOTOFUEL Conference and School, Almeria
09/2016	Keynote lecture 6 th EuCheMS Chemistry Congress, Sevilla
07/2015	Promotion to Senior Research Associate, University of Cambridge
02/2013	Postdoctoral Research Fellowship, DFG
12/2012	Isaac Newton Trust Fellowship, Trinity College, Cambridge
11/2012	Schering Prize for the ‘ <i>Best Chemistry Dissertation</i> ’, Schering Stiftung
09/2011	Paper selected as ‘ <i>Best Publication in Fluorine Chemistry</i> ’, GDCh

Publication List

h-Index: 19

Citations: >2800

[Google Scholar](#)

Peer-reviewed Journal Articles

Y. Cherif, H. Azzi, K. Sridharan, S. Ji, H. Choi, M.G. Allan, S. Benaissa, K. Saidi-Bendahou, L. Dampthey, C. Silva Ribeiro, S. Krishnamurthy, S. Nagarajan, M. Maroto-Valer, [M.F. Kuehnel](#), S. Pitchaimuthu, "Facile Synthesis of Gram-Scale Mesoporous Ag/TiO₂ Photocatalysts for Pharmaceutical Water Pollutant Removal and Green Hydrogen Generation", *ACS Omega* **2022**, DOI: 10.1021/acsomega.2c06657 ([link](#))

S. Pitchaimuthu, K. Sridharan, S. Nagarajan, S. Ananthraj, P. Robertson, [M.F. Kuehnel](#), Á. Irabien, M. Maroto-Valer, "Solar Hydrogen Fuel Generation from Wastewater – Beyond Photoelectrochemical Water Splitting: A Perspective", *Energies* **2022**, *15*, 7399 ([link](#))

A. Kumar, P. Majithia, P. Choudhary, I. Mabbett, [M.F. Kuehnel](#), S. Pitchaimuthu, V. Krishnan, "MXene coupled graphitic carbon nitride nanosheets based plasmonic photocatalysts for removal of pharmaceutical pollutant", *Chemosphere* **2022**, *308*, 136297 ([link](#))

M.G. Allan, M.J. McKee, F. Marken, [M.F. Kuehnel](#),* "Solvent-controlled O₂ diffusion enables air-tolerant solar hydrogen generation", *Energy Environ. Sci.* **2021**, *14*, 5523-5529 ([link](#))

B. Jones, K.R. Davies, M.G. Allan, I. Mabbett, T. Watson, J. Durrant, [M.F. Kuehnel](#), S. Pitchaimuthu, "Photoelectrochemical Concurrent Hydrogen Generation and Heavy Metal Recovery from Polluted Acidic Mine Water", *Sustainable Energy Fuels*, **2021**, *5*, 3084-3091 ([link](#))

M.O. Omorogie,* J.O. Babalola, M.O. Ismaeel, J.D. McGettrick, T.M. Watson, D.M. Dawson, M. Carta, [M.F. Kuehnel](#),* "Activated carbon from *Nauclea diderrichii* agricultural waste – a promising adsorbent for ibuprofen, methylene blue and CO₂", *Adv. Powder Technol.*, **2021**, *32*, 839–847 ([link](#))

J.A. McCune, [M.F. Kuehnel](#), E. Reisner, O.A. Scherman, "Stimulus-mediated ultrastable radical formation" *Chem* **2020**, *6*, 1819–1830 ([link](#)). Highlighted in [Chemistry World](#).

A. Wagner, K.H. Ly, N. Heidary, I. Szabó, K.I. Assaf, S.J. Barrow, K. Sokołowski, N. Kornienko, [M.F. Kuehnel](#), E. Rosta, I. Zebger, W.M. Nau, O.A. Scherman, E. Reisner "Host-guest-chemistry meets electrocatalysis: cucurbit[6]uril on Au as a hybrid organic-inorganic system in CO₂ reduction", *ACS Catal.* **2020**, *10*, 751–761 ([link](#))

J.J. Leung, J. Warnan, K.H. Ly, N. Heidary, D.H. Nam, [M.F. Kuehnel](#), E. Reisner,* "Solar-driven reduction of aqueous CO₂ with a cobalt bis(terpyridine)-based photocathode", *Nat. Catal.* **2019**, *2*, 354–365 ([link](#))

[M.F. Kuehnel](#), C.E. Creissen, C.D. Sahm, D. Wielend, A. Schlosser, K.L. Orchard, E. Reisner "ZnSe nanorods as a visible-light-absorber for photocatalytic and photoelectrochemical H₂ evolution in water", *Angew. Chem. Int. Ed.* **2019**, *58*, 5059–5063 ([link](#))

T. Uekert, [M.F. Kuehnel](#),* D.W. Wakerley, E. Reisner,* "Plastic waste as a feedstock for solar-driven H₂ generation", *Energy Environ. Sci.* **2018**, *11*, 2853–2857 ([link](#)). Featured on the [EPSRC website](#). Highlighted in the media ([BBC](#), [itv News](#), [New Statesman](#), [The Times of India](#), [The Independent](#), [Daily Mail Online](#), [Huffington Post](#), [CNET](#), [Advances Wales](#), [The Chemical Engineer](#), [Chemistry World](#) and many others including BBC radio live interviews)

A.L. Raza, [M.F. Kuehnel](#), M. Talavera, M. Teltewskoi, M. Ahrens, P. Kläring, T. Braun, D. Lentz, "Reactivity of Rhodium Hydrido and Silyl Complexes towards 1,1-Difluoroallene", *J. Fluorine Chem.* **2018**, *214*, 80–85 ([link](#))

D.W. Wakerley, K.H. Ly, N. Kornienko, K.L. Orchard, [M.F. Kuehnel](#), E. Reisner, "Aerobic conditions enhance the photocatalytic activity of CdS/CdO_x quantum dots", *Chem. Eur. J.* **2018**, *24*, 18385–18388 ([link](#)). *Hot Article*, featured on [cover](#), highlighted in [ChemistryViews](#)

[M.F. Kuehnel](#), C.D. Sahm, G. Neri, J.R. Lee, K.L. Orchard, A.J. Cowan, E. Reisner, "ZnSe quantum dots modified with a Ni(cyclam) catalyst for efficient visible-light driven CO₂ reduction in water", *Chem. Sci.* **2018**, *9*, 2501–2509 ([link](#)). Selected for the themed collection '*Outstanding Contributions to Molecular Science for Energy Research*'

[M.F. Kuehnel](#)* and E. Reisner,* "Solar hydrogen generation from lignocellulose", *Angew. Chem. Int. Ed.* **2018**, *57*, 3290–3296 ([link](#))

B. Reuillard, K. H. Ly, T. E. Rosser, M. F. Kuehnel, I. Zebger, E. Reisner, "Tuning Product Selectivity for Aqueous CO₂ Reduction with a Mn(bipyridine)-pyrene Catalyst Immobilized on a Carbon Nanotube Electrode", *J. Amer. Chem. Soc.* **2017**, *139*, 14425–14435 ([link](#))

M.F. Kuehnel, K.L. Orchard, K.E. Dalle, E. Reisner, "Selective photocatalytic CO₂ reduction in water through anchoring of a molecular Ni catalyst on CdS nanocrystals", *J. Amer. Chem. Soc.* **2017**, *139*, 7217–7223 ([link](#)). Among top 20 most accessed articles in JACS

D.W. Wakerley, [†] M.F. Kuehnel, [†] K.L. Orchard, K.H. Ly, T.E. Rosser, E. Reisner, "Solar-driven reforming of lignocellulose to H₂ with a CdS/CdO_x photocatalyst", *Nat. Energy* **2017**, *2*, 17021 ([link](#), [†] shared first authorship). Highlighted in the press ([Reuters TV](#), [BNN Bloomberg TV live interview](#), [Business Weekly](#), [Natural Gas Daily](#), [The Engineer](#) and others)

M. Crespo-Quesada, L.M. Pazos-Outón, J. Warnan, M.F. Kuehnel, R.H. Friend, E. Reisner, "Metal-encapsulated organolead halide perovskite photocathode for solar-driven hydrogen evolution in water", *Nat. Commun.* **2016**, *7*, 12555 ([link](#))

M.F. Kuehnel, D.W. Wakerley, K.L. Orchard, E. Reisner, "Photocatalytic Formic Acid Conversion on CdS Nanocrystals with Controllable Selectivity for H₂ or CO", *Angew. Chem. Int. Ed.* **2015**, *54*, 9627–9631. Featured on the inside cover ([link](#))

M.F. Kuehnel, D. Lentz, T. Braun, "Synthesis of fluorinated building blocks by transition metal-mediated hydrodefluorination reactions", *Angew. Chem. Int. Ed.* **2013**, *52*, 3328–3348 ([link](#))

M.F. Kuehnel, P. Holstein, M. Kliche, J. Krüger, S. Matthies, D. Nitsch, J. Schutt, M. Sparenberg, D. Lentz, "Titanium-Catalyzed Vinylic and Allylic C-F Bond Activation – Scope, Limitations and Mechanistic Insight", *Chem. – Eur. J.* **2012**, *18*, 10701–10714 ([link](#))

M.F. Kuehnel, T. Schlöder, S. Riedel, B. Nieto-Ortega, F.J. Ramírez, J.T. López Navarrete, J. Casado, D. Lentz, "Synthesis of the Smallest Axially Chiral Molecule via Asymmetric Carbon-Fluorine Bond Activation", *Angew. Chem. Int. Ed.* **2012**, *51*, 2218–2220 ([link](#)). Highlighted in *Nachrichten aus der Chemie* 2012, *60*, 6

M.F. Kühnel, D. Lentz, "Fluorinated dienes in transition-metal chemistry – the rich chemistry of electron-poor ligands", *Dalton Trans.* **2010**, *39*, 9745–9759 ([link](#)). Featured on front cover

M.F. Kühnel, D. Lentz, "Titanium-Catalyzed C-F Activation of Fluoroalkenes", *Angew. Chem. Int. Ed.* **2010**, *49*, 2933–2936 ([link](#)). Classified as 'Hot Paper' and honoured with the AG Fluorchemie Publication Prize 2010/2011

M.F. Kühnel, D. Lentz, "Hydrometalation of Fluoroallenes", *Dalton Trans.* **2009**, 4747–4755 ([link](#)). 'Hot Article'

T. Hügler, M.F. Kühnel, D. Lentz, "Hydrazine Borane – A Promising Hydrogen Storage Material", *J. Am. Chem. Soc.* **2009**, *131*, 7444–7446 ([link](#))

Patents

E. Reisner, D. Achilleos, H. Kasap, M. Kuehnel, "Photocatalyst and photocatalytic methods for producing hydrogen", WO/2019/229255 ([link](#))

D. Wakerley, M. Kuehnel, K. Orchard, E. Reisner, "Photocatalyst and photocatalytic methods", WO/2018/096103 ([link](#))

Book Chapters and Journal Articles without Peer Review

M. Tümmeler, M. Kühnel,* „Die Funktionsweise und Betriebsvariablen von PEM-Elektrolyseuren“, *gwf Gas + Energie* **2021** (10). *in press*

M. Kühnel, S. Schattauer, N. Denecke, S. Schmidt, „Testzentren für industrielle H₂-Technologie nehmen Betrieb auf“, *HZwei*, **2021**, *21*(3), 22–23

"Biological approaches to artificial photosynthesis", *Faraday Discuss.* **2019**, *215*, 66–83 ([link](#))

"Synthetic approaches to artificial photosynthesis", *Faraday Discuss.* **2019**, *215*, 242–281 ([link](#))

"Demonstrator devices for artificial photosynthesis", *Faraday Discuss.* **2019**, *215*, 345–363 ([link](#))

"Beyond artificial photosynthesis", *Faraday Discuss.* **2019**, *215*, 422–438 ([link](#))

M. F. Kuehnel and D. Lentz, "Preparation of Fluoroolefins", in *Efficient Preparation of Fluorine Compounds*, ed. H. W. Roesky, Wiley, pp. 315–333, **2013** ([link](#))

Invited and Keynote Lectures

12/2022	Universität Rostock
09/2022	25 th International Conference on Semiconductor Photocatalysis and Solar Energy Conversion, Rostock
07/2022	Brandenburgische Technische Universität Cottbus-Senftenberg
06/2022	University of Edinburgh (Panel discussion)
06/2022	Auswärtiges Amt, Berlin
05/2022	Forum Innovation, College of Europe, Brügge (Panel discussion)
05/2022	Universität Hohenheim
03/2022	Universität Koblenz-Landau
11/2021	Environmental Lecture Series, Technische Universität München
05/2021	GDCh-Kolloquium, Martin-Luther-Universität Halle-Wittenberg
08/2020	Universität Bayreuth
06/2020	SolTech Seminar, Ludwig-Maximilians-Universität München
01/2020	Joint Workshop on Plastic-to-Fuel Recovery, Kuwait
12/2019	Newton Bhabha Researcher Links Workshop on Electrochemistry, Pune (India)
09/2019	Université Grenoble Alpes
08/2019	International Society of Electrochemistry Annual Meeting, Durban (South Africa)
07/2019	Solar SUPERGEN Summer Technical Meeting, Swansea
07/2019	Friedrich-Alexander-Universität Erlangen-Nürnberg
03/2019	Otto-von-Guericke-Universität Magdeburg
03/2019	Christian Doppler Symposium on Solar Fuels, Cambridge
10/2018	Freie Universität Berlin
08/2018	GRK1582 ' <i>Fluorine as a Key Element</i> ' Final Symposium, Berlin
07/2018	Cardiff University
07/2018	ARCANE International Conference, Grenoble
04/2018	MRS Spring Meeting, Phoenix (US)
03/2018	University College London
11/2017	Global Student Engineering Conference, London
09/2017	Sustainable CO ₂ Capture and Utilisation Workshop, Santander (Spain)
06/2017	Freie Universität Berlin
10/2016	1 st FOTOFUEL Conference and School, Almeria (keynote lecture)
09/2016	6 th EuCheMS Chemistry Congress, Seville (keynote lecture)
06/2016	University of Liverpool
09/2015	Christian Doppler Symposium on Solar Fuels, Cambridge
07/2015	UKERC International Energy Summer School, Wyboston (UK)
11/2012	Technische Universität Berlin
09/2010	Karlsruher Institut für Technologie
11/2009	Doctoral Training Centre GRK1582 ' <i>Fluorine as a Key Element</i> ' Inauguration Symposium, Berlin