

SOUVIK ROY

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School of Chemistry, University of Lincoln
Joseph Banks Laboratories, Lincoln, LN6 7DL, UK

PROFESSIONAL EXPERIENCE

- 03/2020–present **Senior Lecturer (Tenure Track Assistant Professor)**
School of Chemistry, University of Lincoln, UK
- 03/2018–02/2020 **Marie-Curie Individual Fellow (MSCA-IF)** (PI: Prof. Erwin Reisner)
Department of Chemistry, University of Cambridge, UK
- 01/2016–02/2018 **Wenner-Gren Postdoctoral Fellow** (PI: Prof. Sascha Ott)
The Ångström Laboratory, Uppsala University, Sweden
- 12/2013–11/2015 **CEA Postdoctoral Research Associate** (PI: Dr. Vincent Artero)
CEA-Grenoble, Laboratoire de Chimie et Biologie des Métaux (LCBM), France

EDUCATION

- 09/2008–10/2013 **PhD / Chemistry, Arizona State University, Tempe, USA**
Thesis: "Biomimetic Models of [FeFe]-hydrogenase: Utilization of peptides and redox non-innocent ligands in synthetic catalysts"
PI: Prof. Anne K. Jones
- 08/2006–06/2008 **M.Sc. / Organic Chemistry, University of Calcutta, Kolkata, India**
Project: "Synthesis of sugar-based heterocycles using vanadium-oxo catalysts"
PI: Prof. Dilip K. Maiti
1st Class (84.8%)
- 07/2003–06/2006 **B.Sc. (Hons.) / Chemistry, Presidency University, Kolkata, India**
Major: Chemistry, Minor: Physics, Mathematics
1st Class (85%)

GRANTS

- 2021 **Research Fund** (Royal Society of Chemistry / RSC), £4,000
- 2021 **Research Grant** (The Royal Society), £19,500
- 2021 **Research Enablement Grant** (Royal Society of Chemistry / RSC), £10,000
- 2018-20 **Marie-Curie Individual Fellowship** (MSCA-IF-2016, European Commission, Horizon 2020; Host: Cambridge University, UK), €195,454
- 2016-18 **Wenner-Gren International Postdoctoral Fellowship** (Wenner-Gren Foundations, Host: Uppsala University, Sweden), €66,000
- 2017 **Wenner-Gren Travel Award** for EuCheMS Inorganic Chemistry Conference / EICC-4 (Wenner-Gren Foundations, Sweden), €1,000

AWARDS & HONOURS

- 2013 **George U. Yuen Memorial Award** for outstanding graduate research in chemistry, Arizona State University, USA
- 2012 **Travel Grant** from ASU for attending GRC, Arizona State University, USA
- 2012 **Distinguished Teaching Award**, Arizona State University, USA

- 2008 **Doctoral Research Fellowship**, Council of Scientific and Industrial Research (NET-CSIR), India; Eligible for S.P.M. Fellowship (*Not Accepted*)
- 2006 **Gold medal and University Scholarship** (1st rank), B.Sc. Chemistry, Presidency College (University of Calcutta), India

PUBLICATIONS

Citations: >1000, *h*-index: 18 (Google Scholar); † *equal contribution*

29. C. D. Sahn, G. Ucoski, S. Roy, E. Reisner*, Automated and Continuous-Flow Platform to Analyze Semiconductor–Metal Complex Hybrid Systems for Photocatalytic CO₂ Reduction, *ACS Catal.*, **2021**, *11*, 11266–11277
28. A. Vijeta, C. Casadevall, S. Roy, E. Reisner*, Visible-light Promoted C–O Bond Formation with an Integrated Carbon Nitride–Nickel Heterogeneous Photocatalyst, *Angew. Chem. Int. Ed.*, **2021**, *60*, 8494–8499
27. S. Roy, M. Miller, J. Warnan, J. J. Leung, C. D. Sahn, E. Reisner*, Electrocatalytic and solar-driven reduction of aqueous CO₂ with molecular cobalt phthalocyanine-metal oxide hybrid materials, *ACS Catal.*, **2021**, *11*, 1868–1876
26. M. A. Bajada†, S. Roy†, J. Warnan†, K. Abdiaziz, A. Wagner, M. M. Roessler, E. Reisner*, A precious-metal-free hybrid electrolyzer for alcohol oxidation coupled to CO₂-to-syngas conversion, *Angew. Chem. Int. Ed.*, **2020**, *59*, 15633–15641
25. S. Roy†, Z. Huang†, A. Bhunia, A. Castner, A. Kumar, X. Zou, S. Ott*, Electrocatalytic Hydrogen Evolution from a cobaloxime-based metal-organic framework thin film, *J. Am. Chem. Soc.*, **2019**, *141*, 15942–15950; **Featured on Front-Cover**, vol. 141, issue 43 (October 30, 2019)
24. S. Roy, E. Reisner*, Light driven CO₂ reduction by mesoporous carbon nitride modified with polymeric cobalt phthalocyanine, *Angew. Chem. Int. Ed.*, **2019**, *58*, 12180–12184; **‘Hot Paper’**
23. C. Papini, C. Sommer, L. Pecqueur, D. Pramanik, S. Roy, E. J. Reijerse, F. Wittkamp, U-P. Apfel, V. Artero, W. Lubitz, M. Fontecave*, A bioinspired artificial [FeFe]-hydrogenase with a synthetic H-cluster, *ACS Catal.*, **2019**, *9*, 4495–4501
22. S. Vanicek, M. Jochriem, C. Hassenrück, S. Roy, H. Kopacka, K. Wurst, T. Müller, R. F. Winter,* E. Reisner,* B. Bildstein*, Redox-rich metallocene tetrazene complexes: synthesis, structure, electrochemistry and catalysis, *Organometallics*, **2019**, *38*, 1360–1371
21. S. Roy†, A. Bhunia†, N. Schuth, M. Haumann, S. Ott*, Light-driven hydrogen evolution catalyzed by a cobaloxime catalyst incorporated in a MIL-101(Cr) metal–organic framework, *Sustainable Energy Fuels*, **2018**, *2*, 1148–1152
20. C. Sommer, S. Rumpel, S. Roy, C. Farès, V. Artero, M. Fontecave, E. Reijerse, W. Lubitz, Spectroscopic investigations of a semi-synthetic [FeFe] hydrogenase with propane di-selenol as bridging ligand in the binuclear subsite: comparison to the wild type and propane di-thiol variants, *J. Biol. Inorg. Chem.*, **2018**, *23*, 481–491
19. N. Queyriaux, E. Giannoudis, C. Windle, S. Roy, J. Pecaut, V. Artero, A. G. Coutsolelos, M. Chavarot-Kerlidou*, A noble metal-free photocatalytic system based on a novel cobal tetrapyrridyl catalyst for Hydrogen production in fully aqueous medium, *Sustainable Energy Fuels*; **2018**, *2*, 553–557
18. G. Caserta, L. Pecqueur, A. Adamska-Venkatesh, C. Papini, S. Roy, V. Artero, M. Atta, E. Reijerse, W. Lubitz, M. Fontecave*, The [FeFe]-hydrogenase maturation protein HydF: Structural and Functional Characterization, *Nat. Chem. Bio.*, **2017**, *13*, 779–784
17. S. Roy†, J.A. Laureanti†, T.L. Groy, A.K. Jones*, Synthesis and electrocatalytic activity of [FeFe]-H₂ase model complexes with non-innocent chelating nitrogen-donor ligands, *Eur. J. Inorg. Chem.*, **2017**, *23*,

- 2942–2950; **Featured on Front-Cover** (2017, 23, 2940); Winner for video-abstract sponsored by ChemPubSoc Europe (<https://vimeo.com/213741004>)
16. S. Pullen, S. Roy, S. Ott*; [FeFe] Hydrogenase Active Site Model Chemistry in a UiO-66 Metal-Organic Framework, *Chem. Commun.*, **2017**, 53, 5227–5230
 15. E. Mijangos[†], S. Roy[†], S. Pullen, R. Lomoth, S. Ott*, Evaluation of two- and three-dimensional electrode platforms for the electrochemical characterization of organometallic catalysts incorporated in non-conducting metal–organic frameworks, *Dalton Trans.*, **2017**, 46, 4907–4911
 14. S. Roy[†], V. Pascanu[†], S. Pullen[†], G. González Miera, B. Martin-Matute*, S. Ott*, Catalyst Accessibility to Chemical Reductants in Metal-Organic Frameworks, *Chem. Commun.*, **2017**, 53, 3257–3260
 13. S. Roy, B. Sharma, J. Pecaut, P. Simon, M. Fontecave, P.D. Tran, E. Derat, V. Artero*, Molecular cobalt complexes with pendant amines for selective electrocatalytic reduction of carbon dioxide to formic acid, *J. Am. Chem. Soc.*, **2017**, 139, 3685–3696
 12. M. Sensi, C. Baffert, C. Greco, G. Caserta, C. Gauquelin, L. Saujet, M. Fontecave, S. Roy, V. Artero, P. Soucaille, I. Meynial-Salles, H. Bottin, L. de Gioia, V. Fourmond, C. Léger*, L. Bertini*, Reactivity of the excited states of the H-cluster of [FeFe]-hydrogenase, *J. Am. Chem. Soc.*, **2016**, 138, 13612–13618
 11. G. Caserta, A. Adamska-Venkatesh, L. Pecqueur, M. Atta, V. Artero, S. Roy, E. Reijerse, W. Lubitz, M. Fontecave*, Chemical assembly of multiple metal cofactors: the heterologously expressed multidomain [FeFe]-hydrogenase from *Megasphaera elsdenii*, *Biochim. Biophys. Acta (BBA) Bioenergetics*, **2016**, 1857, 1734–1740
 10. A. Adamska-Venkatesh, S. Roy, J.F. Siebel, T.R. Simmons, M. Fontecave, V. Artero, E. Reijerse*, W. Lubitz*, Spectroscopic identification of the bridging amine in the active site of [FeFe] hydrogenase using isotopologues of the H-cluster, *J. Am. Chem. Soc.*, **2015**, 137, 12744–12747
 9. S. Roy, M. Bacchi, G. Berggren, V. Artero*, A systematic comparative study of hydrogen evolving molecular catalysts in aqueous solutions, *ChemSusChem*, **2015**, 8, 3632–3638
 8. S. Roy, T.-A. Nguyen, L. Gan, A.K. Jones*, Biomimetic peptide-based models of [FeFe]-hydrogenases: Utilization of phosphine-containing peptides, *Dalton Trans.*, **2015**, 44, 14865–14876
 7. V. Artero, G. Berggren, M. Atta, G. Caserta, S. Roy, L. Pecqueur, M. Fontecave*, From Enzyme Maturation to Synthetic Chemistry: The Case of Hydrogenases, *Acc. Chem. Res.*, **2015**, 48, 2380–2387
 6. G. Caserta, S. Roy, M. Atta, V. Artero, M. Fontecave*, Artificial hydrogenases: Biohybrid and supramolecular systems for catalytic hydrogen production or uptake, *Curr. Opin. Chem. Biol.*, **2015**, 25, 36–47
 5. S. Roy, S.K.S. Mazinani, T.L. Groy, L. Gan, P. Tarakeshwar, V. Mujica, A.K. Jones*, Catalytic hydrogen evolution by Fe(II) carbonyls featuring a dithiolate and a chelating phosphine, *Inorg. Chem.*, **2014**, 53, 8919–8929
 4. S. Roy, A. K. Jones*, Metalloenzymes: Cutting out the middleman, *Nat. Chem. Bio.*, **2013**, 9, 603–605
 3. A. Dutta, M. Flores, S. Roy, J. Schmitt, G.A. Hamilton, H. Hartnett, J. Shearer, A.K. Jones*, Sequential oxidation of thiolate and cobalt metallocenter in a synthetic metalloprotein: Implications for the biosynthesis of nitrile hydratase, *Inorg. Chem.*, **2013**, 52, 5236–5245
 2. S. Roy, T.L. Groy, A.K. Jones*, Biomimetic model for [FeFe]-hydrogenase: Asymmetrically disubstituted diiron complex with a redox-active 2,2'-bipyridyl ligand, *Dalton Trans.*, **2013**, 42, 3843–3853
 1. S. Roy, S. Shinde, G.A. Hamilton, H.E. Hartnett, A.K. Jones*, Artificial [FeFe]-hydrogenase: On resin modification of an amino acid to anchor a hexacarbonyldiiron cluster in a peptide framework, *Eur. J. Inorg. Chem.*, **2011**, 1050–1055

BOOK CHAPTERS

- S. Bellukonda, S. Roy*, "Oxygen reduction reaction in ethanol fuel cells", *In Oxygen Reduction Reaction: Fundamentals, Materials and Applications*; Edited by S. Chatterjee, K. Dutta, and K. Sengupta; Elsevier, **2022**
- A.K. Jones*, C.L. McIntosh, A. Dutta, S. Roy, P. Kwan, S. Yang, "Bioelectrocatalysis of hydrogen oxidation and production", *In enzymatic fuel cells: From fundamentals to applications*; Edited by H. Luckarift, G. Johnson and P. Attanasov; John Wiley & Sons Inc., **2013**

CONFERENCES

- 2021 **International Solar Fuels Conference (ISF 2021)**; Online; "Visible Light Driven CO₂ Reduction by Cobalt Phthalocyanine-based Hybrid Materials" (*poster & flash poster presentation*)
- 2019 **3rd International Solar Fuels Conference (ISF-3/ICARP2019)**; Hiroshima, Japan; "Electrocatalytic hydrogen evolution from a cobaloxime-Based metal-organic framework thin film" (**ISF-3 Young, contributed talk**); "Visible-light driven carbon dioxide reduction by metal-organic polymer integrated carbon nitride" (**ISF-3, contributed talk**)
- 2019 **7th UK Solar Fuel Network Symposium**, St. John's College Cambridge, UK; "Visible-light driven CO₂ reduction by carbon nitride modified with polymeric cobalt-phthalocyanine" (*contributed talk*)
- 2018 **Fuel Cell and Battery Technologies Clustering Meeting** (REA, European Commission); IMEC, Leuven, Belgium; "Sunlight driven CO₂ reduction" (*invited talk*)
- 2017 **EuCheMS Inorganic Chemistry Conference (EICC-4)**; Copenhagen, Denmark; "Metal-organic frameworks with immobilized molecular catalysts for hydrogen evolution" (*contributed talk*)
- 2017 **Symposium on Advanced Biological Inorganic Chemistry (SABIC-2017)**; Kolkata, India; "Molecular cobalt complexes with pendent amines for selective reduction of carbon dioxide to formic acid" (*contributed talk*)
- 2015 **1st International Solar Fuels Conference (ISF-1-Young and ISF-1)**; Uppsala, Sweden; "Systematic screening of hydrogen evolving catalysts in water" (*poster*)
- 2013 **International Conference of Biological Inorganic Chemistry (ICBIC-16)**; Grenoble, France; "Electrocatalytic hydrogen production by functional models of [FeFe]-hydrogenases with redox non-innocent ligands" (*poster*)
- 2012 **Gordon Research Conference and Seminar (GRC-GRS) on Organometallic Chemistry**; Salve-Regina University, Newport, Rhode Island, USA; "Artificial [FeFe]-hydrogenases: Synthesis and characterization of diiron-polycarbonyl clusters in peptide scaffolds using artificial amino acids" (*contributed talk and poster*)
- 2010 **The 9th International Hydrogenase Conference**; Uppsala, Sweden; "Artificial [FeFe]-hydrogenases: Synthesis of diiron-hexacarbonyl cluster in a peptide framework" (*poster*)

INVITED TALKS

- 2021 **Catalight Young Scientist Symposium: Artificial Photosynthesis (CYSS 2021)**; Online Conference (Keynote Lecture); "When molecules meet materials: Heterogenised molecular systems for CO₂ reduction and H₂ evolution reaction"
- 2021 **Invited Seminar IIT Goa**; Goa, India (online); "When molecule meets materials: Heterogenised molecular systems for sustainable energy applications"
- 2019 **King's College London (KCL) Research Seminar**; London, UK; "When molecule meets materials: Developing hybrid organic/inorganic catalysts for sustainable energy applications"
- 2019 **Darwin College Lunchtime Seminar**; Cambridge, UK; "From molecules to materials: New catalysts for artificial photosynthesis"
- 2016 **Consortium for Artificial Photosynthesis (CAP) Workshop**; Uppsala, Sweden; "Hybrid molecular electrode materials based on metal-organic frameworks for proton and CO₂ reduction"
- 2015 **CarBioRed-ANR Meeting**; Collège de France, Paris, France; "Cobalt(III) complexes as catalysts for CO₂ reduction"
- 2013 **Second Annual UA/ASU Student Conference on Renewable Energy**; Tucson, Arizona, USA; "Electrocatalytic hydrogen production by functional models of [FeFe]-hydrogenases with redox non-innocent ligands"
- 2012 **Energy Frontier Research Center (EFRC) Seminar**; Center for Bio-inspired Solar Fuel Production, Arizona State University, USA; "Electrocatalysis by asymmetric artificial hydrogenases: Utilization of peptides and redox non-innocent ligands in synthetic catalysts"

TEACHING

University of Lincoln, UK (Lecturer)

1. Core Chemistry 2.1 – Stability, Structure and Mechanism in Molecular Systems (2nd year theory module); 2021-22 and 2020-21 academic years
2. Chemistry Extension 2 – Electronic Structure, Spectroscopy and Reactivity in D- and F-Block Compounds (2nd year theory module); 2021-22 and 2020-21 academic years
3. Practical Chemistry 2.1 – Organic Synthesis, Purification and Advanced Characterisation ((2nd year practical module); 2021-22 and 2020-21 academic years

University of Cambridge, UK (Head Demonstrator)

1. Part II Inorganic Synthesis Laboratory; 2018-19 and 2019-20 academic years

Arizona State University, USA (Teaching Assistant)

1. Advanced Inorganic Chemistry: Theory and Laboratory (4th year undergraduate modules); 2009-2012
2. Organic Chemistry Laboratory (1st year undergraduate module); 2008-09