

CV Prof. Dr. Raffaella Buonsanti

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Google Scholar ID: <https://scholar.google.ch/citations?user=cWUMss8AAAAJ&hl=en&oi=ao>

Education

2006 - 2010 PhD in Nanoscience, University of Salento, Italy. Advisors: Prof. P.D. Cozzoli
2000 - 2006 Master degree in Chemistry, University of Bari

Employment History

March 2022 - Associate Professor, EPFL
2015 - 2022 Tenure-track Assistant Professor, EPFL
2013 - 2015 Tenure-track Staff Scientist at the Joint Center for Artificial Photosynthesis, Materials
Science Department, Lawrence Berkeley National Laboratory
2012 - 2013 Project Scientist at the Molecular Foundry, Materials Science Department, Lawrence
Berkeley National Laboratory
2010 - 2012 Postdoctoral Researcher at the Molecular Foundry, Materials Science Department,
Lawrence Berkeley National Laboratory

Institutional Responsibilities and Service

2024 - present Director of the Teaching Section of Chemistry and Chemical Engineering
2023 - present Member of the departmental steering committee
2019 - present Member of the CIME (EPFL Center of Electron Microscopy) Steering Committee
2018 - 2022 Member of the Doctoral School Committee of Chemistry and Chemical Engineering
2017 - 2021 Member of the Teaching Committee of Chemistry and Chemical Engineering
2020 Member of the Sustainable Travels Working Group
2019 - 2020 Member of the Nanosafe Working Group

Approved Research Projects

2024-2028 SNSF Project Grant N° 200021_219715 "Design strategies for stable catalysts in CO₂
electroreduction"
2023-2028 ERC CoG Tulip "Developing the Chemistry for Tunable Liquid Metal NanoParticles
towards Reconfigurable Materials"
2021-2024 SNSF Lead Agency Project "Synthesis and transformations of multimetallic
nanoparticles for electrocatalysis"
2020-2024/
2024-2028 Co-PI and Work Package Leader in SNSF NCCR Catalysis

2020-2023 Co-PI and Work Package Leader in FET ProActive LICROX "Light Assisted Solar Fuel
Production by Artificial CO₂ reduction and Water Oxidation"
2020-2022 Academic host for Dr. Kevin Rossi, Recipient of the Marie Curie Individual Fellowship,
Title: "Nano2CORE: nanocrystals for CO₂ reduction"

2020-2022	Academic host for Dr. James Pankhurst, Recipient of the Marie Curie Individual Fellowship, Title: "SURFCAT: Surface-functionalized nanocrystal catalysts for the electrochemical reduction of carbon dioxide"
2017-2018	Swiss National Science Foundation, Scientific Exchange Grant N° IZSEZ0_177984 Title: "1st Winter School at EPFL Valais: Challenges and Opportunities in Energy Research"
2017-2020	Swiss National Science Foundation, AP Energy Grant N° PYAPP2_166897/1 Title: "Colloidal chemistry for engineering complex metal oxides to advance solar-to-fuels conversion studies"
2017-2021	ERC-STG-Grant Title "HYCAT: multifunctional hybrid platforms based on colloidal nanocrystals to advance CO2 conversion studies"
2017-2019	Academic host for Dr. Michal Strach, Recipient of the Marie Curie Individual Fellowship, Title: "NANOaid: Advanced in-situ techniques for the development of metal oxide nanostructures"
2016-2018	Academic host for Dr. Anna Loiudice, Recipient of the Marie Curie Reintegration Fellowship, Title: "NanoINCAGE: Luminescent nanocrystals in a cage for solar-to-fuels conversion",
2016-2020	Gaznat Research Grant , Title: "Electrochemical conversion of CO2 into value-added chemicals"
2016-2018	Project Grant in National Center of Competence in Research MARVEL Title "Colloidal nanocrystals as model systems to uncover structure/properties relation in CO2 electroreduction"

Supervision of Junior Researchers

- Currently promotor of 7 doctoral theses, 10 defended
- Currently supervising 3 postdoctoral researchers, 8 past
- Participation in 40 PhD committees, 36 candidacy exams

Teaching Activities

2022 – present	Introduction to chemical engineering Laboratory Works
2018 – present	Nanomaterials for chemical engineering application, Master Course
2017 – 2019	Colloidal synthesis of nanoparticles and their energy applications, PhD Course
2017 – present	Introduction to Transport Phenomena, Bachelor Course
2016 – present	Project coach for Chemical product design, Master Course

Membership in Panels, Boards, etc. and Individual Scientific Reviewing Activities

2024 – present	Member of the Scientific Advisory Board for the Advanced Research Center Chemical Building Blocks Consortium, https://arc-cbbc.nl/
2021 – present	Associate Editor of ACS Catalysis
2023 – present	Member of the Editorial Advisory Board of ACS Energy Letters
2022 – 2023	Chair of the Nanoscience Subdivision of the ACS Division of Inorganic Chemistry
2021 – 2022	Chair-Elect of the Nanoscience Subdivision of the ACS Division of Inorganic Chemistry
2022 – present	Board member of the Swiss Chemical Society Mat Chem division
2021– present	Board member of the Swiss Chemical Society Green & Sustainable Chem division
2020 – present	Member of the Editorial Advisory Board of Chemistry of Materials

2020 – present	Member of the Editorial Advisory Board for Nanoscale
2020 – present	Member of the Editorial Advisory Board for Chemical Communications
2020 – present	Member of the Editorial Advisory Board for Dalton Transactions
2020 – 2021	Member of the Early Career Advisory Board for ACS Materials Letters
2018 – 2019	Member of the Early Career Advisory Board for ACS Catalysis

Active Membership in Scientific Societies, Fellowships in Renowned Academies

Member of the Swiss Chemical Society (from **2016**), Royal Chemical Society (from **2017**), Materials Research Society (from **2015**)

Prizes, Awards, Fellowships

2024	ACS Inorganic Nanoscience Award
2024	Russel Lecture (Queen's University, Canada)
2023	Eastman Lectures in Catalysis (UC Berkeley, along with Marc Koper, William Mustain, Henry Sheldon White)
2021	Swiss Chemical Society Werner Price
2019	Thieme Chemistry Journal Award
2019	European Chemical Society Lecture Award
2019	Royal Chemical Society ChemComm Emerging Investigator Lectureship
2018	Endowed Chair from the Sandoz Family Foundation

Raffaella Buonsanti, Research output

As of October 2024, Professor Raffaella Buonsanti has co-authored a total of **125 peer-review publications** in international journals, 42 as a PhD and Postdoctoral researcher and **81 during her independent career**. These publications have received over 11000 literature citations and an **h-index of 53**

The full list of publications can be found here:

<https://scholar.google.ch/citations?user=cWUMss8AAAAJ&hl=en&oi=ao>

The 1st and 4th most cited publications have been published during independent career

Publications in international peer-reviewed scientific journals (since at EPFL)

1. L. Zaza, D. C. Stoian, N. Bussel, P. P. Albertini, C. Boulanger, J. Leemans, K. Kumar, A. Loiudice, R. Buonsanti "Increasing precursor reactivity enables continuous tunability of copper nanocrystals from single crystalline to twinned and stacking fault-lined" J. Am. Chem. Soc. 2024,
2. P. B. Green, O. Segura Lecina, P. P. Albertini, M. A. Newton, K. Kumar, C. Boulanger, J. Leemans, P. Thompson, A. Loiudice, R. Buonsanti "Colloidal atomic layer deposition on nanocrystals using ligand-modified precursors" J. Am. Chem. Soc. 2024, 146, 10708-10715
3. V. Lapointe, P. B. Green, A. N. Chen, R. Buonsanti, M. B. Majewski "Long lived CsPbBr₃ superlattices: colloidal atomic layer deposition for structural stability" Chem. Sci. 2024, 15, 4510-4518
4. P. P. Albertini, M. A. Newton, M. Wang, O. Segura Lecina, P. B. Green, D. C. Stoian, E. Oveisi, A. Loiudice, R. Buonsanti "Hybrid Oxide Coatings Generate Stable Cu Catalysts for CO₂ Electroreduction" Nature Mater. 2024, 23, 680-687
5. J. Vavra, G. P. L. Ramona, F. Dattila, A. Kormányos, T. Priamushko, P. P. Albertini, A. Loiudice, S. Cherevko, N. López, R. Buonsanti "Solution-based Cu⁺ transient species mediate the reconstruction of copper electrocatalysts for CO₂ reduction" Nature Catal. 2024, 7, 89

6. O. Segura Lecina, M. Newton, P. B. Green, P. P. Albertini, J. Leemans, K.P. Marshall, D. Stoian, A. Loiudice, R. Buonsanti "Surface chemistry dictates the enhancement of luminescence and stability of InP QDs upon c-ALD ZnO hybrid shell growth" *JACS Au* 2023, 11, 3066
7. V. Okatenko, C. Boulanger, A. N. Chen, K. Kumar, P. Schouwink, A. Loiudice, R. Buonsanti "Voltage-driven Chemical Reactions Enable the Synthesis of Tunable Liquid Ga – Metal Nanoparticles" *J. Am. Chem. Soc.* 2023, 145, 25401
8. P. B. Green, O. Segura Lecina, P. P. Albertini, A. Loiudice, R. Buonsanti "Colloidal-ALD Grown Metal Oxide Shells Enable the Synthesis of Photoactive Ligand/Nanocrystal Composite Materials" *J. Am. Chem. Soc.* 2023, 145, 8189-8197
9. R. Buonsanti "Electronic Lab Notebooks for Materials Synthesis" *Chem. Mater.* 2023, 35, 805
10. P. B. Green, O. Segura Lecina, P. Albertini, A. Loiudice, R. Buonsanti "Colloidal-ALD Grown Metal Oxide Shells Enable the Synthesis of Photoactive Ligand/Nanocrystal Composite Materials" *J. Am. Chem. Soc.* 2023, 145, 8189.
11. V. Okatenko, A. Loiudice, M. A. Newton, D.C. Stoian, A. Blokhina, A. N. Chen, K. Rossi, R. Buonsanti "Alloying as a Strategy to Boost the Stability of Copper Nanocatalysts during the Electrochemical CO₂ Reduction Reaction" *J. Am. Chem. Soc.* **2023**, 145, 5370
12. R. Buonsanti "Electronic Lab Notebooks for Materials Synthesis" *Chem. Mater.* **2023**, 35, 805. This article is an invited Editorial.
13. M. Wang, A. Loiudice, V. Okatenko, I.D. Sharp, A. Llobet, R. Buonsanti "The spatial distribution of cobalt phthalocyanine and copper nanocubes controls the selectivity towards C₂ products in tandem electrocatalytic CO₂ reduction", *Chem. Sci.* **2023**, 14, 1097
14. M. Wang, V. Nikolaou, A. Loiudice, I.D. Sharp, A. Llobet, R. Buonsanti "Tandem electrocatalytic CO₂ reduction with Fe-porphyrins and Cu nanocubes enhances ethylene production", *Chem. Sci.* **2022**, 13, 12673
15. L. Castilla-Amorós, P. Schouwink, E. Oveisi, R. Buonsanti "Tailoring Morphology and Elemental Distribution of CuIn Nanocrystals via Galvanic Replacement", *J. Am. Chem. Soc.* **2022**, 144, 18286.
16. J. R. Pankhurst, L. Castilla-Amorós, D. Stoian, J. Vavra, V. Mantella, P. P. Albertini, R. Buonsanti "Copper-Phosphonate Lamella Intermediates Control the Shape of Colloidal Copper Nanocrystals" *J. Am. Chem. Soc.* **2022**, 144, 12261.
17. V. Okatenko, L. Castilla-Amorós, D. Stoian, J. Vávra, A. Loiudice, R. Buonsanti "The native oxide skin of liquid metal Ga nanoparticles prevents their rapid coalescence during electrocatalysis" *J. Am. Chem. Soc.* **2022**, 144, 1053.
18. A. Loiudice, R. Buonsanti* "Reaction Intermediates in the Synthesis of Colloidal Nanocrystals" *Nature Synthesis* **2022**, 1, 334.
19. L. Zaza, K. Rossi, R. Buonsanti* "Well-Defined Copper-Based Nanocatalysts for Selective Electrochemical Reduction of CO₂ to C₂ products" *ACS Energy Lett* **2022**, 7, 1284
20. O. Segura Lecina, M. Hope, A. Venkatesh, S. Björgvinsdóttir, K. Rossi, A. Loiudice, L. Emsley, R. Buonsanti* "Colloidal-ALD Grown Hybrid Shells Nucleate via a Ligand–Precursor Complex" *J. Am. Chem. Soc.* **2022**, 144, 3998
21. K. Rossi, R. Buonsanti* "Shaping Copper Nanocatalysts to Steer Selectivity in the Electrochemical CO₂ Reduction Reaction" *Acc. Chem. Res.* **2022**, 55, 629

22. G.O. Larrazábal, V. Okatenko, I. Chorkendorff, R. Buonsanti, B. Seger* "An investigation of ethylene and propylene production from CO₂ reduction over copper nanocubes in MEA-type electrolyzer" *ACS Appl. Mater. Interf.* **2022**, 14, 779
23. L. Castilla-Amoros, T.-C. Chang Chien, J. R. Pankhurst, R. Buonsanti* "Modulating the Reactivity of Liquid Ga Nanoparticle Inks by Modifying their Surface Chemistry" *J. Am. Chem. Soc.* **2022**, 144, 1993
24. A. Loiudice, B.P.G. Niau, R. Buonsanti* "Crystal phase control of ternary metal oxides by solid-state synthesis with nanocrystals" *ACS Nanoscale Au* **2022**, doi: 10.1021/acsnanoscienceau.1c00049
25. S.B. Varandili, D. Stoian, J. Vavra, K. Rossi, J. R. Pankhurst, Y. Guntern, N. Lopez, R. Buonsanti* "Elucidating the structure-dependent selectivity towards methane and ethanol of CuZn in the CO₂ electroreduction using tailored Cu/ZnO precatalysts " *Chem. Sci.* **2021**, 12, 14484
26. P. Iyengar, M. J. Kolb, J. Pankhurst, F. Calle Vallejo*, R. Buonsanti* "Theory-guided enhancement of CO₂ reduction to ethanol on Ag-Cu tandem catalysts via particle-size effects" *ACS Catalysis* **2021**, 11, 13330
27. S.W. Sheehan and R. Buonsanti "Deriving value from CO₂: From catalyst design to industrial implementation" *Chem. Catalysis* **2021**, 1, 751.
28. R. Buonsanti and S.W. Sheehan "Catalyst discovery for electrochemical CO₂ conversion" *Chem. Catalysis* **2021**, 1, 754.
29. R. Buonsanti "Copper, my precious!" *Nature Catalysis* **2021**, 4, 736
30. A. Loiudice, A. Segura Lecina, A. Bornet, J. Luther, R. Buonsanti* "Ligand locking on quantum dot surfaces via a mild reactive surface treatment" *J. Am. Chem. Soc.* **2021**, 143, 13418
31. S.B. Varandili, D. Stoian, J. Vavra, K. Rossi, J. R. Pankhurst, Y. Guntern, N. Lopez, R. Buonsanti* "Elucidating the structure-dependent selectivity towards methane and ethanol of CuZn in the CO₂ electroreduction using tailored Cu/ZnO precatalysts " *Chem. Sci.* **2021**, 12, 14484.
32. P. Iyengar, M. J. Kolb, J. Pankhurst, F. Calle Vallejo*, R. Buonsanti* "Elucidating the Facet-dependent Selectivity for CO₂ Electroreduction to Ethanol of Cu-Ag Tandem Catalysts" *ACS Catalysis* **2021**, 11, 4456
33. S.W. Sheehan and R. Buonsanti "Deriving value from CO₂: From catalyst design to industrial implementation" *Chem. Catalysis* **2021**, just accepted
34. R. Buonsanti and S.W. Sheehan "Catalyst discovery for electrochemical CO₂ conversion" *Chem. Catalysis* **2021**, just accepted
35. R. Buonsanti "Copper, my precious!" *Nature Catalysis* **2021**, 4, 736
36. A. Loiudice, A. Segura Lecina, A. Bornet, J. Luther, R. Buonsanti* "Ligand locking on quantum dot surfaces via a mild reactive surface treatment" *J. Am. Chem. Soc.* **2021**, 143, 13418
37. R. Buonsanti "Developing the Chemistry of Colloidal Cu Nanocrystals to Advance the CO₂ Electrochemical Reduction" *Chimia* **2021**, 75, 598
38. R. Buonsanti and W. Smith "Emerging collaborations at the forefront of growth in electrochemical synthesis" *iScience* **2021**, 24, 102639
39. R. Buonsanti * and N. Zheng* "The Inorganic Chemistry of Nanoparticles" *Inorg. Chem.* **2021**, 60, 4179

40. P. Iyengar, M. Kolb, J. Pankhurst, F. Calle Vallejo, R. Buonsanti* "Elucidating the Facet-dependent Selectivity for CO₂ Electroreduction to Ethanol of Cu-Ag Tandem Catalysts" *ACS Catalysis* **2021**, 11, 4456
41. Y. Guntern, J. Vavra, V. Karve, S. Varandili, O. Segura Lecina, C. Gadiyar, R. Buonsanti* "Synthetic Tunability of Colloidal Covalent Organic Framework/Nanocrystal Hybrids" *Chem. Mater.* **2021**, 33, 2646.
42. J. Pankhurst, P. Iyengar, V. Okatenko, R. Buonsanti* "Copper nanocrystal morphology determines the viability of molecular surface functionalization in tuning electrocatalytic behavior in CO₂ reduction", *Inorg. Chem.* **2021**, 60, 6939
43. R. Buonsanti*, A. Loiudice, V. Mantella "Colloidal Nanocrystals as Precursors and Intermediates in Solid State Reactions for Multinary Oxide Nanomaterials" *Acc. Chem. Res.* **2021**, 54, 754
44. Y.T. Guntern, V. Okatenko, J. Pankhurst, S.B. Varandili, P. Iyengar, C. Koolen, D. Stoian, J. Vavra, R. Buonsanti*, Colloidal Nanocrystals as Electrocatalysts with Tunable Activity and Selectivity, *ACS Catal.* **2021**, 11, 1248
45. R. Buonsanti* "Magic clusters are better together" *Nature Mater.* **2021**, 20, 580
46. V. Mantella, S.B. Varandili, J. R. Pankhurst, R. Buonsanti* "Colloidal synthesis of Cu-M-S (M=V, Cr, Mn) nanocrystals by tuning the copper precursor reactivity" *Chem. Mater.* **2020**, 32, 9780
47. S.B. Varandili, D. Stoian, Jan Vavra, J. R. Pankhurst, R. Buonsanti* "Ligand-mediated formation of Cu/metal oxide hybrid nanocrystals with tunable number of interfaces " *Chem. Sci.* **2020**, 11, 13094
48. L. Castilla-Amoros, D. Stoian, J. R. Pankhurst, S.B. Varandili, R. Buonsanti* "Exploring the chemical reactivity of gallium liquid metal nanoparticles in galvanic replacement" *J. Am. Chem. Soc.* **2020**, 2020, 142, 19283
49. V. Mantella, L. Castilla-Amoros, R. Buonsanti* "Shaping non-noble metal nanocrystals via colloidal chemistry" *Chem. Sci.* **2020**, 11, 11394
50. J. Vavra, T.-H. Shen, D. Stoian, V. Tileli*, R. Buonsanti* "Real-time monitoring reveals dissolution/redeposition mechanism in Cu nanocatalysts during the initial stages of the CO₂ reduction reaction " *Angew. Chemie. Int. Ed.* **2020**, 60, 1347.
51. C. Gadiyar, A. Loiudice, F. D'Ambra, E. Oveisi, D. Stoian, P. Iyengar, L. Castilla-Amoros, V. Mantella, R. Buonsanti* "Nanocrystals as precursors in solid state reactions for size- and shape- controlled polyelemental nanomaterials" *J. Am. Chem. Soc.* **2020**, 142, 15931
52. J.R. Pankhurst, P. Iyengar, A. Loiudice, M. Mensi, R. Buonsanti* "Metal-ligand bond strength determines the fate of organic ligands on the catalyst surface during the electrochemical CO₂ reduction reaction" *Chem. Sci.* **2020**, 11, 929
53. A. Loiudice, O. Segura Lecina, R. Buonsanti* "Atomic Control in Multicomponent Nanomaterials: when Colloidal Chemistry meets Atomic Layer Deposition" *ACS Mater. Lett.* **2020**, 2, 1182
54. R. Buonsanti, J. M. Buriak, L. Cabana, B. M. Cossairt, M. Dasog, S. Dehnen, J. L. Dempsey, A. Nirmala Grace, D. Koziej, L. McElwee-White, C. Thomas, J. Y. Yang "Checking in with Women Materials Scientists during a Global Pandemic: May 2020" *Chem. Mater.* **2020**, 32, 4859
55. V. Mantella+, M. Strach+, K. Frank, J.R. Pankhurst, D. Stoian, C. Gadiyar, B. Nickel, R. Buonsanti* "Polymer Lamellae as Reaction Intermediates of Cu Nanospheres Evidenced by In-situ-X-ray Studies" *Angew. Chemie. Int. Ed.* **2020**, 59, 11627.

56. S. Sarys, S. Dona, V. Niemann, A. Loiudice, R. Buonsanti* "Optimizing the Atomic Layer Deposition of Alumina on Perovskite Nanocrystals Films by Using O₂ as a Molecular Probe" *Helv. Chim. Acta* **2020**, 103, e2000055.
57. A. Loiudice, S. Saris, R. Buonsanti* "A Tunable Metal Oxide Shell as a Spacer to Study Energy Transfer in Semiconductor Nanocrystals" *J. Phys. Chem. Lett.* **2020**, 2020, 11, 3430
58. G. De Gregorio, T. Burdyny, A. Loiudice, P. Iyengar, W. Smith, R. Buonsanti* "Facet-dependent selectivity of Cu catalysts in electrochemical CO₂ reduction at commercially viable current densities", *ACS Catalysis* **2020**, 10, 4854
59. S. Popović, M. , Smiljanić, P. Jovanovic, J. Vavra, R. Buonsanti*, N. Hodnik* "Stability and degradation mechanisms of copper-based catalysts for electrochemical CO₂ reduction", *Angew. Chemie. Int. Ed.* **2020**, doi 10.1002/anie.202000617
60. S. Saris, A. Loiudice, M. Mensi, R. Buonsanti* "Exploring Energy Transfer in a Metal/Perovskite Nanocrystal Antenna to Drive Photocatalysis" *J. Phys. Chem. Lett.* **2019**, 10, 7797.
61. S. Sarys, V. Niemann, V. Mantella, A. Loiudice, R. Buonsanti* "Understanding the mechanism of metal-induced degradation in perovskite nanocrystals" *Nanoscale* **2019**, 11, 19543
62. M. Strach, V. Mantella, J.R. Pankhurst, P. Iyengar, A. Loiudice, S. Das, C. Corminboeuf, W. van Beek, R. Buonsanti* "Insights into reaction intermediates to predict synthetic pathways for shape-controlled metal nanocrystals" *J. Am. Chem. Soc.* **2019**, 141, 16312
63. J.R. Pankhurst, Y.T. Guntern, M. Mensi, R. Buonsanti* "Molecular tunability of surface-functionalized metal nanocrystals for selective electrochemical CO₂ reduction" *Chem. Sci.* **2019**, 10, 10356
64. R. Buonsanti* "A solid advance in electrolytes" *Nature Energy* **2019**, 4, 728
65. G. Mangione, J. Huang, R. Buonsanti, C. Corminboeuf* "Dual-facet mechanism in copper nanocubes for electrochemical CO₂ reduction to ethylene" *J. Phys. Chem. Lett.* **2019**, 10, 4259
66. Y.T. Guntern, J.R. Pankhurst, J. Vávra, M. Mensi, V. Mantella, P. Schouwink, R. Buonsanti* "Nanocrystal/Metal-Organic Framework Hybrids as Electrocatalytic Platforms for CO₂ Conversion" *Angew. Chemie. Int. Ed.* **2019**, 58, 2.
67. A. Loiudice, M. Strach, S. Saris, D. Chernyshov, R. Buonsanti* "Universal Oxide Shell Growth Enables In-situ Structural Studies of Perovskite Nanocrystals during the Anion Exchange Reaction" *J. Am. Chem. Soc.* **2019**, 141, 8254.
68. P. Iyengar J. Huang, G.L. De Gregorio, C. Gadiyar, R. Buonsanti* "Size-dependent selectivity of Cu nano-octahedra catalysts for the electrochemical CO₂ reduction to CH₄" *Chem. Commun.* 2019, 55, 8796.
69. S. B. Varandili, J. Huang, E. Oveisi, G.L. De Gregorio, M. Mensi, M. Strach, J. Vavra, C. Gadiyar, A. Bhowmik, R. Buonsanti* "Synthesis of Cu/CeO_{2-x} heterodimers with interfacial active sites to promote CO₂ electroreduction" *ACS Catalysis* **2019**, 9, 5035
70. J. Huang, M. Mounir, E. Oveisi, V. Mantella, R. Buonsanti* "Structural sensitivities in bimetallic catalysts for electrochemical CO₂ reduction revealed by Ag-Cu nanodimers" *J. Am. Chem. Soc.* **2019**, 141, 2490.
71. V. Mantella, S. Ninova, S. Saris, A. Loiudice, U. Aschauer, R. Buonsanti* "Synthesis and size-dependent optical properties of intermediate band gap Cu₃VS₄ nanocrystals" *Chem. Mater.* **2019**, 31, 532.
72. J. Huang, R. Buonsanti* "Colloidal nanocrystals as heterogeneous catalysts for electrochemical CO₂ conversion" *Chem. Mater.* **2019**, 31, 13. *Up-and-Coming Perspective. ACS Editors Choice.*
73. M. Scarongella⁺, C. Gadiyar⁺, M. Strach, L. Rimoldi, A. Loiudice, R. Buonsanti* "Assembly of β -Cu₂V₂O₇/WO₃ nanocomposites and the impact of their composition on structure and photoelectrochemical properties" *J. Mater. Chem. C.* **2018**, 6, 1262. *Emerging Investigators Collection.*

74. J. Wiktor, I. Reshetnyak, M. Strach, M. Scarongella, R. Buonsanti, A. Pasquarello "Sizable excitonic effects undermining the photocatalytic efficiency of β -Cu₂V₂O₇" *J. Phys. Chem. Lett.* **2018**, 9, 5698.
75. J. Huang, N. Hörmann, E. Oveisi, A. Loiudice, G. De Gregorio, O. Andreussi, N. Marzari, R. Buonsanti* "Potential-induced nanoclustering of metallic catalysts during electrochemical CO₂ reduction" *Nature Comm.* **2018**, 9, 3117.
76. C. Gadiyar, M. Strach, P. Schouwink, A. Loiudice, R. Buonsanti* "Chemical transformations at the nanoscale: nanocrystal-seeded synthesis of β -Cu₂V₂O₇ with enhanced photoconversion efficiencies" *Chem. Sci.* **2018**, 9, 5658.
77. W. Luo, W. Xie, R. Mutschler, E. Oveisi, G. L. De Gregorio, R. Buonsanti, A. Züttel "Selective and stable electroreduction of CO₂ to CO at the copper/indium interface" *ACS Catal.* **2018**, 8, 6571.
78. Z. Luo, D. Marson, Q.K. Ong, A. Loiudice, J. Kohlbrecher, A. Radulescu, A. Krause-Heuer, T. Darwish, S. Balog, R. Buonsanti, D.I. Svergun, P. Posocco, F. Stellacci, Quantitative 3D determination of self-assembled structures on nanoparticles using small angle neutron scattering, *Nature Comm.* **2018**, 9, 1343.
79. R. Sharma, A. M. Sawvel, B. Barton, A. Dong, R. Buonsanti, A. Llodes, E. Schaible, S. Axnanda, Z. Liu, J. J Urban, D. Nordlund, C. Kisielowski, D. J. Milliron "Modulation of Carrier Type in Nanocrystal-in-Matrix Composites by Interfacial Doping" *Chem. Mater.* **2018**, 30, 2544.
80. A. Loiudice⁺, S. Saris⁺, E. Oveisi, D.T.L. Alexander, R. Buonsanti*, CsPbBr₃ QD/AlO_x inorganic nanocomposites with exceptional stability in water, light and heat. *Angew. Chem. Int. Ed.* **2017**, 56, 10696.
81. L. H. Hess, J.K. Cooper, A. Loiudice, C.-M. Jiang, R. Buonsanti*, I.D. Sharp*, Probing interfacial energetics and charge transfer kinetics in semiconductor nanocomposites: New insights into heterostructured TiO₂/BiVO₄ photoanodes, *Nano Energy* **2017**, 34, 375.
82. I. D. Sharp*, J. K. Cooper, F. M. Toma, R. Buonsanti, Bismuth vanadate as a platform for accelerating discovery and development of complex transition metal oxide photoanodes, *ACS Energy Letters* **2017**, 2, 139.
83. C. Gadiyar, A. Loiudice, R. Buonsanti*, Colloidal nanocrystals for photoelectrochemical and photocatalytic water splitting, *J. Phys. D: Appl. Phys.* **2017**, 50, 074006.
84. R. Buonsanti*, Colloidal chemistry to advance studies in artificial photosynthesis, *Chimia* **2016**, 70, 780.
85. I. Luz⁺, A. Loiudice⁺, D.T. Sun, W. L. Queen, R. Buonsanti*, Understanding the formation mechanism of metal nanocrystal@MOF-74 hybrids, *Chem. Mater.* **2016**, 28, 3839.
86. A. Loiudice, P. Lobaccaro, E.A. Kamali, T. Thao, B.H. Huang, J.W. Ager, R. Buonsanti*, Tailoring Copper Nanocrystals towards C₂ Products in Electrochemical CO₂ reduction, *Angew. Chemie. Int. Ed.* **2016**, 55, 5789.

Invited contributions to international conferences since at EPFL

Conferences (invited/plenary talks):

NWO Chains 2024 (main chemistry conference in the Netherlands), plenary speaker, Eindhoven, December 2-4, **2024**

Nature Conference, CO₂ conversion by renewable energy, Wuhan, November 8-10, **2024**

ACS Fall Meeting 2024 (4 different invited talks in 4 different divisions of ACS), Denver, August 18-22, **2024**

ACS Fall Meeting 2023 (invited talk in ACS Inorganic Division for 65 years birthday celebration), San Francisco, August 13-17 **2023**;

EuropaCat, <https://www.europacat2023.cz/>, Prague, August 27 -September 1 **2023**

Nanax 10, Nanoscience with nanocrystals <http://nanax.org/> , Klosterneuburg, Austria, 3-7 July **2023**

Argonne National Laboratory User Meeting, Chicago **2023**, joined virtually (<https://www.anl.gov/cnm/apscnm-users-meetings>)

International Conference on Clean Energy for Carbon Neutrality, Hong Kong **2023**, joined virtually (<https://www.cityu.edu.hk/hkice/iccecn2023/program03.html>)

MatSus2023, symposia “Chemistry of Materials” and “Electrocatalysis for the Production of Fuels and Chemicals”, Valencia **2023**

MRS Fall Symposium “Challenges and opportunities in solution synthesis of functional nanomaterials”, Boston, **2022**

Grk Nanohybrid Conference, Hamburg, **2022**

Sol-Gel Conference, Lyon, **2022**

Royal Spanish Chemical Society Biannual Meeting, Granada, **2022**

GRC Renewable Energy: Solar Fuels, Tuscany, **2022**

Spring ACS, ACS Division of Inorganic Chemistry, 65th symposium, **2022**

MRS Fall, Symposium ““Electrocatalytic Materials to Sustainably Convert Atmospheric C, H, O, and N into Fuels and Chemicals”, Boston, **2021**, (online)

NanoGe Fall Meeting, Symposium #SolCat21, **2021** (online)

Account of Chemical Research Journal Club “Transformative Inorganic Nanocrystals”, **2021** (online)

NanoGe The internet conference of Colloidal Quantum Dots, **2021** (online)

Middle Atlantic Regional Meeting of the American Chemical Society, **2021** (online)

ACS Spring Virtual Meeting in Symposia CATL-“Well-Defined Materials for Heterogeneous Catalysis: Synthesis, Characterization, and Performance Studies” and COLL-“Nanomaterials, **2021**

The internet NanoGe Conference on Nanocrystals (iNCNC), **2021**

Online NanoGe Spring Meeting, Symposium “Photophysics of nanoscale semiconductors” **2021**

Pacifichem, Honolulu, December **2020** (cancelled for COVID)

NanoGe Online Conference, Fundamental Processes in Semiconductor Nanocrystals, November **2020**

Cell Press Webinar Light/Matter Interactions, June **2020**

NanoGe Online Meetup: Structure-Function Relationships in CO₂ electrocatalysts, June **2020**

NanoGe Online Meetup: Shape-Controlled Nanocrystals: Synthesis, Characterization Methods and Applications, May **2020**

Electrochemistry, German Chemical Society Conference , Berlin **2020** (cancelled for COVID)

EuChemS, European Chemical Society Conference, Lisbon **2020** (cancelled for COVID)

GRC Inorganic Chemistry, Newport, **2020** (cancelled for COVID)

GRC Renewable Energy: Solar Fuels, Tuscany, **2020** (moved to 2022)

ACS, Philadelphia, **2020** (cancelled for COVID)

Annic_Applied Nanotechnology and Nanoscience International Conference, Paris, **2019**

NanoGe Conference, Solar Fuels, Berlin, **2019**
Nature Conference Solar Fuels, Wuhan, **2019**
ACS Fall Meeting, San Diego, **2019**
GRC Nanomaterials for Application in Energy technology, Ventura, **2019**
GRC Colloidal Semiconductor Nanocrystals, Smithfield, **2018**
ACS Fall Meeting, Boston, **2018**
E-MRS Spring Meeting, Strasbourg, **2018**
MRS Fall Meeting, Boston, **2017**
EuroMat, Thessaloniki, **2017**
21st Solid State Ionics, Padova, **2017**
RSC ISACS21 Challenges in Nanoscience, Beijing, **2017**

Schools, Workshops, Symposia:

[ECOFuel Workshop](#), virtual , November 28th, **2023**;
[12th De Nora Symposium](#), Milan, November 7-8 **2023**;
UK-Swiss Bilateral Meeting on Net Zero organized by Royal Chemical Society and Swiss Chemical Society, 15-16 June **2023**, London
International Sol-Gel Society's eSeminar series_May **2023**
iCANX Talks, Vol. 132, **2023**: <https://www.ican-x.com/icanx-talks>
International Symposium on Photo & Electro Catalytic CO₂ Reduction_Nankai University, September **2022**
International Symposium on Photo & Electro Catalytic CO₂ Reduction_Nankai University, November **2021** (online, [link](#))
ICFO-Univ of Toronto-PFL-Stanford International School Photons for Green Energy, October **2021** (online)
DFG (German Chemical Society) Colloquium "Catalysts and reactors under dynamic conditions for energy storage and conversion ", February **2021** (online)
Summer School of the European Federation of Catalysis Societies, Slovenia, September **2020** (online)
Online Summer School « Electrocatalysts for Energy Applications", July **2020**
ES3 Symposium_Exciton Engineering in Emerging Semiconductors, Madrid, **2020**
ETH-Japan Catalysis Workshop, ETH Zurich, **2019**
SUNCAT Summer School, Stanford, USA, **2019**
Energy-X Workshop, Brussels, **2019**
FOTOFUEL Workshop, Madrid, Spain, **2019**
SurfCat Summer School, Gilleleje, Denmark, **2018**

Department seminars:

2024:

Seminar for Samsung Advanced Institute of Technology, virtual
Department of Chemistry, Queen's University, Kingston, Canada

Department of Chemistry, University of Toronto, Canada;

Seminar at Max-Planck Institute for Kohlenforschung (KOFO), Mullheim, Germany

2023:

UC Berkeley, Kavli Energy NanoScience Institute

Max-Planck-Institut für Kohlenforschung, Mulheim;

Department of Chemistry, Jilian University (online);

Department of Chemistry, Imperial College;

Department of Chemistry, Cambridge;

Department of Chemistry (plenary at the KAVLI Energy Nanoscience Institute), UC Berkeley

2022:

Department of chemistry, PChem Seminar, LMU;

Max Planck Institute (MPI) for Dynamics of Complex Technical Systems;

Department of Chemistry (Inorg Chem Seminar), MIT

2021 : UW (Seattle), UMass (Boston), NYU (New York), University of Virginia, Indiana University

2020 : Université de Paris, Fritz Haber Institute, ICIQ

2019 : TU Delft, University of Barcellona, LMU Munich, DTU Physics

2018 : University of Oslo, KAUST

2017 : ETH, King's College London, University of Geneva

2016 : University of Bern, Paul Scherrer Institute, Fudan University

Conference Organization

2026 Elected co-chair of the Gordon Research Conference "Colloidal Semiconductor Nanocrystals"

2024 General chair of the NanoGe MATSUS24 Fall Meeting <https://www.nanoge.org/MATSUSFall24/home>

2022 Symposium organizer at NanoGe Fall 2022 Meeting ("#Suschem- Materials and electrochemistry for sustainable fuels and chemicals")

2022 Symposium organizer at ACS Fall 2022 Meeting ("Inorganic Nanoscience Award")

2022 Symposium organizer at ACS Spring 2022 Meeting ("Well-Defined Materials for Heterogeneous Catalysis")

2021 Symposium organizer at ACS Spring 2021 Meeting ("Inorganic Nanoscience Award")

2021 Symposium organizer at MRS Fall 2021 Meeting ("Women in Materials Science: Pioneers and a Vision for a More Inclusive Future")

2020 Organizer of the online NanoGe Internet Conference for Quantum Dots iCQD (<https://www.nanoge.org/iCQD/home>)

2018 Chair of the 1st Winter School "Challenges and Opportunities for Energy Research" (<https://nrq2018.epfl.ch>)

OUTREACH ACTIVITIES

Participation to "[ScienceGirls](#)"

Participation to the event [Scientastic](#) – Festival des Sciences de l'EPFL (April 29-30, 2017) to promote EPFL Valais to the general public.

Interview for a local magazine [Valais Valeur Ajoutée](#) to reach out to general public