

contact information

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current position

January 2015 – Assistant Professor of Chemical Engineering and, by courtesy, of Materials Science and Engineering

education

University of Pennsylvania, Post-doctoral Scholar
June 2012 – August 2014
Department of Chemistry, supervisor: Christopher B. Murray

University of Trieste (Italy), PhD in Nanotechnology
December 2011 (Thesis defended 29 March 2012), thesis title: “Tailored nanoarchitectures based on transition metals for heterogeneous catalysis”, supervisor: Prof. P. Fornasiero, co-advisors: Dr. T. Montini (University of Trieste), Prof. R. J. Gorte (University of Pennsylvania)

University of Trieste (Italy), “Laurea Magistrale” Degree in Chemistry (comparable to M.Sc.), July 2008, Summa cum Laude, thesis title: “Nanostructures based on palladium and gold as heterogeneous catalysts”, supervisor: Prof. P. Fornasiero

University of Trieste (Italy), “Laurea di Primo Livello” Degree in Chemistry (comparable to B.Sc.), July 2006, University of Trieste, Summa cum Laude, thesis title: “Synthesis of pyridine-containing thiols for the preparation of mixed monolayers onto gold nanoparticles”, supervisor: Prof. L. Pasquato

honors and awards

- ACS Catalysis Division Early Career Award in Catalysis, 2022
- Leonardo da Vinci Society Scientific Award, 2021
- Mitsui Chemicals Catalysis Science Award for Creative Work, 2020
- ANNIC Mid-Career Nanotechnology Scientific Award, 2019
- Sloan Research Fellowship, Alfred P. Sloan Foundation, 2018
- Hellman Faculty Scholar, 2018
- ERES Young Investigator award, European Rare Earth and Actinide Society, 2018
- Industrial & Engineering Chemistry Research Class of Influential Researchers, 2018
- Catalysis Gordon Research Conference Outstanding Poster Presentation, 2018
- Young Scientist Prize, 16th International Congress on Catalysis, 2016
- Terman Faculty Fellow, Stanford University, 2015-2017
- EFCATS Award Best European PhD Thesis in Catalysis, 2013
- ENI Award “Debut in Research”, 2013
- Levi Award for the best paper of a researcher under 35, Italian Chemical Society (SCI), 2012



- Best PhD Thesis in Inorganic Chemistry, Division of Inorganic Chemistry of the Italian Chemical Society (SCI), 2012
 - "Fernando Tommasini" award, PhD School in Nanotechnology, University of Trieste, 2011
 - University College for Sciences "L. Fonda" Scholarship, 2006-2008
-

bibliometric details

H-index: 42; citations: 7878 (Source: Scopus, February 2022)

synergistic activities

reviewer for the National Science Foundation (NSF), the Stanford Synchrotron Radiation Lightsource – SLAC National Accelerator Laboratory
chair and organizer, ACS and AIChE symposia
junior mentor for AIChE Future Faculty Mentor Program, AIChE

editorial positions

editorial board, *Powder Technology*

editorial activity

regularly serves as reviewer for *Nature*, *Nature Materials*, *Science*, *Journal of the American Chemical Society*, *Angewandte Chemie International Edition*, *Advanced Materials*, *Nature Communications*, *Science Advances*, *ACS Catalysis*, *Journal of Catalysis*, *Chemistry of Materials*, *Nano Letters*, *ACS Nano*, *The Journal of Physical Chemistry*, *Langmuir*, *Chemical Communications*, *Energy and Environmental Science*, *Chemical Reviews*, *Catalysis Letters*, *AIChE Journal*

professional experiences

September – December 2014: Visiting Scientist in the Department of Chemistry, University of Pennsylvania

January - May 2012: Post-doctoral position in Heterogeneous Catalysis, University of Trieste (Italy), under a European Research Institute of Catalysis (ERIC) fellowship

April - September 2011: Visiting Graduate Student in the Department of Chemistry, University of Pennsylvania, Philadelphia (USA), in the group of Prof. Christopher B. Murray, working on monodisperse nanoparticles as catalyst components

June - July 2010: Visiting Graduate Student in the Department of Materials Science and Metallurgical Engineering and Inorganic Chemistry of the University of Cadiz, Spain, in the group of Dr. Juan José Delgado and Prof. Serafin Bernal working on the characterization of core-shell Pd@CeO₂ catalysts with advanced TEM techniques

September - December 2008: Visiting Undergraduate Student in the group of Prof. R. J. Gorte, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia (USA), working under a grant from AFOSR (MURI) on fuel-dispersible catalysts



research interests

design and preparation of materials for catalytic applications
characterization of catalysts under working conditions
development of synthetic strategies to active catalysts
synthesis of functional nanoparticles for catalytic applications

memberships

Italian Chemical Society (SCI)
American Chemical Society (ACS)
Materials Research Society (MRS)
American Institute of Chemical Engineers (AIChE)

journal articles, reviews and perspectives (peer-reviewed – bold indicates corresponding author)

117. Riscoe, A. R.; Oh, J.; **Cargnello, M.** “Sulfur-Treated TiO₂ Shows Improved Alcohol Dehydration Activity and Selectivity.”, *Nanoscale* **2022**, *in press*.
116. Tahsini, N.; Yang, A.-C.; Streibel, V.; Werghe, B.; Goodman, E. D.; Aitbekova, A.; Bare, S. R.; Li, Y.; Abild-Pedersen, F.; **Cargnello, M.** “Colloidal Platinum-Copper Nanocrystal Alloy Catalysts Surpass Platinum in Low-Temperature Propene Combustion.”, *J. Am. Chem. Soc.* **2022**, *in press*.
115. Zhou, C.; Asundi, A. S.; Goodman, E. D.; Hong, J.; Werghe, B.; Hoffman, A. S.; Nathan, S. S.; Bent, S. F.; Bare, S. R.; **Cargnello, M.** “Steering CO₂ Hydrogenation Towards C-C Coupling to Hydrocarbons Using Porous Organic Polymer/Metal Interfaces.”, *Proc. Natl. Acad. Sci. USA* **2022**, *in press*.
114. Streibel, V.; Aljama, H.; Yang, A.-C.; Choksi, T.; Sanchez-Carrera, R.; Schaefer, A.; Li, Y.; **Cargnello, M.**; Abild-Pedersen, F. “Microkinetic modeling of propene combustion on a stepped, metallic palladium surface and the importance of oxygen coverage.”, *ACS Catal.* **2022**, *in press*.
113. Goodman, E. D.; Asundi, A. S.; Hoffman, A. S.; Bustillo, K. C.; Stebbins, J. F.; Bare, S. R.; Bent, S. F.; **Cargnello, M.** “Monolayer Support Control and Precise Colloidal Nanocrystals Demonstrate Metal-Support Interactions in Heterogeneous Catalysts.”, *Adv. Mater.* **2021**, *44*, 2104533.
112. Kim, D.; Zhou, C.; Zhang, M.; **Cargnello, M.** “Voltage Cycling Process for the Electroconversion of Biomass-derived Polyols.”, *Proc. Natl. Acad. Sci. USA* **2021**, *118*, e2113382118.
111. Huang, W.; Johnston-Peck, A. C.; Wolter, T.; Yang, W.-C. D.; Xu, L.; Oh, J.; Reeves, B. A.; Zhou, C.; Holtz, M. E.; Herzing, A. A.; Linderberg, A. M.; Mavrikakis, M.; **Cargnello, M.** “Steam-created Grain Boundaries for Methane C-H Activation in Palladium Catalysts.”, *Science*, **2021**, *373*, 1518-1523.
110. Jackson, R. B.; Abernethy, S.; Canadell, J. P.; **Cargnello, M.**; Davis, J. S.; Féron, S.; Fuss, S.; Heyer, A. J.; Hong, C.; Jones, C. D.; Matthews, H. D.; O’Connor, F. M.; Pisciotta, M.; Rhoda, H. M.; de Richter, R.; Solomon, E. I.; Wilcox, J. L.; Zickfeld, K. “Atmospheric Methane Removal: A Research Agenda.”, *Philos. Trans. R. Soc. A* **2021**, *379*, 20200454.
109. Yang, A.-C.; Streibel, V.; Choksi, T. S.; Aljama, H.; Werghe, B.; Bare, S. R.; Sanchez, R.; Schaefer, A.; Li, Y.; Abild-Pedersen, F.; **Cargnello, M.** “Insights and Comparison of Structure-Property Relationships in Propane and Propene Catalytic Combustion on Pd- and Pt-based Catalysts.”, *J. Catal.* **2021**, *401*, 89-101.
108. Yang, A.-C.; Zhu, H.; Li, Y.; **Cargnello, M.** “Support Acidity Improves Pt Activity in Propane



- Combustion in the Presence of Steam by Reducing Water Coverage on the Active Sites.”, *ACS Catal.* **2021**, *11*, 6672-6683.
107. Schumann, M.; Nielsen, M.; Smitshuysen, T.; Hansen, T. W.; Damsgaard, C. D.; Yang, A.-C.; Cargnello, M.; Grunwaldt, J.-D.; Jensen, A.; Christensen, J. M. “Rationalizing an unexpected structure sensitivity in heterogeneous catalysis – CO hydrogenation over Rh as a case study.”, *ACS Catal.* **2021**, *11*, 5189-5201.
106. Kao, K.-C.; Yang, A.-C.; Huang, W.; Zhou, C.; Goodman, E. D.; Holm, A.; Frank, C. W.; Cargnello, M. “A General Approach for Monolayer Adsorption of High Weight Loadings of Uniform Nanocrystals on Oxide Supports.”, *Angew. Chem. Int. Ed.* **2021**, *60*, 7971-7979.
105. Goodman, E. D.; Carlson, E.; Dietze, E.; Tahsini, N.; Johnson, A.; Aitbekova, A.; Taylor, T. N.; Plessow, P. N.; Cargnello, M. “Size-Controlled Nanocrystals Reveal Spatial Dependence and Severity of Nanoparticle Coalescence and Ostwald Ripening in Sintering Phenomena.”, *Nanoscale* **2021**, *13*, 930-938.
104. Herzing, A.; Riscoe, A. R.; Cargnello, M. “Quantitative 3D Characterization of Novel Polymer-nanocrystal Hybrid Catalysts by Electron Tomography.”, *Micr. Microanal.* **2020**, *26*, 1136-1137.
103. Kunz, L.; Redekop, P.; Ort, D. R.; Grossman, A.; Cargnello, M.; Majumdar, A. “A Phytophotonic Approach to Enhanced Photosynthesis.”, *Energy Environm. Sci.* **2020**, *13*, 4794-4807.
102. Goodman, E. D.; Zhou, C.; Cargnello, M. “The Design of Organic/Inorganic Hybrid Catalysts for Energy and Environmental Applications.”, *ACS Centr. Sci.* **2020**, *6*, 1916-1937.
101. Kunz, L. Y.; Hong, J.; Riscoe, A. R.; Majumdar, A.; Cargnello, M. “Reducing instability in dispersed powder photocatalysis derived from variable dispersion, metallic co-catalyst morphology, and light fluctuations.”, *J. Photochem. Photobiol.* **2020**, *2*, 100004.
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99. Wu, Z.; Zhang, X.; Goodman, E. D.; Huang, W.; Riscoe, A. R.; Yacob, S.; Cargnello, M. “The Dynamics of Copper-Containing Porous Organic Framework Catalysts Reveal Catalytic Behavior Controlled by Polymer Structure.”, *ACS Catal.* **2020**, *10*, 9356-9365.
98. Nielander, A. C.; Blair, S. J.; McEnaney, J. M.; Schwalbe, J. A.; Adams, T.; Taheri, S.; Wang, L.; Yang, S.; Cargnello, M.; Jaramillo, T. F. “Readily Constructed Glass Piston Pump for Gas Recirculation.”, *ACS Omega* **2020**, *5*, 16455-16459.
97. Huang, W.; Zhang, X.; Yang, A.-C.; Goodman, E. D.; Kao, K.-C.; Cargnello, M. “Enhanced Catalytic Activity for Methane Combustion through In-Situ Water Sorption.”, *ACS Catal.* **2020**, *10*, 8157-8167.
96. Yang, A.-C.; Choksi, T.; Streibel, V.; Aljama, A.; Wrasman, C. J.; Roling, L. T.; Goodman, E. D.; Thomas, D.; Bare, S. R.; Sánchez-Carrera, R. S.; Schäfer, A.; Li, Y.; Abild-Pedersen, A.; Cargnello, M. “Revealing the structure of a catalytic combustion active-site ensemble combining uniform nanocrystal catalysts and theory insights.”, *Proc. Natl. Acad. Sci. USA* **2020**, *117*, 14721-14729.
95. Riscoe, A. R.; Wrasman, C. J.; Menon, A.; Dinakar, B.; Goodman, E. D.; Kunz, L. Y.; Yacob, S.; Cargnello, M. “Chemically controllable porous polymer-nanocrystal composites with hierarchical arrangement show substrate transport selectivity.”, *Chem. Mater.* **2020**, *32*, 5904-5915.



94. Feng, E. Y.; Zelaya, R.; Holm, A.; Yang, A.-C.; **Cargnello, M.** "Investigation of the Optical Properties of Uniform Platinum, Palladium and Nickel Nanocrystals Enables Direct Measurements of their Concentrations in Solution.", *Coll. Surf. A* **2020**, *601*, 125007.
93. Boubnov, A.; Timoshenko, J.; Wrasman, C. J.; Hoffman, A. S.; **Cargnello, M.**; Frenkel, A. I.; Bare, S. R. "Insight into restructuring of Pd-Au nanoparticles using EXAFS." *Rad. Phys. Chem.* **2020**, *175*, 108304.
92. Kim, D.; **Cargnello, M.** "Formic acid oxidation boosted by Rh single atoms.", *Nature Nanotech.* **2020**, *15*, 346-347.
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89. Parrish, E.; Rose, K. A.; **Cargnello, M.**; Murray, C. B.; Lee, D.; Composto, R. J. "Nanoparticle diffusion during gelation of tetra poly(ethylene glycol) provides insight into nanoscale structural evolution.", *Soft Matter* **2020**, *16*, 2256-2265.
88. Wrasman, C. J.; Riscoe, A. R.; Lee, H.; **Cargnello, M.** "Dilute Pd/Au alloys replace Au/TiO₂ interface for selective oxidation reactions.", *ACS Catal.* **2020**, *10*, 1716-1720.
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78. Andersen, S. Z.; Čolić, V.; Yang, S.; Schwalbe, J. A.; Nielander, A. C.; McEnaney, J. M.; Enemark-Rasmussen, K.; Baker, J. G.; Singh, A. R.; Rohr, B. A.; Statt, M. J.; Blair, S. J.; Mezzavilla, S.; Kibsgaard, J.; Vesborg, P. C. K.; **Cargnello, M.**; Bent, S. F.; Jaramillo, T. F.; Stephens, I. E. L.; Nørskov, J. K.; Chorkendorff, I. “A rigorous electrochemical ammonia synthesis protocol with quantitative isotope measurements.”, *Nature* **2019**, *570*, 504-508.
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75. Losch, P.; Huang, W.; Vozniuk, O.; Goodman, E. D.; Schmidt, W.; **Cargnello, M.** “Modular Pd/Zeolite Composites Demonstrate that Support Hydrophobic/Hydrophilic Character is Key in Methane Catalytic Combustion.” *ACS Catal.* **2019**, *9*, 4742-4753.
74. Kunz, L.; Diroll, B. T.; Wrasman, C.; Riscoe, A.; Majumdar, A.; **Cargnello, M.** “Artificial inflation of apparent photocatalytic activity induced by catalyst-mass-normalization and a method to fairly compare heterojunction systems.” *Energy Environm. Sci.* **2019**, *12*, 1657-1667.
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72. **Cargnello, M.** “Colloidal nanocrystals as building blocks for well-defined heterogeneous catalysts.”, *Chem. Mater.* **2019**, *31*, 576-596, invited perspective for the “Up-and-coming” series.
71. Losch, P.; Huang, W.; Goodman, E. D.; Wrasman, C. J.; Holm, A.; Riscoe, A. R.; Schwalbe, J. A.; **Cargnello, M.** “Colloidal nanocrystals for heterogeneous catalysis.”, *Nano Today* **2019**, *24*, 15-47.
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69. Aitbekova, A.;* Wu, L.;* Wrasman, C. J.; Boubnov, A.; Hoffman, A. S.; Bare, S. R.; **Cargnello, M.** “Low-temperature restructuring of CeO₂-supported Ru nanoparticles determines selectivity in CO₂ catalytic reduction.”, *J. Am. Chem. Soc.* **2018**, *140*, 13736-13745.
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- Design of Sinter-Resistant Heterogeneous Catalysts.”, *ACS Catal.* **2017**, *7*, 7156-7173.
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1. Cargnello, M.; Gorte, R. J.; Fornasiero, P. "Core-Shell Nanoparticulate Compositions And Methods", US Patent US20140106260A1.

book chapters (non-peer-reviewed)

4. Melchionna, M.; Fornasiero, P.; Cargnello, M. "Opportunities and challenges in the synthesis, characterization, and catalytic properties of controlled nanostructures." In Morphological, Compositional, and Shape Control of Materials for Catalysis, first edition, P. Fornasiero and M. Cargnello Eds., Elsevier, Amsterdam, *Studies in Surface Science and Catalysis* **2017**, *177*, 1-56.



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 2. Cargnello, M.; Fornasiero, P. "Photocatalysis by nanostructured TiO₂ based semiconductors.", pp. 89-136 in *Handbook of Green Chemistry, Green Nanoscience*, M. Selva and A. Perosa Eds., Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, **2012**.
 1. de Rogatis, L.; Montini, T.; Gombac, V.; Cargnello, M.; Fornasiero, P. "Stabilized metal nanoparticles embedded into porous oxides: a challenging approach for robust catalysts.", pp. 71-123 in *Nanorods, Nanotubes and Nanomaterials Research Progress*, Wesley V. Prescott and Arnold I. Schwartz Editors, Nova Science Publishers, New York, **2008**.
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contributed and invited talks

108. (*invited*) Integrated Mesoscale Architectures for Sustainable Catalysis EFRC Center, Harvard University, Cambridge, MA, November 18th 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
107. (*invited*) Department of Chemical and Environmental Engineering, Washington University in Saint Louis, October 29th 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
106. (*keynote lecture*) Mitsui Chemicals Award Ceremony (Virtual), Tokyo, Japan, October 20th 2021, "Tackling big challenges using tiny crystals".
105. (*invited*) Department of Chemical Engineering, University of Illinois at Chicago, October 14th 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
104. (*invited*) Pacific Coast Catalysis Society Annual Meeting (Virtual), October 12th 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
103. (*invited*) ACS Fall Meeting, Atlanta, GA, August 23rd 2021, "Developing Active and Stable Heterogeneous Catalysts Using Nanocrystal Precursors".
102. (*invited*) ACS Fall Meeting, Atlanta, GA, August 22nd 2021, "Nanocrystal-based catalysts for CO hydrogenation to fuels and chemicals".
101. (*invited*) International Symposium on Advanced Materials and Catalysis for Energy and Environmental Applications, July 30th 2021, "Controlled Hybrid Catalysts for the Selective Conversion of CO₂ into Fuels and Chemicals".
100. (*invited*) Virginia Clean Energy and Catalysis Invited Talk Series, University of Virginia, June 1st 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
99. (*invited*) Department of Chemical and Biomedical Engineering, University of Maine, February 26th 2021, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
98. (*invited*) Division of Chemistry and Chemical Engineering, California Institute of Technology, December 3rd 2020, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
97. (*invited*) Department of Chemistry, University of New Haven, October 9th 2020, "Catalytic Materials for a Sustainable Future".
96. (*invited*) University of Toledo – Wayne State University Graduate Research Symposium, October 1st 2020, "Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors".
95. (*invited*) Department of Chemical & Biomolecular Engineering, University of Pennsylvania,



- Philadelphia, PA, September 30th 2020, “Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors”.
94. (*invited*) Institute for Chemical Technology and Polymer Chemistry, Karlsruhe Institute of Technology, Karlsruhe, Germany, July 17th 2020, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 93. (*invited*) Department of Chemical & Environmental Engineering, Yale University, New Haven, CT, February 26th 2020, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 92. (*invited*) Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, January 23rd 2020, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 91. (*invited*) Clariant Corporation, Palo Alto, CA, January 8th 2020, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 90. (*invited*) Department of Chemical & Biomolecular Engineering, University of Houston, Houston, TX, November 22nd 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 89. (*invited*) SABIC Technology Center, Sugarland, TX, November 21st 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 88. (*plenary lecture*), Annual Nanoscience and Nanotechnology International Conference (ANNIC), Paris, France, November 19th 2019, “Understanding and Engineering Catalytic Materials Using Nanocrystal Precursors”.
 87. (*invited*) AIChE Annual Meeting, Orlando, FL, November 13th 2019, “Proton Control in Electrochemical Ammonia Synthesis”.
 86. (*invited*) Department of Chemical Engineering and Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, November 5th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 85. (*invited*) AVS 66th International Symposium and Exhibition, Columbus, OH, October 23rd 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 84. (*invited*) Tufts University, Department of Chemistry, Medford, MA, September 18th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 83. (*invited*) Tufts University, Department of Chemical Engineering, Medford, MA, September 16th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 82. (*invited*) ACS Fall Meeting, San Diego, CA, August 27th 2019, “Highly tunable platform for biomimetic catalysis from nanocrystal-polymer composites”.
 81. (*invited*) ACS Fall Meeting, San Diego, CA, August 26th 2019, “Single-atom species determine the deactivation of supported catalysts”.
 80. (*invited*) University of Trieste, Department of Chemical and Pharmaceutical Sciences, Trieste, Italy, July 18th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 79. (*invited*) University of Udine, Department of Industrial Engineering, Udine, Italy, July 17th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
 78. (*contributed*) 26th North American Catalysis Society Meeting (NAM), Chicago, IL, June 23-28 2019, “The Science behind the Preparation of Well-Defined Colloidal Catalysts for Fundamental



Studies, and Why It Matters”.

77. *(keynote lecture)* TechConnect World Innovation Conference and Expo, Boston, MA, June 18th 2019, “Highly tunable platform for biomimetic catalysts from nanocrystal-polymer composites”.
76. *(invited)* University of North Texas, Department of Materials Science and Engineering, Denton, TX, April 12th 2019, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
75. *(invited)* ACS Spring Meeting, Orlando, FL, April 3rd 2019, “Uncovering the Details of Methane Combustion on Palladium Catalysts Using Well-Defined Nanocrystal Precursors”.
74. *(invited)* ACS Spring Meeting, Orlando, FL, April 1st 2019, “In-situ scattering techniques to study synthesis and crystallization processes of colloidal nanocrystals”.
73. *(invited)* Prairie View A&M University, Department of Chemical Engineering, Prairie View, TX, October 15th 2018, “Tackling big challenges using tiny crystals”.
72. *(invited)* SLAC National Accelerator Laboratory, SSRL Users’ Meeting, September 26th 2018, “Conversion of supported Ru and Pd nanoparticles into single atom catalysts: similar processes, different consequences”.
71. *(invited)* Ecole Polytechnique Federal de Lausanne (EPFL), Department of Chemistry and Chemical Engineering, Lausanne, Switzerland, September 6th 2018, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
70. *(keynote lecture)* 10th International Conference on f-elements (ICFE10), EPFL, Lausanne, Switzerland, September 3rd 2018, “Ceria-supported catalysts: Fundamental understanding and improved performance”.
69. *(invited)* 9th Eastern Mediterranean Chemical Engineering Conference (EMCC9), Ankara, Turkey, August 31st 2018, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
68. *(invited)* ACS Fall Meeting, Boston, MA, August 22nd 2018, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
67. *(invited)* ACS Fall Meeting, Boston, MA, August 19th 2018, “Well-defined nanocrystal catalysts as active phases and premier materials for spectroscopic studies of catalyst restructuring”.
66. *(invited)* ACS Fall Meeting, Boston, MA, August 19th 2018, “Highly tunable platform for biomimetic catalysts from nanocrystal-amorphous polymer composites”.
65. *(invited)* SurfCat Summer School, Gilleleje, Denmark, August 10th 2018, “Electrochemical Ammonia Synthesis”.
64. *(invited)* Seoul National University, Seoul, South Korea, July 12th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
63. *(invited)* NanoKorea Symposium, Kintex, South Korea, July 11th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
62. *(invited)* Chung-Ang University, Seoul, South Korea, July 10th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
61. *(invited)* Korea Advanced Institute of Science and Technology (KAIST), Daejeon, South Korea, July 9th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
60. *(invited)* Taiwan-Stanford Innovation Conference, Taipei, Taiwan, June 20th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.



59. *(keynote lecture)* 25th Canadian Symposium on Catalysis, Saskatoon, Canada, May 9th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
58. *(invited)* BASF, Catalysts Division, Iselin, NJ, March 30th 2018, “Modeling-driven discovery of new catalyst materials for low-temperature hydrocarbon oxidation”.
57. *(invited)* ExxonMobil Research and Engineering Company, Clinton, NJ, March 29th 2018, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
56. *(invited)* ACS Spring Meeting, New Orleans, LA, March 18th 2018, “In-situ scattering techniques to study synthesis and crystallization processes of colloidal nanocrystals”.
55. *(invited)* ACS Spring Meeting, New Orleans, LA, March 18th 2018, “Understanding and Tuning Catalytic Materials For Methane Activation Using Nanocrystal Precursors”.
54. *(invited)* University of Utah, Department of Chemical Engineering, Salt Lake City, UT, March 5th 2018, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
53. *(invited)* 5th Nano Today Conference, Hawaii, USA, December 8th 2017, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
52. *(invited)* Brown University, Department of Chemistry, Providence, RI, December 1st 2017, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
51. *(invited)* Italian Embassy in Washington D.C., ISSNAF Annual Event, Washington, D.C., November 8th 2017, “Tackling Big Challenges Using Tiny Crystals”.
50. *(invited)* ACS Fall Meeting, Washington D.C., August 20th 2017, “Understanding and Controlling the Activity and Stability of Pd/Pt oxide Catalysts for Methane Activation”.
49. *(invited)* Catalysis Research PI Meeting, Department of Energy Office of Science, Gaithersburg, MD, July 27th 2017, “Understanding and Tuning Catalytic Materials Using Nanocrystal Precursors”.
48. *(invited)* Northwestern University, Department of Chemistry, Evanston, IL, June 2nd 2017, “From Model Systems to Efficient Catalytic Materials: One Nanocrystal Fits All”.
47. *(invited)* Argonne National Laboratory, Lemont, IL, June 1st 2017, “From Model Systems to Efficient Catalytic Materials: One Nanocrystal Fits All”.
46. *(invited)* James Franck Institute, University of Chicago, Chicago, IL, May 31st 2017, “Tackling Big Challenges Using Tiny Crystals”.
45. *(invited)* Spring MRS Meeting, Phoenix, AZ, April 20th 2017, “Enhanced energy transfer and doping in semiconductor-metal nanocrystal superlattices”.
44. *(invited)* March 2017 NorCal AIChE South Bay Meeting, Menlo Park, CA, March 21st 2017, “Tackling Big Challenges Using Tiny Crystals”.
43. *(invited)* Eastern Mediterranean Chemical Engineering Conference (EMCC8), Haifa, Israel, February 28th 2017, “Tackling Big Challenges Using Tiny Crystals”.
42. *(invited)* National Institute for Standards and Technology (NIST), Gaithersburg, MD, November 21st 2016, “Tiny crystals for big energy and environmental challenges”.
41. *(contributed)* AIChE Annual Meeting, San Francisco, CA, 17th November 2016, “Engineering Highly Active Brookite Titania Nanorods For Sustainable Hydrogen Production”.
40. *(contributed)* AIChE Annual Meeting, San Francisco, CA, 16th November 2016, “Substitutional Doping in Nanocrystal Superlattices”.
39. *(invited)* “In situ Catalysis with Advanced X-ray Methods”, SLAC Annual Users Meeting, October



- 7th 2016, "Well-defined nanocrystals as active catalysts and premier materials for spectroscopic studies of surface processes".
38. *(contributed)* 16th International Congress on Catalysis, Beijing, China, July 5th 2016, "Uniform nanostructures for heterogeneous catalysis by fast annealing of monodisperse metal nanocrystals".
 37. *(invited)* Materials Design and Processing From Nano to Mesoscale, CHESS/Cornell University, Ithaca, NY, 14th June 2016, "Well-defined metal nanocrystals: synthesis, self-assembly, and applications".
 36. *(invited)* Nanolytica 2016, Berkeley University, Berkeley, CA, May 20th 2016, "Tackling big challenges using tiny crystals".
 35. *(invited)* Materials Research Society Spring Meeting 2016, Phoenix, AZ, 31st March 2016, "Engineering Highly Active Brookite Titania Nanorods for Sustainable Hydrogen Production".
 34. *(invited)* Nanoseminar Series, University of California – Berkeley, Berkeley, CA, 19th February 2016, "Tackling big challenges using tiny crystals".
 33. *(invited)* SLAC National Acceleration Laboratory, Menlo Park, CA, 15th December 2015, "Tackling big challenges using tiny crystals".
 32. *(invited)* University of Michigan, Department of Materials Science, Ann Arbor, MI, 18th November 2015, "Tackling big challenges using tiny crystals".
 31. *(contributed)* AIChE Annual Meeting, Salt Lake City, UT, 12th November 2015, "Efficient Removal of Organic Ligands from Supported Nanocrystals By Fast Thermal Annealing Enables Catalytic Studies on Well-Defined Active Phases".
 30. *(invited)* Stanford Synchrotron Radiation Lightsource (SSRL) Scientific Advisory Committee meeting, SLAC, Menlo Park, CA, 10th September 2015, "Tackling big challenges using tiny crystals".
 29. *(invited)* Meta 2015 International Conference on Metamaterials, City College of New York, New York City, NY, 7th August 2015, "Nanocrystal superlattices as tunable metamaterial assemblies".
 28. *(invited)* Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA, 14th July 2015, "Tackling big challenges using tiny crystals".
 27. *(invited)* PARC Inc., Palo Alto, CA, 26th June 2015, "Tackling big challenges using tiny crystals".
 26. *(invited)* Stanford Energy and Environment Affiliates Program New Faculty Seminar, Stanford, CA, 7th April 2015, "Tackling big challenges using tiny crystals".
 25. *(invited)* SLAC seminar series, Menlo Park, CA, 4th February 2015, "Tackling big challenges using tiny crystals".
 24. *(invited)* Italian Chemical Society Annual Meeting, Università della Calabria, Cosenza, Italy, 9th September 2014, "Tackling big challenges using tiny nanocrystals".
 23. *(invited)* Department of Mechanical and Process Engineering, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, 15th April 2014, "Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy".
 22. *(invited)* Department of Chemical Engineering, Stanford University, Stanford (CA), 31st March 2014, "Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy".
 21. *(invited)* Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge (MA), 21st February 2014, "Playing with Structures at the Nanoscale: Rational



- Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
20. *(invited)* Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia (PA), 19th February 2014, “Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
 19. *(invited)* Department of Chemical Engineering, Lehigh University, Bethlehem (PA), 12th February 2014, “Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
 18. *(invited)* Department of Chemical Engineering and Materials Science, University of Minnesota-Twin Cities, Minneapolis (MN), 4th February 2014, “Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
 17. *(invited)* Department of Chemical and Biological Engineering, University of Wisconsin-Madison, Madison (WI), 28th January 2014, “Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
 16. *(invited)* Department of Chemical and Biological Engineering, Princeton University, Princeton (NJ), 15th January 2014, “Playing with Structures at the Nanoscale: Rational Manipulation of Nanocrystals as Building Blocks in Catalysis and Energy”.
 15. *(contributed)* AIChE Annual Meeting, San Francisco, CA, 8th November 2013, “Exceptional Activity for Methane Oxidation With Catalysts Prepared By Modular Assembly of Subunits”.
 14. *(contributed)* AIChE Annual Meeting, San Francisco, CA, 6th November 2013, “Multiwalled Carbon Nanotubes Drive the Activity of Metal@Oxide Core-Shell Catalysts in Modular Nanocomposites”.
 13. *(contributed)* AIChE Annual Meeting, San Francisco, CA, 4th November 2013, “Nanoscale Engineering of the Metal-Support Interface Reveals Its Crucial Role in Ceria-Based Catalysts”.
 12. *(invited)* Workshop “Theory and practice of catalysis” Telluride, CO, 2nd August 2013, “Playing with structures at the nanoscale: designing catalysts by manipulation of the component building blocks”.
 11. *(invited)* *Lectio Magistralis* ENI Award, University of Bologna, Italy, 27th June 2013, “Tailored nanoarchitectures based on transition metals for heterogeneous catalysis”.
 10. *(invited)* Department of Chemical and Biomolecular Engineering, Rensselaer Polytechnic Institute (RPI), Troy, NY, 29th May 2013, “Playing with structures at the nanoscale: precise catalysts by manipulation of the composing building blocks”.
 9. *(contributed)* MRS Spring Meeting, San Francisco, CA, USA, 4th April 2013, “Exploring semiconductor-plasmonic interaction with well-defined building blocks”.
 8. *(invited)* The Catalysis Society of Metropolitan New York Spring Meeting, University of Princeton, 20th March 2013, “Exceptional activity for methane oxidation over catalysts prepared by modular assembly of subunits”.
 7. *(invited)* Department of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, 14th February 2013, “Tailored nanoarchitectures based on transition metals for heterogeneous catalysis”.
 6. *(invited)* National Conference of the Division of Inorganic Chemistry of the Italian Chemical Society, Sestri Levante (Italy), 13th September 2012, “Tailored nanoarchitectures based on transition metals for heterogeneous catalysis”.
 5. *(contributed)* 244th ACS National Meeting, Philadelphia, PA, USA, 20th August 2012, “Catalytic role of the metal-support interface in d⁸-ceria systems prepared using artificial atoms”.



4. *(invited)* ICTP-SISSA Workshop on New Materials for Renewable Energy, ICTP, Trieste, Italy, 18th October 2011, "Synthesis of dispersible core-shell metal@oxide materials and their application as stable fuel cell catalysts".
 3. *(invited)* Conference "Chemically synthesized nanoparticles and catalysis", Argonne National Lab (Argonne, IL, USA), 28th April 2011, "Synthesis of dispersible core-shell metal@oxide materials and their application as stable fuel cell catalysts".
 2. *(invited)* Universidad de Cadiz, Cadiz, Spain, 15th June 2010, "Embedded phases: a way to active and stable catalysts".
 1. *(invited)* Slovenian Conference on Materials and Technologies for Sustainable Growth, University of Nova Gorica, Ajdovscina, Slovenia, May 12th 2009, "Metal-doped TiO₂ for hydrogen production".
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