HEMAMALA I. KARUNADASA

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Professional Appointments

Stanford University, Assistant Professor of Chemistry, 2012 – 2019
Stanford University, Associate Professor of Chemistry, from Sep 2019
Stanford University, Junior Faculty Fellow, Precourt Institute for Energy, 2014 – 2021
Stanford University, Senior Faculty Fellow, Precourt Institute for Energy, from June 2021
SLAC National Accelerator Laboratory, Stanford Institute for Materials and Energy Sciences, Principal Investigator, from Sep 2019.
SLAC National Accelerator Laboratory, Faculty Scientist, from July 2020.

Academic Background

California Institute of Technology, Post-doctoral researcher, 2010 – 2012
Advisor: Prof. Harry B. Gray. Research: *Molecular catalysts for hydrocarbon oxidation*
University of California, Berkeley and Lawrence Berkeley National Laboratory, Post-doctoral researcher, 2009 – 2010
Advisors: Profs. Christopher J. Chang and Jeffrey R. Long. Research: *Molecular catalysts for generating hydrogen from water*
University of California, Berkeley, *Ph.D.* in Inorganic Chemistry, 2009
Advisor: Prof. Jeffrey R. Long. Thesis: *Heavy atom building units for magnetic materials and molecular catalysts for generating hydrogen from water*
Princeton University, *A.B.* in Chemistry (high honors) and Certificate in Materials Science and Engineering 2003
Advisor: Prof. Robert J. Cava. Thesis: *Geometrically frustrated magnets*

Awards

1. Undergraduate Thesis Award in Inorganic Chemistry, Princeton University, 2003
2. Tyco Electronics, Graduate Fellowship, 2006
3. Outstanding Graduate Student Instructor Award, University of California, Berkeley, 2006
4. BP Post-Doctoral Fellowship, California Institute of Technology, 2011
5. Gabilan Junior Faculty Fellow, Stanford University, 2012
6. Thieme Chemistry Journal Award, 2013
7. National Science Foundation CAREER Award, 2014
8. Rising Star Award, International Conference on Coordination Chemistry (ICCC41), Singapore, 2014
9. Alfred P. Sloan Research Fellowship, 2015
10. Best Oral Presentation, Hybrid and Organic Photovoltaics Conference (HOPV15), Rome, 2015
11. Terman Fellow, Stanford University, 2015
12. Dreyfus Foundation, Postdoctoral Program in Environmental Chemistry, Mentor, 2016
13. Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator, American

Chemical Society, 2020
14. Clarivate Highly Cited Researcher, 2020, 2022.
15. Chambers Fellow, Stanford University, 2021
16. American Chemical Society, Inorganic Chemistry Lectureship award, 2022
17. Brown Science Foundation Investigator Award, 2022
18. Fellow, Royal Chemical Society

Publications

1. "Quantum-classical reentrant relaxation crossover in $Dy_2Ti_2O_7$ spin ice" Snyder, J.; Ueland, B. G.; Slusky, J. S.; Karunadasa, H. I.; Cava, R. J.; Mizel, A.; Schiffer, P. *Phys. Rev. Lett.* **2003**, *91*, 107201.
2. "Ba_2LnSbO_6 and Sr_2LnSbO_6 (Ln = Dy, Ho, Gd) double perovskites: Lanthanides in the geometrically frustrating *fcc* lattice" Karunadasa, H. I.; Huang, Q.; Ueland, B. G.; Schiffer, P.; Cava, R. J. *Proc. Natl. Acad. Sci.* **2003**, *100*, 8097.
3. "Low temperature spin freezing in $Dy_2Ti_2O_7$ spin ice" Snyder, J.; Ueland, B. G.; Slusky, J. S.; Karunadasa, H. I.; Cava, R. J.; Schiffer, P. *Phys. Rev. B* **2004**, *69*, 064414.
4. "Quantum and thermal spin relaxation in the diluted spin ice $Dy_{2-x}M_xTi_2O_7$ (M = Lu, Y)" Snyder, J.; Ueland, B. G.; Mizel, A.; Slusky, J. S.; Karunadasa, H. I.; Cava, R. J.; Schiffer, P. *Phys. Rev. B* **2004**, *70*, 184431.
5. "2,2'-Dibromo-3,3',4,4',5,5',6,6'-octamethyl-1,1'-biphenyl" Karunadasa, H. I.; Leggett, C.; Wong, S. *Acta Crystallogr. Sect. E* **2004**, 60, o1499.
6. "Honeycombs of triangles and magnetic frustration in $SrLn_2O_4$ (Ln = Gd, Dy, Ho, Er, Tm, and Yb)" Karunadasa, H. I.; Huang, Q.; Ueland, B. G.; Schiffer, P.; Cava, R. J. *Phys. Rev. B* **2005**, *71*, 144414.
7. "Synthesis and redox-induced structural isomerization of the pentagonal bipyramidal complexes $[W(CN)_5(CO)_2]^{3-/2-}$" Karunadasa, H. I.; Long, J. R. *Angew. Chem. Int. Ed.* **2009**, *45*, 738.
8. "Magnetic properties of Ba_2HoSbO_6 with a frustrated lattice geometry" Calder, S.; Ke, X.; Bert, F.; Amato, A.; Baines, C.; Carboni, C.; Cava, R. J.; Daoud-Aladine, A.; Deen, P.; Fennell, T.; Hillier, A. D.; Karunadasa, H. I.; Taylor, J. W.; Mendels, P.; Schiffer, P.; Bramwell, S. T. *Phys. Rev. B* **2010**, *81*, 064425.
9. "A molecular molybdenum-oxo catalyst for generating hydrogen from water" Karunadasa, H. I.; Chang, C. J.; Long, J. R. *Nature* **2010**, *464*, 1329.
10. "Enhancing the magnetic anisotropy of cyano-ligated Cr(II) and Cr(III) complexes *via* heavy-halide ligand effects" Karunadasa, H. I.; Arquero, K. D.; Berben, L. A.; Long, J. R. *Inorg. Chem.* **2010**, *49*, 4738.
11. "A molecular MoS_2 edge site for catalytic hydrogen production" Karunadasa, H. I.; Montalvo, E.; Sun, Y.; Majda, M.; Long, J. R.; Chang, C. J. *Science*, **2012**, 335, 698.
12. "A computational and experimental study of the mechanism of hydrogen generation from water by a molecular molybdenum-oxo electro catalyst" Sundstrom, E. J.; Yang, X.; Thoi, V. S.; Karunadasa, H. I.; Chang, C. J.; Long, J. R.; Head-Gordon, M. *J. Am. Chem. Soc.* **2012**, 134, 5233.
13. "Electrochemical generation of hydrogen from acetic acid using a molecular molybdenum-oxo catalyst" Thoi, V.S.; Karunadasa, H. I.; Long, J. R.; Chang, C. J., *Energy and Environ. Sci.* **2012**, *5*, 7762.
14. "Low-spin hexacoordinate Mn(III): synthesis and spectroscopic investigation of homoleptic tris(pyrazolyl)borate and tris(carbene)borate complexes" Forshaw, A. P.; Smith, J. M.; Ozarowski, A.; Krzystek, J.; Smirnov, D.; Zvyagin, S. A.; Harris, T. D.; Karunadasa, H. I.; Zadrozny, J. M.;

Schnegg, A.; Holldack, K.; Jackson, T. A.; Alamiri, A.; Barnes; D. M.; Telser, J. *Inorg. Chem.* **2012**, *52*, 144.

Publications from Stanford

15. "Reversible and irreversible chemisorption in nonporous crystalline hybrids" Solis-Ibarra, D.; Karunadasa, H. I. *Angew. Chem. Int. Ed.* **2014**, *53*, 1039.
16. "Self-assembly of broadband white-light emitters" Dohner, E. R.; Hoke, E. T.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2014**, *136*, 1718.
17. "Lithium cycling in a self-assembled copper chloride-polyether hybrid electrode" Jaffe, A.; Karunadasa, H. I. *Inorg. Chem.* **2014**, *53,* 6494.
18. "A layered hybrid perovskite solar-cell absorber with enhanced moisture stability" Smith, I. C.; Hoke, E. T.; Solis-Ibarra, D.; McGehee, M. D.; Karunadasa, H. I. *Angew. Chem. Int. Ed.* **2014**, *53*, 11232.
19. "Intrinsic white-light emission from layered perovskites" Dohner, E. R.; Jaffe, A.; Bradshaw, L. R.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2014**, *136*, 13154.
20. "Reversible photo-induced trap formation in mixed-halide hybrid perovskites for photovoltaics" Hoke, E. T.; Slotcavage, D. J.; Dohner, E. R.; Bowring, A. R.; Karunadasa, H. I.; McGehee, M. D. *Chem. Sci.* **2015**, *6*, 613 (co-corresponding author).
21. "Pressure-induced conductivity and yellow-to-black piezochromism in a layered Cu–Cl hybrid perovskite" Jaffe, A,; Lin, Y.; Mao, W.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2015**, *137*, 1673.
22. "Quinone-functionalized carbon black cathodes for lithium batteries with high power densities" Jaffe, A,; Saldivar Valdes, A.; Karunadasa, H. I. *Chem. Mater.* **2015**, *27*, 3568.
23. "Post-synthetic halide conversion and selective halogen capture in hybrid perovskites" Solis-Ibarra, D.; Smith, I. C.; Karunadasa, H. I. *Chem. Sci.* **2015**, *6*, 4054.
24. "$CH_3NH_3PbI_3$ perovskite single crystals: Surface photophysics and its interaction with the environment" Grancini, G.; D'Innocenzo, V.; Dohner, E. R.; Martino, N.; Mosconi, E.; De Angelis, F.; Karunadasa, H. I.; Hoke, E. T.; Petrozza, A. *Chem. Sci.* **2015**, *6*, 7305.
25. "A bismuth-halide double perovskite with long carrier recombination lifetime for photovoltaic applications" Slavney, A. H.; Hu, T.; Lindenberg, A. M.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2016**, *138*, 2138.
26. "High-pressure single-crystal structures of 3D lead-halide hybrid perovskites and pressure effects on their electronic and optical properties" Jaffe, A.; Lin, Y.; Beavers, C. M.; Voss, J.; Mao, W. L.; Karunadasa, H. I. *ACS Cent. Sci.* **2016**, *2*, 201.
27. "Red-to-black piezochromism in a compressible Pb–I–SCN layered perovskite" Umeyama, D.; Lin, Y.; Karunadasa, H. I. *Chem. Mater.* **2016**, *28*, 3241.
28. "Mechanism for broadband white-light emission from two-dimensional (110) hybrid perovskites" Hu, T.; Smith, M. D.; Dohner, E. R.; Sher, M.-J; Wu, X.; Trinh, M. T.; Fisher, A.; Corbett, J.; Zhu, X.-Y., Karunadasa, H. I.; Lindenberg, A. M. *J. Phys. Chem. Lett.* **2016**, *7*, 2258 (co-corresponding author).
29. "Light-induced phase segregation in halide-perovskite absorbers" Slotcavage, D. J.; Karunadasa, H. I.; McGehee, M. D. *ACS Energy Lett.* **2016**, *1*, 1199 (invited perspective; co-corresponding author).
30. "Chemical approaches to addressing the instability and toxicity of lead-halide perovskite absorbers" Slavney, A. H.; Smaha, R. W.; Smith, I. C.; Jaffe, A.; Umeyama, D.; Karunadasa, H. I. *Inorg. Chem.,* **2017**, *56*, 46 (invited forum paper).
31. "Decreasing the electronic confinement in layered hybrid perovskites through intercalation" Smith, M. D.; Pedesseau, L.; Kepenekian, M.; Smith, I. C.; Katan, C.; Even, J.; Karunadasa, H. I. *Chem. Sci.*

2017, *8*, 1960.

32. "Between the sheets: Post-synthetic transformations in hybrid perovskites" Smith, I. C.; Smith, M. D.; Jaffe, A.; Lin, Y.; Karunadasa, H. I. *Chem. Mater.* **2017**, *29*, 1868 (invited perspective).
33. "Pressure-induced metallization of the halide perovskite $(CH_3NH_3)PbI_3$" Jaffe, A.; Lin, Y.; Mao, W.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2017**, *139*, 4330.
34. "Defect-induced band-edge reconstruction of a bismuth-halide double perovskite for visible-light absorption" Slavney, A. H.; Leppert, L.; Bartesaghi, D.; Gold-Parker, A.; Toney, M. F.; Savenije, T. J.; Neaton, J. B.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2017**, *139*, 5015.
35. "Structural origins of broadband emission from layered Pb–Br hybrid perovskites" Smith, M.; Jaffe, A.; Dohner, E. R.; Lindenberg, A. M.; Karunadasa, H. I. *Chem. Sci.* **2017**, *8*, 4497.
36. "Halide perovskites under pressure: Accessing new properties through lattice compression" Jaffe, A.; Lin, Y.; Karunadasa, H. I. *ACS Energy Lett.* **2017**, *2*, 1549 (invited perspective).
37. "Light-induced picosecond rotational disordering of the inorganic sublattice in hybrid perovskites" Wu, X.; Tan, L. Z.; Shen, X.; Hu, T.; Miyata, K.; Trinh, M. T.; Li, R.; Coffee, R.; Liu, S.; Egger, D. A.; Makasyuk, I.; Zheng, Q.; Fry, A.; Robinson, J. S.; Smith, M. D.; Guzelturk, B.; Karunadasa, H. I.; Wang, X.; Zhu, X.-Y.; Kronik, L.; Rappe, A. M.; Lindenberg, A. M. *Sci. Adv.* **2017**, *3*, e1602388.
38. "Broadband emission with a massive Stokes shift from sulfonium Pb−Br hybrids" Smith, M. D.; Watson, B. L.; Dauskardt, R. H.; Karunadasa, H. I. *Chem. Mater.* **2017**, *29*, 7083.
39. "Electronic conductivity in a porous vanadyl prussian blue analogue upon air exposure" Manumpil, M.-A.; Leal-Cervantes, C.; Hudson, M. R.; Brown, C. M.; Karunadasa, H. I. *Inorg. Chem.* **2017**, *56,* 12682.
40. "Charge carrier dynamics in $Cs_2AgBiBr_6$ double perovskite" Bartesaghi, D.; Slavney, A. H.; Gélvez-Rueda, M.; Connor, B. A.; Grozema, F. C.; Karunadasa, H. I.; Savenije, T. J. *J. Phys. Chem. C.* **2018**, *122*, 4809.
41. "Terahertz emission from hybrid perovskites driven by ultrafast charge separation and strong electron-phonon coupling" Guzelturk, B.; Belisle, R. A.; Smith, M. D.; Bruening, K.; Prasanna, R.; Tassone, C. J.; Karunadasa, H. I.; McGehee, M. D.; Lindenberg. A. M. *Adv. Mater.* **2018**, *30*, 1704737.
42. "White-light emission from layered halide perovskites" Smith, M. D.; Karunadasa, H. I. *Acc. Chem. Res.,* **2018**, *51*, 619 (invited perspective).
43. "Layered halide double perovskites: Dimensional reduction of $Cs_2AgBiBr_6$" Connor, B. A.; Leppert, L.; Smith, M. D.; Neaton, J. B.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2018**, 140, 5235.
44. "The diversity of layered halide perovskites" Smith, M. D.; Crace, E. J.; Jaffe, A; Karunadasa, H. I. *Annu. Rev. Mater. Res.* **2018**, *48*, 111 (invited review).
45. "Dynamically disordered lattice in a layered Pb−I−SCN perovskite thin film probed by two-dimensional infrared spectroscopy" Nishida, J.; Breen, J. P.; Lindquist, K. P.; Umeyama, D.; Karunadasa, H. I.; Fayer, M. D. *J. Am. Chem. Soc.* **2018**, *140*, 9882.
46. "Small-band-gap halide double perovskites" Slavney, A. H.; Leppert, L.; Saldivar Valdes, A.; Bartesaghi, D.; Savenije, T. J.; Neaton, J. B.; Karunadasa, H. I. *Angew. Chem. Int. Ed.* **2018**, *57*, 12765.
47. "Carving out pores in redox-active one-dimensional coordination polymers" Clayman, N. E.; Manumpil, M. A.; Umeyama, D.; Rudenko, A.; Karunadasa. H. I.; Waymouth, R. M. *Angew. Chem. Int. Ed.* **2018**, *57*, 14585 (co-corresponding author).
48. "Acoustic phonon lifetimes limit thermal transport in methylammonium lead iodide" Gold-Parker, A.; Gehring, P. M.; Skelton, J. M.; Smith, I. C.; Parshall, D.; Frost, J. M.; Karunadasa, H. I.; Walsh, A.;

Toney, M. F. *Proc. Natl. Acad. Sci. USA* **2018**, *115*, 11905.

49. "Tuning the luminescence of layered halide perovskites" Smith, M. D.; Connor, B. A.; Karunadasa, H. I. *Chem. Rev.* **2019**, *119*, 3104 (invited review).
50. "Reactivity of NO_2 with porous and conductive copper-azobispyridine metallopolymers" Clayman, N. E.; Manumpil, M. A.; Matson, B. D.; Wang, S.; Slavney, A. H.; Sarangi, R.; Karunadasa, H. I.; Waymouth, R. M. *Inorg. Chem.* **2019**, *58*, 10856 (co-corresponding author).
51. "Tuning the bandgap of $Cs_2AgBiBr_6$ through dilute tin alloying" Lindquist, K. P.; Mack, S. A.; Slavney, A. H.; Leppert, L.; Gold-Parker, A.; Stebbins, J. F.; Salleo, A.; Toney, M. F.; Neaton, J. B.; Karunadasa, H. I. *Chem. Sci.* **2019**, *10*, 10620.
52. "A pencil-and-paper method for elucidating halide double perovskite band structures" Slavney, A. H.; Connor, B. A.; Leppert, L.; Karunadasa, H. I. *Chem. Sci.* **2019**, *10*, 11041.
53. "High compression-induced conductivity in a layered Cu–Br perovskite" Jaffe, A.; Mack, S. A. Lin, Y.; Mao, W. L.; Neaton, J. B., Karunadasa, H. I. *Angew. Chem. Int. Ed.* **2020**, *59*, 4017.
54. "Carrier diffusion lengths exceeding 1 micron despite trap-limited transport in halide double perovskites" Delor, M.; Slavney, A. H.; Wolf, N. R.; Filip, M. R.; Neaton, J. B.; Karunadasa, H. I.; Ginsberg, N. S. *ACS Energy Lett.* **2020**, *5*, 1337.
55. "Origins of the pressure-induced phase transition and metallization in the halide perovskite $(CH_3NH_3)PbI_3$" Lee, J.-H.; Jaffe, A.; Lin, Y.; Karunadasa, H. I.; Neaton, J. B. *ACS Energy Lett.* **2020**, *5*, 2174.
56. "Dimensional reduction of the small-bandgap double perovskite $Cs_2AgTlBr_6$" Connor, B. A.; Biega, R.-I.; Leppert, L.; Karunadasa, H. I. *Chem. Sci.* **2020**, *11*, 7708.
57. "Expanded analogues of three-dimensional lead-halide hybrid perovskites" Umeyama, D.; Leppert, L.; Connor, B. A.; Manumpil, M. A.; Neaton, J. B.; Karunadasa, H. I. *Angew. Chem. Int. Ed.* **2020,** *59*, 19087.
58. "Dynamic domains and critical scattering in cubic methylammonium lead triiodide" Weadock, N. J.; Gehring, P. M.; Gold-Parker, A.; Smith, I. C.; Karunadasa, H. I.; Toney, M. F. *Phys. Rev. Lett.* **2020**, *125*, 075701.
59. "Single ensemble nonexponential photoluminescent population decays from a broadband white-light emitting perovskite" Thomaz, J. E.; Lindquist, K. P.; Karunadasa, H. I. Fayer, M. D. *J. Am. Chem. Soc.* **2020**, *142*, 16622 (co-corresponding author).
60. "Visualization of the dynamic polaronic strain field in hybrid lead halide perovskites" Guzelturk, B.; Winkler, T.; Van de Goor, T.; Smith, M. D.; Bourelle, S. A.; Feldmann, S.; Trigo, M.; Teitelbaum, S.; Steinrück, H-G.; de la Pena, G. A.; Alonso-Mori, R.; Zhu, D.; Sato, T.; Karunadasa, H. I.; Toney, M. F.; Deschler, F.; Lindenberg, A. M. *Nat. Mater.* **2021**, *20*, 618.
61. "Preservation of a black $CsPbI_3$ perovskite phase to ambient conditions via pressure-directed octahedral tilt" Ke, F. Wang, C.; Jia, C.; Wolf, N. R.; Yan, J.; Niu, S.; Devereaux, T. P.; Karunadasa, H. I.; Mao, W. L.; Lin, Y. *Nat. Commun.* **2021**, *12*, 461.
62. "Revealing local disorder in a silver-bismuth halide perovskite upon compression" Girdzis, S. P.; Lin, Y.; Leppert, L.; Slavney, A. H.; Park, S.; Chapman, K. W.; Karunadasa, H. I.; Mao, L. M. *J. Phys. Chem. Lett.* **2021**, *12*, 532.
63. "Doubling the stakes: The promise of halide double perovskites" Wolf, N. R.; Connor, B. A.; Slavney, A. H.; Karunadasa, H. I. (invited review), *Angew. Chem. Int. Ed.* **2021**, *60*, 2.
64. "Gold-cage perovskites: A three-dimensional Au^{III}–X framework encasing isolated MX_6^{3-} octahedra (M^{III} = In, Sb, Bi; X = Cl^-, Br^-, I^-)" Lindquist, K.; Boles, M.; Mack, S.; Neaton, J. B.; Karunadasa, H.

I. *J. Am. Chem. Soc.* **2021**, *143*, 7440.

65. "Alloying a single and a double perovskite: A $Cu^{+/2+}$ mixed-valence layered halide perovskite with strong optical absorption" Connor, B. A.; Smaha, R.; Li, J.; Gold-Parker, A.; Heyer, A. J.; Toney, M. F.; Lee, Y.; Karunadasa, H. I. *Chem. Sci.* **2021**, *12*, 8689.
66. "Directed assembly of layered perovskite heterostructures as single crystals" Aubrey, M. L.; Saldivar Valdes, A.; Filip, M. R.; Connor, B. A.; Lindquist, K. P.; Neaton, J. B.; Karunadasa, H. I. *Nature*, **2021**, 597, 355.
67. "The halogen chemistry of halide perovskites" Matheu, R.; Vigil, J. A.; Crace, E.; Karunadasa, H. I. *Trends Chem.*, **2022**, *4*, 206 (invited review).
68. "Charge reservoirs in an expanded halide perovskite analog: Enhancing high-pressure conductivity through redox-active molecules" Matheu, R.; Ke, F.; Breidenbach, A.; Wolf, N. R.; Lee, Y.; Liu, Z.; Leppert, L.; Lin, Y.; Karunadasa, H. I. *Angew. Chem. Int. Ed.,* **2022**, e202202911.
69. "Probing lattice dynamics in two-dimensional inorganic pseudohalide perovskites with ultrafast infrared spectroscopy" Xing, X.; Li, J.; Breen, J. P.; Nishida, J.; Karunadasa, H. I.; Fayer, M. D. *J. Phys. Chem. C.* **2022**, 126, 10145.
70. "Reliably obtaining white light layered halide perovskites at room temperature" Crace, E. J.; Su, A.; Karunadasa, H. I. *Chem. Sci*, **2022**, DOI: 10.1039/D2SC02381D.
71. "A practical guide to 3D halide perovskites: Structure, synthesis, and measurement" Lindquist, K. P.; Vigil, J. A.; Su, A.; Karunadasa, H. I. in *Comprehensive Inorganic Chemistry III*, **2022**, (invited book chapter) DOI: 10.1016/B978-0-12-823144-9.00137-0.
72. "Tuning defects in a halide double perovskite with pressure" Wolf, N. R.; Jaffe, A.; Slavney, A. H. Mao, W. L.; Leppert, L.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2022**, *144*, 20763.
73. "Cesium-mediated electron redistribution and electron-electron interaction in high-pressure metallic $CsPbI_3$" Ke, F.; Yan, J.; Niu, S.; Wen, J.; Yin, K.; Yang, H.; Wolf, N. R.; Tzeng, Y.-K.; Karunadasa, H. I.; Lee, Y. S.; Mao, W. L.; Lin, Y. *Nature Commun.,* **2022**, *13*, 7067.
74. "Zwitterions in 3D perovskites: Organosulfide-halide perovskites" Li, J.; Chen, Z.; Saha, S.; Utterback, J. K.; Aubrey, M. L.; Yuan, R.; Weaver, H. L.; Ginsberg, N. S.; Chapman, K. W.; Filip, M. R.; Karunadasa, H. I. *J. Am. Chem. Soc.* **2022**, *144*, 22403.
75. "Quasi-one-dimensional metallicity in compressed $CsSnI_3$" Ke, F.; Yan, J.; Matheu, R.; Niu, S.; Wolf, N. R.; Yang, H.; Yin, K.; Wen, J.; Lee, Y. S.; Karunadasa, H. I.; Mao, W. L.; Lin, Y., *J. Am. Chem. Soc*. **2022**, *144*, 23595.

Patents

1. "Molecular metal-oxo catalysts for generating hydrogen from water," J. R. Long, C. J. Chang, and H. I. Karunadasa. University of California, *US2012228152-A1*.
2. "Molecular metal-disulfide catalysts for generating hydrogen from water," J. R. Long, C. J. Chang, H. I. Karunadasa, and M. Majda. University of California, *US2012217169-A1*.
3. "Reversible and irreversible chemisorption in nonporous, crystalline hybrid structures," H. I. Karunadasa and D. Solis-Ibarra. Stanford University, *US20160193566A1*.
4. "Composition comprising a layered perovskite phosphor and method of formation," H. I. Karunadasa and E. R. Dohner. Stanford University, *WO2015061555A1*.
5. "Solar cells comprising 2D perovskites," H. I. Karunadasa, I. C. Smith, and M. D. McGehee, Stanford University, *US20150357591A1*.
6. "Alloyed halide double perovskites as solar-cell absorbers." H. I. Karunadasa and A. H. Slavney,

Stanford University, *US20180277696A1*.

Teaching

1. CHEM253/153: Advanced Inorganic Chemistry, 2022 (graduate and undergraduate course).
2. CHEM251: Advanced Inorganic Chemistry, 2012, 2013, 2014, 2015, 2019, 2020, 2021 (graduate course).
3. CHEM31M: Chemical Principles: From Molecules to Solids, 2019 to 2022 (undergraduate accelerated general chemistry).
4. CHEM31B: Chemical Principles II, 2014 to 2018 (undergraduate general chemistry).
5. CHEM111: Exploring Chemical Research at Stanford, 2013 (undergraduate course).
6. *Energy@Stanford & SLAC*, 2014, 2015, 2017, 2018, and 2019 (summer school tutorial lectures).

Invited Talks

1. Gordon Research Conference in Inorganic Chemistry, Biddeford, ME, June 2010.
2. University of Pittsburgh, Department of Chemistry, November 2010.
3. University of North Carolina, Chapel Hill, Department of Chemistry, November 2010.
4. University of Washington, Department of Chemistry, November 2010.
5. Stanford University, Department of Chemistry, November 2010.
6. Cornell University, Department of Chemistry, December 2010.
7. University of Illinois Urbana-Champaign, Department of Chemistry, December 2010.
8. Yale University, Department of Chemistry, December 2010.
9. Harvard University, Department of Chemistry, December 2010.
10. University of Chicago, Department of Chemistry, January 2011.
11. University of California, Los Angeles, Department of Chemistry, January 2011.
12. University of California, Berkeley, Department of Chemistry, February 2011.
13. Precourt Institute for Energy, Stanford University, February 2011.
14. Princeton University, Department of Chemistry, March 2011.
15. San Jose State University, Department of Chemistry, May 2013.
16. Energy and Environment Affiliates Conference, Stanford University, October 2013.
17. Intermolecular Inc., San Jose, CA, January 2014.
18. Stanford Materials Science and Engineering Colloquium, May 2014.
19. Stanford Institute for Materials and Energy Sciences (SIMES), SLAC, May 2014.
20. 41st International Conference on Coordination Chemistry (ICCC41), Singapore, July 2014.
21. National University of Singapore, Department of Chemistry, August 2014.
22. 248th American Chemical Society National Meeting, San Francisco, August 2014.
23. Global Climate and Energy Project (GCEP) annual symposium, Stanford University, October 2014.
24. 80th Israel Chemical Society Meeting, Tel Aviv, Israel, February 2015.
25. Weizmann Institute, Department of Materials and Interfaces, Israel, February 2015.
26. North American Solid State Chemistry Conference (NASSCC), Tallahassee, FL, May 2015.
27. Annual Meeting of the American Crystallographic Association, Philadelphia, PA, July 2015.
28. Golden Jubilee Speaker, Golden Jubilee Chemistry Conference, Singapore, August 2015.
29. Nanyang Technological University, Energy Research Institute, Singapore, August 2015.
30. University of California, San Diego, Department of Chemistry, November 2015.
31. University of California, Davis, Department of Chemistry, November 2015.

32. Pacifichem, Honolulu, Hawaii, December 2015.
33. Michigan State University, Department of Chemistry, February 2016.
34. Nanoscale Science and Engineering Seminar, University of California, Berkeley, April 2016.
35. Stanford University Energy Seminar, May 2016.
36. Gordon Research Conference in Inorganic Chemistry, Biddeford, ME, June 2016.
37. "Research Opportunities in Photochemistry, Solar Energy & Advanced X-ray Methods", SLAC National Accelerator Lab., Menlo Park, CA, June 2016.
38. Telluride Science Research Center workshop "Electronic and Structural Dynamics in Hybrid Perovskites: Theory Meets Experiment", Telluride, CO, July 2016.
39. Gordon Research Conference in Solid-State Chemistry, New London, NH, July 2016.
40. Resnick Sustainability Young Investigator Symposium, Caltech, Pasadena, CA, September 2016.
41. Perovskite Solar Cells and Optoelectronics (PSCO-16), Genoa, Italy, September 2016.
42. San Jose State University, Department of Chemistry, November 2016.
43. KTH Royal Institute of Technology, Department of Chemistry, Stockholm, Swedan, December 2016.
44. 253rd American Chemical Society National Meeting, "ACS Central Science 2017 Symposium", San Francisco, April 2017.
45. Plenary speaker, Molecular Foundry Annual User Meeting, Lawrence Berkeley National Lab., Berkeley, CA, August 2017.
46. Keynote speaker, Chemistry department retreat, University of California, Santa Cruz, September 2017.
47. Keynote speaker, Advanced Light Source Annual User Meeting, Lawrence Berkeley National Lab. Berkeley, CA, October 2017.
48. Royal Society International Seminar on "Low-Energy Structural and Electronic Dynamics in Soft Semiconducting Materials" Buckinghamshire, United Kingdom, October 2017.
49. University of California at Berkeley, Department of Chemistry, October 2017.
50. University of Washington, Department of Chemistry, October 2017.
51. Materials Research Society National Meeting, symposium on "Perovskite Materials and Devices–Progress and Challenges", Boston, November 2017.
52. Massachusetts Institute of Technology Student-Invited Inorganic Chemistry Seminar, Boston, MA, February 2018.
53. American Chemical Society National Meeting, symposia on "The Inorganic Chemistry of Lead Halide Perovskites" and "Synthetic Chemistry Addressing Challenges in Energy and the Environment", New Orleans, March 2018
54. Harvard University, Department of Chemistry, April 2018.
55. Materials Research Society National Meeting, symposium on "Emerging Light-Emitting Materials and Devices–Halide Perovskites and Low-Dimensional Nanoscale Emitters" and symposium on "Novel Materials Physics of Perovskite Semiconductors", and tutorial session on "Emerging Low-Dimensional and Perovskite Light-Emitting Materials and Devices" Phoenix, Arizona, April 2018.
56. Northwestern University, Department of Chemistry, April 2018.
57. University of Wisconsin-Madison, Department of Chemistry, May 2018.
58. California Institute of Technology, Department of Chemistry, June 2018.
59. University of California, Los Angeles, Department of Chemistry, June 2018.
60. University of California, Santa Barbara, Materials Research Institute, June 2018.
61. CCI Solar Fuels Capstone Meeting, Ventura, CA, July 2018.

62. Physical Chemistry of Interfaces and Nanomaterials XVII Conference, SPIE Optics and Photonics, San Diego, August 2018.
63. University of Pennsylvania, Department of Chemistry, September 2018.
64. Center for Molecular Analysis and Design Symposium, Stanford University, September 2018.
65. Columbia University, MRSEC colloquium, September 2018.
66. Discovery, Synthesis and Development of Emerging Materials and the Role of the APS-U, Advanced Photon Source, Argonne National Laboratory, Illinois, September 2018.
67. University of Chicago, Department of Chemistry, October 2018.
68. Materials Research Society National Meeting, symposium on "Fundamental Aspects of Halide Perovskite (Opto)electronics and Beyond", Boston, November 2018.
69. University of Illinois, Urbana-Champaign, Illinois, December 2018.
70. Stanford University, Department of Chemistry, December 2018.
71. Duke University, Mechanical Engineering and Materials Science, February 2019.
72. American Chemical Society National Meeting, symposium on "Chemistry at the Interface of Solution-Processed Inorganic Materials", symposium on "Through the Lens of Inorganic Chemistry: Understanding Heterogeneous Processes in Energy Conversion and Storage", and the "F. Albert Cotton Award in Synthetic Inorganic Chemistry" symposium, Orlando, Florida, March 2019.
73. University of Florida, Department of Chemistry, April 2019.
74. Florida State University, Department of Chemistry, April 2019.
75. Materials Research Society National Meeting, symposium on "Perovskite-Based Light Emission & Frontier Phenomena: Single-Crystals, Thin-Films and Nanocrystals" Phoenix, Arizona, April 2019.
76. European Materials Research Society Meeting, symposium on "Halide perovskites: Low dimensions for devices" Nice, France, May 2019.
77. Graphene2019 Conference, symposium on "Energy", Rome, Italy, June 2019.
78. 47th IUPAC World Chemistry Congress, Paris, France, July 2019.
79. Molecular Foundry Annual User Meeting, Lawrence Berkeley National Lab., Berkeley, CA, August 2019.
80. American Chemical Society National Meeting, symposium on "Nanoscale and molecular assemblies: Designing matter to control energy transport", symposium on "Molecular, electronic, and ionic transport in materials for energy", "Chemistry of materials lectureship and best paper award" symposium, and "ACS award in pure chemistry symposium", San Diego, California, August 2019.
81. Princeton University, Department of Chemistry, September 2019.
82. NanoGe Fall meeting symposium on "Halide perovskites: When theory meets experiment from fundamentals to devices" Berlin, Germany, November 2019.
83. Materials Research Society National Meeting, symposium on "Advances in the fundamental science of halide perovskite optoelectronics" Boston, December 2019.
84. Grandpierre Lecturer, Columbia University, Department of Chemistry, January 2020.
85. American Chemical Society National Meeting, "National awards in inorganic chemistry: Plenary session", "ACS award in the chemistry of materials symposium", "Emerging areas in inorganic chemistry" symposium, Philadelphia, March 2020.
86. Materials Research Society National Meeting, symposium on "Next steps for perovskite photovoltaics and beyond" Phoenix, Arizona, April 2020.
87. Phi Lambda Upsilon Lecturer, Kansas State University, Department of Chemistry, Kansas, May 2020.
88. American Chemical Society National Meeting, "Molecular-Scale Photoinduced Driving Forces for

Energy Conversion" symposium, virtual meeting, August 2020.
89. Physical Chemistry of Semiconductor Materials and Interfaces IX Conference, SPIE Optics and Photonics, San Diego, August 2020.
90. American Institute for Chemical Engineers Annual Meeting, San Francisco, November 2020.
91. Materials Research Society National Meeting, symposium on "Frontiers of halide perovskites—Linking fundamental properties to devices" virtual meeting, December 2020.
92. American Chemical Society National Meeting, "Plenary session: "Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator (2020)" award address, "Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator (2021) award symposium", "ACS Award in the Chemistry of Materials (2020) award symposium", virtual meeting, April 2021.
93. Materials Research Society National Meeting, symposium on "Frontier Energy Sciences in Halide Perovskites" virtual meeting, April 2021.
94. Keynote speaker, "Frontiers in Synthetic Moiré Quantum Materials", National Academies of Sciences, Engineering, and Medicine, virtual meeting, May 2021.
95. Centenary Celebrations of the Faculty of Science, University of Colombo, Sri Lanka, June 2021.
96. Gordon Research Conference on Photochemistry, Lewiston, Maine, August 2021.
97. Student-Selected Inorganic Seminar, Department of Chemistry, University of Texas, Austin, TX, September 2021.
98. NanoGe fall meeting, virtual conference, Symposium on "Perovskites: Emerging Materials and Phenomena."
99. Pacifichem, "New challenges in energy chemistry" Honolulu, Hawaii, December 2021.
100. Materials Research Society National Meeting, symposium on "Solid-State Chemistry of New Materials" Boston, MA, December 2021.
101. Portland State University, Department of Chemistry, January 2022.
102. University of Pittsburg, Department of Chemistry, March 2022.
103. Karcher-Barton Award Lecture, University of Oklahoma, Department of Chemistry, April 2022.
104. Materials Research Society National Meeting, symposium on "Semiconductor Physics of Halide Perovskites" and symposium on "Quantum Dot Optoelectronics and Low-Dimensional Semiconductor Electronics" Honolulu, Hawaii, May 2022.
105. Sri Lanka Association for the Advancement of Science, virtual seminar, May 2022.
106. Gordon Research Conference on Unconventional Semiconductors and Their Applications, Ventura, CA, June 2022.
107. NSF/DOE/AFOSR Quantum Science Summer School (QS3), UC Santa Barbara, July 2022.
108. American Chemical Society National Meeting, "Inorganic Chemistry Lectureship" award address, Chicago, IL, August 2022.
109. Princeton University, Department of Chemistry, September 2022.
110. NanoGe Fall meeting, symposia on "The potential of lead-free perovskites: Synthesis, properties and applications" and "Advances on the Understanding and Synthesis of Nanomaterials for Photocatalysis and Optoelectronics", Barcelona, Spain, September 2022.
111. Student Hosted Colloquium, Stanford University, Department of Chemistry, October 2022.
112. Northwestern University, Department of Materials Science and Engineering, October 2022.
113. Materials Research Society National Meeting, symposium on "Advances in the Fundamental Understanding of Halide Perovskites" Boston, MA, December 2022.
114. Pennsylvania State University, Department of Chemistry, March 2023.

115. Columbia University, Department of Chemistry, March 2023.
116. Materials Research Society National Meeting, symposium on "Metal Halide Perovskites for Applications Beyond Optoelectronics" San Francisco, CA, April 2023.
117. Texas A&M University, Department of Chemistry, April 2023.
118. "Chemistry for a sustainable future" Technion Israel Institute of Technology, Haifa, Israel, May 2023.
119. Keynote speaker, International Conference on Materials Chemistry (MC16), Dublin, Ireland, July 2023.
120. Gordon Research Conference in Photochemistry, Lewiston, Maine, July 2023.
121. Materials Research Society National Meeting, symposium on "Emerging Energy Applications of Low-Dimensional Layered and Crystalline Materials" Boston, MA, December 2023.

Professional Activities

1. Associate editor, *Chemical Science*, Royal Society of Chemistry, 2021 to date.
2. International advisory board member, *Angewandte Chemie International Edition*, German Chemical Society, 2021 to date.
3. Editorial advisory board member, *Chemistry of Materials*, American Chemical Society, 2019 to date.
4. International editorial advisory board member, *Journal of the Sri Lanka Association for the Advancement of Science* (SLAAS), 2022 – 2024.
5. Editorial advisory board member, *Inorganic Chemistry*, American Chemical Society, 2016 – 2019.
6. Discussion leader, "power hour" Gordon Research Conference on Unconventional Semiconductors, June 2022.
7. Panelist, Basic Research Needs workshop on Synthesis Science for Energy Relevant Technology, Basic Energy Sciences, Department of Energy, Washington DC, May 2016.
8. Panelist, "Applying for Academic Jobs in a Research University" American Chemical Society annual meeting, April 2021.
9. Organizer, symposia at Solid State Ionics Conference (June 2015), American Chemical Society annual meeting (August 2019), Materials Research Society annual meeting (December 2020), American Physical Society annual meeting (March 2021).
10. Proposal reviewer, annually, National Science Foundation and Department of Energy.

University Service

1. Co-chair, graduate admissions committee, 2022.
2. Chemistry faculty search committee, 2019, 2022.
3. Chemistry graduate admissions committee, 2012 to 2022.
4. Chemistry seminar committee, 2022.
5. Stanford Science Fellows program (postdoctoral fellowship) selection committee, 2021.
6. Chemistry executive committee, 2014 to 2019.
7. University natural sciences long-range planning committee, 2017.
8. Stanford interdisciplinary graduate fellowship selection committee, 2015.
9. Chemistry graduate awards committee, 2013.