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Education

University of California, Berkeley	Environmental Engineering	Ph.D. 2004
University of California, Berkeley	Environmental Engineering	M.S. 1999
Massachusetts Institute of Technology	Environmental Engineering Science	B.S. 1998

Professional Experience

Duke University, Civil & Environmental Engineering.	<i>Professor</i>	2019-present
	<i>Associate Professor</i>	2013-2019
	<i>Assistant Professor</i>	2005-2013
Nicholas School of the Environment, <i>Secondary Faculty Appointment</i>		2011-present
University of Delaware, College of Marine Studies. <i>Postdoctoral Fellow</i>		2004-2005
University of California, Berkeley. <i>Graduate Student Instructor</i>		Fall 1999
Lawrence Livermore National Laboratory. <i>Summer Research Intern</i>		1998, 1999

Overview of expertise and activities

Dr. Heileen (Helen) Hsu-Kim is an environmental engineer with expertise in aquatic geochemistry, trace element biogeochemistry, and nanogeoscience. Her research primarily focuses on trace element contaminants, their distribution in the environment and exposure risks, and technologies to recover valuable metals from unconventional sources. She has published over 100 peer-reviewed journal papers, including several influential papers on environmental nanogeochemistry, mercury biogeochemistry, coal ash geochemistry, and rare earth element recovery. Current research projects include topics related to environmental mercury contamination and exposure to vulnerable populations, unintended consequences of coal ash disposal, technologies to recover rare earth elements from solid wastes, and nanoscale processes as microbe-mineral interfaces. Her current work is supported by grants from the National Science Foundation, the U.S. Department of Energy, and the National Institute of Environmental Health Sciences.

Dr. Hsu-Kim is currently an Associate Editor of the journal *Environmental Science: Processes & Impacts*. She is the chair for the 2022 Gordon Research Conference on *Environmental Science: Water* and currently serves as Treasurer and a member of the Board of Directors for the *Association of Environmental Engineering and Science Professors*. Dr. Hsu-Kim is also the faculty advisor for the Duke student group FEMMES+ (Females Exceling More in Math, Engineering and Science), a K-12 STEM education outreach group for the Durham, North Carolina community.

Teaching

CEE561L/ENV542L Environmental Aquatic Chemistry (graduate level), fall semesters
CEE461L Chemical Processes in Environmental Engineering (undergraduate), fall semesters
CEE/ENV666 Aquatic Geochemistry, (graduate), spring semesters

Honors and Awards

AEESP / Mary Ann Liebert Award for Publication Excellence in *Environmental Engineering Science*, 2019
Environmental Science & Technology Letters Excellence in Review Award, 2016
Research Triangle Institute University Scholar, 2016
Pratt Engineering Excellence in Teaching, 2015
Bass Professorship for excellence in research and teaching, Duke University, 2014-2019
American Society for Engineering Education, 20 Under 40, Prism Magazine, Sept. 2014
Environmental Science & Technology Excellence in Review Award, 2013
Presidential Early Career Award for Scientists and Engineers (PECASE), 2012
Department of Energy Early Career Research Award, 2011
NSF Ridge 2000 Postdoctoral Fellowship, 2004
ACS Environmental Chemistry Division Graduate Student Paper Award, 2003
UC-Berkeley Outstanding Graduate Student Instructor Award, 1999-2000
National Physical Science Consortium Graduate Student Fellowship, 1998-2004

Peer-Reviewed Journal Publications

101. Hower, J.C.; Groppo, J.G.; Hsu-Kim, H.; Taggart, R.K. (2021). Signatures of rare earth element distributions in fly ash derived from the combustion of Central Appalachian, Illinois, and Powder River basin coals. *Fuel*. 301, 121048. DOI: [10.1016/j.fuel.2021.121048](https://doi.org/10.1016/j.fuel.2021.121048)
100. Pan, William K.; Weinhouse, C.; Ortiz, E.; Berky, A.; Fixsen, E.; Mallipudi, A.; Feingold, B.F.; Navio, S.; Rivera, N.A.; Hsu-Kim, H.; Miranda, J.J. (2021). CoNaMad—Cohorte de Nacimiento de Madre de Dios / Madre de Dios Birth Cohort to study effects of in-utero trace metals exposure in the Southern Peruvian Amazon. *Annals of Global Health*.
99. McMillan, H.M.; Rogers, N.; Wadle, A.; Hsu-Kim, H.; Wiesner, M.R.; Hendren, C.O. (2021) Microbial vesicle-mediated communication: convergence to understand interactions within and between domains of life. *Environmental Science: Processes & Impacts*. 23, 664-677. DOI: [10.1039/D1EM00022E](https://doi.org/10.1039/D1EM00022E)
98. Dong, Z.; Deblonde, G.; Middleton, A.; Hu, D.; Dohnalkova, A.; Kovarik, L.; Qafoku, O.; Shutthanadan, V.; Jin, H.; Hsu-Kim, H.; Teaker, N.; Jiao, Y.; Park, D.M. (2021). Microbe Encapsulated Silica Gel Biosorbent for Selective Extraction of Scandium from Coal Byproducts. *Environ. Sci. & Technol.* 55(9), 6320-6328. DOI: [10.1021/acs.est.0c08632](https://doi.org/10.1021/acs.est.0c08632)
97. Hower, J.C.; Groppo, J.G.; Hsu-Kim, H.; Taggart, R.K. (2021). Distribution of rare earth elements in fly ash derived from the combustion of Illinois Basin coals. *Fuel*. 289, 119990. DOI: [10.1016/j.fuel.2020.119990](https://doi.org/10.1016/j.fuel.2020.119990)
96. Alipanah, M.; Park, D.M.; Middleton, A.; Dong, Z.; Hsu-Kim, H.; Jiao, Y.; Jin, H. (2020) Techno-economic and Life Cycle Assessments for Sustainable Rare Earth Recovery from Coal Byproducts using Biosorption. *ACS Sustainable Chemistry & Engineering*. 8(49), 17914-1722. DOI: [10.1021/acssuschemeng.0c04415](https://doi.org/10.1021/acssuschemeng.0c04415)
95. Kose-Mutlu, B., Hsu-Kim, H. and Wiesner, M.R., 2020. Separation of rare earth elements from mixed-metal feedstocks by micelle enhanced ultrafiltration with sodium dodecyl sulfate. *Environmental Technology*, 1-13. DOI: [10.1080/09593330.2020.1812732](https://doi.org/10.1080/09593330.2020.1812732)
94. Berky, A.J., Robie, E., Ortiz, E.J., Meyer, J.N., Hsu-Kim, H. and Pan, W.K. (2020) Evaluation of Peruvian Government Interventions to Reduce Childhood Anemia. *Annals of Global Health*, 86(1), 98. DOI: [10.5334/aogh.2896](https://doi.org/10.5334/aogh.2896)

93. Gerson, J. R.; Naslund, L. C.; Liu, Y.-T.; Hsu-Kim, H.; Driscoll, C. T.; Ross, M. R. V.; Waters, M. N.; Bernhardt, E. S. (2020) Mercury and selenium loading in mountaintop mining impacted alkaline streams and riparian food webs. *Biogeochemistry* 150(1), 109-122. DOI: [10.1007/s10533-020-00690-7](https://doi.org/10.1007/s10533-020-00690-7)
92. Middleton, A.; Park, D.M.; Jiao, Y.; Hsu-Kim, H. (2020). Major element composition controls rare earth element solubility during leaching of coal fly ash and coal by-products. *Intl. J. Coal Geology*. DOI: [10.1016/j.coal.2020.103532](https://doi.org/10.1016/j.coal.2020.103532)
91. Weinhouse, C.; Gallis, J.A.; Ortiz, E.; Berky, A.J.; Morales, A.M.; Diringer, S.E.; Harrington, J.; Bullins, P.; Rogers, L.; Hare-Grogg, J.; Hsu-Kim, H.; Pan, W.K. (2020) A population-based mercury exposure assessment near an artisanal and small-scale gold mining site in the Peruvian Amazon. *J. Exposure Science and Environmental Epidemiology*. DOI: [10.1038/s41370-020-0234-2](https://doi.org/10.1038/s41370-020-0234-2)
90. Reuben, A; Frischtak, H.; Berky, A.; Ortiz, E.J.; Morales A.M.; Hsu-Kim, H.; Pendergast, L.L.; Pan, W.K. (2020) Elevated Hair Mercury Levels Are Associated With Neurodevelopmental Deficits in Children Living Near Artisanal and Small-Scale Gold Mining in Peru. *GeoHealth*. 4(5), e2019GH000222. DOI: [10.1029/2019GH000222](https://doi.org/10.1029/2019GH000222).
89. Wang, Z.; Coyte, R.M.; Dwyer, G.S.; Ruhl, L.S.; Hsu-Kim, H.; Hower, J.C.; Vengosh, A. (2020) Distinction of strontium isotope ratios between water-soluble and bulk coal fly ash from the United States. *Intl. J. Coal Geology*. 222, 103464. DOI: [10.1016/j.coal.2020.103464](https://doi.org/10.1016/j.coal.2020.103464).
88. Park, D.; Middleton, A.; Smith, R.; Deblonde, G.; Laudal, D.; Theaker, N.; Hsu-Kim, H.; Jiao, Y. (2020). A biosorption-based approach for selective extraction of rare earth elements from coal byproducts. *Separation and Purification Technology*. 241, 116726. DOI: [10.1016/j.seppur.2020.116726](https://doi.org/10.1016/j.seppur.2020.116726)
87. Diana, Z.; Sawickij, N.; Rivera, N.A.; Hsu-Kim, H.; Rittschof, D. (2020) Plastic Pellets Trigger Feeding Responses in Sea Anemones. *Aquatic Toxicology*. 222, 105447. DOI: [10.1016/j.aquatox.2020.105447](https://doi.org/10.1016/j.aquatox.2020.105447)
86. Avellan, A.; Simonin, M.; Anderson, S.M.; Geitner, N.K.; Bossa, N.; Spielman-Sun, E.; Bernhardt, E.S.; Castellon, B.T.; Colman, B.P.; Cooper, J.L.; Ho, M.; Hochella, M.F.; Hsu-Kim, H.; Inoué, S.; King, R.S.; Laughton, S.; Matson, C.W.; Perrotta, B.G.; Richardson, C.J.; Unrine, J.M.; Wiesner, M.R.; Lowry, G.V. (2020) Differential Reactivity of Copper- and Gold-based Nanomaterials Controls their Seasonal Biogeochemical Cycling and Fate in a Freshwater Wetland Mesocosm. *Environ. Sci. & Technol*. 54, 1533-1544. DOI: [10.1021/acs.est.9b05097](https://doi.org/10.1021/acs.est.9b05097)
85. Diringer, S.E.; Berky, A.; Marani, M.; Ortiz, E.J.; Karatum, O.; Plata, D.L.; Pan, W.K.; Hsu-Kim, H. (2020) Deforestation Due to Artisanal and Small-Scale Gold Mining Exacerbates Soil and Mercury Mobilization in Madre de Dios, Peru. *Environ. Sci. & Technol*. 54, 286-296. DOI: [10.1021/acs.est.9b06620](https://doi.org/10.1021/acs.est.9b06620)
84. Mello, D. F.; Trevisan, R.; Rivera, N.; Geitner, N. K.; Di Giulio, R. T.; Wiesner, M. R.; Hsu-Kim, H.; Meyer, J. N. (2020) Caveats to the use of MTT, neutral red, Hoechst and Resazurin to measure silver nanoparticle cytotoxicity. *Chemico-Biological Interactions*. 315, 108868. DOI: [10.1016/j.cbi.2019.108868](https://doi.org/10.1016/j.cbi.2019.108868)
83. Feingold, B.J.; Berky, A.; Hsu-Kim, H.; Rojas, E.; Pan, W.K. (2020) Population based dietary exposure to mercury through fish consumption in the Southern Peruvian Amazon. *Environmental Research*. 108720. DOI: [10.1016/j.envres.2019.108720](https://doi.org/10.1016/j.envres.2019.108720)

82. Volkoff, S.; Osterberg, J.; Jayasundara, N.; Cooper, E.; Hsu-Kim, H.; Rogers, L.; Gehrke, G.; Jayaraman, S.; Di Giulio, R. (2019). Embryonic *Fundulus heteroclitus* responses to sediment extracts from differentially contaminated sites in the Elizabeth River, VA. *Ecotoxicology*. 28, (9), 1126-1135. DOI: [10.1007/s10646-019-02116-z](https://doi.org/10.1007/s10646-019-02116-z)
81. Redfern, L.K.; Gardner, C.M.; Hodzic, E.; Ferguson, P.L.; Hsu-Kim, H.; Gunsch, C.K. (2019). A new framework for approaching precision bioremediation of PAH contaminated soils. *Journal of Hazardous Materials*, 378, 120859. DOI: [10.1016/j.jhazmat.2019.120859](https://doi.org/10.1016/j.jhazmat.2019.120859)
80. Rivera, N.A.; Bippus, P.M.; Hsu-Kim, H. (2019). Relative Reactivity and Bioavailability of Mercury Sorbed to or Coprecipitated with Aged Iron Sulfides. *Environ. Sci. & Technol.* 53, 7391-7399. [10.1021/acs.est.9b00768](https://doi.org/10.1021/acs.est.9b00768)
79. Zhang, T.; Lowry, G. V.; Capiro, N. L.; Chen, J.; Chen, W.; Chen, Y.; Dionysiou, D. D.; Elliott, D. W.; Ghoshal, S.; Hofmann, T.; Hsu-Kim, H.; Hughes, J.; Jiang, C.; Jiang, G.; Jing, C.; Kavanaugh, M.; Li, Q.; Liu, S.; Ma, J.; Pan, B.; Phenrat, T.; Qu, X.; Quan, X.; Saleh, N.; Vikesland, P. J.; Wang, Q.; Westerhoff, P.; Wong, M. S.; Xia, T.; Xing, B.; Yan, B.; Zhang, L.; Zhou, D.; Alvarez, P. J. J.. (2019) In situ remediation of subsurface contamination: opportunities and challenges for nanotechnology and advanced materials. *Environmental Science: Nano*. 6, (5), 1283-1302.
78. Smith, R.C.; Taggart, R.K.; Hower, J.C.; Wiesner, M.R.; Hsu-Kim, H. (2019). Selective Recovery of Rare Earth Elements from Coal Fly Ash Leachates Using Liquid Membrane Processes. *Environ. Sci. & Technol.* 53, 4490-4499. DOI: [10.1021/acs.est.9b00539](https://doi.org/10.1021/acs.est.9b00539)
77. Hower, J.C.; Qian, D.; Briot, N.J.; Santillan-Jimenez, E.; Hood, M.M.; Taggart, R.K.; Hsu-Kim, H. (2019). Nano-Scale Rare Earth Distribution in Fly Ash Derived from the Combustion of the Fire Clay Coal, Kentucky. *Minerals*, 9, 206. DOI: [10.3390/min9040206](https://doi.org/10.3390/min9040206)
76. Wyatt, L.; Permar, S.R.; Ortiz, E.; Berky, A.; Woods, C.W.; Fouda Amouou, G.; Itell, H.; Hsu-Kim, H.; Pan, W.K. (2019). Mercury Exposure and Poor Nutritional Status Reduce Response to Six Expanded Program on Immunization Vaccines in Children: An Observational Cohort Study of Communities Affected by Gold Mining in the Peruvian Amazon. *Intl. J. Environ. Res Public Health*. 16(4), 638. DOI: [10.3390/ijerph16040638](https://doi.org/10.3390/ijerph16040638)
75. Taggart, R.K.; Rivera, N.A.; Levard, C.; Ambrosi, J.-P.; Borschneck, D.; Hower, J.C.; Hsu-Kim, H. (2018). Differences in bulk and microscale yttrium speciation in coal combustion fly ash. *Environmental Science: Processes & Impacts*. 20, 1390-1403. DOI: [10.1039/c8em00264a](https://doi.org/10.1039/c8em00264a)
74. Geitner, N.; Cooper, J.; Avellan, A.; Castellon, B.; Perrotta, B.; Bossa, N.; Simonin, M.; Anderson, S.; Inoue, S.; Hochella, M.; Richardson, C.; Bernhardt, E.; Lowry, G.; Ferguson, P.L.; Matson, C.; King, R.; Unrine, J.; Wiesner, M.R.; Hsu-Kim, H. (2018). Size-Based Differential Transport, Uptake, and Mass Distribution of Ceria (CeO₂) Nanoparticles in Wetland Mesocosms. *Environ. Sci. & Technol.* 52, 9768-9776. DOI: [10.1021/acs.est.8b02040](https://doi.org/10.1021/acs.est.8b02040)
73. Chen, C.Y.; Driscoll, C.T.; Eagles-Smith, C.A.; Eckley, C.S.; Gay, D.A.; Hsu-Kim, H.; Keane, S.E.; Kirk, J.L.; Mason, R.P.; Obrist, D.; Selin, H.; Selin, N.E; Thompson, M. (2018). A Critical Time for Mercury Science to Inform Global Policy. *Environ. Sci. & Technol.* 52, 9556-9561. DOI: [10.1021/acs.est.8b02286](https://doi.org/10.1021/acs.est.8b02286)
72. Berky, A.J.; Ryde, I.T.; Feingold, B.; Ortiz, E.J.; Wyatt, L.H.; Weinhouse, C.; Hsu-Kim, H.; Meyer, J.N.; Pan, W.K. (2019). Predictors of mitochondrial DNA copy number and damage in a mercury-exposed rural Peruvian population near artisanal and small-scale gold mining:

- an exploratory study. *Environmental and Molecular Mutagenesis*. 60, 197-210. DOI: [10.1002/em.22244](https://doi.org/10.1002/em.22244)
71. [Ndu, U.](#); Christensen, G.A.; Rivera, N.A.; Gionfriddo, C.M.; Deshusses, M.A.; Elias, D.A.; Hsu-Kim, H. (2018). Quantification of Mercury Bioavailability for Methylation Using Diffusive Gradient in Thin-Film Samplers. *Environ. Sci. & Technol.* 52, 8521-8529. DOI: [10.1021/acs.est.8b00647](https://doi.org/10.1021/acs.est.8b00647)
70. [Taggart, R.K.](#), Hower, J.C.; Hsu-Kim H. (2018). Effects of Roasting Additives and Leaching Parameters on the Extraction of Rare Earth Elements from Coal Fly Ash. *International Journal of Coal Geology*. 196, 106-114. DOI: [10.1016/j.coal.2018.06.021](https://doi.org/10.1016/j.coal.2018.06.021)
69. [King, J.F.](#); [Taggart, R.K.](#); [Smith, R.C.](#); Hower, J.C.; Hsu-Kim, H. (2018). Aqueous Acid and Alkaline Extraction of Rare Earth Elements from Coal Combustion Ash. *International Journal of Coal Geology*. 195: 75-83. DOI: [10.1016/j.coal.2018.05.009](https://doi.org/10.1016/j.coal.2018.05.009)
68. Mutlu, B.K; Cantoni, B.; Turolla, A; Antonelli, M.; Hsu-Kim, H; Wiesner, M.R. (2018). Application of Nanofiltration for Rare Earth Elements Recovery from Coal Fly Ash Leachate: Performance and Cost Evaluation. *Chemical Engineering Journal*. 349: 309-317. DOI: [10.1016/j.cej.2018.05.080](https://doi.org/10.1016/j.cej.2018.05.080)
67. Hower, J.C.; Qian, D.; Briot, N.J.; Henke, K.R.; Hood, M.M.; [Taggart, R.K.](#); Hsu-Kim, H. (2018). Rare earth element associations in the Kentucky State University stoker ash. *International Journal of Coal Geology*. 189: 75-82. DOI: [10.1016/j.coal.2018.02.022](https://doi.org/10.1016/j.coal.2018.02.022)
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65. [Schwartz, G.E.](#); Hower, J.C.; [Phillips, A.L.](#); [Rivera, N.](#); Vengosh, A.; Hsu-Kim H. (2018). Ranking coal ash materials for their potential to leach arsenic and selenium: The relative importance of ash chemistry and site biogeochemistry. *Environmental Engineering Science*. 35(7), 728-738. DOI: [10.1089/ees.2017.0347](https://doi.org/10.1089/ees.2017.0347)
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61. Wyatt, L; Ortiz, E.; Feingold, B.; Berky, A.; [Diringer, S.](#); Morales, A.M.; Rojas, E.; Hsu-Kim, H.; Pan, W. (2017). Geospatial, Temporal, and Dietary Variables Associated with Elevated Mercury Exposure in Peruvian Riverine Communities Upstream and Downstream of Artisanal and Small-scale Gold Mining. *Intl. J. Environ. Res Public Health*. 14(12), 1582. DOI: [10.3390/ijerph14121582](https://doi.org/10.3390/ijerph14121582).
60. Weinhouse, C.; Ortiz, E.J.; Berky, A.J.; Bullins, P.; [Hare-Grogg, J.](#); [Rogers, L.](#); Morales, A.-M.; Hsu-Kim, H.; Pan, W.K. (2017). Hair Mercury Level is Associated with Anemia and Micronutrient Status in Children Living Near Artisanal and Small-Scale Gold Mining in the

- Peruvian Amazon. *American J of Tropical Medicine and Hygiene*. 97(6), 1886-1897. DOI: <https://doi.org/10.4269/ajtmh.17-0269>
59. Hower, J.C.; Hood, M.M.; Taggart, R.K.; Hsu-Kim, H. (2017). Chemistry and petrology of paired feed coal and combustion ash from anthracite-burning stoker boilers. *Fuel*. 199,438-446. DOI: [10.1016/j.fuel.2017.03.007](https://doi.org/10.1016/j.fuel.2017.03.007)
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 56. Schwartz, G.E.; Redfern, L.K; Ikuma, K.; Gunsch, C.K.; Ruhl, L.S.; Vengosh, A.; Hsu-Kim, H. (2016). Impacts of coal ash on methylmercury production and the methylating microbial community in anaerobic sediment slurries. *Environ. Sci.: Processes & Impacts*. 18, 1427-1439. DOI: [10.1039/C6EM00458J](https://doi.org/10.1039/C6EM00458J)
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- Bernhardt, E.S.; Matson, C.W.; Wiesner, M.R. (2012). Long-term transformation and fate of manufactured Ag nanoparticles in a simulated large scale freshwater emergent wetland. *Environ. Sci. & Technol.* 46(13), 7027-7036. DOI: [10.1021/es204608d](https://doi.org/10.1021/es204608d)
22. [Zhang, T.](#); Kim, B.; Levard, C.; Reinsch, B.C.; Lowry, G.V.; Deshusses, M.A.; Hsu-Kim, H. (2012). Methylation of mercury by bacteria exposed to dissolved, nanoparticulate, and microparticulate mercuric sulfides. *Environ. Sci. & Technol.* 46(13), 6950-6958. DOI: [10.1021/es203181m](https://doi.org/10.1021/es203181m)
21. Robins, N.; Hagan, N.; Halabi, S.; Hsu-Kim, H.; Espinoza Gonzales, R.D.; Morris, M.; Woodall, G.; Richter, D.; Heine, P.; [Zhang, T.](#); Bacon, A.; Vandenberg, J. (2012). Estimations of historical atmospheric mercury concentrations from mercury refining and present-day soil concentrations of total mercury in Huancavelica, Peru. *Science of the Total Environment.* 426, 145-154. DOI: [10.1016/j.scitotenv.2012.03.082](https://doi.org/10.1016/j.scitotenv.2012.03.082)
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19. Yang, X.; [Gondikas, A.](#); Marinakos, S.M.; Auffan, M.; Liu, J.; Hsu-Kim, H.; Meyer, J.N. (2012). The mechanism of silver nanoparticle toxicity is dependent on dissolved silver and surface coating in *Caenorhabditis elegans*. *Environ. Sci. & Technol.* 46(2), 1119-1127. DOI: [10.1021/es202417t](https://doi.org/10.1021/es202417t)
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15. [Bryant, L.D.](#); Hsu-Kim, H.; Gantzer, P.A.; Little, J.C. (2011) Solving the problem at the source: controlling Mn release at the sediment-water interface via hypolimnetic oxygenation. *Water Research.* 45, 6381-6392. DOI: [10.1016/j.watres.2011.09.030](https://doi.org/10.1016/j.watres.2011.09.030)
14. Aiken, G.R.; Hsu-Kim, H.; Ryan, J.N. (2011). Influence of dissolved organic matter for the environmental fate of metals, nanoparticles, and colloids. *Environ. Sci. & Technol.* 45, 3196–3201. DOI: [10.1021/es103992s](https://doi.org/10.1021/es103992s).
13. [Deonaraine, A.](#); [Lau, B.L.T.](#); Aiken, G.R.; Ryan, J.N.; Hsu-Kim, H. (2011). Effects of humic substances on precipitation and aggregation of zinc sulfide nanoparticles. *Environ. Sci. & Technol.* 45, 3217–3223. DOI: [10.1021/es1029798](https://doi.org/10.1021/es1029798).
12. Ruhl, L.; Vengosh, A.; Dwyer, G.S.; Hsu-Kim, H.; [Deonaraine, A.](#) (2010). Environmental Impacts of the Coal Ash Spill in Kingston, Tennessee: An Eighteen-Month Survey, *Environ. Sci. & Technol.* 44, 9272-9278. DOI: [10.1021/es1026739](https://doi.org/10.1021/es1026739)

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6. Hsu-Kim, H.; Mullaugh, K.M.; Tsang, J.J.; Yucel, M.; Luther, G.W. (2008). Formation of Zn- and Fe-sulfides near hydrothermal vents at the Eastern Lau Spreading Center: Implications for sulfide bioavailability to chemoautotrophs. *Geochem. Trans.* 9:6. DOI: [10.1186/1467-4866-9-6](https://doi.org/10.1186/1467-4866-9-6)
5. Waite, T.J.; Moore, T.S.; Childress, J.J.; Hsu-Kim, H.; Mullaugh, K.M.; Nuzzio, D.B.; Paschal, A.N.; Tsang, J.; Fisher, C.R.; and Luther, G.W. (2008). Variation in sulfur speciation with shellfish presence at a Lau Basin diffuse flow vent site. *J. Shellfish Res.* 27(1), 163-168.
4. Hsu-Kim, H. (2007). Stability of Metal-Glutathione Complexes During Oxidation by Hydrogen Peroxide and Cu(II)-Catalysis. *Environ. Sci. & Technol.* 41, 2338-2342. DOI: [10.1021/es062269+](https://doi.org/10.1021/es062269+)
3. Tsang, J.J.; Rozan, T.F.; Hsu-Kim, H.; Mullaugh, K.M.; Luther, G.W. (2006). Pseudopolarographic determination of Cd²⁺ complexation in freshwater. *Environ. Sci. & Technol.* 40, 5388-5394. DOI: [10.1021/es0525509](https://doi.org/10.1021/es0525509)
2. Hsu-Kim, H. and Sedlak, D. L. (2005). Similarities between inorganic sulfide and the strong Hg(II)-complexing ligands in municipal wastewater effluent. *Environ. Sci. & Technol.* 39, 4035-4041. DOI: [10.1021/es050013i](https://doi.org/10.1021/es050013i)
1. Hsu, H. and Sedlak, D. L. (2003). Strong mercury(II) complexation in wastewater effluent and surface waters. *Environ. Sci. & Technol.* 37, 2743-2749. DOI: [10.1021/es026438b](https://doi.org/10.1021/es026438b)

Editorial Contributions

- Hsu-Kim, H., Eckley, C.S.; Selin, N.E. (2018). Modern science of a legacy problem: mercury biogeochemical research after the Minamata Convention. *Environ. Sci.: Processes & Impacts*. 20(4), 582-583. <http://dx.doi.org/10.1039/C8EM90016G>
- Hsu-Kim H., Cory R.M. “Water Chemistry by P.L. Brezonik and W.A. Arnold: A new textbook for environmental aquatic chemistry”. AEESP Newsletter. 47(1), 9. January 2012. <http://www.aeesp.org/pdf/publications/AEESPNL.47.1.2012.pdf>
- Aiken G., Hsu-Kim H., Ryan J., Alvarez P. “Guest Comment: Nanoscale Metal-Organic Matter Interactions”. Guest editors G.R. Aiken, H. Hsu-Kim and J.N. Ryan. Special focus issue of

Research Advisees

Postdoctoral Associates/Research Scientists:

Nelson Rivera, 2014-present
Ryan Smith, 2016-2019
Udonna Ndu, 2015-2018
Carol Johnson, 2014-2016
Anh Pham, 2012-2015
Gretchen Gehrke, 2012-2015
Sung-Woo Lee, 2013-2014
Kate Kucharzyk, 2011-2014
Yu-Ting Liu, 2010-2013
Amanda Morris, 2011-2012
Lee Bryant, 2010-2012
Boris Lau, 2007-2008

Graduate students:

Graduated:

Faye Koenigsmark, Ph.D., 2021
Jie Ren, M.S., 2021
Jieqi Liu, M.S., 2020
Ross Taggart, Ph.D., 2018
Jane Cooper, M.S., 2017
Sarah Diringer, Ph.D., 2016
Chuanjia Jiang, Ph.D., 2016
Abigail McEwen, MEM, 2015
Grace Schwartz, Ph.D., 2015
Andreas Gondikas, Ph.D., 2012
Tong Zhang, Ph.D., 2012
Amrika Deonarine, Ph.D., 2011

In-Progress:

Natalia Neal-Walthall, Ph.D. candidate, 2016-present
Andrew Middleton, Ph.D. candidate, 2017-present
Austin Wadle, Ph.D. candidate, 2018-present
Zehao Jin, Ph.D. candidate, 2020-present
Joshua Miller, Ph.D. candidate, 2020-present

Undergraduate:

Zehua (Roy) Wang, CEE major 2021-present
Katherine Li, CEE major, 2021-present
Jenny Liang, Env Eng. major, 2019
Emma Palmer, Env Eng. major, 2018-19
Eliza Letourneau, Env. Sci. major, 2018-19
Madeline McKnight, Chemistry major, 2018-19
April Laranang, REU student, summer 2018

Fangfei Liu, REU student, summer 2018
Joyce Gu, REU student, summer 2018
Xiating Chen, Env Eng. major, 2016
John Hare-Grogg, Environ. Sci. major, 2015-16
Jack King, Env. Eng. major, 2015-16
Elaine Hung, REU student, summer 2015
Devon Manley, REU student, summer 2014
Osman Ulug, REU student, summer 2014
Laura Rogers, Environ. Sci. major, spring 2014 – 2015
Lauren Riedle, UNC Env. Sci. major, 2013-2014
Marika Nell, REU student, summer 2013
Zakary Goldberg, REU student, summer 2013
Karen Yu, REU student, summer 2011
Andrew Matsumoto, REU student, summer 2011
Greer Mackabee, CEE major, graduated 2012
Marianne Leonhardt, CEE major, graduated 2012
Brian Au, CEE major, graduating 2012
Patrick Canning, CEE major, graduated 2009
Natalya Polishchuk, REU student, summer 2007
Kristen Jenkins, biology major, graduated 2008

High School:

Annamarie Eustice, 2017
Kevin Jin, 2017
Hannah McGrath, 2016
Avi Aggarwal, summer (Howard Hughes program) 2010-11
Eileen Jang, summer (Howard Hughes program) 2008-2009

Professional Affiliations

Memberships: American Chemical Society, Association of Environmental Engineering and Science Professors, Geochemical Society, American Society of Civil Engineers
Academic honor societies: Tau Beta Pi, Chi Epsilon, and Phi Beta Kappa

Technical Advisory

Proposal Review Panel, Earth and Environmental Science Panel Member, Stanford Synchrotron Radiation Lightsource, 2019-present.
Associate Editor, *Environmental Science: Processes & Impacts*, RSC Publications. 2016-present.
Editorial Advisory Board. *Environmental Science & Technology Letters*. 2014-present. *ACS ES&T Water* (2020-present)

Service and Outreach Activities

Duke University & Pratt School of Engineering

Nicholas Institute Strategic Advisory Committee (2019-present)
Duke University Standing Committee on Research Misconduct (2019-present)
CEE Masters graduate program, Assistant Director (2018-present)
Civil & Environmental Engineering Graduate Colloquium, program organizer (2017-2020)

Civil & Environmental Engineering faculty search committee, chair (2019-2020)
Advisory Committee for the Vice Provost Office for Faculty Advancement (2018-2019)
Civil & Environmental Engineering faculty search committee (2017-18)
Duke University Diversity Task Force (2014-2015)
Pratt School of Engineering Faculty Council (2013-2015)
University Campus Sustainability Committee (2013-2014)
Environmental Engineering faculty search committee, chair (2013-15)
University Committee on Facilities & Environment (2012-2015)
Academic Council. Representative from the Pratt School of Engineering. April 2012-2016.
Pratt Engineering EXCEL Building faculty planning committee (spring 2007).

Scientific Community

Treasurer and member of Board of Directors, Association of Environmental Engineering and Science Professors, 2018-2021.
DOE, Office of Biological and Environmental Research, Science and Operations Review of the Environmental Molecular Sciences Laboratory, November 29-30, 2017.
DOE, Office of Basic Energy Research, Basic Research Needs Workshop on the Energy-Water Nexus. January 4-5, 2017.
DOE, Office of Biological and Environmental Research, Climate and Environmental Sciencea Division, Committee of Visitors, July 19-21, 2016.
NSF Workshop Participant “Geobiology and Microbial Geochemistry Workshop”, October 10-12, 2013.
NSF Workshop Participant, “Future Directions in Geobiology and Low-Temperature Geochemistry”, September 27-28, 2010
Patterson Award Committee, Geochemical Society, 2008-2011

Community/K-12 Outreach

FEMMES (Females Excelling More in Math, Engineering, and Science), Faculty advisor and workshop volunteer (2007-present).
GAINS Conference, Faculty presenter/speaker. Durham and Chapel Hill, NC. April 3-4, 2016.
NanoDays volunteer. North Carolina Museum of Life & Sciences. 2011 and 2012.
Developed an activity titled *NanoToss* for museum visitors.
Research mentor for Pratt NSF-REU (summer 2007-08, 2010), Howard Hughes Precollege Program in the Biological Sciences.

Invited Speaker at Conferences (last 3 years)

Hsu-Kim, H. Managing Aquatic Mercury Pollution: Strategies for Quantifying Biomethylation Potential. National Environmental Chemistry Conference. Nankai University, Tianjin. August 16-19, 2019.
Hsu-Kim, H. Managing Aquatic Mercury Pollution: Modern Approaches for a Legacy Contaminant. ESPI Editors Symposium. Massachusetts Institute of Technology and the Royal Society of Chemistry. Cambridge, MA. June 24, 2019.
Hsu-Kim, H.; R.K. Taggart; R.C. Smith; M.R. Wiesner; J.C. Hower. Recovery of rare earth elements from coal combustion residuals. 256th American Chemical Society National Meeting. Boston, August 19-23, 2018.

Hsu-Kim, H.; *Keynote*: EH&S of Nano: Now What? Connecting Environmental Nano Research to Trace Element Biogeochemistry. Goldschmidt 2018. Boston, August 13-17, 2018.

Hsu-Kim, H.; T. Zhang; C. Jiang. What Have We Learned from 10+ Years of Nano EH&S?: Connecting Environmental Nano Research to Trace Element Biogeochemistry. 4th International Conference on Environmental Pollution and Health. Nankai University, Tianjin, China, May 18-20, 2018.

Hsu-Kim, H; Managing Aquatic Mercury Pollution: From Coupled Ecosystem Processes to Quantifying Bioavailability. 255th American Chemical Society National Meeting. New Orleans, March 18-22, 2018.

Invited Seminars at Universities and Institutions (last 3 years)

Vanderbilt University. Department of Civil and Environmental Engineering. “Managing Aquatic Mercury Pollution: Modern Approaches for a Legacy Contaminant”. November 15, 2019

University of Michigan, Department of Civil and Environmental Engineering. “Nanoscale Biogeochemistry of Mercury: Modern Approaches for a Legacy Pollutant”. January 26, 2018.

Conference symposia chaired

Chair, 2022 Gordon Research Conference on Environmental Science: Water. Summer 2022

Vice Chair, 2018 Gordon Research Conference on Environmental Science: Water. June 24-29, 2018. Holderness, New Hampshire.

“I’ve Got Tenure, So Now What?: Managing the Triad of Teaching, Research, and Service Post-Tenure”. AEESP 2017 Research and Education Conference. Associated of Environmental Engineering and Science Professors. June 20-22, 2017. Ann Arbor, Michigan.

“Women in Environmental Science and Engineering”, 248th American Chemical Society National Meeting, Division of Environmental Chemistry, August 10-14, 2014, San Francisco, CA.

“Biogeochemical Processes Influencing Mobilization, Transformations, and Bioavailability of Mercury”, Goldschmidt 2014, Sacramento, CA, June 8-13, 2014.

“Assessing micropollutant dynamics in the Earth’s Critical Zone”, 21th Annual V.M. Goldschmidt Conference Prague, Czech Republic. August 15-19, 2011.

“Influence of Natural Organic Matter on the Fate and Transport of Metals, Colloids, and Nanoparticles in Aquatic Systems”, American Chemical Society National Meeting, Division of Environmental Chemistry, March 2010, San Francisco, CA

Conference Papers (Peer-reviewed)

Weston V., Bohnivert A., Elia A., Hsu-Kim H., Ybarra G. (2008). Work in Progress: A STEM Educational Outreach Day for Young Females. Proceedings of the ASEE/IEEE Frontiers in Education Conference. October 22-25, 2008. Saratoga Springs, NY. Article number 4720570, Pages S2D9-S2D10. DOI: 10.1109/FIE.2008.4720570s.

Conference Proceedings (last 3 years; presenter is underlined)

Hsu-Kim, H.; Neal-Walthall, N.; Ndu, U.; Gionfriddo, C.M.; Christensen, G.; Elias, D.
“Discretizing the Geochemical and Microbiological Contributions of Mercury Methylation Potential in Sediments”. American Geophysical Union Fall Meeting 2019. San Francisco, CA. December 9-13, 2019.

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- Koenigsmark, F.; Weinhouse, C.; Ortiz, E.; Berkey, A.J., Pan, W.K.; Hsu-Kim, H. Efficacy of Hair as a Biomarker of Methylmercury Exposure to Communities Within and Outside of Artisanal and Small Scale Gold Mining in Madre de Dios, Peru. NIEHS Superfund Research Program Annual Meeting, Seattle, WA. November 18-20, 2019.
- Hsu-Kim, H.; Rivera, N.A. Heterogeneous Microscale and Nanoscale Arsenic and Selenium Speciation in Coal Fly Ash. 2019 International Pittsburgh Coal Conference. Pittsburgh, PA. September 3-6, 2019.
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- Hsu-Kim, H.; S. Diringer; C. Weinhouse; A. Berky; M. Marani; E. Ortiz; W. Pan. Mobilization, methylation and exposure of mercury from artisanal and small-scale gold mining in Madre de Dios, Peru. 257th American Chemical Society National Meeting. Orlando, April 1-4, 2019.
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- Hsu-Kim, H.; R.C. Smith; M.R. Wiesner. Comparison of Liquid Membranes for the Selectivity and Recovery of Rare Earth Elements from Coal Ash Leachates. 255th American Chemical Society National Meeting. New Orleans, March 18-22, 2018.