

SHIHO KAWASHIMA



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Associate Professor

Civil Engineering and Engineering Mechanics

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Date: Jan 2026

Education:

<u>School</u>	<u>Degree</u>	<u>Date</u>
Columbia University	Bachelor of Science	May 2007
Northwestern University	Master of Science	Dec 2009
Northwestern University	Doctor of Philosophy	Sept 2012

Ph.D. Thesis:

Nanomodification of cementitious materials: Fresh state and early age properties (*published 2013*)

PhD Advisors: Surendra P. Shah, David J. Corr

Description of research:

Major focus areas:

- Low-carbon concrete via waste utilization, CO₂ mineralization, alternative cement chemistries;
- Rheology and processing of fresh cement-/clay-based materials;
- 3D printing of concrete / earth for construction;

Career History:

Employer	Position	Beginning	Ending
Northwestern University	Graduate Research Assistant	Sept 2007	Sept 2012

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Columbia University	Assistant Professor	Jan 2013	Dec 2017
Columbia University	Associate Professor	Jan 2018	Present

Awards Received:

Internal:

- Provost's Grants Program for Junior Faculty who Contribute to the Diversity Goals of the University, 2015;
- SEAS Edward and Carole Kim Faculty Involvement Award, 2020;

External:

- Forbes' 30 under 30: Science, 2015;
- National Science Foundation, CAREER Award, 2017;
- American Ceramics Society (ACerS) Cements Division Early Career Award, 2022;
- ACerS Global Ambassador Award, 2024;
- American Association of State Highway and Transportation Officials (AASHTO) High Value Research (HVR) Honorable Award, 2025;

Current Professional Organization Membership

- *Member, American Concrete Institute (ACI)*
- *Member, American Ceramics Society (ACerS)*
- *Member, International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM)*

Publications: (*corresponding author; students or postdocs supervised underlined)

Note on authorship convention: Senior / advising author listed last if co-authoring with students; if of equal / comparable rank, listed in order of contribution to the work

h-index: 42 (Source: Google Scholar, accessed Jan 23, 2026)

Published Papers in Refereed Journals (Impact factor, IF):

- J1. **Kawashima, S***, and S.P. Shah. Early-age autogenous and drying shrinkage behavior of cellulose fiber-reinforced cementitious materials, *Cement and Concrete Composites*, 33(2): 201-208, 2011. (IF: 7.586)
- J2. Gao, X., **S. Kawashima**, and S.P. Shah. Influence of clays on shrinkage and cracking tendency of SCC, *Cement and Concrete Composites*, 34(4): 478-485, 2012. (IF: 7.586)
- J3. Hou, P., K. Wang, J. Qian, **S. Kawashima**, D. Kong, and S.P. Shah. Effects of colloidal nanoSiO₂ on fly ash hydration, *Cement and Concrete Composites*, 34(10): 1095-1103, 2012. (IF: 7.586)
- J4. **Kawashima, S.***, J-H. Kim, D. Corr and S.P. Shah. Study of the mechanisms underlying the fresh-state response of cementitious materials modified with nanoclays, *Construction and Building Materials*, 36: 749-757, 2012. (IF: 6.141)

- J5. Li, W., J. Xiao, Z. Sun, **S. Kawashima**, and S.P. Shah. Interfacial transition zones in recycled aggregate concrete with different mixing approaches, *Construction and Building Materials*, 35: 1045-1055, 2012. (IF: 6.141)
- J6. Hou P., D. Kong, **S. Kawashima**, J. Qian, D. Corr and S.P. Shah. A novel evidence for the formation of semi-permeable membrane surrounding the Portland cement particles during the induction period. *Journal of Thermal Analysis and Calorimetry*, 1-4, 2012. (IF: 4.626)
- J7. **Kawashima, S.***, P. Hou, D. Corr and S.P. Shah. Modification of cement-based materials with nanoparticles, *Cement and Concrete Composites*, 36(0): 8-15, 2012. (IF: 7.586)
- J8. Hou, P., **S. Kawashima**, K. Wang, D.Corr, J. Qian and S.P. Shah. Effects of colloidal nanosilica on rheological and mechanical properties of fly ash-cement mortar, *Cement and Concrete Composites*, 35(1): 12-22, 2013. (IF: 7.586)
- J9. Hou, P., **S. Kawashima**, D. Kong, D. Corr, J. Qian and S.P. Shah. Modification effects of colloidal nanoSiO₂ on cement hydration and its gel property, *Composites Part B: Engineering*, 45(1): 440-448, 2013. (IF: 9.078)
- J10. **Kawashima, S.***, M. Chaouche, D. Corr and S.P. Shah. Rate of thixotropic rebuilding of cement pastes modified with highly purified attapulgite clays, *Cement and Concrete Research*, 53(0): 112-118, 2013. (IF: 10.933)
- J11. **Kawashima, S.***, M. Chaouche, D. Corr and S.P. Shah. Influence of purified attapulgite clays on the adhesive properties of cement pastes as measured by the tack test, *Cement and Concrete Composites*, 48(0): 35-41, 2014. (IF: 7.586)
- J12. **Kawashima, S.***, J. Seo, D. Corr, M. Hersam and S.P. Shah. Dispersion of CaCO₃ nanoparticles by sonication and surfactant treatment for application in fly ash-cement systems, *Materials and Structures*, 1-13, 2013. (IF: 3.428)
- J13. Fan, Y., S. Zhang, **S. Kawashima** and S.P. Shah. Influence of kaolinite clay on the chloride diffusion property of cement-based materials, *Cement and Concrete Composites*, 45(0): 117-124, 2014. (IF: 7.586)
- J14. Li, W.G., J.Z. Xiaoz, **S. Kawashima**, G.S. Shekhawat, and S.P. Shah. Experimental investigation on quantitative nanomechanical properties of cement paste, *ACI Materials Journal*, 111: 1-6, 2014. (IF: 1.802)
- J15. Jang, S-H., **S.Kawashima**, and H. Yin. Influence of carbon nanotube clustering on mechanical and electrical properties of cement pastes, *Materials*, 9(4): 220, 2016. (IF: 3.623)
- J16. Li, W., **S. Kawashima**, J. Xiao, D. Corr, C. Shi and S.P. Shah. Comparative investigation on nanomechanical properties of hardened cement paste, *Materials and Structures*, 49(5): 1591-1604, 2016. (IF: 3.428)
- J17. Qian, Y. and **S. Kawashima***. Flow onset of fresh mortars in rheometers: Contributions of paste deflocculation and sand particle migration, *Cement and Concrete Research*, 90: 97-103, 2016. (IF: 10.933)
- J18. Qian, Y. and **S. Kawashima***. Use of creep-recovery protocol to measure static yield stress of fresh cement pastes, *Cement and Concrete Research*, 90: 73-79, 2016. (IF: 10.933)
- J19. Ma, S., T. Yu, M. Chaouche, Y. Wang and **S. Kawashima***. Phase evolution of oil well cement slurries with nanoadditive at elevated temperature and pressure conditions, *ACI Materials Journal*, 113(5), 2016. (IF: 1.802)

- J20. Jang, S.H., D.P. Hochstein, **S. Kawashima**, & H. Yin. Experiments and micromechanical modeling of electrical conductivity of carbon nanotube/cement composites with moisture. *Cement and Concrete Composites*, 77: 49-59, 2017. (IF: 7.586)
- J21. Kim, J-H., S.H. Kwon, **S. Kawashima**, H.J. Yim and M. Choi. Rheology of cement-based materials under pumping pressure, *Cement and Concrete Composites*, 77: 60-67, 2017. (IF: 7.586)
- J22. Ferraris, C.F., P. Billberg, R. Ferron, D. Feys, J. Hu, **S. Kawashima**, E. Koehler, M. Sonebi, J. Tanesi, and N. Tregger. Role of Rheology in Achieving Successful Concrete Performance, *Concrete International*, 39(6): 43-51, 2017. (CiteScore: 2.82)
- J23. Qian, Y. and **S. Kawashima***. Distinguishing dynamic and static yield stress of fresh cement mortars through thixotropy, *Cement and Concrete Composites*, 86: 288-96, 2018. (IF: 7.586)
- J24. Ma, S., Y. Qian, and **S. Kawashima***. Experimental and modeling study on the non-linear structural build-up of fresh cement pastes incorporating viscosity modifying admixtures, *Cement and Concrete Research*, 108: 1-9, 2018. (IF: 10.933)
- J25. Lee, S., S. Kawashima, K. Kim, S-K. Woo, and J-P. Won. Shrinkage characteristics and strength recovery of nanomaterials-cement composites, *Composite Structures*, 2018. (IF: 6.37)
- J26. Lee, S., S. Kawashima, K. Kim, S-K. Woo, and J-P. Won. Interfacial properties of nanosilica-treated structural polymer fibres in cement matrix composites, *Composite Structures*, 2018. (IF: 6.37)
- J27. Ma, S., Y. Qian, and **S. Kawashima**. Performance-based study on the rheological and hardened properties of blended cement mortars incorporating palygorskite clays and carbon nanotubes, *Construction and Building Materials*, 171: 663-671, 2018. (IF: 6.141)
- J28. Guerini, V., A. Conforti, G. Plizzari, and **S. Kawashima**. Influence of steel and macrosynthetic fibers on concrete properties, *Fibers*, 6(3), 47, 2018. (CiteScore: 2.01)
- J29. Marchon, D., **S. Kawashima**, H. Bessaies-Bay, S. Mantellato, and S. Ng. Hydration and rheology control of concrete for digital fabrication: Potential admixtures and cement chemistry, *Cement and Concrete Research*, 112: 96-110, 2018. (IF: 10.933)
- J30. Lim, S., H-S. Lee, and **S. Kawashima**. Pore structure refinement of cement paste incorporating nanosilica: Study with dual beam scanning electron microscopy/focused ion beam (SEM/FIB), *Materials Characterization*, 145: 323-328, 2018. (IF: 4.342)
- J31. Lim, S., and **S. Kawashima***. Mechanisms underlying crystalline waterproofing through microstructural and phase characterization, *ASCE Journal of Materials in Civil Engineering*, 31(9), 2019. (IF: 3.651)
- J32. Ma, S. and **S. Kawashima**. A rheological approach to study the early-age hydration of oil well cement: Effect of temperature, pressure and nanoclay, *Construction and Building Materials*, 215: 119-127, 2019. (IF: 6.141)
- J33. Qian, Y., S. Ma, **S. Kawashima**, and G. DeSchutter. Rheological characterization of the viscoelastic solid-like properties of fresh cement pastes with nanoclay addition, *Theoretical and Applied Fracture Mechanics*, 103: 102262, 2019. (IF: 4.017)

- J34. Lee, S., J.P. Won, and **S. Kawashima***. Flexural strength recovery through self-healing of cement-composites reinforced with nanosilica-coated micro polypropylene fibers, *ACI Materials Journal Special Publication*, 335: 63-82, 2019. (IF: 1.802)
- J35. Roussel, N., H. Bessaies-Bey, **S. Kawashima**, D. Marchon, K. Vasilic, and R. Wolfs. Recent advances on yield stress and elasticity of fresh cement-based materials, *Cement and Concrete Research*, 124: 105798, 2019. (IF: 10.933)
- J36. Ma, S. and **S. Kawashima***. Investigating the working mechanisms of viscosity modifying admixtures through rheological and water transport properties, *ASCE Journal of Civil Engineering Materials*, 32(2): 04019357, 2020. (IF: 3.651)
- J37. Hou, P., **S. Kawashima**, X. Cheng, T. Sui, and T. Muzenda. The role of limestone and calcined clay on the rheological properties of LC3, *Cement and Concrete Composites*, 2020: 103516, 2020. (IF: 7.586)
- J38. Ma, S. and **S. Kawashima***, Role of shear stress at rest on the viscoelastic response of fresh cement pastes, *Journal of Rheology*, 64(2): 433-444, 2020. (IF: 4.408)
- J39. Ma, S., A. Akca, D. Esposito, and **S. Kawashima***. Influence of aqueous carbonate species on hydration and carbonation of reactive MgO cement, *Journal of CO2 Utilization*, 41: 101260, 2020. (IF: 7.132)
- J40. Hou, P., X. Wang, P. Zhao, K. Wang, **S. Kawashima**, Q. Li, N. Xie, X. Cheng, and S. Shah. Physicochemical effects of nanosilica on C3A/C3S hydration, *Journal of the American Ceramic Society*, 103(11): 6505-6518, 2020. (IF: 3.784)
- J41. Tian, Y., A. Bourtsalas, **S. Kawashima**, S. Ma, and N. Themelis. Performance of structural concrete using waste-to-energy (W-T-E-) combined ash, *Waste Management*, 118: 180-189, 2020. (IF: 7.145)
- J42. Hou, P., T. Muzenda, Q. Li, H. Chen, **S. Kawashima**, T. Sui, H. Yong, N. Xie, and X. Cheng. Mechanisms dominating thixotropy in limestone calcined clay cement (LC3), *Cement and Concrete Research*, 140:106316, 2021. (IF: 10.933)
- J43. Rim, G., N. Roy, D. Zhao, **S. Kawashima**, P.E. Stallworth, S.G. Greenbaum and A.H.A Park. CO2 Utilization in Built Environment via the PCO2 Swing Carbonation of Alkaline Solid Wastes with Different Mineralogy, *Faraday Discussions*, 2021. (IF: 4.008)
- J44. **Kawashima, S.***, Wang, K., Ferron, R. D., Kim, J. H., Tregger, N., & Shah, S. A review of the effect of nanoclays on the fresh and hardened properties of cement-based materials. *Cement and Concrete Research*, 147: 106502, 2021. (IF: 10.933)
- J45. Douba, A. and **S. Kawashima***. Use of Nanoclays and Methylcellulose to Tailor Rheology for Three-Dimensional Concrete Printing. *ACI Materials Journal*, 118(6): 275-289, 2021. (IF: 1.252)
- J46. Douba, A., Ma, S., & **S. Kawashima**. Rheology of fresh cement pastes modified with nanoclay-coated cements. *Cement and Concrete Composites*, 125, 104301, 2022. (IF: 10.5)
- J47. Tian, Y., A. T. Bourtsalas, **S. Kawashima**, X. Teng, and N. J. Themelis. Performance of Waste-to-Energy fine combined ash/filter cake ash-metakaolin based artificial aggregate. *Construction and Building Materials*, 327: 127011, 2022. (IF: 6.141)

- J48. Akca, A. H., S. Ma, D. Esposito, & **S. Kawashima**. Evaluation of Mechanical Performance of Compacted Magnesium Hydroxide after Carbonation Curing. *ASCE Journal of Materials in Civil Engineering*, 34(5): 04022056, 2022. (IF: 3.651)
- J49. Douba, A., P. Badjatya, and **S. Kawashima**. Enhancing carbonation and strength of MgO cement through 3D printing. *Construction and Building Materials*, 328, 126867, 2022. (IF: 6.141)
- J50. Shi, J., J. Zhao, H. Chen, P. Hou, **S. Kawashima**, J. Qin, X. Zhou, J. Qian, and X. Cheng. Sulfuric acid-resistance performances of magnesium phosphate cements: Macro-properties, mineralogy and microstructure evolutions. *Cement and Concrete Research*, 157, 106830, 2022. (IF: 10.933)
- J51. Taheri, H., M. Mastali, M. Falah, Z. Abdollahnejad, B. Ghiassi, A. Perrot, and **S. Kawashima**. Microfibrillated cellulose as a new approach to develop lightweight cementitious composites: Rheological, Mechanical, and microstructure perspectives. *Construction and Building Materials*, 342, 128008, 2022. (IF: 6.141)
- J52. Tian, Y., N.J. Themelis, A.T. Bourtsalas, **S. Kawashima**, and Y. Gorokhovich, Y. Systematic study of the formation and chemical/mineral composition of waste-to-energy (WTE) fly ash. *Materials Chemistry and Physics*, 126849, 2022. (IF: 4.094)
- J53. Badjatya, P., A.H. Akca, D.V. Fraga Alvarez, B. Chang, S. Ma, X. Pang, E. Wang, Q. Van Hinsberg, D.V. Esposito, and **S. Kawashima***. Carbon-negative cement manufacturing from seawater-derived magnesium feedstocks. *Proceedings of the National Academy of Sciences*, 119(34), e2114680119, 2022. (IF: 12.78)
- J54. Sun, F. X. Pang, **S. Kawashima**, G. Cheng, S. Guo, & Y. Bu. Effect of tartaric acid on the hydration of oil well cement at elevated temperatures between 60° C and 89° C. *Cement and Concrete Research*, 161, 106952, 2022.
- J55. Tian, Y., N.J. Themelis, D. Zhao, A.T. Bourtsalas, and **S. Kawashima**. Stabilization of Waste-to-Energy (WTE) fly ash for disposal in landfills or use as cement substitute. *Waste Management*, 150, 227-243, 2022. (IF: 7.145)
- J56. Douba, A., P. Hou, & **S. Kawashima**. Hydration and mechanical properties of high content nano-coated cements with nano-silica, clay and calcium carbonate. *Cement and Concrete Research*, 168, 107132, 2023. (IF: 10.933)
- J57. Yahia, A., A. Perrot, D. Feys, K.H. Khayat, M. Sonebi, **S. Kawashima**, & W. Schmidt. Viscoelastic properties of fresh cement paste: measuring procedures and influencing parameters. *RILEM Technical Letters*, 8, 23-30, 2023.
- J58. Zhao, D., J.M. Williams, A.H.A. Park, & **S. Kawashima**. Rheology of cement pastes with calcium carbonate polymorphs. *Cement and Concrete Research*, 172, 107214, 2023. (IF: 10.933)
- J59. Zhao, D., J.M. Williams, Z. Li, A.H.A. Park, A. Radlińska, P. Hou, & **S. Kawashima**. Hydration of cement pastes with calcium carbonate polymorphs. *Cement and Concrete Research*, 173, 107270, 2023. (IF: 10.933)

- J60. Tian, Y., A.T. Bourtsalas, **S. Kawashima**, & N.J. Themelis. Using Waste-to-Energy Fine-Combined Ash as Sand or Cement Substitute in Cement Mortar. *Journal of Materials in Civil Engineering*, 35(11), 04023378, 2023. (IF: 10.933)
- J61. Williams, J.M., D. Zhao, N. Zhang, A. Chin, **S. Kawashima**, & A.J. Moment. Directed synthesis of aragonite through semi-continuous seeded crystallization methods for CO₂ utilization. *CrystEngComm*, 25(43), 6050-6066, 2023. (IF: 3.1)
- J62. Williams, J.M., D. Zhao, S. Moon, **S. Kawashima**, A.H.A. Park, & A.J. Moment. Stabilization of pure vaterite during carbon mineralization: defining critical activities, additive concentrations, and gas flow conditions for carbon utilization. *Crystal Growth & Design*, 23(11), 8103-8115, 2023. (IF: 3.8)
- J63. Henschen, J. D. Blood, **S. Kawashima**, & H. Kirkvold. Teaching Additive Manufacturing with Consideration for Cementitious Materials. *ACI Materials Journal Special Publication*, 359, 54-68, 2023. (IF: 1.252)
- J64. Bernard, E., H. Nguyen, **S. Kawashima**, B. Lothenbach, H. Manzano, J. Provis, A. Scott, C. Unluer, F. Winnefeld, P. Kinnunen. MgO-based cements—Current status and opportunities. *RILEM Technical Letters*, 8, 65-78, 2023.
- J65. Williams, J.M., D. Zhao, N. Zhang, A. Zheng, S.G. Greenbaum, **S. Kawashima**, & A.J. Moment. Calcium carbonate and reactive silica recovery from waste cement: The influence of processing parameters on upcycled material properties and carbon intensity. *Chemical Engineering Journal*, 482, 149013, 2024. (IF: 16.7)
- J66. Maierdan, Y., S.J. Armistead, R.A. Mikofsky, Q. Huang, L. Ben-Alon, W.V. Srubar III, & **S. Kawashima***. Rheology and 3D printing of alginate bio-stabilized earth concrete. *Cement and Concrete Research*, 175, 107380, 2024. (IF: 10.933)
- J67. Zhao, D., J.M. Williams, P. Hou, A.J. Moment, & **S. Kawashima**. Stabilizing mechanisms of metastable vaterite in cement systems. *Cement and Concrete Research*, 178, 107441, 2024. (IF: 10.933)
- J68. Maierdan, Y., D. Zhao, P.H. Chokshi, M. Garmonina, & **S. Kawashima***. Rheology, 3D printing, and particle interactions of xanthan gum-clay binder for earth concrete. *Cement and Concrete Research*, 182, 107551, 2024. (IF: 10.933)
- J69. Taheri, H., N.A. Heidari, A. Perrot, G. Siqueira, G. Nyström, & **S. Kawashima**. Selection of suitable cellulose nanofibers derived from eco-friendly sources for the production of lightweight cementitious composites with tuned rheological, mechanical, and microstructure properties. *Cement and Concrete Composites*, 151, 105586, 2024. (IF: 10.5)
- J70. Badjatya, P. & **S. Kawashima***. Critical strain measurements of hydrating Portland cement pastes: A new understanding of microstructure development. *Cement and Concrete Research*, 180, 107489, 2024. (IF: 10.933)
- J71. Carcassi, O.B., Y. Maierdan, T. Akemah, **S. Kawashima**, & L. Ben-Alon. Maximizing fiber content in 3D-printed earth materials: Printability, mechanical, thermal and environmental assessments. *Construction and Building Materials*, 425, 135891, 2024. (IF: 6.141)

J72. Williams, J., D. Zhao, N. Zhang, **S. Kawashima**, & A. Moment. Carboxylic ligands to enhance material recovery from construction waste to produce CaCO₃ for carbon utilization. *Industrial Chemistry & Materials*, 2024. (IF: N/A)

J73. Park, A.H.A., J.M. Williams, J. Friedmann, D. Hanson, **S. Kawashima**, V. Sick, M.R. Taha & J. Wilcox. Challenges and opportunities for the built environment in a carbon-constrained world for the next 100 years and beyond. *Frontiers in Energy Research*, 12, p.1388516, 2024. (IF: 2.6)

J74. Mikofsky, R.A., S.J. Armistead, Y. Maierdan, **S. Kawashima**, & W.V. Srubar III. Physicochemical Interactions of Clays and Polysaccharides for High-Performance Biopolymer-Stabilized Earthen Materials. *ACS Sustainable Chemistry & Engineering*, 2025. (IF: 8.0)

J75. Jacquet, Y., **S. Kawashima**, & J. Spangenberg. Unveiling the structural build-up 3D printable cement-based materials: From small amplitude oscillatory shear (SAOS) to extensional (SAOE) rheological workflows. *Cement and Concrete Research*, 197, 107971, 2025. (IF: 10.933)

J76. Maierdan, Y., S.J. Armistead, A.N. Seshadri, O.B. Carcassi, R.A. Mikofsky, L. Ben-Alon, W.V. Srubar III, K.A. Erk, & **S. Kawashima***. Locust Bean Gum–Stabilized Kaolin-Rich Earthen Composites: from On-Land to Underwater 3D Printing. *Composites Part B: Engineering*, 113092, 2025. (IF: 14.2)

J77. Maierdan, Y., I-K. Kang, J-H. Kim, & **S. Kawashima***. Tuning Clay Self-Assembly for 3D Printing of Bio-Stabilized Earthen Materials. *Matter*, 2025. (IF: 17.5)

Published Proceedings of Refereed Conferences:

C1. Shah, S.P., J.H. Kim and **S. Kawashima**. Science and engineering for self-consolidating concrete. International RILEM Conference on Advances in Construction Materials through Science and Engineering, Hong Kong, China, September 5-7, 2011.

C2. Shah, S.P., **S. Kawashima***, P. Hou and D. Corr. Application of nanoparticles. 3rd International Symposium on Ultra-High Performance Concrete and Nanotechnology for High Performance Construction Materials, Kassel, Germany, Mar 7-9, 2012.

C3. **Kawashima, S.***, M. Chaouche, D. Corr, and S.P. Shah. Adhesive properties of nanoclay-modified cementitious materials. 5th North American Conference on the Design and Use of Self-Consolidating Concrete, Chicago, IL, May 12-15, 2013.

C4. **Kawashima, S.***, M. Chaouche, D. Corr, and S.P. Shah. Rate of rebuilding of cementitious materials with nanoclays. 5th North American Conference on the Design and Use of Self-Consolidating Concrete, Chicago, IL, May 12-15, 2013.

C5. Qian, Y., M. Abdallah, and **S. Kawashima***. Characterization of Cement-Based Materials Modified with Graphene-Oxide. Fifth International Symposium on Nanotechnology in Construction, Chicago, IL, May 24-26, 2015.

C6. Ma, S. and **S. Kawashima***. A study on the rheological behavior of cements modified with attapulgite clays under elevated temperature and pressure conditions. Fifth International Symposium on Nanotechnology in Construction, Chicago, IL, May 24-26, 2015

- C7. Ma, S. and **S. Kawashima***. Microstructural evolution of oil well cement with nanoadditive at elevated temperatures and pressures. 14th International Congress on the Chemistry of Cement, Beijing, China, Oct 13-16, 2015.
- C8. Qian, Y. and **S. Kawashima***. Investigating shear-induced particle migration in fresh cement mortars. RILEM International Symposium on Self-Compacting Concrete (SCC), Washington, D.C. USA, May 15-18, 2016.
- C9. Qian, Y. and **S. Kawashima***. Use of thixotropy model to capture competition between paste deflocculation and sand particle migration. RILEM Materials, Systems and Structures in Civil Engineering, Lyngby, Denmark, August 21-24, 2016.
- C10. Ma, S. and **S. Kawashima***. Rheological and water transport properties of cement pastes modified with viscosity modifying admixtures for 3D concrete printing. Proceedings of RILEM International Conference on Concrete and Digital Fabrication, Zurich, Switzerland, Sept 10 – 12, 2018.
- C11. Guerini, V., A. Conforti, G. Plizzari, and **S. Kawashima**. Methods of evaluation workability for concretes reinforced by different fiber types. Proceedings of RILEM International Conference on Sustainable Materials, Systems and Structures, Rovinj, Croatia, Mar 20 – 22, 2019.
- C12. Douba, A., C. Chan, S. Berrios, and **S. Kawashima***. Synthesis of Hybridized Rheological Modifiers for 3D Concrete Printing. *Proceedings of Digital Concrete 2020 – 2nd RILEM International Conference on Concrete and Digital Fabrication, Eindhoven, Netherlands, July 6 – 8, 2020.*
- C13. Douba, A., P. Badjatya, and **S. Kawashima**. Influence of Infill Pattern on Reactive MgO Printed Structures. *Proceedings of Digital Concrete 2022 – 3rd RILEM International Conference on Concrete and Digital Fabrication, Loughborough, UK, June 26 – 29, 2022.*
- C14. Carcassi, O. M. Zowqi, Y. Maierdan, **S. Kawashima**, and L. Ben-Alon. 3D-printed light straw clay: optimizing printing paths. *Proceedings of International Conference on Non-Conventional Materials and Technology (NOCMAT 2023), João Pessoa, Brazil, Nov 6 – 8, 2023.*
- C15. Shin, E.J., O. Carcassi, Y. Maierdan, **S. Kawashima**, and L. Ben-Alon. Developing 3D-printed Natural Fiber-Rich Earth Materials in Construction. *Proceedings of RILEM International Conference on Earthen Construction (ICEC2024), Edinburgh, UK, July 8 – 19, 2024.*
- C16. Maierdan, Y., S.J. Armistead, R.A. Mikofsky, O. Carcassi, L. Ben-Alon, W.V. Srubar III, & **S. Kawashima**. Exploring Locust Bean Gum as a Robust Binder and Rheology Modifier for Earth Concrete. *Proceedings of Digital Concrete 2024 – 4th RILEM International Conference on Concrete and Digital Fabrication, Munich, Germany, Sept 4 – 6, 2024.*
- C17. Jacquet, Y., Y. Maierdan, **S. Kawashima**, & A. Perrot. Stability prediction of 3D printable fresh construction materials by analyzing thixotropic compressive properties using extensional Dynamic Mechanical Analysis. *Proceedings of Digital Concrete 2024 – 4th RILEM International Conference on Concrete and Digital Fabrication, Munich, Germany, Sept 4 – 6, 2024.*

Memoranda and Reports (from committee work):

- Reported by American Concrete Institute Committees 236 and 241 “ACI 241R-17 Report on Application of Nanotechnology and Nanomaterials in Concrete”
- Reported by American Concrete Institute Committee 238 “ACI 238.1R08 State of the Art Report on Workability of Fresh Concrete”

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- Reported by American Concrete Institute Committee 241 TG1 “State of the Art Report on Dispersion of Nanoparticles in Concrete” (*In Progress*)
- Reported by RILEM Technical Committee Processing of Earth-based materials (PEM), “State of the Art Report” (*In Progress*)
- Reported by RILEM Technical Committee Performance Requirements and Testing of Fresh Printable Cement-based Materials (PFC), “Interlaboratory Study on Quality Control Testing of Fresh Printable Cement-based Materials” (*In Progress*)
- Reported by American Concrete Institute Committees 236 “ACI 236 TG1 Report on Analytical Techniques” (*In Progress*)

Major New Products, Processes, Designs, or Systems:

(Students or postdocs supervised underlined)

Full Application for Patent submitted:

- S. Kawashima, D.V. Esposito, S. Ma, A.H. Akca, “METHODS AND SYSTEMS FOR PROVIDING IMPROVED CEMENT INCORPORATING METAL OXIDES AND HYDROXIDES”. (US. Patent Publication No. [20210188711](#)).
- D.V. Esposito, X. Pang, S. Kawashima, “Systems and Methods for Membrane-Free Electrolysis”. (Patent application: [PCT/US2020024699](#), [WO2020198350A1](#)). Read more about this technology on this [CTV tech brief](#).
- S. Kawashima, D. Zhao, A-P. Park, J. Williams. “Aragonite as a rheology modifier for building materials”. (Patent application: PCT/US2024/032143, [WO2024249956](#)). Read more about this technology on this [CTV tech brief](#).

Entrepreneurship:

- Carbon Infuse (Incorporated 2024), Co-Founder with Diandian Zhao (Co-Founder and CEO)

Invited Lectures:

1. Apr 24, 2015, “Enhancing the fresh and hardened properties of concrete through the use of nanomaterials,” Penn State University, University Park, PA.
2. Feb 24, 2015, “Characterizing thixotropy of cement-based systems,” Levich Institute of Physico-Chemical Hydrodynamics, City College of CUNY, New York, NY.
3. Mar 3, 2015, “Characterizing thixotropy of cement-based systems,” University of Southern California, Los Angeles, CA.
4. Feb 11, 2015, “Characterizing thixotropy of cement-based systems,” University of Houston, Houston, TX.

5. Apr 8, 2016, “Characterizing thixotropy of cement-based systems modified with clays,” Georgia Tech, Atlanta, GA.
6. Sept 22, 2016. “Characterizing thixotropy of fresh cement-based systems,” Korea Electric Power Research Institute’s International Workshop on Structural Life Management of Eco-Power Structures, Daejeon, South Korea.
7. Sept 26, 2016, “Characterizing thixotropy of fresh cement-based systems modified with clays,” Ulsan National Institute of Science and Technology,” Ulsan, South Korea.
8. Nov 1, 2016, “Characterizing thixotropy of fresh cement-based systems,” University of Michigan – Ann Arbor, Ann Arbor, MI.
9. Nov 2, 2016, “Characterizing thixotropy of fresh cement-based systems,” Purdue University, West Lafayette, IN.
10. Mar 9, 2017, “Characterizing thixotropy of fresh cement-based systems modified with clays,” California Institute of Technology, Pasadena, CA.
11. May 3, 2017, “Tailoring the rheological properties of cement-based systems for 3D concrete printing,” University of Illinois at Urbana-Champaign, Champaign, IL.
12. Oct 25, 2017, “Tailoring the rheological properties of cement-based systems for 3D concrete printing,” Northwestern University, Center for Sustainable Engineering of Geological and Infrastructure Materials (SEGIM), Evanston, IL.
13. Apr 5, 2018, “Utilizing admixtures to tailor the rheology of cement-based systems for extrusion-based 3D concrete printing,” Purdue University, School of Civil Engineering, West Lafayette, IN.
14. Nov 19, 2018, “Utilizing admixtures to tailor the rheology of cement-based systems for extrusion-based 3D concrete printing,” New Jersey Institute of Technology, Newark, NJ.
15. Apr 2, 2019, “Utilizing admixtures to tailor the rheology of cement-based systems for extrusion-based 3D concrete printing,” Stevens Institute of Technology, Hoboken, NJ.
16. Aug 20, 2019, “Tailoring structural build-up behavior of fresh cements with organic and inorganic admixtures for 3D concrete printing applications,” University of Jinan, Jinan, Shandong Province, China
17. Nov 15, 2019, “Characterizing and tailoring structural build-up of fresh cements with hybrid admixture systems for 3D concrete printing,” University of Massachusetts at Amherst, Amherst, MA.
18. July 21, 2020, “Cement rheology and processing: future of concrete casting,” 1st Virtual ESIS Summer School – VESS1, Virtual.
19. Sept 29, 2020, “Role of cement rheology in facilitating casting of cement-based materials,” China University of Petroleum (East China), Virtual.
20. Sept 24, 2022, “Understanding the role of admixtures on the structural build-up of fresh cement pastes,” Construction Chemistry Division of the German Chemical Society (GDCH) 4th International Conference on Chemistry of Construction Materials (ICCCM), Sept 26 – 28, 2022, Karlsruhe, Germany. **(Keynote)**
21. Oct 20, 2022, “Leveraging rheology to support future infrastructure,” Society of Rheology (SoR) 93rd Annual Meeting, Session on “Rheology of soil, mud and construction materials,” Oct 9 – 13, 2022, Chicago, Illinois. **(Keynote)**

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22. Nov 14, 2022, “Controlling the structural build-up of fresh cement pastes through the use of admixtures,” Missouri Science and Technology Center for Infrastructure Engineering Studies, Virtual.
23. Feb 10, 2023, “Controlling the structural build-up of fresh cement pastes through the use of admixtures,” University of Miami, Virtual.
24. Feb 23, 2023, “Reducing the embodied carbon of concrete by utilizing binders derived from alternative feedstocks,” Penn State University, Virtual.
25. Mar 21, 2023, “Reducing the embodied carbon of concrete by utilizing binders derived from alternative feedstocks,” Cornell University, Ithaca, NY.
26. Nov 9, 2023, “Rheology of cement pastes with microparticles derived from CO₂ mineralization,” Universidad de Castilla-La Mancha, Virtual.
27. Dec 6, 2023, “Impression 3D de reactive MgO pâte de ciment,” Les challenges environnementaux et scientifiques de l'impression 3D des matériaux de construction, CY L2MGC, Virtual.
28. Jan 11, 2024, “3D printed buildings,” École Polytechnique Executive Master Program, Columbia + Columbia Engineering Executive Education, New York, NY.
29. Feb 28, 2024, “Leveraging Carbonate Polymorphs Derived From Waste and CO₂ Utilization to Tailor Early-Age Concrete Properties,” Gordon Research Conference (GRC) Advanced Materials for Sustainable Infrastructure Development, Ventura Beach, CA.
30. Jun 19, 2024, “Cement Rheology And Processing – why give a CRAP,” American Ceramics Society (ACerS) Annual 14th Advances in Cement-Based Materials Meeting, Jun 19 – 21, 2024, Rolla, Missouri. **(Keynote)**
31. Aug 27, 2024, “Impact of calcium carbonate polymorphs derived from CO₂ mineralization schemes on cement-based materials,” 78th RILEM Annual Week & RILEM Conference on Sustainable Materials & Structures, Aug 25 – 30, 2024, Toulouse, France. **(Keynote)**
32. Oct 26, 2024, “Impact of fillers and SCMs derived from CO₂ mineralization schemes on cement-based materials,” RILEM 1st International Conference on CO₂ mineralization in Construction Materials and Products, Oct 24 – 26, 2024, Changsha, China.
33. Oct 28, 2024, “Impact of fillers and SCMs derived from CO₂ mineralization schemes on cement-based materials,” University of Jinan, Jinan, China.
34. Feb 11, 2025, “Impact of fillers and SCMs derived from CO₂ mineralization schemes on cement-based materials,” Duke University, Durham, NC, USA.
35. Nov 5, 2025, “Impact of fillers and SCMs derived from CO₂ mineralization schemes on cement-based materials,” Workshop on the Sustainability of Concrete, Nov 5 – 6, 2025, University of São Paulo, Brazil.
36. Feb 10-12, 2026, “*Emerging production methods for Mg-based cements*,” 1st International Conference on: Mg-based cements, Feb 10 – 12, 2026, Mürten, Switzerland. **(Keynote)**

Service:

Activity	<u>Department</u>	
	Beginning	Ending
Committee member, CEEM Faculty Search committee	2014	2015
Committee member, CEEM Undergraduate committee	2013	2025

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Committee member, CEEM Faculty Search	2023	2024
Academic Advisor, CEEM 3-2 Combined Plan B.S. Students	2013	Present
Academic Advisor, CEEM MS Students	2013	Present
Committee member, CEEM Communications committee	2020	Present
Committee member, CEEM Admissions committee	2023	Present
Committee member, CEEM DEI committee	2023	Present

<i>Activity</i>	<u><i>School</i></u>	<i>Beginning</i>	<i>Ending</i>
Faculty Representative, SEAS 150 th Anniversary Committee		2013	2014
Department Representative, Committee on Instruction		2016	2020
Instructor/mentor, Egleston Scholar Seminar		2022, 2023	
CEEM Department Speaker, Art of Engineering		2020	Present
Faculty Representative, SEAS Women Faculty Development		2024	Present
Faculty evaluator, Egleston Scholar Admissions		2025, 2026	
CEEM Department Project Lead, Art of Engineering		2026	
Committee member, SEAS Materials Cluster Faculty Search		2026	

<i>Activity</i>	<u><i>University</i></u>	<i>Beginning</i>	<i>Ending</i>
Panelist, Provost's Office for Faculty Achievement Panel, "Navigating the Path to Tenure"		2023	
Reviewer, Provost's Grants Program for Junior Faculty who Contribute to the Diversity Goals of the University Review committee		2023, 2024	

Professional Services:

Associate Editor (AE) / Editorial Board Member (EBM) for Refereed Journals:

- American Society of Civil Engineering (ASCE) Journal of Materials in Civil Engineering (AE, 2017 – 2022)
- ASTM International Advances in Civil Engineering Materials (AE, 2019 – current)
- Cement and Concrete Research (EBM, 2020 – current)
- RILEM Technical Letters (AE, 2020 – current)
- ACI Materials Journal (EBM, 2023 – current; Editor-in-Chief, Apr 2024 – current)

Guest Editor for Special Issue:

- Special Issue of American Concrete Institute (ACI) Materials Journal, *Advances in Rheology and Additive Manufacturing of Concrete* (Co-Guest Editor, Nov 2021 Issue)
- Special Issue of Journal of American Ceramics Society (ACerS), *Emerging Cement Chemistry* (Co-Guest Editor, Planned Dec 2026)

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- Special Issue of Materials & Structures, *C3 Symposium - Special Issue to Commemorate Surendra P. Shah's 90th Birthday* (Co-Guest Editor, planned Dec 2026)

Guest Reviewer for Refereed Journals:

- Cement and Concrete Composites
- ASCE Journal of Materials in Civil Engineering
- ASCE Journal of Engineering Mechanics
- Materials and Structures
- Applied Rheology
- Construction and Building Materials
- Journal of CO₂ Utilization
- Journal of Rheology
- Scientific Reports – Nature Journal
- Soft Matter
- Advanced Functional Materials
- Proceedings of the National Academy of Sciences (PNAS)
- Chemical Engineering Journal

Professional Organization Committee Member:

- RILEM PEM: Processing of earth-based materials
- RILEM MBC: Magnesia-based binders in concrete
- ACI Committee 236 Material Science of Concrete, *Secretary (2021 – 2025); Chair (2025 – Present)*
- ACI Committee 238 Workability of Fresh Concrete
- ACI Committee 238-A Student Workability Competition
- ACI Committee 241 Nanotechnology of Concrete
 - 241 Task Group on Nanoparticle Dispersion (TG1), *Secretary (2021 – Present)*
- ACI Committee 564 3-D Printing with Cementitious Materials
- American Ceramic Society (ACerS), Cements Division
 - *Executive Board member* (2018 – 2022)
 - *Chair* (2020 – 2022)

Conference Committee Member / Organizer:

- Program Committee Member, 'Fifth International Symposium on Nanotechnology in Construction (NICOM5),' Chicago, IL USA, May 24 – 26, 2015
- Scientific Committee Member, 'RILEM International Symposium on Self-Compacting Concrete (SCC),' Washington, D.C. USA, May 15 – 18, 2016
- Scientific Committee Member, 'RILEM 2nd International Conference on Rheology and Processing of Construction Materials,' Dresden, Germany, Sept 8 – 11, 2019
- Scientific Committee Member, '5th International Symposium on Ultra-High Performance Concrete and High Performance Construction Materials,' Kassel, Germany, Mar 11 – 13, 2020

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- Scientific Committee Member, 'Digital Concrete 2020 – 2nd RILEM International Conference on Concrete and Digital Fabrication,' Eindhoven, Netherlands, July 6 – 8, 2020
- Conference co-chair, ASCE Engineering Mechanics Institute Conference, Virtual, May 25 – 28, 2021
- Conference Co-chair, Technical Organizer, 'American Ceramics Society Annual 11th Advances in Cement-Based Materials Meeting,' Virtual, June 23 – 25, 2021
- Conference Co -chair, Technical Organizer, 'American Ceramics Society Annual 12th Advances in Cement-Based Materials Meeting,' UC Irvine, July 11 – 13, 2022
- Scientific Committee Member, 'Construction Chemistry Division of the German Chemical Society (GDCH) 4th International Conference on Chemistry of Construction Materials (ICCCM),' Karlsruhe, Germany, Sept 26 – 28, 2022.
- Conference Co-chair, Local and Technical Organizer, 'American Ceramics Society Annual 13th Advances in Cement-Based Materials Meeting,' Columbia University, June 14 – 16, 2023.
- Scientific Committee Member, '16th International Congress on the Chemistry of Cement (ICCC2023),' Bangkok, Thailand, Sept 18 – 22, 2023.
- Organizing Committee, 'Carbon Conscious Concrete symposium (C3 2025), Professor Shah's 90 year legacy,' Chicago, IL, Oct 23 – 25, 2025.
- International Steering Committee, '1st International Conference on Mg-based Cements (MgO2026),' Mürten, Switzerland, Feb 10 – 12, 2026.

Technical sessions organized:

- "Nanoparticle Dispersion and Applications in Concrete (TC 241/236)," ACI Spring 2019 Convention, Quebec City, Canada, Mar 24 – 28, 2019.
- "Issues and Potential Solutions for Achieving Uniform Dispersion of Nanoparticles in Cementitious Composites and Concrete for the Laboratory and Field," ACI Fall 2020 Convention, Raleigh, NC, Oct 25 – 29, 2020.
- "Adjusting Workability of Successful 3D Concrete Printing – 3-part session (TC 238/564)," ACI Spring 2021 Convention, Baltimore, MD (Virtual), Mar 27 – Apr 1, 2021.
- "100 Year Anniversary of the Slump Cone (TC 238/564)," ACI Fall 2022 Convention, Dallas, TX, Oct 23 – 27, 2022.
- "Real-World Rheology and Sustainability, 6-part session," 95th Annual Society of Rheology Meeting, Austin, TX, Oct 13 – 17, 2024.
- "Materials Science Aspects of Utilizing Recycled Materials in Concrete (TC 236)," ACI Spring 2025 Convention, Toronto, CA, Mar 30 – Apr 3, 2025.

Workshop Invited Participant/Organizer:

- Co-organizer, 3D Concrete Printing PhD/Postdoc Workshop, NSF ACCELNET, University of Texas at Austin, Austin, TX, Jun 27 – 29, 2023.
- Co-organizer, Radicalizing Low-Carbon 3D-Printed Houses Made of Earth: Research Workshop and Hackathon, Columbia University, New York, NY, Jan 8 – 12, 2023.
- Panelist, 2024 Climate Business & Investment Conference, Climate Tech for Net Zero, Columbia Business School, Apr 19, 2024.

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- Participant, Climate Knowledge Initiative Cement Workshop, Columbia Business School, New York, NY, Jun 28, 2024.
- Participant / Presenter, Workshop on the Sustainability of Concrete, University of São Paulo, Brazil, Nov 5 – 6, 2025.
- Participant, NSF US–Saudi Arabia Workshop on Advanced Cementitious Materials for Transformative and Resilient Infrastructure, King Saud University, Riyadh, Saudi Arabia, Apr 12 – 13, 2026.

Reviewer or Panelist for Grant Applications:

- National Science Foundation, Pxxxxxx CMMI Cementitious Materials Panel
- National Science Foundation, Pxxxxxx SBIR/STTR Phase I,II: Infrastructure
- National Science Foundation, Pxxxxxx CMMI LEAP-HI
- National Science Foundation, CMMI MRI
- National Science Foundation, Pxxxxxx CMMI CAREER
- Swiss National Science Foundation, SNSF Advanced Grants (Ad Hoc)

Teaching Experience:

Term	Subject Number	Title	Role
2013y, 2014y, 2015y, 2016y, 2017y, 2018y, 2019y, 2020y, 2022y, 2024y, 2025y	ENME E3114	Experimental Mechanics of Materials	Lecturer
2023x, 2024x, 2025x	CIEN E4995	Topics in Civil Engineering – Material Science of Concrete	Lecturer
2013x, 2014x, 2015x, 2016x, 2017x, 2018x, 2019x, 2020x, 2022y, 2023y	CIEN E4201	Elastic and Plastic Structural Analysis	Lecturer
2020 Summer, 2020 Fall	N/A	Introduction to Civil Engineering Materials (short course via CVN)	Lecturer
2022x, 2023x	ENGIE1002	Egleston Scholar Seminar	Lecturer

Theses Supervised:

Summary

Total

Completed

In Progress

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B.S.	0	0	0
M.S.	2	2	0
As Supervisor	2	2	0
<u>Doctoral</u>			
As Supervisor:	8	4	4
As Reader:	20	20	0

B.S. Senior Design Project

1. Donald Swen, APAM, *Creating Carbon Free Cement: Using Rheology to Find the Role of Calcium in Fly Ash and Slag Systems*, Sept 2018 – May 2019
2. Nicholas Julian Vallin, APAM, *Waste-to-Energy Ash-Based Lightweight Geopolymer Aggregate*, Oct 2019 – May 2020
3. Jaime Madridejos Varela, APAM, *Influence of nanoCaCO₃ as nucleation seeds to promote hydration and carbonation of MgO cements*, Sept 2020 – May 2021
4. Liam Hayes, APAM, *Influence of Recycled Silicates on the Hydration of Cement Paste*, Sept 2022 – May 2023
5. Sherry Tao, Joshua Wang, Eva Qu, EEE, *Oyster Shell Powder – A Natural Substitute for Limestone Filler to Produce Sustainable Cement*, Jan – May 2026

M.S. Theses

1. Veronica Guerini, University of Brescia, Italy, *Workability and Mechanical Properties of Cementitious Materials Reinforced by Different Fiber Types*, Mar 2017
2. Yixi Tian, EAEE, *Production of Structural Concrete from Waste-to-Energy Bottom Ash*, Aug 2018

Doctoral Theses, Supervisor

1. Ye Qian, CEEM, *Characterization of Structural Rebuilding and Shear migration in Cementitious Materials in Consideration of Thixotropy*, Oct 2016 (Current position: Assistant Professor, University of Hong Kong)
2. Siwei Ma, CEEM, *Physical, Chemical, and Mechanical Properties of Cementitious Materials with Rheological Modifiers*, Jun 2018 (Current position: Data Scientist, Galileo Financial Technologies)
3. Yixi Tian, EAEE, *Physical and Chemical Transformation of Waste-to-Energy Residues to Materials for Civil Engineering Applications*, Dec 2021 (Co-advised with Athanasios Bourtsalas and Nickolas J. Themelis) (Current position: Postdoctoral Researcher, MIT)
4. AlaEddin Douba, CEEM, *Admixtures to Tailor the Viscoelastic Properties of 3D Printing Cements*, Jun 2022 (Current position: Staff Engineer, American Concrete Institute)
5. Palash Badjatya, CEEM, *Time-evolution of viscoelastic properties of portland cement paste: Effects of water-to-cement ratio and rigid microfibers, and modeling*, Aug 2024 (Current position: Saint Gobain)

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6. Diandian Zhao, CEEM, *Integration of solid waste upcycling and carbon sequestration in concrete*, Sept 2024 (Current position: Activate Fellow; CEO of Carbon Infuse)
7. Yierfan Maierdan, CEEM, *Facilitating Earthen Construction through Bio-Based Materials and Additive Manufacturing Technologies*, June 2026 (Current position: Postdoctoral Researcher, CEEM)
8. Shengwei Dai, CEEM, *Engineering Carbonation-Cured MgO Binder Systems: Drying Control, Additives, and CO₂ Injection*, In Progress (Expected June 2027)

Doctoral Theses, As Reader (On Thesis Committee):

1. Brett Alexander Benowitz, CEEM, *Modeling and Simulation of Random Processes and Fields in Civil Engineering and Engineering Mechanics*, Columbia University, 2013
2. Jianqiang Wei, CEEM, *Durability of Cement Composites Reinforced with Sisal Fiber*, Columbia University, 2014
3. Sung-Hwan Jang, CEEM, *Characterization and Modeling of Ferromagnetic Particulate Nanocomposites for Strain Sensing*, Columbia University, 2015
4. Madeleine Lopeman, CEEM, *Extreme Storm Surge Hazard Estimation and Windstorm Vulnerability Assessment for Quantitative Risk Analysis*, Columbia University, 2015
5. Matthew Sloane, CEEM, *Fire Effects on Suspension Bridge Main Cables: Methods for Determining Both Temperature and Strain Distributions Within an Exposed Cable*, Columbia University, 2016
6. Efe Karanci, CEEM, *Modeling Corrosion in Suspension Bridge Main Cables*, Columbia University, 2017
7. Mantas Atutis, CEEM, *Analysis of Flexural Behaviour of Concrete Beams Prestressed with Basalt Fiber Reinforced Polymer Bars*, Vilnius Gediminas Technical University, 2018
8. Ketson Roberto Maximiano dos Santos, CEEM, *Nonlinear System Stochastic Response Determination, Reliability Assessment, and Wavelet-Based Parameter Identification Subject to Incomplete Data*, 2019
9. Apostolos Psaros, CEEM, *Stochastic Response Determination of Nonlinear Structural Systems by Utilizing Tools such as Path Integrals, Wavelets, and Compressive Sampling*, 2019
10. Lei Xu, CEEM, *Centrifuge Modeling of Gabion Facing Geosynthetic Reinforced Soil Retaining Walls*, 2020
11. Qiliang Lin, CEEM, *Thermo-mechanical Behavior of functionally graded materials in building applications*, 2020
12. Mohammad Amin Moeini, University of Sherbrooke, *Rheology of Cement-based Materials Used for Large-scale 3D Printing*, 2021
13. Mehdi Zadshir, CEEM, *Design, Characterization, and Modeling of Thermal Management Systems for Building Envelope and Infrastructure Overlays*, 2021
14. Jonathan Blutinger, MECE, *Digital Cuisine: Food Printing and Laser Cooking*, 2021
15. Joni Mici, MECE, *Layered Assembly: Multi-material additive manufacturing, and matter manipulation through parallel electrostatic grippers*, 2021
16. Hwang Jung Geun, CEEM, *Settlement of Millennium Tower in San Francisco*, 2022

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17. Marios Impraïmakis, CEEM, *Unknown Input Structural Health Monitoring*, 2022
18. Jiasheng Ding, EAE, *Graphene Aerogel Epoxy Sphere used as Ultra-Lightweight Proppants*, 2022
19. Hayley McClintock, MECE, *Towards Digital Fabrication of Carbon Fiber Structures*, 2023
20. Daria Ardant, ETH, *Identifying critical parameters for robust poured earth application*, 2024
21. Jonah Williams, EEAE, *Development of Innovative Carbon Mineralization Technologies to form Tailored Carbonates for Carbon-Negative Built Environment*, 2024
22. Raphael Kuhn, ETH, *MgO-silicate cement as a stabilizer for clay-based construction materials*, Expected Feb 10, 2026
23. Luca Michel, ETH, *The stiffness of fresh cement paste*, Expected Mar 17, 2026
24. Kingshuk Mukherjee, University of Miami, *Activation Strategies for Recycled Cement Paste as a Supplementary Cementitious Material*, Expected 2027

Student awards / recognitions

- Siwei Ma, Thornton Tomasetti Foundation Fellowship, 2017 – 2018
- Palash Badjatya, Best Student Presentation, *Digital Concrete 2022 – 3rd RILEM International Conference on Concrete and Digital Fabrication*, Loughborough, UK, June 26 – 29, 2022
- Diandian Zhao, 3rd Place Student Poster, *American Ceramics Society (ACerS), 12th Advances in Cement-Based Materials*, University of California at Irvine, Irvine, CA, July 11 – 13, 2022
- Diandian Zhao, Activate Fellowship, 2023 – 2024 New York Cohort

Postdoctoral Associates

Name	Period of Stay	Current Position
Seungmin Lim	08/2015 – 07/2017	Assistant Professor, Kangwon National University, S Korea
Sujin Lee	01/2016 – 06/2018	Assistant Professor, Keimyung University, S Korea
Hesam Taheri	06/2023 – 05/2024	
Yoonjung Han	10/2025 – Present	Postdoctoral Researcher, Columbia University
Yierfan Maierdan	07/2025 – Present	Postdoctoral Researcher, Columbia University

Outreach Efforts:

Events/programs:

K-12:

- Workshop organizer, “SWE Engineering Exploration Experience,” Society of Women Engineers, Local SEAS Chapter, New York, NY, 2013 – 2020
- Demo/lesson organizer, “Inside Engineering,” SEAS Outreach Programs, New York, NY, 2016 – Present
- Lab tour/demo, “Cement – an interesting material!” Elmont High School, New York, NY, Oct 24, 2023

Undergraduate:

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- CEEM Department Representative, Columbia Engineering Women's Forum, SEAS, New York, NY, 2014, 2015, 2016
- Panelist, ASCE Innovation in Civil Engineering Conference, ASCE Local SEAS Chapter, New York, NY, Apr 26, 2019
- Panelist, Professor's Panel, Columbia Society of Women Engineers E-week, Society of Women Engineers, Local SEAS Chapter, Apr 6, 2023

Graduate:

- Speaker, Engineering Achievers in Graduate Education (EngAGE), SEAS, Mar 1, 2013
- Program Co-organizer and Workshop Organizer, "Engineering and Applied Science," Johns Hopkins Center for Talented Youth (CTY) Program, Sept 20, 2014
- Faculty Representative, Engineering DEI Community Lunch, SEAS, New York, NY, Jan 19, 2024

Summer research advisor/mentor:

K-12:

- Augusta Uwamanzu-Nna, Elmont High School, Jun 2015 – Sept 2015, Intel Science Talent Search 2016 Finalist
- Iyin Tugbobo, Elmont High School, Jun 2017 – Aug 2017, Jun 2018 – Aug 2018

Undergraduate:

- Maika Yzabelle Abdallah, B.S, Sept 2013 – Dec 2014, NSF Summer REU
- Jumari Austin Robinson, B.S., May 2015 – Aug 2015, NSF Summer REU
- Jarrett Poliner, B.S., Jun 2018 – Aug 2018, NSF Summer REU
- Hajin Kim, B.S., Jun 2019– Aug 2018; Jun 2019 – Aug 2019, NSF Summer REU
- Elise Westhoff, B.S., Jun 2019 – Aug 2019, NSF Summer REU
- Ciara Little, B.S., Jun 2020 – Aug 2020, NSF Summer REU
- Annie Loeliger, Jun 2020 – Aug 2020, NSF Summer REU
- Javier Jose Quiros Reiche, Jun 2022 – Aug 2022, NSF Summer REU
- Dairon Estevez, Jun 2022 – Aug 2022, NSF AccelNet
- Bianca Byfield, Jun 2022 – Aug 2022, SURE Program
- Esme Smith, Jun 2024 – Aug 2024, Barnard Summer Research Institute (SRI)
- Jacqueline Donna Salinas, June 2025 – Aug 2025, NSF REU

Graduate:

- Odanis Rosario, M.S., Jan 2014 – Aug 2014, NSF SEGUE scholar
- Deborah Owolabi, B.S., M.S., Jan 2016 – Aug 2017, NSF SEGUE scholar
- Andre Fuqua, M.S., Jan 2017 – Aug 2018, SEAS Dean's Office Summer Research Fund
- Xinhe Yang, MS (MECE), June 2025 – Present, NSF/CDI, Advanced Master's Research Specialization

Past undergraduate research students:

- Alyssa Ramos-Avila, B.S., Jun 2014 – Dec 2014
- Akiva Goldstein, Jan 2016 – May 2016
- Fumin Li, B.S., Jan 2016 – May 2016
- Gayoung (Courtney) Kim, B.S., Jan 2017 – May 2017

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- Lin Ge, B.S., Jan 2019 – May 2019
- Clare Chan, CEEM, Sept 2018 – May 2020
- Ally Israel, CEEM, Sept 2019 – May 2020
- Jaime Andres Danies, CEEM, Sept 2019 – May 2020
- Roberto Alejandro Interiano Jr., CEEM, Sept 2019 – May 2020
- Sabrina Eaglesong Curtis, MECE, May 2019 – May 2020
- Santiago Bugallo, CEEM, Sept 2020 – Dec 2020
- Callie Leann Singer, CEEM, Sept 2020 – Dec 2020
- Jillian Busetto, CEEM, Sept 2021 – Dec 2021
- Amanda Klepper, CEEM, Sept 2021 – Dec 2021
- Christine Anne Beltran Roa, CEEM, Sept 2021 – Dec 2021
- Chana Tropp, CEEM, Jan 2022 – May 2022
- Yuxi Rui, Jan 2024 – May 2024
- Maria Garmonina, Sept 2023 – Aug 2024
- Sabrina Fazio DeAraujo, Jan 2024 – May 2025
- Ruby Ann Frazier, Jan 2024 – May 2025
- Luca Francisco Rios, Jan 2025 – May 2025
- Sara Cao, Sept 2025 - Present
- Emily Shang, Sept 2025 – Present
- Joshua Mousa Ababseh, Sept 2025 – Present