

# KENGRAN YANG

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## Education

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**Joint PhD in Civil and Environmental Engineering and Materials Science** 2016 – 2020

Princeton University (PU), USA

Thesis: "*Gel and Pore Structure Formation in Alkali-activated Materials*"

Graduate Certificate in Computational and Information Science

**MS in Civil and Environmental Engineering** 2014 - 2016

Princeton University (PU), USA

**BEng (First Class Honor) in Civil Engineering** 2011 – 2014

The University of Hong Kong (HKU), China

## Publications

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- (1) **Yang, K.**; White, C. E. Modeling of Aqueous Species Interaction Energies Prior to Nucleation in Cement-Based Gel Systems. *Cem. Concr. Res.* 2021, 139, 106266.
- (2) Gong, K.; Özçelik, V. O.; **Yang, K.**; White, C. E. Density Functional Modeling and Total Scattering Analysis of the Atomic Structure of a Quaternary CaO-MgO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> (CMAS) Glass: Uncovering the Local Environment of Magnesium. *Phys. Rev. Mater.* 2021, 5 (1), 015603.
- (3) **Yang, K.**; White, C. E. Multiscale Pore Structure Determination of Cement Paste via Simulation and Experiment: The Case of Alkali-Activated Metakaolin. *Cem. Concr. Res.* 2020, 137, 106212.
- (4) Salganik, M. J.; Lundberg, I.; Kindel, A. T.; Ahearn, C. E.; Al-Ghoneim, K.; Almaatouq, A.; Altschul, D. M.; Brand, J. E.; Carnegie, N. B.; Compton, R. J.; et al. Measuring the Predictability of Life Outcomes with a Scientific Mass Collaboration. *Proc. Natl. Acad. Sci.* 2020, 117 (15), 8398 LP – 8403.
- (5) **Yang, K.**; Özçelik, V. O.; Garg, N.; Gong, K.; White, C. E. Drying-Induced Atomic Structural Rearrangements in Sodium-Based Calcium-Alumino-Silicate-Hydrate Gel and the Mitigating Effects of ZrO<sub>2</sub> Nanoparticles. *Phys. Chem. Chem. Phys.* 2018, 20 (13), 8593–8606. (**part of 2018 PCCP HOT Articles**)
- (6) Gu, T.; Jeong, H.; **Yang, K.**; Wu, F.; Yao, N.; Priestley, R. D.; White, C. E.; Arnold, C. B. Anisotropic Crystallization in Solution Processed Chalcogenide Thin Film by Linearly Polarized Laser. *Appl. Phys. Lett.* 2017, 110 (4), 41904.
- (7) **Yang, K.**; White, C. E. Modeling the Formation of Alkali Aluminosilicate Gels at the Mesoscale Using Coarse-Grained Monte Carlo. *Langmuir* 2016, 32 (44), 11580–11590.

## Conference Presentations

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Yang K, White CE, Multiscale pore structure determination of alkali-activated metakaolin via simulation and experiment: Micropores to macropores, 10th Advances in Cement Based Materials, University of Illinois at Urbana-Champaign, Urbana, USA, 16-18 June 2019 (Oral)

Yang K, White CE, Density functional modeling of the pre-nucleation clusters of calciumsilicate-hydrate and related gels, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018 (Oral)

Yang K and White CE, *Modeling the formation of sodium and calcium aluminosilicate gels at the mesoscale using coarse-grained Monte Carlo*, Gordon Research Conference on Neutron Scattering, August 6 – 11, 2017, Hong Kong, China (Poster)

Yang K and White CE, *Modeling the formation of sodium and calcium aluminosilicate gels at the mesoscale using coarse-grained Monte Carlo*, 253<sup>rd</sup> ACS National Meeting, April 2-6, 2017, San Francisco, California, USA (Oral)

Yang K and White CE, *Does gel stability play a role in dictating the extent of microcracking in alkali-activated slag paste?*, 6th International Conference on Engineering for Waste and Biomass Valorisation, May 23 – 26, 2016, Albi, France (Oral flash + poster)

Yang K and White CE, *A mesoscale investigation of the alkali-activation reaction using coarse-grained Monte Carlo simulations*, 6th Advances in Cement-based Materials, July 20 – 22, 2015, Manhattan, Kansas, USA (Oral)

## Other Presentations

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Yang K, Özçelik VO, Garg N, Gong K and White CE, *Drying-Induced Atomic Structural Rearrangements in Sodium-Based Calcium-Alumino-Silicate-Hydrate Gel and the Mitigating Effects of ZrO<sub>2</sub> Nanoparticles*, PRISM Annual Research Symposium, March 13 – 14, 2018, Princeton, New Jersey, USA (Poster)

Yang K and White CE, *Density functional modeling of interactions between hydrated calcium clusters and aluminosilicate species*, Princeton E-Filiates Partnership 2017 Annual Meeting, November 10, 2017, Princeton, New Jersey, USA (Poster)

Yang K and White CE, *Does gel stability play a role in dictating the extent of microcracking in alkali-activated slag paste?*, Princeton E-filiates Partnership 2016 Retreat, January 28 – 29, 2016, Princeton, New Jersey, USA (Poster)

Yang K and White CE, *A mesoscale investigation of the alkali-activation reaction using coarse-grained Monte Carlo simulations*, Princeton E-Filiates Partnership 2015 Annual Meeting, November 20, 2015, Princeton, New Jersey, USA (Poster)

## Teaching Experience

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### Assistant in Instruction

- ENE 267: Materials for Energy Technologies and Efficiency, Fall 2018
- CEE 364: Materials in Civil Engineering, Spring 2014, 2015

- CEE 102: *Engineering in the Modern World*, Fall 2014, 2015
- CEE 262: *Structures and the Urban Environment*, Spring 2014

## **Honors & Awards**

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Graduate Student Fellowship, PU	2016
WasteEng2016 Conference Best Student Poster Award	2016
University Research Fellowship Program, HKU	2013
Hong Kong University World Wide Scholarship	2012
Dean's Honors List, HKU	2012