CLAIRE WHITE - CV

DETAILS

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Princeton University
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CURRENT EMPLOYMENT

Position Associate Professor (2019 – present)
Department of Civil and Environmental Engineering, and the
Andlinger Center for Energy & the Environment
Princeton University

Associated Faculty, Department of Chemical and Biological Engineering
Associated Faculty, Department of Mechanical and Aerospace Engineering
Associated Faculty, Princeton Institute for the Science and Technology of Materials
Associated Faculty, Princeton Institute for Computational Science and Engineering
Associated Faculty, High Meadows Environmental Institute

Acting Associate Director for Research, Andlinger Center for Energy and the Environment (Sept 2020 – Apr 2021)

Assistant Professor (2013 – 2019)

SUMMARY OF RESEARCH

Dr. White's research focuses on understanding and optimizing engineering and environmental materials, with an emphasis on sustainable cements and materials for carbon capture, utilization and storage. Current projects include enhanced durability of sustainable cements, calcined clay-based alkali-activated cements, magnesium biocements for CO_2 storage, low cost solid sorbents for CO_2 capture, fundamentals of silicate mineral dissolution, and aqueous ion interactions within cement phases. This research spans multiple length and time scales, utilizing advanced synchrotron and neutron-based experimental techniques, and atomic and mesoscale simulation methodologies.

AWARDS, SCHOLARSHIPS AND PRIZES

President's Award for Distinguished Teaching (Princeton University, 2023)

- Award recognizes a sustained record of distinguished achievement in undergraduate and/or graduate teaching at Princeton University

Gustavo Colonnetti Medalist (RILEM, 2019)

- RILEM is also known as the International Union of Laboratories and Experts in Construction Materials, Systems and Structures. This medal is awarded to a researcher of

less than 35 years, who has made an outstanding scientific contribution to the field of construction materials and structures.

Listed on the **Princeton Engineering Commendation List for Outstanding Teaching** in Spring 2016, Fall 2016, Spring 2017, Fall 2017, Spring 2019, Spring 2020

Howard B. Wentz Jr. Junior Faculty Award (Princeton University, 2017)
- Award recognizes and assists promising junior faculty members in the School of Engineering and Applied Science at Princeton University

CAREER Award (National Science Foundation, 2016)

Discovery Early Career Research Award (Australian Research Council)
- Announced as a recipient of the DECRA grant in November 2012. Receded due to appointment at Princeton University, USA

Outstanding Student Research Prize 2012
- Awarded by the Neutron Scattering Society of America in recognition of outstanding accomplishment in the area of neutron scattering

Director's Postdoctoral Fellowship (2011-2013)
- Los Alamos National Laboratory competitive postdoctoral program

Graduate Research Scholarship
- Australian Postgraduate Award to undertake higher research degree studies, 2007 - 2010

Select Undergraduate Academic Awards (University of Melbourne, 2002 – 2006)
- Argus Scholarship in Civil Engineering for highest academic performance in final year, 2006
- Dean's Honours List in 2006 (Eng), 2005 (Eng), 2004 (Eng & Sci), 2003 (Eng & Sci), 2002

LEADERSHIP ROLES AND EXPERIENCE

Acting Associate Director for Research, Andlinger Center for Energy and the Environment, Princeton University (Sept 2020 – Apr 2021)
- Responsible for awarding of grant funding, postdoctoral fellowships, and visiting faculty program.
- Involved with strategic planning of the center, including areas for future faculty hires.

ABET assessment department coordinator (2020 – present).

Chair of the NIST Center for Neutron Research (NCNR) User Group Executive Committee, National Institute of Standards and Technology, 2021 – present, (vice-chair 2019-2021).

Co-chair of the Environmental Science breakout sessions at the "Science at the Second Target Station Workshop", Oak Ridge National Laboratory, 2019.

- Led breakout group at two-day workshop and documentation of emerging science questions.
- Outcomes of breakout group incorporated into the planning and building of the second spallation target at the Spallation Neutron Source.

Chair of the SNS-HFIR User Group, Oak Ridge National Laboratory, 2015-2016, (vice-chair 2013-2015)

- User group of the neutron facilities at Oak Ridge National Laboratory.

PREVIOUS EMPLOYMENT

Position Director's Postdoctoral Fellow (2011 – 2013)
Lujan Neutron Scattering Center / Physics and Chemistry of Materials, joint position
Los Alamos National Laboratory

Postdoctoral Research Associate (2010 – 2011)
Lujan Neutron Scattering Center / Center for Nonlinear Studies, joint position
Los Alamos National Laboratory

EDUCATIONAL BACKGROUND

2010 Ph.D. Department of Chemical & Biomolecular Engineering, The University of Melbourne

Title *Atomic structure evolution in amorphous geopolymer precursors and gels*

Supervisors Professors Jannie S. J. van Deventer and John L. Provis, Dr Daniel P. Riley

2002 – 2006 B.E. (Civil) (Hons.) The University of Melbourne
B.Sc. (Physics) The University of Melbourne

PEER REVIEWED JOURNAL PAPERS

Citation summary: h-index 28; total citations 2953 (Google Scholar)

(MOST RECENT LISTED FIRST, STUDENTS/POSTDOCS WHERE I WAS THE PRIMARY ADVISOR IN BOLD)

(80) Brugger A, et al., *The complex, unique, and powerful imaging instrument for dynamics (CUPI^{2}D) at the Spallation Neutron Source*, Rev. Sci. Instrum., **2023** 94 (5) 092903 051301

*Invited manuscript.

(79) **Gong K**, **Yang K**, White CE, *Density functional modeling of the binding energies between aluminosilicate oligomers and different metal cations*, Front. Mater., **2023**, 10, DOI: https://doi.org/10.3389/fmats.2023.1089216

(78) Li J, Zeng K, Zhong D, Flamant G, Nzihou A, White CE, Yang H, Chen H, *Algae pyrolysis in molten NaOH-Na_2CO_3 for hydrogen production*, Environ. Sci. Tech., **2023** 57 (16) 6485-6493

(77) Romero Millán LM, Ghogia AC, White CE, Nzihou A, *Iron nanoparticles to catalyze graphitization of cellulose for energy storage applications*, ACS Appl. Nano Mater., **2023** 6 (5) 3549-3559

(76) Ghogia A, Romero Millán LM, White CE, Nzihou A, *Synthesis and growth of green graphene from biochar revealed by magnetic properties of iron catalyst*, ChemSusChem, **2023** 16 (3) e202201864

(75) Calabrese S, Wild B, Bertagni MB, Bourg IC, White CE, Aburto F, Cipolla G, Noto LV, Porporato A, *Nano-to global-scale uncertainties in terrestrial enhanced weathering*, Environ. Sci Technol., **2022** 56 (22) 15261-15272

(74) Wild B, White CE, Bourg IC, *Molecular dynamics simulations of reverse osmosis in silica nanopores*, J. Phys. Chem. C, **2022** 126 (21) 9161-9172

(73) Zheng S, Yang, Chen X, White CE, Hu L, Ren ZJ, *Upscaling 3D engineered trees for off-grid desalination*, Environ. Sci. Technol., **2022** 56 (2) 1289-1299

(72) **Alventosa KML**, **Wild B**, White CE, *The effects of calcium hydroxide and activator chemistry on alkali-activated metakaolin pastes exposed to high temperatures* Cem. Concr. Res., **2022** 154 106742

(71) **Gong K**, White CE, *Time-dependent phase quantification and local structure analysis of hydroxide-activated slag via X-ray total scattering and molecular modeling*, Cem. Concr. Res., **2022** 151 106642

(70) Hajimohammadi A, Masoumi S, Kim T, **McCaslin E**, Alnahhal MF, Almer JD, White CE, *Chemo-mechanical properties of carbon fibre reinforced geopolymer interphase*, J. Am. Ceram. Soc., **2022** 105 (2) 1519-1532

(69) **Gong K**, White CE, *Predicting CaO-(MgO)-Al_2O_3-SiO_2 glass reactivity in alkaline environments from force field molecular dynamics simulations*, Cem. Concr. Res., **2021** 150 106588

(68) Zhou X, Heiranian M, Yang M, Epsztein R, **Gong K**, White CE, Hu S, Kim J-H, Elimelech M, *Selective fluoride transport in sub-nanometer TiO_2 pores*, ACS Nano, **2021** 15 (10) 16828-16838

(67) **McCaslin E**, White CE, *A parametric study of accelerated carbonation in alkali-activated slag*, Cem. Concr. Res., **2021** 145 106454

(66) **Alventosa KML**, White CE, *The effects of calcium hydroxide and activator chemistry on alkali-activated metakaolin pastes*, Cem. Concr. Res., **2021** 145 106453

(65) **Gong K**, **Özçelik VO**, **Yang K**, White CE, *Density functional modeling and total scattering analysis of the atomic structure of a quaternary CaO-MgO-Al_2O_3-SiO_2 (CMAS) glass: Uncovering the local environment of calcium and magnesium*, Phys. Rev. Mater., **2021** 5 (1) 015603

(64) **Yang K**, White CE, *Modeling of aqueous species interaction energies prior to nucleation in cement-based gel systems*, Cem. Concr. Res., **2021** 139 106266

(63) van Deventer JSJ, White CE, Myers RM, *A roadmap for production of cement and concrete with low-CO_2 emissions*, Waste Biomass Valori., **2021** 12 4745-4775

(62) **Yang K**, White CE, *Multiscale pore structure determination of cement paste via simulation and experiment: The case of alkali-activated metakaolin*, Cem. Concr. Res., **2020** 137 106212

(61) Nigay P-M, Salifu AA, Obayemi JD, White CE, Nzihou A, Soboyejo WO, *Assessment of ceramic water filters for the removal of bacterial, chemical, and viral contaminants*, J. Environ. Eng., **2020** 146 (7) 04020066

(60) **Wang SY**, **McCaslin E**, White CE, *Effects of magnesium content and carbonation on the multiscale pore structure of alkali-activated slags*, Cem. Concr. Res., **2020** 130 105979

(59) Dutta NS, Shao P, **Gong K**, White CE, Yao N, Arnold CB, *Understanding solution processing of inorganic materials using cryo-EM*, Opt. Mater. Express, **2020** 10 (1) 119-128

(58) White CE, *Alkali-activated materials: The role of molecular-scale research and lessons from the energy transition to combat climate change*, RILEM Tech. Lett., **2019** 4 110-121 *Invited paper in recognition of the RILEM Gustavo Colonnetti Medal

(57) **Garg N**, **Özçelik VO**, Skibsted J, White CE, *Nanoscale ordering and depolymerization of calcium silicate hydrates in presence of alkalis*, J. Phys. Chem. C, **2019** 123 (40) 24873-24883

(56) Wild B, Daval D, Micha, J-S, Bourg IC, White CE, Fernandez-Martinez A, *Physical properties of interfacial layers developed on weathered silicates: A case study based on labradorite feldspar*, J. Phys. Chem. C, **2019** 123 (40) 24520-24532

(55) Nigay P-M, Salifu AA, Obayemi JD, White CE, Nzihou A, Soboyejo WO, *Ceramic water filters for the removal of bacterial, chemical and viral contaminants*, J. Environ. Eng., **2019** 145 (10) 04019066

(54) **Özcelik VO**, **Garg N**, White CE, *Symmetry-induced stability in alkali-doped calcium silicate hydrate*, J. Phys. Chem. C, **2019** 123 (22) 14081-14088

(53) **Gong K**, Cheng Y, Daemen LL, White CE, *In situ quasi-elastic neutron scattering study on the water dynamics and reaction mechanisms in alkali-activated slags*, Phys. Chem. Chem. Phys., **2019** 21 (20) 10277-10292

(52) **Peys A**, White CE, Rahier H, Blanpain B, Pontikes Y, *Alkali-activation of CaO-FeO_x-SiO_2 slag: Formation mechanism from in-situ X-ray total scattering*, Cem. Concr. Res, **2019** 122 179-188

(51) Ristroph K, Feng J, McManus S, Zhang Y, **Gong K**, Ramachandruni H, White CE, Prud'homme R, *Spray drying OZ439 nanoparticles to form stable, water-dispersible powders for oral malaria therapy*, J. Transl. Med., **2019** 17 97

(50) Feng J, Zhang Y, McManus S, Qian R, Ristroph K, Ramachandruni H, **Gong K**, White CE, Rawal A, Prud'homme RK, *Amorphous nanoparticles by self-assembly: processing for controlled release of hydrophobic molecules,* Soft Matter, **2019** 15 2400-2410

(49) Dutta R, White CE, Greenberg E, Prakapenka VB, Duffy TS, *Equation of state of the α-PbO_2 and $Pa\bar{3}$-type phases of GeO_2, to 120 GPa*, Phys. Rev. B, **2018** 98 144106

(48) Nigay P-M, White CE, Nzihou A, Soboyejo WO, *Removal mechanisms of contaminants in ceramic water filters*, J. Environ. Eng., **2018** 144 (12) 04018128

(47) Nigay P-M, Nzihou A, White CE, Soboyejo WO, *Accumulators for the capture of heavy metals in thermal conversion systems,* J. Environ. Eng., **2018** 144 (12) 04018118

(46) **Peys A**, White CE, Olds DP, Rahier H, Blanpain B, Pontikes Y, *Molecular structure of CaO-FeO_x-SiO_2 glassy slags and resultant inorganic polymer binders,* J. Am. Ceram. Soc., **2018** 101 (12) 5846-5857

(45) White CE, **Garg N**, Olds D, Vocaturo J, Everett SM, Page K, *A uniaxial load frame for in situ neutron studies of stress-induced changes in cementitious materials and related systems*, Rev. Sci. Instrum., **2018** 89 092903
*Invited manuscript for special issue.

(44) Feng J, Zhang Y, McManus S, Ristroph K, Lu H, **Gong K**, White CE, Prud'homme R, *Rapid recovery of clofazimine-loaded nanoparticles with long-term storage stability as anti-cryptosporidium therapy,* ACS Appl. Nano Mater., **2018** 1 (5) 2184-2194

(43) **Gong K**, White CE, *Nanoscale chemical degradation mechanisms of sulfate attack in alkali-activated slag,* J. Phys. Chem. C, **2018** 122 (11) 5992-6004

(42) **Yang K**, **Özçelik VO**, **Garg N**, **Gong K**, White CE, *Drying-induced atomic structural rearrangements in sodium-based calcium-alumino-silicate-hydrate gel and the mitigating effects of ZrO_2 nanoparticles,* Phys. Chem. Chem. Phys., **2018** 20 8593-8606

(41) **Özçelik VO**, **Gong K**, White CE, *Highly surface-active $Ca(OH)_2$ monolayer as a CO_2 capture material*, Nano Lett., **2018** 18 (3) 1786-1793

(40) Yang S, Qin Y, Chen B, Özçelik VO, White CE, Shen Y, Yang S, Tongay S, *Novel surface molecular functionalization route to enhance environmental stability of tellurium containing 2D layers,* ACS Appl. Mater. Interfaces, **2017** 9 (51) 44625-44631

(39) Yang S, Cai H, Chen B, Ko C, Özçelik VO, Ogletree DF, White CE, Shen Y, Tongay S, *Environmental stability of 2D anisotropic tellurium containing nanomaterials: anisotropic to isotropic transition*, Nanoscale, **2017** 9 12288-12294

(38) Nigay P-M, Nzihou A, White CE, Soboyejo WO, *Structure and properties of clay ceramics for thermal energy storage*, J. Am. Ceram. Soc., **2017** 100 4748-4759

(37) **Blyth A**, **Eiben CA**, Scherer GW, White CE, *Impact of activator chemistry on permeability of alkali-activated slags*, J. Am. Ceram. Soc., **2017** 100 4848-4859

(36) **Garg N**, White CE, *Mechanism of zinc oxide retardation in alkali-activated materials: an in situ X-ray pair distribution function investigation*, J. Mater. Chem. A, **2017** 5 11794-11804
Themed issue: Journal of Materials Chemistry A Emerging Investigators 2017

(35) White CE, Olds DP, Hartl M, Hjelm RP, Page K. *Evolution of the pore structure during the early stages of the alkali-activation reaction: an in situ small-angle neutron scattering investigation*, J. Appl. Cryst. **2017** 50 (1) 61-75

(34) Gu T, Jeong H, Yang K, Wu F, Yao N, Priestley RD, White CE, Arnold CB, *Anisotropic crystallization in solution processed chalcogenide thin film by linearly polarized laser*, Appl. Phys. Lett., **2017** 110 041904

(33) **Özçelik VO**, White CE, *Nanoscale charge-balancing mechanism in alkali-substituted calcium–silicate–hydrate gels*, J. Phys. Chem. Lett., **2016** 7 (24) 5266-5272

(32) **Yang K**, White CE, *Modeling the formation of alkali aluminosilicate gels at the mesoscale using coarse-grained Monte Carlo*, Langmuir, **2016** 32 (44) 11580-11590

(31) **Gong K**, White CE, *Impact of chemical variability of ground granulated blast-furnace slag on the phase formation in alkali-activated slag*, Cem. Concr. Res., **2016** 89 310-319

(30) Stan CV, Dutta R, White CE, Prakapenka V, Duffy TS, *High-pressure polymorphism of PbF_2 to 75 GPa,* Phys. Rev. B, **2016** 94 024104

(29) **Natali ME**, White CE, Bignozzi MC, *Elucidating the atomic structures of difference sources of fly ash using X-ray and neutron PDF analysis,* Fuel, **2016** 177 148-156

(28) White CE, *Effects of temperature on the atomic structure of synthetic calcium-silicate-deuterate gels: A neutron pair distribution function investigation,* Cem. Concr. Res., **2016** 79 93-100

(27) **Morandeau AE**, Fitts JP, Lee HD, Shubeita SM, Feldman LC, Gustafsson T, White CE, *Nanoscale heterogeneities in a fractured alkali-activated slag binder: A helium ion microscopy analysis*, Cem. Concr. Res., **2016** 79 45-48

(26) **Morandeau AE**, White CE, *The role of magnesium-stabilized amorphous calcium carbonate in mitigating the extent of carbonation in alkali-activated slag*, Chem. Mater., **2015** 27 (19) 6625-6634

(25) **Morandeau AE**, White CE, *In situ X-ray pair distribution function analysis of accelerated carbonation of a synthetic calcium-silicate-hydrate gel*, J. Mater. Chem. A, **2015** 3 8597-8605

(24) White CE, Daemen LL, Hartl M, Page K, *Intrinsic differences in atomic ordering of calcium (alumino)silicate hydrates in conventional and alkali-activated cements,* Cem. Concr. Res., **2015** 67 66-73

(23) White CE, Henson NJ, Daemen, LL, Hartl M, Page K, *Uncovering the true atomic structure of disordered materials: The structure of a hydrated amorphous magnesium carbonate ($MgCO_3 \cdot 3D_2O$),* Chem. Mater., **2014** 26 (8) 2693-2702

(22) White CE, Kearley GJ, Provis JL, Riley DP, *Inelastic neutron scattering analysis of the thermal decomposition of kaolinite to metakaolin*, Chem. Phys., **2013** 427 82-86
*Special issue: *Advances and frontiers in chemical spectroscopy with neutrons*

(21) White CE, Kearley GJ, Provis JL, Riley DP, *Structure of kaolinite and influence of stacking faults: Reconciling theory and experiment using inelastic neutron scattering analysis*, J. Chem Phys., **2013** 138 (19) 194501

(20) White CE, Page K, Henson NJ, Provis JL, *In situ X-ray pair distribution function analysis of geopolymer gel nanostructure formation kinetics*, Phys. Chem. Chem. Phys., **2013** 15 (22) 8573-8582

(19) White CE, Page K, Henson NJ, Provis JL, *In situ synchrotron X-ray pair distribution function analysis of the early stages of gel formation in metakaolin-based geopolymers*, Appl. Clay Sci., **2013** 73 (SI) 17-25

(18) Provis JL, Hajimohammadi A, White CE, Bernal SA, Myers RJ, Winarski RP, Rose V, Proffen T, Llobet A, van Deventer JSJ, *Nanostructural characterization of geopolymers by advanced beamline techniques*, Cem. Concr. Compos., **2013** 36 (1) 56-64

(17) White CE, Provis JL, Proffen T, van Deventer JSJ, *Molecular mechanisms responsible for the structural changes occurring during geopolymerization: Multiscale simulation,* AIChE J, **2012** 58 (7) 2241-2253

(16) Provis JL, Myers RJ, White CE, Rose V, van Deventer JSJ, *X-ray microtomography shows pore structure and tortuosity in alkali-activated binders,* Cem. Concr. Res., **2012** 42 (6) 855-864

(15) White CE, *Pair distribution function analysis of amorphous geopolymer precursors and binders: the importance of complementary simulations,* Z. Kristallogr., **2012** 227 (5) 304-312

(14) White CE, Provis JL, *Comment on "Structure-directing role of counterions in the initial stage of zeolite synthesis",* J Phys. Chem. C, **2012** 116 (1) 1619-1621

(13) White CE, Provis JL, Llobet A, Proffen T, van Deventer JSJ, *Evolution of local structure in geopolymer gels: an in situ neutron pair distribution function analysis,* J Am. Ceram. Soc., **2011** 94 (10) 3532-3539

(12) Page K, White CE, Estell EG, Neder RB, Llobet A, Proffen T, *Treatment of hydrogen background in bulk and nanocrystalline neutron total scattering experiments,* J Appl. Crystallogr., **2011** 44 532-539

(11) White CE, Provis JL, Proffen T, van Deventer JSJ, *Quantitative mechanistic modeling of silica solubility and precipitation during the initial stages of zeolite synthesis*, J Phys. Chem. C, **2011** 115 (20) 9879-9888

(10) White CE, Provis JL, Kearley GJ, Riley DP, van Deventer JSJ, *Density functional modelling of silicate and aluminosilicate dimerisation solution chemistry* Dalton Trans., **2011** 40 (6) 1348-1355

(9) White CE, Provis JL, Gordon LE, Riley DP, van Deventer JSJ, *Effect of temperature on the local structure of kaolinite intercalated with potassium acetate,* Chem. Mater., **2011**, 23 (2) 188-199

(8) White CE, Perander LM, Provis JL, van Deventer JSJ, *The use of XANES to clarify issues related to bonding environments in metakaolin: a discussion of the paper S. Sperinck et al., "Dehydroxylation of kaolinite to metakaolin-a molecular dynamics study," J. Mater Chem., 2011, 21, 2118-2125* J Mater. Chem., **2011**, 21 (19) 7007-7010

(7) Provis JL, White CE, van Deventer JSJ, *Discussion of Y. Zhang et al., "Study of ion cluster reorientation process of geopolymerization reaction using semi-empirical AM1 calculations," Cem Concr Res 39(12): 1174-1179; 2009.* Cem. Concr. Res., **2010**, 40 (5) 827-828

(6) White CE, Provis JL, Proffen T, van Deventer JSJ, *The effects of temperature on the local structure of metakaolin-based geopolymer binder: a neutron pair distribution function investigation*, J Am. Ceram. Soc., **2010**, 93 (10) 3486-3492

(5) Wurden C, Page K, Llobet A, White CE, Proffen T, *Extracting differential pair distribution functions using MIXSCAT*, J. Appl. Cryst., **2010**, 43, 635-638

(4) White CE, Provis JL, Proffen T, Riley DP, van Deventer JSJ, *Density functional modeling of the local structure of kaolinite subjected to thermal dehydroxylation*, J. Phys. Chem. A, **2010**, 114 (14) 4988-4996

(3) White CE, Provis JL, Proffen T, Riley DP, van Deventer JSJ, *Combining density functional theory (DFT) and pair distribution function (PDF) analysis to solve the structure of metastable materials: The case of metakaolin.*, Phys. Chem. Chem. Phys., **2010**, 12 (13) 3239-3245

(2) White CE, Provis JL, Riley DP, Kearley GJ, van Deventer JSJ, *What is the structure of kaolinite: Reconciling theory and experiment*, J. Phys. Chem. B, **2009**, 113 (19) 6756-6765

(1) Provis JL, Gehman JD, White CE, Vlachos DG, *Modeling silica nanoparticle dissolution in TPAOH-TEOS-H_2O solutions*, J. Phys. Chem. C, **2008**, 112 (38) 14769-14775

BOOKS AND BOOK CHAPTERS

(1) *Handbook on characterization of biomass, biowaste and related by-products*, Nzihou A (Ed.), Springer 2020

Chapter 2 – Generic characterization techniques, Minh DP, Accart P, Boachon C, Calvet R, Chesnaud A, Del Confetto S, Diron J-L, Dong J, Ephraim A, Haurie L, Lyczko N, Rolland C, Romero Millan LM, Roques L, Sane AR, Sani R, Weiss-Hortala E, White CE

Chapter 16 – Solid residues, Weiss-Hortala E, Chesnaud A, Haurie L, Lyczko N, Munirathinam R, Nzihou A, Patry S, Minh DP, White CE

JOURNAL ARTICLES/BOOK CHAPTERS UNDER REVIEW

(1) **Zheng S**, Song C, **Curria MC**, Ren ZJ, White CE, *Ca-based layered double hydroxides for environmentally sustainable carbon capture*

(2) **Gong K**, White CE, *Development of physics-based compositional parameters for predicting the reactivity of amorphous aluminosilicates in alkaline environments*

(3) **Curria MC**, White CE, *Mechanistic insights on solution-based green synthesis of phase-pure Ca-based layered double hydroxides from $Ca(OH)_2$*

(4) **Alventosa KML**, White CE, *Nanostructural evolution of calcium-containing alkali-activated metakaolin during high temperature exposure*

(5) **Pu C**, White CE, *Evaluation of ball-milling with in-situ recrystallization for synthesis of high crystallinity zeolite nanoparticles and related phases*

(6) Abdelkawy A, White CE, Youssef M, *Molecular simulation of chloride ion binding mechanisms to Na-doped tobermorite 14 Å as a model system for sodium-containing cements*

INVITED SEMINARS AND INVITED CONFERENCE PRESENTATIONS

2023

- 26th Congress and General Assembly of the International Union of Crystallography, Melbourne, Australia, 22-29 August, *In operando inelastic neutron scattering and pair distribution function analysis of water and carbon dioxide adsorption by calcium-based layered double hydroxide*

- Gordon Research Conference: Neutron Scattering for a Sustainable Society, Ventura, California, USA, 25-30 June, *The role of neutron scattering in understanding and optimizing low-CO_2 cements.*
- 2023 CMI Annual Meeting, Princeton, New Jersey, USA, 4-5 May, *Sustainable cements.*
- 2023 MRS Spring Meeting & Exhibit, San Francisco, California, USA,10-14 April, *Evaluating structural anisotropy from neutron pair distribution function analysis of uniaxially-loaded sustainable cement undergoing viscoelastic relaxation.*
- University of Minnesota, Minneapolis, Minnesota, USA, 31 March, *Net-zero cement industry by 2050? Potential pathways forward*.

2022

- 10th International Conference on Multiscale Materials Modeling, Baltimore, USA, 2-7 October, *Simulating the pore structure of sustainable cements.*
- NSF Workshop: Architected Metamaterials for Civil Infrastructure, University of Massachusetts Amherst, Massachusetts, USA, 23-25 May, invited panelist.
- University of Miami, virtual, 11 March, *Predicting reactivity of glassy supplementary cementitious materials from composition using simulations*.
- Rutgers University, virtual, 7 February, *Structure of alkali-earth aluminosilicate glasses and predicting their reactivity in alkaline environments*.
- Virtual symposium on Construction and Concrete Innovations (vCONcrete22), hosted by MIT, 25 January, *Predicting relative reactivity of alkali-earth aluminosilicate glasses in alkaline environments.*
- Fourth International Conference on Chemically Activated Materials, virtual, 15-16 January, *Development of alkali-activated metakaolin with reduced CO_2 emissions for industrial applications*.
  Recipient of the 'Outstanding Young Researcher Award', sole recipient.

2021

- International Chemical Congress of Pacific Basin Societies (Pacifichem 2021), virtual, 16-21 December, *Pair distribution function – computed tomography (PDF-CT): Spatially-resolving the atomic structures of amorphous cements at the micron length scale.*
- Northern Arizona University, virtual, 4 November, *The materials science of sustainable cements*
- Princeton University - High Meadows Environmental Institute, 14 September, *Low-cost calcium-based solid sorbents for carbon capture*
- Nanocem workshop "Nucleation and Growth", virtual, 21-22 June, *Density functional theory modeling of pre- and post-precipitation behavior in calcium-silicate-hydrate systems*.
- Princeton University, Forward Fest: Thinking Forward the Environment, virtual, 15 April, panelist

- 3rd International Conference on the Chemistry of the Construction Materials, virtual, 15-17 March, *Impact of sodium and alumina on calcium-silicate-hydrate gel: Fundamental findings and macroscopic implications*
- University of Arizona and Arizona State University, virtual, 19 February, *The materials science of sustainable cement*
- 45th International Conference and Exposition on Advanced Ceramics and Composites (ICACC 2021), virtual, 8-12 February, *The influence of calcium on the pore structure of sustainable cement*

2020

- Rethinking Concrete: Material Conventions in the Anthropocene (Princeton University), virtual, 22-23 October, *Climate change and new concretes*
- Missouri University of Science and Technology, virtual, 28 September, *Augmenting structure and stability of disordered calcium-silicate-hydrate gels in cement-based materials*
- Portland State University, virtual, 19 May, *Seminar class: Industrial CO_2 emissions associated with the construction industry: Overview and outlook*
- Gordon Research Conference: Advanced Materials for Sustainable Infrastructure Development, California, USA, 23-28 February, *Spatially-resolved atomic structures of amorphous phases within alternative binders*

2019

- Total Scattering Measurements Under High Pressure workshop, Oak Ridge National Laboratory, Tennessee, USA, 28-29 October, *Investigating time-dependent creep of cementitious materials using neutron total scattering and a custom-build load frame*
- Caltech, California, USA, 22 May, *The materials science of sustainable cements*
- 2019 CMI Annual Meeting, Princeton University, New Jersey, 16-17 April, *Cement and sustainability*
- 257th American Chemical Society National Meeting & Exposition, Orlando, USA, 31 March – 4 April, *Carbon capture properties of two-dimensional calcium hydroxide*
- American Concrete Institute (ACI) Spring 2019 Convention, Quebec, Canada, 24-28 March, *Enhancing the durability of alkali-activated materials*
- **Plenary** – 2nd RILEM Spring Convention & International Conference on Sustainable Materials, Systems and Structures, Rovinj, Croatia, 18-22 March, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering Systems*
- University of Illinois Urbana-Champaign, Illinois, USA, 4 February, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering systems*
- 43rd International Conference and Exposition on Advanced Ceramics and Composites (ICACC 2019), Florida, USA, 27 January – 1 February, *Alkali-activated materials and their formation mechanisms*
- Georgia Institute of Technology, Georgia, USA, 14 January, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering systems*

2018

- Northwestern University, Illinois, USA, 31 October, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering systems*
- KU Leuven, Leuven, Belgium, 6 September, *Structure, stability and formation rates of the main binder gels in alkali-activated materials*
- 11th Asian-Australasian Conference on Composite Materials, Cairns, Australia, 29 July – 1 August, *Structure, stability and formation rates of the main binder gels in alkali-activated materials*
- University of Illinois Urbana-Champaign, Illinois, USA, 1 May, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering systems*
- Department of Geosciences at Princeton University, New Jersey, USA, 24 April, *Optimizing the structure and stability of sustainable cements*,
- Texas A&M University, Texas, USA, 20 March, *Uncovering and optimizing the chemical mechanisms in alkali-activated materials and related engineering systems*
- Tsinghua University, Beijing, China, 22 January, *Designing sustainable cementitious materials for a sustainable future*
- Nanjing Tech University, Nanjing, China, 20 January, *Designing sustainable cementitious materials for a sustainable future*
- Southeast University, Nanjing, China, 20 January, *Designing sustainable cementitious materials for a sustainable future*,
- Hunan University, Changsha, China, 18 January, *Designing sustainable cementitious materials for a sustainable future*
- **Keynote** - International Workshop on Nano-engineered and Multifunctional Concrete, Harbin, China, 15-16 January, *Drying-induced atomic structural rearrangements in alkali-activated materials and the mitigating effects of nanoparticles*

2017

- Missouri University of Science and Technology, Rolla, Missouri, USA, 7 September, *Uncovering the chemical mechanisms controlling formation, stability and long term degradation of sustainable cements*
- University of Hong Kong, Hong Kong, China, 11 August, *Designing sustainable cementitious materials for a sustainable future*
- Gordon Research Conference: Neutron Scattering, Hong Kong, China, 6-11 August, *Uncovering the atomic structure and mesoscale morphology of amorphous materials by combining multiscale simulations and neutron scattering*
- City University of Hong Kong, Hong Kong, China, 4 August, *Designing sustainable cementitious materials for a sustainable future*
- University of Minnesota, Minneapolis, Minnesota, USA, 25 April, *Uncovering the chemical mechanisms controlling formation, stability and long term degradation of sustainable cements*
- 253rd American Chemical Society National Meeting & Exposition, San Francisco, California, USA, 2-6 April, *Manipulating the layered phases in low-CO_2 cements and related minerals*

2016

- Princeton American Chemical Society Meeting, Princeton, New Jersey, USA, 17 November, *Nanoengineering low-CO_2 concrete using synchrotron and neutron techniques combined with multiscale simulations*
- Gordon Research Conference: Advanced Materials for Sustainable Infrastructure Development, Hong Kong, China, 31 July – 5 August, *Permeability and nanoscale gel stability of alkali-activated materials*
- École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, 30 June, *Investigating the permeability and carbonation behavior of alkali-activated materials*
- EMPA (Swiss Federal Laboratories for Materials Science and Technology), Dübendorf, Switzerland, 29 June, *Investigating permeability and carbonation behavior of sustainable cements*
- Owens Corning, Chambéry, France, 27 June, *Alkali-activated materials*

2015

- American Geophysical Union Fall Meeting, San Francisco, California, USA, 14-18 December, *Investigating permeability and carbonation behavior of sustainable cements*
- MIT, Cambridge, USA, 2 November, *Kinetics and thermodynamics of alkali-activated materials and related amorphous carbonate phases using high-energy X-ray and neutron scattering and density functional modeling*
- L'École des Mines d'Albi-Carmaux, Albi, France, 25 August, *Engineering low-CO_2 cements and related materials*
- **Keynote** - 6th Advances in Cement-Based Materials, Manhattan, Kansas, USA, 20-22 July, *Elucidating the kinetics and thermodynamics of alkali-activated materials using high-energy X-ray and neutron scattering*
- University of Rochester, Rochester, USA, 10 April, *Nanoengineering low-CO_2 concrete using synchrotron and neutron techniques combined with multiscale simulations*
- Worcester Polytechnic Institute, Worcester, USA, 9 April, *Nanoengineering low-CO_2 concrete using synchrotron and neutron techniques combined with multiscale simulations*
- 249th ACS National Meeting & Exposition, Denver, Colorado, USA, 22-26 March, *Uncovering the local atomic structure of a hydrated amorphous magnesium carbonate: The computational chemistry and total scattering iterative methodology*

2014

- **Keynote** - Goldschmidt 2014, Sacramento, California, USA, 8-13 June, *Exploring amorphous aluminosilicates at the nanoscale*
- American Crystallographic Association Annual Meeting, Albuquerque, New Mexico, USA, 24-28 May, *Exploring the potential energy surface of hydrated-amorphous magnesium carbonate: The computational chemistry and total scattering iterative methodology*

- PRISM seminar at Princeton University, Princeton, USA, 7 May, *Engineering sustainable cements at the (atomic and) mesoscale*

2013

- UT Knoxville, Tennessee, USA, May, *Nanoengineering of macroscale materials*
- TMS 2013 Annual Meeting and Exhibition, San Antonio, Texas, USA, 3-7 March, *Amorphous materials: Potential avenues for uncovering their atomic structures*

2012

- **Plenary** - American Conference on Neutron Scattering 2012, Washington, DC, USA, 24-28 June, *Recent progress in elucidating accurate structural representations of disordered complex materials*

2011

- Bragg Institute, Australian Nuclear Science and Technology Organisation, New South Wales, Australia, August, *Probing the local structural evolution of zeolites and cementitious materials using neutron total scattering and multiscale simulations*
- University of Melbourne, Victoria, Australia, August, *The synergy between total scattering and advanced simulation techniques in understanding complex, disordered and nanostructured materials*
- Spallation Neutron Source, Oak Ridge National Laboratory, Tennessee, USA, July, *The role of molecular research in tailoring geopolymer durability*

2010

- American Crystallographic Association 2010 Annual Meeting, Chicago, Illinois, USA, 24-29 June, *Coupling total scattering and density functional theory computations to solve the structure of complex disordered aluminosilicates*
- 12th International Ceramics Congress of Cimtec 2010, Montecatini Terme, Italy, 6-11 June, *The role of molecular research into the commercialization of geopolymer concrete in Australia*

2009

- Lujan Neutron Scattering Center, Los Alamos National Laboratory, 23 June, *Towards total structure solutions of disordered layered aluminosilicates*
- University of California, Berkeley, 15 May, *Towards total structure solutions of disordered layered aluminosilicates*
- CNLS Los Alamos National Laboratory, 22 April, *Towards the total structure solution of metakaolin*

CONFERENCE PRESENTATIONS (ORAL UNLESS NOTED)

(1) Gong K, White CE, Olivetti E, *Composition-structure-reactivity relationship for amorphous aluminosilicates in alkaline environment*, 13th Advances in Cement-Based Materials, New York, New York, USA, 14-16 June 2023

(2) Gong K, Yang K, White CE, *Density functional modeling of the binding energies between aluminosilicate oligomers and different metal cations*, 13th Advances in Cement-Based Materials, New York, New York, USA, 14-16 June 2023

(3) Coopamootoo K, Valenza JJ, White CE, *CO_2 mineralization of silicate minerals and the potential inhibiting effect of amorphous silica-rich surface layers*, 13th Advances in Cement-Based Materials, New York, New York, USA, 14-16 June 2023

(4) Keiser D, White CE, *Evaluating the effects of sodium and aluminum on nanostructural features of calcium silicate hydrates using atomistic modeling and pair distribution function analysis*, 13th Advances in Cement-Based Materials, New York, New York, USA, 14-16 June 2023 (Poster)

(5) Zhang A, White CE, *Pore structure and permeability of alkali-activated calcined clay as durability indicators*, 13th Advances in Cement-Based Materials, New York, New York, USA, 14-16 June 2023

(6) Coopamootoo K, White CE, *CO_2 mineralization of silicate minerals and the potential inhibiting effect of amorphous silica-rich surface layers*, ASCE Engineering Mechanics Institute 2023 Conference, Atlanta, Georgia, USA, 6-9 June 2023

(7) Garg N, Kehoe B, Olds D, Vocaturo J, Everett M, Page K, Neuefeind J, White C, *Molecular insight on creep of cement-based systems from in situ neutron total scattering experiments*, ASCE Engineering Mechanics Institute 2023 Conference, Atlanta, Georgia, USA, 6-9 June 2023

(8) Gong K, White CE, Olivetti E, *Composition-structure-reactivity relationship for amorphous aluminosilicates in alkaline environment*, ASCE Engineering Mechanics Institute 2023 Conference, Atlanta, Georgia, USA, 6-9 June 2023

(9) Beguerie T, Ghogia AC, Weiss E, White CE, Nzihou A, *Non-conventional catalysts and multiscale approach for the thermo-chemical synthesis and investigation of bio-graphene*, ACS Fall 2022, Chicago, Illinois, USA, 21-25 August 2022

(10) Keiser D, White CE, *Influence of aluminum and sodium on the structure of calcium-silicate-hydrate gel: A molecular modeling approach*, 12th Advances in Cement-Based Materials, Irvine, California, USA, 11-13 July 2022 (Poster)

(11) Zhang A, White CE, *Pore solution characterization and permeability analysis of alkali-activated metakaolin*, 12th Advances in Cement-Based Materials, Irvine, California, USA, 11-13 July 2022 (Poster)

*Second place for best poster award

(12) Wild B, Lammers LN, Zhang X, White CE, Bourg IC, *In-situ mineral probes of local fluid-mineral interactions in soils*, Goldschmidt 2022, Honolulu, Hawaii, USA, 11-15 July 2022

(13) Romero Millan LM, Ghogia A, White CE, Nzihou A, *New approaches in assessing the structure of catalyst enhanced graphitic renewable carbons*, 9th International Conference

on Engineering for Waste and Biomass Valorization, Copenhagen, Denmark, 27-30 June 2022

(14) Bourg I, Wild B, White CE, *Molecular dynamics simulations of reverse osmosis in a silica nanopore*, Ion adsorption and electrokinetic transport at interfaces - CECAM Workshop, Marcoule, France, 4-6 May 2022 (invited)

(15) Porporato A, Bertagni M, Calabrese S, Cipolla G, Wild B, Bourg I, Noto L, White CE, *Promises and challenges of terrestrial enhanced weathering*, Carbon Mitigation Initiative Annual Meeting, London, UK, 27-28 April 2022 (invited)

(16) Curria M, Zheng S, White CE, *Carbon capture materials*, Carbon Mitigation Initiative Annual Meeting, London, UK, 27-28 April 2022 (invited)

(17) Zheng S, Song C, Curria M, Ren Z, White CE, Ca-based layered double hydroxides loaded carbon filters for carbon capture, ACS Spring 2022, San Diego, California, USA, 20-24 March 2022

(18) Pu C, Gong K, White CE, *Influence of cation doping on the sulfuric acid resistance of alkali-activated metakaolin*, 75th RILEM Annual Week, virtual, 30 August – 2 September 2021

(19) Wild B, White CE, Bourg I, *Molecular dynamics simulation of water and ion permeation across silica nanopores in the context of silicate weathering*, Goldschmidt 2021, virtual, 4-9 July 2021

(20) Zhang Y, Pu C, White CE, *Top-down synthesis of nano zeolite a as seeding agent in alkali-activated binders*, 11th Advances in Cement-based Materials, virtual, 23-25 June 2021

(21) Alventosa K, Pu C, White CE, Impact of calcium hydroxide and nanozeolites on the reaction kinetics and formation mechanisms of alkali-activated aluminosilicate binders, 8th International Conference on Engineering for Waste and Biomass Valorization, virtual, 31 May – 4 June 2021

(22) McCaslin E, White CE, *Accelerated carbonation of alkali-activated blast furnace slag cement: The mitigating effects of magnesium and silica investigated using spatially-resolved X-ray scattering and fluorescence*, International Conference on Accelerated Carbonation for Environmental and Material Engineering, virtual, 16-19 May 2021

(23) Porporato A, Bertran M, Calabrese S, Cipolla B, Wild B, Bourg I, NotoV, White CE, *Promises and challenges of enhanced weathering and other soil amendments*, Carbon Mitigation Initiative Annual Meeting, virtual, 20-21 April 2021 (invited)

(24) Abdelkawy A, White CE, Youssef M, *Computational study of ion binding mechanisms to alkali activated materials using molecular simulation*, 2021 MRS Spring Meeting & Exhibit, virtual, 17-23 April 2021

(25) Curria M, White CE, *Synthesis and characterization of Ca-based layered double hydroxides as solid sorbents for carbon capture*, GHGT-15, virtual, 15-18 March 2021

(26) Wild B, White CE, Bourg IC, *Coupled fluxes of water and ions (NaCl) during flow through silica nanopores* 261st American Chemical Society National Meeting & Exposition, virtual, 5-16 March 2021 (invited talk for Bourg)

(27) Armstrong M, Feng J, Markwalter CE, Tian C, Ristroph KD, Wang LZ, Yang J, Du H, Lin H, He F, Jiang S, Panmai S, Ramachandruni H, Zhang Y, McManus SA, **Gong K**, White

CE, Rawal A, Prud'homme RK, *Formulation, stability, and scalability of fast-releasing lumefantrine nanoparticles for the treatment of malaria*, AIChE Annual Meeting, virtual, 16-20 November 2020

(28) Wild B, White CE, Bourg IC, *Multi-scale transport and textural properties of Si-rich amorphous interfacial layers*, Glass and Optical Materials Division Annual Meeting (GOMD), virtual, 3-5 August 2020 (invited talk for postdoc)

(29) Wild B, White CE, Bourg IC, *Multiscale investigation of fluid-silicate interfaces and their control on dissolution kinetics*, Goldschmidt 2020, virtual, 21-26 June 2020

(30) White CE, Yang K, *Dominant reactions and potential reaction pathways in the CaO-(Na_2O)-SiO_2-(Al_2O_3)-H_2O system prior to nucleation and growth*, 259th American Chemical Society National Meeting & Exposition, virtual, 22-26 March 2020. Cancelled (did not present at virtual meeting)

(31) Wild B, White CE, Bourg IC, *Control of the macroscopic dissolution rates of silicate materials by nanoporous interfacial layers,* 259th American Chemical Society National Meeting & Exposition, virtual, 22-26 March 2020

(32) Pu CA, White CE, *Influence of nanozeolites on the alkali-activation of metakaolin*, Gordon Research Conference: Advanced Materials for Sustainable Infrastructure Development, Ventura, California, USA, 23-28 February 2020 (Poster)

(33) Curria M, White CE, *Novel sorbents for carbon capture: synthesis and characterization of Ca-based layered double hydroxides,* GRC Chemical Separations: Separations Breakthroughs for Commodity and Specialty Chemicals, Environmental Science and Analytical Chemistry, Galveston, Texas, USA, 26-31 January 2020 (Poster)

(34) McCaslin E, White CE, *Pair distribution function computed tomography to investigate the local atomic structure of carbonated alkali-activated slag paste*, MS&T 2019 Annual Meeting and Exhibition, Portland, Oregon, USA, 29 September - 3 October 2019

(35) Alventosa K, White CE, *Atomic structural evolution of calcium-containing alkali-activated metakaolin exposed to fire conditions*, 6th International Workshop on Concrete Spalling due to Fire Exposure, Sheffield, UK, 19-20 September 2019

(36) Wild B, Koishi A, Fernandez-Martinez A, Daval D, White CE, Bourg I, *Control of silicate-fluid interactions by nanoporous interfacial systems*, Goldschmidt 2019, Barcelona, Spain, 18-23 August 2019

(37) 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

(38) Gong K, White CE, *Unveiling the atomic structure of ground granulated blast-furnace slag by combining multiple computational tools with X-ray and neutron scattering*, 10th Advances in Cement-Based Materials, University of Illinois at Urbana-Champaign, Urbana, USA, 16-18 June 2019

(39) Gong K, White CE, *Tailoring slag chemistry to achieve superior resistance to sulfate attack for alkali-activated slags*, 10th Advances in Cement-Based Materials, University of Illinois at Urbana-Champaign, Urbana, USA, 16-18 June 2019 (Poster)

(40) Pu CA, White CE, *Influence of nanoparticles on the gel structure of metakaolin-based geopolymers*, 10th Advances in Cement-Based Materials, University of Illinois at Urbana-Champaign, Urbana, USA, 16-18 June 2019 (Poster)

(41) Gong K, Ozcelik VO, White CE, *Modeling the structure of quaternary CaO-MgO-Al_2O_3-SiO_2 glass by combining multiple computational tools with X-ray and neutron scattering,* 25th International Congress on Glass (ICG 2019), Boston, USA, 9-14 June 2019

(42) Curria M, White CE, *Carbon capture using monolayer calcium hydroxide: Simulations and Experiments*, Gordon Research Conference: Carbon Capture, Utilization and Storage, Les Diablerets, Switzerland, 5-10 May 2019 (Poster)

(43) Ozcelik VO, Garg N, White CE, *Symmetry induced stability in alkali doped calcium-silicate-hydrate,* 257th American Chemical Society National Meeting & Exposition, Orlando, USA, 31 March – 4 April 2019

(44) Wild B, White CE, Bourg IC, *Impact of pore-scale processes on silicate dissolution kinetics*, American Geophysical Union Fall Meeting, Washington DC, USA, 10-14 December 2018

(45) McCaslin E**,** White CE, *Pair distribution function computed tomography analysis of the local atomic structure of carbonated alkali-activated slag paste*, MS&T 2018 Annual Meeting and Exhibition, Columbus, Ohio, USA, 14-18 October 2018

(46) Gong K**,** Cheng YQ, Daemen LL, White CE, *In situ quasi-elastic neutron scattering study on the water dynamics during formation of sustainable cements*, MS&T 2018 Annual Meeting and Exhibition, Columbus, Ohio, USA, 14-18 October 2018

*Diamond Ranking for the 2018 GEM Award Finalists – ACerS Basic Science Division

(47) Gong K, White CE, *X-ray pair distribution function analysis of the chemically induced degradation in alkali-activated slags,* MS&T 2018 Annual Meeting and Exhibition, Columbus, Ohio, USA, 14-18 October 2018 (Poster)

*3rd place for the Graduate Student Poster Contest

(48) Gong K**,** Cheng YQ, Daemen LL, White CE, *In situ quasi-elastic neutron scattering analysis on the water dynamics during formation of alkali-activated cements*, Gordon Research Conference: Advanced Materials for Sustainable Infrastructural Development, Hong Kong, China, 5-10 August 2018 (Poster)

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

(50) Garg N, White CE, *Effect of alkalis on the atomic structure of C-S-H: Insights from X-ray PDF and NMR*, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018

(51) Alventosa K, White CE, *The effects of calcium and activator solution chemistry on alkali-activated metakaolin pastes*, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018 (Poster)

(52) Gong K, White CE, *Chemical degradation mechanisms in alkali-activated slags exposed to sulfate attack*, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018 (Poster)

*Won a best poster prize

(53) Gong K, White CE, *In situ quasi-elastic neutron scattering study on the water dynamics during formation of alkali-activated slags*, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018

(54) McCaslin E, White CE, *Pair distribution function computed tomography analysis of the local atomic structure of carbonated alkali-activated slag paste*, 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018

(55) Yang K, Özçelik VO, Garg N, Gong K, White CE, *Drying-induced atomic structural rearrangements in alkali-activated materials and the mitigating effects of nanoparticles,* 9th Advances in Cement-Based Materials, University Park, Pennsylvania, USA, 11-12 June 2018

(56) Yang K, Özçelik VO, Garg N, Gong K, White CE, *Drying-induced atomic structural rearrangements in alkali-activated materials and the mitigating effects of nanoparticles*, Engineering Mechanics Institute Conference, Cambridge, Massachusetts, USA, 29 May - 1 June 2018

(57) Garg N, White CE, *Retardation in alkali-activated materials via zinc oxide: Mechanism and implications*, Alkali Activated Materials and Geopolymers: Versatile Materials Offering High Performance and Low Emissions, Tomar, Portugal, 27 May – 1 June 2018

(58) Özçelik VO, Gong K, White CE, *Computational design of defect-engineered $Ca(OH)_2$ monolayer for CO_2 capture*, 255th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, USA, 18-22 March 2018

(59) Özçelik VO, Gong K, White CE, *Computational design of defect-engineered $Ca(OH)_2$ monolayer for CO_2 capture*, APS March Meeting 2018, Los Angeles, California, USA, 5-9 March 2018

(60) Garg N, White CE, *Impact of nano-sized additives on the atomic structure and reaction kinetics of alkali-activated slag*, 37th Cement and Concrete Science Conference, London, UK, 11-12 September 2017

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

(62) Gong K, Özçelik VO, White CE, *Modeling the local structure of ground granulated blast-furnace slag by combining multiple computational tools*, 8th Advances in Cement-Based Materials, Atlanta, Georgia, USA, 26-28 June 2017 (Poster)

*Won a best poster award

(63) Gong K, White CE, *Mechanisms of sulfate attack in alkali-activated slag*, 8th Advances in Cement-Based Materials, Atlanta, Georgia, USA, 26-28 June 2017

(64) McCaslin E, White CE, *Characterization of amorphous calcium carbonate and pore solution during accelerated carbonation of alkali-activated slag*, 8th Advances in Cement-Based Materials, Atlanta, Georgia, USA, 26-28 June 2017

(65) Gong K, White CE, *Modeling the atomic structure of calcium aluminosilicate glasses using an iterative simulation-experiment methodology*, 12th Pacific Rim Conference on Ceramic

and Glass Technology, including Glass & Optical Materials Division Meeting, Waikoloa, Hawaii, USA, 21-26 May 2017

(66) Yang K, White CE, *Modeling the formation of sodium and calcium aluminosilicate gels at the mesoscale using coarse-grained Monte Carlo*, 12th Pacific Rim Conference on Ceramic and Glass Technology, including Glass & Optical Materials Division Meeting, Waikoloa, Hawaii, USA, 21-26 May 2017 (Poster)

(67) McCaslin E, White CE, *Role of magnesium and amorphous calcium carbonate in reducing the extent of carbonation degradation in silicate-activated slag pastes*, 12th Pacific Rim Conference on Ceramic and Glass Technology, including Glass & Optical Materials Division Meeting, Waikoloa, Hawaii, USA, 21-26 May 2017

(68) Garg N, White CE, *Impact of alkalis on the atomic structure of calcium aluminosilicate gels: An x-ray pair distribution function investigation*, 253rd American Chemical Society National Meeting & Exposition, San Francisco, California, USA, 2-6 April 2017

(69) Yang K, White CE, *Modeling the formation of sodium and calcium aluminosilicate gels at the mesoscale using coarse-grained Monte Carlo*, 253rd American Chemical Society National Meeting & Exposition, San Francisco, California, USA, 2-6 April 2017

(70) Özçelik VO, White CE, *Nanoscale charge balancing mechanism in alkali substituted C-S-H gels from first-principles calculations*, 253rd American Chemical Society National Meeting & Exposition, San Francisco, California, USA, 2-6 April 2017

(71) Özçelik VO, White CE, *Nanoscale charge balancing mechanism in calcium-silicate-hydrate gels: Novel complex disordered materials from first-principles*, APS March Meeting 2017, New Orleans, Louisiana, USA, 13-17 March 2017

(72) Gong K, Özçelik VO, White CE, *Modeling the local structure of amorphous materials: A density functional theory investigation*, APS March Meeting 2017, New Orleans, Louisiana, USA, 13-17 March 2017 (Poster)

(73) Dutta R, Stan CV, White CE, Duffy TS, *Theoretical study of the high-pressure isosymmetric phase transition in lead fluoride, PbF_2*, American Geophysical Union Fall Meeting, San Francisco, USA, 12-16 December 2016 (Poster)

(74) Blyth AC, Özçelik VO, Eiben CA, Scherer GW, White CE, *Permeability and gel stability of alkali-activated materials*, American Concrete Institute Convention, Philadelphia, Pennsylvania, USA, 23-27 October 2016

(75) Garg N, White CE, *Impact of nanoparticles on the atomic ordering of C-S-H and C-(N)-A-S-H gels: New insights from synchrotron X-rays*, Gordon Research Conference: Advanced Materials for Sustainable Infrastructure Development, Hong Kong, China, 31 July - 5 August 2016 (Poster)

(76) McCaslin E, White CE, *Development of carbonation resistant low-CO_2 cements*, Gordon Research Conference: Advanced Materials for Sustainable Infrastructure Development, Hong Kong, China, 31 July - 5 August 2016 (Poster)

(77) White CE, Olds DP, Hartl MA, Hjelm RP, Page K, *Quantifying the pore structure evolution in sustainable cements using in situ small-angle neutron scattering analysis*, American Conference on Neutron Scattering, Long Beach, California, USA, 10-14 July 2016

(78) Garg N, White CE, *Impact of nanoparticles on the atomic ordering of C-S-H and C-(N)-A-S-H gels: New insights from synchrotron X-rays*, 7th Advances in Cement-Based Materials, Evanston, Illinois, USA, 10-13 July 2016

(79) Blyth A, Eiben CA, Scherer GW, White CE, *Impact of curing time and activator chemistry on the intrinsic permeability of alkali-activated pastes*, 6th International Conference on Engineering for Waste and Biomass Valorization, Albi, France, 23-26 May 2016

(80) Yang K, 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 Valorization, Albi, France, 23-26 May 2016 (Poster)

*Won a best poster prize

(81) Gong K, White CE, *Modeling the local structure of ground granulated blast-furnace slags: A density functional theory investigation*, 6th International Conference on Engineering for Waste and Biomass Valorization, Albi, France, 23-26 May 2016

(82) Nigay P-M, White CE, Soboyejo W, Nzihou A, *Effect of organics addition in a clay ceramic for the storage of thermal energy*, 6th International Conference on Engineering for Waste and Biomass Valorization, Albi, France, 23-26 May 2016

(83) Ducousso M, Lyczko N, White CE, Morandeau A, Nzihou A, *Local atomic structure of biochars: An X-ray pair distribution function investigation*, 6th International Conference on Engineering for Waste and Biomass Valorization, Albi, France, 23-26 May 2016 (Poster)

(84) Özçelik VO, White CE, *Nanoscale properties and stability simulations of alkali activated cement pastes from first principle calculations*, APS March Meeting 2016, Baltimore, Maryland, USA, 14-18 March 2016 (Poster)

(85) White CE, *Elucidating the atomic structure of synthetic calcium-silicate-hydrate gels using neutron pair distribution function analysis*, Concrete 2015, Melbourne, Victoria, Australia, 30 August – 2 September 2015

(86) White CE, *Thermal and chemical stability of calcium-silicate-hydrate gel*, Goldschmidt 2015, Prague, Czech Republic, 16-21 August 2015

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

(88) Gong K, White CE, *Impact of the mineralogy and local atomic structure of neat slags on the phase formation in alkali-activated slag pastes*, 6th Advances in Cement-Based Materials, Manhattan, Kansas, USA, 20-22 July 2015 (Poster)

*Won a best poster prize

(89) Blyth A, Eiben CA, Scherer GW, White CE, *Impact of curing time and activator chemistry on the intrinsic permeability of alkali-activated pastes*, 6th Advances in Cement-Based Materials, Manhattan, Kansas, USA, 20-22 July 2015 (Poster)

(90) Morandeau AE, White CE, *Carbonation of calcium-silicate-hydrate gel: Elucidation of atomic structure mechanisms and reaction kinetics using pair distribution function analysis*, Fifth International Conference on Accelerated Carbonation for Environmental and Material Engineering, New York City, New York, US, 21-24 June 2015

(91) White CE, Daemen LL, Hartl M, Page K, *Nanoscale ordering in conventional and alternative cementitious materials*, Engineering Mechanics Institute Conference, Stanford, California, USA, 16-19 June 2015

(92) Morandeau A, Fitts JP, Myneni S, White CE, *Controlling microcracking in low embodied energy concrete*, Princeton E-ffiliates Partnership Third Annual Meeting, Princeton, New Jersey, USA, 14 November 2014

(93) Morandeau A, Thiéry M, Dangla P, White CE, *Accelerated carbonation modelling of fly as blended cement paste*, RILEM International Symposium on Concrete Modelling, Beijing, China, 12-14 October 2014

(94) Eiben C, Scherer GW, White CE, *Elucidating the intrinsic permeability of alkali-activated slag cement using the beam-bending method*, 5th Advances in Cement-based Materials: Characterization, Processing, Modeling and Sensing, Cookeville, Tennessee, USA, 9-11 July 2014

(95) White CE, Provis JL, Riley DP, Proffen Th, Perander LM, van Deventer JSJ, *Characterisation and description of the structure of metakaolin by total scattering, density functional theory, and X-ray spectroscopy,* Concrete Repair, Rehabilitation and Retrofitting III - Proceedings of the 3rd International Conference on Concrete Repair, Rehabilitation and Retrofitting, ICCRRR 2012, **2012** 1426-1432 (Cape Town, South Africa, 3-5 September 2012)

(96) Provis JL, Hajimohammadi A, White CE, Bernal SA, Myers RJ, Winarski RP, Rose V, Proffen T, Llobet A, van Deventer JSJ, *Nanostructural characterization of geopolymers by advanced beamline techniques*, 4th International Symposium on Nanotechnology in Construction, Agios Nikolaos, Crete, Greece, 20-22 May 2012

(97) White CE, Bloomer B, Provis JL, Henson NJ, Page K, *The synergy between total scattering and advanced simulation techniques: Quantifying geopolymer gel evolution*, 4th International Symposium on Nanotechnology in Construction, Agios Nikolaos, Crete, Greece, 20-22 May 2012

(98) White CE, *The PDF-DFT synergy for metastable materials: How to obtain structural representations that are energetically favorable*, American Crystallographic Association meeting 2011, New Orleans, Louisiana, USA, 28 May - 2 June 2011

(99) White CE, *The role of total scattering and multiscale modeling in the technological development of geopolymer concrete*, American Crystallographic Association meeting 2011, New Orleans, Louisiana, USA, 28 May - 2 June 2011

(100) White CE, Provis JL, Henson NJ, Page K, Proffen T, van Deventer JSJ, *Multiscale modeling of the structural mechanisms occurring during the formation of geopolymer binders: combining density functional theory and Monte Carlo analysis*, American Crystallographic Association meeting 2011, New Orleans, Louisiana, USA, 28 May - 2 June 2011 (Poster)

(101) White CE, Provis JL, Proffen T, Riley DP, van Deventer JSJ, *Solving the structure of amorphous aluminosilicates: understanding the chemistry of low-CO2 geopolymer concrete*, LANSCE User Group Meeting, Santa Fe, New Mexico, USA, Sept 30 - Oct 1 2009 (Poster)

(102) White CE, Provis JL, Riley DP, Proffen T, van Deventer JSJ, *Towards total structure solutions of disordered layered aluminosilicates*, International Conference on Neutron Scattering 2009, Knoxville, Tennessee, USA, 3-7 May 2009.

(103) White CE, Provis JL, Riley DP, Proffen T, van Deventer JSJ, *Structure of metakaolin from neutron pair distribution function analysis*, 7th AINSE/ANBUG Neutron Science Symposium 2008, Lucas Heights, NSW, Australia, 8-10 Dec 2008.

(104) White CE, Provis JL, Riley DP, Proffen T, van Deventer JSJ, *Towards the total structure solution of metakaolin*, Materials Science & Technology Conference 2008, Pittsburgh, Pennsylvania, USA, 4-9 Oct 2008

(105) Duxson P, Gehman JD, White CE, Provis JL, Separovic F, Gan Z, van Deventer JSJ, *^{17}O MQMAS NMR characterization of geopolymers*, Chemeca 2007, Melbourne, Victoria, Australia, 24-26 Sept 2007

TALKS AT SHORT COURSES AND RELATED EVENTS

White CE, Invited presentation for the event organized by Corporate Engagement and Foundation Relations at Princeton University, titled *Smart Cities: Building the future – New technological frontiers in cities,* 6 May 2019

White CE, *Structure, stability and formation rates of the main binder gels in alkali-activated materials,* invited lecture for the ARC Nanocomm Hub short course on Microstructure - Neutron/X-ray-CT and Australian Synchrotron at Monash University, Clayton, Victoria, Australia, 17 August 2018

White CE, *Alternative cements: Combining modeling and experiments,* invited lecture for the Service-life Prediction of Concrete Doctoral Short Course at Oregon State University, Corvallis, Oregon, USA, 9-14 July 2017

White CE, *CAREER: SusChEM: Controlling carbonation degradation in sustainable cements by stabilizing amorphous calcium carbonate*, speaker at the 2017 NSF Career Development Workshop in Ceramics, Waikoloa, Hawaii, USA, 20-21 May 2017

White CE, *Designing sustainable cementitious materials for a sustainable future*, presenter at the Andlinger Center for Energy and the Environment Building Opening Celebration and Symposium, Princeton, USA, 20 May 2016

White CE, *Short-range correlations using PDF*, lecturer at the 11th LANSCE School on Neutron Scattering, Los Alamos, USA, 18-27 February 2015

White CE, *The role of molecular research in tailoring geopolymer durability*, postdoc talk at the Center for Nonlinear Studies, Los Alamos National Laboratory, New Mexico, USA, April 2011

White CE, Provis JL, Proffen T, Riley DP, van Deventer JSJ, *The PDF-DFT synergy for metastable materials: How to obtain structural representations that are energetically favorable*, invited lecture at *Applications of neutron scattering to materials and earth sciences* workshop, University of California, Berkeley, 11 December 2010.

PATENT APPLICATIONS

- Provisional patent: "Direct precipitation of calcium-based layered double hydroxides", 2021

- Provisional patent: "Electrodeposited layered double hydroxide", 2021
- Provisional patent: "Nanoparticles to mitigate microcracking in alkali-activated materials",

EDITORIAL ACTIVITIES

- Editor – Cement (Elsevier, 2020 - present)
- Editor – Journal of Sustainable Cement-based Materials (Taylor Francis, 2020 - present)
- Scientific Advisory Board member – Waste and Biomass Valorization (Springer, 2016 - present)

PROFESSIONAL MEMBERSHIPS

- Member of the American Society of Civil Engineers
  - Member of Properties of Materials committee within the Engineering Mechanics Institute
- Voting member of ASTM International
- Member of RILEM
  - Member of the Technical Committees: 247-DTA, 238-SCM and 283-CAM
- Member of the American Ceramic Society
- Member of the American Chemical Society

UNIVERSITY SERVICE AND PROFESSIONAL ACTIVITIES

Outside University

- Co-author of American Concrete Institute Committee 242, Report on Alkali-activated Concrete, 2022
- Scientific member of INNOVANDI (the Global Cement and Concrete Research Network) by invitation. Consists of 30 companies from across the cement and concrete industry, including cement and concrete manufacturers, admixture specialists, equipment and technology suppliers, along with 40 scientific institutions. 2020 – present
- Team member of the CUPI^{2}D Instrument Concept (neutron imaging beamline) for the Second Target Station, Oak Ridge National Laboratory, 2020 – present
- Core Competency Advisory Board member, NETL-Penn State University Coalition for Fossil Energy Research, 2020 – present
- Chair of the NIST Center for Neutron Research (NCNR) User Group Executive Committee, National Institute of Standards and Technology, 2021 – present, (vice-Chair 2019-2021)
- Member of the Advisory Board for CLEANKER project, funded by HORIZON2020 (European Union), 2018 – 2020
- Co-chair of the Environmental Science breakout sessions at the "Science at the Second Target Station Workshop", Oak Ridge National Laboratory, 2019
- Chair of the SNS-HFIR User Group, Oak Ridge National Laboratory, 2015-2016

- Vice-chair of the SNS-HFIR User Group, Oak Ridge National Laboratory, 2013-2015
- Reviewer for Department of Energy Office of Technology Transitions: Technology Commercialization Fund
- National Science Foundation proposal reviewer
- CASIS ad-hoc reviewer
- German Research Foundation (DFG) review panelist
- PhD thesis examiner for international universities
- Reviewer of beamtime proposals at Oak Ridge National Laboratory, National Institute of Standards and Technology, Brookhaven National Laboratory

University Service

- President's Advisory Committee on Architecture (2022 – present)
- Committee member of the Committee on the Course of Study (2022 - 2023)
- Member of oversight group for 1st year EGR courses (2021 – present)
- Member of ACEE Director search committee (2021/2022)
- Acting associate director for research, Andlinger Center for Energy and the Environment (Sept 2020 – Apr 2021)
- Member of PRISM faculty search committee (2020/2021)
- ABET assessment department coordinator (2020 – present)
- Member, MAE/ACEE tenure committee (Fall 2020)
- Member, ACEE Executive Committee (2019 – present)
- Member, Program in Sustainable Energy (2015 – present)
- Member, MSE Executive Committee (PRISM) (2017 – present)
- Freshmen Advising (2014/2015 – 2018/2019, 2020/2021, 2022/2023)
- Faculty advisor for the Society of Women Engineers (SWE) (2016 - present)
- Faculty advisor for Graduate Women in Science and Engineering (GWiSE) (2015 - present)
- Member of the search committee for the Associate Laboratory Director, Princeton Plasma Physics Laboratory (2019)
- Member of CEE faculty search committee (2018/2019)
- Committee chair for reassessment of ACEE Distillates Program (2019)
- Committee member of the Committee on the Course of Study (2015 - 2019)
- Committee member of the Credit Audit Committee (Spring 2018)
- Acting program advisor: Architecture and Engineering Program Track, Department of Civil and Environmental Engineering (Fall 2017)
- Faculty advisor of REU students, via PRISM (2014 - 2018)
- Member, SEAS Self-Study Committee: Facilities & Resources (2014/2015)

- Member, Andlinger-PRISM Equipment Committee (2013 - 2015)
- Faculty organizer of the ACEE Highlight Seminar Series (2015/2016, 2021-present)

K12 Outreach

- Organizer of the K-12 outreach program for the Andlinger Center for Energy and the Environment
- Podcast interview – ATHENA (2020)
- Talks at local high schools
- Host high school students in research group during summer (2014, 2015, 2016)
- Supervise high school research student in research group during academic year (2015/2016)
- Booth at Princeton University's Materials Science NanoDay, 2014, 2015, 2016, 2017, 2018

TEACHING

- CEE 364/ARC364: *Materials in Civil Engineering*, Spring 2014, 2015, 2016, 2017, 2018, 2019, 2021, 2022, 2023
- ENE 506: *Synchrotron and Neutron Techniques for Energy Materials*, Fall 2014, 2015, 2017, 2023, Spring 2020
- ENE 267/MSE287: *Materials for Energy Technologies and Efficiency*, Fall 2016, 2018, 2020, 2022