

# Mija H. Hubler, Ph.D.

Assistant Professor  
Structural Engineering and Structural Mechanics  
Material Science & Engineering  
Department of Civil, Environmental, and Architectural Engineering  
University of Colorado, Boulder

## EDUCATION

**Massachusetts Institute of Technology** Civil Engineering Postdoc June 2013-Dec 2014  
Advisor: Franz-Joseph Ulm  
Project: Developed Micro-scratch test to measure toughness of shale and an X-ray imaging and analysis method to evaluate maturity of the rock

**Northwestern University** Civil Engineering PhD 2013  
Advisor: Zdeněk Bažant  
Thesis: Improved Prediction Models of Creep, Shrinkage, and Relaxation of Modern Concretes

**Cornell University** Civil Engineering MS 2009  
Advisor: Christopher Earls  
Thesis: Acoustic Finite Element Modeling of An Immersed Structure

**University of Illinois, Urbana-Champaign** Civil Engineering BS with Honors 2006  
Major Concentration: Structural Engineering  
Minor Concentration: Transportation Engineering

## EMPLOYMENT HISTORY

University of Colorado, Boulder, CO: Assistant Professor, 2015 - present  
F.H. Paschen/S.N. Nielsen, Chicago IL: Construction Management Intern, May-Aug 2005  
Architectural Alliance Inc., Santa Fe, NM: Architect Intern, May-Aug 2004  
Co-Founder and Chief Engineering Advisor, Prometheus Materials, Inc., 2021 - present

## AWARDS AND HONORS

Faculty Leadership Institute Member, 2022  
CU Boulder RIO Faculty Fellow, 2022  
NSF Early CAREER Award, 2022  
Leonardo Da Vinci Award, ASCE Engineering Mechanics Institute 2020  
Gustavo Colonnetti Medalist, RILEM 2020  
Departmental Young Researcher Award, CU, Boulder 2019  
Research Fellowship, Northwestern University, 2012  
Walter P. Murphy Fellowship, Northwestern University, 2009  
Earle J. Wheeler Scholarship, University of Illinois, 2005  
Dean's List Academic Honors, University of Illinois, 2002, 2004, and 2006

## PUBLICATONS

Underline Denotes current and former students or post-doctoral advisee

\* Denotes corresponding author

### *Refereed Journal Articles Published*

- J1. B. Hedegaard, T. Clement, **M. H. Hubler**, "Coupled Pore Relative Humidity Model for Concrete Shrinkage and Creep" *ACI Materials Journal*, *Awaiting online publication date*.
- J2. P. Dixon, T. Tafsirojjaman, J. Klingaman, **M. H. Hubler**, S. Dashti, T. O'Rourke, K. Farrag, A. Manalo, B. Wham, "State-of-the-Art Review of Performance Objectives for Legacy Gas Pipelines with Pipe-in-Pipe Rehabilitation Technologies," *Journal of Pipeline Systems Engineering and Practice*, 2022. <https://doi.org/10.1061/JPSEA2.PSENG-1371>
- J3. L. Li, B. Wang, **M. H. Hubler**, "Carbon nanofibers (CNFs) dispersed in ultra-high performance concrete (UHPC): Mechanical property, workability and permeability investigation" *Cement and Concrete Composites*, 2022. <https://doi.org/10.1016/j.cemconcomp.2022.104592>
- J4. L. Li, Y. Zhang, **M. H. Hubler**, Y. Xi\*, "Experimental Study on Nanoparticle Injection by Using a Lab-scale Wellbore System" *Cement and Concrete Composites*, 2022. <https://doi.org/10.1016/j.cemconcomp.2022.104409>
- J5. **M. H. Hubler\*** and Z. Alquraini, "Working with Randomness: A Perspective on Using Spatial Statistics to Engineer the Mechanics of Heterogenous Materials," *Mechanics Research Communications*, 2021. <https://doi.org/10.1016/j.mechrescom.2021.103788>
- J6. L. Li, Y. Zhang, **M. H. Hubler**, and Y. Xi\*, "Experimental Study on Nanoparticle Injection Technology for Remediating Leaks of Gas Storage and Transportation," *Journal of Petroleum Science and Engineering*, 2021. <https://doi.org/10.1016/j.petrol.2021.108829>
- J7. L. Li, M. Abdelrahman, **M. H. Hubler**, Y. Xi\*, "Numerical Modeling of the Injection of Nanoparticles in Saturated Cementitious Material by Electromigration," *Journal of Engineering Mechanics*, 2021. [https://doi.org/10.1061/\(ASCE\)EM.1943-7889.0001954](https://doi.org/10.1061/(ASCE)EM.1943-7889.0001954)
- J8. J. Qiu, J. Artier, S. M. Cook, W. V. Srubar III, J. C. Cameron\*, **M. H. Hubler\***, "Engineering Living Building Materials (LBMs) towards Enhanced Bacterial Viability and Mechanical Properties," *iScience*, 2021. <https://doi.org/10.1016/j.isci.2021.102083>
- J9. L. Li, **M. H. Hubler**, and Y. Xi\*, "Theoretical Modeling on Chemical Composition and Mechanical Properties of Well Cement under Carbonation Reactions," *Journal of Cleaner Production*, 2020. <https://doi.org/10.1016/j.jclepro.2020.124270>
- J10. **M. H. Hubler\***, S. Al Wakeel, and B. Wang, "Improving Concrete Toughness by Aggregate Arrangement," *RILEM Technical Letters*, 5, 2020. <https://doi.org/10.21809/rilemtechlett.2020.109>
- J11. Y. Zhang, L. Li, Y. Xi, and **M. H. Hubler\***, "Experimental and theoretical study of the restrained shrinkage cracking of early age well cement," *Construction and Building Materials*, 11, 2020. <https://doi.org/10.1016/j.conbuildmat.2020.120368>

- J12. Y. Zhang and **M. H. Hubler\***, “The role of early drying cracks in the shrinkage size effect of cement paste,” *Journal of Engineering Mechanics*, 2020. [https://doi.org/10.1061/\(ASCE\)EM.1943-7889.0001861](https://doi.org/10.1061/(ASCE)EM.1943-7889.0001861)
- J13. L. Li, **M. H. Hubler**, and Y. Xi\*, “Modelling the Corrosion of Steel Casing and the Damage of Well Cement in a Borehole System,” *Construction and Building Materials*, 259, 119701. 2020. <https://doi.org/10.1016/j.conbuildmat.2020.119701>
- J14. C. M. Heveran, S. L. Williams, J. Qiu, J. Artier, **M. H. Hubler**, S. M. Cook, J. C. Cameron, and W. V. Srubar III\*, “Biom mineralization and Successive Regeneration of Engineered Living Building Materials.” *Matter*, 2 (2), 481-494. 2020. <https://doi.org/10.1016/j.matt.2019.11.016>
- J15. P. S. Baqué and **M. H. Hubler\***, “Particle spatial arrangement metrics for near-crack-tip stress,” *Theoretical and Applied Fracture Mechanics*, 104, 102386. 2019. <https://doi.org/10.1016/j.tafmec.2019.102386>.
- J16. C. M. Heveran\*, L. Liang, A. Nagarajan, **M. H. Hubler**, R. Gill, R. J. Cameron, S. M. Cook, and W. V. Srubar, “Engineered Ureolytic Microorganisms Can Tailor the Morphology and Nanomechanical Properties of Microbial-Precipitated Calcium Carbonate.” *Scientific Reports*, 9, 1-13. 2019. <https://doi.org/10.1038/s41598-019-51133-9>
- J17. L. D. Montoya\*, H. K. Gadde, W. M. Champion, N. Li, and **M. H. Hubler**. “PM2.5 generated during rapid failure of fiber-reinforced concrete induces TNF-alpha response in macrophages.” *Science of The Total Environment*, 690, 209-216. 2019. <https://doi.org/10.1016/j.scitotenv.2019.06.535>
- J18. S. Al Wakeel, J. Němeček, L. Li, Y. Xi, and **M. H. Hubler\***. “The effect of introducing nanoparticles on the fracture toughness of well cement,” *International Journal of Greenhouse Gas Control*, 84, 147-153. 2019. <https://doi.org/10.1016/j.ijggc.2019.03.009>
- J19. L. Liang\*, C. M. Heveran, R. Liu, R. T. Gill, A. Nagarajan, J. Cameron, **M. H. Hubler**, W. V. Srubar III, and S. M. Cook\*. “Rational control of calcite precipitation by engineered *Sscherichia coli*.” *ACS Synthetic Biology*, 7 (11), 2497-2506. 2018. <https://doi.org/10.1021/acssynbio.8b00194>.
- J20. S. Al Wakeel, F. Ghanbari, and **M. H. Hubler\***. “Particle arrangement effects on the stress intensity in composite material.” *Engineering Fracture Mechanics*, 202, 33-46. 2018. <https://doi.org/10.1016/j.engfracmech.2018.09.014>.
- J21. S. Al Wakeel, and **M. H. Hubler\***. “Introducing heterogeneity into the micro-scratch test fracture toughness relation for brittle particle composites,” *Experimental Mechanics*, 58, 1127-1247. 2018. <https://doi.org/10.1007/s11340-018-0408-1>.
- J22. S. Monfared\*, H. Laubie, F. Radjai, **M. H. Hubler**, R. Pellenq, and F.-J. Ulm. “A methodology to calibrate and to validate effective solid potentials of heterogeneous porous media from computed tomography scans and laboratory-measured nanoindentation data,” *Acta Geotechnica*, 13(6). 1369-1394. 2018. <https://doi.org/10.1007/s11440-018-0687-9>.

- J23. E. W. Heichelheim, L. D. Montoya, and **M. H. Hubler\***. "Aerosol generation in compressive concrete fragmentation," *Construction and Building Materials*, 155, 1039-1049. 2017. <https://doi.org/10.1016/j.conbuildmat.2017.08.113>.
- J24. **M. H. Hubler\***, J. Gelb, and F.-J. Ulm. "Microtexture analysis of gas shale by XRM imaging," *Journal of Nanomechanics and Micromechanics*, 7(3), 04017005. 2017. [https://doi.org/10.1061/\(ASCE\)NM.2153-5477.0000123](https://doi.org/10.1061/(ASCE)NM.2153-5477.0000123).
- J25. **M. H. Hubler\***, F.-J. Ulm. "Size Effect Law for Scratch Tests of Axisymmetric Shape," *Journal of Engineering Mechanics*. 142(12), 04016094. 2016. [https://doi.org/10.1061/\(ASCE\)EM.1943-7889.0001159](https://doi.org/10.1061/(ASCE)EM.1943-7889.0001159).
- J26. Q. Yu, J.-L. Le, **M. H. Hubler**, R. Wendner, G. Cusatis, and Z. P. Bažant\*, "Comparison of Main Models for Size Effect on Shear Strength of Reinforced and Prestressed Concrete Beams" *Structural Concrete*. 17(5), 778-789. 2016. <https://doi.org/10.1002/suco.201500126>.
- J27. RILEM TC-242-MDC, "RILEM draft recommendation: TC-242-MDC multi-decade creep and shrinkage of concrete: material model and structural analysis\*," *RILEM Materials and Structures*, 48(4), 753-770. 2015. <https://doi.org/10.1617/s11527-014-0485-2>.
- J28. R. Wendner, **M. H. Hubler**, and Z. P. Bažant\*, "Optimization method, choice of form and uncertainty quantification of Model B4 using laboratory and multi-decade bridge databases," *RILEM Materials and Structures*, 4(48), 771-796. 2015. <https://doi.org/10.1617/s11527-014-0515-0>.
- J29. **M. H. Hubler**, R. Wendner, and Z. P. Bažant\*, "Statistical justification of Model B4 for drying and autogenous shrinkage of concrete and comparisons to other models," *RILEM Materials and Structures*, 48(4), 797-814. 2015. <https://doi.org/10.1617/s11527-014-0516-z>.
- J30. R. Wendner, **M. H. Hubler**, and Z. P. Bažant\*, "Statistical justification of model B4 for multi-decade concrete creep using laboratory and bridge databases and comparisons to other models," *RILEM Materials and Structures*, 48(4), 815-833. 2015. <https://doi.org/10.1617/s11527-014-0486-1>.
- J31. **M. H. Hubler**, R. Wendner, and Z. P. Bažant\*, "Comprehensive Database for Concrete Creep and Shrinkage: Analysis and Recommendations for Testing and Recording," *ACI Materials Journal*, 112(4), 547-558. 2015. <http://dx.doi.org/10.14359/51687452>.
- J32. Z. P. Bažant\* and **M. H. Hubler**, "Theory of Cyclic Creep of Concrete Based on Paris Law for Fatigue Growth of Subcritical Microcracks," *Journal of the Mechanics and Physics of Solids*, 63, 187-200. 2013. <https://doi.org/10.1016/j.jmps.2013.09.010>.
- J33. C. Hoover, Z. P. Bažant\*, J. Vorel, R. Wendner, and **M. H. Hubler**, "Comprehensive Concrete Fracture Tests: Description and Results," *Engineering Fracture Mechanics*, 114, 92-103. 2013. <https://doi.org/10.1016/j.engfracmech.2013.08.007>.
- J34. Z. P. Bažant\*, **M. H. Hubler**, and M. Jirásek, "Improved Estimation of Long-Term Relaxation Function from Compliance Function of Aging Concrete," *ASCE Journal of Engineering Mechanics*, 139(2), 146-152. 2013. [https://doi.org/10.1061/\(ASCE\)EM.1943-7889.0000339](https://doi.org/10.1061/(ASCE)EM.1943-7889.0000339).

- J35. Z. P. Bažant\*, Q. Yu, **M. H. Hubler**, V. Křístek, V., and Z. Bittnar, "Wake-up call for creep, myth about size effect and black holes in safety: What to improve in fib model code draft." In *Befestigungstechnik– Bewehrungstechnik* (in honor of Rolf Eligehausen 70<sup>th</sup> birthday), ibidem-Verlag, Stuttgart, W. Fuchs and J. Hofmann, eds., 357-379, 2012. ISBN 978-87158-26-7
- J36. Z. P. Bažant\*, **M. H. Hubler**, and Q. Yu, "Pervasiveness of Excessive Segmental Bridge Deflections: Wake-Up Call for Creep," *ACI Structural Journal*, 108(6), 766-774. 2011.
- J37. Z. P. Bažant\*, **M. H. Hubler**, and Q. Yu, "Excessive Creep Deflections: An Awakening," *Concrete International*, 33(8), 44-46. 2011.
- J38. **M. H. Hubler**, J. J. Thomas\*, and H. M. Jennings, "Influence of nucleation seeding on the hydration kinetics and compressive strength of alkali activated slag paste," *Cement & Concrete Research*, 41(8), 842-846. 2011. <https://doi.org/10.1016/j.cemconres.2011.04.002>.
- J39. B. Shen, **M. H. Hubler**, G. H. Paulino\*, and L. J. Struble, "Functionally-graded fiber-reinforced cement composite: Processing, microstructure, and properties," *Cement & Concrete Composites*, 30(8), 663-673. 2008. <https://doi.org/10.1016/j.cemconcomp.2008.02.002>.

*Peer Reviewed Conference Proceedings:*

- C1. P. Dixon, A. Salah, H. Ahmadi, M. Ulrich, **M. H. Hubler**, S. Dashti, T. O'Rourke, A. Manalo, B. Wham, "An Analytical Approach for Thermally Induced Axial Deformation in Rehabilitated Pipelines," UESI Pipelines Conference.
- C2. D. Culp, M. R. Tupek, P. Newell, **M. H. Hubler**, "Phase-Field Modeling of Fracture in CO<sub>2</sub> Sequestration," American Rock Mechanics Association, *51<sup>st</sup> US Rock Mechanics / Geomechanics Symposium* held in San Francisco, CA, pp. 25-28, ARMA-2017-0644, August 28, 2017.
- C3. S. Al Wakeel, **M. H. Hubler**, "Experimental and theoretical investigation of the fracture behavior of glass beads/epoxy composites using microscratching," In *9<sup>th</sup> International Conference of Fracture Mechanics of Concrete and Concrete Structures*. Pp. 1-11. 2016. DOI 10.21012/FC9.015
- C4. R. Wendner, **M. H. Hubler**, and Z. P. Bažant, "Creep and shrinkage prediction models for concrete: uncertainty quantification," Proceedings of the *11<sup>th</sup> International Probabilistic Workshop*, Nov. 4<sup>th</sup>, 2013 Brno.
- C5. Z. P. Bažant, **M. H. Hubler**, and M. Jirásek, "Improved Estimation of Long-Term Relaxation Function of Aging Concrete from Its Compliance Function," *ConCreep-9*, Sept. 25<sup>rd</sup>, MIT, Cambridge, MA. 2013.
- C6. R. Wendner, **M. H. Hubler**, and Z. P. Bažant, "The B4 model for multi-decade creep and shrinkage prediction," *ConCreep-9*, Sept. 23<sup>rd</sup>, MIT, Cambridge, MA. 2013.
- C7. W. H. Duan, S.J. Chen, **M. H. Hubler**, "Water Sorption Hysteresis in Cement Nano Slits," *ConCreep-9*, Sept. 23<sup>rd</sup>, MIT, Cambridge, MA. 2013.
- C8. Z. P. Bažant, **M. H. Hubler**, R. Wendner, and Q. Yu, "Progress in Creep and Shrinkage Prediction Engendered by Alarming Bridge Observations and Expansion of Laboratory Database," Plenary Lecture, *ConCreep-9*, Sept. 23<sup>rd</sup>, MIT, Cambridge, MA. 2013.

- C9. Z. P. Bažant, **M. H. Hubler**, M. Salviato, “Scaling of Failure Probability of Quasibrittle Structures with Large Cracks.” *11<sup>th</sup> International Conference on Structural Safety and Reliability*, June 16-20, New York, NY. 2013
- C10. R. Wendner, **M. H. Hubler**, Z. P. Bažant, “Recalibration and Uncertainty Quantification of the B3 Creep Model for Long Term Estimates Using Bayesian Methods.” *11<sup>th</sup> International Conference on Structural Safety and Reliability*, June 16-20, New York, NY. 2013
- C11. Z. P. Bažant, **M. H. Hubler**, M. Salviato, K. Kirane, J.-L. Le, “Fracture Scaling and Safety of Quasibrittle Structures: Atomistic Basis, Computational Challenges and New Advances.” *3<sup>rd</sup> International Conference of Computational Modeling of Fracture and Failure of Materials and Structure*, keynote lecture, June 5-7, 2013, Prague, Czech Republic.
- C12. Z. P. Bažant, R. Wendner, **M. H. Hubler**, Q. Yu, “Pervasive lifetime inadequacy of long-span box girder bridges and lessons from multi-decade creep prediction.” *3<sup>rd</sup> International Symposium on Life-Cycle Civil Engineering*, IALCCE, Keynote Lecture, Oct., Vienna 2012.
- C13. Z. P. Bažant, R. Wendner, **M. H. Hubler**, “Model B3.1 for multi-decade concrete creep and shrinkage: Calibration by combined laboratory and bridge data.” *Third International Symposium on Life-Cycle Civil Engineering*, IALCCE, Oct., Vienna 2012.
- C14. C. Hoover, Z. P. Bažant, R. Wendner, J. Vorel, **M. H. Hubler**, et. Al, “Experimental investigation of transitional size effect and crack length effect in concrete fracture.” *3<sup>rd</sup> International Symposium on Life-Cycle Civil Engineering*, IALCCE, Oct., Vienna 2012.
- C15. Z. P. Bažant, Q. Yu, K.-T. Kim, **M. H. Hubler**, et. Al, “Excessive Multi-Decade Deflections of Prestressed Concrete Bridges: How to Avoid Them and How to Exploit Their Monitoring to Improve Creep Prediction Model,” *fib Symposium*, Prague 2011.
- C16. Z. P. Bažant, Q. Yu, **M. H. Hubler**, V. Křístek, and Z. Bittnar. “Wake-Up Call for Creep, Myth about Size Effect and Black Holes in Safety: What to Improve in *fib* Model Code Draft,” Keynote *fib Symposium*, Befestigungstechnik Bewehrungstechnik und...II, R. Eligehausen 70<sup>th</sup> Anniversary, Prague 2011.
- C17. **M. H. Hubler**, W. Aquino, and C. Earls, “*In vivo* ultrasound bone property determination through inverse finite element modeling,” Extended Abstract, *6<sup>th</sup> International Conf. on Computation of Shell and Spatial Structures IASS-IACM 2008*: “Spanning Nano to Mega,” Cornell University, Ithaca, NY. May 2008.

#### Discussions:

- D1. Z. P. Bažant, R. Wendner, G. Boumakis, and **M. H. Hubler**. (2015). Discussion from the Jan/Feb 2015 *ACI Materials Journal*, 112(06), 829-832.

#### Book Chapters:

- B1. Z. P. Bažant, **M. H. Hubler**, Q. Yu, “Damage in Prestressed Concrete Structures Due to Creep and Shrinkage of Concrete,” in Handbook of Damage Mechanics. Voyiadjis, George (Ed.) Springer, New York 2014.
- B2. **M. H. Hubler**, “Creep,” in Aging, Shaking and Cracking of Infrastructures: Concrete Dams and Nuclear Structures. V. Saouma and M. A. Hariri-Ardebili, Springer Nature.

## PRESENTATIONS & POSTERS

Underline Denotes current and former students or post-doctoral advisee

\* Denotes presenter

- P1. S. Ghosh\*, **M. H. Hubler**, P. Sideris, "Mechanical properties of thermally and mechanically accelerated aged concrete," 11<sup>th</sup> Advances in Cement-Based Materials. June 24, 2021.
- P2. J. Artier\*, J. Qiu, S. Cook, W. Srubar III, **M. H. Hubler**, J. Cameron, "Prospects to Enhance Biological and Mechanical Performance in Living Building Materials," Synthetic Biology: Engineering, Evolution & Design (SEED). June 16, 2021.
- P3. Y. Zhang\*, J. Bullard, E. Garboczi, **M. H. Hubler**, "Effects of nanoscale C-S-H behavior on the properties of cement paste," Biot-Bažant 2021. June 1, 2021.
- P4. L. Li\*, B. Wang, **M. H. Hubler**, "Durability and mechanical property improvement of ultra-high performance concrete with carbon nanofibers," Biot-Bažant 2021. June 1, 2021.
- P5. S. Ghosh\*, **M. H. Hubler**, P. Sideris, "Comparative study of the properties of accelerated aged concrete and normally aged concrete," Biot-Bažant 2021. June 1, 2021.
- P6. N. Tonin\*, S. Ghosh, R. Balaji, **M. H. Hubler**, "Implications of climate change on the lifetime of concrete infrastructure in the US," Biot-Bažant 2021. June 1, 2021.
- P7. L. Li\*, Y. Zhang, **M. H. Hubler**, Y. Xi, P. Newell. "Modeling the Corrosion of Steel Casing and Carbonation Reaction in a CO<sub>2</sub> Storage Borehole System" *EMI 2021 Virtual Event*. May 26, 2021.
- P8. Y. Zhang\*, L. Li, J. Nemecek, P. Newell, **M. H. Hubler**, Y. Xi, "Remediation of CO<sub>2</sub> Leakage Pathways in Well Cement Sheaths by Nanoparticle Injection Technique" *EMI 2021 Virtual Event*. May 26, 2021.
- P9. L. Li\*, Y. Zhang, **M. H. Hubler**, Y. Xi, P. Newell. "Experimental study and Numerical Modeling of Nanoparticle Injection Technology for Remediating Leaks of CO<sub>2</sub> Storage" *TMS2020 Virtual Event*. March 16, 2021.
- P10. L. Li\*, Y. Zhang, **M. H. Hubler**, Y. Xi, P. Newell. "Application of Nanoparticle Injection Technology for Remediating Leaks by Using a Horizontally Fullscale Wellbore System" *SES Virtual Technical Meeting*. Sept. 20, 2020.
- P11. B. Wang\*, **M. H. Hubler**, S. Al Wakeel. "Improving Concrete Toughness by Aggregate Arrangement" *SES Virtual Technical Meeting*. Sept. 20, 2020.
- P12. **M. H. Hubler**\*, Y. Zhang, S. Ghosh, Z. P. Bažant, R. Wendner, P. Sideris, J. Bullard, and E. Garboczi. "Modeling long-term deformations of concrete: creep, shrinkage, and cracking" *RILEM Spring Convention*. March 10, Guimaraes, Portugal, 2020.
- P13. **M. H. Hubler**\*. "Bayesian methods for concrete creep prediction and learning optimized concrete microstructure design" TMS2020 149<sup>th</sup> Annual Meeting & Exhibition, Feb. 27, San Diego, CA, 2020.
- P14. Y. Zhang\* and **M. H. Hubler**. "Restrained Shrinkage Cracking of Borehole Cement" *Engineering Mechanics Institute Conference*. June 21, CalTech, Pasadena, CA. 2019.
- P15. S. Williams, J. Qiu, J. Artier, C. Haveran, S. Cook, J. Cameron, **M. H. Hubler**, and W. V. Srubar\*. "Investigating the Successive Regeneration of Hydrogel-Based Microbial Mortars." *Engineering Mechanics Institute Conference*. June 20, CalTech, Pasadena, CA. 2019.
- P16. C. McKee\*, P. Sideris, **M. H. Hubler**, "Seismic Performance Assessment of RC Structures Accounting for Aging Effects," *Engineering Mechanics Institute Conference*. June 20, CalTech, Pasadena, CA. 2019.
- P17. J. Qiu\*, J. Artier, S. Williams, C. M. Haveran, S. Cook, J. Cameron, W. V. Srubar, and **M. H. Hubler**. Poster on "A Novel Lightweight Gelatin-Based Composite Engaging Microbially Induced Calcite Precipitation (MICP) for Infrastructure Applications." *Engineering Mechanics Institute Conference*. June 19, CalTech, Pasadena, CA. 2019.

- P18. **M. H. Hubler\***, S. K. Ghosh, and J. C. Solà, “Implications of climate change on durability of concrete structures.” *10<sup>th</sup> Advances in Cement-Based Materials*, June 17, University of Illinois, Urbana-Champaign, Urbana, IL. 2019.
- P19. Y. Zhang and **M. H. Hubler\***, “Investigation of the Shrinkage – Volume-to-Surface Ratio Relationship in Cement Considering Cracking,” *Engineering Mechanics Institute International Conference*, Tongji University, China, 2018.
- P20. **M. H. Hubler\***, S. Ghosh, A. Valerian, B. Wang, and P. Sideris, “Decelerating Concrete Creep,” American Concrete Institute Convention, Oct. 15, Las Vegas, NV. 2018.
- P21. L. D. Montoya\*, H. Gadde, W. Champion, N. Li, and **M. H. Hubler**, “Inflammatory Effects of Fine Aerosols Generated from Rapid Concrete Failure”, *International Aerosols Conference*, Sept. 6, St. Louis, MO. 2018.
- P22. C. M. Heveran, L. Liang, A. Nagarajan, R. Gill, S. Cook, J. Cameron, **M. H. Hubler**, and W. V. Srubar III. “Microbial-precipitated calcite with tunable morphology and robust nanomechanical properties for living building materials.” *World Congress of Biomechanics, Emerging Areas: Microbial Mechanics*, July, Dublin, Ireland, 2018.
- P23. A. Nagarajan, L. Liang, C. M. Heveran, S. Cook, J. Cameron, R. Gill, **M. H. Hubler**, and W. V. Srubar III. “Calcite production for building biohybrid living structural material from the cyanobacterium *Synechococcus* sp. PCC 7002.” *Synthetic Biology: Engineering, Evolution & Design (SEED)*, June, Scottsdale, AZ. 2018.
- P24. S. Al Wakeel\*, J. Nemecek, L. Li, Y. Xi, and **M. H. Hubler**, “The effect of introducing nanoparticles on the fracture toughness of well cement,” *Engineering Mechanics Institute Conference*. June 1, Massachusetts Institute of Technology, Cambridge, MA. 2018.
- P25. C. Heveran\*, L. Liang, A. Nagarajan, R. Gill, S. Cook, J. Cameron, **M. H. Hubler**, and W. V. Srubar III. “Engineered living building materials: multiscale mechanics of biogenic calcite from genetically modified bacteria.” *Engineering Mechanics Institute*. May, Massachusetts Institute of Technology, Cambridge, MA. 2018.
- P26. D. Culp\*, P. Newell, M. Tupek, and **M. H. Hubler**, “Two-way Coupling of Fracture and Fluid Flow Using a Phase-field Model,” *American Rock Mechanics Association*. June 28, San Francisco, CA. 2017.
- P27. H. K. Gadde and **M. H. Hubler\***, “Effect of hydration and confinement on micro-structure of calcium-silica-hydrate gels,” *Engineering Mechanics Institute Conference*. June 4, San Diego, CA. 2017.
- P28. A. Nagarajan\*, L. Liang, C. Heveran, S. Cook, J. Cameron, R. Gill, **M. H. Hubler** and W. V. Srubar. “Cyano-Calcite production for building living structural materials,” *Annual Midwest Southeast Photosynthesis Conference*. Oct., Turkey Run, IN, 2017.
- P29. E. Heichelheim, **M. H. Hubler**, L. Montoya\*, Poster on “Aerosol Generation from Rapid Concrete Failure” *American Association of Aerosol Research Conference*, Oct. 17, Portland, OR, 2017.
- P30. Y. Xi, **M. H. Hubler**, L. Li, Y. Zhang, P. Newell\*, T. Dewers, J. Nemecek, Poster on “Nanoparticle Injection Technology for Remediating Leaks of CO<sub>2</sub> Storage Formation” *American Geological Union Meeting*, Dec. 12, San Francisco, CA. 2017.
- P31. **M. H. Hubler\***, L. Li, S. Mahnaz, Y. Xi, T. Dewers, and P. Newell, “Electrochemical Nanoparticle Injection Technology for Remediating Leaks.” *Carbon Capture, Utilization, & Storage Conference* 2016, June 14, Tysons, VA. 2016.



- P32. H. Laube\*, S. Monfared, F. Radjai, **M. H. Hubler**, R. Pellenq, and F.-J. Ulm “Multiscale mechanics of shale rock from  $\mu$ -CT Images.” *2<sup>nd</sup> Micromeritics Workshop/GdRi*, Aug. 26-28, Massachusetts Institute of Technology, Cambridge, MA. 2015.
- P33. **M.H. Hubler\*** and Z. P. Bažant, “Theory of Cyclic Creep of Concrete Based on Fatigue of Subcritical Microcracks,” Workshop on Life-cycle Design of Modern Concrete Structures based on Time-dependent Reliability Analysis, July 24, Boulder, CO. 2015.
- P34. **M. H. Hubler\***, F.-J. Ulm, “Assessment of Fracture Properties using Micro-scratch Tests,” *Engineering Mechanics Institute Conference*, Aug. 7, McMaster University, Hamilton, Canada, 2014.
- P35. **M. H. Hubler\***, R. Wendner, and Z. P. Bažant, “Long-term Shrinkage Prediction from Theoretical Considerations and Data Analysis,” *4<sup>th</sup> AcerS/ACBM Conference*, July 9, University of Illinois, Urbana-Champaign, Urbana, IL. 2013.
- P36. R. Wendner\*, **M. H. Hubler**, Z. P. Bažant, “Development and Validation of Model B4 for Concrete Creep and Shrinkage,” *Engineering Mechanics Institute Conference*, Aug. 5, Northwestern University, Evanston, IL. 2013
- P37. **M. H. Hubler\*** and Z. P. Bažant, “Theory of Cyclic Creep of Concrete Based on Fatigue of Subcritical Microcracks,” *Engineering Mechanics Institute Conference*, Aug. 6, Northwestern University, Evanston, IL. 2013
- P38. **M. H. Hubler\***, R. Wendner, and Z. P. Bažant, “B3.1 – An Improved Creep and Shrinkage Model for Modern Concrete,” *Society of Engineering Sciences 49<sup>th</sup> Annual Technical Meeting*, October 10-12, Atlanta, GA. 2012.
- P39. Z. P. Bažant\*, R. Wendner, **M. H. Hubler**, Q. Yu, “Modeling and computational challenges of multi-decade concrete creep effects: an issue of concern for infrastructure sustainability,” semi-plenary lecture, 6<sup>th</sup> European Congress on Computational Methods in Applied Sciences and Engineering, *ECCOMAS 2012*, Sept. 10-14, Vienna, Austria. 2012.
- P40. Z. P. Bažant\*, **M. H. Hubler**, R. Wendner, and Q. Yu, “Computational challenges to cure a plague of multi-decade creep damage in concrete infrastructure: quest for sustainability,” Semi-Plenary Lecture, *WCCM-10*, San Paulo, 2012.
- P41. **M. H. Hubler\***, R. Wendner, and Z. P. Bažant, “An improved creep and shrinkage model for modern concrete,” *EMI/PMC conference*, Notre-Dame, IN, 2012.
- P42. R. Wendner\*, **M. H. Hubler**, and Z. P. Bažant, “Uncertainty in Creep and Shrinkage Prediction of Models for Concrete,” *EMI/PMC conference*, Notre-Dame, IN, 2012.
- P43. Z. P. Bažant\*, **M. H. Hubler**, and M. Bažant, “Snap-through instabilities as a cause of sorption hysteresis and misfit disjoining pressures in hydrated cement and other nanoporous solids,” *EMI/PMC conference*, Notre-Dame, IN, 2012.

#### INVITED LECTURES & SEMINARS

<i>Location</i>	<i>Title</i>	<i>Year</i>
Drexel University	Designing Random Heterogeneous Construction Materials for Fracture Resistance	2022
North Carolina State University	Designing Random Heterogeneous Construction Materials for Fracture Resistance	2022

Princeton University	Designing Random Heterogeneous Construction Materials for Fracture Resistance	2022
University of Minnesota Twin Cities	Using Spatial Statistics to Engineer the Mechanics of Heterogenous Materials	2021
University of Illinois, Urbana-Champaign, IL	Impact of cement cracking on drying shrinkage and controlling concrete creep through dynamic loading	2019
University of California, Irvine, CA	Impact of cement cracking on drying shrinkage and controlling concrete creep through dynamic loading	2019
University of Utah, Salt Lake City, UT	The Impact of Microstructure on Fracture in the Context of Micro-Scale Testing and Fragmentation of Brittle Composites	2018
Colorado School of Mines, Golden, CO	Concrete: Formation, Behavior, Building, and Performance	2017
Los Alamos National Lab, Los Alamos, NM	On quantification, testing, and development of new theories to tune material microstructure for macroscale mechanics	2016
Sandia National Lab, Albuquerque, NM	On quantification, testing, and development of new theories to tune material microstructure for macroscale mechanics	2016
University of Colorado, Boulder, CO	Theory of Cyclic Creep of Concrete Based on Fatigue of Subcritical Microcracks	2016
University of California, Los Angeles, CO	Gas shale fracture testing: texture statistics and fracture parameters	2015
Massachusetts Institute of Technology, Cambridge, MA	Micro-scale texture statistics and fracture parameters of gas shale	2014
John-Hopkins University, Baltimore, MD	The Development of an Improved Prediction Model for the Creep and Shrinkage of Concrete Structures	2013
Northwestern University, Evanston, IL	Improving Concrete Creep and Shrinkage Models using Laboratory Data and Multi-Decade Structural Measurements	2012
Czech Technical University, Prague	Insights for Creep and Shrinkage Models from Bridge Deflections and Extensive Laboratory Data	2011

## TEACHING

### *Courses Taught:*

CVEN 5585: Advanced Topics in Reinforced Concrete

CVEN 3161: Mechanics of Materials I + Lab

CVEN 6161: Advanced Mechanics of Materials II

CVEN 4899: Civil Engineering Senior Project Design Co-Instructor

## AREN 4315: Design of Masonry Structures

### *Advising:*

#### Postdoctoral Scholars

1. Mohammad Matar (2022)
2. Yao Wang (2021 – present)
3. Linfei Li (2020 – 2022)
4. Yige Zhang (2020)
5. Zhanan Zou (2019 - 2021) [co-advised with Wil Srubar]
6. Jishen Qiu (2018 – 2019)
7. Chelsea Haveran (2017- 2018) [co-advised with Wil Srubar]
8. Shahlaa Al Wakeel (2017)

#### PhD Students

1. Basil Alsharari (expected graduation 2027)
2. Gadisa Merdasa (expected graduation 2026)
3. Boning Wang (expect graduation 2024)
4. Naiara Tonin (expect graduation 2024)
5. Sannidhya Kumar Ghosh (graduated 2021)  
“Modelling interdependency of creep and seismic response of uniaxially loaded concrete”
6. Yige Zhang (graduated 2020)  
“The interaction between shrinkage, creep and cracking of concrete during its service life”
7. Farshad Ghanbari (helped transition to position at another university in 2017)  
*\*switched universities in 3<sup>rd</sup> year for family reasons before completing thesis*
8. Shahlaa Al Wakeel (graduated 2016)  
“Theoretical and experimental investigation of matrix inclusions on the fracture toughness of composite material”

#### MS Students

1. Kristen Reed (expected graduation 2023)
2. Emma Anderson (expected graduation 2023)
3. Donald Ethan Borenstein (expected graduation 2023)
4. Jacob Staley (2022)  
“A study of shear strength of a sustainable structural biomaterial via a pullout test”
5. Zahraa Alquraini (2021)  
“Viscoelastic model of loading rate effect in concrete”
6. Shubham Gaur (2020)  
“Experimental study on alternate casting method and functional grading of concrete”
7. Jordi Solà (2019) – *Exchange student from UPC BarcelonaTech*  
“Aging mechanisms of Colorado highway bridges: case study, modeling, and life-cycle analysis”
8. David Culp (2017)  
“Numerical coupling of fracture and fluid pressure using a phase-field model with applications in geomechanics”
9. Harish Gadde (2017)  
“Effect of hydration and confinement on micro-structure of calcium-silica-hydrate gels”
10. Eric Heichelheim (2016)  
“Investigation of aerosol particles produced from rapid failure of concrete”

#### Undergraduate Research Projects

1. Emma Andreasen (2022)

- UROP-supported project "Introducing rock into a geopolymer"
- 2. Henry Dietrick (2021)
- 3. Courtney Martin (2020)
- 4. Cameron Burroughs (2019)  
"Study of gelation during sand casting"
- 5. Pau Baqué (2019) – *Exchange student from Universitat de Girona*  
"Effect of particle spatial arrangement on the near-crack-tip stress"
- 6. Evan Zech (2018)  
"Blast resistance of steel structures"
- 7. Aldrich Valerian (2018)  
"Breathable concrete and maturity measurements of concrete"
- 8. Ricardo José Haddad Salleg (2018)  
"Flexoelectric properties of 3D printed polymers"
- 9. Erin Nebel (2018)  
Patent development for "Geothermal energy device for abandoned wells"
- 10. Yousef Adnan Al-Weqayyan (2017)  
"Design of recyclable concrete"
- 11. Raymond McTigue (2017)  
UROP-supported project "Creep prediction of concrete structures using novel maturity meter method"
- 12. Zachary Walker and Mussie Gebremedhin (2017)  
UROP-supported project "Photo-elastic study of tensile creep of polymer fiber reinforced concrete"
- 13. Rachel Horn (2016)  
"Nondestructive testing of cement sheaths by indentation and tapping of oil pipes"

#### Independent Studies Supervised

- 1. Majid Alabbasi (2022)  
"Self-assembly of microstructures"
- 2. Akshith Joginpally (2021)  
"Chloride permeability considering concrete spatial variability"
- 3. Rakshita Bhat (2021)  
"Effect of climate parameters on the performance of bridges in Colorado"
- 4. Amir Abdull Khalil and Gustavo Adrianzen (2018)  
"Airport design optimization for baggage handling"
- 5. Boning Wang (2018)  
"Thermal cracking during dam construction"

### **PROFESSIONAL ACTIVITIES**

#### International Technical Committees:

Chair of experimental analysis and instrumentation, ASCE/Engineering Mechanics Institute, 2020-present

Chair of ACI 209 Creep and Shrinkage of Concrete, 2021 - present, secretary for subcommittee 209D on rate type modeling, committee member of 209E, 2012 – present

RILEM Technical Committee MDC – Multi-decade creep and shrinkage of concrete: material model and structural analysis, 2012-2013

RILEM Technical Committee 287-CCS: Early age and long-term crack width analysis in RC Structures, 2020-present

Editorial Work: Associate Editor for Journal of Engineering Mechanics, 2021 - present

Proposal Reviewer: 9 NSF review panels, ad-hoc reviewer

Conference Activities:

Track chair for Biot-Bažant Conference (Northwestern University, Evanston, IL, 2020), 2021

Session chair for “Interplay Between Creep, Relaxation, and Shrinkage” at Biot-Bažant Conference, 2021

Session chair for “Impact of Environmental Factors on Creep” at Biot-Bažant Conference, 2021

Co-Organized mini-symposium on “Computational Structural Performance Assessment against Natural Hazards” at Engineering Mechanics Institute Conference, 2021

Co-Organized mini-symposium on “Innovative Experimental Analysis: A Symposium Commemorating Prof. Dr. Asadollah Esmaeily (1958-2018)” at Engineering Mechanics Institute Conference, 2021

Session chair for “Materials Characterization Techniques” at 10<sup>th</sup> Advances in Cement-Based Materials, University of Illinois at Urbana-Champaign, 2019

Organized mini-symposium on “Relating Microstructure to Toughness: Controlling Damage and Fracture, Modeling and Simulation of Material Damage” at Engineering Mechanics Institute Conference, CalTech, 2019

Organized mini-symposium on “Advances in experimental mechanics: Damage detection and identification” at Engineering Mechanics Institute Conference, Massachusetts Institute of Technology, 2018

Session co-Chair for “Analytical and Experimental Investigations on Resilient and Critical Infrastructure under Multiple Hazards” at Engineering Mechanics Institute Conference, 2016 Vanderbilt, 2016

Organized mini-symposium on “Micro- and Nano-Scale Testing of Concrete/Rock/Cementitious Materials” at FraMCoS-9

Session Chair for “3D Time Dependent Numerical Analyses of Concrete Structures” at American Concrete Institute Convention, Kansas City, MO, 2015

A member of the Scientific Committee for International Association of Fracture Mechanics for Concrete and Concrete Structures Conference, FraMCoS-9 (UC Berkeley, 2016), FraMCoS-X (Bayonne, France, 2019), and Engineering Mechanics Institute Conference (Columbia, NY, 2020), Biot-Bažant Conference (Northwestern, IL, 2021)

**OUTREACH & DEI ACTIVITIES**

RIO Faculty Community TED-Style Talk (Oct 19<sup>th</sup>, 2022, Dairy Arts Center, Boulder, CO)

Classroom Math Assistant at Eisenhower Elementary School (Weekly 2022-2023)

CU Boulder Universal Design for Learning Microcredential Class (Spring 2023)