SURENDRA P. SHAH

BIOGRAPHICAL DATA

Presidential Distinguished Professor, The University of Texas at Arlington

Walter P. Murphy Professor (emeritus), Northwestern University

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Education

B.E. from B.V.M. College, India

M.S. from Lehigh University

Ph.D. from Cornell University

Academic Experience

Present Position: Presidential Distinguished Professor
Department of Civil Engineering
Department of Materials Science and Engineering
The University of Texas at Arlington

Walter P. Murphy Professor of Civil Engineering (emeritus), Robert R. McCormick School of Engineering and Applied Science
Northwestern University

Prior Positions: Professor of Civil Engineering and Materials Engineering
University of Illinois at Chicago

Visiting Associate Professor, Department of Civil Engineering
Massachusetts Institute of Technology

Administrative Experience

Present Position: Director, Center for Advanced Construction Materials
The University of Texas at Arlington

Prior Positions: Director, Center for Advanced Cement-Based Materials
Northwestern University

Coordinator, Graduate Program Structural Engineering
Department of Civil and Environmental Engineering
Northwestern University

Director, Center for Concrete and Geo-materials
Northwestern University

Director, Graduate Program
Department of Materials Engineering
University of Illinois, Chicago

Industrial Experience

Present:	Short-term consultant for several industrial companies in U.S. and abroad
Long-Term Positions:	Research Consultant, Lafarge, France
	Research Consultant, U. S. G., Des Plaines, Illinois
	Research Consultant, Wiss, Janney, and Elstner, Northbrook, Illinois
	Research Consultant, Holderbank Management, Ltd., Switzerland
	Research Consultant, Corning Glass Works, Corning, New York
	Research Engineer, Portland Cement Association, Skokie, Illinois
	Design Engineer, Modjeski and Masters, Harrisburg, Pennsylvania

HONORS AND OTHER PROFESSIONAL ACTIVITIES

Member, National Academy of Engineering

Member, National Academy of Inventors

Foreign Member, Chinese Academy of Engineering; Indian Academy of Engineering; Russian Academy of Engineering; and Academy of Athens

Distinguished Professor, IIT, Madras

Distinguished Professor, Jinan University

Friendship Award, Shandong Province, China

Member,Institute of Advanced Studies,HKUST

Honorary Professor, University of L'Aquila; Nanjing Technical University;Tongji University; Hong Kong Polytechnic University; and Dalian Maritime University

NAE Liaison Committee

NAS Panel to evaluate NIST Building and Fire Research

Honorary Member, American Concrete Institute; and The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM, from the name in French)

Member, Institute of Advanced Studies,Hong Kong University of science and technology

Distinguished Lecture Series, University of California, Los Angeles; University of Illinois, Chicago; and Vanderbilt University, Iowa State University, Ames

Fulbright Award, Indian Institute of Technology, Mumbai; and IIT Madras Distinguished Professor, Indian Institute of Technology, Madras

Elizabeth D. Rockwell Engineering Lecture, University of Houston Della Roy Lecture, American Ceramic Society, Detroit,

Frank E. Richart Distinguished Lecture, University of Michigan

Named to the "Top Ten Most Influential Persons in the Concrete Industry," by Concrete Construction

Modeling, Measuring, and Monitoring Concrete Properties, Conference Organized in Honor of Surendra P. Shah, 2006, Greece

Robert E. Philleo Award, American Concrete Institute, Concrete Research Council

Conference Dedication and Special Award, 6th RILEM Symposium on Fiber-Reinforced Concretes (FRC) – BEFIB, Varenna, Italy

Honorary Professor, Department of Civil and Structural Engineering, Hong Kong Polytechnic University

Honorary Symposium, Celebrating Concrete: People and Practice, Conference Dedication and CTU Award, University of Dundee. Scotland

American Concrete Institute, Honorary Symposium- Concrete: Material Science to Application, A Tribute to Surendra P. Shah

The Richard J. Carroll Memorial Lectureship, Johns Hopkins University

American Concrete Institute, Illinois Chapter, Henry Crown Award

American Concrete Institute, Arthur R. Anderson Award to ACBM Center

Charles Pankow Award for Innovation (Collaborative Work with W.R. Grace and ARCO), American Society of Civil Engineers, Civil Engineering Research Foundation, 1997

Engineering-News Record (ENR) Newsmaker Award

Swedish Concrete Award

Walter P. Murphy Professor of Civil Engineering

Arthur R. Anderson Award, American Concrete Institute

Sanford E. Thompson Award, American Society of Testing and Materials (ASTM)

RILEM Gold Medal Award

Teaching Excellence Award, CE students

Distinguished Visiting Professor, National University of Singapore

Alexander von Humboldt Fellowship Award for Distinguished Senior Scientist N

NATO Visiting Senior Scientist to Turkey Guest

Professor, Denmark Technical University

Guest Professor, Delft University of Technology, Delft, The Netherlands

Consultant to NATO Science for Stability Program

Visiting Professor, University of Sydney

NATO Visiting Senior Scientist to France

Member of the Evaluation Team of Danish Research Groups in the field of Concrete

UNIDO Consultant to People's Republic of China

UNESCO Expert to India

Member, Editorial Board, ASCE Journal of Civil Engineering Materials

Member, Editorial Board, Journal of Ferro-Cement

Member, Editorial Board, RILEM Journal of Materials and Structures

Editor-in-Chief, Concrete Science and Engineering

TECHNICAL COMMITTEES

Transportation Research Board, Task Force on Nanotechnology

NAE Liaison Committee

NAS Panel to evaluate NIST Building and Fire Research

ACI- 215 Fatigue of Concrete

ACI- 236 Material Science of Concrete

ACI- 237 Self-Consolidating Concrete

ACI- 231 Properties of Concrete at Early Ages ACI-

440 Fiber Reinforced Polymer Reinforcement ACI-

544 Fiber Reinforced Concrete

ACI- 548 Polymers in Concrete

ACI- 549 Thin Reinforced Cementitious Products and Ferro-Cement

Member, Transportation Research Board Task Force on Nanotechnology

Member, Bureau, RILEM

Chair, Advisory Committee, Engineering Mechanics Division, ASCE

Chairman, Executive Committee, Engineering Mechanics Division, American Society of Civil Engineers (1996-1997)

Chairman, Properties of Concrete, Transportation Research Board

Member, National Initiative on High-Performance Concrete

Member, Materials Research Council, American Concrete Institute

Member, Management Advisory Board, RILEM

Member, Advisory Committee on Cement and Concrete, Strategic Transportation Research Study

Chairman, RILEM Committee on Strain-Softening of Concrete

Chairman, RILEM Committee on Fracture of Concrete

Chairman, Fiber Reinforced Concrete, American Concrete Institute

Vice Chairman, Fracture of Concrete and Rock, Society of Experimental Mechanics

Member, High Strength Concrete, American Concrete Institute

Member, Ferrocement, American Concrete Institute

Member, Fracture Mechanics, American Concrete Institute

Member, Polymer Concrete, American Concrete Institute

Chairman, Fatigue of Concrete Structures, American Concrete Institute

President, Chicago Chapter, American Concrete Institute

Chairman, Properties of Materials, Engineering Mechanics Division, American Society of Civil Engineers Member, Ad Hoc Committee on Ferro-Cement for Developing Countries, National Academy of Sciences

CONFERENCES

Co-Chair, NICOM-7, Nanotechnology in Construction, Melbourne, 2021

Co-Chair, NICOM-6, Nanotechnology in Construction, Hong Kong, 2018

Co-Chair, SCC 2016, 6th North American Conference and 8th International RILEM Symposium, Washington, D.C., 2016

Co-Chair, NICOM-5, Nanotechnology in Construction, Chicago, 2015

Co-Chair, SCC 2013, Fifth North American Conference on the Design and Use of Self-Consolidating Concrete, Westin Michigan Avenue, Chicago, IL, USA, 2013

Chair of Scientific Team, First International Conference in North America on Nanotechnology in Cement and Concrete, Beckman Center, Irvine, CA, May 5-7, 2010

Co-Chair, US-India Workshop for Concrete in Extreme Events, Mumbai, 2009

Chair, SCC 2008, Third North American Conference on the Design and Use of Self-Consolidating Concrete, Chicago, November, 2008

Co-Chairman of Organizing Committee, Lahore, Pakistan, 2007

Member, Advisory Board, Conference on Damage in Composite Materials; Non Destructive Testing and Simulation

Member, International Scientific Committee, FRAMCOS 6th International Conference

Member, Scientific Committee, 10th Int. Inorganic-Bonded Fiber Composites Conference, Sao Paulo, Brazil, 2006

Chair, SCC 2005, Combining the Second North American Conference on the Design and Use of Self-Consolidating Concrete and the Fourth International RILEM Symposium on Self-Compacting Concrete, Chicago, 2005

Co-Chairman, International Conference on Advances in Concrete Composites and Structures, Chennai, India, 2005

Co-Chairman, International Conference, Advances in Concrete Structures and Materials, Xizou, China, 2004

Co-Chair, First North American Conference on the Design and Use of Self-Consolidating Concrete, Chicago, 2002

Co-Chairman, ACI-RILEM Symposium in Non-Destructive Evaluation, Dallas, 2001

Chair, Symposium on High Performance Fiber Reinforced Thin Products, ACI, Chicago, 1999

Co-Chairman, Symposium on Materials Science of Concrete, ACI, Chicago, 1999

Co-Chairman, Engineering Foundation Conference, Canada, 1998

Co-Chairman, Materials for Infrastructure, Institute of Mechanics and Materials, UCSCD, 1998

Co-Chairman, Symposium on Nondestructive Characterization of Materials in Aging Systems, Materials Research Society, Boston, 1997

Co-Chairman, Symposium on Advanced Cement-Based Materials, McNU '97, Evanston, IL, 1997

Co-Chairman, Symposium HH: Structure-Property Relationships in Hardened Cement Paste and Composites, Materials Research Society, 1996 Fall Meeting, Boston, 1996

Co-Chairman, Synthesizing Cement-Based Materials for the 21st Century, American Chemical Society, National Meeting, Chicago, 1995

Co-Chairman, International Conference Workshop on Technology Transfer of the New Trends in Concrete, Barcelona, Spain, November 1994

Co-Chairman, SEM Conference on Nondestructive Testing of Concrete in the Infrastructure, Dearborn, Michigan, 1993

Co-Chairman, ACI Symposium on Materials Science in Concrete, Boston, 1991

Co-Chairman, ACI Symposium on Fiber Reinforced Concrete, Dallas, 1991

Co-Chairman, International Conference on Micromechanics of Failure of Quasi-Brittle Materials, Albuquerque, 1990

Chairman, NATO-ARW on Toughening Mechanism of Quasi-Brittle Materials, Northwestern University, 1990

Co-Chairman, International Conference on Fracture of Concrete and Rock, Cardiff, 1989

Co-Chairman, Symposium on Bond in Cement Based Composites, Materials Research Society, Boston, 1987

Co-Chairman, International Conference on Fracture of Concrete and Rock, Society of Experimental Mechanics, Houston,1987

Co-Chairman, Symposium on Strain Rate Effects in Cement-Based Composites, Materials Research Society, Boston, 1985

Member, Organizing Committee, RILEM Symposium on Fracture of Concrete, Laussane, 1985

Co-Chairman, NSF-STU Seminar on Steel Fiber Reinforced Concrete, Stockholm, 1985

Co-Chairman, International Symposium on Ferrocement, Bangkok, 1985

Chairman, NATO Advanced Research Workshop on Nonlinear Fracture Mechanics, Northwestern University, Evanston, 1984

Member, Scientific Committee, RILEM-CEB Conference on Multiaxial Loading, Toulouse, 1984

Chairman, ACI-RILEM Symposium on Fatigue, Detroit, 1982

Member, Advisory Panel and Chairman of the Session, International Conference on Bond in Concrete,

Scotland, 1982

Co-Chairman, RILEM Symposium on Ferrocement, Bergamo, Italy, 1981

Chairman, Symposium on Recent Research on Fatigue of Concrete Structures, ACI, Puerto Rico, Sept.

1980; Dallas, 1981

Chairman, National Science Foundation Sponsored Workshop on High Strength Concrete, 1979

Member, Steering Committee, Gordon Conference on Building Materials, 1973

Chairman, Conference on New Materials in Concrete Construction, University of Illinois at Chicago, Circle, Chicago, 1979

PUBLICATIONS
Refereed Articles

2020

Li, Z., Corr, D.J., Han, B. and Shah, S.P., 2020. "Investigating the effect of carbon nanotube on early age hydration of cementitious composites with isothermal calorimetry and Fourier transform infrared spectroscopy". *Cement and Concrete Composites*, 107, p.103513

Hou, P., Wang, X., Zhao, P., Wang, K., Kawashima, S., Li, Q., Xie, N., Cheng, X. and Shah, S.P., 2020. "Physicochemical effects of nanosilica on C3A/C3S hydration". *Journal of the American Ceramic society*, 103(11), p.6505-6518

Xue, C., Li, W., Qu, F., Sun, Z. and Shah, S.P., 2020. "Self-healing efficiency and crack closure of smart cementitious composite with crystalline admixture and structural polyurethane". *Construction and Building Materials*, 260, p. 119955

Luo, Z., Li, W., Gan, Y., Mendu, K. and Shah, S.P., 2020. "Applying grid nanoindentation and maximum likelihood estimation for N-A-S-H gel in geopolymer paste: Investigation and discussion". *Cement and Concrete Research*, 135, p. 106112

Dong, W., Li, W., Wang, K., Guo, Y., Sheng, D. and Shah, S.P., 2020. "Piezoresistivity enhancement of functional carbon black filled cement-based sensor using polypropylene fibre". *Powder Technology*, 373, p. 184-194

Zhan, M., Pan, G., Zhou, F., Mi, R. and Shah, S.P., 2020. " In situ-grown carbon nanotubes enhanced cement-based materials with multifunctionality". *Cement and Concrete Composites*, 108, p. 103518

Hou, P., Shi, J., Prabakar, S., Cheng, X., Wang, K., Zhou, X. and Shah, S.P. 2020 "Effects of mixing sequences of nanosilica on the hydration and hardening properties of cement-based materials". *Construction and Building Materials*, 263, p. 120226

Dong, W., Li, W., Wang, K., Han, B., Shen, D. and Shah, S.P. 2020. "Investigation on physicochemical and piezoresistive properties of smart MWCNT/cementitious composite exposed to elevated temperatures". *Cement and Concrete Composites*, p. 103675

Luo, Z., Li, W., Gan, Y., Mendu, K., Shah, S.P. 2020. "Maximum likelihood estimation for nanoindentation on sodium aluminosilicate hydrate gel of geopolymer under different silica modulus and curing conditions". *Composite Part B: Engineering*, 198, p.108185

Zhan, M., Pan, G., Zhou, F., Mi, R. and Shah, S.P., 2020. In situ-Grown Carbon Nanotubes Enhanced Cement-Based Materials with Multifunctionality. *Cement and Concrete Composites*, p.103518.

Feng, Z., Zhao, Y., Zeng, W., Lu, Z. and Shah, S.P., 2020. Using microbial carbonate precipitation to improve the properties of recycled fine aggregate and mortar. *Construction and Building Materials*, *230*, p.116949.

Tang, Z., Li, W.G., Li, P.R. and Shah, S.P., 2020. Durability of Sustainable Construction Materials with Solid Wastes. In *ACMSM25* (pp. 3-13). Springer, Singapore.

2019

Shah, S.P. and Kim, J.H., 2019. Rheology of Fresh Concrete: Historical Perspective and Glance in the Future. In *Rheology and Processing of Construction Materials* (pp. 432-439). Springer, Cham.

D'Alessandro, A., Corr, D.J. and Shah, S.P., 2019. Use of Tetraethyl Orthosilicate to Improve Durability of Ferrocement. *ACI Materials Journal*, 116(6)

Yu, K.Q., Lu, Z.D., Dai, J.G. and Shah, S.P., 2019. Direct Tensile Properties and Stress–Strain Model of UHP-ECC. *Journal of Materials in Civil Engineering*, *32*(1), p.04019334.

Konsta-Gdoutos, M.S., Danoglidis, P.A. and Shah, S.P., 2019. High modulus concrete: Effects of low carbon nanotube and nanofiber additions. *Theoretical and Applied Fracture Mechanics*, *103*, p.102295.

Ren, M., Shi, T., Corr, D.J. and Shah, S.P., 2019. Mechanical Properties of Micro-regions in Cement-based Material based on the PeakForce QNM Mode of AFM. *Journal of Wuhan University of Technology-Mater. Sci.* Ed., 34(4), pp.893-899

"Characterization of the interfacial transition zone of CNF-Reinforced cementitious composites". Cement and Concrete Composites, 2019

Danoglidis, P.A., Konsta-Gdoutos, M.S. and Shah, S.P., 2019. "Relationship between the carbon nanotube dispersion state, electrochemical impedance and capacitance and mechanical properties of percolative

nanoreinforced OPC mortars". *Carbon*, 145, pp.218-228

"Effect and mechanism of colloidal silica sol on properties and microstructure of the hardened cement-based materials as compared to nano-silica powder with agglomerates in micron-scale". *Cement and Concrete Composites*, 98, 2019, pp.137-149 (with Kong et al.,).

Wang, Q., Li, S., Pan, S., Cui, X., Corr, D. and Shah, S.P. 2019. "Effect of graphene oxide on the hydration and microstructure of fly ash-cement system". *Construction and Building Materials*, 198, 2019, pp.106-119

Xu, J., Shen, W., Corr. D. and Shah, S.P. 2019. "Effects of nanosilica on cement grain/CSH gel interfacial properties quantified by modulus mapping and nanoscratch". *Materials Research Express*,

2018

"Novel superhydrophobic cement-based materials achieved by construction of hierarchical surface structure with FAS/SiO2 hybrid nanocomposites", ES Materials and Manufacturing, 1, 57-66, 2018 (with P.Hou et al.,)

"Design of SiO2/PMHS hybrid nanocomposite for surface treatment of cement-based materials". Cement and Concrete Composites, 87, pp.89-97, 2018 (Li, R., Hou, P., Xie, N., Ye, Z., Cheng, X. and Shah, S.P.,)

"Factors Influencing the structure build-up of fresh cement-asphalt emulsion paste", Road Materials and pavement design,Vol.19, 2018,issue 1(with Jin Ouyang).

"Research progress in advanced nanomechanical characterization of cement-base materials". Cement and Concrete Composites, 94, pp. (2018) 277-295 (with Luo, Z., et.al.)

"Effect of Carbon Nanofibers on Autogenous Shrinkage and Shrinkage Cracking of Cementitious Nanocomposites". ACI Materials Journal, (2018)115(4) (with Yuan Gao et.al.).

"Effect of interfacial transition zone on the Young's modulus of carbon nanofiber reinforced cement concrete". Cement and Concrete Research, 107, pp.(2018) 49-63 (with Zhu, X.,et.al.).

"Whether do nano-particles act as nucleation sites for CSH gel growth during cement hydration?". Cement and Concrete Composites, 87, pp.(2018) 98-109 (with Kong D.,et.al.).

"Design of SiO2/PMHS hybrid nanocomposite for surface treatment of cement-based materials". Cement and Concrete Composites, 87, pp.(2018) 89-97 (with Li, R.,et.al.).

"Development of ultra-high performance engineered cementitious composites using polyethylene (PE) fibers". Construction and Building Materials, 158, pp.(2018) 217-227 (with Yu, K.Q.,et.al).

"Factors influencing the structure build-up of fresh cement asphalt emulsion paste". Road Materials and Pavement Design, 19(1), pp.(2018)87-103 (with Jin Ouyang).

"Imaging Strain Localization in Fiber Reinforced Materials". In Optical Phenomenology and Applications pp.(2018) 223-231. Springer, Cham (with Akkaya,et.al.).

Ghandehari, M., Krishnaswamy, S. and Shah, S., 2018. "Phase Measurement Interferometry for Mapping Fracture". In Optical Phenomenology and Applications, pp.(2018) 209-222, Springer, Cham (with Ghandehari,et.al.)

"Development of Ultra-high performance engineered cementitious composites using polyethylene (PE) fibers",Construction and Building Materials, 158(2018)217-227(with Ke-Quan You,et.al.)

"Whether do nano-particles act as nucleation site for CSH growth during cement hydration?",

Cement and Concrete Composites, (CECO_2961) (with Kong Deyu,et.al.)

"Design of SiO2/PMHS hybrid nano composite for surface treatment of cement-based materials, Cement and Concrete Composites,(CECO_2017_617_R1)(with Pengkun Hou,et.al.)

"Factors Influencing the structure build-up of fresh cement-asphalt emulsion paste",Road Materials and pavement design,Vol.19, 2018,issue 1(with Jin Ouyang).

2017

"Experimental and numerical studies on impact behaviors of recycled aggregate concrete-filled steel after exposure to elevated temperature", Materials and Design, vol.136,2017(with Wengui Li. Et.al.)

"Nano-scratch studies of the modification effects of nanoSiO2 on C-S-H gel/cement grain interfaces, Journal of Materials inCivil Engineering, vol 29, issue 9, 2017, (with Xu,J., and Corr,D).

"Effect of CNT and CNF loading and count on the corrosion resistance, conductivity and mechanical properties of nano-modified mortars", Construction and Building Materials, vol.147,2017,(with Konsta- Gdoutos,et.al.)

" Mechanical behavior of recycled aggregate concrete-filled steel tube column after exposure to elevated temperature" Construction and Building Materials, vol. 146,2017(with Li,W.,et.al.)

"Effects of graphene oxide on early-age hydration and electrical resistivity of Portland cement paste",Construction and Building Materials, vol.136,2017(withLi W.,et.al.)

"Viscosity prediction of fresh cement asphalt emulsion pastes", Materials and Structures, vol.50, issue 1,2017(with Ouyang J.,et.al.)

"Early-age shrinkage development of ultra-high-performance concrete under heat curing treatment",Construction and Building Materials, vol.131,2017(with Li W.,et.al.)

"Effects of the hydration reactivity of ultrafine magnesium oxide on cement based materials", Magazine of Concrete Research, June 2017,(with Pengkun Hou, ,et.al.)

2016

"Cement mortar nano composites at low CNT and CNF Content: A Fracture mechanics Experimental Studies", Cement and Concrete Composites, (20160, pp.110-118(with E.E> Gdoutos,et.al.)

"Effect of nanoparticles on the dynamic behavior of recycled aggregate concrete under impact loading,",Materials and Design, vol.112, 2016(with Li W.,et,al.)

"The role and investigation of super-plasticizers in fresh cement asphalt paste through rheology study, Construction and Building Materials, Vol.125,2016(with Ouyang,J.,et.al.)

"Dimensional factors in oxidation induced fracture in reinforced concrete",Construction and Building Materials, Vol.122, 2016(with Zulli M. Ghandehari M, et.al.)

"State of the Art on Prediction of Concrete Pumping", International Journal of Concrete Structures and Materials, vol.10, 2016

"Effects of the hydration reactivity of ultrafine magnesium oxide on cement based materials", Magazine of Concrete Research, June 2017,(with Pengkun Hou, ,et.al.)

"Advanced cement based nanocomposites reinforced with MWCNTs and CNFs", Frontiers of Structural and Civil Engineering, 2016, 10, 142-149 (with E.E., Gdoutos, M.S., Konsta-Gdoutos, P.A., Danoglidis)

"Factors influencing the rheology of fresh cement asphalt emulsion paste", Journal of Materials in Civil Engineering, 2016, 28(11), p. 04016140-2 (with J., Ouyang, D.J., Corr)

"Investigation on the mixing stability of asphalt emulsion with cement through viscosity", Journal of Materials in Civil Engineering, 2016, 28 (12), p. 04016149 (with J., Ouyang, Y., Tan, D.J., Corr, 2016, 28(11), p. 04016140-2

"Strength, energy absorption capability and self-sensing properties of multifunctional carbon nanotube reinforced mortars", Construction Building Materials, 2016, 120, 265-274 (with P.A., Danoglidis, M.S., Konsta-Gdoutos, E.E., Gdoutos)

"In-situ Ca(OH)2 consumption of TEOS on the surface of hardened cement-based materials and its improving effects on the Ca-leaching and sulfate-attack resistivity", Construction and Building Materials. Volume 113, pp 890-896, 2016. (with P., Hou, R., Zhang, Y., Cai, X., Cheng)

"The thixotropic behavior of fresh cement asphalt emulsion paste", Construction and Building Materials. Volume 114, pp 906-912, 2016. (with J., Ouyang, Y., Tan, D.J., Corr)

"The use of tetraethyl orthosilicate silane (TEOS) for surface-treatment of hardened cement-based materials: a comparison study with normal treatment agents, Construction and Building Materials, Volume 117, pp 144

151, 2016, (with Y., Cai, P., Hou, C., Duan, R., Zhang, Z., Zhou, X., Cheng)

"The effects of nano-calcined kaolinite clay on cement mortar exposed to acid deposits", Construction and Building Materials, Volume 102, pp 486-495, 2016 (with Y., Fan, S., Zhang, Q., Wang)

"Studies on early stage hydration of tricalcium silicate incorporating silica nanoparticles: Part II", Construction & Building Materials, Volume 102, Part 1, pp 943-949, 2016.(with Singh, L. P et al.)

"Influence of 2D rGO nanosheets on the properties of OPC paste", Cement and Concrete Composites, 70, 48-59, 2016. (with M., Murugan, M., Santhhanam, S. S., Gupta, T., Pradeep)

"Comparative investigation on nanomechanical properties of hardened cement paste", Materials and Structures, Volume 49, Issue 5, pp 1591-1604, 2016 (with Li, W., Kawashima, S., Xiao, J. & Shi, C)

"Influence of Nanolimestone on the Hydration, Mechanical Strength and Autogenous Shrinkage of Ultrahigh-Performance Concrete", Journal of Materials in Civil Engineering, volume 28, issue 1, 2016 (with Li, Huang,Shi, and Duan)

"Surface treatment on recycled coarse aggregates with nano-materials", Journal of Materials in Civil Engineering, volume 28, issue 2, 2016 (with Zhang, H. B. S., Zhao, Y.& Meng, T)

"Preparation and Properties of Phase Chang Ceramic Loaded with inorganic Salt", Chinese ceramic Society, Vol44, issue(7), 2016(with Kong Deyu,et.al.)

2015

"Effects of colloidal nanoBoehmite and nanoSiO2 on fly ash cement hydration", Construction and Building Materials, Volume 101, Part 1, pp 246-251, 2016 (with J., Zhu, C., Feng, H., Yin, Z., Zhang)

"Nano-modification of cementitious material: toward a stronger and durable concrete, Journal of Sustainable Cement-Based Materials, Volume 5, Issue 1-2, pp 1-22, 2015 (with P., Hou, M.S., Konsta- Gdoutos)

"Influence of colloidal silica sol on fresh properties of cement paste as compared to nano-silica powder with agglomerates in micro-scale", Cement and Concrete Composites, 63, 30-41, 2015 (with D., Kong, D.J., Corr, P., Hou, Y., Yang)

"The modification Effects of Nano-Silica Slurry on Microstructure, Strength and Strain Development of Recycled Aggregate Concrete Applied in an enlarged structural test", Construction & Building Materials, volume 95, pp 721-735, 2015 (with Zhao, Zhang and Meng)

"Effects of nano-silica and nano-limestone on flowability and mechanical properties of ultra-high- performance concrete", Construction & Building Materials, volume 95, pp 366-374, 2015 (with Li, Huang, and Sun)

"Effects of nano-kaolinite clay on the freeze-thaw resistance of concrete," Cement and Concrete Composites, volume 62, pp.1-12, 2015, (with Fan, Zhang and Wang)

"Nanomechanical investigation of the effects of nanoSiO2 on C–S–H gel/cement grain interfaces", Cement and Concrete Composites, 61, 2015, 7–17, (with Xu, J. & Corr, D. J)

"Characteristics of surface-treatment of nano-SiO2 on the transport properties of hardened cement pastes with different water-to-cement ratios", Cement and Concrete Composites, 55, 2015, 26–33, (with Hou, P., Cheng, X., Qian, J., Zhang, R. & Cao, W)

"Studies on early stage hydration of tricalcium silicate incorporating silica nanoparticles: Part I", Construction and Building Materials, 74, 2015, 278–286, (with Singh, L. P., Bhattacharyya, S. K., Mishra, G., Ahalawat, S., & Sharma, U).

"Experimental study of the interfacial transition zone (ITZ) of model rock-filled concrete (RFC)", Cement and Concrete Composites, 55, 2015, 223–231, (with Xie, Y., Corr, D. J., Jin, F.& Zhou, H)

"Ultrasonic monitoring of the setting of cement-based materials: Frequency dependence", Construction and Building Materials, 65(0), 2015, 518–525, (with Yim, H. J.& Kim, J. H)

"Effects of the pozzolanic reactivity of nanoSiO2 on cement-based materials", Cement and Concrete Composites, 55, 2015, 250–258, (with Hou, P., Qian, J. & Cheng, X).

"Nanomechanical properties of C-S-H gel/cement grain interface by using nanoindentation and modulus

mapping", Journal of Zhejiang University SCIENCE A, January 2015, Volume 16, Issue 1, pp 38-46, (with Jing Xu & David J. Corr).

"Experimental Study on the Interfacial Transition Zone (ITZ) of Model Rock-Filled Concrete", Cement and Concrete Composites, Vol. 55, January 2015 (available online), (with Yuetao Xie, David J Corr, Feng Jin and Hu Zhou)

2014

"Experimental Investigation on Quantitative Nanomechanical Properties of Cement Paste", ACI Materials Journal, Vol. 111, Issue no. 1-6, December – January 2014. (with Wengui Li, Jianzhuang Xiao, Shiho Kawashima, Gajendra S. Shekhawat)

"Influence of kaolinite clay on the chloride diffusion property of cement-based materials." Cement and Concrete Composites, 45(0), 117–124. (with Fan, Y., Zhang, S., Kawashima, S.) "Preface", Cement and Concrete Composites, 54, 2014, (with Wang, K., & Khayat, K. H)

"Effects and mechanisms of surface treatment of hardened cement-based materials with colloidal nanoSiO2 and its precursor". Construction and Building Materials, 53, pp.66-73, 2014 (Hou, P., Cheng, X., and Qian, J.)

"Experimental study on mechanical properties of interfacial transition zones in recycled aggregate concrete", Hunan Daxue Xuebao/Journal of Hunan University Natural Sciences, 41 (12), 31-39, 2014 (with Li, W. G., Xiao J. Z., & Huang, L)

"Influence of purified attapulgite clays on the adhesive properties of cement pastes as measured by the tack test." Cement and Concrete Composites, 48(0), 35–41. (with Kawashima, S., Chaouche, M., Corr, D. J).

"Experimental study of filling capacity of self-compacting concrete and its influence on the properties of rock-filled concrete." Cement and Concrete Research, 56(0), 121–128. (with Xie, Y., Corr, D. J., Chaouche, M., Jin, F)

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RESEARCH AWARDS

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Increasing Use of Fly Ash in Concrete through Nano-material Modification, Multiscale Characterization,and Improved Processing, Tennessee Valley Authority (with K. Wang)

Design and Application of High-Volume Fly Ash Self-Consolidating Concrete with the Incorporation of Nanoparticles, Infrastructure Technology Institute, Northwestern University

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Collaborative Research: Measuring, Monitoring, and Modeling the Setting Properties of Concrete,

National Science Foundation (with Z. Sun)

Chemically Bonded Phosphates, Institute of Tribology and Coatings

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Clinker-Free Concrete Made with Illinois Class F Fly Ash, Illinois Clean Coal Institute

Ultrasonic Technique for Monitoring the Setting and Hardening of Concrete, Infrastructure Technology Institute, Northwestern University

Development of Non-Clink Cement for Environmental Hazard Reduction, National Science Foundation

Hybrid Fiber Reinforced Composites, Center for Advanced Cement-Based Materials

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High Performance, Non Corroding Steel Reinforced Concrete, NSF-SBIR Injection System Pilot Study, Hilti Entwicklungsgesellschaft mbH Instrumentation and Laboratory Improvement, National Science Foundation Extruded Fiber Reinforced Cement Composites, Illinois Clean Coal Institut General Wall System Specification, Butler Mfg. Co. Research Center

ACBM-Howard Joint Research Collaboration, National Science Foundation

Studies of Fracture Processes with Computer Vision and Microtomography, Air Force Office of Scientific Research

Constitutive Modeling of Concrete, FAA Center of Excellence for Airport Pavement, University of Illinois Microstructure, Transport Property and Statistical Science, National Institute of Statistical Sciences Stonecraft, Incorporated, General Research

Improved Condition Monitoring for Bridge Management, Infrastructure Technology Institute

Concrete Research Needs Symposium, ITT

Immobilization of Waste in Grout-Main, Westinghouse Hanford The Faculty Enhancement Program, National Science Foundation Simplified Boiling Water Reactor Project, Department of Energy

Strain Softening Response of High Strength Concrete, National Science Foundation

Rate of Loading Dependency of Reinforced Concrete, National Science Foundation - Pennsylvania State

Characterization of Fracture Using Acoustic Emission, AFOSR

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NATO-ARW on Toughening Mechanism of Quasi-Brittle Materials, State of Illinois Challenge Grant, Illinois Business Partnership Program

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Reinforcement of Concrete with Cellulose Fibers, Proctor & Gamble

A Study of Fracture Processes in Concrete Using Laser Holography, AFOSR

Mixed-Mode Fracture of Concrete at High Strain Rate, AFES

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Center for Science and Technology of Advanced Cement-Based Materials (ACBM), National Science Foundation (1989-2000); Industrial Consortia (2000-). The ACBM Center is a consortium of five institutions: Northwestern University, University of Illinois, University of Michigan, Purdue University, and the National Institute of Standards and Technology. Dr. Shah is the Principal Investigator (PI) and the Director of the Center

Toughness Data in Specification of Fiber Reinforced Concrete, National Science Foundation

Modification of the Physico-Chemical Properties of Cement Paste, AFOSR (with Barbara-Ann Lewis)

Influence and Specimen Size Loading Configuration Loading Rate and Fiber Type in the Flexural Behavior of Fiber Reinforced Concrete, Concrete Materials Research Council (with V. S. Gopalaratnam)

Symposium on Bonding in Cementitious Materials, AFOSR (with MRS)

A System for Microscopic Image Analysis for Studying Fracture Toughness and Cement Composites, NSF Equipment Grant

High Rate, Closed-Loop Triaxial Testing System for Concrete, Rock and Soil, DOD Equipment Grant

Dynamic Response of Embedded Structures, AFOSR (with L. M. Keer)

Long-Term Ductility of Glass Fiber Reinforced Concrete Panels, National Science Foundation

Expansive Cement Induced Fracture and Activity Detection, U. S. Army Corps of Engineers, Waterways Experiment Station (with C. H. Dowding)

Symposium on Strain Rate Effects and Fracture in Cement Composites, AFOSR (with Material Research Society)

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Microstructure, Crack Initiation, Propagation and Localization in Concrete, AFOSR

U. S.-Sweden Joint Seminar on Steel Fiber Reinforced Concrete, National Science Foundation

NATO Advanced Research Workshop on Application of Fracture Mechanics to Cementitious Composites, NATO

Post-Peak Tensile Response of Concrete, U. S. Bureau of Reclamation

Effect of Grain Size, Strain Rate and Moisture in Rock, National Science Foundation (with C. H. Dowding)

Strain Rate Effects for Concrete and Fiber Reinforced Concrete, ARO

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Fracture Toughness of Fiber Reinforced Concrete, AFOSR Nondestructive Testing of Concrete, James Electronics German Government Visiting Scientist Award (DAAD)

Instrumented Impact Testing System, University of Illinois Research Board Envelope Curves for Confined Concrete, National Science Foundation Workshop on High Strength Concrete, National Science Foundation

Dynamic Properties of Fiber Reinforced Concrete Subjected to Impact Loading, ARO (with A. Naaman)

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Cooperative Research with Delft Technical University, NATO

Static and Dynamic Properties of Ferro-Cement, National Science Foundation (with A. Naaman) Development of Joint Research with Indian Institute of Science, National Science Foundation Materials for Housing Construction in Developing Countries, University of Illinois Research Board Ferro-Cement Panels, University of Illinois Research Board

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