

Gaurav N. Sant, Ph.D.



Associate Professor and Henry Samueli Fellow, Department of Civil and Environmental Engineering, UCLA

Dr. Gaurav Sant, an Associate Professor and Henry Samueli Fellow in Civil and Environmental Engineering, is the Principal Investigator of the [Laboratory for the Chemistry of Construction Materials \(LC²\)](#). His research is aimed towards increasing the sustainability and resilience of infrastructure by advancing knowledge of construction materials from a chemical and microstructural basis. Dr. Sant's research group is optimizing material compositions and processing techniques (i.e., fabrication and carbonation of hydrated lime) to realize the most efficient fabrication of CO₂NCRETE™

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Education

Ph.D., (2009), Purdue University M.S.C.E, (2007), Purdue University B.S.C.E, (2006), Purdue University

Research Interests

Our research efforts are directed towards the development and design of sustainable low-CO₂ foot-print materials for infrastructure construction applications. These efforts are three-fold encompassing:

1. strategies to utilize natural and waste materials in concrete by inferring optimal chemical combination's and compatibilities of constituent materials using thermodynamic calculations and experimental evaluations,
2. the formulation and-or utilization of application specific organic and inorganic chemicals to improve the properties, durability performance and service-life of concrete structures and
3. developing CO₂-insensitive concretes for use in carbon sequestration and fixation applications.

To this end, our research group develops fundamental constituent chemistry-microstructure-engineering performance descriptors of cementitious materials to correlate and unify the fundamental variables that describe the overall response of the material. These efforts are directed towards the addressing the practical needs of the wider construction community and developing "new concretes" for the next generation of infrastructure construction applications. The overall theme of research aims to rationalize the use of natural resources in construction, promote environmental protection and to advance the cause of ecological responsibility in the concrete construction industry.

Research Projects

- Low-Clinker Factor Cements and Concretes
- Carbon Fixation and Sequestration in Cementitious Materials
- Organic Polymer Additions for Property Modifications
- Blast and Fire Resistant Infrastructure Materials
- Mitigation of Deleterious Phenomena Caused by Salt Crystallization

Selected Awards and Honors

- The Bryant Mather 'Best Paper Award' (Concrete Materials Section): The Transportation Research Board of the National Academies of Science and Engineering, (2006, 2008)

- The Fred Burggraf Award for 'Best Paper by a Young Researcher' – The Transportation Research Board of the National Academies of Science and Engineering, (2007)
- William L. Dolch Graduate Scholarship for Outstanding Research in Materials Science – The School of Civil Engineering, Purdue University, (2007)