Qi Luo

Independent Project Investigator & Alexander von Humboldt Fellow

Phone: +45 91811308 | Email: qluo@cae.au.dk

BIOGRAPHY

Dr. Luo is an Independent Project Investigator at Aarhus University and an incoming Humboldt Fellow at RWTH Aachen University, where he leads groundbreaking interdisciplinary projects in sustainable construction materials. His project, "Thunder Stone," explores the integration of energy storage capabilities into concrete, representing a transformative and multidisciplinary approach to the future of construction materials. Dr. Luo's research focuses on the reaction mechanisms of low-carbon cement, the mechanical origins of its performance, and its life cycle assessment (LCA), aiming to uncover sustainable and scalable solutions for real-world impact. He completed a joint Ph.D. program at the University of California, Irvine, USA, and Guangxi University, China, specializing in multiscale damage analysis and the sustainability of cement-based materials. He previously served as an Associate Professor at Chongqing Jiaotong University (2020–2022) and gained extensive international experience through two postdoctoral appointments: at the National University of Singapore (2022–2023) and Aarhus University in Denmark (2023–present).

Dr. Luo has received funding from the Villum Foundation, Humboldt Foundation, the National Natural Science Foundation of China, and the Natural Science Foundation of Chongqing, China. He has also contributed to international projects with organizations such as the U.S. Department of Transportation, the National Research Foundation of Singapore, and the Danish Offshore Technology Centre. He has authored or co-authored over 20 journal publications in the field of cement and concrete research and serves as a peer reviewer for prestigious journals, including the *Journal of Engineering Mechanics ASCE*, the *International Journal of Damage Mechanics*, and *Construction and Building Materials*, among others.

EDUCATION

University of California Irvine — Irvine, Ca, U.S.A
Joint Ph.D. student at Department of Civil and Environmental Engineering — Apr. 2016 – Jun. 2018

Guangxi University — Nanning, China
Ph.D. student at School of Civil Engineering and Architecture — Sept. 2014–Jun. 2020

Chongqing Jiaotong University — Chongqing, China
B.S.E and M.S.E student at School of Civil Engineering — Sept. 2010 – Jun. 2013

ACADEMIC APPOINTMENTS

Aarhus University — Aarhus, Denmark
Independent PI of Villum Experiment — Jan. 2025 – Present
Department of Civil and Architectural Engineering

National University of Singapore — Singapore
Postdoctoral Researcher — Aug. 2024 – Dec. 2024
School of Civil and Environmental Engineering

Aarhus University — Aarhus, Denmark
Postdoctoral Researcher — Aug. 2023 – Jul. 2024
Department of Civil and Architectural Engineering

National University of Singapore — Singapore
Postdoctoral Researcher — Aug. 2022 – Jul. 2023
School of Civil and Environmental Engineering

Chongqing Jiaotong University — Chongqing, China
Associate Professor — Jun. 2020 – Jul. 2022
School of Civil Engineering

AWARD

- 2025 Young Researcher Award, International Conference on Damage Mechanics (ICDM), awarded biennially to two global researchers under 40; first Chinese recipient
- 2022 Young Elite Talent at Chongqing Jiaotong University
- 2022 Third Prize in the Young Teacher Teaching Competition
- 2021-2022 Consistently Achieved top 5% for Teaching Quality for Two Years (Top 5%)
- 2015 Outstanding Student for Oversea Exchange Scholarship (Top 1%)
- 2013 Chongqing Outstanding Graduate (Top 1%)

RESEARCH PROJECTS

- Alexander von Humboldt Fellowship (Supervisor: Prof. Thomas Matschei), 2027-2028, Multi-scale mechanisms of hydration-carbonation synergy in CO_2 cured concrete for carbon neutrality, RWTH Aachen University. $104,963
- PI, 2025-2026, Thunder Stone (***An unconventional project***), Villum Experiment, Villum Foundation, Denmark. $293,200
- PI, 2021-2023, Damage evolution and deterioration mechanism of the interface between concrete strengthened by UHPC under freeze-thaw cycles, National Natural Science Foundation of China. $63,585
- PI, 2021-2023, Study on the interface degradation mechanism between silane coupling agent modified epoxy and calcium silicate hydrate under corrosive ionic environment, Natural Science Foundation of Chongqing. $21,195
- PI, 2020-2022, Study on the degradation mechanism of CFRP/concrete reinforcement interface in coastal erosion environment, Natural Science Foundation of Chongqing. $19,139
- PI, 2020-2022, Research on pore size distribution and deterioration of ultra-high-performance concrete, Chongqing Jiaotong University. $20,580
- Principal researcher, 2023-2024, Study on the deterioration mechanism of cement and steel interface in CCUS, Danish Offshore Technology Centre.
- Principal researcher, 2022-2023, Engineering a sustainable cementitious material containing clay and limestone, Minster of Education, Singapore.

RESEARCH INTERESTS

Sustainable Construction Materials:	Development of low-carbon cement and CO_2 sequestration techniques.
Energy-Storing Concrete:	Innovative construction materials with integrated energy storage.
Multiscale Material Characterization:	Nano to macro-level analysis of cementitious materials.
Durability & Performance:	Durability related physiochemical process in construction materials
Life-cycle assessment	Utilization of resources and spatial-temporal environmental impacts

CONFERENCE/PRESENTATIONS

International Conference on Atomistic Simulation of Cementitious Materials 2024 NUS, Singapore, 2024
Degradation Mechanism of CFRP Concrete Interface under a Hydrothermal Environment

UCI CEE SEMINAR SERIES WINTER 2024 University of California Irvine, U.S.A,2024
Advancing Carbon Neutrality in Construction: The Transformative Potential of CO_2 Curing Technologies

The 3rd National Academic Conference on Advanced Cementitious Materials Changsha, China, 2023
Study on the hydration mechanism of UHPC-LC^3 based on calcined clay-limestone system

Professor Forum Chongqing Jiaotong University, Chongqing, China, 2020
Concrete design at a macroscopic scale: "Gorilla" concrete

The Third International Conference on Damage Mechanics Tongji University, Shanghai, China, 2018
(Keynote) Microstructural characterization and wave-modulus simulation of concrete materials

TEACHING ACTIVITIES

Theoretical Mechanics Chongqing Jiaotong University
Primary Instructor 2020-2021

Mechanics of Materials Chongqing Jiaotong University
Primary Instructor 2020-2021

Architect Mechanics Chongqing Jiaotong University
Primary Instructor 2021-2022

REVIEW SERVICES

Reviewers of: Journal of Engineering Mechanics ASCE; International Journal of Damage Mechanics; Construction and Building Materials; Case Study in Construction Materials; Advances in Civil Engineering; Frontiers in Materials

STUDENTS SUPERVISED

Guided 13 master's students, many of whom successfully published peer-reviewed papers during their studies. Notably, one will join a Ph.D. program at the National University of Singapore next year, another has secured admission for doctoral studies at Harbin Institute of Technology, and a third is pursuing a Ph.D. at Chongqing Jiaotong University.