



A Proposed Engineering Research Center (ERC) to the National Science Foundation, underpinned by University-Industry Collaboration

SCIENCE ERC is motivated by the urgent need to address decarbonization of cement and steel manufacturing, which is responsible for 16% of all anthropogenic CO₂ emissions and accounts for a significant share of emissions associated with construction.

SCIENCE ERC aims to undertake fundamental and applied R&D that leverages knowledge and expertise from infrastructural materials industry to:

SCIENCE STEEL & CEMENT MANUFACTURING
INNOVATIONS TO ENABLE A LOW CARBON ECONOMY

Addressing industrial emissions through innovative manufacturing science and engineering

Steel and cement production is responsible for ~16% of global CO₂ emissions

SCIENCE ERC catalyzes low- and negative-carbon manufacturing of steel and cement through the convergence of scientific research, scale-relevant piloting, and techno-economic and governance frameworks

- Pioneer new technologies to eliminate carbon emissions from infrastructural materials manufacturing
- Develop novel infrastructure materials through waste upcycling and unique synthesis processes
- Increase process energy-efficiency; use of renewable energy; electrification; and CCUS solutions
- Integrate models and Internet-of-things (IoT) platforms for infrastructure materials manufacturing
- Develop life-cycle and technoeconomic tools to ensure cost- and energy efficiency
- Train an efficient workforce for carbon-lean materials manufacturing

INDUSTRY INVOLVEMENT AND ENGAGEMENT

SCIENCE will serve as a first-of-its-kind academia-industry consortium to reimagine manufacturing of critical infrastructure materials by advancing solutions and schemas that reduce their carbon footprint significantly.

Industrial entities, start-up companies, professional societies, consulting companies, and government agencies are *invited to join as members* of the SCIENCE CONSORTIUM. The consortium members can propose and sponsor research at the participating institutes at reduced overhead rates, have access to SCIENCE advances and national/international partners, and can select students for internships and/or permanent positions.

WEBINAR - 02/27/2023: DECARBONIZE WITH SCIENCE

Please join a virtual SCIENCE webinar on 02/27/2023, 2 PM to 3.30 PM MST (4 PM-5.30 PM EST; 1 PM-2.30 AM PST) hosted by the partner universities to learn more about the consortium and its proposed activities and how your involvement in an industry-academia team is vital to decarbonizing heavy industries. There will be a presentation of a carbon neutrality roadmap for cement, concrete, and steel industries by industry organizations.

Please register at: <https://www.eventbrite.com/e/529585092267>

Contact information:

Prof. Narayanan Neithalath (ASU; Narayanan.Neithalath@asu.edu);

Prof. Gaurav Sant (UCLA; gsant@ucla.edu);

Prof. Ron O'Malley (Missouri S&T; omalleyr@mst.edu);

Prof. Sridhar Seetharaman (ASU; seetharaman@asu.edu);

David Wahls (ASU; David.Wahls@asu.edu)

