

CAVS Mission

CAVS provides a distinctive interdisciplinary platform to concurrently address complex engineering and scientific challenges and train next-generation engineers and scientists. Utilizing high performance computational resources and state-of-the-art analytical tools for modeling, simulation, and experimentation, CAVS researchers develop and validate novel concepts in materials, propulsion, and basic designs for efficient human and vehicle mobility. With such broad impact research and verified, innovative solutions, CAVS claims its position as a world-class center of research, technology, and education excellence.

CAVS Vision

CAVS will be a global leader in interdisciplinary research and development of engineering solutions and technologies to expand the design, production, and infrastructure necessary for sustainable operation of future human and vehicle mobility alternatives.

Engineering Mechanics & Materials Science (EMMS)

Advanced Materials Testing
Capability

Contact Information

Hongjoo Rhee, Ph.D.
Associate Director for EMMS Group
hrhee@cavs.msstate.edu
(662) 325-9221

Roger King, Ph.D.
CAVS Director
rking@cavs.msstate.edu
(662) 325-2189

200 Research Blvd.
Starkville, MS 39759



www.cavs.msstate.edu



www.hpc.msstate.edu



www.bagley.msstate.edu



www.msstate.edu

CAVS

Center for Advanced Vehicular Systems

MISSISSIPPI STATE UNIVERSITY

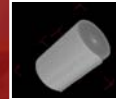
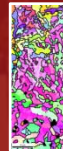
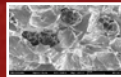
TM

EMMS Mission

- Carry out lab-scale experimentation to address process-structure-property relationship
- Support computational modeling and tools to simulate heterogeneous boundary conditions in processing and performance cases
- Establish a set of small-scale materials processing steps to simulate and optimize industrial processes to impact the growth of regional economy and draw regional/national/international industry participation into education, services, and research on various materials

Advanced Materials Testing Capability

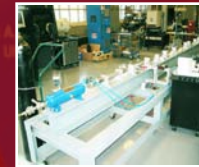
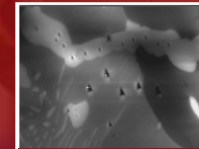
- **Materials Property Characterization**
We have a broad collection of instruments capable of investigating microstructural morphology, surface metrology, bulk properties, stereology, and defect states at the different size scales. (High performance FEG-SEM, EVO-SEM, x-ray CT scanner, optical microscope, surface analyzer, particle size analyzer, spectrometer, corrosion environmental chamber, etc.)



- **High Temperature Characterization**
TGA, DSC, DMA, dilatometer, microwave sintering furnace, muffle furnaces, power injection molder, extruder, powder compaction machines, etc.



- **Mechanical Property Characterization**
Our state-of-the-art facilities emphasize exploratory, correlation, and validation experiments to support model development. Our current manufacturing capabilities include melting, casting, forming, rolling, welding, and powder metallurgy. (Nano- & micro-indenter, high strain-rate Hopkinson bar testers, Instron machines, MTS machines, hardness testers, etc.)



- **Specimen Preparation**
Saws/cutters, polishers, mounting press, ultrasonic cleaner, etching capabilities, machine shop (CNC mill, CNC lathe, milling machine, plasma torch, MIG & TIG welders, etc.)

