The Composites Manufacturing & Simulation Center is driving composites manufacturing into the future by furthering the development and use of composites simulation. We all know current trial-and-error techniques are time-consuming and costly, limiting application of these materials. The CMSC is helping to solve this problem by developing a comprehensive set of simulation tools to model composite structures from manufacturing through retirement. In addition, state-of-the-art manufacturing and characterization facilities provide a one-stop-shop for composites design, manufacturing, prototyping, and model validation. Additionally, the CMSC is dedicated to training engineers across the entire composites community in composites manufacturing and simulation.

GREAT PEOPLE

The CMSC employs a wide range of highly qualified, full-time staff, including faculty, graduate and undergraduate research assistants and full-time research engineers. The faculty represent well over a century of experience in composites manufacturing, characterizing and simulation, including multi-scale modeling from atomistics to macro-scale. Faculty from Purdue Schools and Departments residing in IMI include Aeronautics and Astronautics, Chemical Engineering, Materials Engineering, Aviation Technology and Computer Graphics Technology.

GREAT FACILITIES

The CMSC occupies 32,000 ft² in the Indiana Manufacturing Institute, a building located in the Purdue Research Park and completed in 2016. Over 13,000 ft² are dedicated to composites manufacturing and testing in a lab space that closely mirrors actual processes for aerospace and automotive manufacturing. Currently, this includes the full range of aerospace manufacturing including automated ply cutting, autoclave and oven curing, and CNC tool fabrication. The CMSC has added vehicle manufacturing capabilities with high-pressure resin transfer modeling, laminate stamping, injection over-molding and composites additive manufacturing.

INDUSTRY INVOLVEMENT

The CMSC is a bridge between the academic and industrial communities, connecting the global composites industry and Indiana manufacturing to Purdue University. The CMSC research is driven by industry needs and grounded in academic rigor. Global sponsors and partners include aerospace and automotive OEMs, Tier 1 and 2 suppliers, materials suppliers, wind turbine manufacturers, and commercial software providers. Located in the Purdue Research Park, the CMSC is the portal for industry to interact with the world-class Purdue team around composites design, manufacturing, modeling, and simulation.

UNIQUENESS

The CMSC is dedicated to the future of composites manufacturing, including the promises of additive manufacturing. Sitting side-by-side is a team with capabilities spanning manufacturing, modeling and simulation, performance prediction, characterization, experimental validation, design, and prototyping, including rapid fabrication of composites tooling. With this full complement of capabilities, the CMSC is the locus for composites design, manufacturing, and simulation.