



BART BOATWRIGHT / Staff

Imtiaz Haque, center, ICAR's executive director of automotive engineering, explains to hydrogen symposium goes one of the tests underway at ICAR's Campbell Engineering Center.

# Hydrogen conferees take in ICAR research

National association ends weeklong session touring Greenville campus

By Jeff Wilkinson  
THE STATE

About a dozen attendees of the National Hydrogen Association Conference & Expo in Columbia traveled to the Upstate on Friday to tour the fourth facet of the state's hydrogen and fuel-cell effort.

The event was the last in the weeklong conference that drew 700 con-

ferrees and 2,000 members of the public — a record for the 20-year-old association.

The Clemson University Center for International Automotive Research, called ICAR, is a \$214 million, 250-acre advanced technology research campus located on Interstate 85 in Greenville.

Since it began in 2003,

the campus has created 500 private jobs. An additional 40 private jobs have been announced by a titanium firm for the campus, along with 300 related manufacturing jobs in Laurens County.

All of the jobs are tied to high-tech research.

"The pace (the campus) has developed has been remarkable," said Chris Przirembel, Clemson's vice president for research and economic development. "Its primary purpose is to drive inno-

vation and move that intellectual capital to the marketplace.

"The state is only going to advance with cutting edge technology," he said. "As soon as products become commodities, the manufacture will be moved overseas."

At ICAR, researchers work to improve the interaction between engine, drivetrain and other systems to operate more efficiently together —

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## ICAR

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that includes research into hydrogen fuel-cell vehicles.

"But it's not only about the research," said David Bodde, a professor in the university's entrepreneurial program, "but capturing the value of that research" by partnering with established companies or spinning off new ones.

ICAR uses the same model for auto research that the University of South Carolina is using to market its research in more-efficient hydrogen fuel cells.

Coupled with the Savannah River National Laboratory's work on hydrogen production and storage, and research at Orangeburg's South Carolina State University on hydrogen and fuel cells in public transportation and homes, South Carolina has a full range of hydrogen and fuel-

cell research, officials said.

While Clemson's efforts include fuel cells — particularly how hydrogen fuel cells can be incorporated into auto platforms — it isn't limited to that. The university has four endowed chairs — special researchers and their teams delving into the specialties of auto systems integration, manufacturing, electronics and automotive design.

The centerpiece of the ICAR campus is the \$40 million Carroll A. Campbell Jr. Graduate Engineering Center — a year-old, 90,000-square-foot, futuristic facility housing Clemson's doctoral program in automotive engineering, the nation's only such program.

In a partnership with Upstate auto giant BMW, tire manufacturer Michelin and other companies — including NASCAR's Dale Earnhardt Inc. and the Richard Petty Driving Experience — about 55 master's and doctoral students and 15 or so faculty and staff mem-

bers are researching systems integration improvements for the automotive industry.

The university hopes to increase the program to 100 students.

Since it was established a year and half ago, the campus has attracted the private firm Timken, a Canton, Ohio-based powertrain producer.

The firm moved its research and development arm — as well as 200 new jobs — into a two-story building at ICAR.

BMW houses 300 employees at its four-story information technology research center on the campus.

Also, American Titanium has announced its intention to place 40 research jobs on the campus and 300 manufacturing jobs in Lauren County.

Clemson has experienced the type of private investment that USC hopes the Innovista research campus in downtown Columbia will attract.