



# ICAR

WHAT DOES IT MEAN TO THE REST OF THE WORLD?



THIS TIME LAST YEAR, NABIL ELKOUH, PH.D., THE CHIEF TECHNOLOGY OFFICER OF AMERICAN TITANIUM WORKS (ATW), DIDN'T REALLY KNOW MUCH ABOUT GREENVILLE, S.C.

HE HAD, HOWEVER, HEARD ABOUT CU-ICAR.

*by Lydia Dishman*

**S**o when ATW was doing their homework to select a site for their new operations – to include a mini-mill for producing melted and rolled titanium products and a research facility – the Palmetto State was definitely on the radar.

“We first did a thorough selection process,” Elkouh explains, citing critical needs such as proximity to the airport, access to a qualified labor pool and good labor rates as points that put Greenville among the top five of 15 contenders.

At that point, a delegation of eight representatives ranging from Bob Geolas, CU-ICAR’s executive director, to Joe Taylor, South Carolina Secretary of Commerce, paid a visit to the ATW execs on their home turf in Chicago.

“They impressed us with coordination and with how well they understood our needs. Most states couldn’t see beyond a co-location close enough to collaborate but for each to have a different purpose,” he says about the company’s dual need for a manufacturing plant to handle processes from raw material preparation to finishing and testing, as well as a research laboratory.

Each of the states in the running offered handsome tax incentives. But what cemented the decision to invest an estimated \$422 million and employ more than 300 people in S.C. was CU-ICAR. Elkouh says, “CU-ICAR’s very clear vision is what made us choose them.”

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Elkouh admits he had not been fully aware of the scope of the academic/corporate partnership that flourishes at CU-ICAR, but as he and the ATW principals learned more, they found “it had a similar mission to ATW’s: to interact with academia and business.”

In mid-November, as the automotive industry awaited news of a bailout, ATW announced they would locate facilities in Laurens County as well as on the CU-ICAR campus, offering a ray of hope for the economic woes that had leveled businesses in many different industries – not just the automotive sector.

A few weeks after the ATW announcement, CU-ICAR welcomed another potential investor, Carbon Motors Corporation, a start-up company with plans to manufacture a vehicle specifically designed for law-enforcement.

The E7 Homeland Security Vehicle, a muscular black-and-white beast of a sedan, rolled onto the stage at the Carroll Campbell Graduate Engineering Center with its siren blaring and blue and red lights flashing. Its appearance was part of a multi-city tour to showcase purpose-built features such as an infrared camera for night vision and a built-in radiation detector.

But perhaps what was more exciting was the news delivered by William Santana Li, chairman of the Atlanta-based company, that the company was considering locating manufacturing facilities and headquarters in South Carolina.

Li doesn’t remember exactly when he first heard about CU-ICAR, but says he’s been following its progress since his first visit to the campus three years ago. Currently, Carbon Motors is

deliberating among six states with a decision forthcoming in the second quarter of 2009. While there is no formal agreement yet, Li emphasizes that no matter where they end up, he is keen to keep a working relationship with CU-ICAR.

Eric Miller stood off to the side of the auditorium after the E7 presentation. He smiled and nodded as if opportunities like this came along every day at breakfast. Maybe not every day, but according to Miller, director of business development of the Upstate Alliance, though CU-ICAR is just a few years old, its reputation as a well-executed model of the academic/corporate partnership, is becoming more widespread.

“I’ve been all over the world,” Miller says with a broad grin as he ticks off locations in Europe and Asia as well as across the U.S. “Everyone’s heard of CU-ICAR.”

## TURNING THE IGNITION

These latest events and announcements add to CU-ICAR’s impressive and ever-growing corporate roster. As of mid-2008 CU-ICAR accounted for \$225 million in public and private investment and the creation of 500 new high-paying, technology-oriented jobs.

According to Vice President for Research and Economic Development Dr. Christian Prziembel, who was involved in the development from its genesis back in summer of 2000, CU-ICAR grew

their portfolio of partners organically out of a step-by-step process.

The systematic approach began with identifying Clemson University’s academic strengths, then locating a property to be anchored by the academic unit and surrounded by buildable land to attract private sector investors. The next piece was to design a campus that invited interaction – not just in meetings but also informally – and then to put forth a dedicated effort to recruit partners.

The project that Prziembel is quick to note, “started with no money and no land,” was able to break ground just three years later, due to the dedication to early recruitment. Now such names as AT&T, Timken, Sun Microsystems, Mazda, two Tier One suppliers, and Michelin and BMW (both sponsors of the endowed chair program), have put down roots on the campus.

Looking back at the evolution, Clemson President James Barker says that CU-ICAR can serve as a template for economic development in South Carolina. “It brings together the academic and research strengths of a research university, the public support of state government and the private support of an existing strong industry in the region.

“None of these entities could have created CU-ICAR without the involvement and support of the other two,” Barker says. “But together we present a powerful statement to the automotive industry and to the world about what Clemson University and South Carolina have to offer.”

## REVVING THE ENGINE

The template for economic development in concert with academic research is becoming more widely known as the CU-ICAR staff attends conferences all across the country and overseas. Most recently, Prziembel says he was approached at a conference

for the American Competes Act at Oakridge National Lab by several people, including the President of the University of Tennessee, who confessed, “We shamelessly used your model to attract VW to Chattanooga.”

He went on to add that Congressman Zach Wamp said it was the best model they had seen to bring research and automotive together. “I think it is well known in the auto industry,” Prziembel finishes modestly.

Jim Morton concurs that the auto industry is indeed a small world. The retired Nissan and Michelin executive, now principal of Morton Consulting, believes that Clemson University had established a good name for itself in international circles that preceded the creation of CU-ICAR. His own connection to the Upstate made him aware of CU-ICAR when he was employed at Nissan, and he continues to bring some current clients to see the progress.

“Michelin, BMW, Timken – these companies have an interest in CU-ICAR, and that is sometimes the best advertising, especially when (those companies) talk it up. If people are looking to have a certain relationship with a customer like BMW, they will look at ways to connect with them, and CU-ICAR is a great way to do it,” says Morton.

## THE STUDENTS

“It is a closed industry and word spreads quickly,” says Carl Flesher, CU-ICAR’s Global Business Director, who keeps his focus on long-range planning and marketing.

“In tough times, strong marketing makes a lot of sense,” he says, adding, “I believe in smart marketing, asking, ‘What are the types of companies do we want to attract?’ The OEs are in a lot of financial trouble and their ability to maneuver is hampered, but a lot of smaller companies are the ones generating solutions that major manufacturers will be looking to in the future.”

Flesher says his plan is to continue to look at industry trends and materials, to have a better idea of how to prepare students and build capability. “Marketing also means assessing ourselves and looking out five years to remain relevant,” he explains.

To do so means taking a look at the academic component. He sees a basic problem in the decline in graduation of engineers and, “Their education – though good – is not prepping them to move into management. Those two needs are recognized by major companies.”

“MICHELIN, BMW, TIMKEN - THESE COMPANIES HAVE AN INTEREST IN CU-ICAR.”

It is, apparently, being recognized by students as well. Flesher notes that there are 210 applicants for just 30 positions at the Campbell Graduate Center. Agreeing, Dr. Tom Kurfess, professor and BMW Chair of Manufacturing in the Department of Mechanical Engineering and Director of the Carroll A. Campbell Jr. Graduate Engineering Center, says that number is “amazing” and attributes it to the labs, equipment and faculty which he believes are unparalleled anywhere.

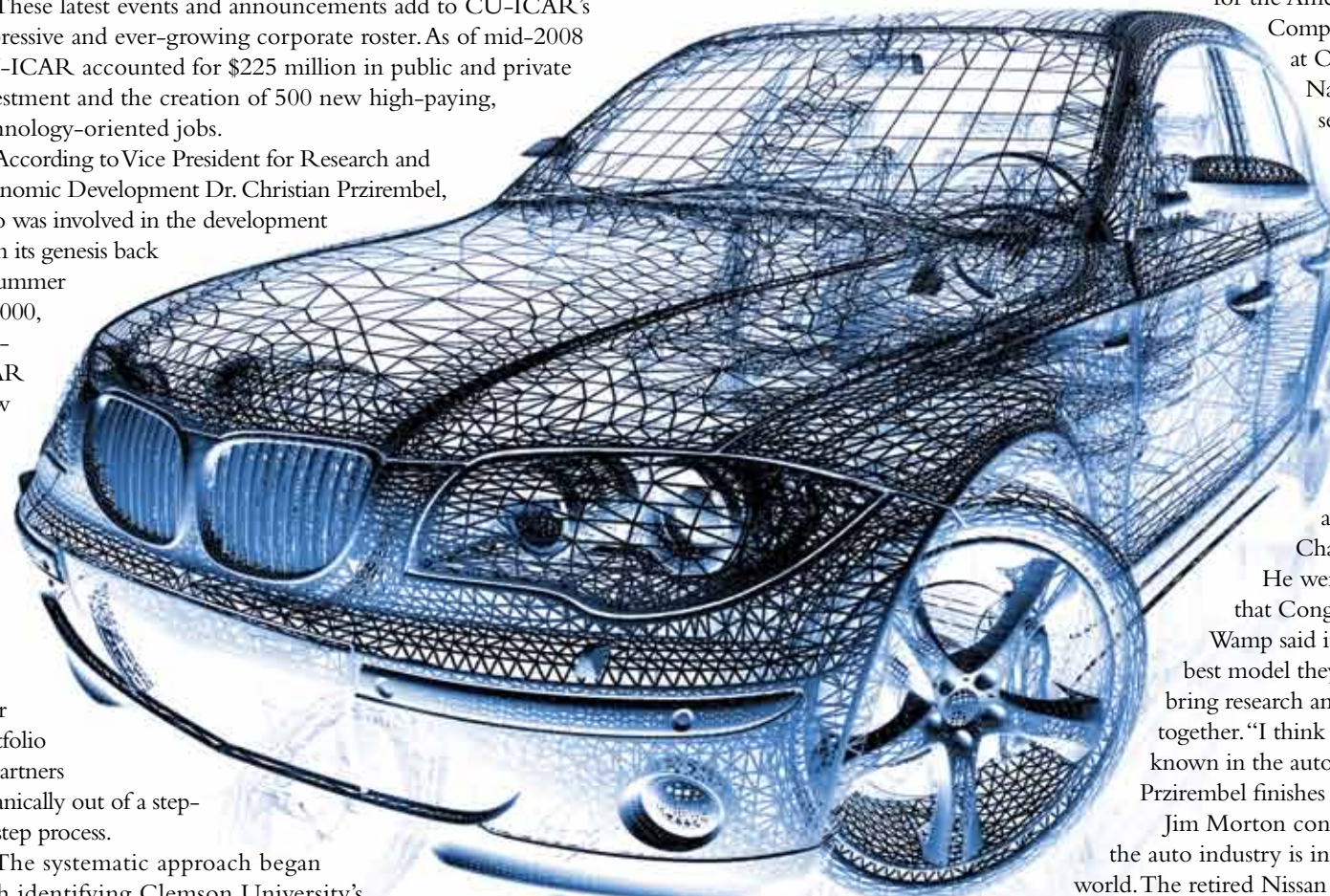
Though Kurfess used some of his contacts to originally draw students such as John Limroth (now a third year Ph.D. candidate) who used to work for National Instruments, there have been plenty of students who have used plain old-fashioned research to find out more about the graduate engineering program.

Chan Wong, originally from Malaysia, found out about CU-ICAR through the internet. “I was looking for a school to further pursue an automotive degree after getting my M.S. degree in electrical engineering at Tulane University.” Wong, also a third-year candidate, says he might even like to stay in the Upstate after graduating, “if possible, with an automotive OEM such as BMW,” though he doesn’t discount the possibility of returning to Malaysia to work with their own automotive OEM, PROTON, or at the academic campus they are building similar to CU-ICAR.

To emphasize the torrent of activity, Kurfess says, “Every week we have a seminar or a speaker from the industry. We’ve had visitors from Toyota and Honda and have a memo of understanding with Nagoya Institute of Technology.” In Kurfess’ eyes, this translates to a head start in tough economic times. “Others want to duplicate us, but won’t be able to for at least a few more years.”

## DRIVING, NOT IDLING

Snapping up a piece of the knowledge economy through the endowed chair program at CU-ICAR is a big proactive move to make to assist the local growth of the industry, according to Kurt Mueller, vice president of Chassis Systems ZF Lemforder North America.



"It is a great step in many ways and represents the maturity we've reached in the industry," Mueller, who is based in Detroit, says, comparing it to ZF's growth in scope with an increase in their business. "We started as assemblers and became a center of competence for design. CU-ICAR's whole partnership with the state, the university and businesses to develop curriculum with suppliers and BMW in mind, is the right direction to go in now."

Elkoush sums up. "I've seen a lot of the parks that universities have put together, and I've never seen anything like this that has such a unified vision and ability to execute that vision. It's really, really impressive." ■

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AND BECAME A CENTER OF  
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### ICAR: IN BRIEF

In 2002, a unique combination of circumstances created a unique economic development opportunity.

BMW was well established in South Carolina and wanted to expand. One in six BMW cars sold worldwide was manufactured in the state. Clemson University was interested in a university presence in Greenville, and 250 acres of suitable property was available along I-85.

Clemson initially proposed to build a full-scale wind tunnel on its proposed site for research and development by the growing regional automotive and motorsports sector, including NASCAR race teams. BMW already had a wind tunnel in Germany and was not interested in another. The company expressed strong interest in a strong academic program to educate U.S. automotive engineers and create an environment to attract the company's German engineers to the state.

With an existing strong academic program in mechanical engineering and a critical mass of automotive and motorsports companies along the I-85 corridor, Clemson was in an excellent position to expand its degree programs to offer master's and doctoral degree programs in automotive engineering.

BMW invested \$400 million in its manufacturing plant and received an incentive package worth \$80 million from the S.C. Dept. of Commerce. The incentive package included \$15 million for a new BMW Information Technology Research Center that brought several hundred new high-paying Research & Development jobs to South Carolina. The ITRC was the first BMW research facility to be located outside Germany. At BMW's request, the S.C. Dept. of Commerce invested \$25 million in funds for construction of Clemson's Carroll A. Campbell Jr. Graduate Engineering Center (CGEC) next to the BMW ITRC on the I-85 site.

BMW invested \$10 million, matched by \$10 million in SC Centers of Economic Excellence (CoEE) funds, for two Endowed Chairs in the new automotive engineering graduate program. Clemson subsequently added two more CU-ICAR CoEE Endowed Chairs with support from Michelin and Timken. Timken subsequently located a second R&D facility on the campus, bringing several hundred additional R&D jobs to the state.

Total public and private investment in CU-ICAR to date totals more than \$200 million. By 2008, the four Endowed Chair positions were filled, six junior faculty were hired, and Clemson's new graduate program in automotive engineering had 55 master's and doctoral degree candidates enrolled in the CGEC. The graduate program will ultimately accommodate 100 students. A number of other partners have joined CU-ICAR; a full list is available at [www.cu-icar.com](http://www.cu-icar.com).

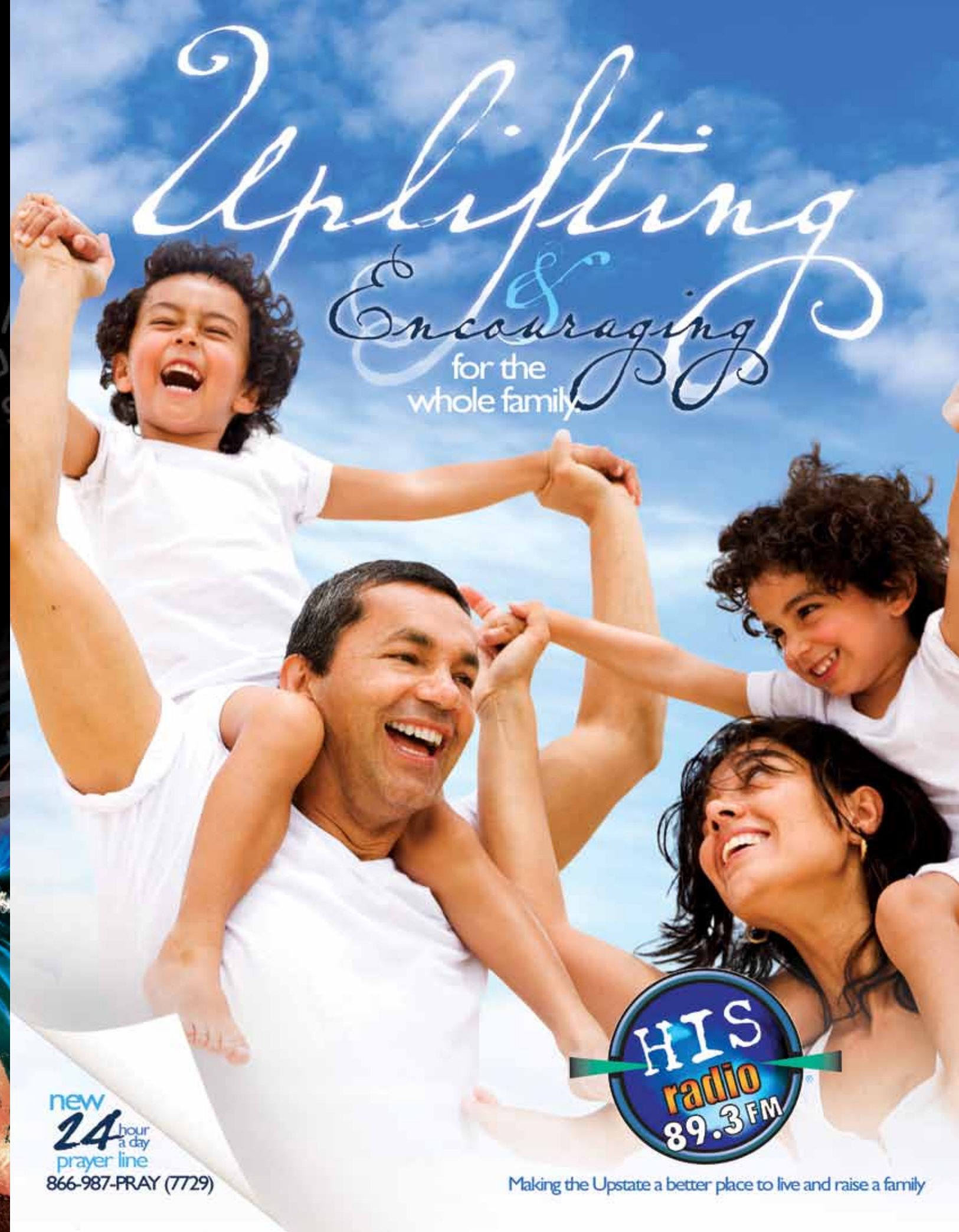
# CU-ICAR

## BY THE NUMBERS

\$215 MILLION+	Total public and private investment
38	Partners
500	Jobs generated
10	Faculty
4	Endowed chairs
55	Graduate students
15	Countries represented by students
3	Countries where students are currently completing internships
250	Acres



Information provided by Clemson University



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