Researcher explores new concepts for air transportation

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Research under way at Clarkson University on possible configurations for green aircraft is resulting in designs that look a lot like nothing most people would imagine. The future calls for out-of-the-box thinking however—and Clarkson's motto is "defy convention"—so researchers there have a head start on innovation.

Pier Marzocca, professor of mechanical & aeronautical engineering in the Wallace H. Coulter School of Engineering at Clarkson, discusses advances in air transportation in the May 7 issue of SAE International. The article is based on a technical paper that he co-wrote along with Clarkson graduate student Casey Stockbridge and Allesandro Ceruti of the University of Bologna. In part, it discusses a process called rapid prototyping (RP). (Read the full article at bit.ly/1n6SdPf , page 6.)

"Rapid prototyping is revolutionizing the way products are designed and manufactured," Marzocca says. "This enables us to identify possible mistakes and misfits in parts so solutions can be found and corrected more rapidly and economically. We use it often to produce models that can be tested in wind tunnel."

In a general sense, RP is an additive manufacturing process, he adds, and a research group from Clarkson recently received funding from NYSERDA to improve current the state-of-the-art metal additive manufacturing process.

This project, led by Marzocca and Assistant Professors of Mechanical &

Aeronautical Engineering Ajit Achuthan and James Gibert, is in collaboration with General Electric and the U.S. DOE Oak Ridge National Laboratory, among others.

The new unconventional airship research was inspired by the European-funded project MAAT (a Multibody Advanced Airship for Transport concept) led by University of Modena and Reggio Emilia. MAAT is a green transportation system with zero emission, powered by photovoltaic and fuel cells, using hydrogen as lifting gas.

Marzocca received his doctoral degree in aerospace engineering from Politecnico di Torino, Italy, and worked as a postdoctoral researcher and visiting assistant professor in Engineering Science and Mechanics at Virginia Tech before joining the Clarkson faculty in 2003. He has been working in the field of aerospace engineering since 1996.

He was recently awarded a visiting professor research fellowship from the Sapienza University of Rome, where he is spending the summer. "This fellowship will allow our group to continue research in exciting areas of green air transportation and also explore collaborative opportunities in Europe, particularly in the aerospace and renewable energy arena," he says.

Provided by Clarkson University