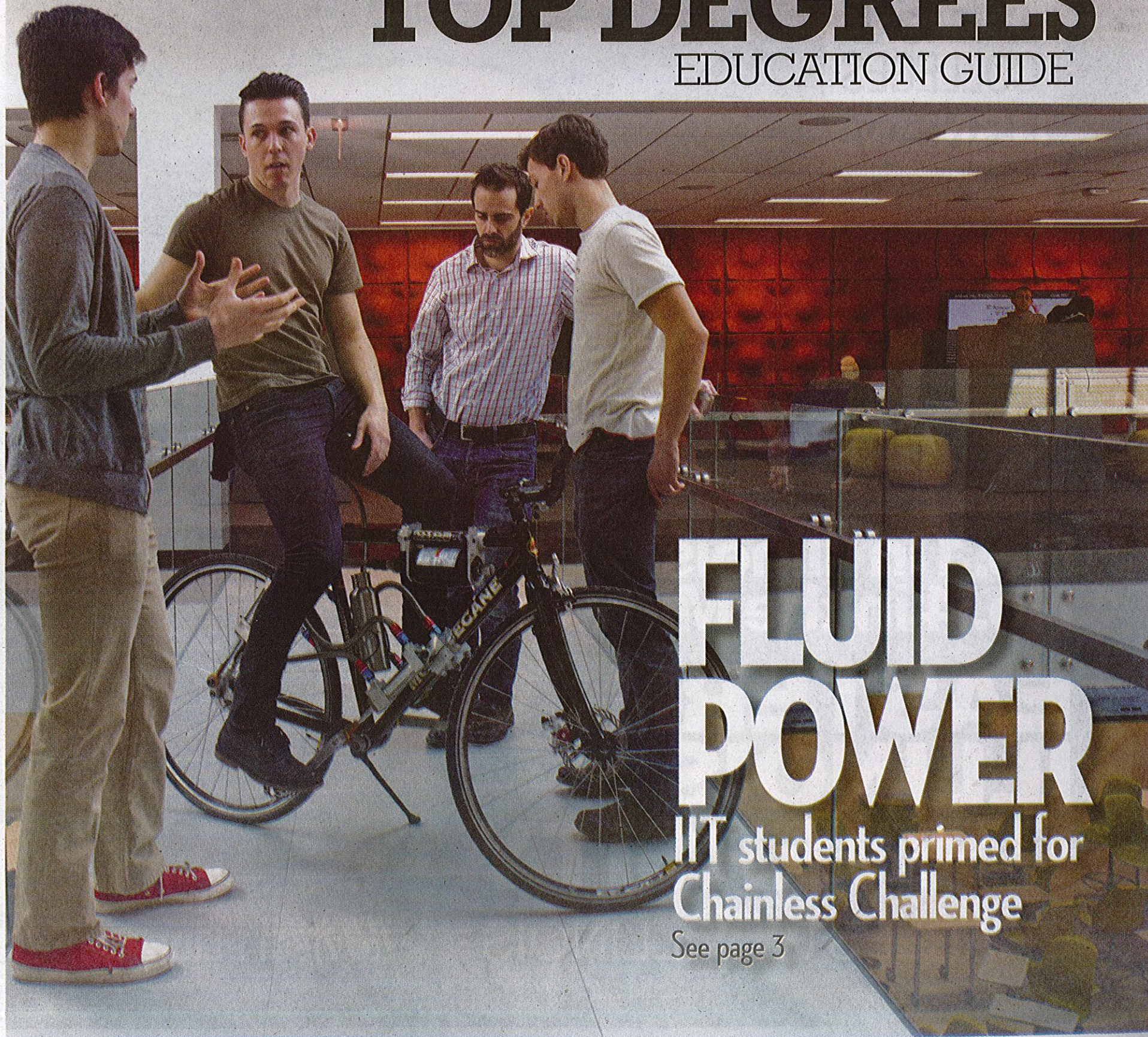


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EDUCATION GUIDE



FLUID POWER

IT students primed for
Chainless Challenge

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IIT STUDENTS READY TO RIDE

Poised for the challenge: IIT students Chaemoon Lee (from left), Carl Ferrario, Nathan Ruhl, Emanouel Milanov and Nicholas Taluzek work on the bicycle they plan to enter in the Parker Chainless Challenge this spring. | PHOTO BY MICHAEL ROBERTS

Team to compete in Parker Chainless Challenge this spring in California

BY REX ROBINSON
For Sun-Times Media

Some undergrad students from the Illinois Institute of Technology's Armour College of Engineering are gearing up to compete this spring in the Parker Chainless Challenge, a feat that involves creating a bicycle that operates without a chain.

The competition is sponsored by the California-based Parker Hannifin Corporation and students from various colleges and universities from around the country are tasked with designing the bicycle (or tricycle), building it and entering it into the competition, this year being held April 8, 9 and 10 at The Great Park in Irvine, Calif.

The goal, according to Matthew Spenko, associate professor of mechanical and aerospace

engineering at IIT, is to get students more familiar with Parker Hannifin and the use of fluid power. It's not about creating a new product as a chain remains the best way to power a bicycle.

"This is definitely not something you would bring to market," Spenko said. "It's not a product development type challenge. It's more about the learning and engineering challenge of doing something different than it is about creating a better bicycle."

The goal is to give the students an open-ended problem to solve. There really is no one solution to the problem of using hydraulics to power a bicycle, Spenko said.

According to the specifications for the challenge as outlined by Parker Hannifin, the objective is to "promote original thinking in a competitive setting by combining two technology platforms that are not normally associated with one another — the

bicycle and fluid power."

Parker Hannifin manufactures motion and control technologies and systems, providing engineered solutions for a variety of mobile, industrial and aerospace markets. The company employs approximately 57,500 people in 50 countries around the world.

There are two different phases of the completion. In the first phase, the students score points based on vehicle and fluid circuit design, hardware selection, analysis of dynamics, fluid flow, expected performance and prototype build date. The students also are tested on time management.

All this leads up to the second and final phase of the competition which involves a sprint race, a time trial race, an efficiency challenge and other races designed to test how well each individual team's bicycle or tricycle performs.

Two years ago, IIT walked away winning six out of seven categories. However, last year (the third year IIT students competed), a part on the bike failed and IIT was knocked out of the competition early, according to Carl Ferrario, project lead for mechanical work on this year's team. This year, he said, he and his fellow team members are hungry for some redemption.

"We're improving on last year's design," said Ferrario, a former bike mechanic and junior at IIT. "We're feeling confident that we worked out the bug."

The bug, Ferrario added, was going to a completely new design too quickly. They used a tricycle design for the first two years and last year was the first year they used a bicycle.

While the competition is important, Ferrario pointed to other benefits of challenge.

"It's that bridge between book learning and working in industry so you can hit the ground running after graduation," he said. It's great working with Parker Hannifin because they're such a big name in the industry."

The students also get a chance to use the latest technology. For example, according to Ferrario, the bicycle he and other students are creating this year is being designed using 3D imaging software.

The students are almost finished with the prototype and are eager to move on to the final phase of the competition. Other IIT team members who are part of this year's Parker Chainless Challenge include Emanouel Milanov, Chaemoon Lee, Nicholas Taluzek, David Cermak and Nathan Ruhl.

Parker Hannifin underwrites the entire competition, paying for the parts necessary to build the bikes and transportation to the competition and also awards cash prizes to both the winning students and their school. This year, IIT will

be competing against students from 10 colleges and universities, including the University of Illinois at Urbana-Champaign, the University of Cincinnati, California Polytechnic State University — San Luis Obispo, Purdue University, Western Michigan University, Murray State University, Cleveland State University, the University of Akron, Case Western Reserve University and Ohio University.

One of the benefits to Parker Hannifin is it gives the company a chance to find quality engineers. For example, two former IIT students who were team members for previous challenges — Josh Buck and Sean O'Halloran — are now employed in Parker's aerospace division.

Bob Meyer, who competed in the challenge for IIT last year, is now a computer aided engineer in vehicle dynamics and loads for General Motors. He said the competition is a great way for students to work on real projects and get solid experience to prepare them for the real world.

"Fluid power is everywhere and it's been around forever; it's hugely powerful and versatile," Meyer said. "Just about the only mark against it is its notorious lack of efficiency. The Chainless Challenge brings this otherwise easy to ignore flaw to center stage. The rules are structured so you can't just apply the industry standard and throw energy at the bikes to overcome the lack of efficiency. You must design out the inefficiency."

Meyer said he is grateful to Parker Hannifin for creating and executing the challenge.

"Anyone can donate to schools but it takes a special kind of company to break the norm and host something like the Chainless Challenge and I think this desire to set the trend is what makes Parker such an extraordinary company,"

Meyer said.

For more information about the student's progress in this year's competition, visit www.engineering.iit.edu.

