

**Nov./Dec. 2002**

*David Shapiro, Co-Editor*

*Dave Smith, Co-Editor*

**ASME Hudson-Mohawk Section**



# Newsletter

## **TECHNICAL PRESENTATION**

***In cooperation with***  
RPI Student Chapter

**Thursday, November 13, 2002**  
6:30 PM to 8:30 PM

Refreshments: Pizza and Soda  
Members: \$5.00  
Non-members: \$6.00

## **TECHNICAL PRESENTATION**

There will be an informal reunion with the RPI student section of ASME on November 13. This will be followed by a technical presentation by Professor Daniel Walczyk on the topic of "Using Laminated Tooling for Manufacturing Large Parts".

Prior to the presentation, pizza and soda will be available. ASME members will cost \$5.00 and non-members will cost \$6.00 for the refreshments.

**Contact:** Please contact Francisco Moraga at [moragf2@rpi.edu](mailto:moragf2@rpi.edu) by November 12<sup>th</sup> if you plan to attend.

**Directions:** From I-787 or I-87, go to Route 7 exit across the Collar City Bridge. Follow signs for Route 7, Hoosick Street. Turn right onto 15th Street (4th traffic light). Overpass across 15<sup>th</sup> Street is RPI. Right at the next light. Park in the lots on the right or left. No charge after 6 pm. The meeting will be in room LOW4034.

## **ASME TOUR OF MCLA**

The tour of MCLA was cancelled due to very low interest, but that our hosts have graciously offered to try again if we think we can get better turnout. Many members work very hard to schedule events that would be of interest to the ASME members. Many of you do not participate in this process, but I hope that we could at least get participation for attending the events.

## **ASME International** **Hudson-Mohawk Section Officers**

Chair: Fred Willett (518) 347-0271 [Fwillett@pti-gt.com](mailto:Fwillett@pti-gt.com)

Vice Chair: Frank Reed (518) 385-4264 [frank.reed@ps.ge.com](mailto:frank.reed@ps.ge.com)

Admin.Assoc.: Tom George (518) 395-4045

Treasurer: Mike Brilliant (518) 387-6558 [brilliant@crd.ge.com](mailto:brilliant@crd.ge.com)

## **Section Newsletter**

The Hudson Mohawk newsletter will be posted at:  
[www.asme.org/sections/hudson-mohawk](http://www.asme.org/sections/hudson-mohawk).

## **Capitol District FIRST Robotic Team**

The students are presently engaged in a mini competition in which they will be involved in team development to design and build a vehicle to compete in a simulated road-racing course. They will create a presentation displaying their ability to model the product development life cycle. These vehicles will autonomously navigate a road-racing course.

This mini competition will prepare the students for the larger goal of designing and building a robot for regional and national competitions starting in January.

What is FIRST? FIRST is a national organization, founded in 1989, to interest and inspire students in mathematics and science. FIRST is an acronym for For Inspiration and Recognition of Science and Technology. Founded by Dean Kamen, President of DEKA Research and Development Corporation, FIRST seeks to stimulate interest in science, technology and mathematics through programs such as the FIRST Robotics Competition, the FIRST Place Science and Technology Center and FIRST LEGO League. Mr. Kamen recognized that, compared to other countries, students in the US do not rank high in math and science. He also saw a decline in enrollment in university engineering and science programs. While the US has been a leader in advanced technology fields, if these two trends continued, we would lose that leadership. FIRST is Mr. Kamen's vision of how to

reverse those trends. Many major business leaders agree with Mr. Kamen and sponsor FIRST efforts. Among them are GE, NASA, Computer Associates, Johnson & Johnson, Ford, United Technologies, Motorola, GM, Daimler Chrysler, Delphi Automotive Systems, Verizon.

The Capitol District Team of 10 teams still active that was involved at the start. Today, there are over 600 teams from around the world involving 10s of thousands of students and volunteers.

We are asking for your support in two ways:

- ?? Be a sponsor and donate what you can
- ?? Become involved as a volunteer mentor.

For additional information, visit our website at: [www.usfirst.org](http://www.usfirst.org) or [www.team250.org](http://www.team250.org). You can also contact Ms. Deb Saulsbery at: [d.saulsbery@team250.org](mailto:d.saulsbery@team250.org).

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## IRAC REPORT

Chair's Report from IRAC

Greetings from ASME Region III IRAC (Interim Regional Administrative Conference)

After some opening remarks, our Region III VP, Ken Kroos, got down to business. The 1<sup>st</sup> topic was overdue activity and financial reports. Thanks to the prompt & complete reporting of our 2001-02 Hudson-Mohawk section officers, I took no action items. Second was a reminder that non-paying members are dropped from the membership rolls on January 1, so if you've been slow to write that check, take heed. Third was an explanation of the regional VP selection process. ASME requires two nominees for each regional VP; so far there are none for Region III. Contact me if you'd like to make a nomination. Finally, Ken requested that each section submit a list of the top employers of mechanical engineers within their section's geographic boundaries. Seena Drapala (past section chair and Regional Operating Board member) and I came up with the following list:

ATLAS COPCO  
GE GLOBAL RESEARCH  
GE POWER SYSTEMS  
LOCKHEED MARTIN KAPL  
NEW YORK STATE  
PLUG POWER LLC  
RENSSELAER POLYTECHNIC INSTITUTE  
UNION COLLEGE  
WATERVLIET ARSENAL

I welcome feedback from our members if I've missed a major employer.

Three interesting seminars completed the conference. The first was a basic leadership seminar led with enthusiasm and purpose by Keith Caver of the Center for Creative Leadership. The second was a workshop on section web page development, and the third was an explanation of the ASME fellow nomination process. I'd be happy to share information from these seminars with any members interested in increasing their involvement with the section.

Another important aspect of the IRAC is the focus on engineering education and increasing the awareness of engineering among young people. I'm happy to report that both RPI and Union College were well represented at the conference. We'll be having joint meetings with each student section this year. We also discussed engineering awareness at the high school level and below. Our section meetings are an excellent opportunity to introduce a student to engineering. Let me extend an invitation to parents, aunts, uncles, older siblings, and anyone else who may know a high school student considering engineering as a career: Come to one of our meetings!

-Fred Willett

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## Distinguished Lecturer in April

It may seem early, but mark your calendars for April 2003. More details will be in a future newsletter.

**Adrian Bejan**

**Topic: *Constructual Theory and Design: Optimal Flow Architecture, from Engineering to Nature***

Similarities abound in the geometry of flow systems in engineering and in nature. For example, tree-shaped flows are everywhere, in computers, lungs, dendritic crystals, urban street patterns, and communication links.

In this lecture, Adrian Bejan starts from the design of optimization of engineered systems and discovers a deterministic principle for the generation of geometric form in natural systems. Shape and structure spring from the struggle for better performance in both engineering and nature. This observation leads to *constructal* theory, that is, the thought that the objective and constraints principle used in engineering is also the mechanism from which geometry in natural flow systems emerges. The principle accounts not only

for tree-shaped flows but also for other geometric forms encountered in engineering and nature—round ducts, regularly spaced internal channels, the proportionality between width and depth in rivers.

In brief, flow systems with geometric structure exhibit at least two flow regimes, one with high resistivity (slow, diffusion, walking) that fills the volumes of smallest finite scale, and one or more with low resistivity (fast, streams, channels, streets). The optimal balancing of the regions with different flow regimes means that the material and channels must be distributed in certain ways. Better global performance is achieved when the distribution is relatively uniform, this in spite of the gaping differences between the high- and the low-resistivity domains.

*Optimal distribution of imperfection* is the principle that generates form. The system is destined to remain imperfect. The system works best when its imperfection (its internal flow resistances) is spread around, so that more and more of the internal points are stressed as much as the hardest working points. One good form leads to the next, as the constructal principle demands: objective served better while under the grip of global and local constraints. There is a time arrow to all these forms, and it points toward the better.

From heat exchangers to river channels, this thought unites the engineered and the natural worlds. Examples will be selected from mechanical structure, thermal structure, heat trees, ducts and rivers, turbulent structure, power systems, flight and structure in transportation and economics.

The lecture is based on Adrian Bejan's most recent book *Shape and Structure, from Engineering to Nature*, Cambridge University Press, Cambridge, UK, 2000.

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## ASME Honors

**DANIEL C. DRUCKER MEDAL - Bestowed in recognition of sustained, outstanding contributions to applied mechanics and mechanical engineering through research, teaching, and/or service to the community.**  
**George J. Dvorak**

For research achievements in plasticity, material fracture and fatigue, and thermal-mechanics of heterogeneous materials, earning him an international reputation.

**THOMAS A. EDISON PATENT AWARD - Bestowed in recognition of a patented device or process that has the potential of significantly enhancing some aspect of mechanical engineering.**

**Hooshang Heshmat**

For dedicated service in the ASME Tribology Division and outstanding technical innovations, including oil-free aircraft engines and non-contacting foil seals.

**BURT L. NEWKIRK AWARD - Was established to recognize notable contributions to the field of tribology in research or development as evidenced by important tribology publications.**

**Thierry A. Blanchet**

For dedicated service in the ASME Tribology Division and research achievements and insights into the performance of polymers, high-temperature vapor-phase lubrication, and wear of orthopedic implants.

You may send congratulatory emails to these recipients at:

[dvorak@rpi.edu](mailto:dvorak@rpi.edu), [miti@albany.net](mailto:miti@albany.net), and [blanct@rpi.edu](mailto:blanct@rpi.edu) respectively.

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**THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
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