



**ASME International  
Hudson Mohawk Section**

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# Newsletter

February 2004

## ASME Seminar

### *The Vortex Breakdown Phenomenon*

**Speaker:** Prof. Zvi Rusak

**Date:** Thursday, February 19<sup>th</sup>

**Time:** 6-6.30 PM Social Hour  
6.30-7.30 PM Dinner  
7.30-8.30 PM Speaker

**Place:** Heffner Alumni House, RPI

**To reserve your seat, contact Sam Sham**  
(shamt@yahoo.com or (518) 395-6785) by noon  
February 17<sup>th</sup>



#### Abstract:

Vortex breakdown is a remarkable phenomenon in fluid mechanics that refers to the sudden and abrupt change in structure of rotating flows with a high level of swirl. This special behavior is still considered a largely unexplained fundamental physical process with a variety of technological applications in the aerodynamics of highly maneuverable fighters, transport airplanes, helicopters, combustors, compressors, turbines, chemical mixers, crystal growth systems and hydrocyclon separators. Breakdown phenomena are also observed in tornados and other meteorological events. The lecture will review the basic nature of the phenomenon, recent theoretical and experimental investigations to explain its nature and insight into future studies and applications.

#### Speaker's Bio:

Zvi Rusak received the degrees of B.Sc. (1980) and M.Sc. (1982), in Aeronautical Engineering from the Technion -

Israel Institute of Technology. He has worked as an aeronautical engineer at the Israeli Air Force (1982 - 1988), where he headed the Aero-elasticity group from 1987- 1988. He received a D.Sc. in Aerospace Engineering from the Technion - IIT in August 1989. Ph.D. thesis advisor: Professor Seginer. He spent 1989 - 1991 as a post-doctorate associate at the Mathematical Sciences Department in RPI, working with Professor Julian D. Cole. He joined the RPI faculty in 1991. Assistant Professor (1991 - 1995), Associate Professor (1995 - 2000), and Full Professor (2000 - Present) in the department of Mechanical, Aerospace, and Nuclear Engineering at RPI. He is currently the Director of the Aerospace Engineering Program at the department (2001-Present). He is an Associate Fellow of the AIAA since 2002. Current research interests span a wide range of issues in modern aerodynamics: Subsonic and Transonic flows, the sonic boom problem, and Supersonic aerodynamics. Research interests also include Vortex Dynamics, Vortex stability and its control, the Vortex Breakdown phenomenon, High Angle of Attack Aerodynamics and Supermanuverability, Rotorcraft Aerodynamics, Viscous Flows, and Bifurcation and Stability theory.

#### Place:

Heffner Alumni House, RPI  
Dinner will be a buffet

Cost	in advance	at door
Participating society member	\$18.00	\$20.00
Member and guest	\$30.00	\$35.00
Student	\$10.00	\$12.00
Non-member	\$22.00	\$27.00

To reserve your seat, please contact Sam Sham ([shamt@yahoo.com](mailto:shamt@yahoo.com) or (518) 395-6785) by noon February 17<sup>th</sup>. Checks can be made payable to ASME Hudson Mohawk Section.

#### Directions:

The directions to the Heffner Alumni House can be found at:  
<http://www.alumni.rpi.edu/heffnerhouse/DrivingDirections.htm>

**From the West:** From the New York State Thruway, take Exit 24, Albany, onto I-90 East. Proceed 6 miles to the exit for I-787 North. Take I-787 North to the exit for Route 7 East, Troy-Bennington. (You may notice a sign for Rensselaer and Russell Sage College at the previous exit, but the Route 7 exit provides an easier approach to the campus.) Follow directions to the meeting place.

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
HUDSON MOHAWK SECTION  
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Schenectady, NY 12301

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**From the East:** From I-90 (Massachusetts Turnpike, Berkshire Spur of the New York Thruway), take Exit B1. Continue west 13.5 miles to the exit for I-787. Keep right on the exit ramp for I-787 North, Troy. Take I-787 North to the exit for Route 7 east, Troy-Bennington. (You may notice a sign for Rensselaer and Russell Sage College at the previous exit, but the Route 7 exit provides an easier approach to the campus.) Follow signs for Route 7, Hoosick Street. Follow directions to the meeting place.

**From the South:** From I-87, New York Thruway, take Exit 23, Albany-Rensselaer-Troy, and follow signs for I-787 North. Take I-787 North to the exit for Route 7 East, Troy-Bennington. (You may notice a sign for Rensselaer and Russell Sage College at the previous exit, but the Route 7 exit provides an easier approach to the campus.) Follow signs for Route 7, Hoosick Street. From the North: From I-87, Adirondack Northway, take Exit 7, Route 7 East, towards Troy. Follow signs for Route 7, Hoosick Street. Follow directions to the meeting place.

#### **Directions to the Meeting Place:**

At the fourth traffic light, turn onto 15th Street. At the second traffic light, turn right onto Peoples Avenue. The Heffner Alumni House is one block down on the southwest corner.

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## **Message from the Chair**

Is spring just around the corner? Who cares? We had an excellent January meeting at Le Caravelle in Albany. Dr. Yu Wang spoke to the section on "Superconducting Generators." This month, as we do every year, we celebrate Engineers' Week. Our February meeting is a joint meeting with several other engineering societies. This year we will be joined by members of AIAA, ASNT, and the Vibration Institute. Please plan to attend.

In October, Prof. Henry Scarton of RPI (and a member of ASME's Council on Engineering) spoke to the section about the changes being discussed at ASME. More information can be found at <http://www.asme.org/change/>. I encourage all

members to become informed about these changes and provide feedback.

ASME Region III (our region) has generously offered to help our section host one or more short courses. I'm interested in member feedback on this proposal. The inventory of available short courses can be found at:  
<http://www.asme.org/education/shortco/courses.htm>.

Finally, nominations are sought for next year's executive committee. If you are interested in getting more involved in your ASME section, please contact me.

Fred Willett

## **Distribution of Section Newsletter**

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

Once each newsletter is posted on the Section's web page, an e-mail notification and link to the above website is sent to members who have e-mail addresses in the ASME member database. If you are an active member of ASME and did not receive an e-mail notification, please go to the ASME web site and update your membership information.  
<http://members.asme.org/myasme/login/myasme.cfm>

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