



VIRGINIA MOUNTAIN SECTION NEWSLETTER

IEEE Region 3, Council 09, Section 65

February 2002

Thursday, February 21

New Technology Innovations for Space Applications*

Kumar Krishan, Ph.D., Fellow, SDPS

*Views presented in this paper are not necessarily those of NASA.

Abstract

Human Exploration and Development of Space (HEDS) is one of five key NASA strategic enterprises for opening the space frontier. Goals of HEDS are: increasing human knowledge of nature's processes using the space environment; exploring and settling the solar system; achieving routine space travel; and enriching life on Earth through living and working in space. Space missions are designed to accomplish these goals. A crucial aspect of these missions is the development of infrastructure to optimize the safety, productivity, and costs. NASA's International Space Station is providing extensive experience in both infrastructure and operations. Operations include planning; scheduling; training; command and control and communications. In view of this enormous scope, a vigorously organized approach is needed to implement successful operations. This entails wise and efficient use of both technical and human resources. This has lead to the use of automated and intelligent systems to accomplish both manned and unmanned missions. However, many revolutionary technologies currently being pursued may find a role in making space missions safe, reliable, and cost-effective. These include solid-state lasers; time-domain sensors and communication systems; nanotechnology and others. In this presentation, an overview of these will be presented, along with their application to space missions.

About The Speaker

Dr. Krishen is the Chief Technologist for

the Technology Transfer and Commercialization Office, NASA Johnson Space Center, Houston, Texas, responsible for developing strategies for joint research, technology projects and plans with, industries, universities, other NASA centers and government agencies. He also has represented JSC as the Principal Technologist on the NASA Council on Science and Technology. His academic degrees are from Kansas State University (Ph.D. and M.S.), Calcutta University (M. Tech and B. Tech), and Jammu and Kashmir University (B.A.) in electronics, electrical engineering, radio physics, and mathematics. Dr. Krishen was an Assistant Professor in Electrical Engineering at Kansas State University before joining Lockheed in 1969 as Staff Scientist. In 1976, he joined NASA and has held key

positions in Advanced Programs in Earth Observations, Science Payloads,

Experiment Systems, Tracking & Communications, Mission Support, New Initiatives, and technology R&D. Authoring more than 130 technical papers/reports, Dr. Krishen is a Fellow of the Society for Design and Process Science (SDPS). He is the recipient of many awards, medals, commendations, and honors from universities, industry, and government organizations, and is listed in Who is Who in the World, Men of Achievement, Personalities of America, and 2000 Outstanding People of the 20th Century.

Reservations

Date: Thursday Feb. 21, 2001
Social: 6:30 PM
Dinner: 7:00 PM
Talk: 8:00 PM

Cost: Member or Guest \$15.00
Student \$ 8.00

Clarion Hotel Roanoke Airport

2727 Ferndale Drive NW
I581 Exit 3 Hershberger Rd West
1st Rt. onto Ordway Drive,
¼ mile, Rt. Into Parking Lot.

Reserve by 5 PM **Monday** Feb. 18

Mark Shepard (540) 387-8710
mshepard@ieee.org

Please specify number of attendees.

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Meeting Report

VMS Annual Student Paper Competition Results

On January 17, 2002, eight students from Virginia Tech and the Virginia Military Institute participated in the IEEE-VMS Annual Paper Competition. This year's event provided a terrific exhibition of a wide array of topics, and all of the entries were well-prepared and well-presented. As always, the judges had a difficult time awarding prizes. After much consideration, the judges awarded first place to Mr. Stephen F. Lee Jr. and Mr. Matthew R. Brooks, from the Virginia Military Institute, for their presentation entitled : "Endovascular Balloon Catheter Pressure Sensor." Congratulations to all of the participants in this year's competition.

... Shawn Addington

Chairman's Chat Room

Our annual student paper competition on January 17th produced a stimulating cross section of student research activities. Topics presented involved fiber optics, electromagnetics, semiconductor fabrication, medical electronics, system integration, acoustics, and instrumentation. Among the six papers were both theoretical analysis and practical application approaches. The papers were well prepared and presented, and all received an appropriate prize. My thanks to the students, the judges, and the VA TECH and VMI organizers. The evening provided an exciting insight for the thirty-four attendees into the scope and quality of contemporary undergraduate EE student research initiatives.

Our next meeting on February 21st will feature Kumar Krishen from the NASA Johnson Space Center. We are delighted to have the opportunity to have Dr. Krishen describe his vision of space exploration, the required support

technologies, and the exciting involvement for today's engineering students. This presentation by a well recognized technologist will appeal to members of industry, students, and the academic community. Be sure to mark the date on your calendar.

As I mentioned last month, I want to urge your participation in the Virginia Mountain Section activities. Our first Executive Committee meeting of 2002 began a discussion of Chapter meetings and committee chair openings as well as section meeting attendance. We hope the programs will be of interest to you. More about this later. In the meantime, see you on February 21st!

...Howard Moses

New Public Tv Program Promotes Engineering To Kids

In support of U.S. National Engineers Week (E-Week), IEEE-USA and several other organizations have teamed with WGBH-Public Television, Boston, USA, to promote "ZOOM into Engineering," a program designed to encourage an interest in math, science and engineering for children ages six to 11. A free E-Week kit, with tools to assist engineers in their volunteer efforts to promote the profession, also is available. E-Week will take place 17-23 Feb.

To obtain an E-Week kit or to learn more about National Engineers Week activities, visit ["http://www.eweek.org/index.shtml"](http://www.eweek.org/index.shtml).

U.S. Supreme Court Discusses IEEE-USA Patent Brief

An IEEE-USA amicus curiae brief on patent rights was one of only two friend-of-the-court briefs discussed in oral arguments in the Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd. patent case heard before the

U.S. Supreme Court earlier this month. In Festo, the Court is considering to what extent the holder of an amended patent is barred from asserting patent rights against another inventor whose design is substantially the same as the patented invention. As an alternative to the "flexible bar" and "absolute bar" standards advocated by the opposing sides in Festo, IEEE-USA asked the Court to consider a "foreseeable bar," where holders of an amended patent give up protection for only those things that were foreseeable by persons familiar with the associated technology. A copy of the brief and other resources are at

["http://www.ieeeusa.org/forum/POLICY/2001/01aug31festo.html"](http://www.ieeeusa.org/forum/POLICY/2001/01aug31festo.html).

Joint Engineers Week Banquet

(Note: The banquet is on the same date as our regular meeting. This announcement is to alert those members who want to participate in Engineers Week activities or have an interest in the topic. We would prefer you attend the VMS meeting of course but the choice is yours. ...editor)



NATIONAL ENGINEERS
WEEK 2002
FEBRUARY 17-23

Artificial Heart Pumps

On Thursday, February 21st, Dr. Paul Allaire will give a presentation on Artificial Heart Pumps to the Joint Engineers Week Banquet. Dr.



Paul Allaire will present a summary of his current research on the development of centrifugal heart pumps (with magnetic bearings) that are being designed for implantation into humans. A major research activity is the design, development and testing of a magnetic

bearing supported artificial heart for human implantation. Several prototypes have been successfully tested.

Dr. Allaire is the Wade Professor of Engineering at the University of Virginia and is the Director of the Virginia Artificial Heart Research Program. He earned his B.S. and M.E. degrees from Yale and a Ph.D. in Mechanical Engineering from Northwestern in 1971. He has been on the faculty at the University of Virginia since 1972. Dr. Allaire's research

When: Thursday, February 21st

Where: Evers Family Restaurant
US 1, Mt. Crawford, VA

Time: 6:00 PM - Social
6:30 PM - Dinner
7:30 PM - Program

Cost: \$11.00 per person
\$6.00 per student

PLEASE RSVP

Sean Haynes (434) 978-7833

Larry Heine (540) 833-2889

interests span several areas of rotating machinery: bearings, rotor dynamics, seals, controls and fluid flows. He is active in biomechanics research. He has published over 140 technical publications including over 50 refereed journal publications and one textbook on finite elements.

Take pride in your profession and come help us celebrate National Engineers Week. The program will also be appropriate non-engineers so please **bring your spouse to the meeting.**

Directions:

Take I-81 to Exit 240. Go West 1 mile to US 11. Take US-11 North ½ mile to Evers on the right.

Update your IEEE Record

The IEEE will accept updates from volunteers (Officers, editors) and we occasionally note discrepancies, in e-

mail addresses for example, and send corrections to headquarters. However, this is a slipshod method at best and IEEE's general policy is that the member is responsible for his or her own information.

Each month when creating address labels and updating local records with new data from Headquarters, we notice numerous obvious errors in the data base e.g., area code 703.

When did you last update your records at IEEE? Have you moved, changed phone number, or e-mail address (most common) ? Please take a moment to reflect and then act if need be.

There are several different ways to correct member information:

There is a web based interactive "change of address" form at:
<http://services1.ieee.org/membersvc/coa/intro.htm>

You can send an e-mail message to:
addresschanges@ieee.org.

Call IEEE Member Services at
1-800-678-IEEE
(1-800-678-4333)

Mail changes to:
IEEE 445 Hoes
Lane PO Box 1331 Piscataway,
NJ 08855-1331 USA
Fax your changes to: 1-732-981-9667

In all cases you will need to include your member number for verification purposes.

50% discount on Essential Teaching Seminars

Learn effective teaching or brush up on your technique.

Teaching Seminars for Engineering Faculty is a three-day faculty development seminar, funded by the United Engineering Foundation and coordinated by ASME with cooperation from IEEE and AICHE.

The Seminar is particularly useful for early-career faculty and faculty who are non-native English speakers.

You Can Expect To:

- Develop an understanding of the basic theory and principles behind effective teaching and learning styles
- Familiarize yourself with writing, speaking and listening skills, which form the basis for interpersonal bonds with students
- Prepare and teach actual classes in a supportive, "learn by doing" format enabling substantive improvements in your teaching skills.
- Utilize teaching assessment techniques to critically evaluate your videotaped performance

IEEE members receive a 50% discount by using their member number. The fee includes reception and all scheduled meals. Limit 30 participants per seminar. Register now for only \$150 for the April and June seminars.

Locations, dates, application requirements and forms are available at
www.asme.org/education/prodev/teach.

For further information, contact Nema Roman,

<mailto:romann@asme.org>.

The VMS Web Site

Browse to:

<http://www.ewh.ieee.org/r3/virginia-mountain/>

It has a wealth of information about the Section and the IEEE not generally available through other sources. It is also an easy way to access other IEEE National or Region Sites and services. Your feedback and input are always welcome. Send it to me: editor

<mailto:j.fennick@ieee.org>

2001-2002 MEETING SCHEDULE

| DATE | SPEAKER/TOPIC | MEETING PLACE |
|---|--|-----------------------|
| September 20 Spouses' Night, 2001 | M. von Spakovsky Fuel Cell Technology | Clarion Hotel Roanoke |
| October 18* (Joint MTTD) | Louis J. Guido Semiconductor LEDs and Lasers: Past, Present, and Future | Clarion Hotel Roanoke |
| November 15 | T. Rappaport Trends in Wireless Communications | Clarion Hotel Roanoke |
| January 17 | Student Projects Details: TBD | Clarion Hotel Roanoke |
| February 21 | Kumar Krishen New Technology Innovations for Space Applications | Clarion Hotel Roanoke |
| March 21 Spouses' Night, 2002* | Robert Trew Technology Future Directions | Clarion Hotel Roanoke |
| April 18 | Otto Szentisi Fiber Optic Network Development | Clarion Hotel Roanoke |
| May 16 | Plant Tour | TBD |

* Changed

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NEWSLETTER

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Go to the VMS Web Site page:
<http://www.ewh.ieee.org/r3/virginia-mountain/misc/SignUpForm.html>

Anyone may submit material for the Newsletter
Deadline:
Monday following each meeting

Submit To: Editor

Change of Address

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 445 Hoes Lane, PO Box 1331
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 Tel: 800-678-IEEE
 Fax: 732-981-9667
 IEEE Web:

<http://services1.ieee.org/membersvc/coa/intro.htm>
 (Changes are forwarded to the Newsletter)

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