Madison Section
NEWSLETTER

Nanotechnology and X-ray Lithography at the UW-Madison Center for Nanotechnology

Date/Time:	Thursday, December 18, 2003, 11:45 AM - 1:00 PM
Speaker:	Donald J. Thielman, Technical Manager, UW-Madison Center for Nanotechnology
Location:	Rocky Rococo's Pizza, 7952 Tree Lane (Madison Beltline Hwy. at Mineral Pt. Rd.), 608.829.1444
Menu:	Pizza buffet, salad and soft drinks (cost $10.00, free for student members)
RSVP:	by December 15th to Tom Yager via email (tyager@ieee.org) or call 608.225.3913

Non-member guests are always welcome!

The Center for NanoTechnology is an interdisciplinary research center of the College of Engineering at the University of Wisconsin-Madison. The Center was established in 1984 to make use of the new electron storage ring, Aladdin, recently commissioned by the Synchrotron Radiation Center. The radiation emitted by this accelerator - soft x-rays - is important for technological applications in the semiconductor manufacturing area. CNTech was established to facilitate the development of this type of technology and its transfer to the U.S. industries. Begun with an initial seed grant from the Wisconsin Alumni Research Foundation (WARF), the Center is now a complete nanotechnology and X-ray lithography technology facility. It includes all the equipment and techniques for making masks, exposing wafers and inspecting the results of the exposures. This talk will cover a brief description of what nanotechnology is, the scale of things, and what research CNTech is doing in the nanotechnology arena.

Don has spent 25 years in instrumentation, aerospace and research at Rockwell-Collins, Nicolet Instruments, UW-Madison, Martin Marietta, University of Arizona, and Lockheed-Martin. His experience includes advanced digitizer design; flight control systems for helicopter and 757/767 autopilots; space instrumentation including Diffuse X-ray Spectrometer, Galileo Net Flux Radiometer, Huygens probe Descent Imager Spectral Radiometer to Saturn's moon Titan, and DS-1 and Mars missions. Don graduated '78 BS - EET from Milwaukee School of Engineering and is currently involved in X-ray and NGL lithography research.

ATC Follow-up

For those that attended the November presentation by ATC (American Transmission Company), some additional information is available at the following link: <http://oasis.midwestiso.org/documents/ATC/Operations.html/>. Documents available include:

- ATC Report on August 14, 2003 Event
- History of Forced Outages On Lines 6831 and V-308
- Northeast Wisconsin/Upper Peninsula Separation 11/14/01 Incident Investigation Report
- Simulation Study of the Northeast Wisconsin/Upper Peninsula Separation Event of November 14, 2001
- TLR 4 time and date info for Rhinelander/Cranberry Loop

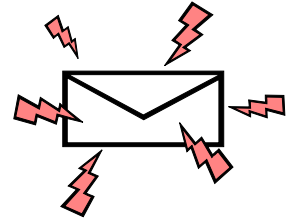## CONTENTS

IEEE Madison Section Elections

At the December 2003 monthly meeting, the IEEE Madison Section will conduct its annual officer elections prior to the technical presentation. Nominations may be made by telephone or via e-mail to the Chair (278-0377, rotter@ieee.org).

Additional candidate nominations are welcome and encouraged for all positions. The nominations to date include:

Chair: Sandy Rotter
Vice-Chair: Bob Sier
Secretary: Les Schroeder
Treasurer: John Hicks
Mem. at Large: Tom Yager
Mem. at Large: Wayne Lenius
Mem. at Large: Mitchell Bradt

Madison Section Mailing List

Some of you may not realize that the IEEE Madison Section has a email mailing list (madison-section). This list is very low volume and is only used for meeting announcements and general announcements that may be important to the membership. Only the list moderator is allowed to post messages so you won't receive any advertising or spam. Instructions on how to subscribe may be found on the IEEE Madison Section web site located at <http://www.bugsoft.com/ieee>. Just look under "Madison Section Mailing List". Basically you just send an email to <majordomo@majordomo.ieee.org> with `subscribe madison-section` in the body of the email (the subject is ignored). The list moderator will receive your request, verify your membership, then add you to the list. You will then receive notification that you have been subscribed to the list. This process may take a few days, so be patient.

DARPA's Grand Challenge Draws 'Unorthodox' Suggestions

by Terry Costlow

Next March, a few dozen unmanned vehicles will leave the Los Angeles area, hoping to get to Las Vegas in less than 10 hours. The winner will hit the jackpot, taking home $1 million, courtesy of a government entity known for taking gambles.

The Defense Advance Research Project Agency (DARPA) is betting that plenty of new technology will emerge as teams from universities and corporations vie for the prestigious "Grand Challenge" award (www.darpa.mil/grandchallenge/). The teams can create vehicles of any size or shape, but the vehicles must require no human intervention to cover the approximately 300-mile route.

The teams' goal will be to design vehicles that can move across rough terrain — likely to include surfaced and un-surfaced roads, trails, off-road areas, and man-made and natural obstacles both above and below the surface — and be the first to complete the designated course within a specified time limit. In turn, DARPA is interested in related technology that can be incorporated into military vehicles that can be sent off and forgotten about until they've arrived at their destinations. Some of today's military vehicles accomplish this objective, but they're slow and have major problems with minor terrain obstacles. DARPA hopes the Challenge will result in solid advances in sensing, behavior and mobility.

Marking a new way for inventing cutting-edge technologies, the Challenge is the first time DARPA is offering a significant cash prize — an approach normally associated with radio stations trying to boost ratings.

"It's a bit surprising, but DARPA is always trying to innovate, not only in technology but also in the ways to come up with it," said Mark Pullen, a former DARPA program director, now Associate Director for the Center of Excellence in Command, Control, Communications and Intelligence at George Mason University. Pullen predicts that if the race is successful, DARPA will use similar creative approaches to fulfill its mission: to promote the development of new technology and foster its transition to products that the military can use.

So far, success seems likely. "We wanted to attract people who were not part of our mainstream, getting outside of our usual supporters," a DARPA spokesperson said. About 75 groups, ranging from off-road specialists to amateur robotics groups and others — submitted vehicle proposals, providing an interesting mix. Underscoring the key drive behind many DARPA efforts, the spokesperson noted that many proposals were "unorthodox." And although many of the proposals didn't make the cut for the actual race, some of the ideas will likely attract further interest from DARPA researchers.

Though DARPA is known for advanced research, only about five percent of its budget is targeted to basic research and to exploring technical and scientific programs to see what useful items they
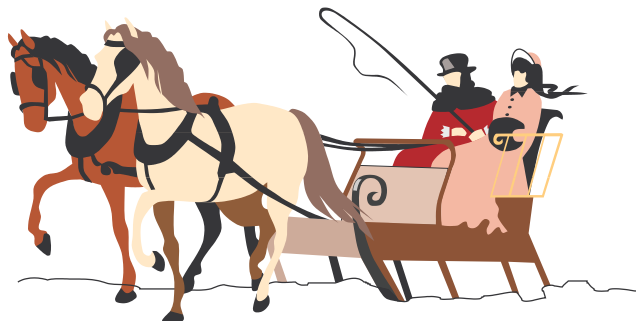
might yield. "DARPA's main focus is looking at technology to solve particular problems. Basic research is more pure science, more like what the National Science Foundation supports," Pullen said.

Five percent may be small, but it represents a fair amount of funding, since DARPA's total expenditures amounted to roughly $2.7 billion during fiscal 2003. The Agency spends most of its budget on creating new capabilities for national security by accelerating knowledge in focused areas and moving it into use. In fact, 40 percent is devoted to what are considered high-risk, high-payoff component technologies.

IEEE-USA Today's Engineer will share the Grand Challenge results — and the potential technology yield in the late spring of 2004.

Terry Costlow has written about the electronics industry for more than 20 years, covering a wide range of technologies and topics.

© Copyright 2003, The Institute of Electrical and Electronics Engineers, Inc.

Your Organization's Ad Here!

Reach over 700 IEEE members in South-Central Wisconsin with information on *your products and services* every month with an ad in this newsletter.

Our members have professional interests in computers, power engineering, signal processing, communications, industry applications and a number of other technical fields.

For more information, contact John Hicks at (608) 233-4875 or jhicks@facstaff.wisc.edu.

Per issue ad rates:	1 Time	2 Times	5 Times	9 Times
Business Card	$ 50	$ 45	$ 42	$ 41
2-Business Card	83	76	71	70
1/4 Page	145	135	129	127
1/2 Page	215	203	195	193
Full Page	330	315	306	303

2790 S. Fish Hatchery
Madison, WI 53711

IEEE
Networking the World™