

61st



**DEVICE
RESEARCH
CONFERENCE**

University of Utah
Salt Lake City, Utah

June 23–25, 2003

TMS



ADVANCE PROGRAM

including
Housing and Registration Forms

<http://www.tms.org/DRC.html>

TABLE OF CONTENTS

Campus map	14-15	Organizing Committee	16-17
Car Rental	22	Parking	12-13
Computer/Network Facilities	5	Recreation	3
EMC Exhibit	4-5	Registration Form	Center Insert
Invited Speakers.....	16-17	Registration Information	2
JEM Publication & Subscription	18-19	Schedule of Events (Preliminary)	23
Location—About Salt Lake City	4	Social Events.....	6-7
Lunch Packages.....	9	TMS Membership	21
Housing		Transportation Information.....	10-13
Off-Campus	10-11	Technical Sessions.....	24-39
On-Campus	6-9		
On-Campus Housing Form.....	Center Insert		

GENERAL INFORMATION

DRC Registration and Housing forms included in this brochure.

EARLY HOUSING AND REGISTRATION ARE ADVISED.

DATE AND LOCATION

The 61st Annual Device Research Conference (DRC) sponsored by the IEEE Electron Devices Society will be held at the University of Utah, Salt Lake City, June 23-25, 2003. This conference is being coordinated with the Electronic Materials Conference of TMS, which will take place June 25-27, 2003, at the same location.

INTENDED AUDIENCE

The 61st Annual Device Research Conference brings together scientists, engineers, and students to discuss new and exciting breakthroughs and advances in the field of device research.

This year's conference will be dedicated to new materials and technologies and novel devices in emerging areas of spin-based devices, carbon nanotubes, molecular devices, plastic electronics, and nanofabrication technology. Invited speakers will present the latest development in these areas.

For technical program information regarding the 2003 Device Research Conference, please contact:

DRC General Program Chair

Jeff Welser

IBM Microelectronics

West Campus – MS E40

2070 Route 52

Hopewell Junction, NY 12533

Telephone: (845) 892-5142

Fax: (845) 892-2568

E-mail: welser@us.ibm.com

Or

DRC Technical Program Chair

Pallab Bhattacharya

University of Michigan

Dept of Electrical Engineering & Computer Science

1301 Beal Avenue

Ann Arbor, MI 48109

Telephone: (734) 763-6678

Fax: (734) 763-9324

E-mail: pkb@eecs.umich.edu

GENERAL INFORMATION

CONFERENCE REGISTRATION

All attendees are encouraged to register in advance to avoid delays in registering at the conference. Both Device Research Conference (DRC) and Electronic Materials Conference (EMC) badges will be accepted by both conferences on Wednesday, June 25. Advance registration fees are as follows:

IEEE and TMS members:\$335.00
Non-members of IEEE and TMS:\$395.00
Students:\$125.00

Registration fee includes Sunday welcoming reception, Monday poster session reception, Tuesday conference picnic, Tuesday rump session, coffee breaks, attendance to all technical sessions, and EMC exhibition on Wednesday.

To register in advance, register via TMS OnLine www.tms.org/DRC.html or complete the registration form provided this mailer. **Advance registrations will be accepted until June 2, 2003.** For questions concerning registrations, please contact TMS Meeting Services at Telephone: (724) 776-9000 ext. 243; Fax: (724) 776-3770; or E-mail: mtgserv@tms.org.

You may register at the conference. Please note: On-site registration fees will be higher. On-site registration will be located in the Olpin Union Building and begin on Sunday afternoon continuing through Wednesday afternoon during the following hours:

Sunday June 22 4:00 PM–9:00 PM
Monday, June 23 7:30 AM–5:00 PM
Tuesday, June 24 7:30 AM–5:00 PM
Wednesday, June 25 7:30 AM–3:00 PM

REFUND POLICY

A written request must be sent to TMS Headquarters, 184 Thorn Hill Road, Warrendale, PA 15086, and postmarked no later than June 2, 2003. A \$50 processing fee will be charged on all cancellations. NO refunds will be issued after June 2, 2003.

MESSAGES

A message board will be located near the Registration Desk in the Olpin Union Building. Messages will be posted in this area throughout the conference.

CAMPUS SMOKING POLICY

University of Utah prohibits smoking in its buildings. Smoking will be allowed only in outdoor areas.

TECHNICAL SESSIONS

The Device Research technical program will commence at 8:30 AM on Monday, June 23. Sessions will be held on grounds at the University of Utah in the Olpin Union Building.

Session and paper titles are included in this brochure.

BEST STUDENT PAPER AWARD

Papers presented by students, based on their own work, are eligible for this annual award. Further information on student travel assistance may be obtained by writing to Jeff Welser, General Program Chair; address on page 1.

PROGRAM

A conference digest with session titles and abstracts of papers to be presented at the meeting will be made available for all registrants at the registration desk when picking up your registration packet.

AMERICANS WITH DISABILITIES ACT



TMS strongly supports the federal Americans with Disabilities Act (ADA), which prohibits discrimination against, and promotes public accessibility for those with disabilities. In support of and compliance with this Act, we ask that those registered attendees requiring specific equipment or services, indicate your needs on the enclosed housing and registration forms.

POLICY ON AUDIO AND VISUAL RECORDING OF TECHNICAL PAPER PRESENTATIONS/SESSIONS

TMS reserves the rights to any audio and video reproduction of all presentations at every TMS sponsored meeting. Recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of TMS and the individual authors is strictly prohibited.

RECREATION

The HPER recreational facility is open daily Monday through Sunday. Hours will be posted at the Service Desk for your convenience. The cost is \$4.00 for adults and children. Equipment includes racquetball courts, weight training rooms, gym, and 3 swimming pools.



GENERAL INFORMATION

ABOUT SALT LAKE CITY

You've picked a great year to visit. Friendly, accessible, sophisticated Salt Lake delivers a metropolitan experience with a mountain twist.

Salt Lake is in the midst of an Olympic-fueled renaissance. Visit this year and you'll find a rejuvenated community with new shopping districts and specialty stores, top-notch lodging for any budget, and world-class attractions, including Historic Temple Square, the world's largest dinosaur museum, and monthly gallery strolls to Salt Lake's best art shops. Every year, thousands flock from all over the globe to the nationally acclaimed symphony, opera, theater, and dance performances. All enjoy Salt Lake's vibrant nightlife, with scores of award-winning clubs, brewpubs, and restaurants.

DRESS

Casual clothing is in order with a sweater or light jacket occasionally needed for the evenings. The University of Utah is essentially a walking campus so be sure to wear comfortable walking shoes.

COMPUTER/NETWORK FACILITIES

Registrants will have the opportunity to access the Union Computer Lab on the 1st floor of the Olpin Union Building. The hours of operation are 9:00 am to 5:00 pm Monday through Thursday, and 10:00 am to 5 pm., Fridays and Saturdays. This is a student computer lab and students do take first precedent on access. There is an additional computer lab in the Marriott Library, which is only a 5-minute walk from the Union Bldg.

EXHIBIT

TECHNICAL EXHIBIT

On Wednesday, June 26, from 9:15 AM until 4:00 PM, DRC attendees are invited to attend the EMC Exhibition of electronic materials technology and related services. It is an opportunity for DRC attendees to meet world leaders in electronic materials research and industry in addition to learning more about their products and services. You are encouraged to visit the exhibits and interact with the participating vendors.

Exhibition Location:

Olpin Union Building,
Ballroom Corridor

Exhibit Dates and Times:

Wednesday, June 25, 2003
9:15 AM–4:00 PM and 7:00 PM–9:00 PM

Thursday, June 26, 2003
9:00 AM–4:00 PM

NOTE: Companies interested in participating in this exhibit should contact TMS for more details and exhibitor information at the following:

Cindy A. Wilson, Exhibits Coordinator
TMS/EMC Technological Exhibit
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: (724) 776-9000, ext. 231
Fax: (724) 776-3770
E-mail: wilson@tms.org

SOCIAL ACTIVITIES

SUNDAY, JUNE 22

Welcoming Reception: All attendees are invited to attend a hosted Welcoming Reception, 6:00 PM–8:00 PM, in the Panorama East Room located in the Olpin Union Bldg.

MONDAY, JUNE 23

Poster Session: The poster session will be held Monday evening in the Olpin Union Ballroom Corridor. Presenters will be on hand to discuss individual posters. A buffet reception will be held concurrently from 5:30 PM to 8:30 PM.

TUESDAY, JUNE 24

Conference Banquet: Conference attendees and their guests will have the opportunity to enjoy a catered dinner at The Utah Museum of Fine Arts. The dinner will begin at 6:00 PM and continue till 8:00 PM. **The cost of this event is included in the full conference and the student registration fees.**

The cost for guests is \$60 for adults and \$25 for children 12 and under. You may order tickets for this event on the registration form. You are encouraged to purchase your tickets in advance. Tickets will be available at the registration desk at the conference. Deadline for ticket sales will be 5:00 PM on Monday, June 23, 2003.

Tuesday Rump Session: After the banquet, attendees are invited to attend the Rump Session on Tuesday evening from 8:30 PM till 10:30 PM. The reception will be located near the session rooms.

INFORMAL COFFEE BREAKS

During the intermission of morning and afternoon sessions (at approximately 10:00–10:40 AM and 3:00–3:40 PM) coffee, tea, and sodas will be served in the Olpin Union Ballroom Corridor.

ON-CAMPUS HOUSING ACCOMMODATIONS

We are pleased to invite DRC attendees to reside on the University of Utah campus. On-campus accommodations will be available on a first request basis; therefore, early registrations and reservations are essential. **No on-site housing reservations will be accommodated at the University.**

Residence Halls and Dining Facilities are located within a 15-minute walk from the session meeting rooms. Residence Hall accommodations are either single or double occupancy, with 2–4 people sharing a bathroom. **There are no rooms with private restrooms.** There is no daily maid service or television. Each person will be provided with 2 sheets, a blanket, a pillow, a pillow case, a towel, soap, and a drinking cup. Telephones are for local calls only; a calling card is required for long distance. Check in is after 2:00 PM; check out is before 10:00 AM. Unfortunately, there is no housing on campus for those with children. We recommend the Marriott University Park Hotel if you will be traveling with children. Please check the hotel listings in the Off-Campus Housing section of this brochure.

The University of Utah offers the following package plans to provide flexibility and the option to attend both DRC and EMC. All residence hall package

plans include full meal service. Residence hall rooms without meals are not available. No adjustments for lodging or meals will be made for late arrival or early departure from the chosen package.

Please indicate your plan preference on the enclosed reservation form and return it with your payment to:

Meghan Webb
Registration Coordinator
University Conference Services
University of Utah
110 South Fort Douglas Blvd
Salt Lake City, UT 84113
Telephone: (801) 587-2980 • Fax: (801) 587-1002
E-mail: conferences@guesthouse.utah.edu

Reservations received by May 31, 2003, will be sent a confirmation by the University Conference Services. Prepayment for the anticipated number of nights is required.

Meals will be served in the Heritage Center during the following hours:

Breakfast 6:30 AM–9:00 AM
Lunch 11:00 AM–2:00 PM
Dinner 4:30 PM–7:30 PM

ON-CAMPUS HOUSING ACCOMMODATIONS

Plan A: Includes lodging Sunday through Tuesday nights and the following 7 meals:

Sunday: dinner

Monday: breakfast and lunch (no Heritage Center meal offered Monday night due to the DRC Poster Session Reception)

Tuesday: breakfast and lunch (no Heritage Center meal offered Tuesday night due to the DRC Banquet)

Wednesday: breakfast and lunch

NOTE: *this package includes dinner on your arrival day.*

Single Occupancy\$149.00 per person

Double Occupancy.....\$129.00 per person

Plan B: Includes lodging Monday and Tuesday nights and the following 5 meals:

Monday: lunch (no Heritage Center meal offered Monday night due to the DRC Poster Session Reception)

Tuesday: breakfast and lunch (no Heritage Center meal offered Tuesday night due to the DRC Banquet)

Wednesday: breakfast and lunch

Single Occupancy\$104.00 per person

Double Occupancy.....\$93.00 per person

Plan C: (for those planning to attend DRC and EMC) Includes lodging Sunday through Thursday night and the following 12 meals:

Sunday: dinner

Monday: breakfast and lunch (no Heritage Center meal offered Monday night due to the DRC Poster Session Reception)

Tuesday: breakfast and lunch (no Heritage Center meal offered Tuesday night due to the DRC Banquet)

Wednesday: breakfast, lunch and dinner

Thursday: breakfast and lunch (no Heritage Center meal offered Thursday night due to the EMC Banquet)

Friday: breakfast and lunch

NOTE: *This package includes dinner on your arrival day.*

Single Occupancy\$245.00 per person

Double Occupancy.....\$212.00 per person

EARLY ARRIVAL PACKAGE

Saturday Night (June 21) Room Rate: (includes lodging Saturday night and the following meals)

Saturday: dinner

Sunday: breakfast (dinner included in main package.)

Single Occupancy\$47.00 per person

Double Occupancy.....\$40.00 per person

LATE DEPARTURE

Friday Night (June 27) Room Rate: (includes lodging Friday evening and the following meals):

Friday: dinner

(Breakfast & lunch included in main packages)

Saturday: breakfast

NOTE: *Checkout is Saturday, 10:00 AM*

Single Occupancy\$47.00 per person

Double Occupancy.....\$40.00 per person

COMMUTER LUNCH PACKAGE

Attendees planning to make off-campus housing arrangements directly with the hotel/motel and wish to purchase a commuter lunch package for on-campus meals, the following packages are available through the University of Utah.

Three (3) DRC lunches\$23.50

Five (5) DRC/EMC lunches.....\$34.50

NOTE: *It is important to apply early on the Housing Reservation Form.*

NO REFUNDS WILL BE MADE FOR LATE ARRIVALS, EARLY DEPARTURES, OR MISSED MEALS

Method of Payment:

Payment in U.S. dollars may be made by:

- Personal check or money order. Checks must be drawn on a U.S. bank and made payable to University Conference Services.
- Credit Card: American Express, Visa, or MasterCard

If you have questions regarding on-campus registration and accommodations, please contact:

Meghan Webb, Registration Coordinator

University Conference Services

University of Utah

110 South Fort Douglas Blvd

Salt Lake City, UT 84113

Telephone: (801) 587-2980 • Fax: (801) 587-1002

E-mail: conferences@guesthouse.utah.edu



OFF-CAMPUS HOUSING ACCOMMODATIONS

A block of rooms have been reserved at special conference rates for the hotel listed below. Rooms will be released as early as Saturday, May 31. Thereafter, reservations can be obtained only on a space available request. Please contact the hotel directly by mail, phone, or fax as soon as possible. Rooms are available for DRC, EMC or both, Sunday through Thursday nights, and **you must identify yourself as either an EMC or DRC attendee**. You can also stay Friday or Saturday night if you request it at the time of making your reservations. **Please note that the following rate DOES NOT include tax.**

Marriott University Park
480 Wakara Way
Salt Lake City, UT 84108
USA

Telephone: (801) 581-1000

Fax: (801) 584-3321

Toll Free: 800-637-4390

\$119.00 (excluding tax)

With spectacular views of Salt Lake City and the Wasatch Mountains, the Marriott University Park provides a retreat-like setting for you. Located adjacent to the University of Utah in high-tech Research Park, the University Park Marriott has what it takes to make your trip successful. Enjoy the comfort of one of our 218 guest rooms, each equipped with remote-control TV, high-speed internet service and in-room coffee. Our restaurant, lounge, indoor pool, whirlpool and fitness room will add to the pleasure of your stay. Ski Utah's famous powder at one of seven world-class ski resorts or take in nearby museums, shopping, sightseeing and nightlife. Let the Marriott University Park make your visit to Salt Lake City a memorable one.

Check-in: 4:00 PM; Check-out: 12:00 PM.

Complimentary parking.

Free shuttle from airport, available 6 AM till 10 PM. Use courtesy phone in baggage claim area of airport to make arrangements.

TRANSPORTATION

The Salt Lake City area may be reached by:

CAR

From the Salt Lake International Airport: Take I-80 East approximately 1.5 miles to the North Temple exit. Follow North Temple approximately 3 miles to State Street (one block beyond the Mormon Temple). Turn right on State Street, and go south 5 blocks to 400 South. Turn left, proceeding east on 400 South for approximately 1.5 miles until you reach the University of Utah campus.

From I-15 northbound: Take the eastbound 600 South exit. At State Street turn left, proceeding 2 blocks north until you reach 400 South. Turn right, proceeding east on 400 South for approximately 2 miles until you reach the University of Utah campus.

From I-15 southbound: Take the eastbound 600 South exit. At 300 West turn left, proceeding approximately 2 blocks north until you reach 400 South. Turn right, proceeding east on 400 South for approximately 2-3 miles until you reach the University of Utah campus.

AIR

Salt Lake City is a major hub of Delta airlines, and is serviced by over 600 daily flights from most major US cities and by many airlines, including United, American, Continental, Southwest, and Northwest. Salt Lake City International Airport is located five miles northwest of downtown Salt Lake City.

As airline security is constantly changing, please be sure to check your airline and airport for rules regarding luggage regulations, check-in times, etc. Go to www.tsa.dot.gov for a list of what can and cannot be carried aboard a plane.

Express Shuttle: Call at least one day in advance for reservations, 1-800-397-0773 (US, Canada, Mexico) or e-mail reservations@expressshuttleutah.com. The University of Utah has a special rate of \$13.00 one way. Indicate that you are traveling to the University of Utah and whether or not you will be traveling in a group. Check in with the shuttle service when you arrive at the airport. Reservations for your return trip can also be made in advance. Plan to depart for the airport 2-3 hours prior to your flight.

TRANSPORTATION

Taxi: Service is available from the Airport to the local hotels not offering free shuttle service. Taxis are available at the airport for approximately \$20 one way. Taxis depart from the taxis stands on the ground floor outside the baggage collection area at each terminal. Travel time from the airport to the University is approximately 20 minutes.

Public Transportation: Runs between the Salt Lake City Airport, downtown Salt Lake City, and the University of Utah. On campus, the University provides an extensive shuttle service. Daily shuttles are in service from 6:00 AM through 7:00 PM. There is shuttle service on weekends and University holidays.

PARKING

Visitors to the University's main campus have three parking options. They may park in pay lots, at meters, or purchase a day/temporary pass.

Pay Lots

There are five pay lots. They are located between the University Bookstore and Marriott Library, adjacent to the Student Services Building, across the street from the Olpin Union, west of the medical bookstore, and in the Business Loop east of the Fine Arts Museum. All pay lots open approximately 7 a.m. Monday through Friday, but close at different times. The rate schedule for all lots is \$1 per hour with a maximum charge of \$8 per exit. Payment can be made using cash, a personal check, credit card, or by validation.

After Hours Envelopes (AHE) are placed on vehicles, which arrived in the pay lot during operating hours but remained in the lot after it closed. If not paid

within 10 calendar days, a \$10 parking citation is automatically issued. After-hours fees can be paid by depositing the envelope in the yellow box located near the exit of each lot, by bringing to Commuter Services, or by mailing either via campus mail or the USPS.

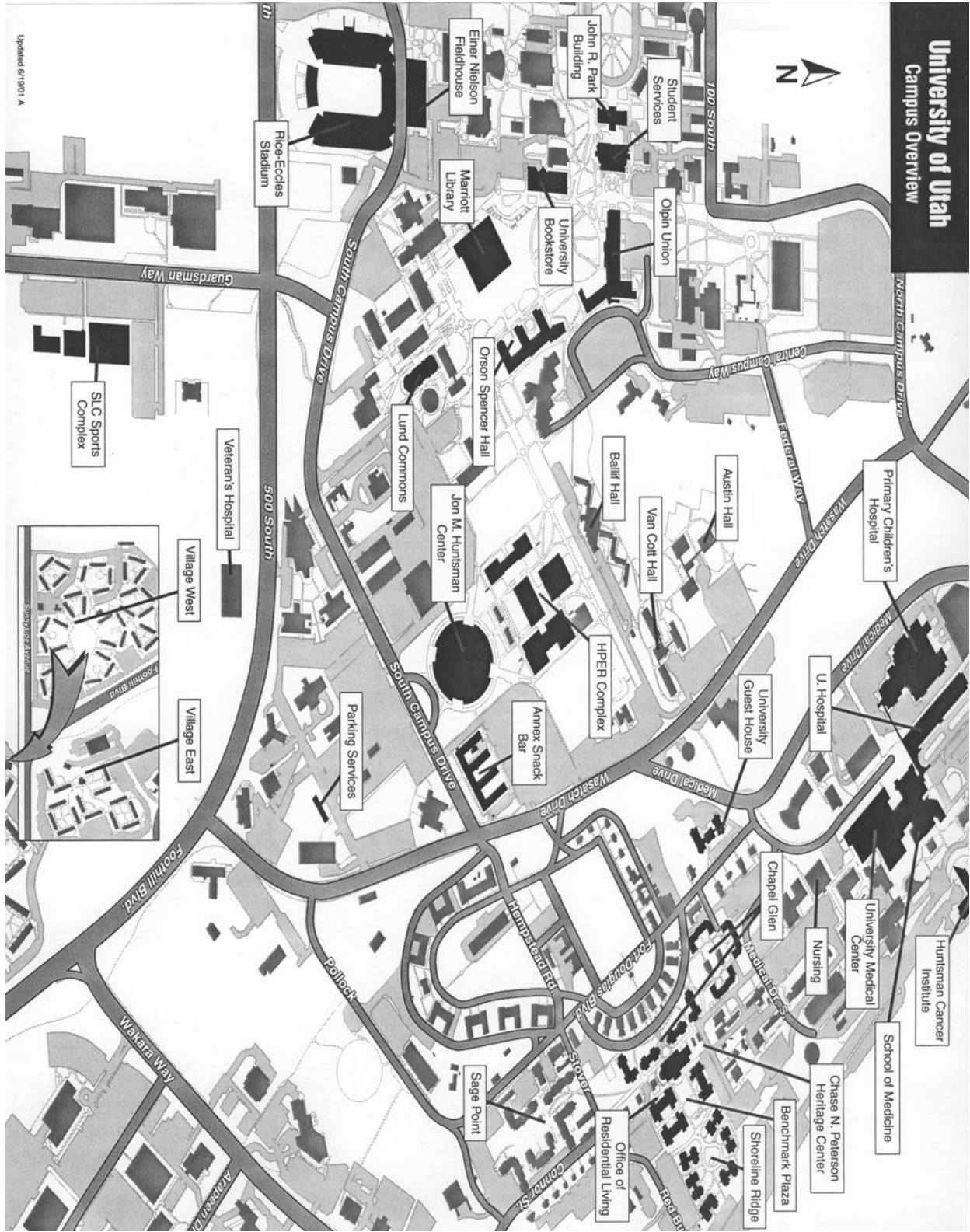
For accountability purposes, we prohibit our booth attendants from accepting After Hours Envelopes. Customers should deposit or mail the envelopes themselves.

Parking Meters

Located in most lots on campus. They allow parking from 36 minutes to 2 hours, depending on location. The time each meter allows is printed on the meter head just below the time window and immediately above the rate schedule. The LED readout displays the time purchased and will not add time when the limit is reached. Meters can take nickels, dimes, and quarters but will not accept foreign coins.

Day/Temporary Passes

If you're visiting the university for one, two, or consecutive days, a day or temporary pass may be your best option. It can be purchased on the day you wish to use it or bought in advance. It allows a visitor to park on campus for specified days in specified lots. The cost per day depends on where you wish to park. It is not valid at meters or in pay lots. Passes are available at Commuter Services or at pay lot booths. A day pass must display the date of the day it is being used in order to be valid. For further assistance, please call the Commuter Services Office at (801) 581-6415; open weekdays 7:30 AM-5:00 PM. They can also be reached via e-mail comments@parking.utah.edu or fax (801) 581-4056.



ORGANIZING COMMITTEE

GENERAL PROGRAM CHAIR

Jeff Welser

*IBM Microelectronics
West Campus - E40
2070 Route 52
Hopewell Junction, NY 12533
Telephone: (845) 892-5142
Fax: (845) 892-2568
E-mail: welser@us.ibm.com*

TECHNICAL PROGRAM CHAIR

Pallab Bhattacharya

*University of Michigan
Dept of Electrical Engineering & Computer Science
1301 Beal Avenue
Ann Arbor, MI 48109-2122
Telephone: (734) 763-6678
Fax: (734) 763-9324
E-mail: pkb@eecs.umich.edu
(<http://www.eecs.umich.edu/PKB-GROUP/>)*

TECHNICAL PROGRAM VICE CHAIR

Alan Seabaugh, *University of Notre Dame*

TREASURER

Tom Jackson, *Pennsylvania State University*

PAST CHAIR

Sanjay Banerjee, *University of Texas*

LOCAL ARRANGEMENTS CHAIR

Mark S. Miller

*University of Utah
Electrical Engineering Dept &
Material Science and Engineering Dept
122 S. Central Campus Dr, Rm 304
Salt Lake City, UT 84112-0560
Telephone: (801) 587-7718
Fax: (801) 581-4816
E-mail: mark.miller@ece.utah.edu*

TECHNICAL PROGRAM COMMITTEE

Bobby Brar, Rockwell Scientific Company

Andy Bryant, IBM

Jeff Casady, Mississippi State University

Kent Choquette, University of Illinois

Kristin de Meyer, IMEC

Jamal Deen, McMaster University

Augusto Gutierrez-Aitken, TRW

Fumio Koyama, Tokyo Institute of Technology

Lynn Loo, University of Texas

Theresa Mayer, Pennsylvania State University

Arto Nurmikko, Brown University

*Leonard Franklin Register II (Frank),
University of Texas*

Tetsuya Suemitsu, MIT

*Joerg Schulze, University of the German
Federal Armed Forces*

Jimmy Xu, Brown University

Bin Yu, Advanced Micro Devices Inc

INVITED SPEAKERS

Joerg Appenzeller, IBM TJ Watson Research Center

Graciela Blanchet, DuPont

Robert Chau, Intel

Steve Chou, Princeton University

Russell Cowburn, University of Durham

Tom Crowe, University of Virginia

Hongjie Dai, Stanford University

Dan Dapkus, University of Southern California

Akira Endoh, Fujitsu

Bill Frensley, University of Texas, Dallas

Bruce Gurney, IBM Almaden

Karl Hess, University of Illinois

Bob Leheny, DARPA

Klaus Ploog, Paul Drude Institute

John Rogers, University of Illinois

Sigurd Wagner, Princeton University

Peidong Yang, University of California, Berkeley

Journal of ELECTRONIC MATERIALS



The *Journal of Electronic Materials* (*JEM*), a monthly archival publication of the Institute of Electrical and Electronics Engineers (IEEE) and The Minerals, Metals & Materials Society (TMS), was created to serve as the publication of the Electronic Materials Conference. Throughout the year, *JEM* publishes

selected papers presented at this conference and others in the electronic materials field and welcomes the submission of articles related to electronic materials issues.

The journal contains technical papers detailing critical new developments in the electronics field, as well as invited and contributed review papers on topics of current interest, designed to enable those in the field of electronics to keep abreast of activities in areas vital to their own technical interests.

Articles that appear in *JEM* are reviewed, selected, and edited by peers in the field who serve as voluntary members of the editorial board or the board of associate editors or as section editors. Generally, they are members of the Electronic Materials Committee of TMS or members of IEEE.

Manuscript Submission:

General manuscripts should be sent to Theodore C. Harman, editor of *JEM* at the following address:

Theodore C. Harman
Lincoln Laboratory
Massachusetts Institute of Technology
244 Wood Street
Lexington, MA 02420-9108
Telephone: (781) 981-4418
Fax: (781) 981-0122
E-mail: tharman@ll.mit.edu

Detailed manuscript submission guidelines are available from the *JEM* web site at:

<http://www.tms.org/jem.html>.

Subscription Information

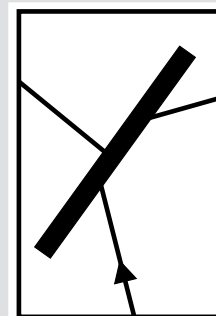
The *Journal of Electronic Materials* acts as a forum for the rapid circulation of the results of original research. The journal focuses on electronic memory and logic structures, magnetic-optical recording media, superlattices, packaging, detectors, emitters, metallization technology, superconductors, and low thermal-budget processing and includes general papers on electronic materials for device application, structure making, reliability, and yield. Articles on methods for preparing and evaluating the chemical, physical, and electronic properties of electronic materials are also included.

JEM subscriptions are available in both print and electronic formats. In addition to receiving on-line access to the current issues of the journal, electronic subscribers have unlimited access to past journal issues with their subscription.

TMS and IEEE members receive significant discounts on *JEM* subscriptions.

Individual issues of the journal may also be purchased through the TMS Document Center for \$25 a copy, plus shipping, at <http://doc.tms.org> or through TMS Subscriptions Representative Mark Cirelli, at the following address:

TMS Subscriptions
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: 1-800-759-4867
(U.S. only)
or (724) 776-9000, ext. 251
Fax: (724) 776-3770
E-mail: subscriptions@tms.org



INQUIRIES

For information regarding meeting registration and pricing, contact:

TMS Meeting Services
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: (724) 776-9000 Ext. 243
Fax: (724) 776-3770
E-mail: mtgserv@tms.org

For information regarding conference logistics, contact:

Michael Packard, CMP
Manager, Meeting Services
TMS
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: (724) 776-9000 Ext. 225
Fax: (724) 776-3770
E-mail: packard@tms.org

For information regarding University of Utah on-campus housing, contact:

Meghan Webb
Registration Coordinator
University Conference Services
University of Utah
110 South Fort Douglas Blvd
Salt Lake City, UT 84113
Telephone: (801) 587-2980
Fax: (801) 587-1002
E-mail: conferences@guesthouse.utah.edu

For further information pertaining to the Electronic Materials Conference, contact:

General Chair

Ilesanmi Adesida
University of Illinois
Micro & Nanotechnology Lab
208 N. Wright St.
Urbana, IL 61801
Telephone: (217) 244-6379
Fax: (217) 244-6375
E-mail: adesida@capone.micro.uiuc.edu

Program Chair

April Brown
Duke University
Box 90291
Durham, NC 27708
Telephone: (919) 660-5442
Fax: (919) 660-5293
E-mail: brown@ee.duke.edu

TMS NON-MEMBER ATTENDEES

Membership offer for new members!

Become a TMS Member today and pay only \$54 for the remainder of 2003 and discover a wealth of information on electronic materials and resultant devices.

Plus, enjoy all of the benefits that TMS Membership has to offer, including:

- A six-month print and electronic subscription to *JOM*, the magazine that explores the traditional, innovative, and revolutionary issues in the minerals, metals, and materials fields.
- An optional subscription of *JEM*, a joint TMS and IEEE publication.
- Networking opportunities with a prestigious membership through international conferences.
- Discounts on TMS publications and conference fees.
- Access to the TMS Organizational Network through the OnLine Membership Directory.
- Plus an array of other membership benefits and services.

Once you have been a part of all that TMS has to offer, you'll want to continue your membership long into the future.

To become a member of TMS, complete a TMS application and return it to the TMS Registration Desk during the conference, along with your \$54 membership fee. Or, you may opt to mail your application and payment to TMS Headquarters, 184 Thorn Hill Road, Warrendale, PA 15086, USA.

You may also join via the TMS website at www.tms.org/Society/membership.html. For more information, you can visit the website or contact the TMS Membership Department at membership@tms.org or 724-776-9000, ext. 241.

Students living in North America can apply for a Joint ASM/TMS Joint Student Membership for \$25. Students living outside North America may apply for TMS Student Membership for \$15.

TMS

SPECIAL RENT-A-CAR



Hertz Rent-a-Car System

Official Car Rental Company for the 2003 Device Research Conference

Meeting rates listed below, with free unlimited mileage, are guaranteed one week before through one week after the actual meeting dates and are **subject to car availability**. Rates are available from all Utah locations.

Reservations may be placed online at www.hertz.com or through the Hertz Meeting Sales Desk in the US at 1-800-654-2240; in Canada at 1-800-263-0600; International: locations call (405)-755-4434 or contact your nearest Hertz reservations center. Identify yourself as an attendee of DRC and reference the CV number which follows:

**You must give the reservations agent:
Hertz CV #02QJ0005**

Car Class		DAILY WEEKEND WEEKLY		
		Per Day	Per Day	5-7 Days
A Economy	2DR	\$35.99	\$21.99	\$135.99
B Compact	4DR	\$40.99	\$25.99	\$149.99
C Midsize	2/4DR	\$44.99	\$27.99	\$169.99
D Sporty	2DR	\$46.99	\$32.99	\$183.99
F Fullsize	4DR	\$49.99	\$34.99	\$199.99
G Premium		\$54.99	\$39.99	\$209.99
I Towncar		\$65.99	\$62.99	\$274.99
L 4 Wheel Drive		\$65.99	\$62.99	\$274.99
R Minivan		\$69.99	\$64.99	\$289.99
U Convertible		\$65.99	\$62.99	\$274.99

Terms and Conditions:

- Meeting rates are guaranteed from one week prior through one week after the meeting dates and are subject to car availability.
- Advance reservations are recommended: blackout dates may apply.
- Government surcharges, taxes, tax reimbursement, airport related fees, vehicle licensing fees and optional items, such as refueling or additional driver fees are extra.
- Minimum rental age is 25 (exceptions apply).
- Standard rental conditions and qualifications apply.
- In the continental US, weekend rentals are available for pick-up between noon Thursday and noon Sunday and must be returned no later than Monday at 11:59 PM.
- Weekend rentals have a minimum two-day keep and Thursday pick-up requires a minimum three-day keep.
- Weekly rentals are from five to seven days.
- Extra day rate for Weekly rentals will be charges at ¼ of the Weekly Rate.

61ST DEVICE RESEARCH CONFERENCE PRELIMINARY SCHEDULE OF EVENTS

Sunday, June 22, 2003

Registration 4:00 pm–9:00 pm
Location Olpin Union Building
- Main Lobby

Welcoming Reception 6:00 pm–8:00 pm
Location Olpin Union Building
- Ballroom Corridor

Monday, June 23, 2003

Registration 7:30 am–5:00 pm
Location Olpin Union Building
- Main Lobby

Plenary Session 8:30 am
Location Olpin Union Building
- Panorama East

Poster Session 5:30 pm
Location Olpin Union Building
- Ballroom Corridor

Tuesday, June 24, 2003

Registration 7:30 am–5:00 pm
Location Olpin Union Building
- Main Lobby

Sessions 8:30 am
Location Olpin Union Building
- Panorama East/Saltair

Conference Banquet 6:00 pm
Location The Utah Museum of Fine Arts

Rump Sessions 8:00 pm–10:30 pm
Location Olpin Union Building
- Panorama East/Saltair/Theatre

Wednesday, June 25, 2003

Registration 7:30 am–3:00 pm
Location Olpin Union Building
- Main Lobby

Sessions 8:30 am
Location Olpin Union Building
- Panorama East/Saltair

**61ST DEVICE RESEARCH
CONFERENCE
PRELIMINARY
ADVANCE PROGRAM**

Monday AM, June 23, 2003

DRC Plenary Session

8:30 AM - 11:45 PM - (Panorama East)

Session Chair:

Pallab Bhattacharya, The University of Michigan

Session Organizer:

Jeffrey Welser, IBM Microelectronics

8:30 AM, Welcoming Remarks

Presentations: IEEE Fellows and Best Student Paper Award

9:00 AM, I-1 Plenary

Intelligent Microsystems: Convergence at the Analog-Digital Interface (Plenary): R. Leheny¹;

¹Microsystems Technology Office, Defense Advanced Research Projects Agency, USA

9:50 AM Break

**Invited Session:
Emerging Technologies and Challenges**

10:15 AM I.-2 Invited

InP HEMTs: Physics, Applications and Future (Invited): A. Endoh¹; Y. Yamashita¹; K. Shinohara²; M. Higashiwaki²; K. Hikosaka¹; T. Matsui²; S. Hiyamizu³; T. Mimura¹; ¹Fujitsu Laboratories Ltd., 10-1 Morinosato-Wakamiya, Atsugi, Kanagawa 243-0197, Japan; ²Communications Research Lab., 4-2-1 Nukui-kitamachi, Koganei, Tokyo 184-8795, Japan; ³Graduate School of Engin. Science, Osaka University, 1-3 Machikaneyama, Tokonaka, Osaka 560-8531, Japan

10:45 AM I.-3 Invited

Issues in Transport (Invited): K. Hess¹; ¹Beckman Institute, University of Illinois, Urbana, IL 61801 USA

11:15 AM I.-4 Invited

Impact of Nanoimprint Lithography to Device Development (Invited): S. Chou¹; ¹NanoStructure Laboratory, Department of Electrical Engineering, Princeton University, Princeton, NJ 08544 USA

*** Student presentation**

**Monday PM, June 23, 2003
(Panorama East)**

**Session II. A.
Wide Bandgap Electronics**

Session Organizer:

Jeff Casady, Semisouth Laboratories

1:40 PM II.A-1

Self-Heating Effects in AlGaIn/GaN High-Power HEMTs: A. P. Zhang¹; L. B. Rolwand¹; E. B. Kaminsky¹; V. Tilak¹; A. F. Allen²; B. J. Edward²; ¹General Electric Global Research Center, Niskayuna, NY 12309 USA; ²Lockheed Martin NE&SS-Radar Systems, Syracuse, NY 13221 USA

2:00 PM II.A-2

Ka-Band CW Power Performance by AlGaIn/GaN HEMTs on SiC: C. Lee¹; J. Yang²; M. Khan²; P. Saunier¹; ¹TriQuint Semiconductor Texas, P.O. Box 833938 Richardson, TX 75083 USA; ²Dept. of Electrical and Computer Eng., University of S. Carolina, Columbia, SC 29208 USA

*** 2:20 PM II.A-3**

P-channel InGaIn-HFET Structure Based on Polarization Doping: T. Zimmerman¹; M. Neuburger¹; M. Kunze¹; I. Daumiller¹; A. Denisenko¹; A. Dadgar²; A. Krost²; E. Kohn²; ¹Department of Electron Devices and Circuits, University of Ulm, Albert-Einstein-Allee 45, D-89081 Ulm Germany; ²Dept. of Semiconductor Epitaxy, O.v. Guericke University Magdeburg, Germany

2:40 PM II.A-4

Microwave Performance of Diamond Surface-Channel FET: M. Kasu^{1,2}; M. Kubovic¹; A. Aleksov¹; I. Kallfass¹; U. Spitzberg¹; N. Kobayashi²; H. Schumacher¹; E. Kohn¹; ¹Department of Electron Devices and Circuits, University of Ulm, Albert-Einstein-Allee 45, D-89081 Ulm Germany; ²NTT Basic Research Laboratories, NTT Corporation, 3-1 Morinosato-Wakamiya, Atsugi, 243-0198, Japan

3:00 PM Break

3:20 PM II.A-5

High Current Gain (>2000) and Reduced Common-Emitter Offset Voltage of GaN/InGaIn Double Heterojunction Bipolar Transistors: T. Makimoto¹; K. Kumakura¹; N. Kobayashi¹; ¹NTT Basic Research Laboratories, NTT Corporation, 3-1 Morinosato-Wakamiya, Atsugi-shi, Kanagawa 243-0198, Japan



3:40 PM IIA-6

Fabrication and Characterization of High Current Gain and High Power (23A-500V) 4H-SiC Darlingtion Bipolar Transistors: *Y. Luo*¹; *J. Zhang*¹; *P. Alexandrov*^{1,2}; *L. Fursin*^{1,2}; *J. H. Zhao*¹; ¹SiCLAB, ECE Department, Rutgers University, Piscataway, NJ 08854 USA; ²United Silicon Carbide, Inc., New Brunswick, NJ 08901 USA

4:00 PM IIA-7

4H-SiC Bipolar Junction Transistors: *I. Perez*¹; *J. Torvik*¹; *B. Zeghbrock*²; ¹PowerSicel, Inc., Boulder, CO 80301 USA; ²On leave from the University of Colorado at Boulder, USA

**Monday PM, June 23, 2003
(Saltair)**

**Session II.B
MOSFETs**

Session Organizer:

**Leonard Franklin Register,
University of Texas at Austin**

1:40 PM II.B-1

Ultra-Narrow Rectangular Cross-Section Si-Fin Channel Double-Gate MOSFETs Fabricated by Using Orientation-Dependent Wet Etching: *Y. X. Liu*¹; *K. Ishii*¹; *T. Tsutsumi*¹; *M. Masahara*¹; *H. Takashima*¹; *E. Suzuki*¹; ¹Nanoelectronics Research Institute (NeRI), National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba Central 2, 1-1-1 Umezono, Tsukuba-shi, Ibaraki 305-8568, Japan

*** 2:00 PM II.B-2**

PMOS Body-Tied FinFET (Omega MOSFET) Characteristics: *T. Park*^{1,2}; *D. Park*¹; *J. H. Chung*¹; *E. J. Yoon*¹; *S. M. Kim*¹; *H. J. Cho*¹; *J. D. Choe*¹; *J. H. Choi*¹; *B. M. Yoon*¹; *J. J. Han*¹; *B. H. Kim*¹; *S. Choi*¹; *K. Kim*¹; *E. Yoon*²; *J. H. Lee*³; ¹Semiconductor R & D Center, Samsung Electronics Co., Ltd., San #24, Nongseo-Ree, Kiheung-Eup, Yongin-Si, Kyunggi-Do, Korea; ²School of Materials Science and Engineering, Seoul National University, Seoul, Korea; ³School of Electronic and Electrical Engineering, Kyungpook National University, Daegu, Korea

2:20 PM II.B-3

Damageless Sputter Deposition for Metal Gate CMOS Technology: *H. Takeuchi*¹; *M. She*¹; *K. Watanabe*²; *T-J. King*¹; ¹EECS Department, University of California at Berkeley, Berkeley, CA 94720-1770 USA; ²Hitachi Ltd., Japan

*** 2:40 PM II.B-4**

Application of Top HfSiON Layer for Improved Poly-Gated HfO₂ PMOSFET Performance: *H-J. Cho*¹; *C. S. Kang*¹; *M. S. Akbar*¹; *K. Onishi*¹; *Y. H. Kim*¹; *R. Choi*¹; *J. C. Lee*¹; ¹Microelectronics Research Center, R9950, The University of Texas, Austin, TX 78758 USA

3:00 PM Break 3:20 PM II.B-5

Low Defects and High Quality Al₂O₃ Ge-on-Insulator MOSFETs: *D. S. Yu*¹; *C. H. Huang*¹; *A. Chin*¹; *W. J. Chen*²; ¹Dept. of Electronics Eng., National Chiao Tung Univ., Hsinchu, Taiwan; ²Dept. of Mechanical Materials Eng., National Yun-Lin Polytechnic Inst., Huwei, Taiwan

3:40 PM II.B-6

GaAs-based MOSFETs with Al₂O₃ Gate Dielectrics Grown by Atomic Layer Deposition: *P. D. Ye*¹; *G. D. Wilk*¹; *B. Yang*¹; *J. Kwo*¹; *H-J. L. Gossman*¹; *M. Frei*¹; *S. N. G. Chu*¹; *S. Nakahara*¹; *J. P. Mannaerts*¹; *M. Sergent*¹; *M. Hong*¹; *K. K. Ng*¹; *J. Bude*¹; ¹Agere Systems, 600 Mountain Avenue, Murray Hill, NJ 07974 USA

**Monday, June 23, 2003, 5:30 PM - 8:30 PM
(Ballroom Corridor)**

Session III. Poster Session

Session Organizer:

**Joerg Schulze, University of the German
Federal Armed Forces, Munich**

*** III-1**

A Fin-Type Independent-Double-Gate NFET: *D. M. Fried*¹; *E. J. Nowak*²; *J. Kedzierski*³; *J. S. Duster*¹; *K. T. Kornegay*¹; ¹AIMS Research Group, 330 Phillips Hall, Cornell University, Ithaca, New York, 14853 USA; ²IBM Microelectronics Division, Essex Junction, VT 05452 USA; ³IBM T.J. Watson Research Center, Yorktown Heights, NY 10598 USA

*** III-2**

Compact Model of MOSFET Electron Tunneling Current Through Ultra-thin SiO₂ and High-k Gate Stacks: *F. Li*¹; *S. P. Mudanai*²; *Y-Y. Fan*¹; *L. F. Register*¹; *S. K. Banerjee*¹; ¹Microelectronics Research Center, The University of Texas at Austin, R9950, Austin, TX 78758 USA; ²Intel Corporation USA

III.-3

A Novel Process for Co-Integration of Vertical Double-Gate and Planar Single-Gate MOSFETs:

M. Masahara¹; T. Matsukawa¹; S. Hosokawa¹; K. Ishii¹; Y. Liu¹; H. Tanoue¹; K. Sakamoto¹; T. Sekigawa¹; H. Yamauchi¹; S. Kanemaru¹; E. Suzuki¹; ¹Nanoelectronics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), 1-1-1 Umezono, Tsukuba, Ibaraki 305-8568, Japan

III.-4

Light Emission from Al₂O₃Si_{1-x}Ge_x/Si MOS Tunnel Diodes:

C. Y. Lin¹; L. H. Lai¹; A. Chin¹; Y. T. Hou²; M. F. Li²; S. P. McAlister³; ¹Dept. of Electronics Eng., National Chiao Tung Univ., Hsinchu, Taiwan; ²Si Nano Device Lab., Dept. of Electrical & Computer Eng., National Univ. of Singapore, Singapore; ³National Research Council, Ottawa, Canada

* III.-5

Fringe Field and Quantum Mechanical Effects on Capacitance Characteristics of Sub-0.1 Micron MOS Devices:

N. G. Gunther¹; A. A. Mutlu¹; M. Rahman¹; ¹Electron Devices Laboratory, Santa Clara University, 500 El Camino Real, Santa Clara, CA 95053-0569 USA

* III.-6

SONNS Memory: Improvement Over SONOS Flash Memory:

M. She¹; H. Takeuchi¹; T-J. King¹; ¹Department of Electrical Engineering and Computer Sciences, University of California, Berkeley, CA 94720-1770 USA

* III.-7

Polarity Dependence of the Reliability Characteristics of HfO₂ with Poly-Si Gate Electrode:

Y. H. Kim¹; K. Onishi¹; C. S. Kang¹; R. Choi¹; H-J. Cho¹; M. S. Akbar¹; J. C. Lee¹; ¹Microelectronics Research Center, Dep. of Electrical and Computer Engineering, The University of Texas, Austin, TX 78758 USA

* III.-8

Multiple Delta Doping for Improved Driftzone Design for Lateral Silicon Power MOSFETs:

C. Tolksdorf¹; A. Ludsteck¹; M. Schmidt¹; S. Sedlmaier¹; J. Schulze¹; I. Eisele¹; G. Debby²; ¹University of German Federal Armed Forces Munich, Institute of Physics, Werner-Heisenberg-Weg 39, 85577 Neubiberg, Germany; ²Infineon Technologies AG Munich, Balanstr. 73, 81541 Munich, Germany

* III.-9

High Power AlGaIn/GaN HEMTs Grown by Plasma-Assisted MBE Operating at 2 to 25 GHz:

T. Waechtler^{1,2}; M. Manfra¹; N. Weimann¹; ¹Bell Laboratories, Lucent Technologies, Murray Hill, NJ 07974 USA; ²Chemnitz University of Technology, 09107 Chemnitz, Germany

* III.-10

Temperature Dependence of the Current-Voltage Characteristics of AlGaIn/GaN HEMT:

L. Shen¹; A. Chini¹; R. Coffie¹; D. Buttari¹; S. Heikman¹; S. Keller¹; U. Mishra¹; ¹Department of Electrical and Computer Engineering, University of California, Santa Barbara, CA 93106 USA

III.-11

Generation of Coherent GHz Acoustic Phonons in AlGaIn/GaN Microwave Field Effect Transistors:

J-H. Song¹; Q. Zhang¹; W. Patterson III¹; A. V. Nurmikko¹; M. J. Uren²; K. P. Hilton²; R. S. Balmer²; T. Martin²; ¹Division of Engineering, Brown University, Providence, RI 02912 USA; ²QinetiQ Ltd., Malvern Worcs WR14 3PS, England

* III.-12

High-Power K-Band Submicron Insulating Gate Heterostructure Field-Effect Transistors:

A. Tarakji^{1,2}; G. Simin¹; H. Fatima¹; V. Adivarahan¹; M. Gaevski¹; W. Sun¹; J. Yang¹; M. Asif Khan¹; M. S. Shur²; R. Gaska²; ¹Department of Electrical Engineering, University of South Carolina, Columbia, SC 29208 USA; ²Sensor Electronic Technology, Inc., Columbia, SC 29209 USA

III.-13

A Physics-Based Model of Frequency-Dependent Electrical Characteristics of GaN MESFETs:

S. S. Islam¹; A. F. M. Anwar²; R. T. Webster³; ¹Department of Electrical Engineering, Rochester Institute of Technology, Rochester, NY 14623-5603 USA; ²Department of Electrical and Computer Engineering, University of Connecticut, Storrs, CT 06269-2157 USA; ³Sensors Directorate, Air Force Research Laboratory, Hanscom AFB, MA 01731-2909 USA

* III.-14

Control of Operating Wavelength and Linewidth in LWIR InAs/InGaAs Dots-in-a-Well Detectors:

G. von Winckel¹; P. Rotella¹; A. Stintz¹; S. Krishna¹; Center for High Technology Materials, EECE Dept., University of New Mexico, Albuquerque, NM 87106 USA

III.-15

High Speed Lateral Trench Detectors with a Junction Substrate: Q. Ouyang¹; J. D. Schaub¹; ¹IBM Semiconductor Research and Development Center (SRDC), IBM Research Division, TJ Watson Research Center, Yorktown Heights, NY 10598 USA

III.-16

Ultrafast Optoelectronic Devices Using Photomixing in Laser-Assisted Field Emission: M. J. Hagmann¹; M. S. Mousa²; M. Brugat³; E. P. Sheshin⁴; A. S. Baturin⁴; ¹762 Lacey Way, North Salt Lake, Utah 84054 USA; ²Department of Physics, Mu'tah University, Al-Karak, Jordan; ³Image Instrumentation Inc., Cooper City, Florida USA; ⁴Moscow Institute of Physics and Technology, Moscow, Russia

* III.-17

Influence of Surface Structure on Electrical Characteristics in SiC MESFETs: H.-Y. Cha¹; C. I. Thomas¹; L. F. Eastman¹; M. G. Spencer¹; ¹401 Phillips Hall, School of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853 USA

III.-18

Monolithic 4H-SiC Darlingtons Transistors with a Peak Current Gain of 2000: Y. Tang¹; T. P. Chow¹; ¹Center for Integrated Electronics, Rensselaer Polytechnic Institute, Troy, NY 12180 USA

* III.-19

Electrolytic Polymer Active Devices: S. P. McGarry¹; N. G. Tarr¹; ¹Department of Electronics, Carleton University, 1125 Colonel By Drive, Ottawa, ON K1S 5B6, Canada

III.-20

5-kV Switches on Flexible Plastic Substrate for Electro-Active Polymer Actuators: S. Périchon Lacour¹; S. Wagner¹; R. Pelrine²; H. Prahald²; ¹Department of Electrical Engineering, Princeton University, Olden Street, Princeton, NJ 08544 USA; ²SRI International, 333 Ravenswood Avenue, Menlo Park, CA 94025 USA

III.-21

High Mobility Poly-Ge TFTs on Flexible Plastic Fabricated at 130°C: D. Shahrjerdi¹; B. Hekmatshoar¹; S. S. Mohajerzadeh¹; A. Khakifirooz¹; ¹Thin Film Laboratory, ECE Department, University of Tehran, Tehran, Iran

III.-22

Gate Capacitance Optimization for Arrays of Carbon Nanotube Field-Effect Transistors: X. Wang¹; H.-S. P. Wong²; P. Oldiges¹; R. J. Miller²; ¹IBM Semiconductor Research and Development Center, Microelectronics Division, Hopewell Junction, NY 12533 USA; ² IBM Semiconductor Research and Development Center, Research Division, IBM T.J. Watson Research Center, Yorktown Heights, NY 10598 USA

III.-23

Improved Power Linearity of InGaP/GaAs HBTs by Collector Doping Design: Y.-M. Hsin¹; Z.-M. Wang¹; H. T. Hsu¹; W. B. Tang¹; C. T. Pan¹; Y. L. Ho¹; ¹Department of Electrical Engineering, National Central University, Chung-Li, 320 Taiwan, R.O.C.

III.-24

Low-Voltage AlGaSb/InAs/AlGaSb PnP HBTs: B. Brar¹; J. Bergman¹; R. Pierson¹; P. Rowell¹; G. Nagy¹; G. Sullivan¹; C. Kadow²; H. K. Lin²; A. Gossard²; M. Rodwell¹; ¹Rockwell Scientific Company, Thousand Oaks, CA 91360 USA; ²ECE Department, University of California, Santa Barbara, CA 93106 USA

* III.-25

Sb-Based Heterostructure Backward Diodes With Improved Sensitivity: R. G. Meyers¹; P. Fay¹; J. N. Schulman²; S. Thomas III²; D. H. Chow²; Y. K. Boegeman²; P. Deelman²; ¹Department of Electrical Engineering, University of Notre Dame, Notre Dame, IN 46556 USA; ²HRL Laboratories LLC, Malibu, CA 90265 USA

III.-26

RF Passive Devices on Si Substrates With Close To Ideal EM Performance: K. T. Chan¹; A. Chin¹; M.-F. Li²; D. L. Kwong³; S. P. McAlister⁴; D. S. Duh⁵; W. J. Lin⁵; ¹Dept. of Electronics Eng., National Chiao Tung Univ., Hsinchu, Taiwan; ²Si Nano Device Lab., Dept. of Electrical & Computer Eng., National Univ. of Singapore, Singapore; ³Dept. of Electrical & Computer Eng., The University of Texas, Austin, TX 78712 USA; ⁴National Research Council, Ottawa, Canada; ⁵Inst. of Nuclear Energy Research, Taoyuan, Taiwan

III.-27

Feasibility Study of GaAs Digital Processors Based on Hexagonal BDD Quantum Logic Circuit Approach: S. Kasai¹; M. Yumoto¹; T. Tamura¹; H. Hasegawa¹; ¹Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University, N-13, W-8 Kita-ku, Sapporo 060-8628, Japan

III.-28

RF MEMS Piezoelectric Switch: S. J. Gross¹; Q. Q. Zhang²; S. Trolrier-McKinstry³; S. Tadigadapa¹; T. N. Jackson¹; ¹Department of Electrical Engineering, The Pennsylvania State University, University Park, Pennsylvania, 16802 USA; ²Geospace Research, El Segundo, CA 90245 USA; ³Department of Material Science & Engineering, The Pennsylvania State University, University Park, Pennsylvania, 16802 USA

III.-29

Effect of Temperature on Nanocrystalline Diamond Field Emission Device Characteristics: I. M. Abdel-Motaleb¹; O. Auciello²; J. Carlisle²; D. Gruen²; J. Birrell³; ¹Department of Electrical Engineering, Northern Illinois University, DeKalb, IL 60115 USA; ²Material Science Division, Argonne National Laboratory, Argonne, IL 60439 USA; ³Department of Material Science and Engineering, University of Illinois, Urbana, IL 61801 USA

III.-30

Electrically Stimulated Cell Membrane Breakdown in Human Placenta TL and Lung Cancer Cell A549 in 3D Trap Arrays on Si Substrate: K. T. Chan¹; S. S. Chuang²; C. H. Wu¹; C. D. Kuo²; A. Chin¹; ¹Dept. of Electronics Eng., National Chiao Tung Univ., Hsinchu, Taiwan; ²Laboratory of Biophysics, Dept. of Medical Research and Education, Taipei Veterans General Hospital, Taiwan

Tuesday AM, June 24, 2003
(Panorama East)

Session IV.
Invited Session: Magnetolectronics

Session Organizer:
Arto Nurmikko, Brown University

8:30 AM IV.-1 Invited

The Evolution of Readback Sensors for Magnetic Recording (Invited): B. Gurney¹; J. R. Childress¹; M. Carey¹; R.A. Fontana Jr.¹; ¹San Jose Research Center, Hitachi Global Storage Technologies Inc., 650 Harry Road, San Jose, CA 95120 USA

9:00 AM IV.-2 Invited

Digital Nanomagnetic Logic (Invited): R. Cowburn¹; ¹Durham University, Physics Department, Science Laboratories, South Road, Durham DH1 3LE, U. K.

9:30 AM IV.-3 Invited

Epitaxial Ferromagnet-Semiconductor Heterostructures for Spin Injection (Invited): K. Ploog¹; ¹Paul Drude Institute for Solid State Electronics, D-10117 Berlin, Germany

10:00 AM Break

Invited Session:
High Performance Devices for Systems

Session Organizer:
Alan Seabaugh, University of Notre Dame

10:20 AM IV.-4 Invited

Terahertz Technology: Where Transistors (So Far) Fear to Tread (Invited): T. Crowe¹; ¹Department of Electrical Engineering, University of Virginia, 351 McCormick Road, PO Box 400743, Charlottesville, VA 22904-4743 USA

10:50 AM IV.-5 Invited

Meso- and Nanophotonic Devices for Integrated Photonic Circuits (Invited): P. Dapkus¹; D. O'Brien¹; ¹Department of Electrical Engineering-Electrophysics and The Center for Photonic Technology, University of Southern California, Los Angeles, CA 90089-0243 USA

11:20 AM IV.-6 Invited

Silicon Nano-Transistors and Breaking the 10 μ m Physical Gate Length Barrier (Invited): R. Chau¹; B. Doyle¹; M. Doczy¹; S. Datta¹; S. Harelund¹; B. Jin¹; J. Kavalieros¹; M. Metz¹; ¹Components Research, Intel Corporation, 5200 N.E. Elam Young Parkway, Hillsboro, OR 97124 USA

Tuesday, PM, June 24, 2003
(Panorama East)

Session V.A.
Nanoelectronics

Session Organizer:
Andy Bryant, IBM Microelectronics

* 1:40 PM V.A-1

SiGe Single-Hole Transistor Fabricated by AFM Oxidation and Epitaxial Regrowth: X-Z. Bo¹; L. P. Rokhinson²; D. C. Tsui¹; J. C. Sturm¹; ¹Center for Photonic and Opto-Electronic Materials, Department of Electrical Engineering, Princeton University, Princeton, NJ 08544 USA; ²Department of Physics, Purdue University, West Lafayette, IN 47907 USA

* 2:00 PM V.A-2

SiGe Quantum Dots Memory Devices with HfO₂ Tunneling Oxide: *D-W. Kim*¹; *T. Kim*²; *Y. Liu*¹; *L. Weltzer*¹; *S. Banerjee*¹; ¹Microelectronics Research Center, The University of Texas at Austin, Austin, TX 78712 USA; ²AMD, 5204 E. Ben White, M/S 608, Austin, TX 78741 USA

2:20 PM V.A-3

Body-Tied Double-Gate SONOS Flash (Omega Flash) Memory Device Built on Bulk Si Wafer: *I. H. Cho*¹; *T-S. Park*^{2,3}; *S. Y. Choi*³; *J. D. Lee*¹; *J-H. Lee*⁴; ¹School of Electrical Engineering and Computer Science, Seoul National University, San 56-1, Shinlim-dong, Kwanak-gu, Seoul 151-742 Korea; ²School of Materials Science and Engineering, Seoul National University, Seoul 151-742 Korea; ³Semiconductor R & D Center, Samsung Electronics Co., Ltd., Kiheung 449-711, Korea; ⁴School of Electronic and Electrical Engineering, Kyungpook National University, Daegu 702-701, Korea

2:40 PM V.A-4

Automatic Control Of The Oscillation Phase Of A Single-Electron Transistor By A Memory Node With A Small MOSFET: *K. Nishiguchi*¹; *H. Inokawa*¹; *Y. Ono*¹; *A. Fujiwara*¹; *Y. Takahashi*¹; ¹NTT Basic Research Laboratories, NTT Corporation, 3-1 Morinosato Wakamiya, Atsugi-shi, Kanagawa Pref., 243-0198, Japan

3:00 PM Break

3:20 PM V.A-5

Silicon Single-Electron Turnstile: *Y. Ono*¹; *K. Yamazaki*¹; *Y. Takahashi*¹; ¹NTT Basic Research Laboratories, NTT Corporation, 3-1 Morinosato Wakamiya, Atsugi, Kanagawa 243-0198, Japan

3:40 PM V.A-6 *Invited*

Systematic Properties of Active Technologies (Invited): *W. Frensley*¹; ¹University of Texas at Dallas, Dallas TX 75080 USA

Tuesday PM, June 24, 2003
(Saltair)

Session V.B.
III-V Electronics and Optoelectronics

Session Organizer:
Augusto Gutierrez-Aitken, TRW

1:40 PM V.B-1

550 GHz-f_T Pseudomorphic InP-HEMTs with Reduced Source-Drain Resistance: *K. Shinohara*¹; *Y. Yamashita*²; *A. Endoh*²; *I. Watanabe*³; *K. Hikosaka*²; *T. Mimura*²; *S. Hiyamizu*³; *T. Matsui*¹; ¹Communications Research Laboratory, 4-2-1 Nukui-kitamachi, Koganei, Tokyo 184-8795, Japan; ²Fujitsu Laboratories Limited, 10-1 Morinosato-wakamiya, Atsugi, Kanagawa 243-0197, Japan; ³Osaka University, 1-3 Machikaneyama, Toyonaka, Osaka 560-8531, Japan

2:00 PM V.B-2

RF Noise Performance of Low Power InAs/AlSb HFETs: *J. Bergman*¹; *G. Nagy*¹; *G. Sullivan*¹; *B. Brar*¹; *C. Kadow*²; *H-K. Lin*²; *A. Gossard*²; *M. Rodwell*²; ¹Rockwell Scientific Company, Thousand Oaks, CA 91360 USA; ²University of California, Santa Barbara, CA 93106 USA

2:20 PM V.B-3

Metamorphic 6.0 Å In_{0.86}Al_{0.14}As/In_{0.86}Ga_{0.14}As Double Heterojunction Bipolar Transistors: *C. Monier*¹; *A. Cavus*¹; *R. Sandhu*¹; *D. Sawdai*¹; *M. Lange*¹; *V. Gambin*¹; *T. Block*¹; *A. Gutierrez-Aitken*¹; ¹Northrop Grumman Space Technology, Redondo Beach, CA 90278 USA

* 2:40 PM V.B-4

AlSb/InAs/InAsP/AlSb Composite-Channel HFETs: *H-K. Lin*¹; *C. Kadow*¹; *M. Dahlström*¹; *J-U. Bae*¹; *M. Rodwell*¹; *A. Gossard*¹; *B. Brar*²; *G. Sullivan*²; *G. Nagy*²; *J. Bergman*²; ¹Department of Materials, University of California, Santa Barbara, CA 93106-5050 USA; ²Rockwell Scientific Company, Thousand Oaks, CA 91360 USA

3:00 PM Break

* 3:20 PM V.B-5

Multiple-Wavelength GaInAs/GaAs Vertical Cavity Surface Emitting Laser Array with Record Wide Wavelength Span: *M. Arai*¹; *T. Kondo*¹; *A. Matsutani*¹; *T. Miyamoto*¹; *F. Koyama*¹; ¹Microsystem Research Center, P & I Lab., Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama 226-8503, Japan

*** 3:40 PM V.B-6**

Focused Ion beam Post-Processing for Single Mode Photonic Crystal Vertical Cavity Surface-Emitting Lasers: *A. J. Danner*¹; *N. Yokouchi*²; *J. J. Raftery Jr.*¹; *K. D. Choquette*¹; ¹University of Illinois-Urbana-Champaign, Urbana, IL 61801 USA; ²on leave from The Furukawa Electric Co. Ltd., Japan

*** 4:00 PM V.B-7**

Intersubband Quantum Cascade Electroluminescent Device With Self-Organized In_{0.4}Ga_{0.6}As/GaAs Quantum Dot Active Region: *C. Fischer*¹; *P. Bhattacharya*¹; ¹Solid State Electronics Laboratory, Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI 48109-2122 USA

4:20 PM V.B-8

Four-Band Quantum Well Infrared Photodetector Array: *S. V. Bandara*¹; *S. D. Gunapala*¹; *J. K. Liu*¹; *S. B. Rafol*¹; ¹Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109 USA

**Tuesday, June 24, 2003,
8:30 PM - 10:30 PM**

**Rump
Session**

R.-1 (Panorama East)

Have We Paid Too Much Attention to ITRS Roadmap Ruled by Moore's Law?
Organizer: Joerg Schulze, University of the German Federal Armed Forces

R.-2 (Saltair)

When Will Carbon Nanotubes Catch Fire?
Organizer: Andy Bryant, IBM Microelectronics

R.-3 (Theatre Room)

The Hottest Transistors In Town
Organizer: Bobby Brar, Rockwell Scientific Company

**Wednesday AM, June 25, 2003
(Saltair)**

**Session VI.
Joint DRC/EMC Invited Session:
Carbon-Based Nanowire Devices**

Session Organizer:

Theresa Mayer, Pennsylvania State University

10:00 AM VI.-1 Invited

Functional Semiconductor Nanowires and Their Optical Properties (Invited): *P. Yang*¹; ¹Department of Chemistry, University of California, Berkeley, CA 94720 USA

10:40 AM VI.-2 Invited

Pushing to the Performance Limit of Carbon Nanotube Electronics (Invited): *H. Dai*¹; ¹Department of Chemistry, Stanford University, Stanford, CA 94305 USA

11:20 AM VI.-3 Invited

Carbon Nanotube Field-Effect Transistors- An Example Of An Ultra-Thin Body Schottky Barrier Device (Invited): *J. Appenzeller*¹; *J. Knoch*²; *Ph. Avouris*¹; ¹IBM T.J. Watson Research Center, Yorktown Heights, NY 10598 USA; ²Massachusetts Institute of Technology, Cambridge, MA 02139 USA

**Wednesday PM, June 25, 2003
(Saltair)**

**Session VII.A.
Joint DRC/EMC Session: Carbon-Based
and Molecular Electronic Devices**

Session Organizer:

Theresa Mayer, Pennsylvania State University

1:30 PM VII.A-1

Selective Growth and Electrical Properties of Single-Walled Carbon Nanotubes: *R. Zhang*¹; *I. Amlani*¹; *R. Tsui*¹; *J. Treske*¹; *J. Baker*¹; ¹Physical Sciences Research Laboratories, Motorola Laboratories, Tempe, AZ 85284 USA

1:50 PM VII.A-2

Negative Differential Resistance In A Bilayer Molecular Junction: *J. Le*¹; *Y. He*²; *C. Mead*¹; *T. R. Hoyer*²; *R. A. Kiehl*¹; ¹Department of Electrical Engineering, ²Department of Chemistry, University of Minnesota, Minneapolis, MN 55455 USA

*** 2:10 PM VII.A-3**

Fabrication and I-V Characterization of Carbon Nanotube Single Electron Transistor Operated at Room Temperature: *T. Kamimura*^{2,4}; K. Sakamoto³; M. Maeda³; K. Kurachi³; K. Matsumoto^{1,2,4}; ¹National Institute of Advanced Industrial Science and Technology 1-1-1 Umezono, Tsukuba, Ibaraki, 305-8568, Japan; ²University of Tsukuba, Japan; ³Meiji University, Japan; ⁴CREST/JST, Japan

2:30 PM VII.A-4

Random Networks of Single-Wall Carbon Nanotubes: Electronic and Sensor Applications: *E. S. Snow*¹; J. P. Novac¹; D. Park¹; ¹Naval Research Laboratory, Washington, D.C. 20375 USA

3:10 PM Break

**Wednesday PM, June 25, 2003
(Panorama East)**

**Session VII.B.
Organic and Plastic Electronics**

Session Organizer:
Lynn Loo, University of Texas at Austin

1:30 PM VII.B-1

Organic Electronics on Flexible Substrates--Paper or Plastic?: *H. Klauk*¹; F. Eder¹; M. Halik¹; U. Zschieschang¹; G. Schmid¹; C. Dehm¹; M. Bergsmann²; R. Einsiedler²; R. Treutlein²; ¹Infineon Technologies, Polymer Materials & Technology, 91052 Erlangen, Germany; ²Hueck Folien GmbH, 4342 Baumgartenberg, Austria

*** 1:50 PM VII.B-2**

A Nonvolatile Pentacene Organic Memory (PENTOM) with a Triple-layer Gate Insulator on a Flexible Substrate: *S. H. Jin*¹; Y. K. Lee¹; C. A. Lee¹; J. W. Kim¹; B-G. Park¹; J. D. Lee¹; ¹Inter-University Semiconductor Research Center (ISRC) and School of Electrical Engineering, Seoul National University, San 56-1, Shinlim-dong, Kwanak-gu, Seoul 11-742, Korea

*** 2:10 PM VII.B-3**

An All-Printed Passive Component Technology for Low-Cost RFID: *D. Redinger*¹; R. Farshchi¹; V. Subramanian¹; ¹EECS Department, University of California, Berkeley, CA 94720 USA

*** 2:30 PM VII.B-4**

Bi-Stable a-Si:H TFT Phosphorescent OLED Active Matrix Pixel: *J.A. Nichols*¹; T. N. Jackson¹; M. H. Lu²; M. Hack²; ¹Department of Electrical Engineering, Pennsylvania State University, 121 Electrical Engineering East, University Park, PA 16802 USA; ²Universal Display Corporation, 375 Phillips Blvd., Ewing, NJ 08618 USA

3:10 Break

**Wednesday PM, June 25, 2003
(Saltair)**

**Session VIII.
Joint DRC/EMC Invited Session:
Plastic Electronics**

Session Organizer:
Lynn Loo, University of Texas at Austin

3:30 PM VIII.-1 Invited

Large Area Printing of Organic Transistors (Invited): *G. B. Blanchet*¹; ¹Dupont, Central Research, Experimental Station E356/284, Wilmington, DE 19880 USA

4:10 PM VIII.-2 Invited

Stretchable and Deformable Macroelectronics (Invited): *S. Wagner*¹; S. P. Lacour¹; P-H. I. Hsu¹; J. C. Sturm¹; Z. Suo²; Departments of ¹Electrical and ²Mechanical and Aerospace Engineering, and POEM, Princeton University, Princeton, NJ 08544 USA

4:50 PM VIII.-3 Invited

Nanoscale Transport in Organic Transistors and LEDs (Invited): J. Zaumseil¹; T.-W. Lee¹; J. W. P. Hsu¹; Y.-L. Loo²; R. Cirelli³; J. A. Rogers⁴; ¹Bell Laboratories and ³New Jersey Nanotechnology Center, 600 Mountain Ave., Murray Hill, NJ 07974 USA; ² University of Texas at Austin, 1 University Station, Austin, TX 78712 USA; ⁴University of Illinois at Urbana-Champaign, 1304 W. Green St., Urbana, IL 61802 USA

TMS

184 THORN HILL ROAD
WARRENDALE, PA 15086-7514 USA

www.tms.org

Address Service Requested

NON-PROFIT
ORGANIZATION
U.S. POSTAGE
PAID
WARRENDALE, PA
PERMIT NO. 16

ADVANCE REGISTRATION FORM

61ST ANNUAL DEVICE RESEARCH CONFERENCE
June 23–25, 2003 / University of Utah, Salt Lake City, Utah

WEB	FAX	MAIL
Take advantage of the convenience of on-line pre-registration via the TMS website: http://www.tms.org . Web registration requires credit card payment.	Fax this form to: TMS Meeting Services (724) 776-3770 Fax registration requires credit card payment.	Return this form with payment to: TMS Meeting Services 184 Thorn Hill Road Warrendale, PA 15086 USA

**ADVANCE REGISTRATION DEADLINE: JUNE 2, 2003
PAYMENT MUST ACCOMPANY FORM**

Forms received after June 2, 2003 will be processed at the next higher fee.

Please print or type: Member Identification Number: (TMS or IEEE) _____

Dr. Prof. Mr. Mrs. Ms. This address is: Business/Home/New Address/Address Correction

Last Name First Name Middle Initial

Employer: _____

Title: _____

Address: _____

City State/Province Zip/Postal Code Country

Telephone: _____ Fax: _____
Country Area/City Local Number Country Area/City Local Number

E-Mail Address: _____ Guest/Spouse Name: _____

Guests do not receive admission to Technical Sessions.

Please check the appropriate category and enter the total where indicated.

REGISTRATION FEES – Includes all Receptions and Tuesday Conference Banquet

	Advance Fees until June 2, 2003	On-site Fees after June 2, 2003
<input type="checkbox"/> Full Conference Member	\$ 335.00	\$ 395.00
<input type="checkbox"/> Full Conference Non-Member	\$ 395.00	\$ 445.00
<input type="checkbox"/> Student (Copy of student school identification card must accompany form.)	\$ 125.00	\$ 175.00

ADDITIONAL SOCIAL FUNCTION TICKETS – Tuesday Conference Banquet

<input type="checkbox"/> Adult	\$60	x	number	_____	\$	_____
<input type="checkbox"/> Children 12 years and younger	\$25	x	number	_____	\$	_____
<input type="checkbox"/> Check if you need transportation to the Tuesday Conference Banquet			number	_____		_____

PAYMENT OPTIONS

<input type="checkbox"/> Check payable to TMS. Payment should be made in US dollars, drawn on a US bank.		
<input type="checkbox"/> VISA		
<input type="checkbox"/> MasterCard	Registration Fees	\$ _____
<input type="checkbox"/> American Express	Additional Tickets	\$ _____
<input type="checkbox"/> Diner's Club	TOTAL FEES PAID	\$ _____

Card No.: _____ Exp. _____

Cardholder Name: _____

Signature: _____

REFUND POLICY: Written requests must arrive at TMS no later than June 2, 2003. A \$50 processing fee will be charged for all cancellations. No refunds will be issued after June 2, 2003.

**ON-CAMPUS HOUSING
RESERVATION FORM**

61ST ANNUAL DEVICE RESEARCH CONFERENCE
June 23–25, 2003 / University of Utah, Salt Lake City, Utah

Attendees wishing to be housed on campus are required to complete this reservation form. **No on-site housing will be accommodated by the University.**

PAYMENT IN FULL MUST ACCOMPANY THIS FORM IN ORDER TO RESERVE A ROOM.

Please print or type:

Name: Mr. Ms. _____
(first) (last)

Affiliation _____

Address _____

City _____ State _____

Zip/Country Code _____ Country _____

Telephone (Home) _____ (Business) _____

Fax _____ E-mail _____

 Please indicate any special needs here: _____

The residence hall accommodations reserved at the University are single and double rooms for individuals or couples. Bath facilities are shared. Rooms will be assigned on a first-request basis so early reservation is recommended.

I PLAN TO ATTEND DRC ONLY AND WISH TO MAKE THE FOLLOWING ARRANGEMENTS: (See On-Campus Housing in this brochure for more details.)

PLAN A: Lodging on Sunday through Tuesday and 7 meals

- PLAN A: Single Occupancy \$149.00
- PLAN A: Double Occupancy \$129.00

PLAN B: Lodging Monday and Tuesday and 5 meals

- PLAN B: Single Occupancy \$104.00
- PLAN B: Double Occupancy \$93.00

PLAN C: Lodging Sunday through Thursday and 12 meals; Includes Parking
I PLAN TO ATTEND BOTH DRC AND EMC. I UNDERSTAND THAT I MUST REGISTER FOR THE ELECTRONIC MATERIALS CONFERENCE SEPARATELY ON THE EMC REGISTRATION FORM, BUT WISH TO MAKE MY HOUSING AND MEALS ARRANGEMENTS ON THIS FORM AS FOLLOWS: (Submit one Housing Reservation form only)

- PLAN C: Single Occupancy \$245.00
- PLAN C: Double Occupancy \$212.00

SATURDAY NIGHT (JUNE 21) ROOM RATE:

Lodging Saturday evening and meals

- Single Occupancy \$47.00
- Double Occupancy \$40.00

FRIDAY NIGHT (JUNE 27) ROOM RATE:

Lodging Friday evening and meals

- Single Occupancy \$47.00
- Double Occupancy \$40.00

NOTE: PLEASE RETURN THIS FORM BY MAY 31, 2003 to:

BY MAIL: Meghan Webb, Conference Services, University of Utah
110 S. Ft. Douglas Blvd., Salt Lake City, UT 84113

BY FAX: (if paying by credit card) (801)-587-1002

Name of person sharing double room: _____

Requesting shared double accommodation; please assign roommate:
(Roommate will be assigned on a first request basis)

Single Double

Female Male

ARRIVAL DATE: _____

DEPARTURE DATE: _____

COMMUTER LUNCH PACKAGE

I plan to make off-campus housing arrangements and wish to purchase a Commuter Lunch Package for on-campus meals.

- 3 DRC Lunches \$23.50 per person \$ _____
- 5 DRC/EMC Lunches \$34.50 per person \$ _____

TOTAL U.S. Dollars accompanying this form \$ _____

PAYMENT METHOD:

- Personal/Bank Check (check must be drawn on a U.S. Bank and made Payable to University Conference Services)
- Charge to my Credit Card
- Master Card VISA American Express

Credit Card # _____

Expiration Date _____

Signature _____

Cardholder Name _____

Return this form no later than May 31, 2003.

Confirmation of reservation

(received by May 31, 2003) will be sent

to you by the University of Utah Conference Services.

If you have questions regarding on-campus reservations,

please call (801)-587-2980; fax (801)-587-1002;

or e-mail conferences@guesthouse.utah.edu

NOTE:

DO NOT mail or fax to TMS