TMS
Minerals • Metals • Materials
184 Thorn Hill Road, Warrendale, Pennsylvania 15086-7528 USA

Address Service Requested

FIRST CLASS MAIL
U.S. POSTAGE
PAID
WARRENDALE, PA
PERMIT NO. 16

TMS
Minerals • Metals • Materials

University of California
Santa Barbara, California
June 30 – July 2, 1999

41st ELECTRONIC MATERIALS CONFERENCE

June 30 - July 2, 1999

ADVANCE PROGRAM
Includes Housing & Registration Forms

http://www.tms.org/Meetings/Specialty/EMC99/EMC99.html

Schedule of Events
41st Electronic Materials Conference

Tuesday, June 29, 1999

Registration 3:00PM-8:00PM

Location ..... University Center / Multicultural Lounge

Wednesday, June 30, 1999

Registration 7:30AM-5:00PM

Location ..... University Center / Multicultural Lounge

Exhibit Booths ..... 10:00AM-5:00PM & 7:00PM-9:00PM

Location ..... University Center / Lagoon Plaza

Welcome Reception 7:00PM-9:00PM

Location ..... University Center / Lagoon Plaza

Plenary Session 8:30AM
(Including Student Awards Ceremony)

Location ..... University Center / Corwin Pavilion

Speaker ..... Dr. Shuji Nakamura

Session A. Semiconductor Quantum Dots – Devices 10:00AM

Session B. Materials Integration – Substrate Fabrication & Bonding 10:00AM

Session C. Characterization, Growth & Properties of Organic Electronic Materials 10:00AM

Session D. Oxides for Devices 10:00AM

Session E. Special Topical Session 1:30PM

Session F. Semiconductor Quantum Dots-Formation & Structure 1:30PM

Session G. Epitaxy for Devices-B 1:30PM

Session H. Electronic Transport in Organic & Molecular Materials 1:30PM

Session I. Column IV Heterostructures & Devices 1:30PM

Thursday, July 1, 1999

Registration 7:30AM-4:00PM

Location ..... University Center / Multicultural Lounge

Exhibit Booths 10:00AM-4:00PM

Location ..... University Center / Lagoon Plaza

Picnic: Evening at the Zoo 6:00PM-9:00PM

Location ..... Santa Barbara Zoological Gardens

Session J. Epitaxy for Devices-A 8:20AM

Session K. Nanoscale Characterization 8:20AM

Session L. Wide Bandgap AlGaN / GaN Heterostructures 8:20AM

Session M. SiC Growth & Characterization 8:20AM

Session N. Infrared Materials & Devices 8:20AM

Session O. Issues for Ferroelectric & High Permittivity Thin Film Materials 8:20AM

Session P. Ordering in Semiconductor Alloys 1:30PM

Session Q. Nanostructure Self-Assembly 1:30PM

Session R. Properties of InGaN Heterostructures & Devices 1:30PM

Session S. Silicon Carbide Processing for Devices 1:30PM

Session T. Materials Integration: Growth & Characterization 1:30PM

Session U. Thermophotovoltaic Materials & Devices 1:30PM

Session V. Thermoelectric & Other Narrow Gap Materials 1:30PM

Friday, July 2, 1999

Registration 7:30AM-10:00AM

Location ..... University Center / Multicultural Lounge

Session W. Epitaxy of III-V 8:30AM

Session X. Composite Materials & Applications 8:20AM

Session Y. Properties of Quantum Wires & Wells 8:20AM

Session Z. Wide Bandgap Nitrides (MBE, Theory & AlN) 8:20AM

Session AA. Metal Contacts to Wide Band Gap Semiconductors 8:20AM

Session BB. Etching & Passivation of Compound Semiconductors 8:20AM

Session CC. Defects & Defect Engineering for Devices 8:20AM

Session DD. Non-Destructive Testing & "In-Situ" Monitoring / Control 1:30PM

Session EE. Semiconductor Quantum Dots-Electronic Structures 1:30PM

Session FF. Issues of Dopants & Defects in Nitrides 1:30PM

Session GG. Epitaxy of II-VI & Chalcopyrites 1:30PM

Session HH. Epitaxy of Si, III-V, Oxides 1:30PM

1999 ELECTRONIC MATERIALS CONFERENCE

University of California
Santa Barbara, California
June 30 – July 2, 1999

http://www.tms.org/Meetings/Specialty/EMC99/EMC99.html

ADVANCE PROGRAM

Includes Housing and Registration Forms

GENERAL INFORMATION

EMC Registration and Housing forms included in the center of this brochure.

EARLY HOUSING AND REGISTRATION ARE ADVISED.

DATE AND LOCATION: The 41st Annual Conference of the Electronic Materials Committee of The Minerals, Metals & Materials Society will be held at the University of California, Santa Barbara, California, June 30 – July 2, 1999. This conference is being coordinated with the Device Research Conference of IEEE, which will take place June 28 – 30, 1999, at the same location.

For information regarding the 1999 Electronic Materials Conference, please contact:

Thomas F. Kuech, General Chairman
University of Wisconsin
Department of Chemical Engineering
1415 Engineering Drive
Madison, WI 53711
Telephone: 608-263-2922
Fax: 608-265-4036
E-mail: kuech@engr.wisc.edu

Michael R. Melloch, Program Chairman
School of Electrical and Computer Engineering
Purdue University
1285 Electrical Engineering Building
West Lafayette, IN 47907-1285
Telephone: 765-494-3528
Fax: 765-494-6441
E-mail: melloch@ecn.purdue.edu

CONFERENCE REGISTRATION: All attendees are encouraged to register in advance to avoid delays in registering at the Conference. Both Electronic Materials Conference (EMC) and Device Research Conference (DRC) badges will be accepted by both Conferences on Wednesday, June 30. Advance registration fees are: full conference $325; one day $275; student $150.

Registration fee includes Welcoming Reception, Coffee Breaks, Thursday Picnic, attendance to all Technical Sessions and Exhibition. One-day fee does not include picnic.

To advance register, complete the registration form provided in the center of this mailer. **Advance registration will be accepted until June 7, 1999.** For questions on advance registrations, please contact TMS Customer Service at Telephone: 724-776-9000 ext. 270; Fax: 724-776-3770; or E-mail: csc@tms.org

You may register at the Conference. On-site registration will be located in the University Center / Multicultural Lounge and will begin on Tuesday afternoon and will continue Wednesday morning through Friday morning during the following hours and location.

Tuesday, June 29……. 3:00PM-8:00PM
Location: University Center / Multicultural Lounge

Wednesday, June 30…….. ..... 7:30AM-5:00PM
Location: University Center / Multicultural Lounge

Thursday, July 1…….. ..... 7:30AM-4:00PM
Location: University Center / Multicultural Lounge

Friday, July 2 ..... 7:30AM-10:00AM
Location: University Center / Multicultural Lounge

MESSAGES: A telephone and message board will be located near the Registration Desk in the Multicultural Lounge. Messages will be posted in this area throughout the Conference. Messages will also be posted in the Residence Halls. If you are residing on campus, you will receive the appropriate number to be used in an emergency in your housing packet.

REFUND POLICY: A written request must be sent to TMS Headquarters, 184 Thorn Hill Road, Warrendale, PA 15086, postmarked no later than June 7, 1999. A $50 processing fee will be charged on all cancellations. NO refunds will be issued after the deadline date.

CAMPUS SMOKING POLICY: UCSB prohibits smoking in its buildings. Smoking will be allowed only in outdoor areas including breezeways and patios.

TECHNICAL SESSIONS: The Electronic Materials technical program will commence at 8:30AM on Wednesday, June 30. Sessions will be held on grounds at the University of California in the University Center. University Center / Corwin Pavilion will be the location of the conference plenary session. Session and paper titles are included in this brochure.

LATE NEWS PAPERS: Late news papers will be considered. Authors must submit the abstract by June 10, 1999, using the TMS Conference Management System (CMS). CMS can be accessed by the website at http: / / www.tms.org / cms. If you have questions or need assistance while using the CMS, please contact TMS Technical Programming Services at 724-776-9000 Ext. 227 or 237. Authors of accepted papers will be notified before the EMC Conference.

TECHNICAL EXHIBIT: In addition to a very strong program, EMC is having an exhibition of electronic materials technology and related services. It is an opportunity for EMC at-

tendees to meet these providers and acquaint themselves with their capabilities and products. You are encouraged to visit the tabletop exhibits and interact with the participating vendors.

Exhibit Location: University Center / Lagoon Plaza

Exhibit Dates and Hours:

Wednesday, June 30 ..... 10:00AM-5:00PM
& 7:00PM-9:00PM

Thursday, July 1 ..... 10:00AM-4:00PM

NOTE: Companies interested in participating in this exhibit should contact TMS for details and exhibitor information at the following address, telephone, fax or email:

Cindy Wilson
TMS / EMC Technological Exhibit
184 Thorn Hill Road
Warrendale, PA 15086-7514
Telephone: 724-776-9000, ext. 231
Fax: 724-776-3770
E-mail: wilson@tms.org

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 requiring specific equipment or services as an attendees of the Electronic Materials Conference to indicate your needs on the enclosed housing and registration forms.

POLICY ON AUDIO AND VISUAL RECORDING OF TECHNICAL PAPER PRESENTATIONS/SESSIONS: The Minerals, Metals & Materials Society (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.

ON-CAMPUS HOUSING ACCOMMODATIONS

We are pleased to invite EMC attendees to reside on the seaside campus of UCSB. Santa Barbara is a summer resort area and accommodations can be difficult to secure. Therefore, early registration and reservations are essential. On-campus accommodations will be available on a first request basis. UCSB residence halls and dining facilities are located within a 5-10 minute walk from the meeting rooms. Residence hall accommodations are either single or double occupancy, with single rooms reserved on a first request basis. Lodging includes beds made on arrival day and daily room service with washcloth and towel change. Restroom and shower facilities are located on each floor. Phone lines are available in the EMC Residence Halls; you may bring your own phone or you can purchase an inexpensive phone at the University Book Store. Also, calling card accessible phones are within the Hall lobby.

The Residence Hall cannot provide a wake-up service, so you may wish to bring an alarm clock as well.

Please check the hotel listings in the Off-Campus Housing section of this brochure.

We offer the following package plans to provide planning 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:

Sally Vito
EMC
Campus Conference Services
University of California
Santa Barbara, CA 93106-6120
Telephone: 805-893-3072
Fax: 805-893-7287
E-mail: svito@housing.ucsb.edu

Confirmation of reservation received by May 30, 1999 will be sent to you by the Conference Office. Prepayment for the anticipated number of nights is required.

Meals will be served in the De La Guerra Dining Commons during the following hours:

Breakfast 7:00AM-8:00AM

Lunch 11:45AM-1:15PM

Dinner 5:30PM-7:00PM

NOTE: Food facilities on campus close at 7:00PM.

Plan A: Includes lodging Tuesday through Thursday nights and the following 9 meals:

Tuesday ..... dinner;

Wednesday .. breakfast, lunch and dinner;

Thursday ..... breakfast, lunch and dinner / evening at the zoo (no dining commons meal offered Thursday night);

Friday ..... breakfast and lunch.

NOTE: this package includes dinner on your arrival day.

Single Occupancy $278.00

Double Occupancy $237.00

Plan B: Includes lodging Wednesday and Thursday nights and the following 7 meals:

Wednesday .. lunch and dinner;

Thursday ..... breakfast, lunch and dinner / evening at the zoo (no dining commons meal offered Thursday night)

Friday ..... breakfast and lunch.

Single Occupancy $216.00

Double Occupancy $189.00

Plan C: (for those planning to attend DRC and EMC) Includes lodging Sunday through Thursday nights and the following 14 meals:

Sunday..... dinner;

Monday ..... breakfast, lunch and dinner;

Tuesday ..... breakfast, lunch and dinner *(DRC Beach Event included in DRC Registration Fee);*

Wednesday .. breakfast, lunch and dinner;

Thursday ..... breakfast, lunch and dinner / evening at the zoo (no dining commons meal offered Thursday night)

Friday ..... breakfast and lunch.

NOTE: This package includes dinner on your arrival day.

Single Occupancy $383.00

Double Occupancy $315.00

LATE DEPARTURE

Friday Night (July 2) Room Rate: (includes lodging Friday evening and the following meals:

Friday ..... dinner
(breakfast & Lunch included in main packages)

Saturday ..... breakfast

NOTE: Checkout is Saturday, 11:00AM

Single Occupancy $60.00

Double Occupancy $47.00

COMMUTER LUNCH PACKAGE:

I plan to make off-campus housing arrangements directly with the hotel / motel and wish to purchase a commuter lunch package for on-campus meals.

Three (3) lunches $21.75

Five (5) lunches $36.25

NOTE: It is important to apply early.

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

Method of Payment:
Payment is U.S. dollars may be made by:

- Personal Check or Money Order. Checks must be drawn on a U.S. Bank and should be made payable to "U.C. Regents".
- Credit Card: Visa or MasterCard

OFF-CAMPUS HOUSING

Blocks of rooms have been reserved, at special conference rates, for the hotels listed below. Rooms will be released as early as mid-May. 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 either DRC, EMC or both, Sunday through Thursday nights, and **you must identify yourself as either a DRC or EMC attendee.** You can also stay Friday or Saturday night if you request it at the time you make your reservations, however, **the special rates below DO NOT apply to weekend rates. Friday and Saturday rates will be higher. Please note that the following rates DO NOT include 10% tax.**

Hotels located in Goleta approximately 4 – 5 miles from campus (7-10 minutes driving time)

Best Western South Coast Inn
5620 Calle Real
Goleta, CA 93117
Phone: 805-967-3200
Fax: 805-683-4466
$89 single / double (Sunday-Thursday night)
Complimentary Continental Breakfast daily 6:00AM – 10:00AM Complimentary beer and wine Monday through Thursday, 5:00PM – 7:00PM available in the lobby.
Complimentary use of nearby athletic club. Rooms equipped with refrigerators, coffee makers and hair dryers. Complimentary airport shuttle provided from 7:30AM – 10:30PM.

Holiday Inn
5650 Calle Real
Goleta, CA 93117
Phone 805-964-6241
Fax: 805-964-8467

Reservation Code: 2DRC or 2EMC

$84 single / double (Sunday – Thursday night)
Beautifully renovated spring 1996; full service restaurant; heated pool in palm garden setting. Holiday Inn's nationally recognized high service standards; complimentary airport shuttle between 6:00AM – 10:00PM.

Ramada Limited
4770 Calle Real
Santa Barbara, CA 93110
Phone: 805-964-3511
Fax: 805-964-0075
$60 single; $10 each additional person (Sunday – Thursday night)
Complimentary Buffet-style Continental Breakfast included; hotel provides complimentary taxi service to and from the airport per room as well as complimentary athletic club privileges.

The following hotel is located off the main entrance onto campus (3 minute driving time):

Pacifica Suites
5490 Hollister Avenue
Goleta, CA 93117
Phone: 805-683-6722
Fax: 805-683-4121
$89 / 1; $99 / 2
Complimentary cooked-to-order breakfast daily, complimentary evening beverages Monday – Saturday. Heated pool and spa. Complimentary airport shuttle 7:00AM – 7:00PM with 24 hour notice.

The following hotels are located in Santa Barbara:

El Encanto Hotel and Garden Villas
1900 Lasuen Road
Santa Barbara, CA 93103
Phone: 805-687-5000
Fax: 805-687-3903
$139 single
Nestled in the foothills of Santa Barbara and overlooking the Pacific Ocean, the historic El Encanto Hotel features garden villas and cottages – many with wood-burning fireplaces, private patios or balconies and an elegant dining room with outdoor terraces. Charter member of Historic Hotels of America.

The Upham Victorian Hotel and Garden Cottages
1404 De La Vina Street
Santa Barbara, CA 93101
Phone: 805-962-0058
Fax: 805-963-2825
$90 single
All rates include a deluxe continental breakfast, afternoon refreshments of fruit, wine and cheese and Oreo cookies and milk in the evening.

The following hotel is located in Montecito:

Montecito Inn
1295 Coast Village Road
Montecito, CA 93108
Phone: 805-969-7854
Fax: 805-969-0623
$120 single / double
Complimentary Continental Breakfast. Pool, Jacuzzi, sauna and exercise room.
Montecito Café and lounge located on site.

WELCOMING RECEPTION: All attendees are invited to attend a hosted Welcoming Reception on Wednesday, June 30 from 7:00PM-9:00PM in the University Center Lagoon Plaza.

EVENING AT THE ZOO: On Thursday, July 1, conference attendees and their guests will have the opportunity to enjoy a catered dinner at the spectacular Santa Barbara Zoological Gardens overlooking the Pacific Ocean. All of the animals will be left out late for this event and a miniature train will circle the zoo throughout the evening allowing guests to enjoy the panoramic view of the Pacific Ocean as well as the mountains. Small children will delight in carousel rides early in the evening!

The cost of this event is included in the full conference and student registraton fee. It is not included in the one-day registration fee.

The cost for one-day registrants and guests is $55 for adults and $20 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 Noon on Wednesday, June 30, 1999.

INFORMAL COFFEE BREAKS: During the intermission of morning and afternoon sessions (at approximately 10:00-10:20AM and 3:10-3:30PM) coffee, tea, assorted pastries and sodas will be served in the University Center Lagoon Plaza, location of exhibits.

TRANSPORTATION: The Santa Barbara area may be reached by:

CAR: Santa Barbara lies on US 101, some 120 miles north of Los Angeles International Airport and 330 miles south of San Francisco International Airport. The University of California Santa Barbara campus is located on its own beaches some 10-15 miles north of Santa Barbara. To reach UCSB from Santa Barbara, drive north on US 101 and take Highway 217, UCSB – airport Exit. When driving south on US 101 (from San Francisco), take the Storke Rd – UCSB exit, travel about 1 mile on Storke, turning left onto El Colegio road which leads directly onto campus. When entering campus, stop at the campus gate and request directions to the Residence Hall if you will be residing on campus. If you are staying off-campus and only need to register for the conference, please request directions to the University Center which will be open during the specified Conference Registration hours indicate in this brochure.

BUS: Greyhound bus lines provide substantial service from Los Angeles and San Francisco. The local station is in downtown Santa Barbara. MTD bus service and taxi service are available from the terminal to campus.

TRAIN: Amtrak provides daily service from San Francisco and Los Angeles. The station is located in downtown Santa Barbara. Taxi service is available from the terminal to campus.

AIR: Santa Barbara Airport is adjacent to the University and is served by American Airlines and currently five commuter airlines (United Express, American Eagle, Skywest/Delta, American West, USS Air Express). See announcement in this brochure for special fares offered by US Airways for EMC/DRC. UCSB offers complimentary shuttle service from the airport. The vehicle will be marked UCSB Conferences Shuttle. Pick-up will be in front of the terminal or near the baggage area. If you don't see the shuttle vehicle, call 893-2189 or 893-2469. **The UCSB shuttle service is only provided for those attendees staying on campus.** If you will be staying in a hotel, you will need to contact them for shuttle information.

TAXI: Taxi service is available from the Airport to the local hotels not offering free shuttle service.

PARKING: Parking at UCSB is by permit only. Parking is complimentary for those residing on-campus in the Residence Hall. When you arrive at UCSB you can receive directions and a temporary parking permit from the gate attendant by identifying yourself as an Electronic Materials Conference (EMC) attendee. This temporary permit will need to be replaced with the permit you will receive at the Residence Hall.

Attendees residing off-campus may purchase a daily permit from the gate attendant for $5 or purchase a 4-day permit (Tuesday through Friday) for $12 at registration. However, pre-purchasing of parking permits is encouraged to eliminate standing in lines. See Housing Reservation Form to pre-purchase permit.

Parking citations are issued for failure to display permits and / or parking in incorrect areas.

RECREATION: The University Recreation Center is open Monday through Saturday. Equipment includes racquetball and squash courts, weight training rooms, and 3 swimming pools. The cost of a Recreation Center pass is $3.50 / adult / day. Passes can be purchased at the campus Conference Service Office or at the Conference Registration Desk. Consult with the Residence Halls desk attendant for hours. Those EMC participants residing on campus may also check out recreational equipment (volleyballs, basketballs, frisbees, billiard, and pingpong equipment) from the service desk by presenting your room key to the Desk Attendant. Goleta public beach is accessible by a short walk from the East Gate of the campus and is open from dawn to dusk. The University beach, east and south of the campus, is directly accessible from the residence halls.

ABOUT SANTA BARBARA: The city of Santa Barbara, founded by the Spanish in the 18th century, is considered to be one of the jewels of the California coast. It lies approximately 100 miles northwest of Los Angeles, nestled against the Santa Ynex Mountains and overlooking the Pacific Ocean. In June, the days are warm (70s) and the nights are cool (50s), with occasional morning fog. Nearby are many excellent ocean beaches, lakes, forests, mountains with varied hiking trails, and such man-made attractions as the Hearst Castle, the flower fields of Lompoc, the Old World Danish Village of Solvnag, the Mission, Court House, and other examples of Spanish architecture.

DRESS: Casual clothing is in order with a sweater or light jacket occasionally needed for the evenings. UCSB is essentially a walking campus, so be sure to wear comfortable walking shoes.

For additional information regarding the University of California Santa Barbara housing, please contact:

Sally Vito
UCSB Campus Conference Services
Santa Rosa Administrative Center
University of California
Santa Barbara, CA 93106-6120
Phone: 805-893-3072
Fax: 805-893-7287
E-mail: svito@housing.ucsb.edu

STUDENT TRAVEL ASSISTANCE: Student authors who plan to present a paper at the 1999 Electronic Materials Conference may be eligible for travel assistance depending on the particular circumstances involved. To apply for student travel assistance, submit an application no later than June 12, 1999 to:

Thomas F. Kuech, General Chairman
University of Wisconsin
Department of Chemical Engineering
1415 Engineering Drive
Madison, WI 53711
Phone: 608-263-2922
Fax: 608-265-4036
E-mail: kuech@engr.wisc.edu

STUDENT AWARDS: Three $500 student awards are given annually by the Electronic Materials Committee for the best presentations by students at the conference. Student papers will be judged on both scientific content and presentation at the Electronic Materials Conference.

Awards will be presented during the plenary session on Wednesday, June 30, in the Corwin Pavilion.

PUBLICATION OF CONFERENCE PAPERS: There are no formal conference proceedings, but the conference abstracts will be published in the Journal of Electronic Materials. We also encourage you to submit manuscripts on your work to the Journal of Electronic Materials. There are three special issues of the Journal of Electronic Marerials scheduled with manuscript due dates shortly after the conference that might be of particular interest to conference participants. Those special issues are:

"Compliant and Alternative Substrates"
There will be a special issue of the Journal of Electronic Materials dedicated to recent advances in the area of compliant and alternative substrates. This special issue is scheduled for publication in July 2000. Information for authors may be found on the inside back cover of current issues of the journal. The final date for submission of manuscripts is September 10, 1999. Papers are solicited in the areas of compliant and alternative substrate design, fabrication, and modeling, as well as applications of these substrates to lattice-mismatched epitaxy and devices.

Original manuscripts with original figures suitable for reproduction, two copies of the manuscript, and a completed copyright form should be submitted to one of the co-editors at the addresses below:

Matthew L. Seaford
Air Force Research Lab
Materials and Manufacturing Directorate
3005 P. Street, Suite 6
Building 62, Room 132
WPAFB, OH 45433-7707
Phone: 937-656-5708
Fax: 937-656-7788
e-mail: seaforml@ml.wpafb.af.mil

Peter Moran
University of Wisconsin
Department of Chemical Engineering
1415 Johnson Drive
Madison, WI 53706
Phone: 608-265-6779
Fax: 608-265-8963
e-mail: pmoran@itis.com

Thomas F. Kuech
University of Wisconsin
Department of Chemical Engineering
1415 Engineering Drive
Madison, WI 53711
Phone: 608-263-2922
Fax: 608-265-4036
e-mail: kuech@engr.wisc.edu

Theresa Mayer
Penn State University
Department of Electrical Engineering
111K Electrical Engineering West
University Park, PA 16802
Phone: 814-863-8458
Fax: 814-865-7065
e-mail: tsm2@psu.edu

"Quantum Dots"

There will be a special issue of the Journal of Electronic Materials dedicated to quantum dots. This special issue is scheduled for publication in April 2000. Information for authors may be found on the inside back cover of current issues of the journal. The final date for submission of manuscripts is September 1, 1999. Papers are solicited in areas of quantum dot formation, processing, device applications, and electrical, optical and structural characterization.

Original manuscripts with original figures suitable for reproduction, two copies of the manuscript, and a completed copyright form should be submitted to one of the co-editors at the addresses below.

Prof. Supriyo Bandyopadhayay
Dept. of Electrical Engineering
University of Nebraska
Lincoln, NE 68588-0511
phone: 402-472-0294
fax: 402-472-4732
email: bandy@quantum1.unl.edu

Prof. Clivia M. Sotomayor-Torres
Institute of Materials Science &
Dept of Electrical Engineering
University of Wuppertal
Gauss-Strasse 20
42097 Wuppertal
GERMANY
phone: 49-202-439-2920
fax: 49 -202- 439-3037
email: clivia@uni-wuppertal.de

Prof. Akio Sasaki
Osaka Electro-Communication Univ.
Department of Electronics
Neyagawashi 572, Japan
phone: 81-720-24-1131
fax.: 81-720-24-0014
email: sasaki@isc.osakac.ac.jp

"III-V Nitrides and SiC"
Because of the rapid advances in and technical importance of SiC and III-V nitride materials and devices, there will be a special issue of the Journal of Electronic Materials dedicated to these materials. This special issue is scheduled for publication in March 2000. Information for authors may be found on the inside back cover of current issues of the journal. The final date for submission of manuscripts is August 1, 1999. Papers are solicited in areas of epitaxy, processing, device applications, and electrical, optical and structural characterization. This will be the sixth such special issue in the Journal of Electronic Materials. If the trend of increasing number of submissions continues, two special issues may be published, one on III-V Nitrides and one on SiC.

Original manuscripts with original figures suitable for reproduction, two copies of the manuscript, and a completed copyright form should be submitted to the appropriate co-editor listed below.

III-V Nitride Editor

Ilesanmi Adesida
Microelectronics Laboratory
University of Illinois
208 N. Wright St
Urbana, IL 61801
phone: 217-244-6379
fax: 217-244-6375
email: adesida@capone.ccsm.uiuc.edu

SiC Editors

Michael R. Melloch
1285 Electrical Engineering Bldg.
Purdue University
West Lafayette, IN 47907-1285
phone: 765-494-3528
fax: 765-494-6441
email: melloch@ecn.purdue.edu

JOURNAL OF ELECTRONIC MATERIALS: The full conference member $357, USA Nonmember $475 and NON-USA Nonmember $499 registration fees includes a subscription to the 2000 Journal of Electronic Materials which will include manuscripts of papers presented at the 1999 Electronic Materials Conference. Those who register for one day may order a subscription to the 1999 JEM on the registration form.

PROGRAM: A complete program with abstracts of papers to be presented at the meeting will be made available for all registrants at the time of registration.

Steven Stockman
Hewlett-Packard Company

James C. Sturm
Princeton University

Michael Tischler
Epitronics Corporation

Raymond K. Tsui
Motorola, Inc.

Kang L. Wang
University of California-Los Angeles

Bruce W. Wessels
Northwestern University

Jerry M. Woodall
Purdue University

Laura Ann Wills
Hewlett Packard Co.

Eli Yablonovitch
University of California-Los Angeles

Edward Yu
University of California-LaJolla

Alex Zunger
NREL

INVITED ORGANIZERS FOR THE 1999 EMC CONFERENCE: The Electronic Materials Conference wishes to thank the following invited organizers for their support and contribution to the technical program presented at this years conference:

Carol Ashby
Sandia National Laboratories

Supriyo Bandyopadhayay
University of Nebraska

Ishwara Bhat
Rensselaer Polytechnic Institute

Thomas F. Boggess
University of Iowa

Len Brillson
Ohio State University

Mike Capano
Purdue University

Greg Charache
Lockheed Martin

Shigefusa Chichibu
Science University of Tokyo

Tim Coutts
NREL

P. Daniel Dapkus
University of Southern California

Steve Denbaars
University of California, Santa Barbara

Daniel P. Docter
HRL Laboratories

Kurt Eyink
Wright Patterson Air Force Base

Mark Goorsky
University of California, Los Angeles

Robert J. Hamers
University of Wisconsin

Marian Hargis
MellWood Laboratories

Julia Hsu
University of Virginia

David Janes
Purdue University

Andrew D. Johnson
DERA

Theresa S. Mayer
Pennsylvania State University

Paul McIntyre
Stanford University

Mark Miller
University of Virginia

Suzanne Mohney
Pennsylvania State University

Karen Moore
Motorola

SUBSCRIPTION INFORMATION:
Journal of Electronic Materials
A monthly publication of the Electronic Materials Committee of TMS and the Electron Devices Society of IEEE.

For information regarding meeting registration, subscription and pricing contact:

The Minerals, Metals & Materials Society (TMS)
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: 724-776-9000 Ext. 270
Fax: 724-776-3770
E-mail: csc@tms.org

For information regarding conference logistics contact:

Marlene Karl
Meeting Coordinator
The Minerals, Metals & Materials Society (TMS)
184 Thorn Hill Road
Warrendale, PA 15086
Telephone: 724-776-9000 Ext. 232
Fax: 724-776-3770
E-mail: karl@tms.org

For information regarding University of California Santa Barbara on-campus housing contact:

Sally J. Vito
Campus Conference Services
University of California
Santa Barbara, CA 93106-6120
Telephone: 805-893-3072
Fax: 805-893-7287
E-mail: svito@housing.ucsb.edu

For further information pertaining to the Device Research Conference, DRC registration and DRC housing forms, contact:

Emmanuel Crabbe, DRC General Chair
IBM SRDC
MS E40, Building 630
1580 Route 52
Hopewell Junction, NY 12533
Telephone: 914-892-2056
Fax: 914-892-4604
E-mail: crabbe@watson.ibm.com

or

Bart Van Zeghbroeck, DRC Technical program Chair
Department of Electrical & Computer Engineering
Engineering Center EE1B55
University of Colorado at Boulder
Boulder, CO 80309-0425
Telephone: 303-492-2809
Fax: 303-492-2758

JOHN BARDEEN AWARD

Lionel Kimerling
John Bardeen Award

The John Bardeen Award, established in 1994, recognizes an individual who has made outstanding contributions and is a leader in the field of electronic materials.

Recipient: *Lionel Kimerling*

Citation: *Professor Kimerling is a world leader in the field of defects in electronic materials.*

Lionel Kimerling is Thomas Lord Professor of Materials Science and Engineering and director of the Materials Processing Center at the Massachusetts Institute of Technology.

He earned his S.B. in metallurgy and his Ph.D. in materials science at the Massachusetts Institute of Technology in 1965 and 1969, respectively. He was a member of the technical staff at ATT Bell Laboratories from 1972 to 1981, at which time he became head of the Materials Physics Research Department at ATT Bell Laboratories. He joined the staff of Massachusetts Institute of Technology in 1990. He has also served as a lecturer at Aarhus University, Denmark, and Technion University, Israel.

Dr. Kimerling was the 1994 president of TMS and a past director of the TMS Electronic, Magnetic, & Photonic Materials Division. He is a member of the TMS Foundation Board of Trustees. He has received several honors, and is a fellow of the American Association for the Advancement of Science and the American Physical Society.

"TMS is the primary intellectual reservoir of the materials profession. Within TMS I have grown to appreciate the diversity of ideas and goals in the materials field. The annual TMS Electronic Materials Conference has been the testing ground for my research and a launch pad for its applications. I am grateful to be honored by my peers from who I have benefited so much."

SPECIAL AIRFARE

U·S AIRWAYS

Official Carrier

of the 1999 Electronic Materials Conference

US Airways agrees to offer an exclusive low rate for the attendees traveling to the 1999 Electronic Materials Conference in Santa Barbara, California.

This special fare will offer a 5% discount off First or Envoy Class and any published US Airways promotional round trip fare. A **10%** discount off unrestricted coach fares will apply with seven day advance reservations and ticketing required. For Travel to **Los Angeles, CA,** this special fare will offer a **7%** discount off first or Envoy Class and any published US Airways promotional round trip fare. A **12%** discount off unrestricted coach fares will apply with seven day advance reservations and ticketing required. **Plan ahead and receive an additional discount by ticketing 60 days or more prior to departure.** These discounts are valid provided all rules and restrictions are met and are applicable for travel from all points on US Airways' route system.

The above discounts are not combinable with other discounts or promotions, and are valid three days before and after the meeting dates. Additional restrictions may apply on international travel.

To obtain these discounts, you or your professional travel consultant must call US Airways' Meeting and Convention Reservation Office at **(800) 334-8644; 8:00 AM – 9:30 PM, Eastern Time. Select option "1" when making the call.**

REFER TO GOLD FILE NO. 38131065.

Once your reservations are confirmed, we will mail the tickets to you or suggest several other convenient methods of purchase.

If you normally use the services of a travel agent or corporate travel department, please have them place the call so that they may obtain the same advantages for you. The special meeting fare is only available through the Meeting and Convention Reservation Office

Hertz Rent-a-Car System…

has been selected as the Official Car Rental company for the Electronic Materials Conference in Santa Barbara, California.

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 Southern California locations.

Advance reservations may be made by calling the Hertz reservations number **(US: 1-800-654-2240; Canada: 1-800-263-0600; International: contact your nearest Hertz reservation center)** and **identify yourself as an attendee of the Electronic Materials Conference and reference the CV number which follows:**

You must give the reservations agent the Hertz CV #24902.

MEETING RATES FROM ALL SOUTHERN CALIFORNIA LOCATIONS				
Car Class	DAILY Per Day	WEEKEND Per Day	WEEKLY 5-7 Day	*WEEKLY 5-7 Days
A Economy 2DR	$34.99	$21.99	$129.99	$139.99
B Compact 4DR	$37.99	$23.99	$144.99	$154.99
C Midsize 2/4DR	$40.99	$25.99	$159.99	$169.99
D Sporty 2DR	$43.99	$30.99	$174.99	$184.99
F Fullsize 4DR	$47.99	$32.99	$189.99	$199.99
I Luxury	$65.99	$62.99	$294.99	$304.99
L 4 Wheel Drive	$65.99	$62.99	$274.99	$284.99
R Minivan	$65.99	$62.99	$274.99	$284.99

***For rentals from Los Angeles Airport the weekly rate is only $10.00 higher than the other locations.** Standard rental and credit qualifications apply. Taxes, vehicle licensing fees / tax reimbursement, transportation fee, transaction fee and optional items, such as refueling, are extra. At many airports and hotels, a 5% - 12.75% airport / hotel concession fee recovery applies on car rental.

Terms and Conditions:

-UNLIMITED MILEAGE ALLOWANCE ON ABOVE RATES.
-One-way service fee will apply when cars are not returned to renting location.
-Additional daily charges for optional coverages (Loss Damage Waiver,
Personal Accident Insurance, Personal Effect Protection, refueling and state
tax) are not included in the above rates.
-Drivers must meet standard Hertz age, driver and credit requirements
-Hertz is a frequent flyer partner with US Airways, Delta, Northwest, United and American Airlines. Frequent flyer information may be requested at time of car booking.

ATTENTION: TMS NON-MEMBER ATTENDEES

FOR NEW TMS MEMBERS ONLY!

ENTER THE NEW MILLENIUM AS A MEMBER OF TMS!

We want you to join TMS and experience the Society and what it has to offer. Pay only $45.00 and receive membership in TMS for the remainder of 1999!

Receive a six month subscription to the hardcopy of *JOM* and enjoy articles such as "*Progress in the Commercial Application of High-Temperature Superconductors*" plus an optional subscription to *JEM*, a joint TMS and IEEE publication; discounts on TMS publications and conference fees, easy access to the World Wide Web (WWW) with TMS OnLine, plus an array of other membership benefits and services. Once you've been a part of TMS and seen all that's happening in electronic materials programming, you'll want to continue your membership long into the future.

All you need to do is complete a TMS application and return it to the TMS Registration Desk during the conference, along with your $45.00 payment. Or, you may opt to mail your application and payment to TMS Headquarters, 184 Thorn Hill Road, Warrendale, PA 15086, U.S.A.
(Your membership cannot be processed without a completed application.)

Non-member students may apply for Joint ASM/TMS Student Membership for $25.00 annually (students living in North America only), or TMS Student Membership for $15.00 annually (students living outside North America.)

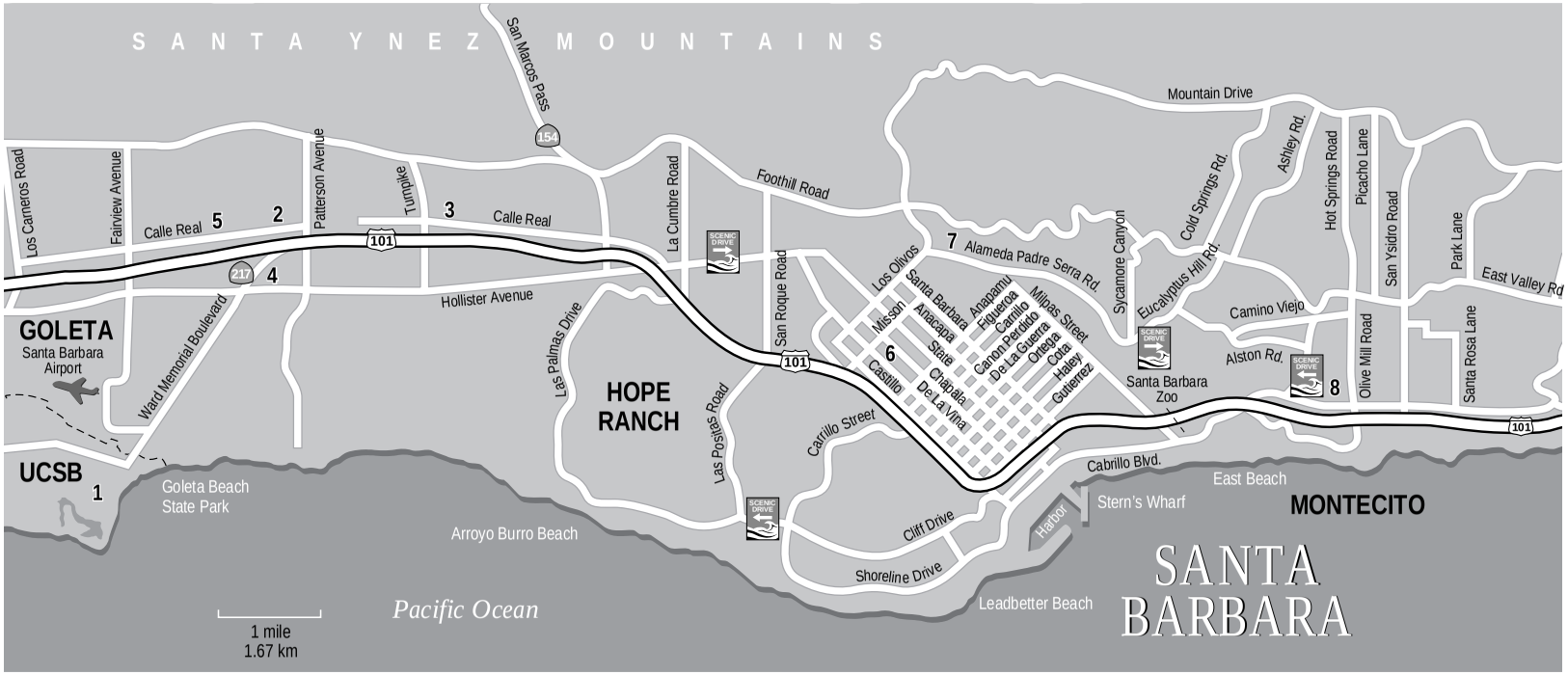
ATTENTION: EMC ATTENDEES

NOMINATIONS ARE NEEDED!

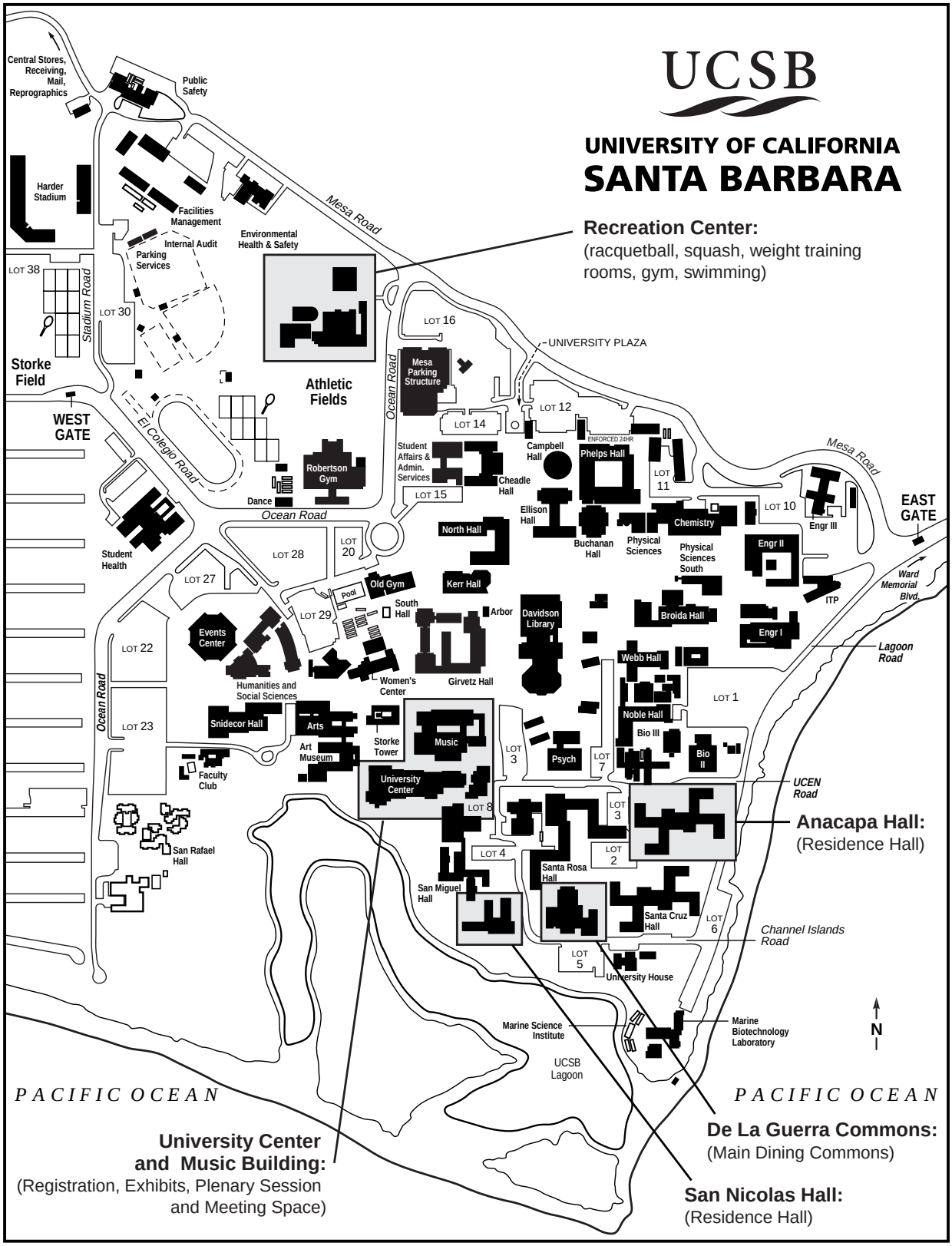
You are encouraged to submit a nomination for the TMS John Bardeen Award. This award recognizes an individual who has made an outstanding contribution and is a leader in the field of electronic materials.

The award is named in honor of John Bardeen who, through a career of theoretical and experimental research, set the foundation for the current state of understanding of electronic materials. Two areas where Bardeen had great impact were the invention and development of the solid state transistor and the theory that developed greater understanding of superconductivity.

For award criteria and additional information, just pick up a nomination form at the TMS Registration desk at EMC, or you may download the nomination form from the TMS Homepage on the WWW at http://www.tms.org.



GOLETA AREA	SANTA BARBARA AREA	SANTA BARBARA FOOTHILLS	MONTECITO AREA
1. UCSB Residence Hall	6. The Upham Victorian Hotel	7. El Encanto Hotel & Garden Villas	8. Montecito Inn
2. Best Western South Coast Inn			
3. Ramada Limited			
4. Pacifica Suites Santa Barbara			
5. Holiday Inn			


UCSB
UNIVERSITY OF CALIFORNIA
SANTA BARBARA
Recreation Center:
(racquetball, squash, weight training rooms, gym, swimming)
University Center and Music Building:
(Registration, Exhibits, Plenary Session and Meeting Space)
De La Guerra Commons:
(Main Dining Commons)
San Nicolas Hall:
(Residence Hall)
Anacapa Hall:
(Residence Hall)
Central Stores, Receiving, Mail, Reprographics
Public Safety
Harder Stadium
Facilities Management
Internal Audit
Environmental Health & Safety
Parking Services
Mesa Road
Stadium Road
Storke Field
WEST GATE
El Colegio Road
Athletic Fields
Robertson Gym
Dance
Ocean Road
Mesa Parking Structure
UNIVERSITY PLAZA
Student Affairs & Admin. Services
Cheadle Hall
Campbell Hall
Phelps Hall
ENFORCED 24HR
Ellison Hall
Buchanan Hall
Physical Sciences
Chemistry
Physical Sciences South
Engr II
Engr III
ITP
EAST GATE
Ward Memorial Blvd.
Lagoon Road
Student Health
North Hall
Old Gym
Pool
Kerr Hall
South Hall
Arbor
Davidson Library
Broida Hall
Engr I
Events Center
Humanities and Social Sciences
Women's Center
Girvetz Hall
Webb Hall
Noble Hall
Bio III
Bio II
Snidecor Hall
Arts
Art Museum
Storke Tower
Music
University Center
Psych
Faculty Club
San Rafael Hall
UCEN Road
Santa Rosa Hall
San Miguel Hall
Santa Cruz Hall
Channel Islands Road
University House
Marine Science Institute
Marine Biotechnology Laboratory
UCSB Lagoon
N
PACIFIC OCEAN
PACIFIC OCEAN
LOT 38
LOT 30
LOT 16
LOT 14
LOT 12
LOT 11
LOT 10
LOT 15
LOT 28
LOT 20
LOT 27
LOT 29
LOT 22
LOT 23
LOT 1
LOT 3
LOT 7
LOT 8
LOT 4
LOT 2
LOT 6
LOT 5

TECHNICAL PROGRAM

*** Indicates Invited Paper**

+ Indicates Student Paper

Wednesday, June 30, 1999

EMC PLENARY LECTURE/STUDENT AWARDS

Ceremony: 8:30 AM

Room: Corwin Pavalion

Session Chairman: Thomas Kuech, University of Wisconsin, Department of Chemical Engineering, Madison, WI 53706

Plenary Speaker:

Topic: Present and Future Prospects of InGaN-Based Blue LEDs and LDs: *Shuji Nakamura*[1]; [1]Nichia Chemical Industries, Ltd., R&D Dept., 491, Oka, Kaminaka, Anan, Tokushima Japan

BREAK: 9:30 AM - 10:00 AM

Wednesday AM, June 30, 1999

Session A. Semiconductor Quantum Dots - Devices

Session Chairs: Kang Wang, University of California, Los Angeles, CA USA; Mark Miller, University of Virginia, Dept. of Elect. Eng., Charlottesville, VA USA

10:00 AM
Gain and Emission Characteristics of MOVPE Grown InP/GaInP Quantum Dot Lasers: *Thomas Riedl*[1]; Joerg Porsche[1]; Markus Ost[1]; Ferdinand Scholz[1]; Andreas Hangleiter[1]; [1]University of Stuttgart, 4th Phys. Institute, Pfaffenwaldring 57, Stuttgart 70550 Germany

10:20 AM
4 Watt High Power Quantum Dot Lasers: *M. Grundmann*[1]; Ch. Ribbat[1]; M.-H. Mao[1]; F. Heinrichsdorff[1]; N. N. Ledentsov[1]; D. Bimberg[1]; A. R. Kovsh[2]; A. Yu. Egorov[2]; D. A. Lifshits[2]; M. V. Maximov[2]; Yu. M. Shernyakov[2]; V. M. Ustinov[2]; A. E. Zhukov[2]; Zh. I. Alferov[2]; [1]TU Berlin, Institute of Solid State Phys., PN 5-2, Hardenbergstr. 36, Berlin 10623 Germany; [2]A. F. Ioffe Physico-Technical Institute, Polytechnicheskaya 26, St. Petersburg 194021 Russia

10:40 AM
Electroluminescence of Stacked In(Ga)As/GaAs QDs at 1.3 μm - 1.4 μm: *Frank Heinrichsdorff*[1]; Nikolai Zakharov[2]; Peter Werner[2]; Alois Krost[1]; Dieter Bimberg[1]; [1]Technische Universität Berlin, Institut

für Festkörperphysik, Sekr. PN 5-2, Berlin 10623 Germany; [2]Max-Planck-Institut für Mikrostrukturphysik, Weinberg 6, Halle, 06120 Germany

11:00 AM
Collisional Carrier Kinetics and Broadening of Spectral Lines in Quantum Dot Structures: *Alexander V. Uskov*[1]; [1]Lebedev Physical Institute, Div. of Quantum Radio Physics, Leninsky pr 53, 117924 Moscow Russia

11:20 AM +
Direct Bandgap Materials for Monolithic Optical Interconnects on Silicon: *Victoria Ann Williams*[1]; Alfred T. Schremer[1]; Joseph M. Ballantyne[1]; [1]Cornell University, Elect. Eng., Ithaca, NY 14850 USA

11:40 AM Late News

Wednesday AM, June 30, 1999

Session B. Materials Integration - Substrate Fabrication and Bonding

Session Chairs: Pete Moran, University of Wisconsin-Madison, Dept. of Chem. Eng., Madison, WI USA; Alan Doolittle, Georgia Institute of Technology, Atlanta, GA USA

10:00 AM +
Fabrication of Thin Film InGaN LED Membranes by Laser Liftoff: *William S. Wong*[1]; Nathan W. Cheung[2]; Timothy D. Sands[3]; Michael Kneissl[4]; David P. Bour[4]; Ping Mei[4]; Linda T. Romano[4]; Noble M. Johnson[4]; [1]University of California, Dept. of Mats. Sci. and Min. Eng., 211-181 Cory Hall, #1772, Berkeley, CA 94720-1772 USA; [2]University of California, Dept. of Elect. Eng. and Comp. Sci., 513 Cory Hall, Berkeley, CA 94720 USA; [3]University of California, Dept. of Mats. Sci. and Min. Eng., 559 Evans Hall, Berkeley, CA 94720-1760 USA; [4]Xerox PARC, Electr. Mats. Lab., 3333 Coyote Hill Rd., Palo Alto, CA 94304 USA

10:20 AM +
GaN LEDs Transferred to Copper Substrates Using Laser Assisted Debonding: *Philip R. Tavernier*[1]; Monica C. Hansen[1]; Steve P. DenBaars[1]; David R. Clarke[1]; [1]University of California Santa Barbara, Dept. of Mats., Bldg. 503 Rm. 1355, Santa Barbara, CA 93106-5050 USA

10:40 AM +
A Comparison of Wet and Dry Chemistries for Hydrophobic Silicon Wafer Bonding: *James B. Mattzela*[1]; Paul A. Roman[1]; Jerzy Ruzyllo[1]; Theresa S. Mayer[1]; [1]The Pennsylvania State University, Dept. of Elect. Eng., University Park, PA 16802

11:00 AM +
Deposition of Borosilicate Glasses by Low Pressure Chemical Vapor Deposition Using Tetraethylorthosilicate and Trimethylborate: *Darren Michael Hansen*[1]; David Charters[1]; Yee Au[1]; Wai Mak[1]; Wisnu Tejasukmana[1]; Peter D. Moran[1]; Thomas F. Kuech[1]; [1]University of Wisconsin, Chem. Eng., 1415 Engineering Dr., Madison, WI 53706 USA

11:20 AM
Ion-Cutting of GaSb Wafers: *Y. Zheng*[1]; Z. F. Guan[1]; S. S. Lau[1]; D. M. Hansen[2]; T. F. Kuech[2]; T. E. Haynes[3]; T. Hoechbauer[4]; M. Nastasi[4]; [1]University of California, San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Dr., Mail Code 0407, La Jolla, CA 92093-0407 USA; [2]University of Wisconsin-Madison, Dept. of Chem. Eng., Madison, WI 53706-1691 USA; [3]Oak Ridge National Laboratory, Solid State Div., Oak Ridge, TN 37831 USA; Los Alamos National Laboratory, Mats. Sci. & Tech. Div., Los Alamos, NM 87545 USA

11:40 AM Late News

Wednesday AM, June 30, 1999

Session C. Characterization, Growth and Properties of Organic Electronic Materials

Session Chairs: Jianna Wang, Penn State University, Dept. of Elect. Eng., State College, PA USA; Rashid Bashir, Purdue University, School of Elect. and Comp. Eng., West Lafayette, IN USA

10:00 AM
Dependence of Emission Quantum Yield on Chain Packing in Electroluminescent Polymers: *Lewis J. Rothberg*[1]; Christopher J. Collsion[1]; Rachel Jakubiak[1]; Yi Li[1]; Christine M. Liberatore[1]; EdVin Soh[1]; [1]University of Rochester, Dept. of Chem./NSF Center for Photoinduced Charge Transfer, Hutchison Hall 200, Rochester, NY 14627 USA

10:20 AM +
Near-Field Scanning Optical Microscopy of Conjugated Polymer Films: *Jessie A. DeAro*[1]; Paul J. Carson[1]; Jonathon Z. Sexton[1]; Steven K. Buratto[1]; [1]University of California, Santa Barbara, Chem. Dept., Santa Barbara, CA 93106 USA

10:40 AM
CPAFM: A Tool for Nanoscale Structure and Electronic Properties: *Tommie Wilson Kelley*[1]; C. Daniel Frisbie[2]; [1]University of Minnesota, Chem. Eng. and Mats. Sci., 421 Washington Ave., SE, 151 Amundson Hall, P.O. Box 134, Minneapolis, MN 55455 USA; [2]University of Minnesota, Chem. Eng. and Mats. Sci., 421 Washington Ave., SE, 151 Amundson Hall, Minneapolis, MN 55455 USA

11:00 AM +
Growth of Thermally Evaporated Pentacene Films on SiO2: *Jonathan Andrew Nichols*[1]; David James Gundlach[1]; Chris D. Sheraw[1]; Darrell G. Schlom[2]; Thomas Nelson Jackson[1]; [1]The Pennsylvania State University, Dept. of Elect. Eng., 121 Elect. Eng. East, University Park, PA 16802 USA; [2]The Pennsylvania State University, Dept. of Mats. Sci. and Eng., 103 Steidle Bldg., University Park, PA 16802 USA

11:20 AM
Nanoscale Investigation of the Optical Properties of Tris-8-Hydroxyquinoline Aluminum Films (Alq_3): *Grace M. Credo*[1]; Steven K. Buratto[1]; [1]UC Santa Barbara, Dept. of Chem., Santa Barbara, CA 93106-9510 USA

11:40 AM Late News

Wednesday AM, June 30, 1999

Session D. Oxides for Devices

Session Chair: Dan Dapkus, University of Southern California, Los Angeles, CA USA

10:00 AM +
Increased Lateral Oxidation Rates of AlInAs on InP Using Short-Period Superlattices: *Eric Hall*[1]; Andrew Huntington[1]; Ryan Naone[1]; Herbert Kroemer[2]; Larry A. Coldren[2]; [1]University of California, Santa Barbara, Mats. Dept., Santa Barbara, CA 93106 USA; [2]University of California, Santa Barbara, ECE Dept., Santa Barbara, CA 93106 USA

10:20 AM +
As Overpressure Mediated Crystallinity Change of AlGaAs Compounds and its Application in Formation of Bragg Reflectors: *Kuo-Lih Chang*[1]; D. E. Wohlert[1]; G. W. Pickrell[1]; J. H. Epple[1]; H. C. Lin[1]; K. Y. Cheng[1]; K. C. Hsieh[1]; [1]University of Illinois at Urbana-Champaign, Dept. of Elect. and Comp. Eng., Urbana, IL 61801 USA

10:40 AM +
The Effect of an Oxide Aperature on the Base-Collector Capacitance of a GaAs Heterojunction Bipolar Transistor: *James G. Champlain*[1]; Umesh K. Mishra[1]; [1]University of California, Elect. and Comp. Eng., Santa Barbara, CA 93106 USA

11:00 AM +
Electrical Properties of Al2O3 Gate Dielectric: *Chin Chang Liao*[1]; W. J. Chen; C. H. Lu[1]; Albert Chin[1]; C. Tsai[1]; [1]National Chiao Tung University, Dept. of Electronics Eng., Hsinchu Taiwan; National Huwei Institute Tech, Dept. of Mech. Mats. Eng., Huwei Taiwan

11:20 AM Late News

11:40 AM Late News

Session E. Special Topical Session

Session Chairs: Jim Speck, University of California, Mats. Dept., Santa Barbara, CA USA; Richard Miles, SDL Inc., San Jose, CA USA

1:30 PM *Invited
Electron Microscope Studies Studies of Defects: D. Cherns

2:00 PM *Invited
The Technological Significance of Defects in III-Nitride Materials: *S. Jeffrey Rosner*[1]; [1]Hewlett-Packard Laboratories, 3500 Deer Creek Rd., Palo Alto, CA 94303

2:30 PM *Invited
Lateral and Pendeo-Epitaxial Overgrowth and Defect Reduction of GaN Films: *Robert F. Davis*[1]; O-H. Nam[1]; Thomas Gehrke[1]; Kevin J. Linthicum[1]; Tsvetanka S. Zheleva[1]; Pradeep Rajagopal[1]; Darren B. Thomson[1]; Chris A. Zorman[2]; Mehren Mehregany[2]; [1]North Carolina State University, Mats. Sci., Box 7907, Raleigh, NC 27695-7907 USA; [2]Case Western Reserve University, Elect., Systems and Comp. Eng. and Sci., Cleveland, OH 44106 USA

3:00 PM *Invited
Effect of Native Point Defects on Nitride Materials and Devices: *Chris G. Van de Walle*[1]; [1]Xerox PARC, 3333 Coyote Hill Rd., Palo Alto, CA 94304 USA

3:30 PM Break

3:50 PM *Invited
The Effect of Doping and Growth Stoichiometry on the Properties of Threading Dislocations in Gan: *Alan F. Wright*[1]; Kevin Leung[1]; [1]Sandia National Laboratories, Dept. 1113, MS 1415, P.O. Box 5800, Albuquerque, NM 87185-1415 USA

4:10 PM *Invited
Effects of Point Defects and Dislocations on Transport Properties of GaN: *David C. Look*[1]; [1]Wright State University, Semiconductor Research Center, Dayton, OH 45435

4:40 PM *Invited
Lateral Epitacial Overgrowth: S. P. Denbaars, University of California, Mats. Dept. Bldg. EII, Santa Barbara, CA 93110 USA

5:10 PM *Invited
Characterization of Nitride Semiconductor Heterostructures and Laser Diodes: *D. P. Bour*[1]; M. Kneissl[1]; L. T. Romano[1]; C. G. Van deWalle[1]; J. Northrup[1]; N. M. Johnson[1]; [1]XEROX Palo Alto Research Center, Electr. Mats. Laboratory, 3333 Coyote Hill Rd., Palo Alto, CA 94304

Session F. Semiconductor Quantum Dots - Formation and Structure

Session Chairs: Ben V. Shanabrook, Naval Research Lab, Code 6870, Washington, DC USA; Craig Pryor, Pryor Consulting, Porterville USA

1:30 PM
Infrared Spectroscopy of Intraband Transition in Modulation Boron-Doped Gesi Quantum Dot Superlattices: *Wen-Gang Wu*[1]; Yin-Sheng Tang[2]; [1]Universtiy of California/Los Angeles, Device Research Lab., Dept. of Elect. Eng., 56-125B EIV, Box 951594, Los Angeles, CA 90095-1594 USA; [2]Universtiy of California/Los Angeles, Device Research Lab., Dept. of Elect. Eng., 56-125B EIV, Box 951594, Los Angeles, CA 90095-1594 USA

1:50 PM
Study of Phonons in Self-Organized Multiple Ge Quantum Dots: *Jianlin Liu*[1]; Yinsheng Tang[1]; Kang L. Wang[1]; [1]University of California at Los Angeles, Dept. of Elect. Eng., Device Research Laboratory, Los Angeles, CA 90095-1594

2:10 PM
Raman Spectroscopy of the Topology of the InAs/GaAs Self-Assembled Quantum Dots: Yuri Alexander Pusep[1]; [1]Federal University of Sao Carlos, DF, Via Washington Luis, km 235, Sao Carlos, Sao Paulo 13565-905 Brasil

2:30 PM
Microscopic Transient Photoluminescence of Site-Controlled InAs Dots: *Tetsuya Nishimura*[1]; Tomonori Ishikawa[1]; Shigeru Kohmoto[1]; Kiyoshi Asakawa[1]; Osamu Wada[1]; [1]The Femtosecond Tech. Research Association, 5-5 Tokodai, Tsukuba, Ibaraki 300-2635 Japan

2:50 PM
Optical Properties of InAs/InP Self-Assembled Quantum Dots Grown by Metalorganic Chemical Vapor Deposition: *Euijoon Yoon*[1]; Youngboo Moon[1]; Tae-Wan Lee[1]; Heedon Hwang[1]; Sukho Yoon[1]; Young Dong Kim[2]; Uk Hyun Lee[3]; Donghan Lee[3]; Hong-Seung Kim[4]; Jeong Yong Lee[4]; [1]Seoul National University, School of Mats. Sci. & Eng., Rm. 32-203, Seoul 151-742 Korea; [2]Kyung Hee University, Dept. of Phys., Seoul Korea; [3]Chungnam National University, Dept. of Phys., Taejon Korea; [4]Korea Advanced Institute of Sci. & Tech., Dept. of Mats. Sci. & Eng., Taejon Korea

3:10 PM Break

3:30 PM
Fluorescence Intermittency and Quantum Efficiency of Individual Porous Silicon Nanoparticles: *Michael D. Mason*[1]; Grace M. Credo[1]; Steven K. Buratto[1]; [1]Universtiy of California, Santa Barbara, Dept. of Chem., Goleta, CA 93106 USA

3:50 PM
Origin of Size Distribution in ZnSe Self-Organized Quantum Dots Grown on ZnS layers: *Takehiko Tawara*[1]; Satoru Tanaka[1]; Hidekazu Kumano[1]; Ikuo Suemune[1]; [1]Hokkaido University, Research Institute for Electr. Sci., Kita-12, Nishi-6, Kita-ku, Sapporo, Hokkaido 060-0812 Japan

4:10 PM
Structural Studies of Stacked InAs Quantum Dots in a Silicon Matrix Grown by MBE: N. D. Zakharov[1]; *Peter Werner*[1]; Victor M. Ustinov[2]; George E. Cirlin[2]; O. V. Smolski[2]; D. V. Denisov[2]; P. S. Kop'ev[1]; Zh. I. Alferov[2]; N. N. Ledentsov[2]; Robert Heitz[3]; Dieter Bimberg[3]; [1]MPI of Microstructure Physics, Halle (Saale) D - 06120 Germany; [2]A.F. Ioffe Physical-Technical Institute, St. Petersburg Russia; [3]Technical University of Berlin, Berlin D-10623 Germany

4:30 PM
In-Situ Self-Organization of Two- and Three-Dimensional High-Density InAs Quantum Wire Arrays on (100) InP: *Hanxuan Li*[1]; Theda Daniels-Race[1]; Zhanguo Wang[2]; [1]Duke University, Dept. of Elect. & Comp. Eng., Durham, NC 27708-0291 USA; [2]Institute of Semiconductors, Chinese Academy of Sciences, Laboratory of Semiconductor Mats. Sci., Beijing 100083 P. R. China

4:50 PM Late News

Wednesday PM, June 30, 1999

Session G. Epitaxy for Devices

Session Chairs: Ray Tsui, Motorola Labs, Tempe, AZ USA; Mike Tischler, Epitronics Corporation, Mesa, AZ USA

1:30 PM
Tellurium Memory Effects on OMVPE-Grown In0.3Ga0.7As0.997N0.003/GaAs Laser Diodes: *Nein-Yi Li*[1]; Chris Hains[1]; Jun Lu[1]; Kai Yang[1]; Julian Cheng[1]; [1]University of New Mexico, Center for High Tech. Mats., 1313 Goddard Ave. SE, Albuquerque, NM 87106 USA

1:50 PM +
Investigation of P-Type GaInNAs for Heterojunction Bipolar Transistor Base Layers: *Huoping Xin*[1]; Charles W. Tu[1]; Peter M. Asbeck[1]; Rebecca J. Welty[1]; [1]Universtiy of California at San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Drive, La Jolla, CA 92093-0407 USA

2:10 PM +
Growth and Characterization of Long Wavelength (1 Micron) GaInAsN Photo-detectors using Gas Source Molecular Beam Epitaxy: *Sudhir G. Subramanya*[1]; Joachim Kruger[1]; Piotr Perlin[1]; Eicke R. Weber[1]; Dan E. Mars[2]; Chris Kocot[2]; Ying-Lan Chang[2]; [1]University of California at Berkeley, Mats. Sci. and Min. Eng., 161M, 211-225 Cory Hall #1772, Berkeley, CA 94720-1772 USA; [2]Hewlett Packard

Laboratories, 3500 Deer Creek Rd., B26M-7, Palo Alto, CA 94304 USA

2:30 PM
InGaAsN for High Efficiency Solar Cells Grown by Metalorganic Chemical Vapor Deposition: *Andrew A. Allerman*[1]; Steven R. Kurtz[1]; Eric D. Jones[1]; James M. Gee[1]; Rob M. Sieg[1]; [1]Sandia National Laboratories, P.O. Box 5800, Albuquerque, NM 87185 USA

2:50 PM Late News

3:10 PM Break

3:30 PM +
AlGaAs and InGaAs-based Light Emitters on Si via Relaxed Graded GeSi Buffer Layers: *Michael E. Groenert*[1]; Vicky K. Yang[1]; Eugene A. Fitzgerald[1]; [1]Massachusetts Institute of Technology, Dept. of Mats. Sci. and Eng., Rm. 13-4025, 77 Massachusetts Ave., Cambridge, MA 02139 USA

3:50 PM +
Lattice Matched $Zn_xBe_{1-x}Te$ Films with GaAs and ZnSe for P-Contact Layers of ZnSe-based II-VI Laser Diodes: *M. W. Cho*[1]; J. H. Chang[1]; S. Saeki[1]; K. Godo[1]; H. Makino[1]; T. Yao[1]; [1]Tohoku University, Institute for Mats. Research, 2-1-1 Katahira, Sendai 980 Japan

4:10 PM
Selective InAs Contact to GaAs: *Kumar Shiralagi*[1]; Ruth Zhang[1]; Ray Tsui[1]; [1]Motorola Labs, Physical Sciences Research Laboratories, 2100 East Elliot Rd., M/S-EL308, Tempe, AZ 85284 USA

4:30 PM +
Development of Multi-Functional InGaAs-Based Ohmic Contacts for GaAs Devices: *Mitsumasa Ogura*[1]; Masanori Murakami[1]; [1]Kyoto University, Dept. of Mats. Sci. and Eng., Kyoto Japan

4:50 PM
Use of Multi-Quantum Wells for Photoabsorption Enhancement in Compound Semiconductor Solar Cells: *Yoshitaka Okada*[1]; Yoshiyuki Suzuki[1]; Takatoshi Kikuchi[1]; [1]University of Tsukuba, Institute of Mats. Sci., Tennodai 1-1-1, Tsukuba, Ibaraki 305-8573 Japan

Wednesday PM, June 30, 1999

Session H. Electronic Transport in Organic & Molecular Materials

Chairperson: Shelby Nelson, Colby College,Waterville, ME USA; David Janes, Purdue University, West Lafayette, IN USA

1:30 PM *Invited
What Determines the Resistance of a Molecule?: Supriyo Datta[1]; [1]Purdue University, USA

2:10 PM
Simulation of Molecular Devices from First-Principal: *Massimiliano Di Ventra*[1]; Norton Lang[2]; Sokrates T. Pantelides[1]; [1]Vanderbilt University, Physics and Astronomy, Stevenson Center, Nashville, TN 37235 USA; [2]IBM, Research Div., Thomas J. Watson Research Center, Yorktown Heights, New York, NY 10598 USA

2:30 PM +
Electronic Transport Characteristics Through Diisocyanide: *Jia Chen*[1]; Laurie E. Calvet[1]; Chongwu Zhou[1]; Mark A. Reed[1]; Dustin W. Carr[2]; Desiree S. Grubisha[3]; Dennis W. Bennett[3]; [1]Yale University, Electri. Eng. Dept., Rm. 509, 15 Prospect St., New Haven, CT 06520 USA; [2]Cornell University, Cornell Nanofabrication Facility, G05 Knight Lab, Ithaca, NY 14853 USA; [3]University of Wisconsin-Milwaukee, Dept. of Chem. and Biochem., 3210 North Cramer St., Milwaukee, WI 53211 USA

2:50 PM
Improved Contacts for Organic Electronic Devices Using Self-Assembled Charge Transfer Materials: *Jianna Wang*[1]; David J. J. Gundlach[1]; Chung-Chen Kuo[1]; Thomas N. Jackson[1]; [1]The Pennsylvania State University, Center for Thin Film Devices, and Electronic Mats. and Processing Research Laboratory, 121 EE East, University Park, PA 16802 USA

3:10 PM Break

3:30 PM *Invited
High Mobility Charge Transportation Aromatic Hydrocarbon Single Crystals: *Jan Hendrik Schön*[1]; Steffen Berg[1]; Christian Kloc[1]; Bertram Batlogg[1]; [1]Bell Laboratories, Lucent Technologies, 700 Mountain Ave., Murray Hill, NJ 07974-0636 USA

4:10 PM
High Mobility Polymer Thin Film Transistors Based on Copolymers of Thiophene and 3-Hexyl Thiophene: *Jianna Wang*[1]; David J. Gundlach[1]; Alan J. Benesi[2]; Thomas N. Jackson[1]; [1]The Pennsylvania State University, Center for Thin Film Devices, and Electr. Mats. and Processing Research Laboratory, 121 EE East, University Park, PA 16802 USA; [2]The Pennsylvania State University, Chem. Dept., University Park, PA 16802 USA

4:30 PM +
Contact Limited Performance of Pentacene Thin Film Transistors: *David J. Gundlach*[1]; Jonathan A. Nichols[1]; Chung-Chen Kuo[1]; Hagen Klauk[1]; Chris D. Sheraw[1]; Darrell G. Schlom[2]; Thomas N. Jackson[1]; [1]The Pennsylvania State University, Dept. of Elect. Eng., 121 Elect. Eng. East, University Park, PA 16802 USA; [2]The Pennsylvania State University, Dept. of Mats. Sci. and Eng., 103 Steidle Bldg., University Park, PA 16802-5005 USA

4:50 PM Late News

Session I: Column IV Heterostructures and Devices

Session Chairs: Eugene Fitzgerald, MIT, Cambridge, MA USA; Ya-Hong Xie, UCLA, Dept. of Mats. Sci. & Eng., Los Angeles, CA USA

1:30 PM +
Exploitation of Facet Formations in SiGe/Si Selective Epitaxial Growth for Achieving a Nanometer Template: *Greg D. U'Ren*[1]; Mark S. Goorsky[1]; Kang L. Wang[2]; [1]UCLA, Dept. of Mats. Sci. and Eng., 6532 Boelter Hall, 405 Hilgard Ave., Los Angeles, CA 90095-1595 USA; [2]UCLA, Dept. of Elect. Eng., 405 Hilgard Ave., Los Angeles, CA 90095-1594 USA

1:50 PM +
Selective Si Epitaxial Growth Using Ultrathin Oxide Mask Formed By Resistless Patterning: *Shawn G. Thomas*[1]; Greg D. U'Ren[2]; Mark S. Goorsky[2]; Kang L. Wang[1]; [1]University of California, Los Angeles, Elect. Eng. Dept., 63-109 Eng. IV, Los Angeles, CA 90095-1595; [2]University of California, Los Angeles, Mats. Sci. and Eng. Dept., Los Angeles, CA 90095-1595

2:10 PM
Electrical and Structure Characterization of Single Crystalline SiGe Formed by Ge Deposition and RTP: *Y. H. Wu*[1]; W. J. Chen[2]; Albert Chin[1]; C. Tsai[1]; [1]National Chiao Tung University, Dept. of Electronics Eng., Hsinchu, Taiwan ROC; [2]National Huwei Inst. Tech., Dept. of Mechanical Mats. Eng., Huwei, Taiwan ROC

2:30 PM
Surfactant Mediated Epitaxy of Ge/Si Heterostructures for Device Applications: *Karl R. Hofmann*[1]; Martin Kammler[1]; Dirk Reinking[1]; Michael Horn-von Hoegen[2]; [1]University of Hannover, Inst. f. Halbleitertechnologie, Appelstrasse 11 A, D-30167 Hannover Germany; [2]University of Hannover, Inst. F. Festkoerperphysik, Appelstrasse 2, D-30167 Hannover Germany

2:50 PM +
Direct Growth of Ge on Si for Integrated Si Microphotonic Photodetectors: *Hsin-Chiao Luan*[1]; A. M. Agarwal[1]; Kzumi Wada[1]; E. A. Fitzgerald[1]; L. C. Kimerling[1]; [1]Massachusetts Institute of Tech., Dept. of Mats. Sci. and Eng., 13-4130, 77 Mass Ave., Cambridge, MA 02139 USA

3:10 PM Break

3:30 PM +
Boron Segregation in Polycrystalline Si(1-x-y)Ge(x)C(y) Alloys: *Eric Jonathan Stewart*[1]; Malcolm S. Carroll[1]; Chia-Lin Chang[1]; James C. Sturm[1]; [1]Princeton University, Dept. of Elect. Eng., Center

for Photonics and Optoelectronic Mats., J303 Eng. Quad, Olden St., Princeton, NJ 08544 USA

3:50 PM
X-ray Diffraction and Transmission Electron Microscopy Study of the Development of Texture in Polycrystiallin $Si_{1-x}Ge_x$ Thin Films: *Wei Qin*[1]; D. G. Ast[2]; T. I. Kamins[3]; [1]Institute of Microelectronics, 11 Sci. Park Rd., Singapore Sci. Park II, Singapore 117685 ROS; [2]Cornell University, Mats. Sci. & Eng. Dept., Ithaca, NY 14853 USA; [3]Hewlett-Packard Laboratories, Palo Alto 94303-0867 CA

4:10 PM
Diamond Epitaxy for Electronic Devices: *Aleksandar Aleksov*[1]; Mike Kunze[1]; Andrei Vescan[1]; Wolfgang Ebert[1]; Erhard Kohn[1]; Andreas Bergmaier[2]; Guenther Dollinger[2]; [1]University of Ulm, Dept. of Electron Devices and Circuits, Albert-Einstein-Allee 45, Ulm D-89081 Germany; [2]Technische Universitaet Muenchen, Dept. E12, Beschleunigerlabor der LMU/TUM, Muenchen Germany

4:30 PM +
Epitaxial Growth of Si/Y2O3/Si: A Potential SOS Structure: *Michael Edward Hunter*[1]; Mason J. Reed[1]; John C. Roberts[2]; N. A. El-Masry[1]; S. M. Bedair[2]; [1]NC State University, Mats. Sci. and Eng., 232 Riddick Labs, P.O. Box 7916, Raleigh, NC 27695 USA; [2]NC State University, Elect. and Comp. Eng., 232 Daniels Hall, P.O. Box 7911, Raleigh, NC 27695 USA

4:50 PM
In Situ Observation of Epitaxial Co Silicidation on Si(001): *Kunihiro Sakamoto*[1]; Tatsuro Maeda[1]; [1]Electrotechnical Laboratory, Electron Devices Div., 1-1-4 Umezono, Tsukuba, Ibaraki 305-8568 Japan

Thursday AM, July 1, 1999

Session J. Epitaxy for Devices

Session Chairs: Russell D. Dupris, University of Texas at Austin, PRO/MEP-R9900, Austin, TX USA; Steven Stockman, Hewlett-Packard Company, San Jose, CA USA

8:20 AM +
DC Characterization of Annealing Effect on the Carbon Doped Base of InGaP/GaAs HBTs Grown by LP-MOCVD: *Qinghong (Jack) Yang*[1]; Dennis W. Scott[1]; Patrick D. Meyer[1]; John Miller[1]; Gregory E. Stillman[1]; [1]University of Illinois, Elect. and Comp. Eng., 208 N. Wright St., Urbana, IL 61801 USA

8:40 AM
Effect of High-Temperature Annealing on Device Performance of GaInP/GaAs HBTs Grown by LP-MOVPE: F. Brunner[1]; E. Richter[1]; T. Bergunde[1]; *P. Kurpas*[1]; A. Maasdorf[1]; J. W. Tomm[2]; S. Gramlich[1]; I. Rechenberg[1]; S. Kraus[1]; M. Achouche[1]; J. Würfl[1]; M. Weyers[1]; [1]Ferdinand-Braun-Institut fuer Hoechstfrequenztechnik, Mats. Tech. Dept., Rudower Chaussee 5, D-12489 Berlin Germany; [2]Max-Born-

Institut fuer Nichtlineare Optik und Kurzzeitspektroskopie, Rudower Chaussee 6, Berlin D-12489 Germany

9:00 AM
Low Resistance Visible Wavelength Distributed Bragg Reflectors: *J. M. Fastenau*[1]; G. Y. Robinson[1]; [1]Colorado State University, Dept. of Elect. & Comp. Eng., Fort Collins, CO 80523 USA

9:20 AM
High P-Type Doping in InAlP Grown by Metalorganic Chemical Vapor Deposition: *Yuichi Sasajima*[1]; Russell D. Dupuis[1]; [1]The University of Texas at Austin, Microelectronics Research Center, PRC/MER 2.606K-R9950, Austin, TX 78712-1100 USA

9:40 AM +
Growth and Characterization of InAlGaP Superlattice Lasers: Yuichi Sasajima[1]; *Richard D. Heller*[1]; Russell D. Dupuis[1]; David A. Kellogg[2]; Nick Holonyak[2]; David T. Mathes[3]; Robert Hull[3]; [1]The University of Texas at Austin, Microelectronics Research Center, PRC/MER 1.606D, Austin, TX 78712-1100 USA; [2]University of Illinois at Urbana-Champaign, Microelectronics Laboratory, 208 North Wright St., Urbana, IL 68101-2991 USA; [3]University of Virginia, Dept. of Mats. Sci. and Eng., Thornton Hall, Charlottesville, VA 22903-2442 USA

10:00 AM Break

10:20 AM
Device Quality, Bandgap Engineered InAs-Channel FET Material Structures: *Leye A. Aina*[1]; Harry S. Hier[1]; Anu Mahajan[2]; G. Cueva[2]; Ilesanmi Adesida[2]; Terrance L. Worchesky[3]; Rheanna Riebau[3]; [1]Epitaxial Technologies, LLC, 1450 South Rolling Rd., Baltimore, MD 21227 USA; [2]University of Illinois Urbana Campus, 208 North Wright St., Urbana, IL 61801 USA; [3]University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, MD 21250 USA

10:40 AM
Transport Properties of InAs Layers Grown on GaP Substrate by MBE: *E. H. Chen*[1]; V. Gopal[2]; E. P. Kvam[2]; J. M. Woodall[1]; [1]Yale University, Dept. of Elect. Eng., New Haven, CT 06520; [2]Purdue University, School of Mats. Eng., W. Lafayette, IN 47907

11:00 AM
Effects of HEMT Pseudomorphic Channel Material Design on Device Performance: *Yaochung Chen*[1]; Richard Lai[1]; Mike Wojtowicz[1]; Mike Barsky[1]; Ronald Grundbacher[1]; T. P. Chin[1]; Dwight C. Streit[1]; [1]TRW, Inc., Electr. & Tech. Div., One Space Park, D1/1050, Redondo Beach, CA 90278 USA

11:20 AM
Growth of High-Performance InP IMPATT Diodes by Metalorganic Chemical Vapor Deposition: *Ho-Ki Kwon*[1]; Joongseo Park[1]; Russell D. Dupuis[1]; James W. McClymonds[2]; Michael J. Welch[2]; [1]The University of Texas at Austin, Microelectronics Research Center, MRC/MER - R9900, Austin, TX 78712-1100 USA; [2]Raytheon Electronic Systems, 131 Spring St., Lexington, MA 02173 USA

11:40 AM Late News

Session K. Nanoscale Characterization

Session Chairs: Julia Hsu, University of Virginia, Charlottesville, VA USA; Edward Yu, University of California, San Diego, CA USA

8:20 AM +
Nanoscale Charge Transport Properties of Co/SiO_2 Multilayer Structures and Their Application in a Novel Magnetic Field Sensor: *Daniel M. Schaadt*[1]; Edward T. Yu[1]; Sandra Sankar[2]; Ami E. Berkowitz[2]; [1]University of California at San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Drive, La Jolla, CA 92093-0407 USA; [2]University of California at San Diego, Dept. of Phys., Center for Magnetic Recording Research, 9500 Gilman Dr., La Jolla, CA 92093-0401 USA

8:40 AM
Novel Application of Kelvin Force Microscopy: *Rafi Shikler*[1]; Tamir Meoded[1]; Norbert Fried[1]; Nurit Ashkenasy[1]; Yossi Rosenwaks[1]; [1]Tel-Aviv University, Faculty of Electr. Eng., Dept. of Phy. Electr., Ramat-Aviv, Tel-Aviv 69978 Israel

9:00 AM +
InGaAs/InP Quantum Well Intermixing Studied by Cross-Sectional Scanning Tunneling Microscopy: *Huajie Chen*[1]; Randall M. Feenstra[1]; P. G. Piva[2]; I. V. Mitchell[2]; R. D. Goldberg[3]; G. C. Aers[4]; P. J. Poole[4]; S. Charbonneau[4]; [1]Carnegie Mellon University, Dept. of Phys., Pittsburgh, PA 15213; [2]University of Western Ontario, Dept. of Phys. and Astronomy, London N6A3k7 Canada; [3]University of Salford, Joule Laboratory, Dept. of Phys., Salford M5 4WT UK; [4]National Research Council of Canada, Institute for Microstructural Sciences, Ottawa K1A0R6 Canada

9:20 AM
Role of Interface Roughness in High-Electron Mobility Transistor (HEMT) Structures: An MBE-STM Study: *Haeyeon Yang*[1]; Zhao Ding[1]; Daniel B. Bullock[1]; Vincent P. LaBella[1]; Paul M. Thibado[1]; [1]University of Arkansas, Dept. of Phys., Fayetteville, AR 72701

9:40 AM
Ordering-Induced Band Structure Effects in GaInP Studied by Ballistic Electron Emission Spectroscopy: *Michael Kozhevnikov*[1]; Venkatesh Narayanamurty[1]; Yong Zhang[2]; Angelo Mascarenhas[2]; Jerry Olson[2]; [1]Harvard University, Gordon McKay Laboratory, 9 Oxford St., Cambridge, MA 02138 USA; [2]National Renewable Energy Laboratory, 1617 Cole Boulevard, Golden, CO 80401 USA

10:00 AM Break

10:20 AM +
Nanoscale Characterization of Stresses in Semiconductor Devices: *James John Demarest*[1]; Robert Hull[1]; Kathryn Schonenberg[2]; Koenraad Janssens[3]; [1]University of Virginia, Mats. Sci. and Eng., Thornton Hall, McCormick Rd., Charlottesville, VA 22903 USA; [2]International Business Machines Corporation, IBM Research Div./SRDC,

Hudson Valley Research Park, 1580 Rt. 52, B/640, M/S AE1, Hopewell Junction, NY 12533 USA; [3]OCAS, The Research Centre of the Sidmar Group, J.F. Kennedylaan 3, B-9060, Zelzate Belgium

10:40 AM
Extending Lateral Composition Modulations in InAs/AlAs Superlattices with Miscut Substrates: *David M. Follstaedt*[1]; Andrew G. Norman[2]; S. Phil Ahrenkiel[2]; John L. Reno[1]; Steve R. Lee[1]; Eric D. Jones[1]; Joanna Mirecki Millunchick[3]; Angelo Mascarenhas[2]; Yong Zhang[2]; Ray D. Twesten[4]; [1]Sandia National Laboratories, Dept. 1112, Mail Stop 1056, Albuquerque, NM 87185-1056 USA; [2]National Renewable Energy Laboratory, Golden, CO 80401-2163 USA; [3]University of Michigan, Mats. Sci. and Eng., Ann Arbor, MI 48109-2163 USA; [4]University of Illinois, Center for Microanalysis, Urbana, IL 61801-2985 USA

11:00 AM +
Non-Alloyed Ohmic Contact on GaAs at Nanometer Scale: *Takhee Lee*[1]; B. L. Walsh[3]; D. B. Janes[3]; E. H. Chen[3]; Jia Liu[2]; J. M. Woodall[3]; M. R. Melloch[3]; R. P. Andres[2]; R. Reifenberger[1]; [1]Purdue University, Dept. of Phys., W. Lafayette, IN 47907 USA; [2]Purdue University, School of Chemical Eng., W. Lafayette, IN 47907; [3]Purdue University, School of Elect. and Comp. Eng., W. Lafayette, IN 47907

11:20 AM
Nanomagnetic and Superconducting Properties of Self-Assembled Quantum Dots: *Supriyo Bandyopadhyay*[1]; Latika Menon[1]; Seema Nair[1]; Hou Zheng[2]; David J. Sellmyer[2]; [1]University of Nebraska, Dept. of Elect. Eng., Lincoln, Nebraska 68588-0511 USA; [2]University of Nebraska, Dept. of Phys., Lincoln, NE 68588-0111 USA

11:40 AM Late News

Thursday AM, July 1, 1999

Session L. Wide Bandgap AlGaN/GaN Heterostructures

Session Chairs: Ilesanmi Adesida, University of Illinois-Urbana, Urbana-Champaign, IL USA; Umesh Mishra, University of California, ECE Dept., Santa Barbara, CA USA

8:20 AM
Stress/Strain during MOCVD of AlGaN/GaN on LT GaN/AlN Buffers: *Jung Han*[1]; Jeff J. Figiel[1]; Sean J. Hearne[1]; Jerry A. Floro[1]; Steve R Lee[1]; [1]Sandia National Laboratories, MS-0601, P.O. Box 5800, Albuquerque, NM 87185-0601 USA

8:40 AM +
Local Electronic Structure of AlGaN/GaN Heterostructures Probed by Scanning Capacitance Microscopy: *Kurt V. Smith*[1]; Ed T. Yu[1]; J. M. Redwing[2]; K. S. Boutros[2]; [1]University of California, San

Diego, Elect. and Comp. Eng., 9500 Gilman Dr. 0407, La Jolla, CA 92093 USA; [2]ATMI/Epitronics

9:00 AM
Polarization Fields in AlGaN/GaN Heterojunctions: *James Paul Ibbetson*[1]; [1]University of California, ECE Dept., Santa Barbara, CA 93106

9:20 AM +
Surface Potential Effects Due to the Piezoelectric Charge Associated with Dislocations in GaN: *Changchun Shi*[1]; Peter M. Asbeck[2]; Edward T. Yu[2]; [1]University of California, San Diego, Dept. of Phys., 9138-I, Regents Rd., La Jolla, CA 92037; [2]University of California, San Diego, Dept. of Elect. and Comp. Eng., San Diego, CA

9:40 AM
Two Dimensional Electron Gas Density and Polarization Effects in AlGaInN/GaN Heterostructures: *J. W. Yang*[1]; Asif Khan[1]; R. Gaska[2]; G. Simin[1]; A. Bykhovski[2]; Michael S. Shur[2]; [1]University of South Carolina, ECE Dept., Columbia, SC 29208 USA; [2]Rensselaer Polytechic Institute, ECSE and CIEEM, Troy, NY 12180 USA

10:00 AM Break

10:20 AM +
Growth and Characterization of AlGaN/GaN Heterostructures: *Christopher J. Eiting*[1]; Damien J. H. Lambert[1]; Ho-Ki Kwon[1]; Bryan S. Shelton[1]; Mike M. Wong[1]; Ting-Gang Zhu[1]; Doris E. Lin[1]; Russell D. Dupuis[1]; [1]The University of Texas at Austin, PRC/MER-R9900, Microelectronics Research Center, Austin, TX 78712-1100 USA

10:40 AM
Effect of Surface Roughness on Electron Mobility in AlGaInN/GaN Heterostructures.: *Asif Khan*[1]; Remis Gaska[2]; J. W. Yang[1]; Michael S. Shur[2]; [1]USC, ECE, Columbia, SC 29208 USA; [2]Rensselaer Polytechnic Institute, ECSE and CIEEM, Troy, NY 12180 USA

11:00 AM +
High Electron Mobility 2DEG in AlGaN/GaN Structures: *Chris R. Elsass*[1]; Yulia Smorchkova[2]; Erik Haus[1]; Paul Fini[1]; Pierre Petroff[3]; Steven P. DenBaars[3]; Umesh Mishra[2]; James Speck[1]; Ben Heying[1]; [1]University of California, Santa Barbara, Mats. Dept., Santa Barbara, CA 93106 USA; [2]University of California, Santa Barbara, ECE, Santa Barbara, CA 93106; [3]University of California, Santa Barbara, Mats. and ECE Dept., Santa Barbara, CA 93106

11:20 AM
Correlation Between Material Quality and Low-Frequency Noise Level in GaN Heterostructure Field Effect Transistors: *Alexander A. Balandin*[1]; Richard Li[1]; Shujun Cai[1]; Jiang Li[1]; Kang L. Wang[1]; E. N. Wang[2]; M. Wojtovicz[2]; [1]UCLA, Elect. Eng. Dept., Device Research Laboratory, Rm. 56-125B, Eng. IV Bldg., UCLA, Los Angeles, CA 90095 USA; [2]TRW Inc., Redondo Beach, CA 90278 USA

11:40 AM
Characterization of GaN MIS Structures: *Tamotsu Hashizume*[1]; Ryuusuke Nakasaki[1]; Hideki Hasegawa[1]; [1]Research Center for Interface Quantum Electronics (RCIQE) and Graduate School of Electronics and Information Eng., Hokkaido University, Kita-ku, Kita 13 Nishi 8, Sapporo, Hokkaido 060-8628 Japan

Session M. SiC Growth & Characterization

Session Chairs: Marea Skowronsici, Carnegie Mellon University, Pittsburgh, PA USA; Shigehiro Nishino, Kyoto Institute of Technology, Kyoto, Japan

8:20 AM +
Formation of Macrodefects in SiC Physical Vapor Transport Growth: *Edward Kyle Sanchez*[1]; Volker D. Heydemann[2]; Tom Kuhr[1]; Gregory S. Rohrer[1]; Marek Skowronski[1]; [1]Carnegie Mellon University, Mats. Sci. and Eng., 5000 Forbes Ave., 138 Roberts Hall, Pittsburgh, PA 15213 USA; [2]II-VI Inc., 375 Saxonburg Blvd., Saxonburg, PA 16056 USA

8:40 AM
Local Epitaxy and Epitaxial Laterial Overgrowth of SiC: *Igor Ivanovich Khlebnikov*[1]; Yuri Igorevich Khlebnikov[1]; J. A. Freitas[2]; Tangali S. Sudarshan[1]; [1]University of South Carolina, Dept. of Elect. & Comp. Eng., 301 S. Main St., Columbia, SC 29208 USA; [2]Naval Research Laboratory, Electronics Sci. and Tech. Div., 4555 Overlook Ave., S.W., Washington, DC 20375-5347 USA

9:00 AM
Susceptor Effects on 4H-SiC Epitaxial Growth: *Barbara E. Landini*[1]; [1]ATMI, 7 Commerce Drive, Danbury, CT 06810 USA

9:20 AM
Epitaxial Growth of 6H-SiC on Spherically Polished 6H-SiC Substrate Using Si_2Cl_6+C_3H_8 +H_2 by CVD : *Shigehiro Nishino*[1]; Yasuichi Masuda[1]; Yuki Nishio[1]; [1]Dept. of Electronics and Information Sci., Faculty of Eng. and Design, Kyoto Institute of Tech., Matsugasaki, Sakyo-ku, Kyoto 606 Japan

9:40 AM +
Crystalline Quality and Polytype Formation of SiC Films Grown With Different Concentrations of Ge on (111) Si Substrates: *Wendy L. Sarney*[1]; Lourdes G. Salamanca-Riba[1]; P. Zhou[2]; Crawford Taylor[2]; Michael Spencer[2]; R. P. Sharma[1]; K. A. Jones[3]; [1]University of Maryland, College Park, Dept. Mats. & Nuclear Eng., Bldg. 090, College Park, MD 20742 USA; [2]Howard University, Mats. Sci. Center of Excellence, 2300 6th St. NW, Washington, DC 20059 USA; [3]U.S. Army Research Lab, Adelphi, MD 20783 USA

10:00 AM Break

10:20 AM
Deep Donor in Bulk N-Type 4H-SiC: *W. C. Mitchel*[1]; A. Saxler[1]; Ronald E. Perrin[1]; John Sizelove[1]; S. R. Smith[1]; J. S. Solomon[1]; A. O. Evwaraye[2]; [1]Air Force Research Laboratory, Mats. and Manufacturing Div., AFRL/MLP, Wright-Patterson AFB, OH 45433-7707 USA; [2]University of Dayton, Dept. of Phys., 3000 College Park, Dayton, OH 45469 USA

10:40 AM +
Radiotracer Spectroscopy on Ta Related Deep Levels in 4H-SiC: *Joachim Kurt Grillenberger*[1]; Norbert Achtziger[1]; Rainer Sielemann[2]; [1]University of Jena, Institut für Festkörperphysik, Max-Wien-Platz 1, Jena 07743 Germany; [2]Hahn-Meitner-Institut, FD, Glienicker Straße 100, Berlin 14109 Germany

11:00 AM
Effect of NO Annealing Conditions on Electrical Characterization of N-Type 4H-SiC MOS Capacitors: *Hui-feng Li*[1]; Denis Sweatman[1]; Sima Dimitrijev[1]; H. Barry Harrison[1]; [1]Griffith University, School of Microelectronic Eng., Brisbane, QLD 4111 Australia

11:20 AM Late News

11:40 AM Late News

Thursday AM, July 1, 1999

Session N. Infrared Materials and Devices

Session Chairs: Robert M. Biefeld, Sandia National Laboratory, Dept. 1113, Albuquerque, NM USA; Tom Boggess, University of Iowa, Iowa City, IA USA

8:20 AM
Influence of Interfacial Layers on GaAsSb/InP Heterostructures: Xiangang Xu[1]; Jinsheng Hu[1]; Nouredine Matine[1]; *Simon P. Watkins*[1]; Colombo R. Bolognesi[1]; [1]Simon Fraser University, Dept. of Phys., 8888 University Dr., Burnaby, BC V5A 1S6 Canada

8:40 AM
MOCVD Growth of InAsSb/InPSb SLS's for Use in Infrared Emitters: *Robert M. Biefeld*[1]; Steven R. Kurtz[1]; Jamie D. Phillips[1]; [1]Sandia National Laboratory, 1113, MS 0601, P.O. Box 5800, Albuquerque, NM 87185-0601 USA

9:00 AM +
MBE Growth of High Quality InGaAsSb/AlGaAsSb Heterostructures Using the Digital Alloying Technique: *C. Mourad*[1]; K. J. Malloy[1]; R. Kaspi[2]; [1]Center for High Tech. Mats., University of New Mexico, Albuquerque 87106 NM; [2]Air Force Research Laboratory, AFRL/DELS, Kirtland, AFB 87117

9:20 AM
InSb Based Mid-IR Light Emitting Diodes and Lasers: *Tim Ashley*[1]; David T. Dutton[1]; C. Tom Elliott[1]; Neil T. Gordon[1]; Andrew D. Johnson[1]; Tim J. Phillips[1]; Graham J. Pryce[1]; Graham Berry[2]; Ben N. Murdin[3]; Eoin P. O'Reilly[3]; [1]Defence Evaluation & Research Agency, St. Andrews Rd., Malvern, Worcestershire WR14 3PS UK; [2]University of Wales, Cardiff, Dept. of Phys. & Astro., P.O. Box 913, Cardiff, Wales CF2 3YB UK; [3]University of Surrey, Dept. of Phys., Guildford, Surrey GU2 5XH UK

9:40 AM
New Techniques for EPI-Down Mounting of Mid-IR Type-II Quantum-Well Lasers: *Edward Hugh Aifer*[1]; William W. Bewley[1]; Christopher L. Felix[1]; Linda J. Olafsen[1]; Igor Vurgaftman[1]; Donna W. Stokes[1]; Jerry R. Meyer[1]; [1]Naval Research Laboratory, Optical Sciences, Code 5613, 4555 Overlook Ave., Washington, DC 20375 USA

10:00 AM Break

10:20 AM
Linewidth Enhancement Factor in Mid-Infrared Semiconductor Laser Active Regions: *Michael E. Flatte'*[1]; J. T. Olesberg[1]; Thomas F. Boggess[1]; [1]The University of Iowa, Dept. of Phys. and Astronomy, 100 IATL, Iowa City, IA 52242 USA

10:40 AM +
Carrier Recombination Dynamics of InGaSb Under Picosecond Free-Electron Laser Excitation: *R. T. Kotitschke*[1]; A. R. Adams[1]; B. N. Murdin[1]; H. Pellemanns[2]; T. Ashley[3]; G. Pryce[3]; A. D. Johnson[3]; C. T. Elliott[3]; P. C. Findlay[4]; C. R. Pidgeon[4]; [1]University of Surrey, Dept. of Phys., Guildford, Surrey GU2 5XH UK; [2]FOM Institute for Plasma Physics, "Rijnhuizen", P.O. Box 1207, Nieuwegein 3430 BE The Netherlands; [3]DERA, St. Andrews Rd., Malvern, Worcs. WR14 3PS UK; [4]Heriot-Watt University, Dept. of Phys., Edinburgh EH14 4AS UK

11:00 AM
Optical and Structural Studies of InAsSb/AlInAsSb Quantum Wells for Use in MID-IR Lasers: *Philip D. J. Calcott*[1]; Trevor Martin[1]; Martin T. Emeny[1]; Michael J. Kane[1]; David J. Wallis[1]; Gerald Williams[1]; [1]Dera Malvern, Electronics Div., St. Andrews Rd., Great Malvern, Malvern, Worcs. WR14 3PS UK

11:20 AM
Fabrication of a 3-D Simple Cubic Infrared Photonic Crystal: *Lisa Zavieh*[1]; Theresa S. Mayer[2]; [1]The Pennsylvania State University, Intercollege Mats. Eng. Program, 121 Elect. Eng. East, University Park, PA 16802 USA; [2]Penn State University, Dept. of Elect. Eng., 121 Elect. Eng. East, University Park, PA 16802 USA

11:40 AM
InxGa1-xAs/AlyGa1-yAs/AlzGa1-zAs Asymmetric Step Quantum Well Mid-Infrared (3-5.3um) Detectors: *Wen-Gang Wu*[1]; [1]University of California, Los Angeles, Device Research Lab., Elect. Eng. Dept., 56-125B EIV, Box 951594, Los Angeles, CA 90095-1594 USA

Session O. Issues for Ferroelectric and High Permittivity Thin Film Materials

Session Chairs: Laura Wills, Hewlett Packard Laboratories, Palo Alto, CA USA; Paul McIntyre, Stanford University, Dept. of Mats. Sci. & Eng., Stanford, CA USA

8:20 AM *Invited

Modeling of Oxide Materials for Memory Applications: *Rainer Waser*[1]; [1]IFF, Research Center, Julich D-52425 Germany

9:00 AM

The Effect of Thickness on the Dielectric Properties of Thin Epitaxial Films of $BaTiO_3$: *Soma Chattopadhyay*[1]; Andrew Teren[1]; Brent H. Hoerman[1]; Jin-Ha Hwang[1]; Thomas O. Mason[1]; Bruce W. Wessels[1]; [1]Northwestern University, Mats. Sci. & Eng. Dept., Mats. Sci. and Life Sciences Bldg., 2225 N. Campus Dr., Evanston, IL 60208 USA

9:20 AM

Non-Stoichiometry Accommodation and Properties in (BaxSr1-x)Ti1+yO3+z Thin Films Grown By Chemical Vapor Deposition: *Susanne Stemmer*[1]; Stephen K. Streiffer[2]; Nigel D. Browning[1]; C. B. Parker[3]; Angus I. Kingon[3]; [1]University of Illinois at Chicago, Phys. Dept., 845 W. Taylor St., Chicago, IL 60607-7059 USA; [2]Argonne National Laboratory, Mats. Sci. Div., 9700 South Cass Ave., Bldg. 212, Argonne, IL 60439-4838 USA; [3]North Carolina State University, Dept. Mats. Sci. and Eng., Raleigh, NC 27695-7919 USA

9:40 AM

A Mass Spectral Study of the Surface Decomposition Chemistry of Precursors for Chemical Beam Epitaxy of Lithium Niobate: *Dovas Saulys*[1]; Vladimir Joshkin[2]; Mikhail Khoudiakov[1]; Arthur Ellis[1]; Thomas F. Kuech[3]; Leon McCaughan[4]; [1]University of Wisconsin, Dept. of Chem., Room 7303, 1101 University Ave., Madison, WI 53706 USA; [2]University of Wisconsin, Mats. Research Sci. & Eng. Ctr., Room 1111, 1415 Eng. Dr., Madison, WI 53706 USA; [3]University of Wisconsin, Dept. of Chem. Eng., 1410 Eng. Dr., Madison, WI 53706 USA; [4]University of Wisconsin, Dept. of Elect. & Comp. Eng., 1415 Eng. Dr., Madison, WI 53706 USA

10:00 AM Break

10:20 AM *Invited

Advanced Gate Dielectrics for Scaled CMOS: *Glen Wilk*[1]; [1]Texas Instruments, Central Research Labs, Dallas, TX 75243

11:00 AM

Characterization of MFIS and MFMIS Structures Using SrBi2Ta2O9 Film with SrTa2O6/SiON Stacked Buffer Layer: *Eisuke Tokumitsu*[1]; Gen Fujii[2]; Hiroshi Ishiwara[2]; [1]Tokyo Institute of Technology, Precision and Intelligence Lab., 4259 Nagatsuta, Midori-ku, Yokohama, Kanagawa 226-8503 Japan; [2]Tokyo Institute of Technology, Frontier Collaborative Res. Center, 4259 Nagatsuta, Midori-ku, Yokohama, Kanagawa 226-8503 Japan

11:20 AM
Process Integration of TEOS-Based SiO2 Films for Inter-Layer Dielectric on Ferroelectric Capacitors: Jeong-han Kim[1]; *Yang-han Yoon*[1]; Heon-Do Kim[1]; Sam-Dong Kim[1]; Jeong-Tae Kim[1]; [1]Hyundai Electronics Industries, Co., Ltd., Semiconductor Advanced Research Div./Process Research Dept. IV, 633, Sinhae-ri, Ganam-myun, Yeoju-kun, Kyoungki-do 467-880 Korea

11:40 AM
Photo-Patternable Precursors to Oxide Electrodes for Ferroelectric Memory Devices: *Charles D. E. Lakeman*[1]; Adam C. King[1]; [1]TPL Inc., Specialty Mats., 3921 Academy Parkway North, NE, Albuquerque, NM 87109 USA

Thursday PM, July 1, 1999

Session P. Ordering in Semiconductor Alloys

Session Chairs: Alex Zunger, NREL, Golden, CO USA; Gerald Stringfellow, University of Utah, College of Eng., Salt Lake City, UT USA

1:30 PM
Ordered InGaAs: Low-Temperature MOVPE Growth and Polarization Dependent Electroabsorption Measurements: *Werner Prost*[1]; Jochen Spieler[2]; Peter Velling[1]; Thomas Kippenberg[2]; Peter Kiesel[2]; Jan Krauss[2]; Gottfried H. Dohler[2]; F. J. Tegude[1]; [1]Gerhard-Mercator-University Duisburg, Solid-State Electronics Dept., Lotharstraße 65 , ZHO, Gebäude LT, Duisburg D-47057 Germany; [2]Friedrich-Alexander University Erlangen-Nürnberg, Insitute for Technical Physics I, Erwin-Rommel-Str. 1, Erlangen D-91058 Germany

1:50 PM
Microstructure of CuPt-B Ordered GaInAs Films: *S. P. Ahrenkiel*[1]; D. J. Arent[1]; M. C. Hanna[1]; [1]National Renewable Energy Laboratory, 1617 Cole Blvd., Golden, CO 80401 USA

2:10 PM
Phase Separation and Ordering Co-Existing in MOCVD InxGa1-xN: *Mark K. Behbehani*[1]; Edwin L. Piner[1]; Sandra X. Liu[1]; Nadia A. El-Masry[1]; Salah M. Bedair[2]; [1]North Carolina State University, Mats. Sci. and Eng., 232 Riddick, P.O. Box 7916, Raleigh, NC 27695 USA; [2]North Carolina State University, Elect. and Comp. Eng., 432 Daniels, P.O. Box 7911, Raleigh, NC 27695 USA

2:30 PM
Band Structure and Stability of Ordered Zinc-Blende-Based Semiconductor Polytypes: *Su-Huai Wei*[1]; A. Zunger[1]; S. B. Zhang[1]; Tomi Mattila[1]; [1]National Renewable Energy Laboratory, 1617 Cole Blvd., Golden, CO 80401 USA

2:50 PM
X-ray Diffraction Study of Ordering in Epitaxial $ZnSnP_2$: *Sebastien Francoeur*[1]; G. A. Seryogin[1]; S. A. Nikishin[1]; H. Temkin[1]; [1]Texas Tech University, Elect. Eng. Dept., Lubbock, TX 79409 USA

3:10 PM Break

3:30 PM
Comparison of Dopants Used to Control Ordering in GaInP: *Chris Fetzer*[1]; Yu Hsu[1]; Rung-Ting Lee[1]; Sung-Won Jun[1]; J. Kevin Shurtleff[1]; Gerald B. Stringfellow[1]; [1]University of Utah, Dept. of Mats. Sci. and Eng., 223 KRC, Salt Lake City, UT 84112 USA

3:50 PM
Ordering and Antiphase Boundaries in Te-Doped GaInP Layers Grown by Organometallic Vapour Phase Epitaxy: *T-Y Seong*[1]; C.-J. Choi[1]; S.H. Lee[2]; G.B. Stringfellow[2]; [1]Kwangju Institute of Sci. and Tech., Dept. of Mats. Sci. and Eng., Kwangju 500-712 Korea; [2]University of Utah, Dept. of Mats. Sci. and Eng., Salt Lake City, UT 84112 USA

4:10 PM
Maximum Direct-Gap Reduction in CuPt Ordered $Al_xGa_{1-x}InP$ ($0 \le x \le 1$) Determined by Generalized Ellipsometry: *M. Schubert*[1]; J. A. Woollam[1]; B. Rheinlander[2]; I. Pietzonka[3]; V. Gottschalch[3]; [1]University of Nebraska-Lincoln, Center for Microelectronic and Optical Mats. Research, Lincoln, NE 68588; [2]University Leipzig, Faculty of Physics and GeoSci., Leipzig 04103 Germany; [3]University Leipzig, Faculty of Chem. and Min. Ogy, Leipzig 04103 Germany

4:30 PM
A Polarized-Piezoreflectance Study of Spontaneous Ordering In AlInP2 Including the Effects of Temperature: W. C. Yeh[1]; *Ying-sheng Huang*[1]; C. S. Chang[2]; [1]National Taiwan University of Sci. and Tech., Dept. of Electr. Eng., 43 Keelung Rd. Sec. 4, Taipei 106 Taiwan; [2]United Epitaxy Company, Hsinchu 300 Taiwan

4:50 PM +
Observation of Type I/II Transition in GaAs/InGaP Heterostructure by C-V Profiling.: *Shouvik Datta*[1]; M. R. Gokhle[1]; A. P. Shah[1]; T. K Sharma[2]; B. M. Arora[1]; [1]Tata Institute of Fundamental Research., Solid State Electronics Group/Dept. of Condensed Matter Phys. & Mats. Sci., Homi Bhabha Rd., Colaba, Mumbai, Maharashtra. 400 005. India; [2]Centre for Advance Tech., Indore 452 013 India

Thursday PM, July 1, 1999

Session Q. Nanostructure Self-Assembly

Session Chairs: Supriyo Bandyopadhyry, University of Nebraska, Dept. of Elect. Eng., Lincoln, NE USA; David Janes, Purdue University, School of Elect. Eng., West Lafayette, IN USA

1:30 PM
In-Situ Growth of InAs Quantum Dots on Patterned GaInAs/InP Nanostructures: Magnus Borgström[5]; Jonas Johansson[1]; Ivan Maximov[1]; *Werner Seifert*[1]; Lars Samuelson[1]; [1]University of Lund, Solid State Phys., Box 118, Lund S-221 00 Sweden

1:50 PM
Formation of Nanoscale Self-Assembled Si1-xGex Islands Using Chemical Vapor Deposition and Subsequent Thermal Annealing of Thin Metastable Films: *Rashid Bashir*[1]; Abul Ehsan Kabir[2]; Kuo-Jen Chao[3]; Cara L. Weitzsacker[3]; [1]Purdue University, Elect. and Comp Engr, 1285 EE Bldg., W. Lafayette, IN 47906 USA; [2]National Semiconductor, 2900 Semiconductor Dr., MS E-100, Santa Clara, CA 95051 USA; [3]Charles Evans and Associates, 240 Santa Ana Court, Sunnyvale, CA 94086 USA

2:10 PM +
Fabrication and Characterization of Magnetic Semiconductors "Spin Wires" and "Spin Dots": *O. Ray*[1]; J. J. Berry[1]; A. A. Sirenko[1]; N. Samarth[1]; J. A. Gupta[2]; I. Malajovich[2]; D. D. Awschalom[2]; [1]Pennsylvania State University, Dept. of Phys., 104 Davey Lab, State College, PA 16802 USA; [2]University of California, Dept. of Phys., Santa Barbara, CA 93106

2:30 PM
Preparation and Characterization of Gold-Platinum Nanorods: Sa Huang[1]; Benjamin Martin[2]; Daniel Dermody[2]; Thomas Mallouk[2]; Thomas Jackson[1]; *Theresa Mayer*[1]; [1]Penn State University, Elect. Eng., 121 Elect. Eng. East, University Park, PA 16802 USA; [2]Penn State University, Dept. of Chemistry

2:50 PM +
Self-Assembly of Patterned Films of Nanometer-Diameter Gold Clusters that are Linked by Organic Molecules: *Jia Liu*[1]; Ronald P. Andres[1]; [1]Purdue University, Dept. of Chem. Eng., 1283 Chem. Eng. Bldg., West Lafayette, IN 47097-1283 USA

3:10 PM Break

3:30 PM +
Directed Self-Assembly of Metal/Semiconductor Structures for Nanoelectronic Devices and Circuits: *Brian L. Walsh*[1]; M. Batistuta[1]; Takhee Lee[2]; Jia Liu[3]; Q. Qu[3]; E. H. Chen[1]; R. P. Andres[1]; D. B. Janes[1]; R. Reifenberger[2]; [1]Purdue University, School of Elect. and Comp. Eng., West Lafayette, IN 47907; [2]Purdue University, Dept. of Phys., Lafayette, IN 47907; [3]Purdue University, School of Chem. Eng., West Lafayette, IN 47907

3:50 PM
Dry-Etched Grating in the MQW Active Layer for DFB Laser Arrays Fabrication: *Talneau Anne*[1]; Bouadma Nouredine[1]; Slempkes Serge[1]; Ougazzaden Abdallah[1]; [1]OPTO+, France Telecom/CNET, Route de Nozay, Marcoussis 91460 France

4:10 PM
Various AFM Nano-Oxidation Processes for Planar Type Single Electron Transistor: *K. Matsumoto*[1]; Y. Gotoh[1]; T. Maeda[1]; [1]Electrotechnical Laboratory, 1-1-4, Umezono, Tsukuba-shi, Ibarakikenn, 305 Japan

4:30 PM +
Semiconductor Patterning Techniques Based on Self-Assembled Structures: *M. V. Batistuta*[1]; D. B. Janes[1]; B. Walsh[1]; J. Liu[1]; Q. Qu[1]; R. P. Andres[1]; E. L. Peckham[1]; E. -H. Chen[1]; [1]Purdue University

4:50 PM
Thermo-Mechanical Properties of Polymers for Nanoimprint Lithography: *Thomas Hoffmann*[1]; Frank Gottschalch[1]; Clivia M. Sotomayor Torres[1]; [1]BUGH Wuppertal, Institute of Mats. Sci., Gauss-Str. 20, Wuppertal 42097 Germany

Thursday PM, July 1, 1999

Session R. Properties of InGaN Heterostructures and Devices

Session Chairs: Joan Redwing, Epitronics, Phoenix, AZ USA; Christian Wetzel, Meijo University, High Tech Research Center 1-501, Shigomaguchi Tenpaku-ku, Nagoya, Japan

1:30 PM
Single-Mode Nitride-Based Laser Diodes Using Thick n-AlGaN Layers: *T. Takeuchi*[1]; N. Hayashi[1]; M. Iwaya[1]; K. Isomura[1]; K. Kimura[1]; M. Yamaguchi[1]; T. Detchprohm[1]; S. Yamaguchi[1]; C. Wetzel[1]; H. Amano[1]; I. Akasaki[1]; S. Watanabe[2]; Y. Yamaoka[2]; R. Shioda[2]; T. Hidaka[2]; Ys. Kaneko[2]; Yw. Kaneko[2]; N. Yamada[2]; [1]Dept. of Elect. and Electr. Eng., Meijo University, Nagoya 468-8502 Japan; [2]Hewlett-Packard Laboratories, 3-2-2 Sakado, Takatsu-ku, Kawasaki 213-0012 Japan

1:50 PM
Violet-Blue InGaN/GaN MQW Light Emitting Diodes on Epitaxially Laterally Overgrown GaN.: *Koen Jacobs*[1]; Wim Van der Stricht[1]; Ingrid Moerman[1]; Piet Demeester[1]; Steven Verstuyft[1]; Joël De Nayer[1]; Peter Van Daele[1]; Amal Amokrane[2]; Sophie Dassonneville[2]; Brigitte Sieber[2]; Edward J. Thrush[3]; [1]University of Gent, Inform. Tech.-IMEC, Sint-Pietersnieuwstraat 41, Gent B-9000 Belgium; [2]Université des Sciences et Technologies de Lille, Laboratoire de Structure et Propriétés de l'Etat Solide, UPRESA 8008, Bâtiment C6, Villeneuve d'Ascq Cédex 59655 France; [3]Thomas Swan & Co, Ltd., Unit 1C, Button End, Harston, Cambridge CB2 5NX UK

2:10 PM
Dislocation Reduction in GaN Epilayers via Lateral Overgrowth from Trenches: *Y Chen*[1]; S.Y. Wang[1]; R. S. Kern[2]; C. H. Chen[2]; C. P. Kuo[2]; [1]Hewlett-Packard Company, Hewlett-Packard Laboratories, 3500 Deer Creek Rd. MS26U-12, Palo Alto, CA 94304; [2]Hewlett-Packard Company, Optoelectronics Div., 370 West Trimble Rd., San Jose, CA 95131

2:30 PM +
Measurement of Crystallographic Tilt in the Lateral Epitaxial Overgrowth of GaN: *Paul T. Fini*[1]; James P. Ibbetson[2]; Hugues Marchand[2]; Lijie Zhao[1]; Steven P. DenBaars[1]; James S. Speck[1]; [1]University of California, Santa Barbara, Mats. Dept., Bldg. E-II, Santa Barbara, CA 93110 USA; [2]University of California, Santa Barbara, ECE Dept., Bldg. E-I, Santa Barbara, CA 93110 USA

2:50 PM +
MOCVD Growth and Characterization of AlInGaN Quaternary Alloys: *Michael E. Aumer*[1]; S. F. LeBoeuf[1]; F. G. McIntosh[1]; Y. C.

Chang[1]; J. F. Muth[1]; R. M. Kolbas[1]; S. M. Bedair[1]; [1]North Carolina State University, Dept. of Elect. and Comp. Eng., Box 7911, Raleigh, NC 27695 USA

3:10 PM Break

3:30 PM
Behavior of Quantum Well Excitons Under Internal Fields of GaN/AlGaN and InGaN/GaN/AlGaN Quantum Well Structures: *Shigefusa F. Chichibu*[1]; Takahiro Deguchi[2]; Takayuki Sota[2]; Steven P. DenBaars[3]; Shuji Nakamura[4]; [1]Science University of Tokyo, Elect. Eng. Dept., Faculty of Sci. and Tech., 2641Yamazaki, Noda, Chiba 278-8510 Japan; [2]Waseda University, Dept. of Elect., Electronics, and Comp. Eng., 3-4-1, Ohkubo, Shinjuku, Tokyo 169-8555 Japan; [3]University of California, Santa Barbara, Mats. and ECE Depts., Santa Barbara, CA 93106-5050 USA; [4]Nichia Chemical Industries, Research and Development Dept., 491 Oka, Kaminaka, Anan, Tokushima 774-8601 Japan

3:50 PM
Piezoelectric Effects in the Radiative Centers of GaInN/GaN Quantum Wells and Devices: *Christian Wetzel*[1]; Tetsuya Takeuchi[1]; Hiroshi Amano[1]; Isamu Akasaki[1]; [1]Meijo University, High Tech Research Center, 1-501 Shiogamaguchi, Tenpaku-ku, Nagoya, Aichi 468-8502 Japan

4:10 PM
Phase Separation in InGaN/GaN MQWs: *L. T. Romano*[1]; M. D. McCluskey[2]; T. Suski[3]; J. Jun[3]; [1]Xerox Palo Alto Research Center, 3333 Coyote Rd., Palo Alto 94304 CA; [2]Washington State University, Dept. of Shock Phys., Pullman 99164-2814 WA; [3]Unipress, UI, Sokolowska 29, 01-142 Warsaw Poland

4:30 PM +
Role of Below Bandgap States in the Radiative Emission of InGaN/GaN Quantum Well Structures: *Georgiy O. Vaschenko*[1]; Milan S. Minsky[2]; Dinesh Patel[1]; Luiz S. Assis[1]; Robert L. Pidcock[1]; Carmen S. Menoni[1]; Stacia Keller[2]; Evelyn L. Hu[2]; Steven P. DenBaars[2]; [1]Colorado State University, Dept. of Elect. Eng., Fort Collins, CO 80523 USA; [2]University of California, Santa Barbara, Dept. of Mats. Eng. and Elect. and Comp. Eng., Santa Barbara, CA 93106 USA

4:50 PM +
Optical Band Gap Dependence on Thickness and Composition of InGaN Grown on GaN: *Christopher Arlen Parker*[1]; Mason J. Reed[2]; John C. Roberts[1]; Sandra X. Liu[2]; N. A. El-Masry[2]; S. M. Bedair[1]; [1]NC State University, Elect. and Comp. Eng., 232 Daniels Hall, Box 7911, Raleigh, NC 27695 USA; [2]NC State University, Mats. Sci. and Eng., 232 Riddick Labs, Box 7916, Raleigh, NC 27695 USA

Session S. Silicon Carbide Processing for Devices

Session Chairs: Michael A. Capano, Purdue University, School of ECE, W. Lafayette, IN USA; Tom Jackson, Penn State University, University Park, PA USA

1:30 PM
Phosphorus and Nitrogen Implantation into 4H-SiC: *Michael A. Capano*[1]; Rajkumar Santhakumar[1]; Mrinal K. Das[1]; James A. Cooper[1]; Michael R. Melloch[1]; [1]Purdue University, School of Elect. and Comp. Eng., 1285 Elect. Eng. Bldg., West Lafayette, IN 47907-1285 USA

1:50 PM
Hydrogen Passivation of Aluminum and Boron Acceptors in SiC by Low Energy Ion Implantation: *Norbert Achtziger*[1]; Christian Huelsen[1]; Wolfgang Witthuhn[1]; Margareta K. Linnarsson[2]; Martin Janson[2]; Bengt G. Svensson[2]; [1]University Jena, Institut fuer Festkoerperphysik, Max-Wien-Platz 1, Jena D- 07743 Germany; [2]Royal Institute of Tech., Solid State Electronics, Electrum 229, Kista-Stockholm S-16440 Sweden

2:10 PM +
Effect of Implant Activation Annealing Conditions on the Inversion Channel Mobility in 4H- and 6H-SiC MOSFETs: *Mrinal Kanti Das*[1]; Michael A. Capano[1]; James A. Cooper[1]; Michael R. Melloch[1]; [1]Purdue University, School of Elect. and Computer Eng., 1285 Elect. Eng. Bldg., West Lafayette, IN 47907-1285 USA

2:30 PM
Electrical Characteristics of Schottky Barriers on 4H-SiC: The Effects of Barrier Height Nonuniformity: *B. J. Skromme*[1]; E. Luckowski[1]; K. Moore[1]; M. Bhatnagar[1]; C. E. Weitzel[1]; T. Gehoski[1]; D. Ganser[1]; [1]Motorola, Inc., Mats. Tech. Laboratories, EL720, 2100 E. Elliot Rd., Tempe, AZ 85284 USA

2:50 PM +
Characteristics of Nickel Schottky Junctions on Trench Sidewalls of Reactive Ion Etched 4H-SiC Surfaces: *V. Khemka*[1]; T. P. Chow[1]; R. J. Gutmann[1]; [1]Rensselaer Polytechnic Institute, Center for Integrated Electrs. and Electr. Manufacturing, Troy, NY 12180-3590

3:10 PM Break

3:30 PM
High Rate Etching of Silicon Carbide: *F. Khan*[1]; L. Zhou[1]; A. T. Ping[1]; I. Adesida[1]; [1]University of Illinois at Urbana-Champaign, Dept. of Elect. and Comp. Eng., 208 N Wright St., Urbana, IL 61801-2355 USA

3:50 PM
Fast, Smooth, and Anisotropic Etching of SiC using SF6/Ar: *Myeong S. So*[1]; Seung-Gu Lim[1]; Thomas N. Jackson[1]; [1]The Pennsylvania State University, Dept. of Elect. Eng., 121 Elect. Eng. East, University Park, PA 16802 USA

4:10 PM
Analysis of the Temperature Dependence of the SiO_2 / SiC Barrier Height: *Richard Waters*[1]; Bart Van Zeghbroeck[1]; [1]University of Colorado, Dept. of Elect. and Comp. Eng., Boulder 80309-0525 CO USA

4:30 PM
Atomic-Scale Mechanisms of Oxygen Precipitation and Thin-Film Oxidation of SiC: *Massimiliano Di Ventra*[1]; Sokrates T. Pantelides[1]; [1]Vanderbilt University, Physics and Astronomy, Stevenson Center, Nashville, TN 37235 USA

4:50 PM Late News

Thursday PM, July 1, 1999

Session T. Materials Integration: Growth and Characterization

Session Chairs: Theresa Mayer, Penn State University, University Park, PA USA; Matt Seaford, Air Force Research Laboratory, WPAFB, OH USA

1:30 PM
Lattice-Mismatched InGaAs Layers Grown on GaAs and InP Compliant Substrates: *Koen Vanhollebeke*[1]; Ingrid Moerman[1]; Peter Van Daele[1]; Piet Demeester[1]; [1]University of Gent-IMEC, Dept. of Information Tech. (INTEC), Sint-Pietersnieuwstraat 41, Gent, - 9000 Belgium

1:50 PM
A Comparison of Experimental and Calculated HRXD Spectra of Mismatched InGaAs Films Grown on Borosilicate Glass-Bonded GaAs Compliant Substrate Structures: *P. D. Moran*[1]; D. M. Hansen[1]; J. G. Cederberg[1]; K. A. Dunn[1]; L. J. Mawst[1]; S. E. Babcock[1]; R. J. Matyi[1]; T. F. Kuech[1]; [1]University of Wisconsin, 1415 Johnson Dr., Madison, WI 53706 USA

2:10 PM +
Strain Relaxation in InxGa1-xAs Lattice Engineered Substrates: *Prashant M Chavarkar*[1]; Lijie Zhao[2]; Stacia Keller[1]; Andrew Fisher[3]; James S. Speck[2]; Umesh K. Mishra[1]; [1]University of California, Dept. of Elec. and Comp. Eng., Santa Barbara, CA 93106 USA; [2]University of California, Mats. Dept., Santa Barbara, CA 93106 USA; [3]University of California, QUEST, Santa Barbara, CA 93106 USA

2:30 PM +
On the Strain Relaxation and Misfit Dislocation Introduction Mechanisms in Highly Lattice Mismatched InAs/GaP Epitaxy: *Vidyut Gopal*[1]; Alexander L. Vasiliev[1]; Enhsing Chen[2]; Eric P. Kvam[1];

Jerry M. Woodall[2]; [1]Purdue University, School of Mats. Eng., 1289, MSEE Bldg., W. Lafayette, IN 47907 USA; [2]Yale University, Dept. of Elect. Eng., 15, Prospect St., P.O. Box 208284, New Haven, CT 06520-8284 USA

2:50 PM Late News

3:10 PM Break

3:30 PM
Comparison of InGaSb/InAs Superlattice Structures Grown by MBE on GaSb, GaAs, and Compliant GaAs Substrates: *D. H. Tomich*[1]; K. G. Eyink[1]; G. L. Brown[1]; L. Grazulis[1]; K. Mahalingam[1]; M. L. Seaford[1]; C. H. Kuo[2]; W-Y. Hwang[2]; C. H. Lin[2]; [1]Air Force Research Laboratory, Mats. and Manufacturing Directorate, 3005 P St. Suite 6, WPAFB, OH 45433-7707; [2]Applied Optoelectronics Inc., Sugar Land, TX 77478

3:50 PM
Low Dislocation Relaxed SiGe Grown on a Novel Compliant Substrate: *Yuhao Luo*[1]; Jian-Lin Liu[1]; Gaolong Jin[1]; Kang L. Wang[1]; Chih Chen[2]; King-Ning Tu[2]; Caroline D. Moore[2]; Mark S. Goorsky[2]; [1]University of California at Los Angeles, Dept. of Elect. Eng., Eng. IV 17-142, 405 Hilgard Ave., Los Angeles, CA 90095-1594 USA; [2]UCLA, Dept. of Mats. Sci. and Eng., 6532 Boelter Hall, 405 Hilgard Ave., Los Angeles, CA 90095-1595 USA

4:10 PM
Optically-Pumped Mid-Infrared Lasers on Traditional and Compliant Substrates: *Stefan J. Murry*[1]; Chau-Hong Kuo[1]; Chih-Hsiang Lin[1]; Han Q. Le[1]; Shin-Shem Pei[1]; [1]University of Houston, Space Vacuum Epitaxy Center, SR1 Rm. 724, 4800 Calhoun, Houston, TX 77204-5507 USA

4:30 PM
Optically Pumped Stimulated Emission in Freestanding GaN Prepared by Hydride Vapor Phase Epitaxy: *S. T. Kim*[1]; D. C. Moon[2]; C. K. Kim[3]; Y. H. Choi[3]; T. K. Yoo[3]; [1]Taejon National University of Tech., Dept. of Mats. Eng., 305-3 Samsung-dong, Dong-gu, Taejon 300-717 Korea; [2]Kwangwoon University, Dept. of Electr. Mats. Eng., 447-1 Wolgye-dong, Nowon-gu, Seoul 139-701 Korea; [3]LG Corporate Institute of Tech., Optoelectronic Group, 16 Woomyeon-dong, Seocho-gu, Seoul 137-724 Korea

4:50 PM Late News

Session U. Thermophotovoltaic Materials & Devices

Session Chairs: L. Ralph Dawson, UNM-CHTM, Albuquerque, NM USA; Parvez Uppal, Lockheed Martin, Nashua, NH USA

1:30 PM
Photon Recycling in 0.53 eV InGaAsSb: *Greg Walter Charache*[1]; [1]Lockheed Martin, Knolls Atomic Power Laboratory, River Rd., Schnectady, NY 12065-1072 USA

1:50 PM
Spectral Ellipsometry of GaSb and GaInAsSb/GaSb: Experiment and Modelling: *Martin Munoz*[1]; K. Wei[1]; Fred H. Pollak[1]; Greg Charache[2]; C. A. Wang[3]; [1]Brooklyn College of CUNY, Phys. Dept., 3438N, 2900 Bedford Ave., Brooklyn, NY 11210 USA; [2]Lockheed Martin, Schenectady, NY 12301 USA; [3]MIT Lincoln Laboratory, Lexington, MA 02420 USA

2:10 PM
Phase Instabilities and Microstructure in InGaAsSb/GaSb Heterostructures: Y-C Chen[1]; V. Bucklen[1]; *Krishna Rajan*[1]; C. Wang[2]; G. Nichols[3]; P. Sander[3]; G. Charache[3]; [1]Rensselaer Polytechnic Institute, Mats. Sci. and Eng. Dept., Bldg. MRC-110, Troy, NY 12180-3590 USA; [2]Lincoln Laboratories, Lexington, MA 02420-1072 USA; [3]Lockheed-Martin Corporation, Schenectady, NY 12301-1072 USA

2:30 PM
OMVPE Growth of InGaAsSb Thermophotovoltaic Cells: N. A. Morris[1]; *Z. A. Shellenbarger*[2]; D. Z. Garbuzov[1]; R. U. Martinelli[1]; V. B. Khalfin[1]; H. Lee[1]; G. C. Taylor[1]; G. S. Tompa[2]; J. C. Connolly[1]; [1]Sarnoff Corporation, 201 Washington Rd., Princeton, NJ 08543; [2]Structured Mats. Industries, Inc., 120 Centennial Ave., Piscataway, NJ 08854

2:50 PM
A Study of the Relative Tilt of GaInSb Epitaxial Layers on GaSb Substrates Grown by Metalorganic Vapor Phase Epitaxy: *Ishwara B. Bhat*[1]; Hassan Ehsani[1]; Ronald Gutmann[1]; Greg Charache[2]; Mathew Freeman[2]; [1]Rensselaer Polytechnic Inst., ECSE Dept., JEC 6003, 110 8th St., Troy, NY 12180 USA; [2]Lockheed Martin Corporation, Schenectady, NY 12301

3:10 PM Break

Session V. Thermoelectric and Other Narrow Gap Materials

Session Chairs: Tim Sands, University of California-Berkeley, MS & ME Dept., Berkeley, CA USA; Kang Wang, University of California, EE Dept., Los Angeles, CA USA

3:30 PM
MOCVD Growth of High Mobility InSb on Si Substrates for Hall Effect Applications.: *Michael W. Pelczynski*[1]; Jean J. Heremans[1]; [1]Emcore Corporation, ERA, 394 Elizabeth Ave., Somerset, NJ 08873 USA

3:50 PM
The Effect of Annealing Temperature on the Structural and Electrical Properties of Au/n-GaSb Contacts: *H. Ehsani*[1]; C. Hitchcock[1]; R. J. Gutmann[1]; I. Bhat[1]; G. Charache[2]; M. Freeman[2]; [1]Rensselaer Polytechnic Institute, Elect., Comp., and System Eng., Troy, NY 12180 USA; [2]Lockheed Martin Corporation, Schenectady, NY 12301-1072 USA

4:10 PM
300K Thermoelectric Figure of Merit in the Range of 3 Utilizing Phonon-Blocking Electron-Transmitting Structures: *Rama Venkatasubramanian*[1]; Edward Siivola[1]; Thomas Colpitts[1]; [1]Research Triangle Institute, Center for Semiconductor Research, 3040 Cornwallis Rd., Research Triangle Park, NC 27709 USA

4:30 PM
Thermoelectric Quantum Dot Superlattices: *T. C. Harman*[1]; P. J. Taylor[1]; D. L. Spears[1]; M. P. Walsh[1]; [1]MIT Lincoln Laboratory, P.O. Box 73, Lexington, MA 02420-9180 USA

4:50 PM
Temperature Dependence of Thermionic Emission Cooling in Single Barrier and Superlattice Heterostructures: *Ali Shakouri*[1]; Chris LaBounty[2]; Patrick Abraham[2]; Yi-Jen Chiu[2]; John E. Bowers[2]; [1]University of California, Jack Baskin School of Eng., 1156 High St., Santa Cruz, CA 95064 USA; [2]University of California, ECE Dept., Santa Barbara, CA 93106 USA

Session W. Epitaxy of III-V

Session Chair: Jenn-ming Kuo, Bell Labs, Murray Hill, NJ USA

8:20 AM
Structural and Optical Properties of Strained InGaAs/GaAs Quantum Wells Grown by MOVPE on (111)A GaAs Substrates: *Soohaeng Cho*[1]; A. Majerfeld[1]; A. Sanz-Hervás[1]; B. W. Kim[4]; C. Villar[2]; Jongseok Kim[1]; [1]University of Colorado, Dept. of Elect. and Comp. Eng., CB425, Boulder, CO 80309 USA; [2]E.T.S.I. Telecomunicación, UPM, Departamento de Tecnología Electrónica, Ciudad Universitaria, 28040 Madrid, Spain; [4]Electronics and Telecommunications Research Institute, P.O. Box 106, Yusong, Taejon, 305-600 Korea

8:40 AM +
An Investigation on the Mechanisms Responsible for Ar^+-Laser Induced Growth Enhancement Of GaAs by Chemical Beam Epitaxy: *Bin Q. Shi*[1]; Charles W. Tu[1]; [1]University of California, San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Dr., La Jolla, CA 92093-0407 USA

9:00 AM
Enhancement of Electron Mobilities in Pseudomorphic $In_{0.7}Ga_{0.3}As/In_{0.52}Al_{0.48}As$ Modulation-doped Quantum Wells with (411)A Super-flat Interfaces Grown by Molecular Beam Epitaxy: *Takahiro Kitada*[1]; Masato Ueno[1]; Toyohiro Aoki[1]; Satoshi Shimomura[1]; Satoshi Hiyamizu[1]; [1]Osaka University, Graduate School of Eng. Sci., 1-3 Machikaneyama, Toyonaka, Osaka 560-8531 Japan

9:20 AM
High Quality GaAs0.68P0.32/In0.13Ga0.87P/Si QW Structure with a Very Few Threading Dislocations: *Yasuhiro Fujimoto*[1]; Hiroo Yonezu[1]; Naoki Ohshima[1]; Kenji Momose[1]; [1]Toyohashi University of Technology, Dept. of Elect. and Electr. Eng., 1-1 Hibarigaoka, Tempaku-cho, Toyohashi, Aichi 441-8580 Japan

9:40 AM +
Dependence of Cracker Temperature to Silicon During Concentration in InGaAlP Layers Grown by Solid Source Molecular Beam Epitaxy: *Yi-Cheng Chengis*[1]; Kuochou Tai[1]; S. T. Chou[2]; K. F. Huang[3]; *W. J. Lin*[4]; *W. H. Lan*[4]; A. C. H. Lin[4]; *T. C. Wang*[4]; [1]National Chiao-Tung University, Institute of Opto-Elect. Eng., 1001, Ta-Hsieh Rd., HsinChu, Taiwan ROC; [2]Chung-Cheng Institute of Technology, Dept. of Elect. Eng., Tahsi, Taoyuan, Taiwan ROC; [3]National Chiao-Tung University, ElectroPhysics Dept., 1001, Ta-Hsieh, HsinChu, Taiwan ROC; [4]Chung Shang Institute of Science and Technology, Material R & D Center, Lun-Tang P.O. Box 90008-8-6, Taoyuan, Taiwan ROC

10:00 AM Break

Session X. Composite Materials and Applications

Session Chairs: Daniel Docter, HRL Laboratories, Malibu, CA USA; Jerry Woodall, Yale University, New Haven, CT USA

10:20 AM +
Transit Time and Light Absorption Effects in ITG-GaAS and Applications to MSM-Photodetectors: *Vijay Krishnamurthy*[1]; Marian C. Hargis[2]; Michael R. Melloch[2]; [1]Purdue University, School of Elect. and Comp. Eng., Mailbox #258, West Lafayette, IN 47907-1285 USA; [2]Purdue University, School of Elect. and Comp. Eng., West Lafayette, IN 47907-1285 USA

10:40 AM +
Ultrafast Carrier Dynamics in Be-Doped Low Temperature Grown GaAs Studied by Double-Pulse Excitation: *Ri-an Zhao*[1]; Petra Specht[1]; Eicke R. Weber[1]; Nen-Wen Pu[2]; Jeff Bokor[2]; [1]University of California-Berkeley, Dept. of Mats. Sci. and Eng., 211-226 Cory Hall #1772, Dept. of EECS, Berkeley, CA 94720 USA; [2]University of California, Dept. of Elect. Eng. and Comp. Sci., Berkeley, CA 94720 USA

11:00 AM +
Experimentally Verified Conduction Model for a Low-Resistance Non-Alloyed Ohmic Contact Utilizing Low-Temperature-Grown GaAs: *N.-P Chen*[1]; H. J. Ueng[2]; D. B. Janes[2]; K. J. Webb[2]; M. R. Melloch[2]; [1]Purdue University, Dept. of Phys., 1396 Phys. Bldg., West Lafayette, IN 47907 USA; [2]Purdue University, School of Elect. and Comp. Eng., 1285 Elect. Eng. Bldg., West Lafayette, IN 47907 USA

11:20 AM +
Thermal Conductivity of Low-Temperature-Grown GaAs: *Andrew W. Jackson*[1]; James P. Ibbetson[2]; Arthur C. Gossard[1]; Umesh K. Mishra[2]; [1]University of California, Mats. Dept., Santa Barbara, CA 93106 USA; [2]University of California, ECE Dept., Santa Barbara, CA 93106 USA

11:40 AM
Surface Atomic Process of Incorporation of Excess Arsenic in Molecular Beam Epitaxy of GaAs: A. Suda[1]; *N. Otsuka*[1]; [1]Japan Advanced Institute of Science and Technology, School of Mats. Sci., Asahidai -1, Tatsunokuchi, Nomigun, Ishikawa 923-1292 Japan

Session Y. Properties of Quantum Wires and Wells

Session Chairs: Jim Merz, University of Notre Dame, Notre Dame, IN USA; Clivia Sotomayor-Torres, University of Wuppertal, Institute of Mats. Sci. & Dept. of Elect. Eng., Wuppertal, Germany

8:20 AM
Structural and Alloy Composition Uniformity of InGaAs Ridge Quantum Wires Grown by Selective MBE on Patterned InP Substrates: *Chao Jiang*[1]; Hajime Fujikura[1]; Tsutomu Muranaka[1]; Hideki Hasegawa[1]; [1]Hokkaido University, Research Center for Interface Quantum Electronics and Graduate School of Electronics and Information Eng., North 13, West 8, Kita Ku, Sapporo, Hokkaido 060-8628 Japan

8:40 AM
Spin Splitting of Exciton Band in Asymmetric Double Quantum Wells: Guangyou Yu[1]; Xiwu Fan[1]; Jiying Zhang[1]; Dezhen Shen[1]; [1]Changchun Institute of Physics, Chinese Academy of Sciences, Laboratory of Excited State Processes, 1 Yan An Rd., Changchun, Jilin 130021 ROC

9:00 AM
Mobility Edge and Exciton Relaxation in CdSe/ZnSe Quantum Wells: *Jinxi Shen*[1]; R. Pittini[1]; K. Yui[1]; I. Souma[1]; Y. Oka[1]; E. Kurtz[2]; T. Yao[3]; [1]Tohoku University, Research Institute for Scientific Measurements, Katahira 2-1-1, Sendai, Miyagi 980-8577 Japan; [2]University of Karlsruhe, Institute for Applied Phys., Karlsruhe D-76128 Germany; [3]Tohoku University, Institute for Mats. Research, Katahira 2-1-1, Sendai, Miyagi 980-8577 Japan

9:20 AM
Recombination Lifetime Measurements of InGaN/GaN Multiple Quantum Wells: *Eun-joo Shin*[1]; N. W. Song[1]; J. I. Lee[1]; D. Kim[1]; M. Y. Ryu[2]; P. W. Yu[2]; D. Lee[3]; Y. -H. Choi[4]; C. -H. Hong[5]; [1]Korea Research Institute of Standards and Sci., Spectroscopy Group, Yusong-ku, P.O. Box 102, Taejon 305-600 Korea; [2]K-JIST, Dept. of Information & Communications, Kwangju 506-712 Korea; [3]Chungnam National University, Dept. of Phys., Taejon 305-764 Korea; [4]L. G. CIT, Optoelectronics Group, Seoul 137-140 Korea; [5]Jeonbuk National University, SPRC, Jeonju 560-756 Korea

9:40 AM
Study of Temperature-Dependent Photocurrent and Dark Current Measurements for a Maximization of Carrier Collection and a Voltage Enhancement of MQW P-I-N Diodes: *Cedric Monier*[1]; *Frederick Newman*[1]; Inna Serdiukova[1]; Lissandro Aguilar[1]; Mauro F. Vilela[1]; Alexandre Freundlich[1]; [1]University of Houston, Space Vacuum Epitaxy Center, 4800 Calhoun St., Sci. & Research I, Houston, TX 77204-5507 USA

10:00 AM Break

10:20 AM
Improved Heterointerface Quality of AlGaAs/GaAs Quantum Wires Characterized by AFM and Microscopic Optical Measurements: *Xue-Lun Wang*[1]; Mutsuo Ogura[1]; Valia Voliotis[2]; Roger Grousson[2]; [1]Japan Science and Technology Corporation, Electrotechnical Laboratory and CREST, , 1-1-4 Umezono, Tsukuba, Ibaraki 305 Japan; [2]Groupe de Physique des Solides, CNRS, Universities Paris 6 and Paris 7, 2 place Jussieu, F-75251, Paris Cedex 05 France

10:40 AM
Optical Properties in InGaN/GaN Structures Grown by Metal-Organic Chemical Vapor Deposition: *Mee Yi Ryu*[1]; Eun-joo Shin[2]; J. H. Song[1]; S. W. Park[1]; P. W. Yu[1]; N. W. Song[2]; J. I. Lee[2]; D. Kim[2]; E. S. Oh[3]; Y. J. Park[3]; H. S. Park[3]; T. I. Kim[3]; [1]Kwangju Institute of Science and Technology, Dept. of Information and Communications, 1 Oryong-dong, Puk-gu, Kwangju 500-712 ROK; [2]Korea Research Institute of Standards and Science, Spectroscopy Group, P.O. Box 102, Taejon 305-600 ROK; [3]Samsung Advanced Institute of Technology, Photonics Laboratory, P.O. Box 111, Suwon 440-600 ROK

11:00 AM
Modulation Spectroscopy Study of a Strained Layer GaAs/GaAsP Multiple Quantum Well Structure: *L. Malikova*[1]; Fred H. Pollak[1]; Oleg Gorea[2]; Alexander Korotcov[2]; [1]Brooklyn College of CUNY, Phys. Dept., 3438N, 2900 Bedford Ave., Brooklyn, NY 11210-2889 USA; [2]State University of Moldova, Dept. of Phys., Chisinau, MD 2009 Moldova

11:20 AM
The Annealing Effects on Optical and Structural Properties of (ZnSe)2(CdSe)n Short-Period-Superlattices Multiple Quantum Wells: *Ru Chin TU*[1]; Yan Kuin SU[1]; Shu Tsun Chou[2]; [1]National Cheng-Kung University, Dept. of Elect. Eng., 1, University Rd., Tainan City 703 Taiwan; [2]Chung Cheng Institute of Technology, Dept. of Elect. Eng., Taoyuan 335 Taiwan

11:40 AM +
Transient Luminescence and Exciton Dynamics in (CdMn)Te/(CdMg)Te Quantum Wells: *Mukul C. Debnath*[1]; J. X. Shen[1]; I. Souma[1]; E. Shirado[1]; T. Saito[1]; T. Sato[1]; R. Pittini[1]; Y. Oka[1]; [1]Tohoku University, Research Institute for Scientific Measurements, Katahira 2-1-1, Sendai, Miyagi 980-8577 Japan

Friday AM, July 2, 1999

Session Z. Wide Bandgap Nitrides (MBE, Theory, and AlN)

Session Chairs: Chris van der Walle, Xerox Palo Alto, CA USA; Russell Dupuis, University of Texas, Austin, TX USA

8:20 AM +
Dielectric and Lattice-Dynamical Properties of III-Nitrides: *Ulrike Grossner*[1]; Jurgen Furthmuller[1]; Friedhelm Bechstedt[1]; [1]Friedrich-Schiller-Universitaet, IFTO, Max-Wien-Platz 1, Jena 07743 Germany

8:40 AM
Pressure Coefficient of Nitrides and Their III-V Alloys: *Su-Huai Wei*[1]; T. Mattila[1]; A. Zunger[1]; [1]National Renewable Energy Laboratory, 1617 Cole Blvd., Golden, CO 80401 USA

9:00 AM
Measurement of Al Mole Fraction of Bulk AlGaN and AlGaN/GaN Heterostructures by Photoconductance and Reflectance Methods: *L. S. Yu*[1]; D. Qiao[1]; S. S. Lau[1]; J. M. Redwing[2]; [1]University of California, San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Dr., La Jolla, CA 92093-0407 USA; [2]ATMI, Epitronics, 21002 North 19 Ave., Suite 5, Phoenix, AZ 85027 USA

9:20 AM +
Growth of Bulk AlN by Physical Vapor Transport: *Tim Housain*[1]; P. Zhou[1]; H. N. Jayatirtha[1]; M. G. Spencer[1]; V. Dmitriev[2]; Yu Melnik[2]; A. Nikolaev[3]; [1]Howard University School of Engineering, Rm. 1124 Material Sci. Center, 2300 6th St. NW., Washington, DC 20059 USA; [2]TDI Inc., 8660 Dakota Drive, Gaithersburg, MD 20877 USA; [3]A. F. Ioffe Institute, 26 Polytechnicheskaya St., St. Petersburg Russia

9:40 AM
Microstructural Analysis of the Recrystallization in AlN Nucleation Layers: *Yves-Matthieu Le Vaillant*[1]; René Bisaro[2]; Jean Olivier[3]; Pierre Galtier[4]; Jean-Yves Duboz[5]; Bernard Gil[6]; Sandra Ruffenach-Clur[7]; Olivier Briot[8]; Roger-Louis Aulombard[9]; [1]Thomson-CSF/University Montpellier, Laboratoire Central de Recherches/GES, Universit? de Montpellier II, pl. E. Bataillon, GES, cc074, Montpellier 34095 France; [2]Thomson-CSF, Laboratoire Central de Recherches, Domaine de Corbeville, Orsay 91 404 France; [3]Thomson-CSF, Laboratoire Central de Recherches, Domaine de Corbeville, Orsay 91404 France; [4]Thomson-CSF, Laboratoire Central de Recherches, Domaine de Corbeville, Orsay 91404 France; [5]Thomson-CSF, Laboratoire Central de Recherches, Domaine de Corbeville, Orsay 91404 France; [6]Universté de Montpellier, Groupe d'Etude des Semiconducteurs, pl. E. Bataillon, Montpellier 34095 France; [7]Universté de Montpellier, Groupe d'Etude des Semiconducteurs, pl. E. Bataillon, Montpellier 34095 France; [8]Universté de Montpellier, Groupe d'Etude des Semiconducteurs, pl. E. Bataillon, Montpellier 34095 France; [9]Universté de Montpellier, Groupe d'Etude des Semiconducteurs, pl. E. Bataillon, Montpellier 34095 France

10:00 AM Break

10:20 AM
Lateral Epitaxial Overgrowth of GaN Films by Molecular Beam Epitaxy: *M. R. Hoit*[1]; A. M. Dabiran[2]; B. E. Ishaug[1]; A. Parkhomovsky[1]; R. Held[1]; P. I. Cohen[1]; [1]University of Minnesota, Elect. and Comp. Eng., 200 Union St. SE, Minneapolis, MN 55455 USA; [2]Silver Sky Technologies, Inc., 644 Pond View Terrace, St. Paul, MN 55120 USA

10:40 AM
Strain Relaxation and Homogeneity of AlGaN Grown by Molecular Beam Epitaxy: *Sven Einfeldt*[1]; Kai Vogeler[1]; Verena Kirchner[1]; Tim Boettcher[1]; Heidrun Heinke[1]; Detlef Hommel[1]; Dirk Rudloff[2]; Juergen Christen[2]; [1]University of Bremen, Institute of Solid State Phys., P.O. Box 330440, Bremen 28334 Germany; [2]University of Magdeburg, Institute of Experimental Phys., P.O. Box 4120, Magdeburg 39016 Germany

11:00 AM +
Surfactant Effect and Polarity Inversion Due to Mg on the GaN(0001) Surface: *V. Ramachandran*[1]; R. M. Feenstra[1]; D. W. Greve[2]; J. E. Northrup[3]; [1]Carnegie Mellon University, Dept. of Phys., Pittsburgh, PA 15213 USA; [2]Carnegie Mellon University, Dept. of Elect. and Comp. Eng., Pittsburgh, PA 15213 USA; [3]Xerox, Palo Alto Research Center, 3333 Coyote Hill Rd., Palo Alto, CA 94304 USA

11:20 AM
Influence of Structural Defects on Transport Properties of GaN Grown by Reactive MBE and Magnetron Sputter Epitaxy (MSE): *Haipeng Tang*[1]; James B. Webb[1]; Jennifer Bardwell[1]; Brian Leathem[1]; Sylvain Charbonneau[1]; Sylvain Raymond[1]; [1]National Research Council, Institute for Microstructural Sciences, Bldg. M-50, Montreal Rd., Ottawa, Ontario K1A 0R6 Canada

11:40 AM +
Optimization of High Quality GaN by MBE: *B. Heying*[1]; I. Smorchkova[2]; C. Elsass[1]; E. Haus[1]; P. Fini[1]; T. Mates[1]; S. P. DenBaars[1]; U. Mishra[2]; J. S. Speck[1]; [1]UC Santa Barbara, Mats. Dept., Santa Barbara, CA 93106 USA; [2]UC Santa Barbara, ECE Dept., Santa Barbara, CA 93109 USA

Friday AM, July 2, 1999

Session AA. Metal Contacts to Wide Band Gap Semiconductors

Session Chairs: Suzanne Mohney, Penn State University, University Park, PA USA; Lisa Porter, Carnegie Mellon University, Dept. of Mats. Sci. & Eng., Pittsburgh, PA USA; Louis Guido, Carnegie Mellon University, Dept. of Mats. Sci. & Eng., Pittsburgh, PA USA

8:20 AM
Large Schottky Barriers and Memory Operation for Ni/p-GaN Contacts: *Kenji Shiojima*[1]; Tomoya Sugahara[2]; Shiro Sakai[2]; [1]NTT, Photonics Laboratories, 3-1 Morinosato Wakamiya, Atsugi-shi, Kanagawa 243-0198 Japan; [2]Tokushima University, Dept. of Elect. and Electr. Eng., 2-1 Minami-josanjima, Tokushima, 770-8506 Japan

8:40 AM +
High Temperature Behavior of Barrier Height and Ideality Factor of Ni/Au Contacts to P-Type GaN: *Ricky Wenkuei Chuang*[1]; Albert Q. Zou[1]; Jeffrey D. Nay[1]; YongSheng Zhao[1]; Henry P. Lee[1]; Z. J. Dong[2]; F. F. Xiong[2]; Robert Shih[2]; M. Bremser[3]; [1]University of California, Irvine, Dept. of Elect. and Comp. Eng., 3333 Eng. Gateway Westwing, Irvine, CA 92697 USA; [2]Alpha Photonics Inc., 2019 Saturn St., Monterey Park, CA 91754 USA; [3]AIXTRON Inc., 1670 Barclay Blvd., Buffalo Grove, IL 60089 USA

9:00 AM
Current Transport Mechanism of Low-Resistance TaTi Ohmic Contact Materials for P-GaN: *Yasuo Koide*[1]; M. Suzuki[1]; T. Arai[1]; Y. Matsunaga[1]; T. Kawakami[1]; Masanori Murakami[1]; T. Uemura[2]; N. Shibata[2]; Y. Taga[3]; [1]Kyoto University, Dept. of Mats. Sci. and Eng., Sakyo-ku,

Kyoto 606-8501 Japan; [2]Toyoda Gosei Co. Ltd, Optelectronis, Technical Dept. No. 2, Heiwa-cho, Nakashima-gun, Aichi 490-1312 Japan; [3]Toyota Central Research & Development Labs. Inc., Nagakute, Aichi 048-1192 Japan

9:20 AM +
Indium Tin Oxide as a Transparent Contact to P-GaN: Tal Margalith[1]; *Oded Buchinsky*[2]; Dan A. Cohen[2]; Amber C. Abare[2]; Monica Hansen[1]; Steven P. DenBaars[1]; Larry A. Coldren[2]; [1]University of California at Santa Barbara, Dept. of Mats., Santa Barbara, CA 93106 USA; [2]University of California at Santa Barbara, Dept. of ECE, Santa Barbara, CA 93106 USA

9:40 AM +
Surface Treatment of P-GaN by KOH Solution Studied by Synchrotron Radiation Core-Level Spectroscopy: *Jingxi Sun*[1]; K. A. Rickert[2]; J. M. Redwing[3]; A. B. Ellis[2]; F. J. Himpsel[4]; T. F. Kuech[1]; [1]University of Wisconsin-Madison, Dept. of Chem. Eng., 1415 Eng. Drive, Madison, WI 53706 USA; [2]University of Wisconsin-Madison, Chemistry Dept.; [3]Epitronics, Phoenix, Arizona; [4]University of Wisconsin-Madison, Phys. Dept.

10:00 AM Break

10:20 AM +
Characterization of Rhenium Schottky Contacts on N-Type AlxGa1-xN at High Temperatures: *L. Zhou*[1]; A. T. Ping[1]; J. Redwing[2]; I. Adesida[1]; [1]University of Illinois, Dept. of Elect. and Comp. Eng., Microelectronics Lab, MC-249, Urbana, IL 61801-2355 USA; [2]ATMI/Epitronics, Phoenix, AZ 85027 USA

10:40 AM
Improved Surface Morphology and Thermal Stability of Al/Ti/n-GaN: *Joon Seop Kwak*[1]; Suzanne E. Mohney[1]; R. Scott Kern[2]; [1]The Pennsylvania State University, Dept. of Mats. Sci. and Eng., University Park, PA 16802 USA; [2]Hewlett Packard Company, 370 W. Trimble Rd., San Jose, CA 95131-1008 USA

11:00 AM +
A New Approach to Thermodynamically Stable Contacts for Binary Wide Bandgap Semiconductors: *Ilan Shalish*[1]; Yoram Shapira[1]; Moshe Eizenberg[2]; [1]Tel-Aviv University, Dept. of Physical Electronics, Tel-Aviv 69978 Israel; [2]Thechnion - Israel Institute of Tech., Dept. of Mats. Eng., Haifa 32000 Israel

11:20 AM
Metallization Schemes for High Temperature Electrical Contacts to Silicon Carbide: Taehoon Jang[1]; Gerald W. M. Rutsch[2]; Bruce Odekirk[3]; *Lisa M. Porter*[1]; [1]Carnegie Mellon University, Mats. Sci. & Eng., 5000 Forbes Ave., Pittsburgh, PA 15213-3890 USA; [2]University of Pittsburgh, Dept. of Phys., Pittsburgh, PA 15260 USA; [3]3C Semiconductor Corporation, 5429 SW Viewpoint Terr., Portland, OR 97201 USA

11:40 AM
Effect of Si1-xCx Interface Layer on the Properties of Metal Contacts to P-Type SiC: *Johnson Olufemi Olowolafe*[1]; Jun Liu[1]; Sarbajit Datta[1]; [1]University of Delaware, Elect. and Comp. Eng., Newark, Delaware 19716 USA

Session BB. Etching and Passivation of Compound Semiconductors

Session Chairs: Marian Hargis, Purdue University, West Lafayette, IN USA; Carol Ashby, Sandia National Laboratories, Albuquerque, NM USA

8:20 AM +
In Situ Etch and Regrowth of a InAs/AlGaSb Heterostructure: *Giovanni Bellomi*[1]; William. J. Mitchell[1]; Eric Hall[1]; Evelyn L. Hu[1]; [1]University of California Santa Barbara, QUEST, Santa Barbara, CA 93106-5050 USA

8:40 AM +
Inductively Coupled Plasma Selective Reactive Ion Etching of GaAs/InGaP For Device Fabrication: *W. Lanford*[1]; C. Lee[1]; G. Cueva[1]; L. Zhou[1]; I. Adesida[1]; Noren Pan[2]; [1]University of Illinois at Urbana-Champaign, Dept. of Elect. and Comp. Eng., 208 N. Wright St., Urbana, IL 61801-2355; [2]Kopin Corporation, Inc., Taunton, MA 02780

9:00 AM
GaAs/AlGaAs Selective Dry Etching by Sawtooth-Wave Modulated Inductively Coupled SiCl4/SF6 Plasma: *Yusuke Matsukura*[1]; Jun Wada[2]; Mizuhisa Nihei[1]; Hitoshi Tanaka[1]; [1]Fujitsu Laboratories Ltd., Compound Semiconductor LSIs Lab., 10-1, Morinosato-Wakamiya, Atsugi, Kanagawa 243-0197 Japan; [2]Fujitsu Quantum Devices Ltd., 1000, Kamisukiahara, Showa-cho, Nakakomagun, Yamanashi 409-3883 Japan

9:20 AM
Air-Stable Surface Passivation of III-V Semiconductors and Application to Devices: *Carol I. H. Ashby*[1]; Kevin R. Zavadil[1]; Albert G. Baca[1]; Ping-Chih Chang[1]; B. E. Hammons[2]; Michael J. Hafich[1]; [1]Sandia National Laboratories, Dept. 1711, MS 0603, P.O. Box 5800, Albuquerque, NM 87185-0603 USA; [2]Emcore West, 10420 Research Rd. SE, Albuquerque, NM 87123 USA

9:40 AM
Effects of Chemical Treatments and Sulfide Passivation on Surface Recombination In GaN: *G. L. Martinez*[1]; M. R. Curiel[1]; *B. J. Skromme*[1]; R. J. Molnar[2]; [1]Arizona State University, Dept. of Elect. Eng. and Center for Solid State Electronics Research, P.O. Box 876206, Tempe, AZ 85287-6206 USA; [2]Lincoln Laboratory, Massachusetts Institute of Tech., Room E-124D, 244 Wood St., Lexington, MA 02173-9108 USA

10:00 AM Break

10:20 AM
Investigation of the Chemisorption and Reaction of Chlorine with the GaN (0001) Surface: *Jingxi Sun*[1]; K. A. Rickert[2]; L. Zhang[1]; A. B. Ellis[2]; F. J. Himpsel[3]; T. F. Kuech[1]; [1]University of Wisconsin-

Madison, Chem. Eng. Dept., 1415 Engineering Dr., Madison, WI 53706 USA; [2]University of Wisconsin-Madison, Chem. Dept.; [3]University of Wisconsin-Madison, Phys. Dept.

10:40 AM
Photoluminescence Measurements of Dry Etch Damage in GaN: *Elaine D. Haberer*[1]; Ching-Hui Chen[2]; Monica Hansen[1]; Evelyn L. Hu[2]; [1]University of California, Santa Barbara, Mats. Dept., Santa Barbara, CA 93106 USA; [2]University of California, Santa Barbara, Elect. and Comp. Eng. Dept., Santa Barbara, CA 93106 USA

11:00 AM
A Simple Wet Etch for GaN: *Jennifer A. Bardwell*[1]; Ian G. Foulds[1]; James B. Webb[1]; Haipeng Tang[1]; [1]National Research Council of Canada, IMS, Bldg. M-50, Ottawa, ON K1A 0R6 Canada

11:20 AM
Photoelectrochemical Etching of GaN for Materials Characterization and Device Fabrication: *I. Adesida*[1]; C. Youtsey[1]; D. Selvanathan[1]; T. Pierson[1]; A. Daga[1]; M. Hossain[1]; L. Romano[2]; [1]University of Illinois at Urbana-Champaign, Dept. of Elect. and Comp. Eng. and Microelect. Lab., 208 N. Wright St., Urbana, IL 61801-2355; [2]Xerox PARC, Palo Alto, CA 94304

11:40 AM +
Development of Photoelectrochemical Etching for Gallium Nitride Device Fabrication: *A. R. Stonas*[1]; P. Kozodoy[1]; C. Chen[1]; H. Marchand[1]; E. L. Hu[1]; [1]University of California at Santa Barbara, QUEST/Elect. and Comp. Eng., University of California, ECE Dept., Box 14, Santa Barbara, CA 93106 USA

Friday AM, July 2, 1999

Session CC. Defects and Defect Engineering for Devices

Session Chairs: Steven A. Ringel, The Ohio State University, Dept. of Elect. Eng., Columbus, OH USA; Steve Stockman, Hewlett-Packard Optoelectronics Division, San Jose, CA USA

8:20 AM +
Wafer Edge Misfit Dislocation Nucleation in p/p+ Vapor Phase Silicon: *Petra Feichtinger*[1]; Hiroaki Fukuto[1]; Mark S. Goorsky[1]; Dwain Oster[2]; Jim Moreland[2]; Mohan Rao[2]; [1]University of California, Los Angeles, Dept. of Mats. Sci. and Eng., School of Eng. and Applied Sci., 2521 Boelter Hall, Los Angeles, CA 90095-1595 USA; [2]Wacker Siltronic Corp., 7200 NW Front Ave., Portland, OR 97283

8:40 AM
Reduction of Defect Induced Leakage Currents by the Use of Nitrided Field Oxides in Selective Epitaxial Growth (SEG) Isolation for Silicon ULSI: *Rashid Bashir*[1]; Tai-chi Su[1]; Gerold W. Neudeck[1]; John P. Denton[1]; [1]Purdue University, Elect. and Comp. Eng., 1285 EE Bldg., W. Lafayette, IN 47906 USA

9:00 AM +
Selective SiGe Nanostructures Grown by UHVCVD: *Thomas Andrew Langdo*[1]; Matthew T. Currie[1]; Gianni Taraschi[1]; Eugene A. Fitzgerald[1]; [1]Massachusetts Institute of Tech., Dept. of Mats. Sci. and Eng., 77 Massachusetts Ave., Cambridge, MA 02139 USA

9:20 AM +
Minority Carrier Properties and Defects in MBE-Grown AlGaAs/GaAs Heterostructures on Ge: *John A. Carlin*[1]; John J. Boeckl[1]; Steven A. Ringel[1]; Brian M. Keyes[2]; [1]The Ohio State University, Elect. Eng., 2015 Neil Ave., Columbus, OH 43210 USA; [2]National Renewable Energy Laboratory, Golden, CO 80401 USA

9:40 AM +
Performance and Microstructure of Visible Light-Emitting Diodes Grown on High-Quality InGaP/GaP Epitaxial Transparent Substrates by MOVPE: *Andrew Y. Kim*[1]; [1]MIT, Dept. of Mats. Sci. and Eng., MIT 13-4025, 77 Massachusetts Ave., Cambridge, Massachusetts 02139 USA

10:00 AM Break

10:20 AM
Photoreflectance Study of Phosphorus Passivation of GaAs: *Richard Beaudry*[1]; Xiangang Xu[1]; Jinsheng Hu[1]; Simon P. Watkins[1]; [1]Simon Fraser University, Dept. of Phys., 8888 University Dr., Burnaby, B.C. V5A 1S6 Canada

10:40 AM
Reversal of Electrical Stress Degradation in Fully Self-Aligned InP/GaAsSb/InP DHBTs by a Surface Treatment in Ozone: *Colombo R. Bolognesi*[1]; *Noureddine Matine*[1]; Georg Soerensen[1]; Xangang Xu[2]; Simon P. Watkins[2]; [1]Simon Fraser University, School of Eng. Sci., Compound Semiconductor Device Lab., 8888 University Dr., Burnaby, British Columbia V5A 1S6 Canada; [2]Simon Fraser University, Dept. of Phys., 8888 University Dr., Burnaby, British Columbia V5A 1S6 Canada

11:00 AM +
Traps in Pseudomorphic InGaAs/AlGaAs/GaAs HEMTs Measured by Deep Level Capacitance and Current Transient Spectroscopy: *Evelyn N. Wang*[1]; Mike Wojtowicz[1]; Dwight C. Streit[1]; [1]TRW, Inc., Electr. & Tech. Div., 1 Space Park, R6/2573, Redondo Beach, CA 90278 USA

11:20 AM +
Physical Evidence of Hydrogen Degradation of InP HEMTs: *Roxann R. Blanchard*[1]; Jesus A. del Alamo[1]; Albert Cornet[2]; [1]Massachusetts Institute of Tech., 60 Vassar St., Room 39-313, Cambridge, MA 02139 USA; [2]Universitat de Barcelona, Facultat de Fisica, Av. Diagonal, 645-647, Barcelona E-08028 Spain

11:40 AM Late News

Session DD. Non-Destructive Testing and "In-Situ" Monitoring/Control

Session Chairs: Kurt G. Eyink, Wright Patterson AFB, OH USA; John A. Roth, HRL Labs, Malibu, CA USA

1:30 PM
Characterization of P-Dopant Interdiffusion in 1.3 μm InGaAsP/InP Laser Structures using Modulation Spectroscopy: *A Jeager*[1]; Fred H Pollak[1]; C L Reynolds[3]; M Geva[3]; [1]Brooklyn College of CUNY, Phys. Dept., 3438N, 2900 Bedford Ave., Brooklyn, NY 11210 USA; [3]Lucent Technologies, Bell Laboratories, Breinigsville, PA 18031 USA

1:50 PM
Room Temperature Polarized Photoreflectance Characterization of GaAlAs/InGaAs High Electron Mobility Transistor Structures Including the Influence of Strain Relaxation: *Ying-sheng Huang*[1]; T. H. Chen[1]; W. D. Sun[2]; Fred H. Pollak[2]; Mark Goorsky[3]; D. Streit[4]; M. Wojtowicz[4]; [1]National Taiwan University of Sci. and Tech., Dept. of Elect. Eng., 43 Keelung Rd. Sec. 4, Taipei 106 Taiwan ; [2]Brooklyn College of CUNY, Phys. Dept., 2900 Bedford Ave., Brooklyn, NY 11210-2889 USA; [3]UCLA, Dept. of Mats. Sci. and Eng., Los Angles, CA 90095 USA; [4]TRW, Electr. and Tech. Div., Redondo Beach, CA 90278 USA

2:10 PM +
Depth Defined Optoelectronic Modulation Spectroscopy: Chi-Hsin Chiu[1]; *John Garth Swanson*[1]; [1]Kings College London, Electronic Eng., Strand, London WC2R 2LS UK

2:30 PM +
Surface Photovoltage Spectroscopy of Two Dimensional Structures and Devices: *Nurit Ashkenasy*[1]; Sanelia Solodky[1]; Mark Leibovitch[2]; Yossi Rosenwaks[1]; Irit Halkon[2]; Yoram Shapira[1]; [1]Tel Aviv University, Dept. of Phys. Electr., Faculty of Eng., Ramat-Aviv, Tel-Aviv 69978 Israel; [2]ELTA Electronics Industries, Ltd., P.O. Box 330, Ashdod 77102 Israel

2:50 PM +
UHV Contactless Capacitance-Voltage Characterization of Free Silicon Surfaces: *Toshiyuki Yoshida*[1]; Hideki Hasegawa[1]; Takamasa Sakai[2]; [1]Research Center for Interface Quantum Electronics (RCIQE) and Graduate School of Electronics and Information Eng., Hokkaido University, Kita-ku, Kita 13 Nishi 8, Sapporo, Hokkaido 060-8628 Japan; [2]Dainippon Screen Manufacturing Co., Ltd., Fushimi-ku Hazukashi, Furukawa-cho 322, Kyouto, Kyouto-hu 612 Japan

3:10 PM Break

3:30 PM +
Far UV Spectroscopic Reflectometry: *S. Lim*[1]; S. Kriventsov[1]; T. Mayer[1]; T. Jackson[1]; J. Freeouf[2]; [1]Penn State University, Center for Thin Film Devices and Electronic Mats. and Processing Research Lab., University Park, PA 16802; [2]Interface Studies Inc., Katonah, NY 10536

3:50 PM
Spectroscopic Ellipsometry for Real-Time Control of Heteroepitaxy of HgCdTe on Si: *L. A. Almeida*[1]; Nibir K. Dhar[2]; J. David Benson[3]; Michael Martinka[3]; Andrew J. Stoltz[1]; John H. Dinan[3]; [1]E-OIR Measurements, Inc., P.O. Box 1240, Spotsylvania, VA 22553-1240 USA; [2]Army Research Laboratory, Adelphi, MD; [3]Night Vision & Electronic Sensors Directorate, Fort Belvoir, VA 22060-5806 USA

4:10 PM
In Situ Controlled Electronic Properties of Low Temperature GaAs(001) for Two-Photon Absorbers: *J. Herfort*[1]; G. Apostolopoulos[1]; W. Ulrici[1]; L. Däweritz[1]; K. H. Ploog[1]; M. Leitner[2]; P. Glas[2]; [1]Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5-7, D-10117 Berlin Germany; [2]Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Rudower Chaussee 6, D-12474 Berlin Germany

4:30 PM +
Investigation of Indium Surface Segregation in Solid Source MBE Growth of InxGa1-xSb: *David H. Tomich*[1]; Kurt G. Eyink[1]; Steve Fenstemaker[2]; Larry Grazulis[2]; Charles W. Tu[3]; [1]Air Force Research Laboratories, MLPO, 3005 P St. Ste. 6, Bldg. 651, WPAFB, OH 45433-7707 USA; [2]Research Institute, University of Dayton, 300 College Park Dr., Dayton, OH 45469-0167 USA; [3]University of California, San Diego, Dept. of Elect. and Comp. Eng., 9500 Gilman Dr., Mail Code 0407, La Jolla, CA 92093-0407 USA

4:50 PM
Improved Composition and Layer Interface Control by Modeling Knudsen Cell Heating Cycle: *Stephen J. Adams*[1]; Kurt G. Eyink[1]; [1]Air Force Research Laboratory, Wright-Patterson AFB, AFRL/MLPO, Wright-Patterson AFB, OH 45433-7750 USA

Friday PM, July 2, 1999

Session EE. Semiconductor Quantum Dots - Electronic Structures

Session Chairs: Mark Miller, University of Virginia, Dept. of Elect. Eng., Charlottesville, VA USA; Peter Sercel, University of Oregon, Phys. Dept., Eugene, OR USA

1:30 PM
Modified Fermi-Level Pinning of the (100) GaAs Surface Through InAs Quantum Dots in Different Stages of Overgrowth: *Carsten Walther*[1]; H. Niehus[1]; A. Thamm[2]; W. T. Masselink[1]; [1]Humboldt University Berlin, Dept. of Phys., Invalidenstr. 110, Berlin 10115 Germany; [2]Paul-Drude-Institut, Hausvogteiplatz 5-7, Berlin 10117 Germany

1:50 PM
Tunneling Spectroscopy of Electron States in Self-Assembled InAs Dots: *Kanji Yoh*[1]; Yoshiyuki Kitasho[1]; [1]Research Center for Interface Quantum Electronics, Hokkaido University, N 13, W 8, Kita-ku, Sapporo, Hokkaido 060 Japan

2:10 PM
Variation of the Potential Well of Self-Assembled InAs/GaAs Quantum Dots with Fixed Ground State Luminescence Energy: *Markus Arzberger*[1]; Ulrich Käsberger[1]; Liwen Chu[1]; Gerhard Böhm[1]; Markus-Christian Amann[1]; Gerhard Abstreiter[1]; [1]Walter Schottky Institut, Am Coulombwall, Garching D-85748 Germany

2:30 PM
Electronic Detection of Optically Induced Charge Storage in Self Assembled InAs Quantum Dots: *Doris Heinrich*[1]; Matthias Skalitz[1]; Jonathan Finley[1]; Jan Hoffmann[1]; Artur Zrenner[1]; Gerhard Bohm[1]; Gerhard Abstreiter[1]; [1]Walter Schottky Institute, Technical University Munich, Am Coulombwall, D-85748 Garching Germany

2:50 PM
Dark Excitons Due to Direct Coulomb Interactions in Silicon Quantum Dots: *Fernando A. Reboredo*[1]; Alberto Franceschetti[1]; Alex Zunger[1]; [1]National Renewable Energy Laboratory, Solid State Theory, 1617 Cole Blvd., Golden, CO 80401

3:10 PM Break

3:30 PM
Photoluminescence of Strain-Induced Coupled Quantum Dot-Pairs: *H.-W. Ren*[1]; T. Okuno[2]; K. Nishibayashi[2]; J.-S. Lee[1]; S. Sugou[1]; M. Sugisaki[1]; Y. Masumoto[1]; [1]Single Quantum Dot Project, ERATO, JST, c/o NEC Corp., 34 Miyukigaoka, Tsukuba 305-8501 Japan; [2]University of Tsukuba, Institute of Phys., Tsukuba 305-8571 Japan

3:50 PM
Experimental Determination of Intra-level Relaxation Time in Quantum Dots with Different Energy Level Spacing: *H. Koskenvaara*[1]; M. Sopanen[1]; H. Lipsanen[1]; M. Brasken[2]; M. Lindberg[2]; [1]Helsinki University of Tech., Optoelectronics Lab., Espoo FIN-02150 Finland; [2]Abo Akademi University, Dept. of Phys., Turku FIN-20500 Finland

4:10 PM
Band Structure Modification of InP Dots at High Pressure: *Linshi Miao*[1]; Dinesh Patel[1]; Carmen S. Menoni[1]; Olga I. Micic[2]; Arthur J. Nozik[2]; [1]Colorado State University, Elect. and Comp. Eng., Fort Collins, CO 80523-1373 USA; [2], National Renewable Energy Laboratory, Golden, CO 80401 USA

Session FF. Issues of Dopants and Defects in Nitrides

Session Chairs: Christian Wetzel, Meijo University, High Tech Research Center, Tempaku-ku, Nagoya, Japan; Alan Wright, Sandia National Laboratories, Albuquerque, NM USA

1:30 PM +
Influence of Dislocations in InGaN/GaN Quantum Well Grown by Metalorgaic Chemical Vapor Deposition: *Tomoya Sugahara*[1]; [1]The University of Tokushima, Sakai Lab. Dept. of Elect. and Electr. Eng., 2-1 Minami-Josanjima, Tokushima 770-8506 Japan

1:50 PM
Atomic Scale Analysis of Defect Structures and Properties in III-Nitride Materials by Z-Contrast Imaging and EELS in STEM: *Yan Xin*[1]; Nigel D. Browning[1]; Steve J. Pennycook[2]; Siva Sivananthan[1]; Robert Sporken[3]; F. Omnés[4]; B. Beaumont[4]; J. P. Faurie Faurie[4]; Pierre Gibart[4]; [1]University of Illinois at Chicago, Phys., 845 W Taylor St., Chicago, IL 60607 USA; [2]Oak Ridge National Laboratory, Solid State Div., Oak Ridge, TN 37831 USA; [3]Facultes Universitaires Notre-Dame de La Paix, Laborotoire L.I.S.E Belgium; [4]CRHEA-CNRS, rue Bernard Gregory, 06560 Valbonne France

2:10 PM
Investigation of the Formation of the 2.8eV PL Band in P-Type GaN: *Fatemeh Shahedipour*[1]; Bruce W. Wessels[1]; [1]Northwestern University, Mats. Sci. and Eng., 2225 N. Campus Dr., Evanston, IL 60208

2:30 PM
Effect of Threading Dislocations, Mg-Doping and Etching on the Photoconductivity Spectra of GaN: *John T. Torvik*[1]; J. I. Pankove[1]; S. Nakamura[2]; I. Grzegory[3]; S. Porowski[3]; [1]Astralux, Inc., 2500 Central Ave., Boulder, CO 80301 USA; [2]Nichia Chemical Ind., R&D Dept., 491 Oka Kaminaka, Anan, Tokushima 774 Japan; [3]Polish Academy of Sciences, High Pressure Research Center, Sokolowska 29/37, 01-42, Warsaw Poland

2:50 PM
Optically Detected Magnetic Resonance Study of Defects in Undoped, Be-Doped, and Mg-Doped GaN: *Friedrich Karl Koschnick*[1]; Karsten Michael[1]; Johann Martin Spaeth[1]; Bernard Beaumont[2]; Pierre Gibart[2]; Enrique Calleja[3]; Elias Munoz[3]; [1]University of Paderborn, Phys. Dept., Warburger Str. 100, Paderborn 33098 Germany; [2]CRHEA-CNRS, Valbonne France; [3]University of Madrid, Madrid Spain

3:10 PM Break

3:30 PM
Optical Properties of Rare Earth Doped GaN Grown by MBE: *Andrew J. Steckl*[1]; [1]University of Cincinnati, ECE/CS Dept., P.O. Box 210030, 899 Rhodes Hall, Cincinnati, OH 45221-0030 USA

3:50 PM
Near-Surface Cathodoluminescence Spectroscopy of Erbium Doped AlN: *Alexander P. Young*[1]; Stephen H. Goss[2]; Leonard J. Brillson[1]; J. D. MacKenzie[3]; C. R. Abernathy[3]; [1]Ohio State University, Elect. Eng., 205 Dreese Lab., 2015 Neil Ave., Columbus, OH 43210-1272 USA; [2]Ohio State University, Center for Mats. Research, 205 Dreese Lab., 2015 Neil Ave., Columbus, OH 43210-1272 USA; [3]University of Florida, Mats. Sci. and Eng., Gainesville, FL 32611 USA

4:10 PM
Isoelectronic Doping of Gallium Nitride with Arsenic: *Peter H Mitev*[1]; M. Gherasimova[1]; B. Gaffey[1]; L. J. Guido[1]; [1]Yale University, Center For Microelect. Mats. and Structures, P.O. Box 208284, New Haven, CT 06520-8284 USA

4:30 PM
Yellow Luminescence and Electronic Conductivity in GaN: *Ilan Shalish*[1]; Leeor Kronik[1]; Yoram Shapira[1]; Joseph Salzman[2]; [1]Tel-Aviv University, Dept. of Phys. Electr., Tel-Aviv 69978 Israel; [2]Technion-Israel Institute of Tech., Elect. Eng., Solid-State Institute and Microelect. Center, Haifa 32000 Israel

4:50 PM
Electric Force Microscopy of Induced Charges and Surface Potentials in GaN Modified by Light and Strain: *P. M. Bridger*[1]; Zvonimir Z. Bandic[1]; Eric C. Piquette[1]; T. C. McGill[1]; [1]California Institute of Tech., Applied Phys., Mail Stop 128-95, Pasadena, CA 91125 USA

Friday PM, July 2, 1999

Session GG. Epitaxy of II-VI and Chalcopyrites

Session Chair: Charles Tu, University of California-San Diego, LaJolla, CA USA

1:30 PM
Homoepitaxy of ZnTe by MBE: *J. H. Chang*[1]; H. M. Wang[1]; K. Arai[1]; M. W. Cho[1]; K. Godo[1]; H. Makino[1]; T. Hanada[1]; K. Satoh[2]; O. Oda[2]; T. Yao[1]; [1]Tohoku University, Institute for Mats. Research, 2-1-1 Katahira, Aoba-ku, Sendai, 980-8577 Japan; [2]Central R&D Laboratory, Japan Energy Corporation, Japan

1:50 PM
High Quality ZnSe Layers with an Atomically Flat Surface Grown on GaAs(001)by Molecular Beam Epitaxy: *Kenat Arai*[1]; Akihiro Ohtake[2]; Takashi Hanada[1]; Tetsuji Yasuda[3]; Takafumi Yao[1]; [1]Tohoku University, Institute for Mats. Research, 2-1-1, Katahira,

Aoba, Sendai 980-8577 Japan; [2]Joint Research Center for Atom Technology, Angstrom Technology Partnership, 1-1-4, Higashi, Tsukuba 305-0046 Japan; [3]Joint Research Center for Atom Technology, National Institute for Advanced Interdisciplinary Research, 1-1-4, Higashi, Tsukuba 305-0046 Japan

2:10 PM
Growth and Characterization of Multiple Quantum Wells of $ZnSn(P_xAs_{1-x})/GaAs$: *Georgiy A. Seryogin*[1]; Sergey A. Nikishin[1]; Henryk Temkin[1]; [1]Texas Tech University, Dept. of Elect. Eng., MS3102, Lubbock, TX 79407 USA

2:30 PM
Epitaxial Growth of γ-In_2Se_3 Films with a Defect Wurtzite Structure by Molecular Beam Epitaxy: *Tomohiko Ohtsuka*[1]; Tamotsu Okamoto[2]; Akira Yamada[1]; Makoto Konagai[1]; [1]Tokyo Institute of Tech., Dept. of Elect. and Electr. Eng., Faculty of Eng., 2-12-1, O-okayama, Meguro-ku, Tokyo 152-8552 Japan; [2]Tokyo Institute of Tech., Research Center for Quantum Effect Electronics, 2-12-1, O-okayama, Meguro-ku, Tokyo 152-8552 Japan

2:50 PM Late News

3:10 PM Break

Friday PM, July 2, 1999

Session HH. Epitaxy of Si, III-V, Oxides

Session Chair: Colombo Bolognesi, Simon Fraser University, Dept. of Elect. Eng., Burnaby, BC Canada

1:30 PM
Characterization of Silicon Atomic-Layer-Epitaxy by an Atomic-Force Microscope: *Keiji Ikeda*[1]; Yasuo Satoh[1]; Satoshi Sugahara[1]; Masakiyo Matsumura[1]; [1]Tokyo Institute of Tech., Dept. of Physical Electronics, 2-12-1, O-okayama, Meguro-ku, Tokyo 152-8550 Japan

1:50 PM
Surface Phases of InP (001) in the MOVPE Process: *Robert F. Hicks*[1]; Lian Li[1]; Byung-Kwon Han[1]; Daniel Law[1]; Qiang Fu[1]; Connie Li[1]; [1]University of California, Chem. Eng. Dept., Los Angeles, CA 90095

2:10 PM
The Structure of Aluminum Antimonide Surfaces Grown by Molecular Beam Epitaxy: *Allan S. Bracker*[1]; William Barvosa-Carter[1]; James C. Culbertson[1]; Brian R. Bennett[1]; Lloyd J. Whitman[1]; Benjamin V. Shanabrook[1]; [1]Naval Research Laboratory, Electronics Sci. and Tech. Div., Code 6876, 4555 Overlook Ave., SW, Washington, DC 20375 USA

2:30 PM

MBE Growth of ZnO Films on GaN and Characterization: *H. J. Ko*[1]; Y. F. Chen[1]; S. K. Hong[1]; T. Yao[1]; [1]Tohoku University, Institute for Mats. Research, 2-1-1 Katahira, Aoba-ku, Sendai 980 Japan

2:50 PM

Plasma Assisted Molecular Beam Epitaxy and Characterization of the MgxZn1-xO/ZnO Hetero-Structures: *Yefan Chen*[1]; Takafumi Yao[1]; Yosaburo Segawa[2]; Hang-ju Ko[1]; Soon-ku Hong[1]; [1]Tohoku University, Institute for Mats. Research, Katahira 2-1-1, Aoba-ku, Sendai, Miyagi-ken 980-0821 Japan; [2]The Institute of Physical and Chemical Research, Photon Dynamics Research Center, Koeji 19-1399, Nagamachi Aoba-ku, Sendai, Miyagi-ken Japan

3:10 PM Break