
AT A GLANCE

Saturday

6:00 p.m.-8:00 p.m. Portola - DT

Sunday

7:00 a.m.-8:00 a.m. De Anza Foyer - DT
7:00 a.m.-7:45 a.m. De Anza Foyer - DT
 8:00 a.m.-4:45 p.m. De Anza II - DT
 8:00 a.m.-5:00 p.m. TBD
12:20 p.m.-1:30 p.m. De Anza I - DT
 5:00 p.m.-8:00 p.m. De Anza Foyer - DT
 5:30 p.m.-8:30 p.m. De Anza II - DT
5:00 p.m.-8:00 p.m. De Anza I & Foyer - DT

Monday

7:00 a.m.-5:00 p.m. De Anza Foyer - DT
7:00 a.m.-8:00 a.m. De Anza Foyer - DT
 8:00 a.m.-8:30 a.m. De Anza I, II, & III - DT
 8:30 a.m.-11:30 a.m. De Anza I, II, & III - DT
 1:00 p.m.-2:30 p.m. De Anza I - DT
 1:00 p.m.-2:30 p.m. De Anza II - DT
 3:00 p.m.-4:50 p.m. De Anza I - DT
 3:00 p.m.-4:50 p.m. De Anza II - DT
5:00 p.m.-7:00 p.m. Serra Ballroom - MCC

Tuesday

7:00 a.m.-5:00 p.m. De Anza Foyer - DT
7:30 a.m.-8:30 a.m. Serra Ballroom - MCC
 7:30 a.m.-4:00 p.m. Serra Ballroom - MCC
 8:30 a.m.-9:50 a.m. De Anza I - DT
 8:30 a.m.-9:50 a.m. De Anza II - DT
 10:30 a.m.-12:00 p.m. De Anza I - DT
 10:30 a.m.-12:00 p.m. De Anza II - DT
12:00 p.m.-1:30 p.m. Serra Ballroom - MCC
 1:30 p.m.-3:00 p.m. De Anza I - DT
 1:30 p.m.-3:00 p.m. De Anza II - DT
 3:30 p.m.-5:00 p.m. De Anza I - DT
 3:30 p.m.-5:00 p.m. De Anza II - DT
7:00 p.m.-10:00 p.m. Monterey Aquarium

Wednesday

7:00 a.m.-12:00 p.m. De Anza Foyer - DT
7:30 a.m.-8:30 a.m. De Anza Foyer - DT
 8:20 a.m.-10:00 a.m. De Anza I - DT
 8:30 a.m.-10:00 a.m. De Anza II - DT
 10:30 a.m.-12:20 p.m. De Anza I - DT
 10:30 a.m.-12:10 p.m. De Anza II - DT
 1:30 p.m.-2:40 p.m. De Anza I - DT
 1:20 p.m.-3:00 p.m. De Anza II - DT
 3:30 p.m.-5:00 p.m. De Anza I - DT
 3:30 p.m.-5:00 p.m. De Anza II - DT
5:00 p.m.

DT - DoubleTree**MCC - Monterey Conference Center**

Visit us on the World-Wide Web at: <http://www.gaasic.org/>

CHAIRMAN'S MESSAGE

On behalf of the organizing committee and the IEEE EDS, MTT-S, and SSCS, I invite you to be a part of the upcoming 2002 IEEE GaAs IC Symposium. This year's symposium will be held October 20th to the 23rd in beautiful Monterey, California at the DoubleTree Hotel.

Over the last 24 years, the IEEE GaAs IC Symposium has become the pre-eminent international forum on developments in integrated circuits using GaAs, InP, SiGe, GaN, SiC and other compound semiconductor devices. In 2002, the Symposium continues its tradition of presenting the best from around the world in high frequency microelectronics.

This year's program continues to highlight the importance of compound semiconductors in commercial wireless and optical communications. Major focus areas of this year's GaAs IC Symposium, organized by Chris Bozada and the Technical Program Committee, include:

Microwave and Millimeter wave IC design;
ICs for Optical Communications, featuring Optical Modulator Drivers, Optical Front Ends, and other OC-768 applications;
Novel Device, Material, and Substrate Technology

The technical sessions will highlight all aspects of compound semiconductor IC technology, ranging from materials characterization to systems applications, including everything in between.

Additionally, this year's IEEE GaAs IC Symposium continues our tradition of providing focused educational opportunities through our Short Course and Primer Course, both held on Sunday, October 20th. Brad Nelson has organized a very interesting and timely one-day Short Course on "IC Design for Receivers" taught by five industry experts. In addition, Stephen Long and Donald Estreich will once again present our Primer Course, an excellent tutorial presented within the context of this year's Symposium contents. Further, you will have the opportunity to learn of new products from the approximately 50 exhibitors in the GaAs IC Technology Exhibition.

To complement the full technical program, we have provided several social events to allow interactions with colleagues while catching up with the newest technology available on the market. These events include the Sunday evening Opening Reception, the Monday evening Technology Exhibition Reception and the Symposium Theme Party Tuesday evening at the world-famous Monterey Bay Aquarium. The Aquarium features an exciting new exhibit on jellyfish that you won't want to miss.

Finally, I would like to announce the winners of our Fifth Outstanding Paper Award from the 2001 Symposium. They are T. Quach, P. Watson, W. Okamura, E. Kaneshiro, A. Gutierrez-Aitken, T. Block, J. Eldridge, T. Jenkins, L. Kehias, A. Oki, D. Sawdai, R. Welch, and R. Worley, for their paper entitled "Broadband Class-E Power Amplifier for Space Radar Application". We hope you'll join us in Monterey for the 24th IEEE GaAs IC Symposium.

Tim Henderson, Chairman
2002 IEEE GaAs IC Symposium

CORPORATE BENEFACTORS

This year, we are pleased to continue with the GaAs IC Symposium Corporate Benefactors Program. This program allows companies interested in compound semiconductors to show their support of the Symposium by making contributions towards the cost of some of our social events.

These additional resources enable the Symposium to increase the quality of our event, as well as allowing companies an opportunity for some tasteful promotional activities.

This year's Advanced Benefactors at the writing of the advance program are:

AIXTRON
AXT
BAE SYSTEMS
KOPIN
SUMITOMO ELECTRIC

We thank them for their generosity, and look forward to continued support from the corporate sector in future years.

The Symposium Web Site www.gaasic.org has become a critical tool for the dissemination of information for prospective attendees of the Symposium. Every year, the web site must be updated and maintained to effectively serve this purpose. We would like to acknowledge the following company for sponsoring the Symposium web site for the 2002 GaAs IC Symposium:

ANADIGICS

Comments regarding the web site or any publicity materials should be directed to the Publicity Chair.

GENERAL INFORMATION

IEEE 24th GaAs IC Symposium
October 20-23, 2002
DoubleTree Hotel Monterey
Monterey, California

REGISTRATION

	<u>Advance</u> (Received by Sept 17)	<u>Regular</u> (After Sept 17 or on site)
Symposium Registration		
IEEE Member	\$450	\$500
Non-IEEE	\$500	\$550
Student	\$160	\$210
Special 1-day Registration (sessions only, no digest or social)		
IEEE Member	\$210	\$235
Non-IEEE	\$235	\$260
Short Course		
Student Registration	\$210	\$230
GaAs IC Primer Course		
Student Registration	\$120	\$120
Technical Digest Only		
	\$65	\$65
Short Course Notes Only		
	\$95	\$95
Digest CD ROM Only		
	\$75	\$75
Primer Course Notes Only		
	\$65	\$65
Extra Reception Ticket		
	\$40	\$40
Extra Theme Party Ticket		
	\$75	\$75

The full Symposium registration fee includes: attendance at all technical sessions and panels; one copy of the Technical Digest and CDROM; continental breakfasts; and morning and afternoon coffee breaks. Also included are admittance to: the Sunday Opening Reception; the GaAs IC Technology Exhibition Opening Reception on Monday; all exhibits; and the exciting Tuesday evening Theme Party. The special 1-day registration fee, however, does not include the digest and social activities. Additional copies of the Technical Digest and of the Primer and Short Course Notes will be available for purchase at the Symposium.

For **ADVANCE REGISTRATION**, complete the enclosed Advance Registration Form with your remittance of the appropriate fee (check or credit card) **BY September 17, 2002** to:

Registrar, 2002 IEEE GaAs IC Symposium
 c/o IEEE Conference Management Services
 445 Hoes Lane
 Piscataway, NJ 08855
 USA
 Tel: (732) 981-3415
 FAX (732)465-6447
 email: GaAs02reg@ieee.org

The remittance is payable by checks in U.S. dollars only, by personal/company check drawn on a U.S. bank, U.S. currency traveler's checks, or international money order. Checks must be made payable to "2002 IEEE GaAs IC Symposium" and must be encoded with the bank number, account number, and check number. Credit cards and wire transfers may also be used. Bank drafts from non-U.S. banks and foreign currency are unacceptable and will be returned.

We urge you to pre-register to reduce your costs and to simplify your check-in at the Symposium. Your Technical Digest and registration materials will be ready for you at the Advance Registration Desk.

Registration Center:

The Symposium Registration Center is located in the Portola Room of the DoubleTree Hotel on Saturday and the De Anza Foyer of the DoubleTree Hotel for Sunday through Wednesday. The operating hours will be as follows:

Short & Primer Course Registration only

Saturday, October 19	6:00 p.m. - 8:00 p.m.
Sunday, October 20	7:00 a.m. - 8:00 a.m.
Sunday, October 20	5:00 p.m. - 5:30 p.m.(Primer)

Symposium Registration

Sunday, October 20	5:00 p.m. - 8:00 p.m.
Monday, October 21	7:00 a.m. - 5:00 p.m.
Tuesday, October 22	7:00 a.m. - 5:00 p.m.
Wednesday, October 23	7:00 a.m. - 12:00 noon

Refund Policy:

Please note that after September 17, 2002, your Advance Registration fee, Short Course fee, GaAs IC Primer fee, and fees for additional Symposium Technical Digest, or Reception/Party ticket fees are not refundable. Full refunds less \$50 handling fee will be granted for cancellations received in writing by September 17, 2002. The letter to the Symposium Registrar (see address at IEEE above) requesting the refund should state the preregistrant's name and to whom the refund check should be made payable. All refunds will be processed after the Symposium. **NO PRE-REGISTRATION REFUNDS WILL BE GRANTED AFTER September 17, 2002.**

ACCOMMODATIONS

Hotel Reservations:

A block of rooms has been reserved at special discounted rates for Symposium participants at our headquarters hotel, the DoubleTree Hotel Monterey. Located in the heart of Monterey, the DoubleTree is adjacent to the Monterey Conference Center. It overlooks scenic Fisherman's Wharf and the Monterey Bay, only four miles from the Monterey Peninsula Airport.

The hotel recently underwent extensive renovations of their guest rooms, offering cable TV, radio telephones with voice messaging and minibar. Rooms are available for non-smokers and with wheelchair access. They also feature room service, restaurants, cafes, cocktail lounges with entertainment, sports bars, outdoor pool and spa, health club, and many fine shops.

Hotel Address and Phone Numbers:

The DoubleTree Hotel Monterey
2 Portola Plaza
Monterey, CA 93940
Phone: 831-649-4511
Fax: 831-649-4115
Guest Fax: 831-372-0620

We ask you to please support your Symposium and more fully enjoy all the activities by staying at our official headquarters hotel. The Symposium relies on attendees staying at the DoubleTree to reduce the costs charged for the use of meeting rooms. Room reservations should be made as soon as possible, and no later than September 27, 2002. Rooms are available at the special Symposium group rates of \$162 single or double per night. These rates do not include room taxes, currently 10.05% per night. Rates are net for travel agents. A limited number of rooms have been set aside for the use of bonafide U.S. government employees at the prevailing government rate of \$94 single or \$124 double.

To make a reservation, please call the hotel direct at 831-649-4511 and ask for Reservations. Be certain to request the Special Group Rate for the IEEE GaAs IC Symposium. Please do not call any regional hotel chain 800 number, since they will NOT be aware of our special arrangements.

It is strongly recommended that you call the hotel direct thereby obtaining an immediate confirmation. If you choose to mail or fax your request, be sure to follow up on it. After the September 27, 2002 deadline, rooms will be on a space available basis at possibly higher rates. Check-in time is 3 p.m. or later; check-out time is 12 noon. If necessary, you may cancel your reservation at the DoubleTree up to 24 hours prior to your scheduled arrival. There will be a \$50 charge for early departures; please confirm your departure date at check-in. You can self-park at the DoubleTree for \$10 per day, or \$12 per day for valet.

You can reserve online by visiting www.doubletreemonterey.com, then click on group reservations and enter password. There is also a link from the Symposium's web site www.gaasic.org directly to the DoubleTree Hotel Monterey. The password for both is GaAs02.

TRANSPORTATION

Special Airfares:

Special discounted airfares for **2002 IEEE GaAs IC Symposium** on October 20-23, 2002 in Monterey, California have been negotiated by **IEEE Global Travel Services**. Discounts are as high as **15%** off the lowest published airfares with **Air Canada, Continental, and United Airlines**. If

Saturday night stays or super-saver airfares are not applicable, deeply discounted airfares are available. Discount code A606098 entitles attendees to receive special rates that have also been negotiated with Avis Rental Car Company.

Travel arrangements using the negotiated air carriers or the carriers of your choice can be made through IEEE Global Travel Services by **calling between the hours of 8:30 a.m. and 5:30 p.m. EST. Monday through Friday. Within the US and Canada, call (800) TRY-IEEE, (800-879-4333); and outside of the US and Canada, call (732) 562-5387**. Or, you may visit their on-line travel service web site at <http://www.ieeetravelonline.org>. This secure site offers simple and convenient service through which you can search, reserve, and ticket your travel anytime, anywhere. Or, you can e-mail your request to travel-team@ieee.org.

You may also your fax requirements to the IEEE Global Travel Services at (732) 562-8815. When faxing, please be sure to include your travel dates, departure, and return times, and phone and fax numbers. A Travel Counselor will contact you promptly.

Airport Transportation:

The Monterey Peninsula Airport, serving one of the world's favorite destinations for both business and pleasure, offers commercial service with convenient connecting flights to and from anywhere in the world. Or you can fly into the area's major airports, San Jose and San Francisco, and take the scenic drive to Monterey.

Driving Directions:

From Monterey Peninsula Airport/Highway 68 from Salinas:

Take the Monterey Fisherman's Wharf exit, at first light turn right onto Aguajito, turn left onto Del Monte, at third light get into left lane and the DoubleTree will be to your right.

From North on Highway 1:

Take the Del Monte/Pacific Grove exit, at seventh light, get into the left lane, and drive until you get to the DoubleTree which will be to your right.

From South/Carmel on Highway 1:

Take the Aguajito exit, turn left at the first light (going under the freeway), follow Aguajito to Del Monte, turn left onto Del Monte, at third light get into left lane and the DoubleTree will be on your right.

ADDITIONAL INFORMATION

Message Desk:

A Symposium Message Desk will be in operation in the Registration area during registration hours from Sunday, October 20 at 5pm to Wednesday, October 23 at noon. Please advise callers who wish to reach you during the day to ask the hotel operator for the IEEE GaAs IC Symposium message desk. The DoubleTree Hotel's main telephone number is 831-649-4511. Please check the message board periodically during the Symposium.

Distribution of Relevant Information:

The GaAs IC Symposium will provide an officially designated area near the registration desk to serve as the proper display area for those in need of space to disseminate free material relevant to the GaAs IC industry. Printed material of any form will not be allowed to indiscriminately proliferate the registration area, hallways, lobbies, or other gathering areas, in proximity to the Symposium, technical sessions, evening social activities, panel sessions, or the exhibition.

Meeting Room Locations:

All meetings will be held in the various ballrooms on the 1st floor of the

DoubleTree Hotel. Short and Primer Course registration will be held in the Portola room on Saturday from 6:00pm - 8:00 pm. Conference registration will be held daily in the De Anza Foyer, the technical and panel sessions will take place in the De Anza ballrooms I, II, and III. Specifically, the Primer and Short Courses will be held in De Anza II. The Sunday night welcoming reception will take place in the De Anza I ballroom and Foyer. Exhibits and related events will be held in the Serra Ballroom of the Monterey Conference Center which is a Ballroom's walk away. Please refer to the 'Symposium at a Glance' (inside front cover) and the locator map (inside back cover) for specific room locations.

No Photographic and/or Recording Equipment:

No photographic or recording equipment will be permitted at any time during the technical sessions of the IEEE GaAs IC Symposium.

Breakfasts:

On Sunday, October 20 a continental breakfast will be available for Short Course registrants only in the De Anza Foyer. There will be a complimentary continental breakfast for all Symposium attendees to be held in the De Anza Foyer on Monday and Wednesday and at the GaAs IC Technical Exhibition on Tuesday in the Serra Ballroom of the Monterey Conference Center. Mondays breakfast is sponsored by BAE Systems.

Coffee Breaks:

The locations of coffee breaks will be as follows:

Short Course Registrants (only) -

Sunday, October 20: De Anza Foyer

Primer Course Registrants (only) -

Sunday, October 20: De Anza Foyer

Symposium Registrants -

Monday, October 21: De Anza Foyer

Tuesday, October 22: Serra Ballroom
Monterey Conference Center

Wednesday, October 23: De Anza Foyer

Coffee breaks are sponsored by AIXTRON, AXT, Kopin and Sumitomo Electric.

Symposium Social Events:

SYMPOSIUM OPENING RECEPTION

We welcome you to Monterey on Sunday evening, October 20 from 5:00 p.m. to 8:00 p.m. in the De Anza I and Foyer of the DoubleTree Hotel Monterey. Come and meet up with your old friends and make new acquaintances over light hors d'oeuvres and wine, beer, or soft drinks. One free admission is included with your registration, and extra tickets may be purchased at registration for \$40.

EXHIBITION OPENING RECEPTION

Our exhibitors are hosting a reception to mark the exhibition opening on Monday, October 21 from 5:00 p.m. to 7:00 p.m. Every Symposium participant is invited to enjoy the hors d'oeuvres and schmooze and cruise the exhibits in the Serra Ballroom of the Monterey Conference Center adjacent to the DoubleTree Hotel.

EXHIBITION LUNCH

On Tuesday at 12 noon the Exhibition Luncheon will be hosted in the Serra Ballroom of the Monterey Conference Center adjacent to the DoubleTree Hotel. The lunch is free to all Symposium participants, so come along, visit with the exhibitors, ask questions, make deals and find out what is going on in our industry.

SYMPOSIUM PARTY

Join us for the Symposium Theme Party on Tuesday, October 22, from 7:00pm to 10:30pm in the Outer Bay Wing at the world-famous Monterey Bay Aquarium. A NEW feature attraction that has been added this year is the "Jellies" exhibit. This stunning new exhibit just opened in April of 2002 and includes a free Jellies exhibit screen saver for all those who attend. Buses will be provided for transportation to the aquarium and back. The outer Bay Wing of the aquarium has been open for only five years and depicts marine life 60 miles offshore in the Monterey Canyon. Among the highlights is the United States' largest collection of jellyfish and a huge million-gallon tank filled with exotic species. This tank is the largest window to the ocean in the world with a visible area of 55 feet long and 17 feet high. The many aquarium exhibits provide a fascinating view of over 40 species collected from waters as deep as 3,300 feet below the ocean's surface. Many of these unique sea animals are not currently on live display anywhere else in the world.

Along with these spectacular displays of nature, we will offer an excellent dinner buffet featuring the best of California cuisine, beer, and wine. This fascinating atmosphere and the good food and refreshments will provide an excellent atmosphere to meet with colleagues old and new. One free admission to the Symposium Party is included with each full registration, and extra tickets can be purchased at the registration center for only \$75.

For further information the attractions of the Monterey Aquarium, please visit their web site at www.mbayaq.org

Monterey Attractions:

Among the many features Monterey itself has to offer is historic Cannery Row, a popular visitor area offering a multitude of unique galleries, shops, wine tasting rooms, and restaurants. Fisherman's Wharf, once the center of Monterey's fishing industry, also offers seafood restaurants, fish markets, and specialty shops. Sight-seeing and whale-watching charter and tour companies operate off the wharf daily. Within driving distance of Monterey are numerous wineries offering tours, as well as opportunities for scenic hiking, biking, water sports, golf, and even rock climbing.

Weather:

There is a significant variance in temperatures and weather patterns throughout Monterey County. The average maximum for October in the Monterey Peninsula is 70.4F and the average minimum 50.8F. It is advisable to dress in layers, with light to medium weight clothes during the day, and sweaters and jackets at night. For weather information, call 831-656-1725.

SYMPOSIUM HIGHLIGHTS

Technical Program:

The technical program for the 2002 IEEE GaAs IC Symposium consists of 57 technical papers, six panel sessions, a Fab Forum, an Industry Exhibit, the annual Short Course "IC Design for Receivers" and our introductory level class on Compound Semiconductor ICs (the Primer Course "Basics of Compound Semiconductor ICs"). This year we have invited 14 papers on a wide range of important topics. In addition, we continue the tradition of including important, late breaking news in selected sessions.

Exciting new developments from a variety of compound semiconductor disciplines will be presented. There is a tremendous amount of activity in the wireless and optical communication areas, as well as a strong interest in military electronics.

Short Course: "IC Design For Receivers"

This year the GaAs IC Symposium will present the fifteenth in a series of Short Courses applicable to various aspects of RF, Microwave and high speed circuit technology. The course will discuss the latest trends in IC design for wireless and wired receivers and the architectures that drive them. An overview of system architectures and their enabling technologies will be addressed. Areas covered include direct frequency conversion versus multi-frequency conversion schemes, RF front end LNA/switch/mixer IC design trades, and demodulation. Specific wired and wireless areas addressed are: cable modem, set top box, 3G basestations, WLAN, broadband and millimeter wave receiver.

Topics Covered and Instructors:

System Receive Path - Larry Burns
 Wireless Front End Design - Allen Podell
 3G basestation IC design - John Nisbet
 Broadband and mm-wave RX Design - TBD
 IC's for Wireless LAN 802.11a - TBD

Registration for the course is as noted in "Registration". A limited number of Short Course Notes will be available after the course for purchase by Symposium registrants, subject to availability. The cost is \$95.

Direct questions to:

Brad Nelson, Short Course Organizer
 Sirenza Microdevices (formerly Stanford Microdevices)
 408-616-5400
 bnelson@sirenza.com

GaAs IC Primer Course:

The GaAs IC Symposium will again offer an introductory-level class, "Basics of GaAs, InP, and SiGe RFICs," intended for professionals in the electronics industry with little or no experience in compound semiconductor ICs or for anyone who wants an excellent review. The class covers analog/microwave and optical communications ICs and their applications. The material is designed to provide a brief overview of concepts and issues unique to compound semiconductor ICs so that participants will be better able to profit from the Symposium Technical Program. The class is taught by Donald B. Estreich, an Agilent Technologies manager with 23 years experience in design and application of GaAs analog and microwave ICs, and Stephen Long, a University of California, Santa Barbara professor, also with 23 years experience in GaAs IC development. The class will be held Sunday evening, October 20th, Sunday, from 5:30 p.m. to 8:30 p.m.

The registration fee is \$240 for professionals and \$120 for students. The fee includes a handout containing a copy of the overheads with an extensive reference list. Space is limited, so **ADVANCE REGISTRATION IS HIGHLY RECOMMENDED**. For additional information, please contact the Primer Course Coordinator:

Mitchell Shifrin
 Hittite Microwave Corporation
 Chelmsford, MA
 Phone: 978-250-3343

Registration for the class is as noted in "Registration". A limited number of copies of the handouts will be available to symposium registrants, subject to availability. The cost is \$65.

Panel Sessions:

This year we have six exciting Panel Sessions spread over the 3 days of the technical sessions. These are intended to be timely, thought-provoking, educational, and possibly even controversial. The topics are as follows:

Panel Session 1:

"Markets in Defense Applications - Where Do We Go From Here?"

Monday, October 21st; 1:00 p.m. - 2:30 p.m.

Panel Session 2:

"10Gb/s versus 40Gb/s - When will there be more OC768 modules sold than startup companies?"

Monday, October 21st; 1:00 p.m. - 2:30 p.m.

Panel Session 3:

"Alternative Substrate Technology"

Tuesday, October 22nd; 3:30 p.m. - 5:00 p.m.

Panel Session 4:

"Truth - Radio on Chip or Radio on Module"

Tuesday, October 22nd; 3:30 p.m. - 5:00 p.m.

Panel Session 5:

"WLAN Power Amplifier Technology Shootout"

Wednesday, October 23rd; 3:30 p.m. - 5:00 p.m.

Panel Session 6:

"InP vs SiGe for 40G"

Wednesday, October 23rd; 3:30 p.m. - 5:00 p.m.

Please see the "Symposium Program" section later in this brochure for more complete descriptions of each of these Panel Sessions (listed according to their day and time).

Fab Forum:

The 2002 Fab Forum (formerly called the Vendor Product Forum), coordinated by Marko Sokolich of HRL Labs, will provide an opportunity for potential customers, business partners, or other interested parties to learn about some of the latest IC fab capabilities of our industry. The forum will be held on Tuesday, October 22 from 1:30 p.m. to 3:00 p.m.

This session lasts about 90 minutes with several speakers from leading companies in the industry. Each vendor is given 15 minutes for their presentation and questions from the audience.

GaAs IC Technology Exhibition:

The 2002 GaAs IC Technology Exhibition will be held concurrently with the IEEE GaAs IC Symposium on October 21 and 22 in the Serra Ballroom of the Monterey Conference Center, located adjacent to the DoubleTree Hotel. The Exhibition is open to all Symposium registrants. A wide variety of companies who sell state-of-the-art compound semiconductor integrated circuits as well as companies who sell critical products and services to the III-V IC industry will be represented. The early list of exhibitors already includes:

ACCENT OPTICAL TECHNOLOGIES
 ADVANCED CERAMICS CORP
 AIXTRON, INC
 AMERICAN XTAL TECHNOLOGY
 ANRITSU COMPANY
 ANSOFT CORPORATION
 APPLIED EPI, subsidiary of VEECO INSTRUMENTS
 APPLIED WAVE RESEARCH, INC.
 EMCORE CORPORATION
 FREIBERGER COMPOUND MATERIALS USA
 GLOBAL COMMUNICATION SEMICONDUCTORS, INC.
 GLOBAL COMMUNICATION TECHNOLOGY CORP
 INSACO, INC
 INTEGRATED SYSTEMS ENGINEERING, INC
 IQE, INC.
 KOPIN CORPORATION
 LEHIGHTON ELECTRONICS, INC
 M/A-COM
 MAXWELL TECHNOLOGIES
 MICROMANIPULATOR CO., INC. (THE)
 PICOGIGA, INC
 RIBER
 SAES PURE GAS, INC.
 STRATEDGE CORP.
 SUMITOMO ELECTRIC
 TEGAL CORPORATION
 THERMO VG SEMICON
 VEECO INSTRUMENTS, INC
 WIN SEMICONDUCTOR CORP.

The Exhibition will feature informative and interesting displays with corporate representatives on hand between the hours of 5:00 p.m. and 8:00 p.m. on Monday, October 21 and 7:30 a.m. to 4:00 p.m. on Tuesday, October 22. The Exhibition will also host the Exhibition Opening Reception on Monday evening from 5:00 p.m. until 7:00 p.m. and the Exhibition Luncheon from noon until 1:30 p.m. on Tuesday. All Symposium coffee breaks on Tuesday including breakfast will be held in the exhibition area.

There is still time for additional organizations to participate in the Exhibition. Interested parties should contact Mr. Harry Kuemmerle of VIP Meetings & Conventions, Pacific Palisades, CA at (310) 459-4691, Fax (310) 459-0605, e-mail: vipmtgs@aol.com. Or visit the GaAs IC Symposium's website at www.gaasic.org to download application forms or for additional information on the Exhibition, including the latest list of exhibitors.

Late-Breaking News Papers:

We have solicited papers containing late-breaking news for the Symposium Program. The times and locations of these presentations will be posted at the Symposium, as well as on the GaAs IC Symposium website at

<http://www.gaasic.org/>

In addition, extended abstracts for these papers will appear in the Symposium Digest.

Technical Digest:

Extra copies of the Technical Digest can be purchased by Symposium registrants through Advance Registration. A limited number of digests will also be available for sale at the Registration Desk after 1:00 p.m. on Tuesday, October 22nd. The cost of the paper bound digest, if ordered through Advance Registration or purchased on-site, is \$65. The CD ROM Digest for 2002 will also be offered for \$75. A limited number of digests from previous years will be available for \$40. Digests will also be available after the Symposium by mail from the IEEE Customer Service Center, 445 Hoes Lane, Piscataway, NJ 08854 at (800) 678-4333.

Outstanding Paper Award:

The 2002 IEEE GaAs IC Symposium will select a contributed paper for the Outstanding Paper Award. All contributed regular papers (not the invited papers) will automatically be considered as candidates. Symposium attendees will have an opportunity to provide feedback through a Symposium questionnaire as well as to the Session Chairpersons. The award winner will be publicly announced shortly after this year's Symposium with the award formally presented at next year's GaAs IC Symposium.

SHORT COURSE

Sunday, October 20, 2002
DoubleTree Hotel Monterey
De Anza II
8:00 a.m. - 4:45 p.m.

“IC Design for Receivers”

Course Coordinator: Brad Nelson
 Sirenza Microdevices
 408-616-5400
 bnelson@sirenza.com

Short Course Description

This year the GaAs IC Symposium will present the fifteenth in a series of Short Courses applicable to various aspects of RF, Microwave and high-speed circuit technology. The course will discuss the latest trends in IC design for wireless and wired receivers and the architectures that drive them. An overview of system architectures and their enabling technologies will be addressed. Areas covered include direct frequency conversion versus multi-frequency conversion schemes, RF front end LNA/switch/mixer IC design trades, and demodulation. Specific wired and wireless areas addressed are: cable modem, set top box, 3G basestations, WLAN, broadband and millimeter wave receiver.

Topics Covered and Instructors:

- a) System Receive Path - Larry Burns
- b) Wireless Front End Design - Allen Podell
- c) 3G basestation IC design - John Nisbet
- d) Broadband and mm-wave RX Design - TBD
- e) IC's for Wireless LAN 802.11a - TBD

In the unlikely event that an instructor is unable to participate, an alternate instructor may be substituted.

Who Should Attend

The short course is a must for everyone interested in wireless and wired receivers from system level designers to IC designers. Our lectures will cater to a range of interests and experience levels. The course is designed to give all attendees a solid overview of device, circuit and system considerations for current advanced receivers and the trends driving them.

Short Course Schedule

The course will be held on Sunday October 20th and will begin with a continental breakfast. Instructors will begin promptly at 8:00AM. A lunch will be provided as well as morning and afternoon refreshment breaks.

7:00AM	Registration and Breakfast (De Anza Foyer)
8:00AM	Introduction and Overview (De Anza II) Brad Nelson, Sirenza Microdevices
8:05AM	System Receive Path Larry Burns, Broadcom
9:25AM	Wireless Front End Design Allen Podell
10:45AM	Coffee Break
11:00AM	3G Basestation IC Design (De Anza II) John Nisbet, Sirenza Microdevices
12:20PM	Lunch (De Anza I)
1:30PM	IC's for WLAN 802.11a Instructor TBD
2:50PM	Coffee Break
3:05PM	Broadband and Millimeter Wave Rx Design Instructor TBD
4:25PM	Questions and Discussion
4:45PM	Close of Short Course

Short Course Pre-Registration

So that we may properly plan for attendance, we encourage you to pre-register for the Short Course. A limited number of registrations will be available on-site immediately prior to the start of the course. The price for the Short Course is \$420 for those that pre-register, and \$460 for those that register on-site. The price for students is \$210 for those that pre-register, and \$230 for on-site registration. The registration fee includes the lectures, a book of Short Course Notes, continental breakfast, lunch, and morning/afternoon refreshments. Additional copies of the Short Course Notes may be purchased for \$95 each.

GaAs IC PRIMER COURSE

Sunday, October 20, 2002
DoubleTree Hotel Monterey
De Anza II
5:30 p.m. - 8:30 p.m.

“Basics of GaAs ICs”

Course Coordinator: **Mitchell Shifrin**
 Hittite Microwave Corporation
 Chelmsford, MA
 Phone: 978-250-3343

Instructors: **Stephen I. Long**
 University of California
 Santa Barbara, CA

Donald B. Estreich
 Agilent
 Santa Rosa, CA

Course Objective and Description:

The popular Primer Course “Basics of GaAs ICs” is an introductory-level class intended for professionals in the electronic industry with little or no experience in GaAs IC technology. It also provides an excellent review for those with more experience. The course covers: digital and analog/RF/microwave circuits; III/V materials; MOS and bipolar devices; and fabrication technology. The course is tailored to provide background for symposium participants to better understand and appreciate the papers presented, including a glossary of those ever-cryptic acronyms. Throughout the course, comparisons among the GaAs technologies will be presented as well as comparisons with silicon technologies. Also, a number of GaAs integrated circuits along with the intended applications will be described.

Instructors Stephen I. Long and Donald B. Estreich each have over 20 years of experience working with GaAs ICs. A copy of their viewgraphs with an extensive bibliography will be distributed to each Primer Course registrant. Ample discussion time will provide an opportunity for participants to have questions answered by the instructors.

Course Agenda:

5:30 p.m.	Introduction
5:35 p.m.	GaAs History, Materials, and Processes
6:00 p.m.	Device Operation
6:30 p.m.	Discussion
6:40 p.m.	Break
6:50 p.m.	Digital Circuits
7:30 p.m.	Analog/RF/Microwave Circuits
8:10 p.m.	Summary and Discussion
8:30 p.m.	Close

OTHER MEETINGS

2002 GaAs Reliability Workshop:

The 17th annual Workshop on GaAs Reliability, sponsored by JEDEC JC-14.7 Committee on GaAs Reliability and Quality Standards and the EIA, and with co-sponsorship of the Electron Devices Society of the IEEE, will be held in conjunction with the IC Symposium on Sunday, October 20, 2002, from 8:00 a.m. to 5:00 p.m. at the DoubleTree Hotel in Monterey, CA.

The workshop will bring together researchers, manufacturers and users of GaAs and other III-V compound semiconductor devices. Papers presenting the latest results, including work-in-progress, and new developments in all aspects of GaAs reliability will be presented. Potential authors are requested to submit an electronic copy of a one to two page comprehensive summary, suitable for a 15 minute presentation, to: Dr. Wallace T. Anderson, Technical Program Chairman, at anderson@estd.nrl.navy.mil, Naval Research Laboratory, Code 6835, Washington DC 20375, phone (202) 767-1755. The deadline for receipt of submissions is August 5, 2002, and the Advanced Program will be published on our WEB site when available. Late news papers of significant interest will also be considered.

Registration for the workshop is \$95.00 in advance, or \$125.00 at the door. To pre-register, mail your name, Post Office address, email address, and phone number with a check for \$95 to: EIA/JEDEC, JC-14.7 Workshop, 2500 Wilson Boulevard, Arlington, VA 22201-3834 by October 7, 2002. Registration includes a full day of GaAs reliability papers, two breaks, a luncheon and a copy of the Proceedings. Late registration will be available from 7:30 a.m. to 8:30 a.m. on the morning of the workshop. For further information or to download a pre-registration form, visit our WEB site at www.jedec.org and click on GaAs, or contact: Dr. Anthony A. Immorlica, Jr., Workshop Chairman, BAE SYSTEMS, 130 D.W. Highway, Merrimack, NH 03054; email: anthony.a.immorlica@baesystems.com.

SEMI Compound Semiconductor Materials Standards and ASTM Committee Meeting

The next SEMI Standards Compound Semiconductor Materials Committee Meeting is scheduled during the IEEE GaAs IC Symposium for Monday, October 21, 2002, from 8:00-10:00 PM in a meeting room to be determined.

SEMI and ASTM hold joint meetings to develop test methods and specifications as a cooperative effort.

The SEMI Standards Compound Semiconductor Materials Committee would like to cordially invite the 2002 IEEE GaAs IC Symposium attendees interested in the development of internationally approved standards for Wafer Specifications (GaAs, InP, SiC dimensions/orientation, electrical properties), Epitaxy Layer Specifications, non-destructive mobility measurements, eddy current probe measurement resolution, test methods for etch pit density (EPD), room temperature resistivity mapping and investigations of electronic data interchange (EDI) codes for wafer marking to attend the next committee meeting on Monday, October 21, 2002.

Based in San Jose, Calif., SEMI is an international industry association serving more than 2,500 companies participating in the semiconductor and flat panel display equipment and materials markets. SEMI maintains offices in Austin, Beijing, Boston, Brussels, Hsinchu, Moscow, Seoul, Singapore, Tokyo and Washington, D.C. For more information, visit SEMI on the Internet at www.semi.org.

For additional information, please contact:

Committee Co-chair: James Oliver, Northrop-Grumman, P.O. Box 1521 M/S 3K13, Baltimore, MD 21203; Phone: 410-765-0117; Fax: 410-765-7370; james_d_oliver@md.northgrum.com

Committee Co-chair: Russ Kremer, Freiburger Compound Materials, USA, 10151 Stroud Lane, Dayton, OH 45458; Phone: 937-291-2899; fcmusa2@aol.com

SEMI Contact: Kenneth Schramko, Standards Engineer, SEMI, 3081 Zanker Road, San Jose, CA 95134; Phone: 408-943-6996; Fax: 408-943-7943; kschramko@semi.org

SYMPOSIUM PROGRAM

Monday, October 21, 2002

REGISTRATION AND CONTINENTAL BREAKFAST

7:00 a.m. - 5:00 p.m.

Registration - De Anza Foyer - DoubleTree

7:00 a.m. - 8:00 a.m.

Continental Breakfast - De Anza Foyer - DoubleTree

SYMPOSIUM OPENING

8:00 a.m. - 8:25 a.m.

De Anza I, II & III - DoubleTree

Introduction and Awards Presentation

2002 Symposium Chairman

Tim Henderson, *TriQuint Semiconductor*

2002 Technical Program Chairman

Chris Bozada, *Air Force Research Laboratory*

SESSION A: PLENARY SESSION

8:30 a.m. - 11:30 a.m.

De Anza I, II & III - DoubleTree

Chairpersons: Brad Nelson, *Sirenza Microdevices*
Gary Valentine, *Raytheon Electronic Systems*

8:30 a.m.

A.1 **SiGe BiCMOS Process Technology** (Invited Paper)
P. Kempf, M. Racanelli, *JAZZ, 4311 Jamboree Rd., Newport Beach, CA 92600*

9:00 a.m.

A.2 **The Transforming MMIC** (Invited Paper)
E. Martinez, *DARPA/MTO, 3701 N. Fairfax Drive, Arlington, VA 22203*

9:30 a.m.

A.3 **A 2.4 & 5 GHz Dual Band 802.11 WLAN Supporting Data Rates to 108 Mb/s** (Invited Paper)
B. McFarland, A. Shor, A. Tabatabaei, *Athenos Communications, 529 Almanor Ave. Sunnyvale, CA 94085*

10:00 a.m. - 10:30 a.m.

Coffee Break

10:30 a.m.

A.4 **High-Speed Optoelectronic Packaging** (Invited Paper)
B. Velsler, *Kyocera America, Inc., San Diego, CA, 92123*

11:00 a.m.

A.5 **Integrated Circuits for Fiber Systems** (Invited Paper)
J. Sitch, *Nortel Networks, 35 Carling Ave., Ottawa, ON K2H 8E9, Canada*

11:30 a.m.

End of Session A

11:30 a.m. - 1:00 p.m.

Break for Lunch

Monday, October 21, 2002

PANEL SESSION 1:

Markets in Defense Applications - Where Do We Go From Here?

1:00 p.m. - 2:30 p.m.

De Anza I - DoubleTree

Organizers/Moderators: John Martinez, *BAE Systems*
Jim Sowers, *Space Systems/Loral*

In the past 5-10 years most of the emphasis on MMICs and device development and manufacturing has been focused on developing commercial markets. Commercial suppliers consider time to market (in volume) and cost a priority and will spend what it takes to get it, whereas the military suppliers are mainly attentive to performance in very small quantities and are reluctant to make upgrades to old production facilities. These differences have typically meant that very capable, high-capacity lines are in place for commercial production while traditional defense suppliers are hamstrung by legacy equipment and the techniques they impose. Some traditional defense companies have tried to tap the commercial markets and later pulled back, while the newer commercial companies have largely ignored defense markets in the past. With the recent interest/increases in defense spending and declines in commercial markets, questions arise as to how the MMICs and other critical ICs will be supplied. Our expert panelists will be addressing the following questions in this area:

1. How have the opportunities in defense changed in recent years, and how did the surge in commercial markets influence this?
2. Can the current fab capacity that has been formed by the influences/developments over the past 5-10 years handle the commercial and military market needs? Is the right kind of capacity in the right places?
3. Do fabs now need to address both commercial and military markets to sustain profitability?
4. What are the key difficulties in mixing commercial and defense operating requirements? Are they destined to remain separated?

Panel Members:

Dominique Pons	<i>UMS</i>
Tony Immorlica	<i>BAE Systems</i>
Lisa Aucoin	<i>Raytheon</i>
Mike Golio	<i>Thoughtbeam (A Motorola Company)</i>

2:30 p.m. - 3:00 p.m.

Coffee Break

PANEL SESSION 2:

10Gb/s versus 40Gb/s - When will there be more OC768 modules sold than startup companies?

1:00 p.m. - 2:30 p.m.

De Anza II - DoubleTree

Organizers/Moderators: The' Linh Nguyen, *Finisar Corp.*
Pierre Mandeville, *Nortel Networks*

As 40Gb/s components mature, the debate of TDM versus WDM starts again. Economics had thus far settled the debate in favor of TDM solution, particularly demonstrated in the case of OC192 vs. DWDM OC48. But has the equation changed this time around for OC768? With large percentage of fiber still unlit, telecom down turn, and carrier spending on the decline, are we about to see a revolution within the 10Gb/s space? Cost/bit/distance still remains the figure of merit, and system engineers from both camps are looking for ways to bring that down. Advance in CMOS makes electrical

Monday, October 21, 2002

equalization implementation even cheaper with integrated DSP. Can this drive the cost of 10Gb/s down as well as enable longer 10Gb/s reach. More efficient modulation scheme and availability of ultra DWDM components (50 GHz and 25 GHz spacing optical filter and add/drop MUX and DEMUX) can tilt the scale towards 10Gb/s DWDM. Advance in low cost high-speed chip-scale packaging can dictate how the system can be partitioned and the level of integration demand on the IC. This can have positive influence the cost structure of 40Gb/s implementations. Advance in OEIC and high level of integration on InP technologies can make 40Gb/s ICs very cost effective in systems that require higher overhead FEC and/or equalization to overcome fiber nonlinear impairments.

Panel Members:

John Sitch	<i>Nortel Networks</i>
Allan Armstrong	<i>RHK, Inc.</i>
Marc Rocchi	<i>OMMIC</i>
Kursad Kiziloglu	<i>Intel Corp.</i>
Hanan Anis	<i>Ceyba</i>

2:30 p.m. - 3:00 p.m.

Coffee Break

SESSION B: ICs for Microwave/Millimeter Wave Applications

3:00 p.m.

De Anza I - DoubleTree

Chairpersons: Dan Scherrer, *Agilent Technologies*
Gary Valentine, *Raytheon Electronic Systems*

3:00 p.m.

B.1 **Overview on GaAs MMICs for Automotive Radar** (Invited Paper)
M. Camiade, *United Monolithic Semiconductors, RD 128, BP46, 91401 Orsay Cedex, France*

3:30 p.m.

B.2 **A Four-Stage Ku-Band 1 Watt PHEMT MMIC Power Amplifier**,
H.Z. Liu, C.C. Wang, Y. H. Wang, *National Cheng-Kung University, Tainan, Taiwan ROC*; J.W. Huang, C. H. Chang, W. Wu, C. L. Wu, C. S. Chang, *Transcom, Inc. Taiwan*

3:50 p.m.

B.3 **A Compact 30 GHz MMIC High Power Amplifier (3W CW) in Chip and Packaged Form**, K. Kong, D. Boone, M. Vernon, M. King, E. Reese, G. Brehm, *TriQuint Semiconductor, 500 W. Renner Rd, Richardson, TX 75080*

4:10 p.m.

B.4 **1-Watt Broad Ka-band Ultra Small High Power Amplifier MMICs Using 0.25- μ m GaAs PHEMTs**, A. Bessemoulin, J. Dishong, G. Clark, D. White, P. Quentin, H. Thomas, D. Geiger, and S.R. Nelson, *United Monolithic Semiconductors, RD 128, BP46, 91401 Orsay Cedex, France*

4:30 p.m.

B.5 **Multi-Stage G-Band (140-220 GHz) InP HBT Amplifiers**, M. Urteaga, D. Scott, S. Krishnan, Y. Wei, M. Dahlstrom, Z. Griffith, N. Parthasarathy, M. Rodwell, *ECE, UCSB, Santa Barbara, CA 93106*

4:50 p.m.

End of Session B

Monday, October 21, 2002

SESSION C: Optical Front End ICs

3:00 p.m.

De Anza II - DoubleTree

Chairpersons: The'Linh Nguyen, *Finisar Corp*
Anu Mahajan, *TriQuint Semiconductor*

3:00 p.m.

C.1 **Low Cost, High Performance InGaAs Avalanche Photodiodes for Datacom Transceivers**, (Invited) J.C. Dries, *Sensors Unlimited, 3490 Route 1 Princeton, NJ 08550*

3:30 p.m.

C.2 **Monolithic Integration of In_{0.53}Ga_{0.47}As Photodiodes and In_{0.53}Ga_{0.47}As/In_{0.52}Al_{0.48}As HEMTs on GaAs Substrates for Long Wavelength OEIC Applications**, J.H. Jang, G. Cueva, I. Adesida, *Dept. ECE, Univ. of IL Urbana-Champaign, 208 N. Wright St. Urbana, IL 61801*; R. Sankaralingam, P. Fay, *U. of Notre Dame*; W.E. Hoke, *Raytheon RF Components, Andover, MA*

3:50 p.m.

C.3 **A 40 Gb/s Integrated Differential PIN+TIA with DC Offset Control Using InP SHBT Technology**, D. Caruth, S.C. Shen, D. Chan, M. Feng, *Xindium Technologies, Inc, 100 Trade Center Drive, Suite 304, Champaign, IL 61820*

4:10 p.m.

C.4 **40 GHz Transimpedance Amplifier with Differential Outputs using InP/InGaAs Heterojunction Bipolar Transistors**, C.Q. Wu, E.A. Sovero, B. Massey, *Vitesse Semiconductor, 741 Calle Plano, Camarillo, CA 93012*

4:30 p.m.

C.5 **SiGe Differential Transimpedance Amplifier with 50 GHz Bandwidth**, J.S. Weiner, A. Leven, V. Houtsma, Y. Baeyens, Y.K. Chen, *Bell Labs/Lucent Technologies, 600 Mountain Ave, Murray Hill, NJ 07974*; P. Paschke, *Lucent Technologies, Germany*

4:50 p.m.

End of Session C

GaAs Technology Exhibition
Opening Reception
Serra Ballroom
Monterey Conference Center
5:00 p.m. - 7:00 p.m.

Tuesday, October 22, 2002**REGISTRATION AND CONTINENTAL BREAKFAST**

7:00 a.m. - 5:00 p.m.

Registration - De Anza Foyer - DoubleTree

7:30 a.m. - 8:30 a.m.

Continental Breakfast - Serra Ballroom - Monterey Conference Center**SESSION D: HBT and HEMT Reliability**

8:30 a.m.

De Anza I - DoubleTree

Chairpersons: Tony Immorlica, *BAE Systems*
Bill Peatman, *ANADIGICS*

8:30 a.m.

D.1 **Reliability of InGaP Emitter HBTs at High Collector Voltage,** B. Yeats, M. Bonse, P. Chandler, M. Culver, D. D'Avanzo, G. Essilfie, C. Hutchinson, D. Kuhn, T. Low, T. Shirley, *Agilent Technologies, 1400 Fountain Grove Parkway, Santa Rosa, CA 95403*

8:50 a.m.

D.2 **0.1 μ m InGaAs/InAlAs/InP HEMT MMICs - a Flight Qualified Technology,** Y.C. Chou, D. Leung, R. Grundbacher, R. Lai, M. Barsky, Q. Kan, D. Eng, M. Wojtowicz, T. Block, S. Olson, P.H. Liu, A. Oki, D. Streit, *TRW Inc., Redondo Beach, CA 90278*

9:10 a.m.

D.3 **High Reliability in Low Noise InGaP Gated PHEMTs,** C.S. Wang, H.K. Huang, Y.H. Wang, *Dept. EE, National Cheng-Kung University, Tainan, Taiwan*; C.L. Wu, C.S. Chang, *Transcom Inc., Taiwan*

9:30 a.m.

D.4 **Impact of RF Stress on Dispersion and Power Characteristics of AlGaIn/GaN HEMTs,** S.H. Hsu, P. Valizadeh, D. Pavlidis, *Dept of EECS, U. of Michigan, Ann Arbor, MI 4810*; J.S. Moon, M. Micovic, D. Wong, T. Hussain, *HRL Labs, Malibu, CA*

9:50 a.m.

End of Session D**SESSION E: Broadband Amplifier and Optical Modulator Drivers**

8:30 a.m.

De Anza II - DoubleTree

Chairpersons: Vincent Hietala, *Quellan Inc.*
Benjamin Tang, *Primarion*

8:30 a.m.

E.1 **A 3-V Fully Differential Distributed Limiting Driver for 40 Gb/s Optical Transmission Systems,** D.S. McPherson, F. Pera, M. Tazlauanu, S.P. Voinigescu, *Quake Technologies, Inc. Ottawa, ON, K2K 2T8, Canada*

8:50 a.m.

E.2 **Technology and Circuit Considerations for High Performance Optical Driver Design,** A. Turudic, W.A. Wohlmuth, B. Davenport, M. Heins, C. Steinbeiser, C.F. Campbell, J.M. Carroll, *TriQuint Semiconductor, Inc., 2300 NE Brookwood Pkwy, Hillsboro, OR 97123*

Tuesday, October 22, 2002

9:10 a.m.

E.3 **An Over 110-GHz InP HEMT Flip-Chip Distributed Baseband Amplifier with Inverted Microstrip Line Structure for Optical Transmission Systems,** S. Masuda, T. Hirose, T. Takahashi, S. Iijima, K. Ono, N. Hara, K. Joshin, *Fujitsu Laboratories, Ltd., 10-1 Morinosato-Wakamiya, Atsugi 243-0197, Japan*; M. Nishi, S. Yokokawa, *Fujitsu Quantum Devices, Ltd. Japan*

9:30 a.m.

E.4 **A High Gain-Bandwidth Product InP HEMT Distributed Amplifier with 92 GHz Cut-off Frequency for 40 Gb/s Applications and Beyond,** C. Meliani, G. Rondeau, G. Post, J. Decobert, W. Mouzannar, E. Dutsseuil, R. Lefevre, *OPTO+, Alcatel R&I, Route de Nozay, F-91461 Marcoussis, France*

9:50 a.m.

End of Session E

9:50 a.m. - 10:30 a.m.

Coffee Break**SESSION F: Frequency Conversion Techniques for Wireless Applications**

10:30 a.m.

De Anza I - DoubleTree

Chairpersons: Malcolm Stubbs, *CRC*
Yves Baeyens, *Bell Labs /Lucent Technologies*

10:30 a.m.

F.1 **Adaptive Modeling and Design of Highly Integrated 3D Microwave-Millimeter Wave Radio Front-Ends** (Invited Paper), E.M. Tentzeris, *School of ECE, Georgia Inst. Of Tech, Atlanta, GA 30332*

11:00 a.m.

F.2 **Direct Up-Conversion MMIC with RF Bandwidth of 4 to 12 GHz,** J.J. Komiak, W. Kong, K. Nichols, *BAE Systems, 65 Spit Brook Rd NHQ1-423, Nashua, NH 03061*

11:20 a.m.

F.3 **A 16 GHz MMIC Image-Rejection Resistive Mixer with InP HEMTs,** A. Orzati, F. Robin, H.P. Meier, W. Bachtold, *Swiss Federal Inst. Of Tech., Gloriastrasse 35, CH-8092 Zurich, Switzerland*

11:40 a.m.

F.4 **Architectural Trade-Offs for SiGe BiCMOS Direct Conversion Receiver Front-Ends for IEEE802.11a,** S. Chakraborty, J. Laskar, *School of ECE, Georgia Inst. of Tech, 791 Atlantic Drive, Atlanta, GA 30332*; S.K. Reynolds, T. Beukema, H. Ainspan, *IBM, Yorktown Heights, NY*

12:00 p.m.

End of Session F

Tuesday, October 22, 2002**SESSION G: Emerging Technologies**

10:30 a.m.

De Anza II - DoubleTree

Chairpersons: Walter Wohlmuth, *TriQuint Semiconductor*
Jim Sowers, *Space Systems/Loral*

10:30 a.m.

G.1 **RF Power Devices for Cellular Communications** (Invited Paper)
C. Weitzel, *Motorola, 2100 E. Elliot Rd, Tempe, AZ 85284*

11:00 a.m.

G.2 **Gallium Nitride: Use in High Power Control Applications**
(Invited Paper) R.H. Caverly, N.V. Drozdovski, C. Joye, M. Quinn,
Dept. of ECE, Villanova University, Villanova, PA 19085

11:20 a.m.

G.3 **New Product Applications and Technology Directions with SiGe BiCMOS**, J. Dunn, D. Harame, A. Joseph, D. Coolbaugh, G. Freeman, R. Groves, K. Stein, R. Volant, S. Subbanna, V. Marangos, S. St Onge, E. Eshun, P. Cooper, J. Johnson, V. Ramachandran, D. Ahlgren, D. Wang, and X. Wang, *IBM, 1000 River Rd, Essex Jct. VT 05452*

11:40 a.m.

G.4 **DC and RF Characteristics of Depletion-mode GaAs MOSFET Employing a Thin Ga₂O₃/Gd₂O₃ Layer (74Å) as Gate Dielectric**, B. Yang, P.D. Ye, J. Kwo, M.R. Frei, H-J. L. Gossmann, J.P. Mannaerts, M. Sergent, M. Hong, K. Ng, J. Bude, *Agere Systems, 600 Mountain Ave. RM 2D-307E, Murray Hill, NJ 07974*

12:00 p.m.

End of Session G

Exhibition Lunch
Serra Ballroom - MCC
12:00 noon - 1:30 p.m.

FAB FORUM:**The Indium Phosphide Invasion**

1:30 p.m. - 3:00 p.m.

De Anza I - DoubleTree

Organizer/Moderator: Marko Sokolich, *HRL Labs*

The 2002 Fab Forum (this year's version of the Vendor Product Forum), will provide an opportunity for potential customers, business partners, or other interested parties to learn about some of the advanced III-V semiconductor fabrication processes across the globe. Speakers will describe the advantages of their fab technology, any additional services that they offer and the model for access (if any) in 15 minute talks. Companies with captive fabrication facilities are welcome to describe how their fab capability results in superior products.

Speakers will sit on a panel to answer audience questions. Speakers from TRW, Triquint, Global Communication Semiconductors, Vitesse, Xindium and others will present. If you wish to participate as a speaker (there are a few slots left) please notify Marko Sokolich (msokolich@hrl.com). Additional speakers will be accommodated on a first-come, first-served basis.

Tuesday, October 22, 2002**SESSION LN1: Late News Papers**

1:30 p.m. - 3:00 p.m.

De Anza II - DoubleTree

3:00 - 3:30 p.m.

Coffee Break**PANEL SESSION 3: Alternative Substrate Technology**

3:30 p.m. - 5:00 p.m.

De Anza I - DoubleTree

Organizers/Moderators: Jan-Erik Mueller, *Infineon Technologies*
Cedric Monier, *TRW*

III-Vs are under pressure from Si in respect to high performance at low cost. The panel discusses what kind of material and device technology will be used by the III-V community in future to give an answer to this threat. How are the prospects for bringing down material's cost for III-Vs at even increased performance? The advantages and drawbacks of various approaches including technology status will be discussed.

Among the issues to be covered besides cost and device performance are types of devices available, reliability, manufacturability, yield, wafer diameter, integration capability (having the potential of Si in mind). On the panel are experts with different views (wafer supplier, epi supplier, device manufacturer) to cover this complex subject.

Panel Members:

Mike Golio	<i>Thoughtbeam (A Motorola Co.)</i>
Augusto L. Gutierrez-Aitken	<i>TRW</i>
Peter Frijlink	<i>OMMIC</i>
Robert J. Tobin	<i>American Xtal Technology</i>
Phil F. Marsh	<i>Raytheon</i>
Yohei Otoki	<i>Hitachi Cable</i>

PANEL SESSION 4: Truth - Radio on Chip or Radio on Module

3:30 p.m.-5:00 p.m.

De Anza II - DoubleTree

Organizers/Moderators: Joy Laskar, *Georgia Tech*
Dan Scherrer, *Agilent Technologies*

It's been almost a decade and the jury is still out on what is the best approach to implement a radio, is it a highly integrated solution in the form of a single chip? Is it a traditional multi-chip solution or a module? While there are some clear advantages for an integrated single chip approach, many still argue that the single chip is just not possible. Bets have been placed and various wireless standards are customized to provide an advantage for one approach versus the other, but yes the jury is still out. The traditional multi-chip solutions continue to dominate as they evolve into to multi-chip modules while single chip ICs gain momentum and open the doors for silicon technologies in the RF world. There may never be a clear winner or loser, but this topic remains as hot as ever.

This panel session will include discussions on radio architectures, semiconductor technologies, and packaging processes with an emphasis on the truth! Single-chip or Multi-Chip!

Tuesday, October 22, 2002**Panel Members:**

Berinder Brar	<i>Rockwell Science Center</i>
Kenji Itoh	<i>Mitsubishi</i>
Babak Matinpour	<i>RF-Solutions</i>
Bill McFarland	<i>Atheros</i>
Anh-Vu Pham	<i>UC-Davis</i>

5:00 p.m.

End of Panels 3 & 4

Symposium Theme Party
Monterey Aquarium
7:00 p.m. - 10:00 p.m.

Wednesday, October 23, 2002**REGISTRATION AND CONTINENTAL BREAKFAST**

7:00 a.m.- 12:00 noon

Registration - De Anza Foyer - DoubleTree

7:30 a.m. - 8:30 a.m.

Continental Breakfast - De Anza Foyer - DoubleTree**SESSION H: Power Amplifier Techniques and Technology**

8:20 a.m.

De Anza I - DoubleTree

Chairpersons: Dave Halchin, *RF Micro Devices*
 Paul Blount, *Hittite Microwave*

8:20 a.m.

H.1 **A MMIC Smart Power Amplifier of 21% PAE at 16 dBm Power Level for W-CDMA Mobile Communications Terminals**, J.H. Kim, S.G. Kim, C.S. Park, *School of Engineering, Information and Communications University, 58-4 Hwaam, Yusong, Daejeon 305-732, Korea*

8:40 a.m.

H.2 **An 8-Watt 3.5 GHz Power Amplifier with Tunable Matching**, S. Rockwell, R. Emrick, B. Bosco, S. Franson, M. Miller, E. Johnson, J. Crowder, *Motorola Labs, 7700 S. River Parkway, ML28, Tempe, AZ 85248*

9:00 a.m.

H.3 **A 4-Watt X-Band Compact Coplanar High Power Amplifier MMIC with 18-dB Gain and 25% PAE**, A. Bessemoulin, H. Massler, R. Quay, S. Ramberger, M. Schlechtweg, *Fraunhofer Institute for Applied Solid-State Physics, Tullastrasse 72, D-79108 Freiburg, Germany*

9:20 a.m.

H.4 **X-Band Successive Detection Log Amplifier/Limiter MMIC Implemented in 0.15 μ m Double Recess PHEMT**, J.J. Komiak, W. Kong, K. Nichols, *BAE Systems, 65 Spit Brook Rd NHQ1-423, Nashua, NH 03061*

9:40 a.m.

H.5 **A 23/3-dB Dual-Gain Low-Noise Amplifier for 5-GHz-Band Wireless Applications**, Y. Aoki, N. Hayama, M. Fujii, and H. Hida, *NEC Corporation, Japan*

10:00 a.m.

End of Session H**SESSION I: 40G Digital ICs**

8:30 a.m.

De Anza II - DoubleTree

Chairpersons: Zhihao Lao, *OpNext*
 Allan Armstrong, *RHK, Inc.*

8:30 a.m.

I.1 **An Overview and Comparison of Parametric Test Methodologies for 10 Gbit/s SONET/SDH and Ethernet Components and Systems** (Invited Paper) G.D. LeCheminant, *Agilent Technologies Lightwave Division, 3910 Brickway Blvd, Santa Rosa, CA 95403*

9:00 a.m.

I.2 **50-Gbit/s 4-bit Multiplexer/Demultiplexer Chip-Set using InP HEMTs**, K. Sano, K. Murata, S. Sugitani, H. Sugahara, T. Enoki, *NTT Photonics Labs, NTT Corp, 3-1 Morinosato Wakamiya, Atsugi-shi Kanagawa 243-0198, Japan*

Wednesday, October 23, 2002

9:20 a.m.

- I.3 **STS-768 Multiplexer with Full Rate Output Data Retimer in InP HBT**, A. Hendarman, E.A. Sovero, X. Xu, K. Witt, *Vitesse Semiconductor Corp, 741 Calle Plano, Camarillo, CA 93012*

9:40 a.m.

- I.4 **InP DHBT Technology for Design for 40 Gbit/s Full-Rate Clock Communications Circuits**, J. Godin, M. Riet, S. Blayac, P. Berdaguer, V. Dhaluin, F. Alexandre, M. Kahn, A. Pinquier, A. Kasbari, J. Moulu, A. Konczykowska, *Alcatel R&I/OPTO+, Route de Nozay, 91460 Marcoussis, France*

10:00 a.m.

End of Session I

10:00 a.m. - 10:30 a.m.

Coffee Break**SESSION J: Advances in Modeling and Simulation**

10:30 a.m.

De Anza I - DoubleTree**Chairpersons:**

Olin Hartin, *Motorola*
Pierre Mandeville, *Nortel*

10:30 a.m.

- J.1 **Designing High-Speed MMICs and OEICs for 10Gb/s and 40 Gb/s Optical Transponder Front-Ends** (Invited Paper), K. Laursen, C. Yuen, D. Chu, *OEpic, Inc. 1231 Bordeaux Drive, Sunnyvale, CA 94089*

11:00 a.m.

- J.2 **Direct Extraction of InGaP/GaAs HBT Large Signal Model**, A. Raghavan, B. Banerjee, S. Venkataraman, J. Laskar, *Yamacraw Design Center, School of ECE, Georgia Inst. of Technology, 791 Atlantic Drive, Atlanta, GA 30332*

11:20 a.m.

- J.3 **Three-Dimensional Analysis of Leakage Currents in III-V HBTs**, V. Palankovski, R. Klima, S. Selberherr, *Inst. for Microelectronics TU Vienna, Gusshausstr. 27-29, A-1040 Vienna, Austria; R. Schultheis, Infineon, Germany*

11:40 a.m.

- J.4 **Simulations of Quantum Transport in HEMT using Density Gradient Model**, E. Lyumkis, R. Mickevicius, O. Penzin, B. Polsky, K. El Sayed, A. Wettstein, W. Fichtner, *Integrated Systems Engineering., 111 N. Market St., San Jose, CA 95113*

12:00 p.m.

- J.5 **Bias Dependence of 0.25 μ m pHEMT Parasitic Elements as Determined with a Direct Extraction Method**, C. Campbell, *TriQuint Semiconductor, PO Box 833938, Richardson, TX 75243*

12:20 p.m.

End of Session J**Wednesday, October 23, 2002****SESSION K: Application of Novel Circuits and Technologies**

10:30 a.m.

De Anza II - DoubleTree**Chairpersons:**

Mohammad Madihian, *NEC USA*
Kevin Kobayashi, *Sirenza Microdevices*

10:30 a.m.

- K.1 **Gallium Nitride (GaN) HEMTs: Progress and Potential for Commercial Applications** (Invited Paper), J. Shealy, J. Smart, M. Poulton, R. Sadler, D. Grider, B. Sousa, P. Garber, B. Hosse, P. Wilkerson, B. Zaroff, J. Dick, T. Mercier, J. Bonaker, S. Gibb, M. Hamilton, C. Greer, and M. Isenhour, *RF Micro Devices, Inc., 10420 Harris Oaks Blvd., Charlotte, NC 28269*

11:00 a.m.

- K.2 **A C-Band Fully Organic-Based Transmitter Module**, C.-H. Lee, *RF Solutions, Inc., 3145 Avalon Ridge Place, NW Suite 200, Norcross GA 30071*; M.F. Davis, S.-W. Yoon, S. Chakraborty, K. Lim, S. Pinel, J. Laskar, T. Nonaka, R. Tummala, *Georgia Inst. of Technology*; A. Sutono, *Infinera, Inc. Sunnyvale, CA*

11:20 a.m.

- K.3 **High Power Monolithic AlGaIn/GaN HEMT Oscillator**, V. Kaper, V. Tilak, H. Kim, A. Vertyatchikh, R. Thompson, T. Prunty, L.F. Eastman, J.R. Shealy, *Dept. of ECE, Cornell University, 112 Phillips Hall, Ithaca, NY 14853*

11:40 a.m.

- K.4 **A Broadband (1-20 GHz) SiGe Monolithic SPDT Switch**, R. Tayrani, *Raytheon System Company, El Segundo, CA*

12:00 p.m.

- K.5 **A New MMIC Sampling Phase Detector Design for Space Applications**, S. Desgrez, D. Langrez, M. Delmond, J.-C. Cayrou, J.-L. Cazaux, *Alcatel Space Industries, 26 avenue J.F. Champollion 31037 Toulouse, France*

12:20 p.m.

End of Session K

12:20 p.m. - 1:20 p.m.

Break for Lunch**SESSION L: High Performance HBTs**

1:30 p.m.

De Anza I - DoubleTree**Chairpersons:**

Cedric Monier, *Sandia Labs*
Jan-Erik Mueller, *Infineon Technologies*

1:30 p.m.

- L.1 **InP/GaAsSb/InP Double Heterojunction Bipolar Transistors** (Invited Paper), C.R. Bolognesi, M.W. Dvorak, S.P. Watkins, *Simon Fraser University, School of Engineering Science/Dept. of Physics, 8888 University Drive, Burnaby BC, Canada V5A 1S6*

2:00 p.m.

- L.2 **High-Performance and High-Uniformity InP/InGaAs/InP DHBT Technology for High-Speed Optical Communication Systems**, C.T. Liu, C. Chen, Y. Yang, J. Frackvoiak, L. Chua, W. Sung, A. Tate, J. Tong, R. Reyes, R. Kopf, R. Ruel, D. Werder, V. Houtsma, G. Georgiou, J. Weiner, Y. Baeyens, and Y. Chen, *Bell Labs, Lucent Technologies, 700 Mountain Ave., Murray Hill, NJ 07974*

2:20 p.m.

- L.3 **Enhanced CDMA Performance from an InGaP/InGaAsN/GaAs N-P-N Double Heterojunction Bipolar Transistor**, R. Yarborough, J. Yang, T. Henderson, *TriQuint Semiconductor Inc., P.O. Box 833938, Richardson, TX 75083*; B. Landini, R. Welsler, *Kopin Corp, Taunton, MA*

2:40 p.m.

End of Session L**SESSION M: Analog and High Speed Digital ICs**

1:20 p.m.

De Anza II - DoubleTree

Chairpersons: Bert Oyama, *TRW S&EG*
Marko Sokolich, *HRL*

1:20 p.m.

- M.1 **High Dynamic Range InP HBT Delta Sigma Analog-to-Digital Converters**, W. Skones, D. Ching, P. Cheng, C. Wong, *TRW S&EG, MS O2/2332, One Space Park, Redondo Beach, CA 90728*

1:40 p.m.

- M.2 **A 12-Gsample/s Track-and-Hold Amplifier in InP DHBT Technology**, J. Lee, A. Leven, Y. Baeyens, C. Chen, L. Yang, W.J. Sung, C-T. Liu, J. Frackvoiak, L. Chua, R. Kopf, Y.K. Chen, *Bell Labs, Lucent Technologies, Rm 1C-413, 600 Mountain Ave., Murray Hill, NJ 07974*

2:00 p.m.

- M.3 **44 GHz Fully Integrated and Differential Monolithic VCOs with Wide Tuning Range in AlInAs/InGaAs/InP DHBT**, A. Kurdoghlian, M. Mokhtari, C.H. Fields, S. Thomas III, *HRL Laboratories, 3011 Malibu Canyon Road, Malibu, CA 90265*

2:20 p.m.

- M.4 **100+ GHz Static Divide-By-2 Circuit in InP-DHBT Technology**, M. Mokhtari, C. Fields, R.D. Rajavel, *HRL Laboratories, 3011 Malibu Canyon Road, Malibu, CA 90265*

2:40 p.m.

- M.5 **87 GHz Static Frequency Dividers in an InP-based Mesa DHBT Technology**, S. Krishnan, Z. Griffith, M. Urteaga, Y. Wei, D. Scott, M. Dahlstrom, N. Parthasarathy, M.J.W. Rodwell, *Dept. of ECE, UC Santa Barbara, CA 93106*

3:00 p.m.

End of Session M

3:00 p.m. - 3:30 p.m.

Coffee Break**PANEL SESSION 5: WLAN Power Amplifier Technology Shootout**

3:30 p.m.-5:00 p.m.

De Anza I - DoubleTree

Organizers/Moderators: Brad Nelson, *Sirenza Microdevices*
Mitch Shifrin, *Hittite Microwave*

This session will address the hotly debated questions surrounding WLAN power amplifier technology and design. What approach will win market share in the high growth WLAN 802.11 a/b/g networks of tomorrow? Issues on every ones mind: Will SiGe take over THIS TOO? Which technology is poised and ready today? Is voltage ever going to a single cell 1.5V, what

then? Is there any place for FET's in this market? With OFDM how are we ever going to meet linearity and efficiency for that low capacity laptop battery? What technology PA is best suited for the holy grail front end: switch, PA, LNA in one box? What about integrated dual band Mr. Hotshot Designer? Does it just become a multi-technology module in the end? Haven't we learned anything from those handset PA guys? Will these IC's be cheap enough? In five years will we all be able to afford a useable 802.11a tablet home computer that feels like a newspaper, book, magazine, video phone and web browser with no wires?

Panel Members:

Paul Blount	<i>Hittite Microwave</i>
Arie Shor	<i>Atheros</i>
Sanjay Moghe	<i>RF Solutions</i>
Jim Wight	<i>IceFyre Semiconductor</i>
Matthias Bopp	<i>Atmel</i>

PANEL SESSION 6: InP vs SiGe for 40G

3:30 p.m. - 5:00 p.m.

De Anza II - DoubleTree

Organizers/Moderators: Bob Cordell, *Tyco Telecommunications*
Allan Armstrong, *RHK, Inc.*

InP HBT and SiGe are the leading contenders for most functions in emerging 40 Gb/s communications systems. The InP HBT technology promises very high performance, but its level of integration is comparatively low and its perceived cost is high. SiGe performance at 40 G appears marginal, but it promises high levels of integration and lower cost. In either case, packaging will play a very important role. The choice of technology will also affect system partitioning. Which approach promises the lowest system cost? Will each technology find a different niche in the 40G technology, such as short reach applications versus long-reach applications? Does the number of packages really matter insofar as system cost? How does a single-chip SiGe solution in an expensive high-frequency package compare to an InP-CMOS chipset in a small high-frequency package plus an inexpensive high-pinout package? Can a SiGe CDR provide as much system BER margin at 40G as an InP solution? Will InP costs come down as the technology enters the commercial marketplace? Is the InP technology mature enough to power the 40G thrust? How much complexity are you really going to put on a SiGe CDR/DEMUX? These and related controversies will be addressed by this panel. So as to maintain focus, participants will be encouraged to concentrate on the 1:16 CDR/DEMUX system function.

Panel Members:

Gopal Raghavan	<i>Inphi</i>
Dhaval Brahmhatt	<i>Modern Telecom</i>
Minh Le	<i>Vitesse</i>
Paul Kempf	<i>JAZZ Semiconductor</i>
Rob Glidden	<i>AMCC</i>

5:00 p.m.

Close of Symposium

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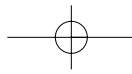
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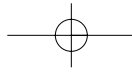
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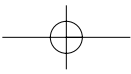
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