

# MTT-S Panel Sessions

## PSA: Millimeter-Wave Monolithic Integrated Circuits

*Date:* June 2, 1992  
*Time:* 11:30 a.m.–1:00 p.m.  
*Location:* San Miguel Room—Convention Center  
*Sponsor:* MTT-6 Microwave and Millimeter Wave Integrated Circuits  
*Organizer:* Dr. Gailon E. Brehm, Texas Instruments  
*Panelists:*  
Mike Kim, TRW  
Manfred Schindler, Raytheon Research  
Hua Quen Tserng, Texas Instruments  
Dr. Sander Weinreb, Martin Marietta

### Abstract:

Recent advances in transistors, particularly 0.1 micrometer-gate HEMTs, have enabled the achievement of excellent gain, noise figure, power, and efficiency at frequencies as high as 100 GHz. A correspondingly intense activity has emerged to fabricate MMICs capitalizing on that technology. Recent circuits have emphasized advances in the millimeter-wave circuit state of the art in three dimensions—circuits with operating frequencies well above 50 GHz, output power and efficiency advances at frequencies above 30 GHz, and highly-dense multifunction circuits above 30 GHz. Panelists will provide not only data on the latest circuits but insight into the technological breakthroughs that have made performance at millimeter waves possible.

## PSB: Critical Issues in Experimental Validation

*Date:* June 2, 1992  
*Time:* 11:30 a.m.–1:00 p.m.  
*Location:* Ruidoso Room—Convention Center  
*Sponsor:* MTT-1 Microwave Computer-Aided Design  
*Organizer:* James C. Rautio  
*Panelists:*  
Inder Bahl (ITT)  
Mare Goldfarb, Raytheon  
Robert Schaeffer, HP  
Ray Shimodo, Boeing  
James Rautio, Sonnet

### Abstract:

While microwave and electromagnetic software have seen tremendous growth in the last decade, experimental techniques have failed to keep pace. At the present state of the art in experimental validation, error analyses are rarely, if ever performed. In addition, validations rarely carry credibility across more than the group that performs the validation, forcing each group that needs validation of a particular analysis to repeat the validation. This panel session will initiate discussion with regard to these issues, which include proper experiment design, error and sensitivity analysis, experimental significance and experimental objective. The ultimate goal of experimental validation is to provide an experimental protocol of such quality that the results of experimental validation using such protocol carries credibility outside the group performing the validation.

# Panel Sessions

## PSC: MMICs for Commercial Market—Fact or Fantasy?

*Date:* June 2, 1992  
*Time:* 11:30 noon–1:00 p.m.  
*Location:* Cimarron Room—Convention Center  
*Sponsors:* MTT-6 Microwave & Millimeter Wave Integrated Circuits  
*Organizers:* Ramesh Gupta, COMSAT Labs  
Fazal Ali, University of California, Berkeley  
*Panelists:* Doug Mathews, Motorola  
Dan Millicker, Hewlett Packard  
Richard Porko, M/A Com

### **Abstract:**

Recent market forecasts for 1990s project a rapid increase in GaAs MMIC applications in commercial products and systems. These projections are driven by MMIC applications in a wider variety of commercial systems and improvements in manufacturing processes and packaging, resulting in lower costs. However, GaAs and silicon MMICs are competing technologies, which also complement each other, for commercial MMIC components and products. In this panel session, invited speakers from the industry and user community for commercial MMIC products will address the competitive issues for GaAs MMICs versus the silicon alternative, explore the difficulties in making the transition to commercial products, and present the lessons learned from the experiences in making commercial products successful. Key MMIC design, manufacturing, and business issues for commercial products and examples of some of these products will be discussed.

# Panel Sessions

## PSD: Process Technology and Testing Challenges for High Volume Commercial MMICS

*Date:* June 3, 1992  
*Time:* 11:30 a.m.–1:00 p.m.  
*Location:* San Miguel Room—Convention Center  
*Sponsor:* MTT-6 Microwave and Millimeter-Wave Integrated Circuits  
*Organizers:* George Norris, Motorola  
Mike Golio, Motorola  
Fazal Ali, University of California, Berkeley  
*Panelists:* To Be Announced

### **Abstract:**

Emerging commercial RF applications stress the need for low unit cost and high volumes (millions of chips) in the MMIC foundry. Many accepted process areas (such as via holes, wafer thinning, gate recess, active layer technology, and crossovers) must be critically reexamined in the light of electrical performance gains versus cost and throughout, this panel will address some of the following questions:

### **Process:**

Microstrip or coplanar elements? Thinned wafers (4–5 mil) with via holes or thicker unviaed wafers (10 mils and up)?  
Are ion implanted MESFETs the best (or only) choice for commercial MMICs?  
Will 100 or 150 mm wafer diameters affect this?  
Can recessed gate FET technology meet system needs for low DC power?  
Is non-recessed gate technology manufacturable?  
What are the critical active and passive device parameters in a typical commercial application (e.g., communication)? Is this different from DoD?  
Is integration of RF and digital in one process important?

### **Testing:**

Do we need to RF/DC test commercial ICs on wafer? Can we afford it?  
What is the impact on required process yield if not?  
Is 100% package testing required?

### **General:**

Time to market is critical for commercial applications . . . how does this affect the commercial foundry?

# Panel Sessions

## PSE: IVHS in America

*Date:* June 3, 1992  
*Time:* 11:30 a.m.–1:00 p.m.  
*Location:* Ruidoso Room—Convention Center  
*Sponsor:* MTT-S  
*Organizers:* James Constantino, IVHS AMERICA  
*Panelists:* Norman Van Ness, Director, Traffic Management and IVHS  
Richard Mandelbaum, Supervisor, IVHS Architecture Planning, AT&T  
Donald E. Orne, PATH Director, Univ. of Calif., Institute of Transportation Studies  
Robert L. French, Principal, R. L. French & Associates  
William M. Spreitzer, Technical Director, IVHS Program Office, General Motors Corporation

### **Abstract:**

The use of advanced technology to improve surface transportation is crucial to U.S. efforts to relieve congestion, prevent accidents, conserve fuel, and enhance the environment. Intelligent Vehicle Highway Systems (IVHS) are considered by many to offer a major potential for improving traffic operations and safety. IVHS applies the technologies of communications, control, electronics, and computer hardware and software to both vehicles and infrastructure to improve the safe, expeditious, and economic movement of people and goods. IVHS is becoming the principle element of many surface transportation plans.

The IVHS program will be carried out using a unique public-private partnership of government, universities, and the private sector called the Intelligent Vehicle Highway Society of America, or quite simply IVHS AMERICA. IVHS AMERICA's mission is to coordinate and foster the public-private partnership to make the U.S. surface transportation system significantly safer and more effective by accelerating the identification, development, and deployment of advanced technologies. IVHS AMERICA also has a central role in developing strategic plans and fostering international cooperation in this area.

## PSF: Technology Transfer

*Date:* June 4, 1992  
*Time:* 11:30 a.m.–1:00 p.m.  
*Location:* To Be Announced  
*Sponsor:* IMP 1992 Steering Committee  
*Organizers:* Robert L. Hutchins, BDM  
Shyam H. Gurbaxani, UNM and USAF Phillips Laboratory

### **Abstract:**

Recent international business and political developments have produced fundamental changes in the role of national laboratories. The State of New Mexico with its DOE and DOD laboratories—LANL, SNL, USAF Phillips Lab, WSMR, and others—has played a key role in the legislation and implementation of Technology Transfer. A distinguished panel of scientists and administrators along with some invited papers will present the status of this newly evolving subject.