

pose of providing typical examples. This in no way implies a commercial endorsement by the speakers.

WFFP: RECENT ADVANCES IN PRINTED CIRCUIT ANTENNA TECHNOLOGY FOR WIRELESS COMMUNICATIONS

Date & Time: Friday, June 18; 8:00 AM-5:00 PM

Location: Anaheim Marriott, Marquis Ballroom, Northwest

Presenters: **Richard Q. Lee**, NASA Lewis Research Center
John Huang, NASA JPL
Rainee Simons,
Dynacs and NASA Lewis Research Center
Doris I. Wu, Ansoft Corp.
Kai Chang, Texas A & M Univ.

Organizers: Rainee N. Simons
Richard Q. Lee

Sponsor: MTT-20, Wireless Communications

This workshop will provide participants with a good understanding of printed antenna technology for wireless communications covering the frequency range of 900 MHz to 77 GHz. The workshop commences with an overview of new antenna concepts. This is followed by presentations on array design, advanced modeling features using software tools and efficient feeding techniques. In the second half of the workshop, active antennas, mobile and future millimeter-wave satellite communication antennas will be discussed. The workshop concludes with a presentation on the recent advances in printed slot antennas. The target audience is microwave engineers involved in antenna design for wireless applications. This workshop provides a forum for open discussions among participants. The presentations will comprised both tutorials as well as recent advances in printed antenna technology.

WFFQ: ULTRA HIGH SPEED CRYOELECTRONIC CIRCUITS

Date & Time: Friday, June 18; 8:00 AM-5:00 PM

Location: Anaheim Marriott, Grand Ballroom, Salon B

Speakers: **Bob Hammond**, STI
Elie Trak, Hypres
R. Walden, HRL Labs
Akis Goutzoulis, Northrop Grumman
S. Benz, NIST
Andy Smith, TRW
J.X. Przybysz, Northrop Grumman
S. Kaplan, Hypres
Dale Durand, TRW
A. Silver, TRW
M. Nisenoff, NRL

Organizers: Salvador H. Talisa, Northrop Grumman
Arnold H. Silver

Sponsor: MTT-18, Microwave Superconductivity

High performance digital electronic circuits and subsystems are crucial components of many future microwave systems involving digital receivers, phased antenna arrays, digital beam-forming and advanced processing for military and commercial applications. Commercial semiconductor microprocessor chips are predicted to have clock frequencies in excess of 1 GHz by the year 2000 time frame. In addition, current superconducting digital circuit prototypes have been operated at clock frequencies well in excess of 20 GHz and have applications as analog-to-digital and digital-to-analog converters, direct digital frequency synthesizers and low phase noise clocks. Although it may not always be obvious to the digital community, it is quite clear to microwave engineers that these cannot be treated as conventional "low frequency" circuits but must be designed, fabricated, packaged and tested as microwave circuits.

This workshop will include introductory talks on the state-of-the-art semiconductor; optical and superconducting high-speed digital

technologies including roadmaps projecting where they will advance in the next decade. These will be followed by talks on GHz cryoelectronic circuit design and packaging concepts. At the conclusion of the workshop the attendees will have a better understanding of the commonalities between future digital and microwave devices and the importance of developing a microwave approach to advanced digital electronics.

WFFR: THE EMERGENCE OF NEW MICROWAVE SYSTEMS ABOVE 45 GHz

Date & Time: Friday, June 18; 8:00 AM-5:00 PM

Location: Anaheim Marriott, Marquis Ballroom, Northeast

Topics & Presenters:

- **Standards and Systems (morning)**
Ferdo Ivanek, Communications Research
Aldo Paraboni, Politecnico di Mikano
Gabriele Marzocchi, Multiservices
Kostantin Kojucharow, Dresden University
Mario Lopriore, ESA
- **Equipment and Technology (afternoon)**
H. Daembkes,
United Monolithic Semiconductors
P. Quentin, United Monolithic Semiconductors
Lamberto Raffaelli, ARCOM
Fabrizio Montauti, P-COM
Marco Piloni, ITALTEL
Massino Claudio Companini,
Alenia Aerospazio

Organizers: Gabriele Marzocchi
Ferdo Ivanek

Sponsor: MTT-20, Wireless Communications

Many converging factors push the use of frequency bands above 45 GHz for Ptop and Ptopm links in urban areas:

- saturation of lower frequency bands due to their intense use for terrestrial and satellite applications
- increasing demand for urban back-haul links by new mobile operators who do not have fiber available
- advent of new broadband services requiring wireless LANs as more flexible and less expensive solution

The morning session will focus on regulatory and propagation aspects with main examples of system application. The afternoon session will present several descriptions of equipment design and implementation. A final roundtable among major worldwide manufacturers will conclude the workshop.

WFFS: TECHNOLOGIES FOR THE NEXT MILLENNIUM

Date & Time: Friday, June 18; 8:00 AM-5:00 PM

Location: Anaheim Marriott, Grand Ballroom, Salon G

Speakers: **Dimitris Pavlidis**, University of Michigan
Mark Rodwell,
University of California, Santa Barbara
Bernard Meyerson, IBM
Roger Davidheiser, TRW
Bruce Kopp, John Hopkins University

Organizers: Arvind K. Sharma, TRW/ETD,
H. John Kuno, QuinStar Technology

Sponsor: 1999 IMS Technical Program Committee

Technical achievements during the last decade or so in compound semiconductor materials, devices and processing technologies have resulted in widespread use of monolithic microwave and millimeter-wave integrated circuits (MMICs). New packaging, assembly and manufacturing technologies were also developed to reduce the cost of modules. The overall affordability of MMICs and