

# The IMS2002 Technical Program

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## I. INTRODUCTION

THE 2002 IEEE Microwave Theory and Techniques Society (IEEE MTT-S) International Microwave Symposium (IMS) was held in Seattle, WA, on 2–7 June 2002. Despite the economic downturn in many microwave-related markets, the paper submissions were near-record levels. A database-oriented paper submission system was successfully piloted. 27 workshops, three tutorials, five special sessions, three panel sessions, two special sessions on the 50th anniversary of the IEEE MTT-S, and one rump session were presented and all were well attended. The dedicated work of many volunteers, including the authors, presenters, and members of the Technical Program Committee (TPC) and the IEEE MTT-S IMS2002 Steering Committee, resulted in a very successful IEEE MTT-S IMS2002.

## II. TECHNICAL SESSIONS

The contributed paper sessions continue to be the main attraction of the IEEE MTT-S IMS. In 2002, there were 886 papers submitted, which was second only to 937 submitted in 2001. 491 papers were accepted, of which 301 were presented in regular sessions and 189 were presented at Interactive Forum sessions on each of three days. The quality of papers was high, and there was strong competition for paper acceptance. 57% of the presented papers were from outside of North America, reflected the increasingly international contributions to the IEEE MTT-S IMS. Particularly noticeable is the growth of contributions from Taiwan, R.O.C., Singapore, Korea, and China.

The IEEE MTT-S IMS was again held in the same week with the IEEE RFIC Symposium and the IEEE Automatic Radio Frequency Techniques Group (ARFTG) Conference. There were six joint sessions with the IEEE RFIC Symposium on Tuesday, and one with the IEEE ARFTG on Thursday. There were 122 paper submissions to the IEEE RFIC Symposium.

In addition to the regular contributed paper sessions, there were five special sessions. Topics and organizers for special sessions were solicited in the Calls for Papers. The special session topics included “RFIC’s for 3G Terminals and Base Stations,” “High-Speed, Non-Contacting Electrical Probing,” “THz Technology and Applications,” “Wide Bandgap Devices and Their Application in High Power and Low Noise Circuits,” and “Optical Processing of Antenna Signals.”

## III. ELECTRONIC PAPER SUBMISSION SYSTEM

2002 was another year of evolution in the process the IEEE MTT-S IMS uses for gathering and reviewing contributed papers and final manuscripts. A web-based program written in

Lotus Notes was expanded from the 2001 system in order to perform the following functions:

- gather all IEEE MTT-S IMS and RFIC author inputs and paper submissions;
- sort the papers into the 32 TPC subcommittees;
- distribute the papers to the 300 reviewers of the TPC;
- collect scores and provide confidential online reviewer discussions;
- create the presentation sessions;
- gather reviewers’ comments for authors and output author notifications;
- output program information for the printed program and IEEE MTT-S IMS2002 website;
- collect final manuscripts and output these to the digest and CD ROM producers.

Throughout these processes, virtually no paper forms were required, and no “roll call” meeting was needed after the main TPC meeting where paper acceptances are finalized and sessions created. The 2002 committee focused on sorting the papers to the correct subcommittee as early as possible, to give transferred papers as complete and fair a review as others. The system worked quite well overall, but had various minor bugs and misinterpretations of instructions that are almost inevitable in an initial design.

## IV. WORKSHOPS AND TUTORIALS

IEEE MTT-S IMS2002 also featured 27 workshops and three tutorials in half- or full-day formats. Each workshop provided an update and/or explored the state-of-the-art in a microwave topic. The objective of the tutorials was to provide newcomers to an area or newcomers to microwaves enough background information on Sunday to understand other papers during the week. The tutorial topics were an introduction to microwave circuit design, a tutorial on microwave microelectromechanical systems (MEMS), and a tutorial on electromagnetic (EM) simulators. All of the tutorials and workshops were very well attended. Workshop, tutorial, and panel session topics and organizers were solicited from the IEEE MTT-S at large in the Calls for Papers. A web-based system was used for gathering and disseminating proposals and workshop information.

## V. PANEL SESSIONS AND RUMP SESSION

There was a panel session on each day of the paper sessions. The format is intended explore controversial technology questions and generate heated debates among the panelists and with the audience. The topics included “Is the Single-Chip Radio Dead?,” “RF MEMS: Revolution or Evolution?,” and “Making Sense or Cents: Which WLAN Technology Will Survive?.” An even more informal format was available for the rump session

on Monday night, which explored integration of electron design automation (EDA) tools in "Breaking EDA Barriers . . . Silos to Seamless RF Design Automation." This rump session was arranged approximately four weeks before the IEEE MTT-S IMS2002, and was not listed in the printed program.

## VI. STUDENT PAPER COMPETITION

The IEEE MTT-S Student Paper Competition encourages and recognizes excellence in research in microwave science and technology. 241 papers were submitted to the competition this year. Among these submissions, 140 were accepted for presentation, and the TPC selected 24 finalists. All of the accepted student papers were presented at their appropriate paper sessions. In addition, the 24 finalists also presented their papers at the Student Paper Competition Interactive Forums. Prizes were awarded to the six best papers among the finalists and all student finalists were given certificates and complimentary registration to the IEEE MTT-S IMS2002. Cash awards totaling \$2900 and additional prizes have been donated by the IEEE MTT-S. The National Science Foundation and IEEE MTT-S sponsored travel subsidies to the IEEE MTT-S IMS for all the finalists.

## VII. SPECIAL TECHNICAL ACTIVITIES CELEBRATING THE 50TH ANNIVERSARY OF THE IEEE MTT-S

The IEEE MTT-S celebrated its 50th birthday this year, along with 50 years of great progress in microwave technology. The IEEE MTT-S IMS2002 had two special activities commemorating this anniversary. The first was a Special Session, which briefly reviewed both the history of microwave technology over the past 50 years and the history of the IEEE MTT-S. This was moderated by Leo Young and featured panelists H. George Oltman, Jr., Harold Sobol, Kiyo Tomiyasu, Ted Saad, and James Wiltse. The second activity was a Special Interactive Forum on the 50th Anniversary of the IEEE MTT-S, where attendees interacted with authors of the papers from the March 2002 50th Anniversary Special Issue of the IEEE TRANSACTIONS ON MICROWAVE THEORY AND TECHNIQUES.

## VIII. CONCLUSIONS

Like a scientific experiment, the IEEE MTT-S IMS can be viewed as an experiment that is run each year, with the Steering Committee trying to hold some variables constant while optimizing others. The overall results of each experiment are difficult

to compare since the most important results are specific to the expectations of each attendee. However, from the metrics of the number of papers and workshops contributed and presented, number of attendees, and number of technical activities offered, the IEEE MTT-S IMS2002 technical program was certainly a success. The paper submission system required authors and reviewers to learn some new processes, but was generally another big step forward in streamlining the process.

The lead time required between paper submission and the conference has not changed significantly over the years, but typical technology and product development times have shortened dramatically. The publication lead time is now longer than a consumer product life cycle. The publication lead time is paced by the critical path of paper sorting, reviews, author notification, editing the final manuscripts, digest editing, and digest printing and delivery. The IEEE MTT-S should consider whether the current lead time is optimal or whether a different process or format is more desirable. For example, all-electronic paper submissions and reviews, more automated author notifications, and CD-only publishing could shorten the publication time by at least a month. Shorter author editing deadlines or accepting only papers that are ready to publish (without an editing step) could cut another month or two.

"Microwave Week" is highly successful as measured by attendance, but it is perhaps too successful to fit into one week any more. Workshops have filled up the Sunday schedule, and even Sunday had some overlapping topics. Many attendees complain of too many parallel sessions, too many parallel workshops, or too many parallel side meetings. The IEEE MTT-S IMS2002 Steering Committee took special care to group the technical sessions into topics that would minimize overlaps, but more parallel sessions inevitably restrict the attendee experience to a smaller subset of the IEEE MTT-S IMS topics. Thus, the IEEE MTT-S should also grapple with whether or when some of the meetings or topics are more optimally moved to another symposium time or to a second week of several conferences with a microwave theme. It is only natural that a growing field spawn new symposia, and "Microwave Week" is evidence that a critical mass of topics, attendees, and exhibitors is a good model for other meetings.

The success of the Technical Program is a direct result of the volunteer contributions of the authors, attendees, reviewers of the TPC, and the long hours of the IEEE MTT-S Steering Committee members. We salute the many volunteers who contributed to the IEEE MTT-S IMS2002 and offer a big "thank you" to all.



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From 1976 to 1979, he designed microwave integrated circuits with Farinon Electric, San Carlos, CA. From 1979 to 1985, he designed GaAs integrated circuits and managed a GaAs integrated circuit (IC) design group with Tektronix Inc. and Triquint Semiconductor. He created the first 18-, 26-, and 50-GHz wafer probes and the first wide-band power probes. He is CEO and cofounder of Cascade Microtech Inc., Beaverton, OR, a company that develops, manufactures, and markets wafer probes and probing systems worldwide. He has authored or coauthored numerous technical papers. He holds ten patents.

Mr. Strid was the recipient of the 1987 IEEE Automatic RF Techniques Group (ARFTG) Automated Measurements Technology Award and the 1991 IEEE Microwave Theory and Technique Society (IEEE MTT-S) Microwave Applications Award for development of microprobe technology.



**Ed Godshalk** (M'78–SM'99) received the B.S. and M.S. degrees in electrical engineering from Washington University, St. Louis, MO, in 1982 and 1983, respectively, the B.A. degree in physics from Monmouth College, Monmouth, IL, in 1982, and the Ph.D. degree in electrical engineering from Oregon State University, Corvallis, in 1998.

From 1983 to 1985, he was with the Central Microwave Company, where he developed waveguide and microstrip microwave components. In 1985, he joined the Millitech Corporation, where he developed millimeter-wave systems, such as digital radios, and related components. In 1989, he joined Cascade Microtech, where he invented the world's first waveguide input wafer probe (50–75 GHz), followed by a 75–110-GHz version, and later invented the air coplanar (ACP) wafer probe, which is still in production today. In 1994, he joined Tektronix, where he was involved with cryogenic microwave circuits and SONET/OC-192 systems. From 1995 to 1997, he had his own business, which developed and sold microwave oscillators and phase-locked sources. In 1997, he joined Maxim Integrated Products, Beaverton, OR, where he formed the Electro-Magnetics

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Dr. Godshalk has been on the IEEE Automatic RF Techniques Group (ARFTG) Executive Committee for nine years. He was the recipient of two IEEE ARFTG Best Paper Awards.