



AUTOMATIC RF TECHNIQUES GROUP

NEWSLETTER

WINTER 2015

NUMBER 54

Important deadlines:

February 8th, 2016: 87th conference paper submission deadline

March 7th, 2016: Student sponsorship applications due

October 1st, 2016: Student fellowship applications due

October 7th, 2016: 88th conference paper submission deadline

Fall 2015 ARFTG Microwave Measurement Symposium: Microwave Measurements with Applications to Bioengineering and Biomedicine

OVERVIEW



Georgia Tech Hotel and Conference Center, location of the Fall 2015 ARFTG Symposium

The Fall 2015 ARFTG Microwave Measurement Symposium took place at the Georgia Tech Hotel and Conference Center in Atlanta, GA. The event was held over four days from Tuesday, December 1st to Friday, December 4th. The Symposium consisted of a 1½ day short course on microwave measurements, a workshop, an NVNA users' forum, a visit to Georgia Tech, and the main conference. The theme of this year's symposium was "*Microwave Measurements with Applications to Bioengineering and Biomedicine*". The main event was the 86th ARFTG Microwave Measurement Conference, which took place on Thursday and Friday. In addition to these technical events, there was an awards banquet on Thursday evening and a vendor exhibition during the main conference. Taken together, this amounted to four days packed with exciting activities for RF, microwave, and millimeter-wave engineers and technologists.

SHORT COURSE ON MICROWAVE MEASUREMENTS

A course on practical microwave measurements, organized by P. Roblin, was held on December 1st-2nd. About 14 people attended this course with topics covering everything from power, S-parameter, noise, oscilloscope, and spectral measurements to mm-wave and on-wafer techniques, nonlinear characterization, and load pull. We are very appreciative of the twelve instructors who made this short course successful.

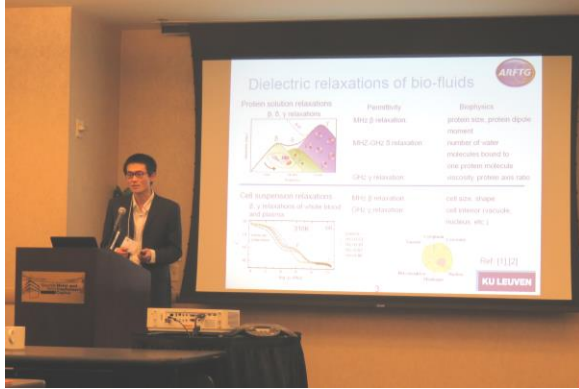


The Short Course introduces attendees to a wide range of microwave measurements topics.

WORKSHOP

A workshop was held as part of the symposium. The theme was "*Microwave Microfluidics*", and it was held on the afternoon of Wednesday, Dec. 2nd and was

organized by J. Booth. Approximately 30 people were in attendance and heard lectures from S. Liu (KU Leuven), J. Hwang (Lehigh University), P. Wang (Clemson University), K. Grenier, (LAAS-CNRS), and J.-C. Chien (University of California, Berkeley).



A workshop on ‘Microwave Microfluidics’ was presented at the Fall Symposium.

CONFERENCE TECHNICAL SESSIONS

The 86th ARFTG Microwave Measurement Conference began on Thursday, December 3rd with introductions by ARFTG Vice-President, J. Martens, and the conference co-chair, J. Gering. On this occasion, about 60 people attended. The conference consisted of six oral sessions and an interactive forum, defined by Technical Program Chair, J. Gering. Videos of presented papers will be available at www.arftg.org. ARFTG is pleased to thank the sponsors of this conference:

Gold sponsors: Qorvo.

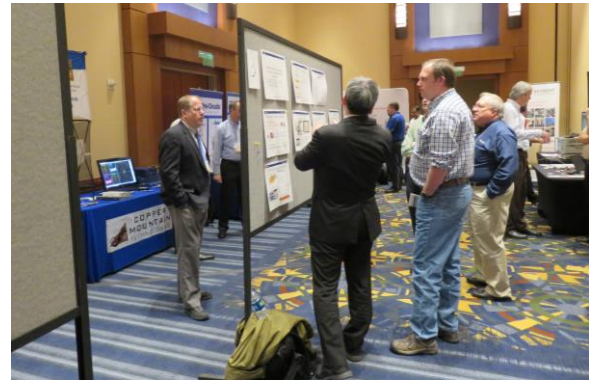
Silver sponsors: Anritsu, Copper Mountain Technologies, Keysight Technologies, Maury Microwave., and National Instruments.

For future sponsorship opportunities, contact the Sponsorship Chair, at sponsorship@arftg.org.



Thanks to the ARFTG sponsors!

The best oral paper, as voted on by the conference attendees, was “Microwave characterization of inkjet-printed CPW on PET substrates,” by A. Sahy *et al.* (Univ. of Toledo, Warsaw Univ. of Technology, NIST, and Univ. of Surrey). The best interactive forum paper was selected to be “Impedance standard substrate fabricated by screen printing technology,” by M Horibe *et al.* (AIST). The Best Exhibitor was voted as Maury Microwave, for the second time in a row.



ARFTG attendees discuss with interactive forum presenters.

CONFERENCE EXHIBITS

The exhibition provides an excellent opportunity to see the latest range of products available from some of the leading suppliers in microwave measurement industry.

This conference’s exhibiting companies were: Anritsu, Copper Mountain Technologies, Focus Microwaves, Gowanda, Junkosha, Keysight Technologies, Maury Microwave, Microsanj, Mini-Circuits, Spinner, Tegam, Tektronix, TTE Filters, and Wireless Telecom Group.

To exhibit at a future conference, please contact the Exhibits Chair, at exhibits@arftg.org.



ARFTG allows for extensive interaction between attendees and exhibitors.

ANNUAL BUSINESS MEETING

The annual ARFTG Business Meeting was held on Dec. 3rd, 2015. A significant part consisted of electing five members to the ARFTG Executive Committee. Biographies for the candidates were distributed prior to voting. The outcome of the voting was the (re-)election of five members to ExCom: J. Dunsmore, R. Ginley, P. Roblin, A. Rumiantsev, and D. Schreurs.

CONFERENCE AWARDS



ARFTG Awards Banquet: place for social interactions.

ARFTG Vice-President, J. Martens, presided over the conference awards ceremony, which took place during the banquet on Thursday evening. Certificates of appreciation were presented to the organizers of the 86th conference, namely M. Sayed as Conference Co-Chair, J. Gering, as Conference Co-Chair and Technical Program Chair, and S. Kenney as Local Host.



ARFTG Vice-President Jon Martens presents the Awards for Best Oral paper and Best Interactive Forum paper at the 85th conference.

Awards were also given for best papers and exhibitors from the previous (85th) conference held in Phoenix, AZ. The best oral paper award went to "Rectangular-Waveguide Impedance," by D. Williams, *et al.* (NIST and PTB). The best interactive forum presentation was awarded to "Physical Models for 2.4 mm and 3.5 mm

Coaxial VNA Calibration Kits Developed within the NIST Microwave Uncertainty Framework," by J. Jargon, *et al.* (NIST and KRIS). The Best Exhibitor was awarded to Maury Microwave.



ARFTG Vice-President Jon Martens presents the ARFTG Distinguished Service Award to Mitch Wallis.

This was followed by the ARFTG Awards. On this occasion, the Distinguished Service Award was presented to M. Wallis. Finally, the following persons were announced Lifetime Members: J. Cable and D. Williams. Qualification information is at <http://www.arftg.org/membership/lifemember.html>.



ARFTG attendees visiting Georgia Tech cleanroom.

NVNA USERS' FORUM

A meeting of the NVNA Users' Forum was held at the 2015 INMMiC Workshop, held on Oct. 1st in Taormina, Italy. Moderators were D. Schreurs and P. Roblin, and over 35 people attended. G. D'Amore (Keysight Technologies) presented a research update on "DynaFET modeling flow for GaN and GaAs devices". Next, D. Schreurs (KU Leuven) informed the audience about "Latest developments on IEEE standardization efforts: NVNA nomenclature and EVM definition. Finally, P. Roblin (The Ohio State Univ.) moderated a lively discussion on "Measurement based power amplifier design techniques."

A second meeting was held in conjunction with Fall ARFTG on Dec. 3rd. It was moderated by A. Reynoso Hernandez and over 30 people attended. In the first research update, D. Root (Keysight Technologies) talked about "Predictable behavioral modeling of transistors," followed by D. Bepalko presenting on "Systematic Improvement of PHD Model Prediction by Improving Harmonic Source Superposition During Model Extraction," and finally J.-P. Teyssier (XLIM & Keysight Technologies) spoke about "Advanced Measurements with NVNA". More information can be found at http://www.arftg.org/about_nvna.html.

The NVNA Users' Forum was followed by a meeting of the P1770 MTT-S standards working group on "Recommended Practice for The Usage of Terms Commonly Employed in the Field of Large-Signal Vector Network Analysis," chaired by D. Williams. For further information, please contact [D. Williams](#).

www.arftg.org. ARFTG will also be co-sponsoring two workshops: "Large Signal Network Analysis: from instrumentation architectures to software applications for your RF design flow improvement," organised by T. Reveyrand and A. Raffo, and "Power and Signal Integrity Characterization Techniques," organised by M. Resso, H. Barnes and K. Wong.

NVNA Users' Forum

ARFTG is organizing two NVNA Users' Forums in 2016. This is an excellent opportunity for an informal exchange of ideas related to nonlinear vector measurements. Please contact the organizers for more information: P. Roblin, A. Reynoso Hernandez, D. Schreurs, and J.-P. Teyssier.

- Spring ARFTG: May 26th, San Francisco, CA.
- Fall ARFTG: Dec. 7th, Austin, TX.

FUTURE EVENTS

Summer 2016 ARFTG activities



The Marriot Marquis Hotel, site for the 87th ARFTG Microwave Measurement Conference.

Microwave Measurement Conference

The 87th ARFTG Microwave Measurement Conference will be held on May 27th, 2016, in San Francisco, CA, as part of Microwave Week 2016 (May 22nd-27th), which also includes the IEEE MTT-S International Microwave Symposium (www.ims2016.org), the Radio Frequency Integrated Circuits symposium (<http://rfic-ieee.org/>) and workshops. The theme is "Measurements for Emerging Communications Technologies". Students interested in obtaining financial assistance to attend the conference should contact the Conference Chair. Any awards will be discretionary, and preference will be given to authors of accepted papers.

For more information, be welcome to contact the Conference Chair, [J. Wood](#) or the Technical Program Co-Chairs, [D. Schreurs](#) and [G. Collins](#) or visit

Fall 2016 ARFTG Symposium

The Fall 2016 ARFTG Microwave Measurement Symposium will be held in Austin, TX, from Tuesday, December 6th through Friday, December 9th, 2016. It is planned to hold the 88th ARFTG Conference, a short course, two workshops and the NVNA Users' Forum. For more information, contact the Conference Chair, [J. Martens](#) or the Technical Program Chair, [M. Wallis](#). More information will be available at www.arftg.org.

ARFTG STUDENT PROGRAMS

ARFTG can award one or more graduate fellowships annually to students working in RF/microwave measurement related topics. This year, the Roger Pollard Memorial Student Fellowship in Microwave Measurement was awarded to Mr. D. Ribeiro (Univ. of Aveiro). The application instructions and criteria for the next award cycle are published at www.arftg.org.

ARFTG can also provide sponsorships to support student attendance. For the Fall 2015 symposium, three such sponsorships were awarded. For information on sponsorships at future conferences, see www.arftg.org or contact the sponsorships chair at sponsorship@arftg.org.

ADDENDUM

Every effort has been made to publish correct information in this newsletter. Significant errors should be reported to the ARFTG Executive Committee Secretary [D. Schreurs](#), so that corrections can be reported in the next issue.