



THE INSTITUTION OF ELECTRICAL AND ELECTRONICS ENGINEERS INC.

MTT/ED/AP/LEO- SOCIETIES JOINT CHAPTER
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United Kingdom & Republic of Ireland Section



IEEE SEMINAR

“Transmitters for Wireless Communication ...”

*Professor Dave Rutledge
Caltech University
Pasadena, California, USA*

The Electromagnetics Centre for Microwave and
Millimetre-wave Design & Applications
Dept of Electrical Engineering & Electronics, UMIST
Manchester, M60 1QD, UK

- Date: Friday 24th October 2003
- Venue: room C53/MB - Department of Electrical Engineering and Electronics, UMIST,
- Time: 12.30 pm – 1.30 pm
(After the talk there will be refreshment)

ALL WELCOME

Abstract: Professor Rutledge will talk about current teaching and research programs in Electrical Engineering at Caltech, including a privately funded initiative in advanced network research, the Lee Center for advanced networking. In addition he will discuss recent results in his research group in new transmitters for wireless communications. They have demonstrated a single-chip amplifier with a 5-W output at 34GHz. The device uses a quasi-optical array to combine the outputs of 512 gallium-arsenide transistors. The feed for the grid is waveguide mode converter with a TE₀₁ input. The chip was fabricated at the Rockwell Science Center. This chip could have applications for satellite Internet uplinks. Recently, they have built an amplifier for the 60-GHz frequency range with Northrop-Grumman's InP technology. At low frequencies in the HF, range, we have demonstrated a new type of switching amplifier called Class E/F that combines the soft-switching characteristics of Class E with the harmonic control of class F. This approach was to make an amplifier with an output of 200 W at 7 MHz and a drain efficiency of 83%. At microwave frequencies, they are concerned with the problem of how to make a high-power transmitter that is suitable for wireless network connections for notebook computers.

Professor Rutledge is the Tomiyasu Professor of Electrical Engineering at Caltech. He is Director of Caltech's Lee Center for Advanced Networking. His research has been in integrated-circuit antennas, active quasi-optics, computer-aided design, and high-efficiency power amplifiers. He was the Editor of the Transactions on Microwave Theory and Techniques, and a Distinguished Lecturer of the IEEE Antennas and Propagation Society. He is the author of the electronics textbook, *The Electronics of Radio*, published by Cambridge University Press, and co-author of the microwave computer-aided-design software package, *Puff*, which has sold 30,000 copies.