

# Special Issue on Space Terahertz Technology

THE papers in this special issue arise from results reported at the Fifth International Symposium on Space Terahertz Technology, held in May 1994 at the University of Michigan, Ann Arbor. The conference is sponsored by the NASA Office of Advanced Concepts and Technology (OACT), with cooperative sponsorship by the IEEE Microwave Theory and Techniques Society. The emphasis of the conference is on the sensitive detection of terahertz radiation and on the generation of solid-state local oscillator sources at terahertz frequencies. The conference reflects NASA's interest in terahertz sensors appropriate for spaceborne application for use in earth remote-sensing, atmospheric remote-sensing and radio-astronomy. The conference was organized by The University of Michigan's NASA-Center for Space Terahertz Technology.

It is very interesting to see that, for the first time ever, the number of papers dealing with the *generation* of the local oscillator power at millimeter-wave and terahertz frequencies vastly outnumber the number of papers dealing with the *detection* of millimeter-wave and terahertz radiation. In fact, of the 11 papers presented in this issue, only four papers present

issues related to receiver technology. This is in severe contrast to the April 1994 issue, where nine out of 10 papers were related to receiver technology. The reason for this dramatic change is twofold. First, the SIS receiver technology has matured quickly in the past two years and it is now possible to build waveguide and planar quasi-optical SIS receivers with state-of-the-art performance up to 600 GHz (six to eight times the quantum noise limit). Second, it is becoming apparent to the terahertz community that the biggest challenge is to produce a reliable solid-state power source with a reasonable dc to rf efficiency. If achieved, this solid-state terahertz source will allow the construction of space-based receivers without the use of a far-infrared laser. It will also be used in the construction of focal-plane SIS imaging arrays.

The guest editors gratefully acknowledge the essential contributions of those who reviewed the articles for this special section. They are listed below.

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