

Duration: 08:30 - 12:30

Room: Oslo

WM-06

THz Electronics Technology for Communications and Sensing

Organisers:

Peter Gardner, The University of Birmingham, UK

Marina Gashinova, The University of Birmingham, UK

Abstract

THz electronics opens up the spectrum from a few hundred GHz to about 1 THz, enabling high resolution sensing and high bandwidth communications. These will generate true mass market applications. Micromachining technologies applied to waveguiding structures and travelling wave tubes, and continual advances in semiconductor devices, are enabling the extension of mm-wave circuits upwards in frequency. Important applications are emerging, for example: high resolution imaging radar for autonomous platforms, and the development of high data rate wireless communications, which will continue to be vitally important well beyond 5G and the Internet of Things. This workshop explores several aspects of THz electronics. Part 1 will focus on technology, showing how guided wave structures, interconnects, antennas and active circuits are realised and integrated on semiconductor substrates and micromachined waveguiding structures. The extension of TWTA technology into THz bands and the technology and application of resonant tunnelling diodes are also covered as examples of emerging active components. Part 2 considers applications in low THz radar and wireless communications, and concludes with discussion of the low THz measurement challenges.

Programme

08:30 - 08:40 Introduction

Peter Gardner, University of Birmingham, UK

08:40 - 09:05 THz-MICs Interconnect and Integrated Antenna Technology on GaN on Low-Resistivity Silicon Substrates

Khaled Elgaid, University of Glasgow, UK

09:05 - 09:25 Micromachined THz Waveguiding Structures and Filters

Mike Lancaster, Xiaobang Shang, Cheng Guo, University of Birmingham, UK

09:25 - 09:50 Broadband Gyrotron Travelling Wave Amplifiers for Communication and Spectroscopic Applications

Wenlong He, C. R. Donaldson, L. Zhang, P. McElhinney, H. Yin, J. R. Garner, K. Ronald, A. W. Cross, A. D. R. Phelps, University of Strathclyde, UK

09:50 - 10:10 Resonant Tunnelling Diode Terahertz Sources for Broadband Wireless Communications

Edward Wasige, University of Glasgow, UK

10:10 - 10:50 Break

10:50 - 10:55 Introduction to Part 2

Peter Gardner, University of Birmingham, UK

10:55 - 11:20 Low-THz Medium Range Radar

Marina Gashinova, University of Birmingham, UK

11:20 - 11:45 Wireless Communications Towards the 300 GHz

Claudio Paoloni, Lancaster University, UK

11:45 - 12:10 Measurement Challenges in THz Electronics

Nick Ridler, National Physical Laboratory, UK

12:10 - 12:30 General Discussion and Closing Remarks

Marina Gashinova, University of Birmingham, UK