

Introduction to this Special Issue

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The theme of this special issue of the Journal of Infrared, Millimeter, and Terahertz Waves is “THz for Life.” This theme reflects the fact that THz science and technology now span application areas that extend from the origins of life in the universe to the benefit of life on Earth, from applications in astronomy and space science to new techniques and instruments in biology, biochemistry and the life sciences. “THz for Life” also reflects the hope and belief that this important and still expanding field will serve as a research niche for young scientists and engineers that may last them throughout their own career life.

All of the articles which appear were solicited by the editor and reflect topics of interest from the 33rd International Conference on Infrared, Millimeter, and Terahertz Waves held in Pasadena, California, USA in September 2008. Considering that spare time has now become one of the rarest commodities (next to funding) amongst our current generation of career scientists and engineers, the editor would like to personally thank all of the authors who contributed their time to the invited papers which appear in this special issue. The editor would also like to thank the many reviewers who selflessly gave up some of their precious time to screen and add suggestions to help in finalizing the contributed papers. Lastly, no special issue would be appearing in your mailbox or on your shelf if it were not for the tireless efforts of Editor-in-Chief, Professor Toshitaka Idehara, and the staff at Springer, Jeanine Jordan, Jeanine Burke, Rebecca Nilson and Eloisa Orilla.

The recent rise in the number of people who are now familiar with, or at least have heard the term Terahertz, is remarkable. Even more remarkable are the numbers of papers (and proposals) which now include THz in their title or abstract [1]. Our community is fortunate in having both a long standing conference series and associated journal whose missions have been to collect, archive and disseminate technical and scientific knowledge and achievements in this broad interdisciplinary field which spans millimeter-waves to the far infrared and now benefits from the work of an even broader community of optical engineers. In this special issue the editors have tried to capture a

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wider range of topics than might otherwise appear in a single journal. *Havenith et al.* discuss some exciting recent results on spectroscopy of water clusters and their interaction with proteins in solvate solutions. *Keilmann et al.* describe yet another of the many exciting applications of scanning near field optical microscopy. *Pfeiffer et al.* present CMOS imaging detector arrays at 650 GHz. *Am Weg et al.* and *Cooper et al.* present the first demonstrations of submillimeter-wave radar imaging and applications. *Ramundo et al.* review bio applications and their interrogation by THz probing. *Knap et al.* use FET's as THz detectors and *Manohara et al.* shows us how even carbon nanotubes fit into the THz world as potential cathodes for high frequency electron-based sources. *Gallerano et al.* use the output from room-sized free electron laser sources to enhance near and far field imaging techniques in the millimeter. *Ortolini et al.* show near field coupling of millimeter-waves into micron scale HEMTs. Finally, *Rosen and Rosen* pair up to provide an overview of real world medical applications that span microwaves to optical components and techniques. The editors hope each reader will find something of interest within these pages that will keep them coming back to THz.

Reference

1. A. Redo-Sanchez and Xi-Cheng Zhang, "Terahertz Science and Technology Trends," IEEE Journal of Selected Topics in Quantum Electronics **14** (2), 260–269 (2008).