May 2022

IEEE Open Journal of Antennas and Propagation

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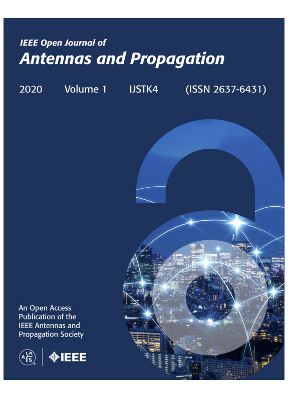


Dear Colleagues,

In the May newsletter we share with you fresh content of the *IEEE Open Journal of Antennas and Propagation (IEEE OJAP)*. We also invite you to tune into the new episode of OJAP TALKS and enjoy an insightful discussion with Professor Kwai-Man Luk on cutting-edge antenna technologies that enable next-generation wireless applications.

Happy reading!

Sincerely,
Konstantina (Nantia) Nikita
Editor-in-Chief
IEEE Open Journal of Antennas and Propagation

OJAP Talks

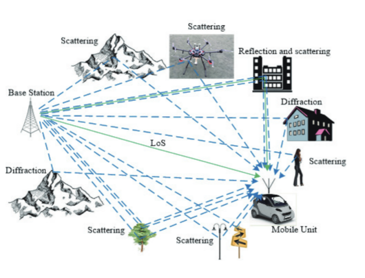
Exploring the enabling role of cutting-edge technologies in antennas and propagation with Kwai-Man Luk

In this episode of OJAP TALKS, OJAP's Associate Editor, Dr Qammer Abbasi, talks with Prof. Kwai-Man Luk from the City University of Hong Kong. Prof. Luk speaks about the transformative power of millimeter-wave antenna technologies for next-generation wireless applications. He discusses the latest trends in millimeter-wave antenna design and goes through the key challenges towards achieving miniaturization, wide bandwidth, and increased performance. He also sheds light on the enabling role of liquid antennas for future communications and reflects on the opportunities presented by reconfigurable intelligent surfaces for mobile communications, sensing, energy harvesting, and wireless power transfer.

Tune into the podcast

Volume 3 | Highlights

A Survey of Dense Multipath and Its Impact on Wireless Systems



by **Suying Jiang, Wei Wang, Yang Miao, Wei Fan, and Andreas F. Molisch**

The article provides a comprehensive review of the key topics for dense multipath components in terms of modeling, parameter estimation, characterization, and impact on wireless applications, and outlines future open research topics.

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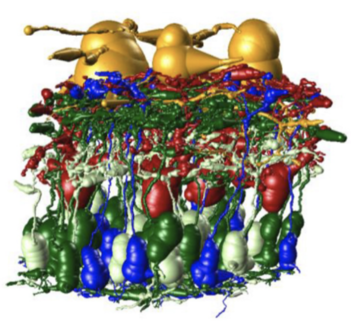
Next-Generation Healthcare: Enabling Technologies for Emerging Bioelectromagnetics Applications

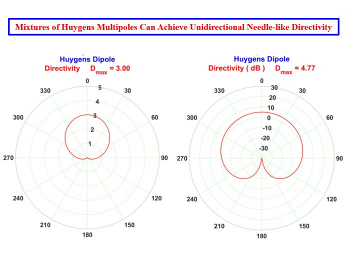


by **Asimina Kiourti, Amin M. Abbosh, Maria Athanasiou, Toni Björninen, Aline Eid, Cynthia Furse, Koichi Ito, Gianluca Lazzi, Mohamed Manoufali, Matteo Pastorino, Manos M. Tentzeris, Katrina Tisdale, Erdem Topsakal, Leena Ukkonen, William G. Whittow, Huanan Zhang, and Konstantina S. Nikita**

The article sheds light on enabling technologies that help realize body area sensing and stimulation, and provides a review of emerging bioelectromagnetics applications that may readily benefit from such technologies. Key challenges and opportunities are discussed, and future directions are highlighted.

Read more

Mixtures of Multipoles - Should They Be in Your EM Toolbox?

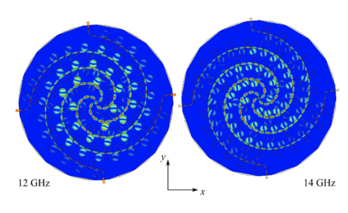


by **Richard W. Ziolkowski**

Combinations of electric and magnetic multipoles and recent keen science and engineering research interest in them are reviewed. It is demonstrated with several 2D and 3D systems that multipoles and engineered mixtures of them can achieve unidirectional, high directivity and even superdirective systems, as illustrated with these unidirectional examples arising from mixtures of Huygens multipoles.

Read more

High-Gain Dual-Band Dual-Sense Circularly Polarized Spiral Series-Fed Patch Antenna

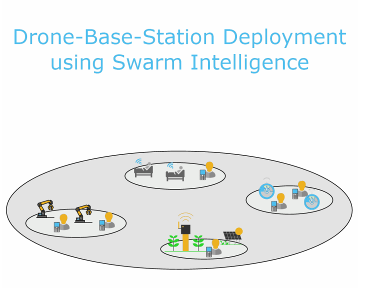


by **Nghia Nguyen-Trong, Shengjian Jammy Chen, and Christophe Fumeaux**

The proposed antenna can meet the strict requirements of satellite communications on a single-layered substrate with a simple feeding network. Critical aspects of this type of antennas, including feeding, element placement, radiation efficiency and aperture efficiency are also thoroughly discussed.

Read more

Drone-Base-Station for Next-Generation Internet-of-Things: A Comparison of Swarm Intelligence Approaches

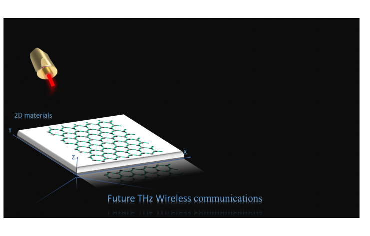


by **Dimitrios Pliatsios, Sotirios K. Goudos, Thomas Lagkas, Vasileios Argyriou, Alexandros-Apostolos A. Boulogeorgos, and Panagiotis Sarigiannidis**

The dense deployment of base stations for accommodating the Next-Generation Internet-of-Things (NG-IoT) is not always possible or cost-efficient. To this end, Drone-Base-Stations (DBSs) facilitate the network expansion and satisfaction of NG-IoT requirements. The article evaluates the performance of Swarm Intelligence algorithms towards finding the optimal position of DBSs.

Read more

Two-Dimensional Materials for Future Terahertz Wireless Communications



by **Abdoalbaset Abohmra, Zia Ullah Khan, Hasan T. Abbas, Nosherwan Shoaib, Muhammad A. Imran, and Qammer H. Abbasi**

For Next-Generation wireless communication applications, a detailed analysis and assessment of state-of-the-art 2D materials integrated devices is provided, including sources, modulators, and detectors. Graphene, TMDs, and perovskite are examples of 2D materials used in high-speed Terahertz wireless communications.

Read more

Features

A Study on the Radiation Characteristics of Microelectronic Probes
Ziyang Zheng and Yue Ping Zhang

Imaging and Calibration of Electromagnetic Inversion Data With a Single Data Set
Eungjoo Kim, Cena T. Mohammadi, Mohammad Asefi, Joe Lovetri, Ian Jeffrey, and Colin Gilmore

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Group Sparsity Penalized Contrast Source Solution Method for 2-D Non-Linear Inverse Scattering
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Fundamental Limits on Substructure Dielectric Resonator Antennas
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Quad-Furcated Profiled Horn: The Next Generation Highly Efficient GEO Antenna in Additive Manufacturing
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A Gain-Enhanced Patch Antenna With a Periodic Microstrip Rampart Line
Xiaoning Chen, Yuming Wei, Yuanxin Li, Zhixi Liang, Shao Yong Zheng, and Yunliang Long

The Use of Metasurfaces to Enhance Microwave Imaging: Experimental Validation for Tomographic and Radar-Based Algorithms
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Broadband Low-Loss On-Body UHF to Millimeter-Wave Surface Wave Links Using Flexible Textile Single Wire Transmission Lines
Mahmoud Wagih

Wide-Scan Focal Plane Arrays for mmWave Point-to-Multipoint Communications
Roel X. F. Budé, Amr Elsakka, Ulf Johannsen, and A. Bart Smolders

Unified Reciprocal Space Processing for Short-Range Active and Passive Imaging Systems
Aaron V. Diebold, Thomas Fromenteze, Ettien Kpré, Cyril Decroze, Mohammadreza F. Imani, and David R. Smith

Intelligence Enabled by 2D Metastructures in Antennas and Wireless Propagation Systems
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A Compact Wideband Dual-Polarized Base Station Antenna Using Asymmetric Dipole
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Cylindrical MIMO-SAR Imaging and Associated 3-D Fourier Processing
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Multi-Layered Coating Metasurfaces Enabling Frequency Reconfigurability in Wire Antenna
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A Ray Tracing Tool for Propagation Modeling in Layered Media: A Case Study at the Chip Scale
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Dual-Function Triple-Band Heatsink Antenna for Ambient RF and Thermal Energy Harvesting
Azamat Bakytbekov, Thang Q. Nguyen, Ge Zhang, Michael S. Strano, Khaled N. Salama, and Atif Shamim

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Olympia Karadima, Pan Lu, Ioannis Sotiriou, and Panagiotis Kosmas

A Finite Element-Based Characteristic Mode Analysis
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Broadband Circularly Polarized Microstrip Patch Antenna With Diamond-Shaped Artificial Ground Structure
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Dual-Band Circularly Polarized Antenna Array for 5G Millimeter-Wave Applications
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Sensor Arrangement in Through-the Wall Radar Imaging
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The Viet Hoang, Rupesh Kumar, Thomas Fromenteze, María García-Fernández, Guillermo Álvarez-Narciandi, Vincent Fusco, and Okan Yurduseven

Compact and Low-Profile Linear-/Circular-Polarization Dielectric Resonator Antennas With Extended Bandwidths
Jie-Er Zhang, Qinfang Zhang, Weibin Kong, Wen-Wen Yang, and Jian-Xin Chen

Design of microfluidic reflectarray elements for multi-reconfiguration using liquid metal
Eduardo Carrasco, Juan Gomez-Cruz, Mario Serrano-Berrueco, Carlos E. Saavedra, and Carlos Escobedo

Dimension and sampling of the near-field and its intensity over curves
Giovanni Leone, Raffaele Moretta, and Rocco Pierri

Broadband Compact Substrate-Independent Textile Wearable Antenna for Simultaneous Near-and Far-Field Wireless Power Transmission
Mahmoud Wagih, Abiodun Komolafe, Alex S. Weddell, and Steve Beeby

Methodology for Measuring the Frequency Dependence of Multipath Channels Across the Millimeter-Wave Spectrum
Damla Guven, Benjamin F. Jamroz, Jack Chuang, Camillo Gentile, Robert D. Horansky, Kate A. Remley, Dylan F. Williams, Jeanne T. Quimby, Alec J. Weiss, and Rodney Leonhardt

Explore more antennas and propagation research

Open Special Sections

- **Surface Wave and Metasurface Electromagnetic Engineering** | Submission deadline: 30 April 2022
- **Unconventional Techniques and Applications for Electromagnetic Inverse Problems** | Submission deadline: 1 May 2022
- **Recent Advances in Compact/Integrated Antenna Techniques for 5G Applications** | Submission deadline: 30 June 2022
- **Unmanned Aerial Vehicle-based Antenna and Field Measurements** | Submission deadline: 30 June 2022
- **Reconfigurable Antennas for Intelligent In-Door 5G Base Station Systems** | Submission deadline: 30 June 2022
- **Ultra-Wideband and Millimeter-Wave Phased-Array Antennas for Wireless Power and Data Telemetry towards Next-Generation Autonomous Systems** | Submission deadline: 31 July 2022
- **Antennas for RF Energy Harvesting and Wireless Power Transfer Applications** | Submission deadline: 31 October 2022
- **Advances in Antenna Design for Metaverse and Other Modern Smart Mobile Devices** | Submission deadline: 31 October 2022
- **Sub-THz and THz Radio Propagation: Measurements and Characterization** | Submission deadline: 31 December 2022

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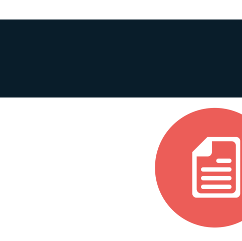
2022 IEEE OJAP Video Contest

Corresponding authors are expected to submit an up to 2-minute video clip pertaining to the research presented in their submitted article. The best video will be selected by an independent editorial judging committee based on the degree of technical content presentation, innovation, and video quality.
Submission deadline: December 31, 2022

Enter the contest



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