

2020 Fourteenth International Congress on Artificial Materials for Novel Wave Phenomena (Metamaterials 2020)

**New York City, New York, USA
27 September – 4 October 2020**



**IEEE Catalog Number: CFP20MEV-POD
ISBN: 978-1-7281-6105-1**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20MEV-POD
ISBN (Print-On-Demand):	978-1-7281-6105-1
ISBN (Online):	978-1-7281-6104-4

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

PHOTONIC SPIN-ORBIT COUPLING AND TOPOLOGICAL PROPERTIES OF EVANESCENT FIELDS.....	4
Anatoly V. Zayats	
FROM POLARIZABILITY TO EFFECTIVE PERMITTIVITY OF TIME-VARYING MATERIALS	6
M. S. Mirmoosa; T. T. Koutserimpas; G. A. Ptitcyn; S. A. Tretyakov; R. Fleury	
VIRTUAL ABSORPTION/GAIN THROUGH TIME MODULATION	9
Dimitrios L. Sounas	
DYNAMICAL PROPERTIES OF A PERIODIC MASS-SPRING NONLINEAR SEISMIC METAMATERIAL	12
R. Zivieri	
AMPLIFICATION OF LIGHT WITHIN A ONE-DIMENSIONAL PHOTONIC CRYSTAL WITH HARMONICALLY OSCILLATING DIELECTRIC CONSTANT OF EACH LAYER.....	15
Tsuyoshi Ueta	
FABRY-PEROT CAVITIES AND MATCHING SLABS IMPLEMENTED IN TIME-DOMAIN BY USING TIME-VARYING METAMATERIALS	18
D. Ramaccia; A. Toscano; F. Bilotti	
TOPOLOGICAL BULK MODES FOR LASING APPLICATION IN KAGOME LATTICE	21
S. Wong; S. S. Oh	
DESIGN OF A REFLECTING LUNEBURG LENS BY METAL-ONLY METASURFACE.....	24
J. Ruiz-García; E. Martini; C. Della Giovampaola; R. Sauleau; D. González-Ovejero; S. Maci	
MODIFIED FLOQUET BOUNDARY CONDITION FOR OPEN BOUNDARY PROBLEMS WITH N-PATH SYMMETRY	27
C. Scarborough; A. Grbic	
FUNDAMENTAL DESIGN OF MULTI-LAYER FRESNEL ZONE PLATES AS ULTRASONIC LENS FOR TRANSCRANIAL TREATMENT	30
H. Itoga; T. Ueta	
ENTANGLED QUANTUM EMITTERS IN THE PRESENCE OF A METALLIC NANODISK.....	33
Vasilios Karanikolas	
CAN WE BRING EM ENHANCEMENT TO THE MULTI-WAVELENGTH SCALE?	36
S. Foteinopoulou	
COMPLEX FREQUENCY EXCITATION ENABLING PERFECT MATCHING OF REACTIVE-LOADED TRANSMISSION LINES	39
A. Marini; D. Ramaccia; A. Toscano; F. Bilotti	
SENSING VIA EXCEPTIONAL POINTS IN SPACE AND TIME PERIODIC SYSTEMS AND IN PT-SYMMETRIC SYSTEMS	42
M. Y. Nada; T. Mealy; E. Hafezi; A. Nikzamir; F. Capolino	
LIGHT CONFINEMENT IN CORELESS TWISTED PHOTONIC CRYSTAL FIBERS.....	45
A. Copeland; A. Aceves	
SMART EM ENVIRONMENT AS ENABLING TECHNOLOGY FOR FUTURE WIRELESS SYSTEMS.....	48
M. Salucci; B. Li; A. Benoni; P. Rocca; A. Massa	
BROADBAND METASURFACES THROUGH FIRST ORDER APPROXIMATION OF SURFACE IMPEDANCES	51
Ashif A. Fathnan; Andreas E. Olk; David A. Powell	
THEORETICAL AND EXPERIMENTAL INVESTIGATION OF THE EMERGENCE OF SURFACE STATES ON PHOTONIC CRYSTALS AS HYBRID DIELECTRIC METASURFACE BOUND STATES OF THE TERMINATION LAYER	54
A. C. Tasolamprou; L. Zhang; E. N. Economou; C. M. Soukoulis; Th. Koschny	
MODELLING OF ELASTIC METAMATERIALS WITH MULTIPLE LOCAL RESONATORS	57
Zhengwei Li; Xiaodong Wang	
EQUIVALENT-CIRCUIT-BASED STABILITY ANALYSIS OF NON-FOSTER SCS NEGATIVE CAPACITOR	60
A. Brizic; S. Hrabar	
DIPOLE ANTENNAS WITH TIME-VARYING BODY AND SHAPE	63
M. H. Mostafa; G. Ptitcyn; S. Tretyakov	

MAGNET-FREE CIRCULATOR FORMED BY A TIME-VARYING NONRECIPROCAL PHASE SHIFTER.....	66
<i>Sajjad Taravati; George V. Eleftheriades</i>	
PERMITTIVITY SENSOR BASED ON A SLOW-WAVE ARTIFICIAL TRANSMISSION LINE	69
<i>J. Coromina; J. Muñoz-Enano; P. Vélez; A. Ebrahimi; J. Scott; K. Ghorbani; F. Martin</i>	
MODE CONVERSION IN CYLINDRICAL WAVEGUIDES USING METASURFACES.....	75
<i>F. Alsalamy; A. Grbic</i>	
TUNABLE INVERSE FARADAY EFFECT IN THE PHOTONIC CRYSTAL NANOSTRUCTURES WITH THE MAGNETIC LAYER OF GRADIENT THICKNESS.....	78
<i>O. V. Borovkova; M. A. Kozhaev; A. N. Kalish; V. I. Belotelov</i>	
HIGHLY EFFICIENT AND COMPACT MAGNET-FREE ISOLATOR BASED ON TIME-MODULATED LOOPS.....	81
<i>Sajjad Taravati; George V. Eleftheriades</i>	
HIERARCHICAL LARGE-SCALE ELASTIC METAMATERIALS AS AN INNOVATIVE PASSIVE ISOLATION STRATEGY FOR SEISMIC WAVE MITIGATION.....	84
<i>N. Kherraz; M. Miniaci; F. Bosia; A. S. Gliozzi; M. Onorato; N. M. Pugno</i>	
TUNABLE SECOND HARMONIC GENERATION IN ALGAAS METASURFACE THROUGH RECONFIGURABLE LIQUID CRYSTAL	87
<i>D. Rocco; L. Carletti; R. Caputo; M. Finazzi; M. Celebrano; C. De Angelis</i>	
EXPLOITING VORTEX MODES IN THE DESIGN OF PATCH ANTENNAS FOR PATTERN DIVERSITY AND MIMO SYSTEMS	93
<i>M. Barbuto; A. Alù; F. Bilotto; A. Toscano</i>	
NONRECIPROCITY IN UNIFORM TIME-VARYING MATERIALS USING SPATIAL DISPERSION.....	96
<i>G. Ptitsyn; X. Wang; A. Diaz-Rubio; V. S. Asadchy; M. S. Mirmoosa; S. Fan; S. A. Tretyakov</i>	
ANTENNA APPLICATIONS OF FREQUENCY-AND TIME-DOMAIN SELECTIVE DEVICES.....	99
<i>S. Vellucci; M. Barbuto; A. Monti; A. Toscano; F. Bilotto</i>	
EFFECTIVE MEDIUM APPROACH FOR INVESTIGATION OF OPTICAL PROPERTIES OF NANOCOMPOSITES WITH PLASMONIC NANOPARTICLES.....	102
<i>P. Varlamov; Y. Andreeva; M. Sergeev; F. Vocanson; T. Itina</i>	
ON THE DYNAMIC TAILORING OF ONE-WAY SURFACE PLASMONS OVER DRIFT-BIASED GRAPHENE METASURFACES	105
<i>N. K. Paul; J. S. Gomez-Diaz</i>	
TIME-VARYING ROUTE TO NON-FOSTER ELEMENTS.....	108
<i>S. Hrabar</i>	
EFFICIENT SIMULATION OF BI-PERIODIC, LAYERED STRUCTURES WITH THE T-MATRIX METHOD.....	110
<i>D. Beutel; A. Groner; T. Höß; C. Rockstuhl; I. Fernandez-Corbaton</i>	
THERMAL RADIATION ENGINEERING VIA QUANTUM NONLINEAR MIXING OF PHOTONS.....	115
<i>C. Khandekar; L. Yang; A. W. Rodriguez; Z. Jacob</i>	
COHERENT RETROREFLECTORS FOR REALIZATION OF BOUND STATES IN WAVEGUIDES.....	118
<i>G. Ptitsyn; F. S. Cuesta; S. A. Tretyakov</i>	
NON-FOSTER SELF-OSCILLATING SINGLE-LOOP ANTENNA	124
<i>Silvio Hrabar; Dmitry Kholodnyak; Bair Buiantuev; Dominik Dobrijevic; Marin Jakovcev; Matko Martinic; Ante Zeljko; Igor Krois</i>	
GEOMETRICAL OPTICS SOLUTION FOR PERIODIC MULTILAYER ANISOTROPIC SLAB SCATTERING.....	130
<i>M. Balasubramanian; S. D. Campbell; P. L. Werner; D. H. Werner</i>	
A FIXED-FREQUENCY RECONFIGURABLE HOLOGRAPHIC LEAKY-WAVE ANTENNA FOR DYNAMICALLY-CONTROLLED RADIATION PATTERNS	133
<i>Minseok Kim; George V. Eleftheriades</i>	
INVESTIGATION OF THE COMBINED FREQUENCY AND ANGULAR DEPENDENCIES OF RESONANCES IN A METAGRATING USING A WAVEGUIDE MODEL.....	136
<i>Abdulaziz H. Haddab; Edward F. Kuester</i>	
ACHIEVING ELECTROMAGNETIC ISOLATION BY USING UP- AND DOWN-CONVERTING TIME-VARYING METASURFACES.....	139
<i>D. Ramaccia; D. L. Sounas; A. Marini; A. Toscano; F. Bilotto</i>	
DIFFERENTIAL MICROFLUIDIC SENSORS BASED ON ELECTROINDUCTIVE-WAVE (EIW) TRANSMISSION LINES.....	141
<i>M. Gil; P. Vélez; F. Aznar-Ballesta; A. Mesegar-Ruiz; J. Muñoz-Enano; F. Martin</i>	

DESIGN AND OPTIMIZATION OF A SHARED APERTURE MULTIFUNCTIONAL METASURFACE ANTENNA	144
<i>T. Sleasman; D. Shrekenhamer; P. Vichot; S. Lashley</i>	
ELECTRODYNAMIC MODELS OF COMPOSITES AND METAMATERIALS BASED ON THE METHOD OF MINIMAL AUTONOMOUS BLOCKS	147
<i>S. Maly</i>	
MANIPULATING SURFACE PLASMONS PROPAGATION USING ULTRA-COMPACT AND NON-DIELECTRIC DESIGNS.....	150
<i>J. Riley; N. Healy; V. Pacheco-Peña</i>	
MAGNETIC LOCALIZED SURFACE PLASMONS FOR MAGNETIC RESONANCE IMAGING APPLICATIONS	153
<i>C. Rizza; E. Palange; A. Galante; M. Alecci</i>	
'PERFECT' FARADAY-ROTATION METASURFACE	156
<i>G. Lavigne; T. Kodera; C. Caloz</i>	
EFFICIENT IMPLEMENTATION OF ACTIVE EXTERIOR CLOAKING IN THREE DIMENSIONS.....	159
<i>Cheuk-Him Yeung; Tom Shearer; William J. Parnell</i>	
MULTIPLE SCALE METHOD APPLIED TO HOMOGENIZATION OF IRRATIONAL METAMATERIALS	162
<i>S. Guenneau; F. Zolla; E. Cherkaev; N. Wellander</i>	
BOOST IN SECOND HARMONIC GENERATION VIA QUASI-BOUND STATES IN THE CONTINUUM IN A GAIN-LOSS ASSISTED CORE-SHELLED NANOWIRE	165
<i>H. K. Gandhi; D. Rocco; L. Carletti; C. D. Angelis</i>	
ENHANCED WHITE-LIGHT PHOTOLUMINESCENCE IN HYBRID METAL-DIELECTRIC NANOSPONGE	168
<i>A. Larin; D. Zuev</i>	
EFFICIENT MIE RESONANCE OF METAL-MASKED TITANIUM DIOXIDE NANOPILLARS.....	171
<i>X. Shang; L. N. Shi; J. B. Niu; C. Q. Xie</i>	
NUMERICAL INVESTIGATION OF THE ENHANCED PROPAGATION FOR ELECTROMAGNETIC NONDESTRUCTIVE TESTING BY METASURFACE-BASED IMPEDANCE MATCHING	174
<i>T. Hao; W. A. Zheng</i>	
EQUIVALENT SURFACE IMPEDANCES FOR BELOW-CUTOFF PROPAGATION IN CIRCULAR WAVEGUIDES	177
<i>C. J. M. Barker; A. K. Iyer</i>	
TEMPORALLY MODULATED NON-HERMITIAN OPTICAL SYSTEMS BASED ON EPSILON-NEAR-ZERO MEDIA.....	180
<i>Z. Hayran; F. Monticone</i>	
BROADBAND ABSORPTION LIMITS FOR ULTRATHIN SOLAR CELLS	183
<i>Aobo Chen; Francesco Monticone</i>	
 MILLIMETER-WAVE META CELLS LOADED COPLANAR TRANSMISSION LINE FOR COMPONENT APPLICATIONS	186
<i>Christopher Hardly Joseph; Davide Mencarelli; Luca Pierantoni</i>	
GRAVITOMAGNETIC DIPOLE MOMENT OF GRAVITATIONAL UNIT CELLS.....	189
<i>Thomas P. Weldon; Christopher G. Daniel; Kathryn L. Smith</i>	
HIGH-UNIFORMITY, HIGH-PERFORMANCE DOUBLE MATERIAL DIELECTRIC DIFFRACTIVE METAGRATINGS.....	192
<i>O. Shramkova; V. Drazic; L. Blondé; B. Varghese; V. Allié</i>	
PARALLEL OPTICAL SPATIAL SIGNAL PROCESSING BASED ON 2×2 MIMO COMPUTATIONAL METASURFACE.....	195
<i>Amirhossein Babaee; Ali Momeni; Mohammad Moein Moeini; Romain Fleury; Ali Abdolali</i>	
A PHASE CONJUGATING METASURFACE	198
<i>F. Salas; W. Alomar; A. Grbic</i>	
BROADBAND TRANSPARENT METASURFACES FOR ANOMALOUS REFRACTION	204
<i>M. Londoño; A. C. Escobar; J. D. Baena</i>	
A 3D-PRINTED LIGHTWEIGHT AND BROADBAND METAMATERIAL ABSORBER MADE BY COPPER-BASED CONDUCTIVE COMPOSITE	207
<i>Zhen Yang; Qingxuan Liang; Yubing Duan; Zhaojun Li; Tianning Chen; Dichen Li</i>	
TOWARD MODELING OF COMPLIMENTARY METAMATERIAL ELEMENTS USING HIGHER-ORDER MOMENTS FOR METASURFACE ANTENNA DESIGN	216
<i>Insang Yoo; David R. Smith</i>	

METASURFACE QUANTUM WELL PHOTODETECTORS WITH BROADENED PHOTORESPONSE USING A PATCHWORK OF CAVITIES WITHIN A SUBWAVELENGTH PERIOD.....	219
<i>M. Hainey; T. Mano; T. Kasaya; Y. Jimba; H. Miyazaki; T. Ochiai; H. Osato; K. Watanabe; Y. Sugimoto; T. Kawazu; Y. Arai; A. Shigetou; H. T. Miyazaki</i>	
OMNIDIRECTIONAL, FREQUENCY SELECTIVE METASURFACE ABSORBER BASED ON QUASI-BOUND STATES IN THE CONTINUUM	222
<i>K. Shastri; F. Monticone</i>	
BEAMFORMING WITH NEURAL-NETWORKED PROGRAMMABLE METASURFACES	225
<i>S. Maslovski; A. Abraray; N. Carvalho; A. Navarro</i>	
HIGH-REFRACTIVE-INDEX NANOPARTICLES ON OPTICAL FIBRES FOR HIGH-RESOLUTION LENSING APPLICATIONS	228
<i>W. Aljuaid; N. Healy; V. Pacheco-Peña</i>	
DEMONSTRATION OF THE RELATION BETWEEN CO- AND CROSS-POLARIZABILITIES USING A MULTIPOLE EXPANSION OF THE ELECTROMOTIVE FORCE FOR PLANAR BIANISOTROPIC SCATTERERS.....	231
<i>A. C. Escobar; J. D. Baena</i>	
A REFLECTIVE METASURFACE FOR PERFECT CYLINDRICAL TO PLANAR WAVEFRONT TRANSFORMATION.....	234
<i>J. Budhu; A. Grbic</i>	
TOPOLOGICAL PHENOMENA IN ANTENNA SYSTEMS	237
<i>M. Barbuto; M. A. Miri; A. Alù; F. Bilotti; A. Toscano</i>	
A DISCONTINUOUS GALERKIN TIME DOMAIN SOLVER WITH GENERALIZED DISPERSION MODEL AND ITS APPLICATION TO THE ANALYSIS OF THIN PIXELIZED OPTICAL METASURFACES	242
<i>Wending Mai; Sawyer D. Campbell; Pingjuan L. Werner; Yifan Chen; Douglas H. Werner</i>	
TUNABLE FREQUENCY BAND STRUCTURE IN PHOTO-RESPONSIVE ELASTIC METAMATERIALS	245
<i>A. S. Gligozzi; M. Miniaci; A. Chiappone; A. Bergamini; F. Bosia; E. Descrovil</i>	
ON THE CORRECT DEFINITION OF POLARIZATION FOR METAMATERIALS.....	254
<i>J. D. Baena</i>	
TIME-DEPENDENT METASURFACES FOR TUNABLE BROADBAND HARMONICS GENERATION	257
<i>V. Zubryuk; P. Shafirin; A. Shorokhov; A. Musorin; T. Dolgova; G. Shvets; M. Shcherbakov; A. Fedyanin</i>	
DEEP LEARNING FOR GENERALIZED MULTIOBJECTIVE OPTIMIZATION OF METAMATERIALS	261
<i>R. P. Jenkins; P. J. O'Connor; S. D. Campbell; P. L. Werner; D. H. Werner</i>	
SUB-WAVELENGTH PASSIVE OPTICAL ISOLATORS USING WEYL SEMIMETALS	264
<i>V. Asadchy; C. Guo; B. Zhao; S. Fan</i>	
SPIN-MOMENTUM LOCKING OF CHIRAL SURFACE WAVES	267
<i>Sara M. Kandil; Dia'aaldin Bisharat; Daniel F. Sievenpiper</i>	
SPECTRAL DESIGN OF ACTIVE MECHANICAL AND ELECTRICAL METAMATERIALS	270
<i>H. Ronellenfitsch; J. Dunkel</i>	
METAMATERIAL BASED SPECTRO-POLARIMETRIC SYSTEMS	276
<i>G. Gerini; L. P. Stoevelaar; T. Cecotti</i>	
MILLIMETER-WAVE AND SUB-THZ MODULATED METASURFACE ANTENNAS	281
<i>D. González-Ovejero; X. Morvan; L. Le Coq; O. De Sagazan</i>	
MULTI-BAND WAVEFORM-SELECTIVE METASURFACES TRANSMITTING CONTINUOUS WAVEFORMS BASED ON MORE THAN ONE FREQUENCY	284
<i>H. Wakatsuchi; R. Higashihura; H. Takeshita; D. Nita</i>	
ENGINEERING THE ELECTRIC AND MAGNETIC RESPONSE OF ALL-DIELECTRIC METASURFACES THROUGH CORE-SHELL MIE RESONATORS	287
<i>A. Monti; A. Alù; A. Toscano; F. Bilotti</i>	
EXCITATION OF THE LIGHT LINE MODE WITH METAMATERIALS COMPOSED OF PARALLEL CONDUCTORS BASED ON EQUIVALENT-CIRCUIT MODEL INCLUDING RETARDED ELECTROMAGNETIC COUPLING	291
<i>D. Akimarul; T. Hisakadol; M. Islam; O. Wadal</i>	
MANIPULATION WITH TERAHERTZ WAVE FRONTS USING SELF-COMPLEMENTARY METASURFACES	294
<i>V. A. Lenets; S. A. Kuznetsov; A. D. Sayanskiy; P. A. Lazorskiy; J. D. Baena; S. B. Glybovski</i>	

IN-PLANE DRIVING OF ANAPOLE RESONANCES IN SILICON DISKS AT TELECOM WAVELENGTHS.....	297
<i>E. Díaz-Escobar; E. Pinilla-Cienfuegos; T. Bauer; A. I. Barreda; A. Griol; L. Kuipers; A. Martínez</i>	
FABRICATION AND OPTICAL PROPERTIES OF PLASMONIC NANOCOMPOSITE STRUCTURES	300
<i>Y. Andreeva; P. Varlamov; F. Vocanson; N. Destouches; T. Itina</i>	
DOUBLE IMAGING BY A PERIODIC BI-FOLD TRANSFORMATION MEDIUM.....	303
<i>Y. Takano; A. Sanada</i>	
RETRIEVAL OF THE CONSTITUTIVE PARAMETERS AND DISPERSION RELATION OF GLIDE-SYMMETRIC METAMATERIALS VIA THE MULTIMODAL TRANSFER MATRIX METHOD	312
<i>A. C. Escobar; J. P. Del Risco; O. Quevedo-Teruel; F. Mesa; J. D. Baena</i>	
A TOPOELECTRICAL HIGHER-ORDER CHERN INSULATOR.....	315
<i>X. Ni; Z. Xiao; A. B. Khanikaev; A. Alù</i>	
IE-GSTC ANALYSIS OF METASURFACE CAVITIES AND APPLICATION TO REDIRECTION CLOAKING	318
<i>Mojtaba Dehmollaian; Christophe Caloz</i>	
ROUTING OPTICAL SPIN AND PSEUDOSPIN WITH METASURFACES.....	321
<i>Y. Mazor; A. Alù</i>	
FAST RETRIEVAL OF EFFECTIVE MATERIAL PARAMETERS USING ARTIFICIAL NEURAL NETWORK.....	324
<i>T. Repán; C. Rockstuhl</i>	
HILBERT FRACTAL INSPIRED DIPOLES FOR B1+ FIELD CONTROL IN ULTRA-HIGH FIELD MRI.....	327
<i>T. S. Vergara Gomez; M. Dubois; K. Rustomji; E. Georget; T. Antonakakis; S. Rapacchi; F. Kober; S. Enoch; R. Abdeddaim</i>	
TRANSVERSE MAGNETO-OPTICAL EFFECT IN ASYMMETRIC PLASMONIC NANOSTRUCTURES	330
<i>O. V. Borovkova; H. Hashim; M. A. Kozhaev; A. N. Kalish; S. A. Dagesyan; A. N. Shaposhnikov; V. N. Berzhansky; A. K. Zvezdin; L. V. Panina; V. I. Belotelov</i>	
ALUMINUM-BASED HYBRID GRATINGS FOR INFRARED SPECTRAL EMISSIVITY DESIGN.....	333
<i>Romil Audhkhasi; Michelle L. Povinelli</i>	
TAILORING THE INTERACTIONS BETWEEN ELECTRIC AND MAGNETIC DIPOLES IN PLASMONIC AND DIELECTRIC METASURFACES.....	340
<i>A. Monti; A. Alù; A. Toscano; F. Bilotti</i>	
VALLEY-HALL TOPOLOGICAL TRANSPORT IN GRAPHENE PLASMONIC CRYSTAL WAVEGUIDES.....	343
<i>Jian Wei You; Yupei Wang; Nicolae. C. Panoiu</i>	
OPTIMAL MONITORING OF SMALL POLARIZATION PERTURBATIONS WITH METASURFACES	349
<i>Shaun Lung; Jihua Zhang; Kai Wang; Khosro Zangeneh Kamali; Mohsen Rahmani; Dragomir N. Neshev; Andrey A. Sukhorukov</i>	
COMPACT ANTENNAS IN RIDGE GAP WAVEGUIDE WITH CIRCULAR POLARIZATION.....	352
<i>Dayan Pérez-Quintana; Iñigo Ederra; Miguel Beruete</i>	
OVERCOMING MANTLE CLOAKING LIMITS IN ANTENNA APPLICATIONS THROUGH NON-LINEAR METASURFACES	355
<i>S. Vellucci; A. Monti; M. Barbuto; M. Salucci; G. Oliveri; A. Toscano; F. Bilotti</i>	
PERSPECTIVES ON HUYGENS' METASURFACES FOR ANTENNA BEAMFORMING.....	358
<i>Vasileios G. Ataloglou; Ayman H. Dorrah; George V. Eleftheriades</i>	
OMEGA BIANISOTROPIC METASURFACES AS HUYGENS' METASURFACES WITH ANI-REFLECTIVE COATINGS	361
<i>Sherman W. Marcus; Ariel Epstein</i>	
HUYGENS'-METASURFACE-ASSISTED RECONFIGURABLE LEAKY-WAVE ANTENNAS WITH DYNAMICALLY-CONTROLLED RADIATION PATTERNS	364
<i>Minseok Kim; George V. Eleftheriades</i>	
BROADBAND UNIAXIAL DIELECTRIC-MAGNETIC METAMATERIAL WITH GIANT ANISOTROPY FACTOR.....	367
<i>J. D. Baena; J. P. Del Risco; A. C. Escobar</i>	
LATTICE RESONANCES IN METASURFACES COMPOSED OF SILICON NANO-CYLINDERS	370
<i>S. Jamilan; Elena Semouchkina</i>	

3D-PRINTED METASURFACES OF CAPPED HELICES PROVIDING BROADBAND NEGATIVE MODE INDEX	373
<i>P. Petrov; A. P. Hibbins; N. Aboulkhair; E. Saleh; J. R. Sambles</i>	
THREE-DIMENSIONAL META-FILMS – A DISCOVERY PLATFORM FOR STRUCTURED ELECTROMAGNETIC MATERIALS	376
<i>D. B. Burckel; K. M. Musick; P. J. Resnick; M. B. Sinclair; M. Goldflam</i>	
SPACETIME METAMATERIALS PERSPECTIVES	379
<i>C. Caloz</i>	
METAMATERIALS, GYROSCOPES, AND TWO CENTURY-OLD PROBLEMS IN NUMBER THEORY	382
<i>Ben Z. Steinberg; I. Kazma</i>	
HIGH SENSITIVITY FANO-LIKE ROD-TYPE SILICON PHOTONIC CRYSTAL REFRACTIVE INDEX SENSOR	385
<i>S. C. Kilic; S. Kocaman</i>	
NONLINEAR DIELECTRIC METASURFACES: TOWARDS HIGH EFFICIENCY AND FULL SPATIAL PHASE CONTROL	388
<i>B. Liu; B. Reineke; B. Sain; R. Zhao; L. Huang; Y. Jiang; T. Zentgraf</i>	
NONRECIPROCAL LONGITUDINAL VIBRATIONS OF FINITE ELASTIC STRUCTURES WITH SPATIOTEMPORALLY MODULATED PROPERTIES	391
<i>B. M. Goldsberry; S. P. Wallen; M. R. Haberman</i>	
TAILORING NONLINEAR DIFFRACTION IN SILICON METASURFACES	394
<i>Andrea Tognazzi; Kirill Okhlopkov; Attilio Zilli; Davide Rocco; Luca Fagiani; Erfan Mafakheri; Monica Bollani; Marco Finazzi; Michele Celebrano; Maxim Shcherbakov; Andrey Fedyanin; Costantino De Angelis</i>	
REFLECTION-FREE TRANSMISSION IN RECIPROCAL SLOT LINE WAVEGUIDE	397
<i>D. J. Bisharat; D. F. Sievenpiper</i>	
SUB-STRUCTURE LIMITS TO OPTICAL PHENOMENA	400
<i>L. Jelinek; M. Gustafsson; M. Capek; K. Schab</i>	
HOW TO DECOUPLE AND CLOAK INTERLEAVED PHASED ARRAYS	403
<i>Hossein Mehrpour Bernety; Shefali Pawar; Harry G. Skinner; Seong-Youp Suh; Andrea Alù; Alexander B. Yakovlev</i>	
METAMIRROR FOR GENERATION AND CONTROL OF BESSEL BEAM	406
<i>R. Feng; B. Ratni; J. Yi; A. De Lustrac; H. Zhang; S. N. Burokur</i>	
CONCEPTUAL DEVELOPMENT OF VIBROACOUSTIC METAMATERIAL STRUCTURES FOR THIN-WALLED COMPOSITE STRUCTURES FOR AEROSPACE APPLICATIONS	409
<i>D. Manushyna; H. Atzrodt; N. Deschauer</i>	
SCATTERING MATRICES AS A PARADIGM FOR ARTIFICIAL MATERIALS BASED DEVICES SYNTHESIS	412
<i>R. Palmeri; T. Isernia</i>	
FEEDBACK-BASED TOPOLOGICAL MECHANICAL METAMATERIALS	415
<i>L. Sirota; Y. Lahini; R. Ilan; Y. Shokef</i>	
WAVE PROPAGATION IN DOUBLE-NEGATIVE ACOUSTIC METAMATERIAL MULTILAYERS	418
<i>T. Terao</i>	
AVERAGED POWER OF MULTITONE WAVE PACKETS AND MIXING PRODUCTS	421
<i>A. Schuchinsky</i>	
LOSSES OF SLOW INTERFACE WAVES IN PLASMONIC AND SPINTRONIC STRUCTURES	424
<i>A. Schuchinsky</i>	
ELECTRO-OPTICALLY MODULATED REFLECTIVE AND TRANSMISSIVE METASURFACES	427
<i>A. Forouzmand; H. Mosallaei</i>	
ON THE RADIATIVE EMISSION AND EXCITATION RATE OF QUANTUM EMITTERS IN PLASMONIC NANOSTRUCTURES	433
<i>K. Bedingfield; A. Demetriadoul</i>	
THERMAL SPIN PHOTONICS IN NONEQUILIBRIUM AND NONRECIPROCAL SYSTEMS	441
<i>C. Khandekar; Z. Jacob</i>	
SIMULTANEOUS CONTROL OF ACOUSTIC AND ELECTROMAGNETIC WAVES USING METASURFACES	444
<i>A. Díaz-Rubio; S. Tretyakov</i>	
COMPRESSIBILITY-NEAR-ZERO DIRECTIVE SOUND	447
<i>C. Rasmussen; A. Alù</i>	
RECENT ADVANCES IN SPACE-TIME-CODING DIGITAL METASURFACES	450
<i>L. Zhang; X. Q. Chen; R. W. Shao; J. Y. Dai; Q. Cheng; M. Moccia; G. Castaldi; T. J. Cui; V. Galdi</i>	

DISCRETE-SPACE METAMATERIALS FOR OPTICAL SIGNAL PROCESSING	453
<i>Mohammad Moein Moeini; Dimitrios L. Sounas</i>	
SYNTHESIS OF NIC-BASED REFLECTION AMPLIFIERS FOR METASURFACES	456
<i>Josip Loncar; Anthony Grbic; Zvonimir Šipuš</i>	
TOPOLOGICAL AMORPHOUS METASURFACES BASED ON ELECTROMAGNETIC DUALITY	459
<i>D. J. Bisharat; D. F. Sievenpiper</i>	
THEORY AND APPLICATION OF ANALYTICAL MODELS FOR THIN-WIRE NANOLOOP ANTENNAS	462
<i>R. J. Chaky; D. H. Werner</i>	
DESIGN OF HIGH-TRANSMISSION PLASMONIC WAVELENGTH AND POLARIZATION FILTERS FOR INFRARED PHOTODETECTORS	465
<i>T. Wenger; A. Soibel</i>	
DESIGN METHODS FOR 3D MEMBRANE PROJECTION LITHOGRAPHY METASURFACE UNIT CELLS	468
<i>E. B. Whiting; S. D. Campbell; D. H. Werner; P. L. Werner</i>	
A LOW-REFLECTION ABSORPTIVE METASURFACE FOR MID-IR WAVELENGTHS	471
<i>I. A. Faniayeu; V. Mizeikis; A. Dmitriev</i>	
2.5D METASTRUCTURES; DESIGN, OPTIMIZATION, AND EXPERIMENTAL DEMONSTRATION	474
<i>M. Mansouree; H. Kwon; E. Arbabi; A. McClung; A. Faraon; A. Arbabi</i>	
TE BAND STRUCTURE FOR HIGH CONTRAST HONEYCOMB MEDIA	479
<i>Maxence Cassier; Michael I. Weinstein</i>	
TUNABLE ELASTIC WAVE BANDGAP AND LOCAL RESONANCES IN SINGLE-PHASE METAMATERIAL WITH APPLIED DEFORMATION	484
<i>Nitish Kumar; Siladitya Pal</i>	
ADVANCED MANUFACTURING TECHNIQUES FOR STRUCTURALLY INTEGRATED METASURFACES	487
<i>K. J. Nicholson; T. C. Baum; J. Yu</i>	
FROM ADVANCED CLOAKING METASURFACES TO A NEW GENERATION OF INTELLIGENT ANTENNAS	490
<i>M. Barbuto; A. V. Marini; A. Monti; D. Ramaccia; S. Vellucci; A. Toscano; F. Bilotto</i>	
TOWARDS INTEGRATED CHIROOPTICAL APPLICATIONS	493
<i>J. Enrique Vázquez-Lozano; Alejandro Martínez</i>	
MULTIFUNCTIONAL SINGLE-LAYER METASURFACE FOR ELECTROMAGNETIC WAVE MANIPULATIONS	496
<i>I. A. Faniayeu; I. A. Fanyaev; S. A. Khakhomov; I. V. Semchenko</i>	
METAGRATINGS BEYOND BEAM MANIPULATION	499
<i>K. Killamsetty; L. Biniashvili; Y. Kerzhner; O. Rabinovich; A. Epstein</i>	
METASURFACES 3.0: A KEY ENABLING TECHNOLOGY FOR THE DEVELOPMENT OF BEYOND-5G COMMUNICATION SYSTEMS	502
<i>M. Barbuto; A. V. Marini; A. Monti; D. Ramaccia; S. Vellucci; A. Toscano; F. Bilotto</i>	
RETROREFLECTIVE SUBHARMONIC FREQUENCY TRANSLATION WITH A SPATIOTEMPORAL METASURFACE	505
<i>Zhanni Wu; Cody Scarborough; Anthony Grbic</i>	
EXPERIMENTAL DEMONSTRATION OF NON-FOSTER SELF-OSCILLATING HUYGENS RADIATOR	508
<i>L. Vincelj; R. W. Ziolkowski; S. Hrabar</i>	
EFFICIENT LIGHT TRAPPING IN THE INFRARED USING GOLD – BLACK PHOSPHORUS NANOSTRUCTURED ABSORBERS	517
<i>Romil Audhkhasi; Michelle L. Povinelli</i>	
TUNABLE AND ROBUST LONG-RANGE COHERENT DIPOLE INTERACTIONS MEDIATED BY WEYL BOUND STATES	520
<i>I. García-Escano; A. González-Tudela; J. Bravo-Abad</i>	
Author Index	