Waves

Scientific Committee

Committee coordinator(s)

Pierre-Noël Favennec – Frédérique de Fornel
Institut Mines-Télécom, Paris – CNRS, Université de Bourgogne, Dijon
pierre-noel.favennec@armorscience.com – ffornel@u-bourgogne.fr

Pascal Besnard, ENSSAT, Université de Rennes 1
Mathias Fink, ESPCI ParisTech, Paris
Sébastien Guenneau, Institut Fresnel, Marseille
Marc Himbert, LNE-CNAM, La Plaine Saint-Denis
Alain Priou, Université Paris Ouest Ville d'Avray
Anatoly Zayats, King’s College, London, United Kingdom

Topics covered

Acoustics
Antennas
Electromagnetic compatibility
Electromagnetism
Electromagnetic Metrology
Lasers
Micro and Nanotechnologies
Optical Communication
Photonics
Propagation
Radar
Radiocommunication
Surface Waves
Teledetection
Waves in Medicine
Wave-Matter Interaction
Wireless Power Transfer
Forthcoming Sets

Advanced Lasers – A Advanced Structures & B Uses
  coordinated by Pierre-Noël Favennec, Pascal Besnard, Frédérique de Fornel
Coupled Waves coordinated by Pierre-Noël Favennec, Frédérique de Fornel
Electromagnetic Environment coordinated by Pierre-Noël Favennec, Frédérique de Fornel
Metamaterials Applied to Waves coordinated by de Frédérique Fornel, Sébastien Guenneau
Nano-optics coordinated by Pierre-Noël Favennec, Frédérique de Fornel

Advanced Lasers
Coordinated by Pierre-Noël Favennec, Pascal Besnard, Frédérique de Fornel

Fiber Lasers by Chartier Thierry, Pureur David
Integrated Lasers on Silicon by Cornet Charles, Léger Yoan, Robert Cédric
Organic Lasers by Boudrioua Azzedine, Fischer Alexis, Chakaroun Mahmoud
Physics of Intense Lasers by Balcou Philippe
Recent Advances in Semiconductor Lasers by Grillot Frédéric

Forthcoming Titles

Acoustic Waves by Guenneau Sébastien
Antenna Designs for NFC Devices by Paret Dominique
Electro-optics for Non-ionizing Radiation Dosimetry and Bioelectromagnetism
  1by Duvillaret Lionel, Levêque Philippe
Optics in Spatial Instruments by Cerrutti-Maori Guy, Otrio Georges
Passive and Active RF-Microwave Circuits by Jarry Pierre, Beneat Jacques N.
The five senses of communication by Tréheux Michel
The photon by Besnard Pascal
For nano MRI to fulfill its potential as a 3D imaging technique that can visualize the atomic structure of molecules, it is necessary to consider the reconstruction of sparse images. Many works have leveraged the assumption of sparsity in order to achieve an improved performance that would not otherwise be possible. This book reviews the latest results on molecular imaging for nano MRI.
LTE Services
Jean-Gabriel Remy, Catholic University of Paris, Charlotte Letamendia, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848217874 • 2014 • 236 pages • USD 105.00 • ISTE-WILEY

LTE (Long Term Evolution) is commonly marketed as 4G. LTE and LTE Advanced have been recognized by ITU-R and ITU-T (International Telecommunications Union – Telecommunications) as the principal solution for the future mobile communication networks standards. They are thus the framework of what the marketing calls 4G and possibly also 5G. This book describes various aspects of LTE as well as the change of paradigm, which it is bringing to mobile communications, focusing on LTE standards and architecture, OFDMA, the Full IP Core Network and LTE security.

Contents
1. LTE Roll-Out.
2. Operation and Maintenance.
3. OTT Services.

LTE Standards
Jean-Gabriel Remy, Catholic University of Paris, Charlotte Letamendia, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848215887 • 2014 • 306 pages • USD 145.00 • ISTE-WILEY

Contents
1. LTE Standards and Architecture.
2. OFDMA.
3. The Full IP Core Network.

MMSE-based Algorithm for Joint Signal Detection, Channel and Noise Variance Estimation for OFDM Systems
Vincent Savaux, Yves Louét, Supélec, Rennes, France

Coordinated by Bernard Dubuisson

ISBN: 9781848216976 • 2014 • 136 pages • USD 70.00 • ISTE-WILEY

This book presents an algorithm for the detection of an orthogonal frequency division multiplexing (OFDM) signal in a cognitive radio context by means of a joint and iterative channel and noise estimation technique. Based on the minimum mean square criterion, it performs an accurate detection of a user in a frequency band, by achieving a quasi-optimal channel and noise variance estimation if the signal is present, and by estimating the noise level in the band if the signal is absent.

Contents
1. Background and System Model.
2. Joint Channel and Noise Variance Estimation in the Presence of the OFDM Signal.
3. Application of the Algorithm as a Detector for Cognitive Radio Systems.
Dispersions Engineering for Integrated Nanophotonics
Olivier Vanbésien, University of Lille, Emmanuel Centeno, Blaise Pascal University, Clermont-Ferrand, France

Coordinated by Frédérique de Fornel

ISBN: 9781848215641 • 2014 • 128 pages • USD 65.00 • ISTE-WILEY

Dispersion engineering in regular and graded photonic crystals to promote anomalous refraction effects are studied by the authors of this book, from the basic concepts to experimental demonstration via nanofabrication considerations.

Acoustic Particle Velocity Measurements using Lasers
Principles, Signal Processing And Applications
Jean-Christophe Valièrè, University of Poitiers, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848215627 • 2014 • 160 pages • USD 80.00 • ISTE-WILEY

This book concerns the presentation of particle velocity measurement for acoustics using lasers, including Laser Doppler Velocimetry (LDV or Anemometry (LDA)) and Particle Imagery Velocimetry (PIV).

The author presents the importance of measuring acoustic velocity, particularly when acoustics is nonlinear, as well as characterizing the near fields.

UHF RFID Technologies for Identification and Traceability
Jean-Marc Laheurte, University of Paris-Est Marne-La-Vallée, Christian Ripoll, ESIEE, Dominique Paret, dp-Consulting, Christophe Loussert, TAGS, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848215924 • 2014 • 192 pages • USD 85.00 • ISTE-WILEY

UHF Radio Frequency Identification (RFID) is an electronic tagging technology that allows an object, place or person to be automatically identified at a distance without a direct line-of-sight using a radio-wave exchange.

A reference document on the tag antenna design and chip technologies in UHF RFID, UHF RFID Technologies for Identification and Traceability also includes perspectives on end-users, market and production.
Bistatic SAR/GISAR/FISAR Geometry, Signal Models and Imaging Algorithms
Andon Dimitrov Lazarov, Burgas Free University and Todor Pavlov Kostadinov, Burgas Technical University “Asen Zlatarov”, Bulgaria

Coordinated by Pierre-Noël Favennec
ISBN: 9781848215740 • 2013 • 192 pages • USD 95.00 • ISTE-WILEY

This book provides a general theoretical description of such bistatic technology in the context of synthetic aperture, inverse synthetic aperture and forward scattering radars from the point of view of analytical geometrical and signal formation as well as processing theory.

Signal formation and image reconstruction algorithms are developed with the application of high informative linear frequency and phase code modulating techniques, and numerical experiments that confirm theoretical models are carried out.

Method of Moments for the Scattering from 2D Problems
Christophe Bourlier and Nicolas Pinel, University of Nantes, Gildas Kubické, DGA, French Ministry of Defense, France

Coordinated by Joseph Saillard
ISBN: 9781848214729 • 2013 • 160 pages • USD 80.00 • ISTE-WILEY

The Method of Moments (MoM) is applied in this book to compute the field scattered by scatterers such as canonical objects (cylinder or plate) or a randomly rough surface, and also by an object above or below a random rough surface. Since the problem is considered to be 2D, the integral equations (IEs) are scalar and only the TE (transverse electric) and TM (transverse magnetic) polarizations are addressed (no cross-polarizations occur).

Wireless Power Transfer via Radiowaves
Naoki Shinohara, Research Institute for Sustainable Humanosphere, Kyoto University, Japan

Coordinated by Pierre-Noël Favennec
ISBN: 9781848216051 • 2013 • 256 pages • USD 105.00 • ISTE-WILEY

The author explores the different technologies of WPT, such as microwave generators with semi-conductor and microwave tubes, antennas, phased arrays, beam efficiency, and rectifiers (rectennas). These are described by comparing a coupling WPT.

The book also covers the applications of WPT, such as energy harvesting, sensor networks, point-to-point WPT, WPT to moving target (airplanes, vehicles, etc.), and solar power satellites, making it suitable for all specialists in the field of WPT and RF.
Electromagnetic Wave Scattering from Random Rough Surfaces
Asymptotic Models
Nicolas Pinel, Alyotech Technologies, Rennes and Christophe Bourlier, PolytechNantes, France

Coordinated by Joseph Saillard

ISBN: 9781848214712 • 2013 • 160 pages • USD 80.00 • ISTE-WILEY

Focusing on the case of random rough surfaces, this book presents classical asymptotic models used to describe electromagnetic wave scattering.

The authors begin by outlining the basic concepts relevant to the topic before moving on to look at the derivation of the scattered field under asymptotic models, based on the Kirchhoff-tangent plane, in order to calculate both the scattered field and the statistical average intensity.

Contents
2. Derivation of the Scattered Field under Asymptotic Models.
3. Derivation of the Normalized Radar Cross-Section under Asymptotic Models.

Optics in Instruments
Applications to Biology and Medicine
Edited by Jean-Pierre Goure, Jean Monnet University, Saint-Etienne, France

Waves Series

ISBN: 9781848212442 • 2013 • 256 pages • USD 125.00 • ISTE-WILEY

Optics in Instruments: Applications in Biology and Medicine details instruments and measurement systems using optical methods in the visible and near-infrared, as well as their applications in biology and medicine, through looking at confocal laser scanning microscopy, the basis of instruments performing in biological and medical analysis today, and flow cytometry, an instrument which measures at high speed the parameters of a cell passing in front of one or more laser beams.

Contents
3. Optical Coherence Tomography.
4. Therapeutic Applications of Lasers.
5. Plasmonics.

Metamaterials and Wave Control
Edited by Éric Lheurette, University of Lille, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848215184 • 2013 • 240 pages • USD 90.00 • ISTE-WILEY

This book provides an overview of the metamaterial concept as a prospect for a new practical tool for the study of waves and engineering, including both the electromagnetic spectrum, from microwaves to optics, and the field of acoustic waves.

Contents
1. Overview of Microwave and Optical Metamaterial Technologies.
5. Dissipative Loss in Resonant Metamaterials.
7. Metamaterials for Control of Surface Electromagnetic and Liquid Waves.
8. Classical Analog of Electromagnetically Induced Transparency.
Wireless Telecommunication Systems
Michel Terré and Mylène Pischella, CNAM, Paris and Emmanuelle Vivier, ISEP, France

Coordinated by Pierre-Noël Favennec

ISBN: 9781848215436 • 2013 • 224 pages • USD 95.00 • ISTE-WILEY

In this book, the authors propose a macroscopic approach on wireless systems, and aim at answering key questions about power, data rates, multiple access, cellular engineering and access networks architectures. They present a series of solved problems, whose objective is to establish the main elements of a global link budget in several radiocommunications systems.

Contents

Digital Holography
Pascal Picart, ENSIM, Le Mans, France and Jun-chang Li, Kunming University of Sciences and Technologies, China

Waves Series

ISBN: 9781848213449 • 2012 • 384 pages • USD 147.00 • ISTE-WILEY

This book presents a substantial description of the principles and applications of digital holography. The first part of the book deals with mathematical basics and the linear filtering theory necessary to approach the topic. The next part describes the fundamentals of diffraction theory and exhaustively details the numerical computation of diffracted fields using FFT algorithms. A thorough presentation of the principles of holography and digital holography, including digital color holography, is proposed in the third part.

Contents

Radio Resource Allocation and Dynamic Spectrum Access
Badr Benmammar and Asma Amraoui, University Abou Bekr Belkaïd Tlemcen, Algeria

Coordinated by Pierre-Noël Favennec

ISBN: 9781848214453 • 2012 • 96 pages • USD 50.00 • ISTE-WILEY

This book presents the state of the art of the different techniques for spectrum access using cooperation and competition to solve the problem of spectrum allocation and ensure better management of radio resources in a radio cognitive context.

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### Backlist Titles (published prior to 2012)

**Optics in Instruments**  
Edited by Jean-Pierre Goure, Jean Monnet University, Saint-Etienne, France  
9781848212435 • 2011 • 320 pages • USD 132.00

**Non-standard Antennas**  
Edited by François Le Chevalier, THALES Air Systems, Dominique Lesselier, Paris-Sud University and Robert Staraj, University of Nice Sophia Antipolis, France  
9781848212749 • 2011 • 480 pages • USD 205.00

**Mechanical and Electromagnetic Vibrations and Waves**  
Tamer Bécherrawy, Consultant, France  
9781848212831 • 2011 • 448 pages • USD 177.00

**Photonic Waveguides**  
Theory and Applications  
Azzedine Boudrioua, University of Metz, France  
9781848210271 • 2009 • 352 pages • USD 165.00

**Music and Acoustics**  
From Instrument to Computer  
Philippe Guillaume, INSA, Toulouse, France  
9781905209262 • 2006 • 208 pages • USD 150.00

**Vibrations and Acoustic Radiation of Thin Structures**  
Physical Basis, Theoretical Analysis and Numerical Methods  
Paul J.T. Filippi, Consultant, France  
9781848210561 • 2008 • 288 pages • USD 140.00

**Vibration in Continuous Media**  
Jean-Louis Guyader, INSA, Lyon, France  
9781905209279 • 2006 • 448 pages • USD 250.00

**Ultra Wide Band Antennas**  
Edited by Xavier Begaud, TELECOM ParisTech, France  
9781848212329 • 2010 • 304 pages • USD 135.00

**Measurements using Optic and RF Waves**  
Edited by Frédérique de Fornel, University of Burgundy and Pierre-Noël Favennc, Consultant Engineer, France  
9781848211872 • 2009 • 336 pages • USD 165.00

**Materials and Acoustics Handbook**  
Edited by Michel Bruneau and Catherine Potel, Acoustic Laboratory of Maine University, Le Mans, France  
9781848210745 • 2009 • 944 pages • USD 435.00

**Sonar and Underwater Acoustics**  
Jean-Paul Marage, Consultant and Yvon Mori, Consultant, France  
9781848211896 • 2010 • 640 pages • USD 215.00

**Free-space Optics**  
Propagation and Communication  
Olivier Bouchet and Hervé Sizun, France Telecom, Christian Boisrobert, University of Nantes, Frédérique de Fornel, University of Burgundy and Pierre-Noël Favennc, Consultant engineer, France  
9781905209026 • 2006 • 224 pages • USD 115.00

**Fundamentals of Acoustics**  
Michel Bruneau, University of Maine, France  
Thomas Scelo (translator and contributor), University of Auckland, New Zealand  
9781905209255 • 2006 • 640 pages • USD 275.00
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