regime and the photovoltaic effect can enhance the photovoltaic properties of the cell..

09:10 : Invited talk
Active IR and THz Light Modulators Based on Epsilon-Near Zero InAs and GaSb Semiconductor Frequency-Selective Surfaces
Julien Guise, Fernando Gonzalez-posada Flores, Stephan Blin, Thierry Taliercio
University of Montpellier (France)

Our research explores light-matter interaction applications, focusing on surface field-enhanced optical filters and transducers in the mid-infrared (MIR) and terahertz (THz) spectral ranges using plasmonic effects. We present thermal and optical activation of epsilon-near-zero (ENZ) materials based on epitaxial InAs and GaSb semiconductors, with emphasis on frequency-selective surface optical devices.

09:30 : Invited talk
Sub-1-volt, Reconfigurable Gires-tournois Resonators For Colored Monopixel Array
Young Min Song
Gwangju Institute of Science and Technology (Korea)

We present an electrically reconfigurable Gires-Tournois resonator integrated with polyaniline for full-colour, energy-efficient modulation at CMOS-compatible voltages. This system achieves vibrant colour shifts across the visible spectrum within a sub-1V range, supporting ultrahigh pixel densities and wafer-scale fabrication, with bistable memory-in-pixel functionality for low-power passive matrix addressing in display applications.

09:50 : Invited talk
Exploring Channelrhodopsin-2 And Gold Nanoparticle Interaction For Optogenetics
Roberto Messina[1], Luca Bellucci[2], Stefano Corni[3], Lucia Cascino[1], Stefania D'Agostino[1], Laura Zanetti Polzi[4]
[1] *University of Salento (Italy),* [2] *CNR Institute of Nanoscience (Italy),* [3] *University of Padova (Italy),* [4] *CNR-Institute of Nanoscience (Italy)*

A molecular dynamics study revealed that functionalized gold nanoparticles are able to form stable complexes with Channelrhodopsin-2, without disturbing the protein structure and dynamics. The results pave the way for exploiting the polaritonic properties of nanoparticles to tune the photoactivity of light-gated ion channels in a controlled way.

10:10 : Invited talk
Pixelated plasmonic metasurfaces as a platform for sensing applications in mid-IR
Amirmostafa Amirjani, Ewald Janssens
KU Leuven (Belgium)

In this study, we present the pixelated plasmonic metasurface for detecting mid-infrared molecular fingerprints and for the chemical identification and compositional analysis of surface-bound analytes. The pixelated plasmonic metasurface successfully detected the molecular fingerprints of glucose (1 nM) in the wavenumber range of 1000 cm-1 to 1800 cm-1.

8:30 - 10:30 — Carihuela

Session 4A5

Symposium V: Architectured Elastic, Acoustic Metamaterials and Phononic Crystals

Organized by: Marco Miniaci, Jensen Li, Jean-Philippe Groby, Vincent Pagneux and Noé Jiménez

Chaired by: Marco Miniaci, Jensen Li and Jean-Philippe Groby

08:30 : Invited talk
Phase-matching Holographic Metasurfaces For Accurate Acoustic Image Generation
Víctor Vegas-Luque, Diana Andrés Bautista, Alba Eroles Simó, Juan José Rodríguez García, Francis-

co Camarena Femenia, Noé Jiménez González
Universitat Politecnica de Valencia (Spain)

Holographic metasurfaces can tailor acoustic wavefronts to produce arbitrary acoustic images, however, current methods are not able to accurately encode the target phase distribution. We propose a novel technique for designing the metasurface by matching the phase at the lens exit with the target phase over a whole volume.

08:50 : Invited talk
Visualization Of Topological Edge And Boundary Modes In Mechanical Metamaterials
Motonobu Tomoda[1], Konosuke Yamaguchi[2], Gun Yoon[2], Hayato Takeda[2], Ryoya Minami[2], Osamu Matsuda[2], Oliver Wright[2]
[1] *Oita University (Japan),* [2] *Hokkaido University (Japan)*

We developed two types of two-dimensional mechanical wave machines to investigate topologically protected edge and boundary vibration modes. One system simulates quantum Hall effects by breaking time-reversal symmetry through the Coriolis force. The other replicates quantum valley Hall effects, where vibrations propagate along a topological interface.

09:10 : Invited talk
Compact Elastic Plate For Bound State In The Continuum
Zhihui Wen[1], Marc Marti-Sabaté[2], Yabin Jin[3], Daniel Torrent[4], Yegao Qu[1]
[1] *Shanghai Jiao Tong University (China),* [2] *Imperial College London (United Kingdom),* [3] *East China University of Science and Technology (China),* [4] *Universitat Jaume I (Spain)*

We demonstrate high-quality flexural wave localization mechanism in symmetric scatterer clusters, where resonance quality (Q) escalates with energy density, approaching bound states in the continuum (BICs) with infinite Q. High-multipole modes form whispering galleries. A cylindrical-shelled metaplate achieves symmetry-protected BICs, enabling compact, high-efficiency wave control for on-chip applications.

09:30 : Invited talk
On The Practical Use Of Wooden Logs Sonic Crystals As Road Traffic Noise Barriers
Paulo Amado-Mendes, Luis Godinho
University of Coimbra (Portugal)

The concept of sonic crystals for road traffic noise mitigation has been explored, making use of a highly sustainable solution made of wooden logs. Complementary approaches have been adopted, with extensive numerical analyses, concept validation in laboratory conditions and in situ prototype acoustic characterization.

09:50 : Invited talk
Topological Modes In Phononic Waveguide Interfaces
Koijam Monika Devi[1], Clivia M. SotomayorTorres[2], Yan Pennec[1], Bahram Djafari-rouhani[1]
[1] *Université de Lille (France),* [2] *INL International Iberian Nanotechnology Laboratory (Portugal)*

We report phononic waveguide interfaces capable of supporting topological edge modes. We investigate the topological properties of the edge modes in different waveguide interfaces, revealing robust propagation with negligible backscattering. Our results provide valuable insights for the design of low-loss phononic components for device applications.

10:10 : Invited talk
Accurate Fem Investigation Of Acoustic Properties In Aerospace Sandwich Structures With Metamaterial Core
Maria Cinefra[1], Martino Carlo Moruzzi[2], Marco Petrolo[3], Matteo Filippi[3], Giuseppe Petrone[4]
[1] *Politecnico di Bari (Italy),* [2] *Università di Bologna (Italy),* [3] *Politecnico di Torino (Italy),* [4] *Università degli Studi di Napoli Federico II (Italy)*

Noise and vibrations in aircraft can deeply affect the passengers comfort and pilots well-being, on the other hand, spacecraft and its payload are subjected to severe structural vibrations during launch phase. A possible solution is the use of metamaterials as acoustic treatments for the trim panels of these vehicles.