

Esax 2024

Extreme Sensing and Chirality
International Workshop

September 29-October 3, 2024



Location: Cetraro (CS), Italy



Venue: Grand Hotel San Michele



DAY 1: SUNDAY SEPTEMBER 29

Arrival and registration

20:00 - 21:30 Welcome dinner

DAY 2: MONDAY SEPTEMBER 30

08:45 - 09:00	Welcome and introduction	Francesco De Angelis Istituto Italiano di Tecnologia, Italy
09:00 - 09:40	"Matter-to-life transition" in photonic time crystals	Nikolay I. Zheludev - University of Southampton, UK
09:40 - 10:15	Needle in a Haystack: Sensing polarization differences in the regime of 10^{-5} in photon-starved applications	Carin Lightner - ENANTIOS, ETH-Zurich, Switzerland
10:15 - 10:35	Coffee break	
10:35 - 11:10	Broadband Optical Activity Spectroscopy with Interferometric Fourier-Transform Balanced Detection	Giulio Cerullo - Politecnico di Milano, Italy
11:10 - 11:45	Chiral Structured-Illumination Microscopy	Jer-Shing Huang - Leibniz Institute of Photonic Technology, Germany
11:45 - 12:00	Enhanced Raman biopolymer sequencing	Kirill Khabarov - Istituto Italiano di Tecnologia, Italy
13:00 - 14:30	Lunch	
16:00 - 16:35	Tbd	Romain Quidant - ETH Zurich, Switzerland
16:35 - 17:10	Chiral Nanophotonics: Enabling \leq Attomole Detection in Biophysical Measurements	Malcolm Kadodwala - University of Glasgow, UK
17:10 - 17:45	Applications of Nanophotonic Metasurfaces for Biosensing, Spectroscopy and Bioimaging	Hatice Altug - Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland
17:45 - 18:05	Coffee break	
18:05 - 18:20	Effect of cation size on cation-DNA interaction, studied using nanopipette translocation and optical tweezers	Alejandro Colchero - Universidad de Barcelona, Spain
18:20 - 18:35	High-throughput single-molecule spectroscopic and electrical profiling proteins by a gold plasmonic nanopore	Wang Li - Nanjing University, China
18:35 - 18:50	Deep Neural Network aided Nanoplasmonic Infrared Sensor for the Detection of Neurodegenerative Diseases Based on Structural Protein Biomarkers	Barkay Dagli - Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland
18:50 - 18:55	Enhancement of Circular Dichroism Response of Biological Chiral Molecules mediated by Plasmonic Nanoparticles	Liliana Valente - University of Calabria, Italy
18:55 - 19:00	Electromechanical experiments of DNA unzipping	Isabel Pastor - University of Barcelona, Spain
19:00 - 19:05	Moiré Superlattice for Efficient Simulating Berry Phase Photonic Crystals	Seokwoo Kim - Pohang University of Science and Technology, South Korea
19:05 - 19:10	Artificial intelligence-enhanced metasurfaces for the instantaneous measurement of dispersive refractive index	Seokho Lee - Pohang University of Science and Technology, South Korea
20:00 - 21:30	Dinner	

DAY 3: TUESDAY OCTOBER 1

09:00 - 09:35	From hyper-Rayleigh to hyper-Raman optical activity	Ventsislav Valev - University of Bath, UK
09:35 - 10:00	A perspective on chiral structured light	Kayn Forbes - University of East Anglia, UK
10:00 - 10:25	Polarization-resolved sensing with photonic crystal multilayers and dielectric mid-infrared antennas	Paolo Biagioni - Politecnico di Milano, Italy
10:25 - 10:45	Coffee break	
10:45 - 11:10	Nanophotonics-based chiral sensing of drug solutions	Andrea Marini - University of LAquila, Italy
11:10 - 11:35	Pushing the Limits of SERS Sensitivity through Nanoparticle Morphology Modulation and Interface Engineering	Laura Fabris - Politecnico di Torino, Italy
11:35 - 12:00	Multiscale modeling of single molecule spectroscopies enhanced by plasmonic nanostructures	Stefano Corni - University of Padova & CNR-NANO Modena, Italy
13:00 - 14:30	Lunch	
16:00 - 16:35	Variance sum rule for entropy production	Felix Ritort - University of Barcelona, Spain
16:35 - 17:00	Harnessing Chirality and Hyperbolicity of Optical Metasurfaces	Giuseppe Strangi - Case Western Reserve University (USA) and NLHT - UNICAL (Italy)
17:00 - 17:25	Cell-Driven Supramolecular Assembly of Organic Nanofibers	Guglielmo Lanzani - Istituto Italiano di Tecnologia and Politecnico di Milano, Italy
17:25 - 17:45	Coffee break	
17:45 - 18:10	Two Types of New Nanopores for Single Molecule DNA and Protein Analysis	Kang Wang - Nanjing University, China
18:10 - 18:35	Towards accessible extreme fluorescence sensing and single photon chiral emission	Guillermo Acuna - Université de Fribourg, Switzerland
18:35 - 19:00	All-optical light routing and polarization sorting by nonlinear interferometry via metasurfaces	Michele Celebrano - Politecnico di Milano, Italy
20:00 - 21:30	Dinner	

DAY 4: WEDNESDAY OCTOBER 2

09:00 - 09:35	Extreme sensitivity in direct label-free detection	Vahid Sandoghdar - Max Planck Institute for the Science of Light, Germany
09:35 - 10:00	Ultrafast molecular chirality: a topological connection	Olga Smirnova - Max-Born Institute & Technical University Berlin, Germany; Technion, Department of Physics, Israel
10:00 - 10:25	Topological-spectral correlations in space-time beams	Antonio Ambrosio - Istituto Italiano di Tecnologia, Italy
10:25 - 10:45	Coffee break	
10:45 - 11:00	Advancing the computational frameworks for entropy-driven membrane-based processes: From cellular membrane poration to chiral twist in colloidal membranes	Salvatore Buonocore, Istituto Italiano di Tecnologia, Italy
11:00 - 11:15	Gradient Metasurfaces for Enhanced Spectroscopy and High-Harmonic Generation	Felix Richter - Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland

DAY 4: WEDNESDAY OCTOBER 2

11:15 - 11:30	Advancing Chiral Biosensing: Biointerface-Functionalized Metasurfaces for Enhanced Sensitivity and Specificity	Alexa Guglielmelli - University of Calabria, Italy
11:30 - 11:45	Intrinsic Superchirality in Planar Plasmonic Metasurfaces	Giovanna Palermo - University of Calabria, Italy
13:00 - 14:30	Lunch	
15:30 - 15:55	Enantioselective Dynamic Systems	Serena Arnaboldi - Università degli Studi di Milano, Italy
15:55 - 16:20	OptoFluidic platform for highly sensitive analysis of flowing samples	Luigino Criante - Istituto Italiano di Tecnologia-CNST Milano, Italy
16:20 - 16:45	Single-molecule SERS detection of post-translational modifications using plasmonic nanopores	Jian-An Huang - University of Oulu, Finland
16:45 - 17:10	Ultrafast chiral spectroscopy for stereocontrolled photochemistry	Malte Oppermann - University of Basel, Switzerland
17:10 - 17:30	Coffee break	
17:30 - 17:55	Photo-acoustic spectroscopy with widely tuneable laser reveals resonant circular dichroism in nanostructures	Emilija Petronijevic - Sapienza University of Rome, Italy
17:55 - 18:20	Simulations of Circular dichroism and circularly polarized luminescence of chiral materials	Adriana Pietropaolo - Università di Catanzaro, Italy
18:20 - 18:45	Molecule-particle transfer of chirality through plasmonic coupling	Mario Zapata-Herrera - Donostia International Physics Center (DIPC), Spain
18:45 - 19:10	Nanoscale chiral light matter interactions	Aitzol Garcia-Etxarri - Donostia International Physics Center (DIPC), Spain
20:00 - 21:30	Gala Dinner	

DAY 5: THURSDAY OCTOBER 3

09:00 - 10:30	Open discussion on European Projects
10:30 - 10:50	Coffee break
10:50 - 11:30	Open discussion on future initiatives...
11:30 - 12:00	Conclusion and final remarks
13:00	Lunch & Departures

Sponsor

