

BIOAM-2016 WORKSHOP PROGRAM

November, 14

8:30 – 9:30 **Registration**



SESSION I Chair Tatiana NOVIKOVA, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France

9:30 **Workshop opening**, Pere ROCA I CABARROCAS, LPICM Director, CNRS, Ecole polytechnique, Université Paris-Saclay, France

9:40 **Welcome word**, Linda OUKACINE, ANR representative, National Contact Point ERA-NET MED, SPICE (Physical Sciences, Engineering, Chemistry and Energy), France

9:50 **Spin angular momentum of 3D polarization states** (*Invited*), José J. GIL, Universidad de Zaragoza, Zaragoza, Spain

10:20 **Possibilities for vortex structures in random light beams** (*Invited*), Olga KOROTKOVA, Physics Department, University of Miami, Miami, Florida, USA

10:50 **Spin-orbit interactions of light in asymmetric beams**, Nazar AL-WASSITI, South Ural State University, Chelyabinsk, Russia; Evelina BIBIKOVA, Nataliya KUNDIKOVA, South Ural State University, Chelyabinsk, Russia, Institute of Electrophysics, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia

11:10 **Coffee break**

SESSION II Chair Enric GARCIA-CAUREL, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France

11:25 **Saturated negative and complementary speckle patterns** (*Invited*), Marc GUILLON, Jérôme GATEAU, Marco PASCUCCI, Neurophotonics Laboratory, CNRS, Université Paris Descartes, France; Hervé RIGNEAULT, Aix-Marseille University, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France; Gilles TESSIER, Valentina EMILIANI, Neurophotonics Laboratory, CNRS, Université Paris Descartes, France

11:55 **Generating OAM fields and other types of polarization distributions with liquid crystal elements**, Gerben BOER, ARCoOptix, Switzerland

12:15 **Holographic generation of highly focused vector fields with arbitrary transversal polarization** (*Invited*), Rosario MARTINEZ-HERRERO, David MALUENDA, Universidad Complutense de Madrid, Madrid, Spain; Ignasi JUVELLS, Artur CARNICER, Universitat de Barcelona, Barcelona, Spain

12:45 **Lunch** (Club Magnan, Ecole polytechnique)

SESSION III Chair Razvigor OSSIKOVSKI, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France

14:00 **Spatial evolution of differential Mueller matrix in turbid media: a stochastic approach** (*Invited*), Vincent DEVLAMINCK, Jean-Michel CHARBOIS, Université Lille 1, Villeneuve d'Ascq, France

14:30 **Transport and depolarization of light in multiple scattering media** (*Invited*), Rémi CARMINATI, Romain PIERRAT, Institut Langevin, ESPCI, Paris, France; Kevin VYNCK, LP2N, CNRS, Institut d'Optique Graduate School, University of Bordeaux, Talence, France

15:00 **Single biaxial crystal based snapshot polarimeters**, Angel LIZANA, Irene ESTÉVEZ, Alex TURPIN, Alba PEINADO, Victor SOPO, Claudio RAMIREZ, Juan CAMPOS, Departament de Física, Universitat Autònoma de Barcelona, Bellaterra, Spain

15:20 **Polarimetric imaging in chiral media**, Oriol ARTEAGA, Departament de Física Aplicada, FEMAN group, IN2U, Universitat de Barcelona, Spain

15:40 **Coffee break**

SESSION IV Chair Oriol ARTEAGA, FEMAN group, University of Barcelone, Spain

- 15:55 **Comparison of the detection performance of static and adaptive polarization imagers** (*Invited*), François GOUDAIL, Laboratoire Charles Fabry, Institut d'Optique Graduate School, CNRS, Université Paris Sud, Palaiseau, France
- 16:25 **From Molecules to Meta-molecules for Nonlinear Optics** (*Invited*), Clément LAFARGUE, Radek KOLKOWSKI, Joseph ZYSS, LPQM, Ecole Nationale Supérieure de Cachan, France
- 16:55 **Dynamics of DNA G-quadruplex structures by time-resolved circular dichroism** (*Invited*), Marco SCHMID, Pascale CHANGENET-BARRET, François HACHE, Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Palaiseau, France
- 17:25 **Measurement of small light absorption in microparticles by means of optically induced rotation** (*Invited*), Oleg V. ANGELSKY, Yuriy A. USHENKO, Correlation Optics Department, Chernivtsi National University, Ukraine; Alexandre Y. BEKSHAEV, Research Institute of Physics, I.I. Mechnikov National University, Odessa, Ukraine; Petr P. MAKSIMYAK, Alexandre P. MAKSIMYAK, Correlation Optics Department, Chernivtsi National University, Ukraine; Steen G. HANSON, DTU Fotonik, Department of Photonics Engineering, Roskilde, Denmark
- 17:55 **Circular polarization memory in multiple scattering media and associated similarity relations**, Callum MACDONALD, Fresnel Institute, Marseille, France, University of Otago, Dunedin, New Zealand
- 18:15 **POSTER SESSION** (organization assisted by SPIE Student Chapter, Ecole polytechnique) in parallel with **WELCOME COCKTAIL** (Salon d'Honneur)
1. **Rotating two-lobe light fields**, Eugeny ABRAMOCHKIN, Lebedev Physical Institute, Samara, Russia; Svetlana KOTOVA, Lebedev Physical Institute, Samara, Russia, Samara National Research University Samara, Russia; Nikolay LOSEVSKY, Lebedev Physical Institute, Samara, Russia; Darya PROKOPOVA, Lebedev Physical Institute, Samara, Russia; Samara National Research University Samara, Russia; Evgenia RAZUEVA, Lebedev Physical Institute, Samara, Russia
 2. **Method for Small Ellipticities Measurements of Coherent Light**, Evelina BIBIKOVA, Nataliya KUNDIKOVA, South Ural State University, Chelyabinsk, Russia, Institute of Electrophysics, Ural Branch of Russian Academy of Sciences, Ekaterinburg, Russia
 3. **Evaluation of Polarization Difference Imaging at a Long Working Distances**, Yohann SILLAM, Amir BERNAT, David LEVITZ, MobileODT Ltd., Tel Aviv, Israel
 4. **Reciprocity in vector radiative transport and the sensitivity of probing regions to various polarization imaging channels**, Callum MACDONALD, Ugo TRICOLI, Anabela DA SILVA, Vadim MARKEL, Aix-Marseille Université, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France
 5. **Medium with Orthogonal Eigenpolarizations: Differential Approach**, Sergey SAVENKOV, Ivan KOLOMIETS, Yevgen OBEREMOK, Alexander KLIMOV, Taras Shevchenko National University of Kiev, Ukraine
 6. **First Jones Equivalence Theorem: Differential and Multiplicative Approaches**, Sergey SAVENKOV, Ivan KOLOMIETS, Yevgen OBEREMOK, Alexander KLIMOV, Taras Shevchenko National University of Kiev, Ukraine
 7. **Illumination spectral bandwidth as a new degree of freedom for active polarimetric imagers in target detection applications**, Lijo THOMAS, Matthieu BOFFETTY, François GOUDAIL, Laboratoire Charles Fabry, Institut d'Optique Graduate school, Palaiseau, France
 8. **Detection of cervical neoplasia using Mueller polarimetric imaging: continued statistical evaluation**, Meredith KUPINSKI, OSC, University of Arizona, Tucson, Arizona, USA; Jean REHBINDER, Stanislas DEBY, Jérémy VIZET, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France; Huda HADDAD, Applied physics department, Faculty of science, Tafila Technical University, Tafila, Jordan; Benjamin TEIG, Service d'anatomie pathologique, CHU de Bicêtre, Le Kremlin-Bicêtre, France; André NAZAC, Service de Gynécologie Obstétrique, CHU de Bicêtre AP-HP, Le Kremlin-Bicêtre, France, Department of Obstetrics and Gynecology, University Hospital Brugmann, Université Libre de Bruxelles, Brussels, Belgium; Angelo PIERANGELO,

François MOREAU, Tatiana NOVIKOVA, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France

9. **Mueller polarimetric imaging of uterine cervix: from proof of principle experiments to *in-vivo* measurements**, Jean REHBINDER, Jérémy VIZET, Stanislas DEBY, Stéphane ROUSSEL, Tatiana NOVIKOVA, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France ; André NAZAC, Service de Gynécologie Obstétrique, CHU de Bicêtre AP-HP, Le Kremlin-Bicêtre, France, Department of Obstetrics and Gynecology, University Hospital Brugmann, Université Libre de Bruxelles, Brussels, Belgium; Ranya SOUFAN, Catherine GENESTIE, Institut Gustave Roussy, Service d'anatomie pathologique gynécologique, Villejuif, France; Christine HAIE-MEDER, Institut Gustave Roussy, Département de Curiethérapie, Villejuif, France ; Anne Gaëlle POURCELOT, Perrine CAPMAS, Sylvie ZANON, Hervé FERNANDEZ, Service de Gynécologie Obstétrique, CHU de Bicêtre AP-HP, Le Kremlin-Bicêtre, France; François MOREAU, Angelo PIERANGELO, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France
10. **Autofluorescence Polarization Spectroscopy for Differentiation between Cancerous and Normal Colorectal Tissues**, Tsanislava GENOVA, Ekaterina Borisova, Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria; Nikolai PENKOV, Queen Jiovanna-ISUL University Hospital, Sofia, Bulgaria; Borislav VLADIMIROV, Latchezar AVRAMOV, Institute of Electronics, Bulgarian Academy of Sciences, Sofia, Bulgaria
11. **Variation of polarimetric properties of isotropic and anisotropic scattering samples with thickness within the framework of differential Mueller matrix formalism**, Sang Hyuk YOO, Tatiana NOVIKOVA, Enric GARCIA-CAUREL, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France; Alexander BYKOV, Alexey POPOV, Igor MEGLINSKI, Oulu University, Oulu, Finland; Razvigor OSSIKOVSKI, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France
12. **Multifunctional polarization-correlation microscopy and laser autofluorescence polarimetry of optical anisotropic biological layers**, Oleg V. ANGELSKY, Alexander G. USHENKO, Alexander V. DUBOLAZOV, Yuriy A. USHENKO, Chernovtsi National University, Chernovtsi, Ukraine
13. **Chiroptical properties photo-induced by femtosecond laser irradiation in silica glass**, Jing TIAN, Rudy DESMARCHELIER, Matthieu LANCRY, Bertrand POUMELLEC Institut de Chimie Moléculaire et des Matériaux d'Orsay, UMR CNRS-PSUD 8182, Orsay, France
14. **Micro-waveplates and space variant birefringent optical components photoinduced by femtosecond laser**, Matthieu LANCRY, Jing TIAN, Bertrand POUMELLEC, Institut de Chimie Moléculaire et des Matériaux d'Orsay, UMR CNRS-PSUD 8182, Orsay, France

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SESSION V Chair David LEVITZ, MobileODT, Israel

- 9:00 **Assessment and modeling of anisotropic biological tissue properties with Mueller matrix Polarimetry** (*Invited*), Jessica RAMELLA-ROMAN, Florida International University, Miami, USA
- 9:30 **Polarization-resolved second harmonic imaging of collagen** (*Invited*), Claire TEULON, Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Palaiseau, France ; Gaël LATOUR, Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Palaiseau, France, Laboratoire Imagerie et Modélisation en Neurobiologie et Cancérologie, Univ. Paris-Sud, CNRS, Université Paris-Saclay, Orsay, France ; Guillaume DUCOURTHIAL, Ivan GUSACHENKO, Marie-Claire SCHANNE-KLEIN, Laboratoire d'Optique et Biosciences, Ecole Polytechnique, CNRS, INSERM, Palaiseau, France
- 10:00 **Probing Biological Tissues with Elliptically Polarized Light**, Anabela DA SILVA, Susmita SRIDHAR, Callum MACDONALD, Aix-Marseille Université, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France
- 10:20 **Laser Diagnostics of Biotissues with Circularly Polarized Light**, Alexander BYKOV , Alexey POPOV, Oulu University, Oulu, Finland; Markus MAKINEN, Oulu University Hospital, Oulu,

Finland; Tatiana NOVIKOVA, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France; IGOR MEGLINSKI, Oulu University, Oulu, Finland

10:40 **Coffee break**

SESSION VI Chair Sergey SAVENKOV, Taras Shevchenko National University of Kiev, Ukraine

10:55 **Learning approach to identify tissues in Spectro-polarimetric Mueller Imaging** (*Invited*), Jihad ZALLAT, Université de Strasbourg, Illkirch, France

11:25 **Polarization spatial distributions generator based on a single Parallel Aligned Liquid Crystal on Silicon Display**, Irene ESTÉVEZ-CARIDE, Angel LIZANA, Xuejie ZHENG, Alba PEINADO, Claudio RAMIREZ, Departament de Física, Universitat Autònoma de Barcelona, Spain; Jose Luis MARTÍNEZ, Andrés MÁRQUEZ, Department of Physics, Systems Engineering and Signal Theory, Universidad de Alicante, Spain; Ignacio MORENO, Department of Materials Science, Optics and Electronics Technology, Universidad Miguel Hernández de Elche, Elche, Spain; Juan CAMPOS, Departament de Física, Universitat Autònoma de Barcelona, Spain

11:45 **Towards depth-resolved spectroscopy with elliptically polarized light**, Susmita SRIDHAR, Fresnel Institute, Marseille, France; Institut de Ciències Fotoniques, Universitat Politècnica de Catalunya, Barcelona, Spain; Callum MACDONALD, Anabela DA SILVA, Fresnel Institute, Marseille, France;

12:05 **The algebraic decomposition of Mueller matrices as a tool for enhanced physical insight: theory and experiment**, Razvigor OSSIKOVSKI, Enric GARCIA-CAUREL, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France; Igor MEGLINSKI, Oulu University, Oulu, Finland; Tatiana Novikova, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, France

12:25 **Lunch** (Club Magnan, Ecole polytechnique)

SESSION VII Chair Olga KOROTKOVA, Department of Physics University of Miami, Miami, Florida, USA

13:40 **Curl forces: new dynamics with implications for optics** (*Invited*) Michael BERRY, University of Bristol, UK

14:30 **Optical sorting of chiral entities using optical angular momentum of light** (*Invited*), Etienne BRASSELET, LOMA, CNRS, University of Bordeaux, Bordeaux, France

15:00 **Transmission-matrix-based point-spread-function engineering through a complex medium**, (*Invited*), Antoine BONIFACE, Mickael MOUNAIX, Baptiste BLOCHET, Rafael PIESTUN, Sylvain GIGAN, Laboratoire Kastler Brossel, ENS, UPMC, CNRS, Collège de France, France

15:30 **Angular momentum of light in biophotonics applications: Usage of orbital angular momentum for ranging and for super resolved imaging and of spin angular momentum for blood flow tracking and for glucose sensing** (*Invited*), Zeev ZALEVSKY, Bar-Ilan University, Ramat-Gan, Israel

16:00 **Vortex-atom interaction: OAM transfer to an atomic sample and its retrieval**, Laurence PRUVOST, Laboratoire Aimé Cotton, CNRS, Univ-Paris-Sud, ENS-Cachan, Univ Paris-Saclay, Orsay, France

16:20 **Coffee break**

Session VIII Chair Igor MEGLINSKI, Oulu University, Finland

16:35 **OCT to the diagnosis and treatment monitoring of cervical cancer**, (*Invited*), Natalia SHAKHOVA, Institute of Applied Physics of Russian Academy of Sciences, Nizhny Novgorod, Russia

17:05 **Enhancement of clinical applications of cross-polarization optical coherence tomography by image quantification**, Mikhail KIRILLIN, Institute of Applied Physics RAS, Nizhny Novgorod, Russia; Elena KISELEVA, Ekaterina GUBARKOVA, Natalia GLADKOVA, Nizhny Novgorod State Medical Academy, Nizhny Novgorod, Russia; Ekaterina SERGEEVA, Pavel AGRBA, Natalia SHAKHOVA, Institute of Applied Physics RAS, Nizhny Novgorod, Russia

17:25 **Polarization difference imaging of the uterine cervix in colposcopy patients**, Alexander KASS, MobileODT, Tel Aviv, Israel; Michael FRIEDMAN, Rambam Hospital, Haifa, Israel; Amit SAFIR,

Ronit SLYPER, MobileODT, Tel Aviv, Israel; Tzvia Dvora RUBENSHEIN, Rambam Hospital, Haifa, Israel; David LEVITZ, MobileODT, Tel Aviv, Israel;

17:45 ***In-vivo* Mueller polarimetric imaging of uterine cervix**, Jérémy VIZET, Jean REHBINDER, Stanislas DEBY , Stéphane ROUSSEL, LPICM, CNRS, Ecole POLYTECHNIQUE, Université Paris-Saclay, Palaiseau, France; André NAZAC, Service de Gynécologie Obstétrique, CHU de Bicêtre AP-HP, Le Kremlin-Bicêtre, France, Department of Obstetrics and Gynecology, University Hospital Brugmann, Université Libre de Bruxelles, Belgium; Ranya SOUFAN, Catherine GENESTIE, Institut Gustave Roussy, Service d'anatomie pathologique gynécologique, Villejuif, France; Christine HAIE-MEDER, Institut Gustave Roussy, Département de Curiethérapie, Villejuif, France; Anne Gaëlle POURCELOT, Perrine CAPMAS, Sylvie ZANON, Hervé FERNANDEZ, Service de Gynécologie Obstétrique, CHU de Bicêtre AP-HP, Le Kremlin-Bicêtre, France; François MOREAU, Angelo PIERANGELO, LPICM, CNRS, Ecole polytechnique, Université Paris-Saclay, Palaiseau, France

18:05 **Closing remarks**

18:15 **Wine and cheese tasting (venue to be announced later)**