Title : Laser diagnostics of pulsed nanosecond plasma for biomedical application

First Name : STARIKOVSKAIA | **Name** : Svetlana | **Laboratory** : LPP

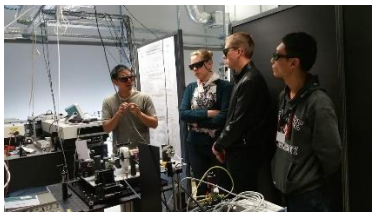
Email : svetlana.starikovskaia@lpp.polytechnique.fr

Webpage : www.lpp.fr

Research Area: Lasers and Plasma Physics, Optics [Biophysics as a secondary area]

Methods: laser spectroscopy, optical emission spectroscopy, electrical probes, bio-methods

PhD track subject : Application of cold atmospheric plasma had gained an increasing interest in numerous bio-applications: wound healing, blood coagulation, cancer treatment. Because of its complexity, plasma-cell interaction demand a multidisciplinary character of study. The aim of the work will be to develop a plasma source compatible with mesenchymal stem cells (MSCs) research of our colleagues from Institute Gustave Roussy (IGR) and University of Reims; to characterize, using picosecond laser spectroscopy, a distribution of plasma parameters, as E-field, O-atoms and OH density; to choose and develop a technique allowing to follow cell changes under the action of plasma in real time; to participate in biological experiments on plasma action on MSCs.



Explanation of E-field measurements by generation of the 2nd harmonics of a picosecond laser radiation (E-FISH)

References : [1] Electric field measurements in plasmas: how focusing strongly distorts the E-FISH signal, T.L.Chng, S.M.Starikovskaia and M.-C. Schanne-Klein, 2020 Plasma Sources Sci. Technol. 29, 125002, https://doi.org/10.1088/1361-6595/abbf93

[2] Phase imaging microscopy for the diagnostics of plasma-cell interaction, Y. Ohene, I. Marinov, L. de Laulanie, C. Dupuy, B. Wattelier and S.Starikovskaia, Applied Physics Letters, 106 (2015), 106, 233703, http://dx.doi.org/10.1063/1.4922525