Annex

MSCA IF 2017 call for proposals: Examples of projects selected for funding
**Exploring new directions in protection from gender-based violence**

This project aims to address violence against individuals who challenge traditional gender norms and expectations. This research takes a comprehensive approach to gender-based violence and sexual orientation and gender issues, exploring the formal and practical potential of the GBV framework to protect T/I individuals from violence.

The Individual Fellow who will carry out the project is Dr. Lorena SOSA, who was awarded her doctorate in 2015.

**Project:** Transgender and Intersex protection from gender-based violence: exploring new directions (TRANS-END)

**Host organisation:** UNIVERSITEIT UTRECHT, Utrecht, Netherlands

**Partner organisation:** Facultad de Filosofía y Letras de la Universidad de Buenos Aires, Buenos Aires, Argentina

**MSCA funding:** EUR 215,285,40 over 3 years

**Magnonic artificial neural network applications**

Machine learning applications based on artificial neural networks have undergone rapid progress in recent years. NeuroMag’s objective is to implement an interference-based matrix-vector multiplier using spin waves (magnons), and targets the groundbreaking proof-of-concept of a magnonic matrix-vector multiplier and its operation, paving the way towards magnonic artificial neural networks.

The Individual Fellow who will carry out the project is Dr. José Diogo COSTA, who was awarded his doctorate in 2017.

**Project:** Magnonic Matrix-Vector-Multiplier for Neural Network Applications (NeuroMag)

**Host organisation:** INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM, Leuven, Belgium

**MSCA funding:** EUR 172,800,00 over 2 years

**Investigating diamonds**

The project aims at combining, for the first-time, a thorough non-destructive in situ characterization of sulphide inclusions in diamonds with homogenization experiments coupled with isotopic analyses to investigate their genesis and the evolution of the Earth’s interior through time. SINDIA’s goals are to shed new light into the composition, origin and age of mantle sulphides, the origin and age of diamonds and in particular to validate the mostly widely used dating system in diamond research.

The Individual Fellow who will carry out the project is Martha Giovanna PAMATO, who was awarded her doctorate in 2014.

**Project:** Sulphide INclusions in DIAmonds: A Window into The Earth’s Interior Through Time (SINDIA)

**Host organisation:** UNIVERSITA DEGLI STUDI DI PADOVA, Padua, Italy

**MSCA funding:** EUR 168,277.20 over 2 years
Geometric analysis of dilute plasmas

The ultimate goal of this Fellowship is to understand the long-time behaviour of plasmas governed by the relativistic Vlasov-Maxwell system (RVM). The current main difficulty in the field is that particles that travel close to the speed of light nearly interact with their own fields. It is not currently known whether particles can be accelerated to such speeds, and, if so, whether this necessarily leads to development of singularities, and the project aims to address this.

The Individual Fellow who will carry out the project is Prof. Junyong ZHANG, who was awarded his doctorate in 2011.

**Project:** Geometric Analysis of Dilute Plasmas (GRANDPA)
**Host organisation:** CARDIFF UNIVERSITY, Cardiff, United Kingdom
**MSCA funding:** EUR 195,454,80 over 2 years

Tackling neurological diseases

Basal ganglia is a brain structure, whose dysfunction is tightly tied with a variety of severe neurological diseases, including the widespread Parkinson’s and more rare Huntington’s diseases. The project aims at the development of a detailed basal ganglia system-level computational model, constrained by experimental data and coupled to a movement system. Use of analytical and numerical approaches and close interaction with experimental neuroscientists during the model development will make it provide a coherent explanation of many basal ganglia-related behaviors in healthy and pathological brains.

The Individual Fellow who will carry out the project is Dr. Dmitrii Todorov, who was awarded his doctorate in 2014.

**Project:** Oscillations in Basal Ganglia Disorders (OSCBAGDIS)
**Host organisation:** Consorci Centre de Recerca Matematica, Bellaterra, Spain
**MSCA funding:** EUR 170,121.60 over 2 years

Towards a more effective protection against viruses

This proposal concerns Reversible Self-assembled Monolayers (rSAMs) as dynamic nanoparticle shells for multivalent interactions at biointerfaces. The main aims of this proposal are: 1) to investigate the use of rSAMs as dynamic nanoparticle shells for multivalent inhibition of viruses and 2) to assess such systems as nanoplasmonic sensors for antibody-free ultrasensitive, robust and rapid in situ virus detection.

The Individual Fellow who will carry out the project is Yulia Sergeeva, who was awarded her doctorate in 2013.

**Project:** Nanoparticles with switchable shells for virus sensing and inhibition (rSAMs-NANO)
**Host organisation:** MALMO HOGSKOLA, Malmo, Sweden
**MSCA funding:** EUR 185,857.20 over 2 years
Amplification of EUV radiation

The coherent extreme ultra violet (EUV) pulses produced via high harmonic generation in gases are now the main workhorse for various applications of atomic physics and physical chemistry. As the generation efficiency is very low, the number of applications is limited by the low EUV photon flux. The main ambition of this project is to perform a coherent parametric amplification of the EUV pulses in order to significantly increase the EUV photon flux.

The Individual Fellow who will carry out the project is Ondrej HORT, who was awarded his doctorate in 2014.

Project: CoHerent AMplification and PArametric GeNeration of Euv radiation (CHAMPAGNE)
Host organisation: FYZIKALNI USTAV AV CR V.V.I, Prague, Czech Republic
MSCA funding: EUR 154,720.80 over 2 years

Global value chains and the core-periphery divide

In the post-Bretton Woods world economy, global value chains have become the principal pipelines not only of trade, but also of capital and technology flows, with a decisive impact on the industrial structure of local economies and the technological dynamics of their innovation systems. The project aims to investigate from an empirical, theoretical and normative perspective this impact, as well as its macroeconomic repercussions in terms of productivity, growth, employment, income distribution and the core-periphery technological divide.

The Individual Fellow who will carry out the project is Georgios CHORAFAKIS, who was awarded his doctorate in 2013.

Project: Global Value Chains and Local Innovation Systems in Southern Europe: The Coevolution of Technology, Trade and Finance, and the Technological Divide (GlobaLISe)
Host organisation: CENTRE FOR PLANNING AND ECONOMIC RESEARCH, Athens, Greece
MSCA funding: EUR 152,653.20 over 2 years