Description for the general public

Magnetoencephalography (MEG) is a similar technique to the well-known electroencephalography (EEG). The two methods are mutually complementary in the sense that EEG measures the electric field whereas MEG measures the magnetic field, both stemming from the electric currents behind the neuronal activity in the brain. One of the advantages of MEG over EEG is that it does not require electrodes to be in contact with the skin of the examined person. Hence, the time required for preparing a person for the examination is substantially reduced.

The amount of data acquired from a MEG device is enormous. This is cumbersome for the clinician to arrive at adequate interpretation of the results because it is often difficult to ascertain what constitutes a signal and what can be regarded as noise. Hence, extracting the clinically relevant information from MEG signals is not a trivial task. One approach is to use a stimulus to obtain the so-called *evoke*d responses of the brain (for example, auditory or visual) that after data averaging are easier to interpret. However, interpreting the so-called *induced* activity in the human brain requires far more sophisticated methods, which are often computationally very intensive. The project aims at developing new statistical signal processing algorithms that would reduce the computational burden of techniques for measuring brain activity currently applied in MEG. The project will be performed in collaboration with one of the best European universities, the Pierre and Marie University (Sorbonne), Paris.