Magnetism and organic chemistry for a long time have not been disciplines having too much in common. It clearly changed within recent years when molecular materials turned out to be able to transport spins. Spin transport lays at the foundation of spintronics, dealing with information processing and storage. Spintronics was initially fully based on inorganic systems. However, within recent years the rise of molecular spintronics is observed based on inorganic/organic interfaces. Unique magnetic phenomena, including spin filtering, manifest themselves at such spinterface. As recently shown, chiral organic molecules themselves are capable of spin filtering *(chiral-induced spin selectivity effect - CISS)*. Moreover, once grafted on the surface of metal, they are capable of changing its magnetic properties *(magnetism induced by proximity of adsorbed chiral molecules - MIPAC)*.

Even though molecular spintronics is vividly developing field, surprisingly little has been done to explore its potential in combination with advantages offered by light-induced processes in organic chromophores. **Therefore, the main focus of this project is to fabricate inorganic/organic hybrids by self-assembly of chromophore-containing organic molecules onto the chosen thin ferromagnetic films (FM) with ultimate goal of probing/detecting in as designed systems spin-polarized (spin-selective) photoinduced electron transfer and its influence on the faith of the photoexcited chromophore and dynamic magnetic properties of the underlying ferromagnet.** Such a scientific goal of the project imposes necessity of using a twin-track approach to the planned studies: on the one hand investigating photochemistry of the excited chromophores once bound to the ferromagnet and on the other hand exploring light-induced changes in the magnetization dynamics of the chromophore-modified FM thin layer.

Organic molecules of choice (chiral and non-chiral) will be immobilized on the FM surface forming self-assembled monolayers (SAM). The structure of the molecular layer will be elucidated using various surface-sensitive methods. Subsequently, photochemistry of the FM-bound chromophores will be investigated using combination of the absorption and emission techniques, both in steady-state as well as in time-resolved regime. Magnetization dynamics of the chromophore-modified FM thin layer in dark and under light illumination will be probed using microresonator-based ferromagnetic resonance (micro-FMR), a technique perfectly suited to directly pick up the results of spin-polarized electron transfer into or out of the magnon system, while being fully compatible with light illumination.

We believe that this project due to twin-track approach and choice of the experimental methods will allow to elucidate the nature of the photochemical and photophysical processes occurring in the organic chromophore/ferromagnet hybrids. As such it will significantly contribute to extend the already existing knowledge concerning the light-induced processes in hybrid inorganic/organic systems. Moreover, it will open new avenues for the study of light-accompanied phenomena in such hybrid structures. Consequently, it will effectively bring closer the realization of the synergy between photonics and molecular spintronics paving a way to optically controlled magnetic systems in the future.