The CLAS group of SPhN, with the technical support from Irfu, led the first fully exclusive experiments dedicated to the production of photons (the so-called DVCS process) and mesons (DVMP) off the nucleon, at Jefferson Lab. A first test of scaling in the DVCS process was obtained, indicating Compton scattering at the quark level and therefore the applicability of the Generalized Parton Distribution (GPD) framework even at low energy. These precise data in addition to DVCS and DVMP observables measured in a large kinematical domain allowed for the first preliminary extraction of GPDs, paving the way for their complete determination in the valence region after the 12 GeV upgrade of the CEBAF accelerator at Jefferson Lab. Irfu was highly visible in this endeavor, as members of the CLAS group were spokespersons of all major GPD-related experiments. Moreover, the obtained results led to high-profile publications and many invitations to conferences. A second set of DVCS and DVMP experiments ran at Jefferson Lab in 2008-2010. The data are currently being analyzed and will lead to added accuracy in the extracted observables, which in turn will refine our knowledge of GPDs. The 12 GeV experiments have been proposed by CLAS group spokespersons and will include two years of beam time with either an unpolarized hydrogen target or polarized longitudinal and transverse targets.

For the past five years, SPhN physicists from the CLAS group have been developing a GPD phenomenology platform. With the collaboration of groups from other P2IO institutions a 4-year program, called PARTONS, was submitted to ANR and received a grant in 2012. The platform consists of comprehensive databases of theoretical predictions and experimental results, fitting engines for the extraction of GPDs from DVCS and DVMP data as well as the propagation of uncertainties, a 3D-imaging visualization software, and an interactive website to provide public access to models and predictions. Our current theoretical efforts focus on advanced GPD modeling and higher-order corrections to key experimental channels such as DVCS and DVMP. With these tools, high-profile studies have already been published: an original extraction of GPDs from worldwide DVCS data, the very first indication of GPD universality in the DVCS and DVMP processes, a demonstration that gluon GPDs may be uniquely constrained by measurements at COMPASS and even at lower energy, at Jefferson Lab, the development of more flexible GPD models in the Double Distribution framework, and lastly, a significant contribution to the Electron-Ion Collider physics case through predictions for DVCS observables. Our phenomenology task force has gained a large momentum since 2008 and even more so thanks to the ANR support through the funding of postdocs and visitors.

For the upgrade of the Hall B spectrometer, CLAS12, we have proposed to equip a large part of the future central tracker with Micromegas detectors built using the bulk technology developed at Irfu. This project includes several challenging aspects, *e.g.* the operation at very high luminosity and in a 5T magnetic field (either parallel or perpendicular to the detectors), the use of curved Micromegas, the limited available space and tight integration with the other detectors, and the necessity to locate the readout electronics 1.5m from the Micromegas detectors. Many specific tests have been performed at Irfu, CERN and Jefferson Lab to validate every aspect of our design, in particular our solution to deal with the large magnetic field and the spark rate at high luminosity. Several full-scale, cylindrical metallic or resistive prototypes have been built, and a dedicated ASIC, DREAM, has been developed and successfully tested. All these studies have inspired several tracker projects such as MINOS, ASACUSA, the Hall B Forward Tagger and triggered new R&D for the Electron-Ion Collider internal barrel tracker. Moreover, they lead to extremely innovative developments, such as the use of 1.5m-long electronic cables, and a patented multiplexing scheme for the readout. The CLAS12 detector production will begin in 2014, for an installation in Hall B in 2015 and commissionning following by data taking in 2016.