The NEOShield-2 EU Project – The Italian contribution

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The Near Earth Object (NEO) population comprehends small bodies that periodically approach or intersect the Earth's orbit. NEOs could have possible impacts with the Earth and, whatever the scenario, their physical characterization is essential to define successful mitigation strategies. Moreover, their study is important per se, since they represent the closest remnants of the planetary formation, 4.5 billion years ago, and the knowledge of their physical properties allows us to put constraints on the formation and early evolution of the Solar System. On the basis of these considerations, the NEO population is an important target for ground-based studies. Unfortunately, less than 15% of the 13500 known NEOs has a physical characterization, showing a great diversity - in sizes, shapes, rotational periods, albedos, and composition - and their increasing discovery rate (currently ∼1500 objects/year) makes the situation progressively worse.

At a European level, the European Commission promoted the study on NEOs by approving and financing the NEOShield-2 project (2015-2017) in the framework of the Horizon 2020 program. The aims of NEOShield-2 are: i) to study detailed technologies and instruments to conduct close approach missions to NEOs or to undertake mitigation demonstration, and ii) to retrieve the physical properties of a wide number of NEOs, in order to design impact mitigation missions and assess the consequences of an impact on Earth.

The Italian contributors to the NEOShield-2 project (INAF-OAR and Padova University) are responsible for the Task 10.2.1 'Colours and Phase function'. The aim of this task is to acquire photometric measurements for a wide sample of NEOs in order to i) perform phase function analysis, ii) retrieve surface colors and iii) obtain a preliminary taxonomical classification. This activity is developed in close collaboration with the ESA SSA NEO Coordination Centre.