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KEYNOTE: EXPLOITING THE SYNERGIES OF OBSERVING NEO AND SPACE DEBRIS WITH THE FLYEYE TELESCOPE

Abstract

The Italian scientific community has a long-lasting tradition in orbital dynamics and in the observation of natural and artificial objects. This has allowed the Italian Space Agency to assume a leadership role within the European programs devoted to monitoring NEOs and the space debris population.

Planetary Defense has been addressed through the Italian participation to the SSA (now "Space Safety") Programme of the European Space Agency. The establishment of the NEO Coordination Center at ESRIN (Frascati, Italy) strongly relies on the heritage of NEODyS, the first impact monitoring system in the world developed at the University of Pisa. As for the sensors, the realization of an extremely wide-field high-sensitivity telescope based on an innovative optical design conceived by INAF (the National Institute for Space Astrophysics) and OHB-I as prime-contractor, is nearing completion. This telescope, dubbed "Flyeye" because the incoming light is distributed over 16 different cameras, will allow ESA to enter the NEO discovery scenario, focusing on the detection of small yet potentially dangerous objects passing close to our planet. The technical characteristics of the Flyeye are such that the telescope can be also designed to carry out optical surveys of the space debris population with an unprecedented efficiency. This makes it an important asset both at national level and within the Space Surveillance programs of the European Union, such as the EUSST initiative and its future evolution.

Therefore, ASI is launching an initiative which encompasses a broad spectrum of activities. Hosting the first ESA Flyeye telescope at its Space Geodesy Center located in Matera (Italy) for a temporary installation will allow to both, carry out an extensive testing of its performances for NEO detection in an ideal logistic site, and figure out the possible applications for space surveillance in a realistic environment. The experience gained will lead to the adapted design and to the realization at a national level of the first Flyeye for space objects observations. In particular it is expected that it will be able to maintain a

catalogue of MEO objects above a threshold size of 35 cm.

This paper describes the main characteristics of the Flyeye telescope and provides an estimation of the added value for SST application in terms of cataloguing capabilities of High-LEO and MEO objects. The deployment of a network of Flyeye telescopes and its impact on the European cataloguing capabilities will also be presented.