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OBSERVATIONAL ACTIVITIES AT ESA'S SSA-NEO COORDINATION CENTRE

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ABSTRACT

ESA's SSA-NEO Coordination Centre (NEOCC), located in Frascati, Italy, is one of the key components of the NEO segment of ESA's Space Situational Awareness programme. Among its goals, the Centre has a mandate to coordinate, collect and analyse telescopic observations of near-Earth asteroids, with a particular focus on those having non-zero impact probability with Earth. To reach this goal, the Centre has access to a wide range of observational resources, obtained via proposals, direct agreements with observatories and international scientific collaborations. We present the observations and results made possible by this unique network.

Our most widely used resource is ESA's Optical Ground Station (OGS), a 1 m telescope in Tenerife, Canary Islands, on which we have about 4 nights per month dedicated to NEO follow-up. Despite its moderate aperture, the OGS is ideal to perform wide-field recoveries and immediate follow-up of large uncertainty NEOs, due to its large 47' field of view. Every available night, the OGS is also used for a small-scale survey called TOTAS, which has discovered about a dozen NEOs and two comets over the past few years.

More recently, ESA built two smaller 56 cm instruments, called Test-Bed Telescopes (TBT), with the goal of testing an automated scheduling and control system, in preparation for a future dedicated ESA survey with a fly-eye type telescope. The first TBT is installed and operational in Cebreros, Spain, offering a 2.5° field of view and extremely good fast tracking capabilities in a fully robotic mode of operation. A twin telescope will soon be installed in the Southern Hemisphere.

In addition to those newly built telescopes, ESA supported the refurbishment of the 80 cm Calar Alto Schmidt telescope, which is now available to the NEOCC staff to perform real-time remote observations of interesting targets, including NEO recoveries.

Moving to resources not directly managed by ESA, our Centre has a long-term agreement for high-priority access to the Very Large Telescope (VLT) to obtain follow-up and recovery observations of possible impactors. This program, in collaboration with the European Southern Observatory, has been very successful and has allowed our team to obtain high-precision astrometry of objects as faint as magnitude 27.

In order to obtain the most global possible coverage of observational opportunities, over the past few years we've also developed collaborations that gave our team access to facilities located all over the world. As an example of such collaborations we can mention our work with the Observatory of Rome to observe NEOs with the 8.4 meter Large Binocular Telescope in Arizona, and an extremely fruitful collaboration with the Observatório Nacional in Rio de Janeiro to use the 1 m OASI telescope for NEO astrometry. We also recently established a collaboration with the Korea Astronomy and Space Science Institute to get access to two 1.8 m and 0.6 m Korean telescopes that are ideally placed to cover the longitudinal gap in follow-up from East Asia.
