ESO observations of potentially hazardous NEOs

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• Active participation in AT-14 since 2005
• Recommendations to Member States endorsed by UN GA in 2013
• Established an internal expert group to “use ESO’s large telescopes to perform critical observations that cannot be done elsewhere”.
• Carries out astrometric observations of ‘critical’ NEOs in coordination with ESA (in the frameworks of the ESA SSA and the ESO DDT monitoring ToO programmes)
• Joined IAWN in 2015
This ESA/ESO astrometric campaign:

- Faint objects with a high value on the Palermo scale* which cannot be observed with smaller telescopes;
- Recently discovered NEOs which are rapidly fading** below the detection threshold for smaller telescopes before their orbit can be secured.

The VLT astrometry refines orbits, ensuring that objects shall not be ‘lost’, and clarifying their status as potential impactor.

*index > –6 on the Palermo Scale
**typically, with visual magnitude in the 23-26.5 range
• Observations with the 8.2-metre Unit 1 Telescope (Antu) of the ESO Very Large Telescope (VLT) at Cerro Paranal (Chile)

• Observations can be scheduled at very short notice

• Observations since October 2013 at the level of 11h per semester, which corresponds to ~20 objects per year.
• Data are retrieved and processed at the ESA NEO Coordination Centre (NEOCC) in Frascati, resulting in an improved orbit.

• The measured positions are also reported to the Minor Planet Center, and

• independently analysed by the JPL-based Sentry system.
2004 WF6, at magnitude V=26.4, the faintest NEO recovery.
• 22 NEOs were removed from the "risk list", or pushed to very low level of Palermo Index.

• For another 12 objects, the orbit has been improved, securing them for future observations, but their Palermo Index is still high.

• The orbit of 3 more objects were improved, but resulting in a higher Palermo Index: these are actually more risky than previously though. Fortunately, none has risen to become known future impactors.
• A total of 37 objects observed until today.
• The NEODyS risk list contains typically ~100-120 objects.
Thank you for your attention!