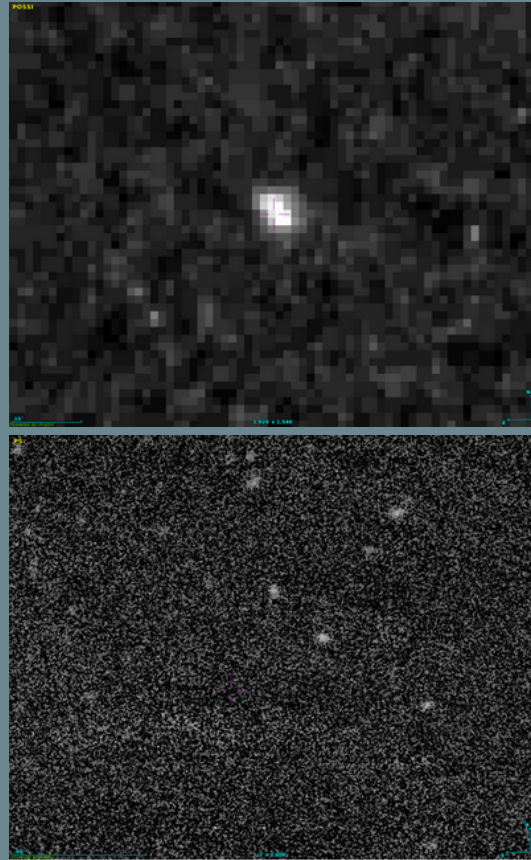
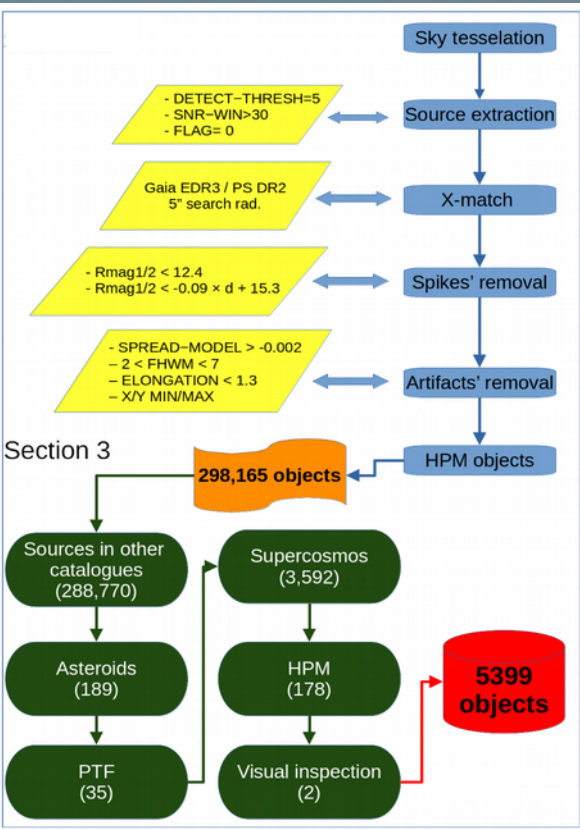


Discovering vanishing objects in POSS I red images using the Virtual Observatory



We report a search for vanishing sources in POSS I (Palomar Observatory Sky Survey) red images using virtual observatory archives, tools and services. The search aims at finding POSS I sources not present in recent catalogues like PAN-STARRS DR2 (limiting magnitude $r=21.4$) or Gaia EDR3 (limiting magnitude $G=21$).

We found 298 165 sources visible only in POSS I plates, out of which 288 770 had a crossmatch within 5 arcsec in other archives (mainly in the infrared), 189 were classified as asteroids, 35 as variable objects, 3592 as artefacts from the comparison to a second digitization (Supercosmos) and 180 as high proper motion objects without information on proper motion in Gaia EDR3.

The remaining unidentified transients (5399 sources) as well as the 172 163 sources not detected in the optical but identified in the infrared regime are available from a virtual observatory compliant archive and can be of interest in searches for strong M-dwarf flares, high-redshift supernovae, asteroids, or other categories of unidentified red transients.

CREDIT: CAB, CSIC-INTA

Left: Flowchart of the process.

Right: POSS-I source not detected in more recent surveys.