

FITS Image Archive at ESA'S NEO Coordination Centre



R. Rudawska^{1,2}, A. Porru^{1,3}, L. Conversi^{1,5}, M. Micheli^{1,2}, D. Koschny⁴, J. L. Cano^{1,5}, E. Brendel⁶

¹ESA NEO Coordination Centre, Italy, ²RHEA Systems, The Netherlands, ³Alia Space Systems, Italy, ⁴LRT/TU Munich, ⁵ESA ESRIN, Italy, ⁶CGI, Germany

Introduction

To assess the threat level of a near-Earth asteroid (NEA) the discovery alone is not enough. It is crucial to compute reliable orbits based on accurate astrometric positions that would cover an arc as long as possible. We can accomplish this by performing follow-up observations or mining astronomical archives to look for information preceding the discovery itself.

FITS image archive

To fulfil these goals, ESA's NEO Coordination Centre (NEOCC) coordinates, collects and analyses telescopic observations of NEOs using ESA's owned telescopes or telescopes under agreement with the Agency. All collected image data is then stored in the NEOCC FITS Image Archive for long-term preservation.

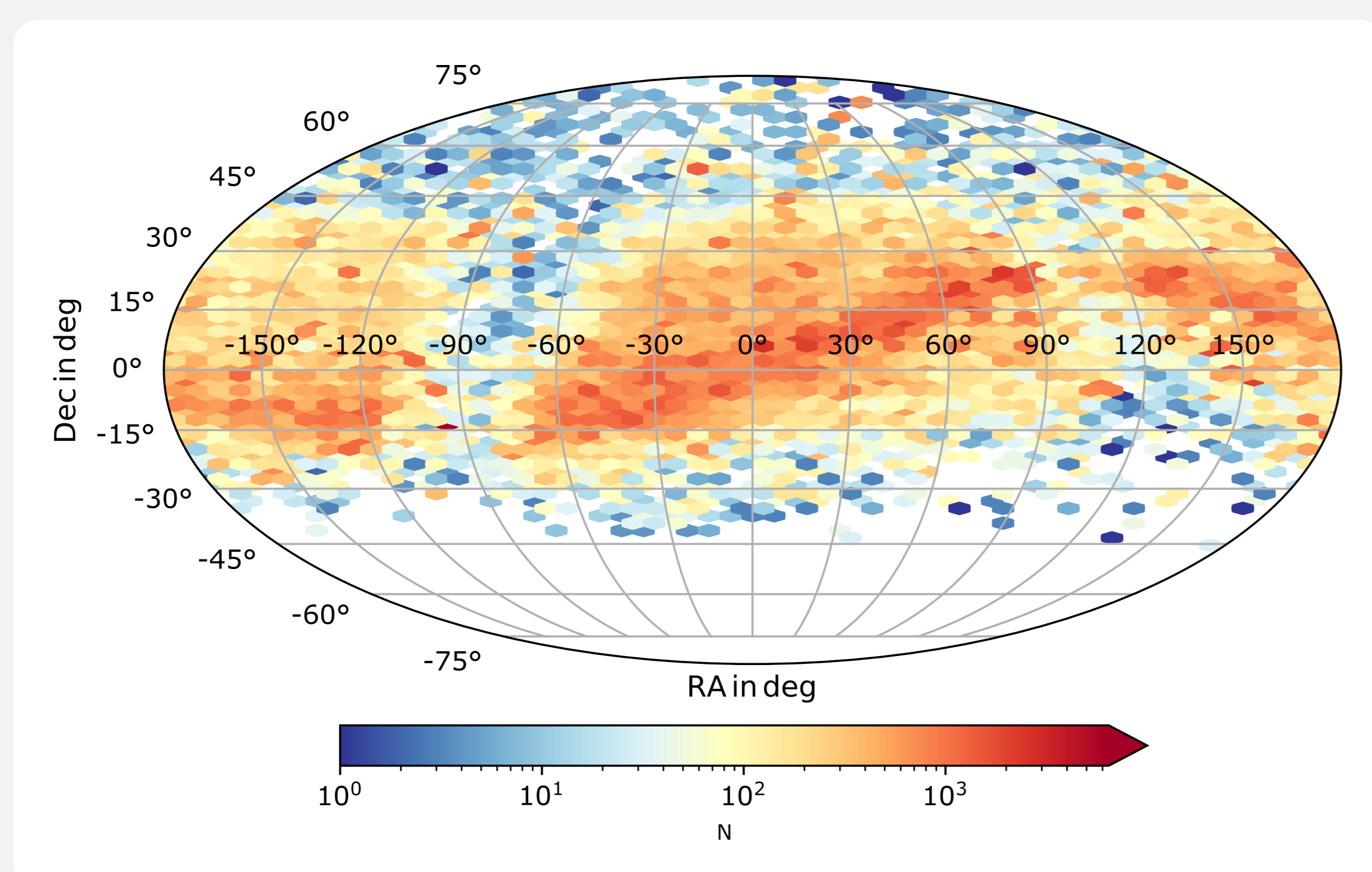
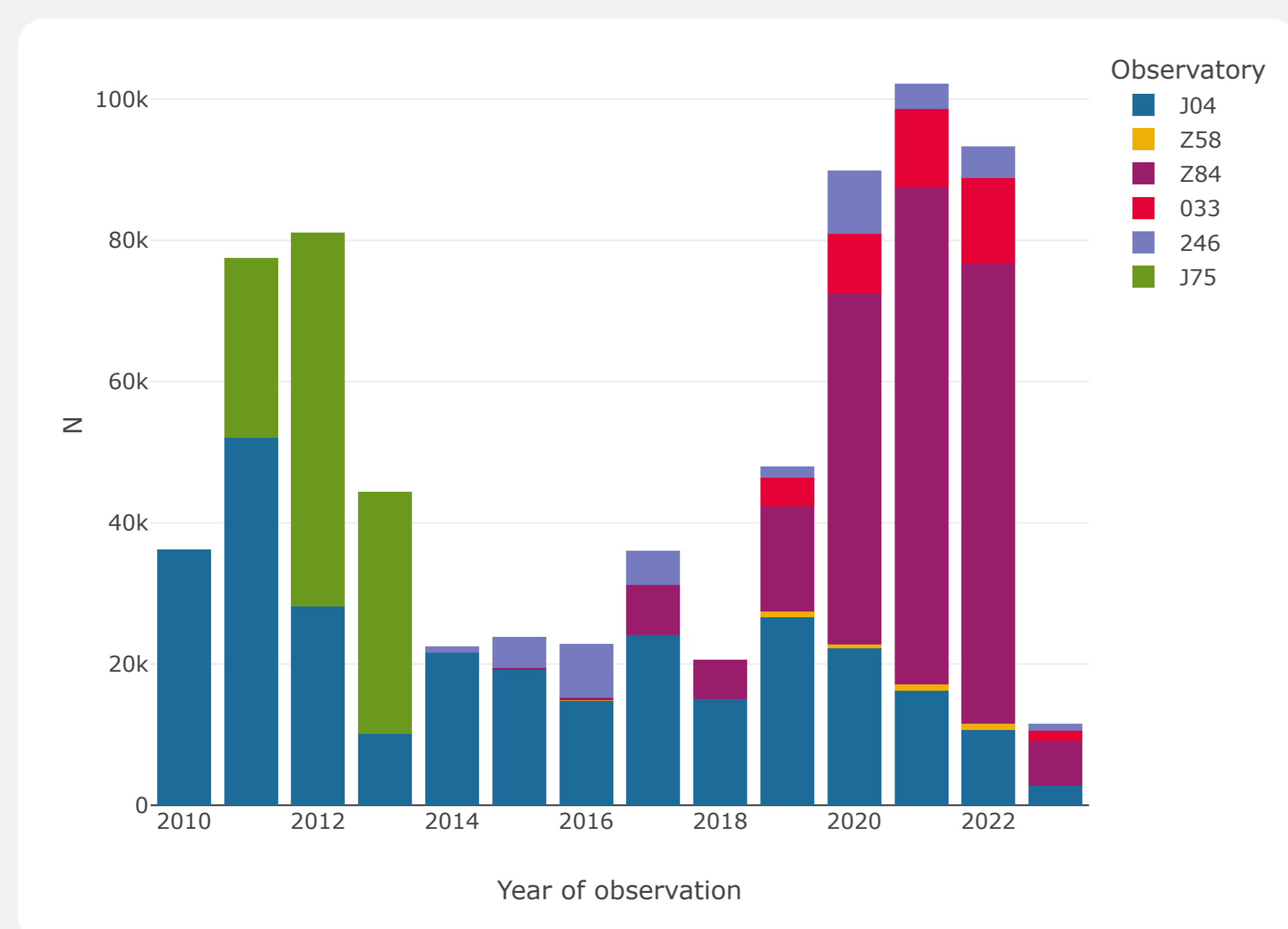


Figure above shows the area of the sky covered by the NEOCC image database. All of the available images in the archive have already been analysed to discover or follow-up already known asteroids, and their astrometric measurements have been submitted to the Minor Planet Center (MPC).

Currently, there are up to 800 000 images in our database. The archive includes images from telescopes such as:

- ESA Optical Ground Station (J04),
- ESA Cebreros TBT Observatory (Z58),
- Calar Alto-Schmidt (Z84),
- Karl Schwarzschild Observatory (033),
- Klet Observatory (246),
- La Sagra Sky Survey (J75),

and soon from ESA La Silla TBT Observatory (W57) and other observatories cooperating with ESA.



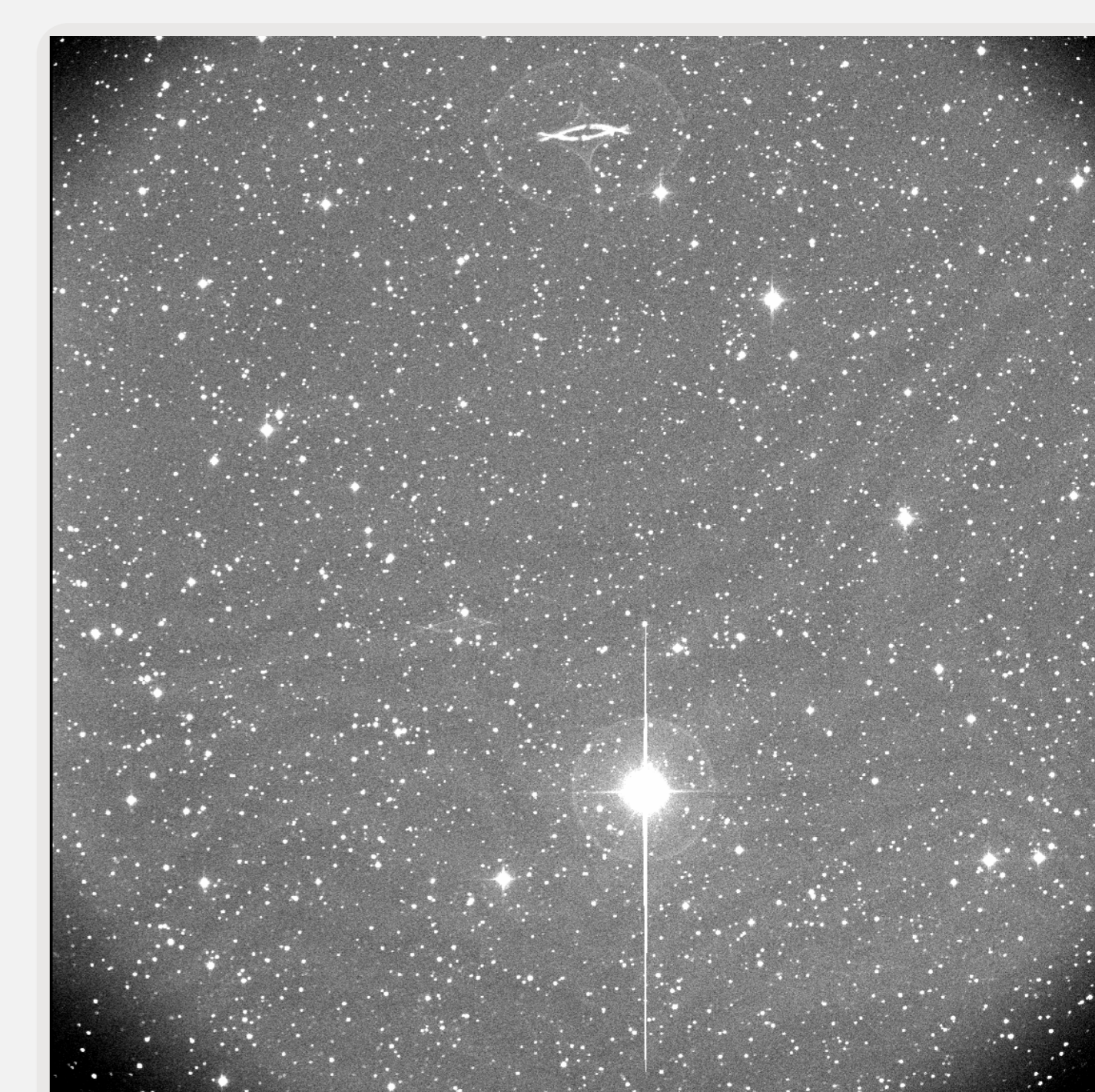
The image archive - upon user registration request to the NEOCC - provides capabilities to search and download selected image data:

<https://neo.ssa.esa.int/image-database>

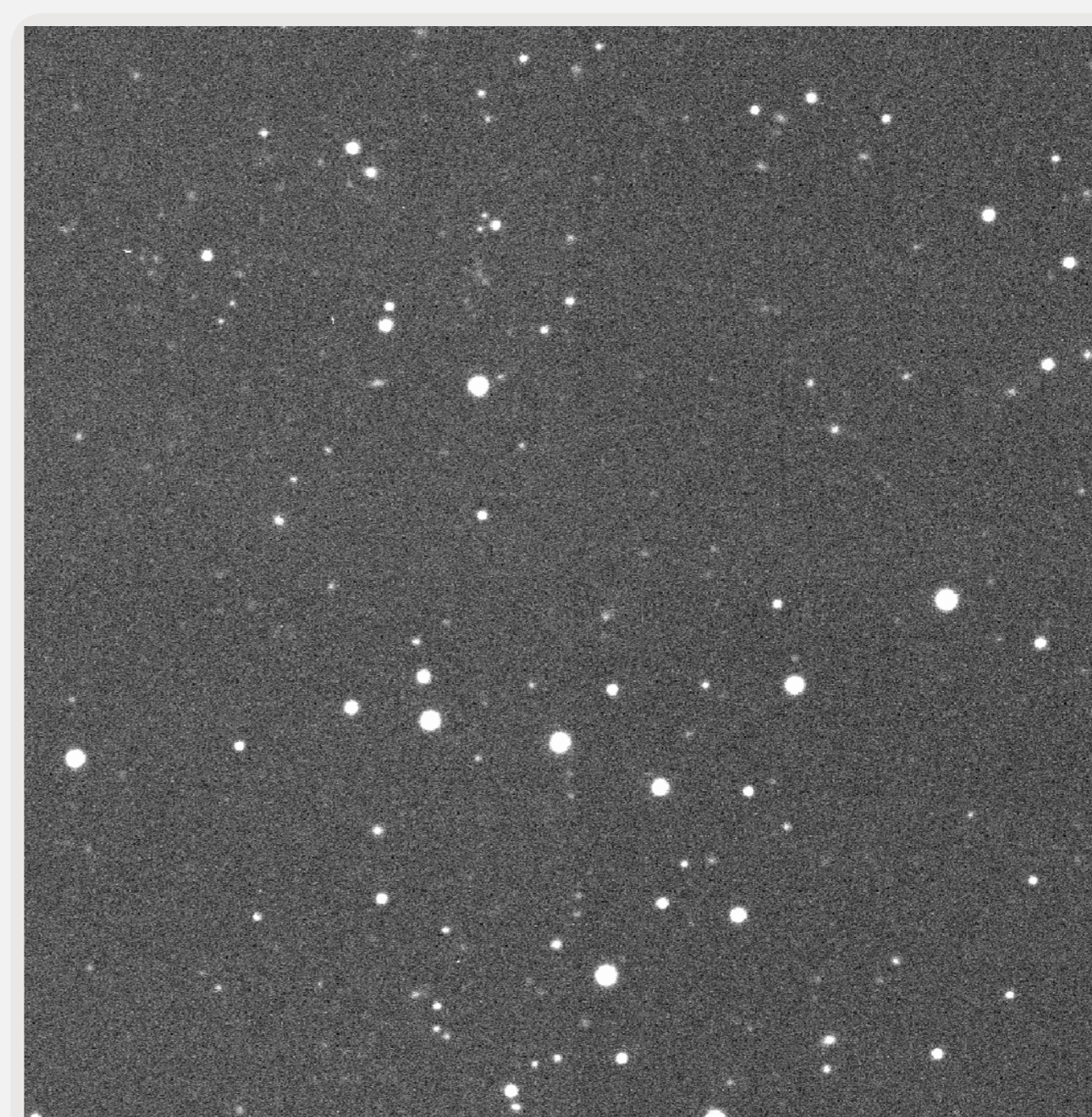
Moreover, the NEOCC image database is linked into the Solar System Object Image Search (SSOIS) system developed by the Canadian Astronomy Data Centre (CADC; Gwyn, Hill, Kavelaars, 2012). Here the search can be done with either a set of observations, an object name, orbital elements or a full ephemeris. SSOIS generates an ephemeris and returns a list of all matching images that points to NEOCC image database. Therefore, the database is extremely useful in order to allow further inspections of the images and to possibly find unidentified detections of NEOs or other moving objects.



Optical Ground Station (J04)



Calar Alto-Schmidt (Z84)



Karl Schwarzschild Observatory (033)



Klet Observatory (246)



La Sagra Sky Survey (J75)

References

- GWYN, S.D., HILL, N., KAVELAARS, J.J. (2012), *SSOS: a moving-object image search tool for asteroid precovery*. Publications of the Astronomical Society of the Pacific, 124, 579.