

Wide-field photographic astronomical observations: database and web-based searches

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The idea of repeated usage of the vast information on wide-field photographic plates and films obtained from the astronomical observations was discussed in the framework of the International Astronomical Union (IAU) Commission 9 during the IAU General Assembly in 1991 (West 1991, Tsvetkov 1991). The intention was that wide-field photographic astronomical observations be fully exploited for the benefit of the worldwide astronomical community. The first necessary steps were to compile an inventory of all wide-field plate archives existing all over the world and afterwards to collect the information about the plates in a Wide-Field Plate Database (WFPDB, Tsvetkov et al. 1998a). As a result of the active correspondence with more than 200 astronomical observatories and institutes, a list of Wide-Field Plate Archives (LWFPA) was created (Tsvetkov 1992) and converted later into a Catalogue of Wide-Field Plate Archives (CWFPFA, Tsvetkov et al. 1998b).

The last updated version (3.1) of the CWFPFA contains detailed information on 315 archives from 244 telescopes in 95 observatories all over the world, with 1 968 784 plates and films altogether. The analyses of this catalogue has shown that for only 632 211 plates the information exists in computer-readable form, presenting 32% of all known plates. Archives with 918 874 plates are still in printed or written form. The information for 379 704 plates is partly in computer-readable form. For archives with 37 995 plates there is not any information available on the form of their catalogues. Distinction between direct plates and spectral plates yields a total of 1 909 568 direct plates, while the spectral plates amount to 59 216. An increase of the total number of all wide-field plates and films should be expected with inclusion of plates stored at Leiden (37 000), Bologna Observatory (20 000), and

Hamburg Observatory (35 000), according to estimates by Tsvetkov (1992) and Hudec (1999).

The main problem is to convert the data from the original log-books into computer-readable form for the generation of plate catalogues. This takes a lot of time. For example, the major contribution to the WFPDB is the computer-readable catalogue of Sonneberg plate archive (Bräuer and Fuhrmann 1992, Bräuer *et al.* 1999), containing about 250 000 plates; it took 10 years to compile this. Experience of the WFPDB working team from the last 5 years, when information for 100 000 plates from different archives was added to the database confirms almost the same speed of converting the log-books into computer-readable catalogues. In order to convert the information for the estimated additional 900 000 plates into computer-readable form at this same speed, it would take our working group some 45 more years! This means that in order to make existing plate archives fully available to the astronomical community in the form of a complete WFPDB, the creation of a plate catalogue is the first, but very necessary step. The message is: we have to find a way to accelerate this important part of the project.

Since 1994 the WFPDB has had a homepage (<http://www.wfpa.acad.bg>) with detailed information for the CWFPA and the database. In 1998 the address was changed to <http://www.skyarchive.org>. During the IAU General Assembly in 1997 Tsvetkov (1997) announced that the major part of the WFPDB had been installed with the help of F. Ochsenbein at CDS Strasbourg, where an on-line search is possible via the VizieR catalogue browser at <http://vizier.u-strasbg.fr/cats/VI.htx/>. The WFPDB catalogue number is VI/90. This part of the WFPDB contains data for 323 635 plates from 57 archives. At present the data from additional 45 original catalogues with 132 000 plates are in preparation for inclusion in the WFPDB. Meanwhile data from these catalogues are available only through a written request to <http://www.skyarchive.org>. Thus the total number of archives in the WFPDB will soon amount to 102 from 32 observatories with a total of 455 635 plates.

In parallel with the development of WFPDB, the following web-based searches have already been done on the basis of it:

- *Near-Earth asteroids.* We conducted a search for predisccovery observations of the potentially hazardous asteroid 1997 XF11. The WFPDB revealed that the object could possibly be spotted on 27 plates.
- *Light-curves of variable stars.* E. Semkov (Rozhen Observatory)

recently reported on the photometry of V 350 Cep; on the basis of archival plates the light curve of the star could be completed considerably.

- *Search for flare cycles in late dwarf stars.* The project suggested by R. Gershberg (Crimea Astrophysical Observatory) considered the use of patrol observations in different stellar aggregates for investigation of red dwarf stars.
- *Flare star patrol plate search.* Such searches were carried out in the regions of stellar aggregates in Orion, Pleiades, Cygnus, and Praesepe.
- *Optical counterparts of Gamma-ray bursts.* Search for plates containing fields of small error boxes for gamma ray bursts was conducted by the WFPDB team in collaboration with R. Hudec and K. Hurley.
- *M 31 investigations.* A list of plates obtained in the region of M 31 at several observatories is available.
- *Supernova search.* The results of this project chaired by H. Meusinger (Tautenburg Observatory) are reported in these proceedings.

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