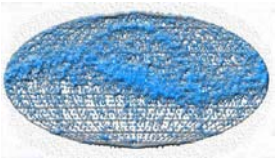

Wide-Field Plate Database

NAROO-GAIA

THE WIDE-FIELD PLATE DATABASE

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Abstract: The Wide-Field Plate Database (WFPDB **www.wfpdb.org)** as a basic source of data for the wide-field astronomical photographic plates obtained with professional telescopes worldwide, is presented. Now the WFPDB consists of four parts: Catalogue of Wide-Field Plate Archives (CWFPAs); Catalogue of Wide-Field Plate Indexes (CWFPIs), Data Bank of Digitized Plate Images, Links to online services and cross-correlation with other needed catalogues and journals.

The CWFPIs has a static version for about 323 000 plates installed in Strasbourg **(http://vizier.u-strasbg.fr/cats/VI.htx**) with online search via VizieR (see Search in the WFPDB - catalogue number VI/90), and an enlarged and regularly updated version installed in Sofia (http://wfpdb.org/search), and mirrored in Potsdam since 2007 **(http://vodata.aip.de/WFPDBsearch**/). This last version contains up to March 2012 the parameters of 563 612 plates **(http://wfpdb.org/allsky.html**) from 131 archives with provided possibilities for data search, quick plate preview with low resolution in JPEG files of some of the plates and complete plate image with high resolution in FITS files upon request.

More than 280 000 plates in different observatories in Europe were digitized with commercial high-quality flatbed scanners last decade. The developed technology in Sofia for plate digitization with such scanners is presented too. The digitized plate images are with low resolution for quick plate visualization and easy online access, and with high resolution aiming photometric and astrometric investigations and with implementation of contemporary methods for compression. There is no universal procedure for scanning the plates, but an optimal one for a given telescope could be chosen.

A special attention on the plate archiving is paid to some plate collections in Germany, Bulgaria, Hungary, Belgium, Romania, etc., where with the help of our working team and the efforts of astronomers, networking and information technology specialists, and librarians, the process of plate archiving is running actively.

A new reduction of old observations in the Gaia era
Paris Observatory, June 20-22, 2012

WFPDB - A TOOL FOR WEB ACCESS TO HISTORICAL WIDE-FIELD ASTRONOMICAL OBSERVATIONS

WIDE-FIELD PLATE DATABASE

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Bulgarian Academy of Sciences
72 Tsarigradsko Shosse Blvd.
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Telephone: (+359 2) 979 5935
GSM: (+395) 879603463 FAX: (+359 2) 975 3201
E-mail: wfpdb at skyarchive.org

The Wide-Field Plate Database (WFPDB) project started in the Institute of Astronomy, Bulgarian Academy of Sciences, about 15 years ago. Its aim is to collect data from wide-field astronomical plates (> 1°) [1]. The project collects catalogue data (extracted from the log books), describing the plates, as well as digitised images, obtained from scanning the plates.

Currently the WFPDB system, which is maintained at the Sofia Sky Archive Data Centre (SSADC) contains catalogue data for ~ 600 000 plates, as well as ~1 TB of image data.

A new reduction of old observations in the Gaia era
Paris Observatory, June 20-22, 2012

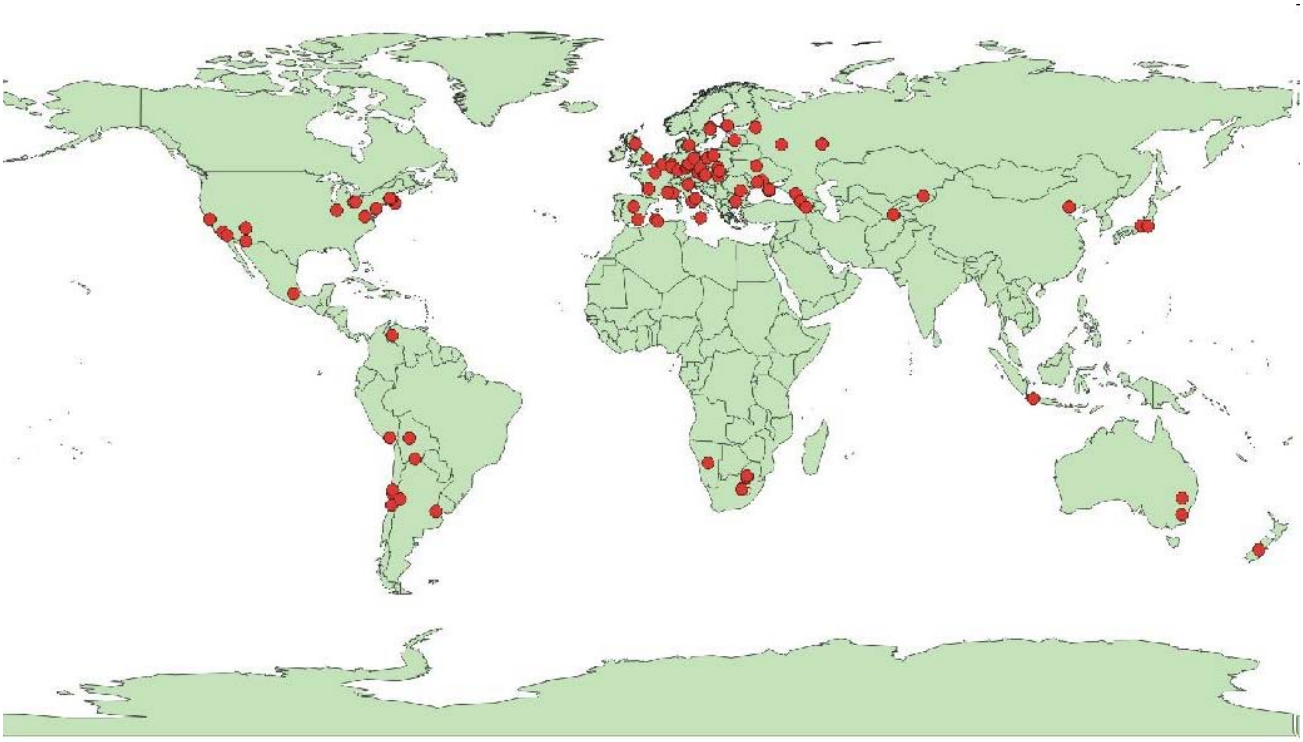
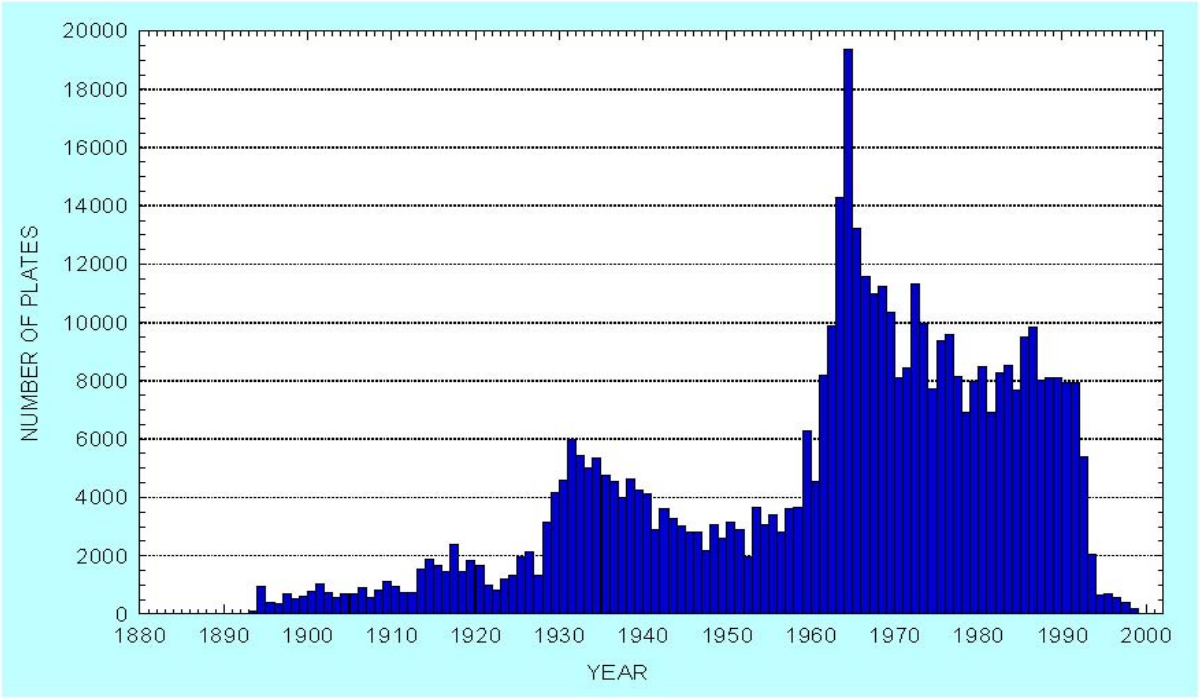


Fig. 1. World-wide distribution of wide-field telescopes

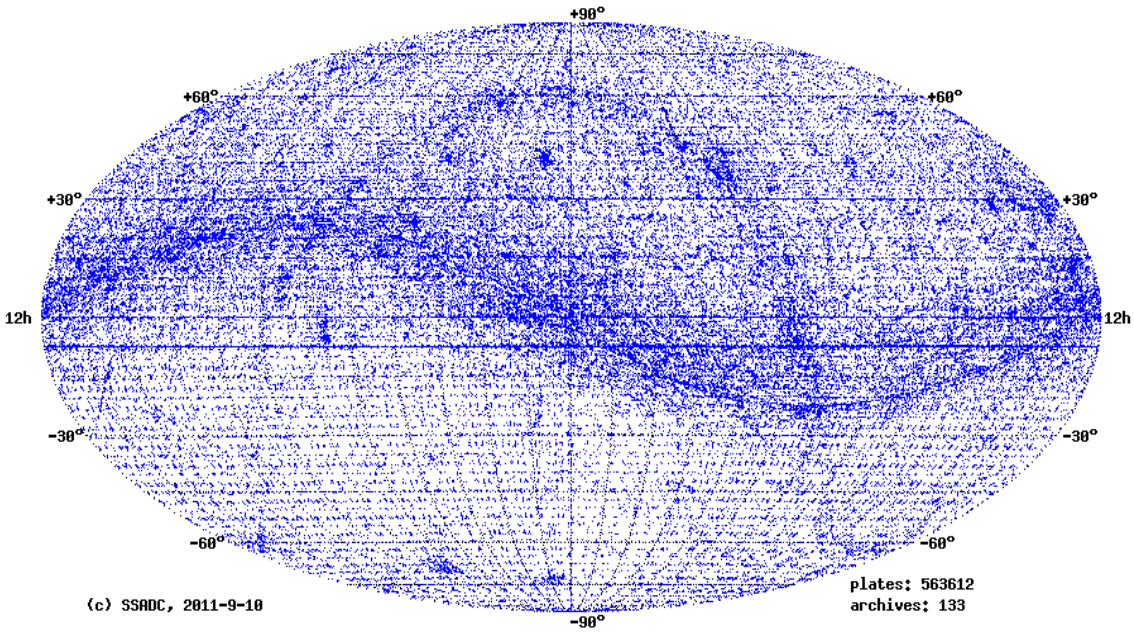


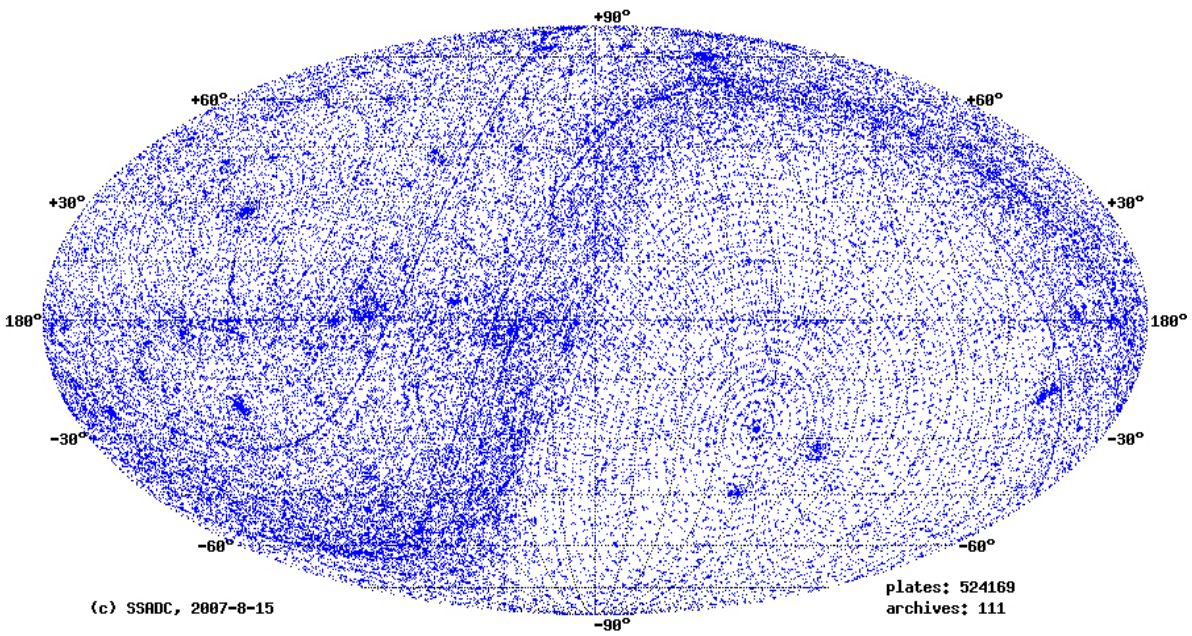
Number of the wide-field plates versus time of observation

A new reduction of old observations in the Gaia era
Paris Observatory, June 20-22, 2012

PREPARATION OF COMPUTER-READABLE VERSIONS FROM THE ORIGINAL PLATE-LOGS AND THEIR INCORPORATION IN THE WFPDB

Currently WFPDB contains information for 563612 plates form 133 catalogues





FORMAT OF THE CATALOGUE OF WIDE-FIELD PLATE ARCHIVES

PIPELINE STRUCTURE DESCRIPTION

Observatory Abbreviation	Telescope Aperture (cm)	Telescope Index	WFPDB Observatory and Telescope Identifier (example: HAR025)

Location of the plate archive, town (site)	Plate Archive Location
Observatory, Name, Site, Country	

Marsden No.	Time Zone	Observatory Longitude	Observatory Latitude	Olservatory Altitude	Observatory Characteristics

Telescope Clear Aperture	Telescope Mirror Diameter	Telescope Focal Length	Wide-Field Telescopes Parameters

Plate Scale	Instrument Type	Field Angular Dimension	Plate Scale, Field and Type of the Instrument

Year of Beginning of Telescope Operation	Year of End of Telescope Operation	Period of Operation

Film Identification	Number of Direct Plates	Number of Objective Prism Plates	Plate Quantity

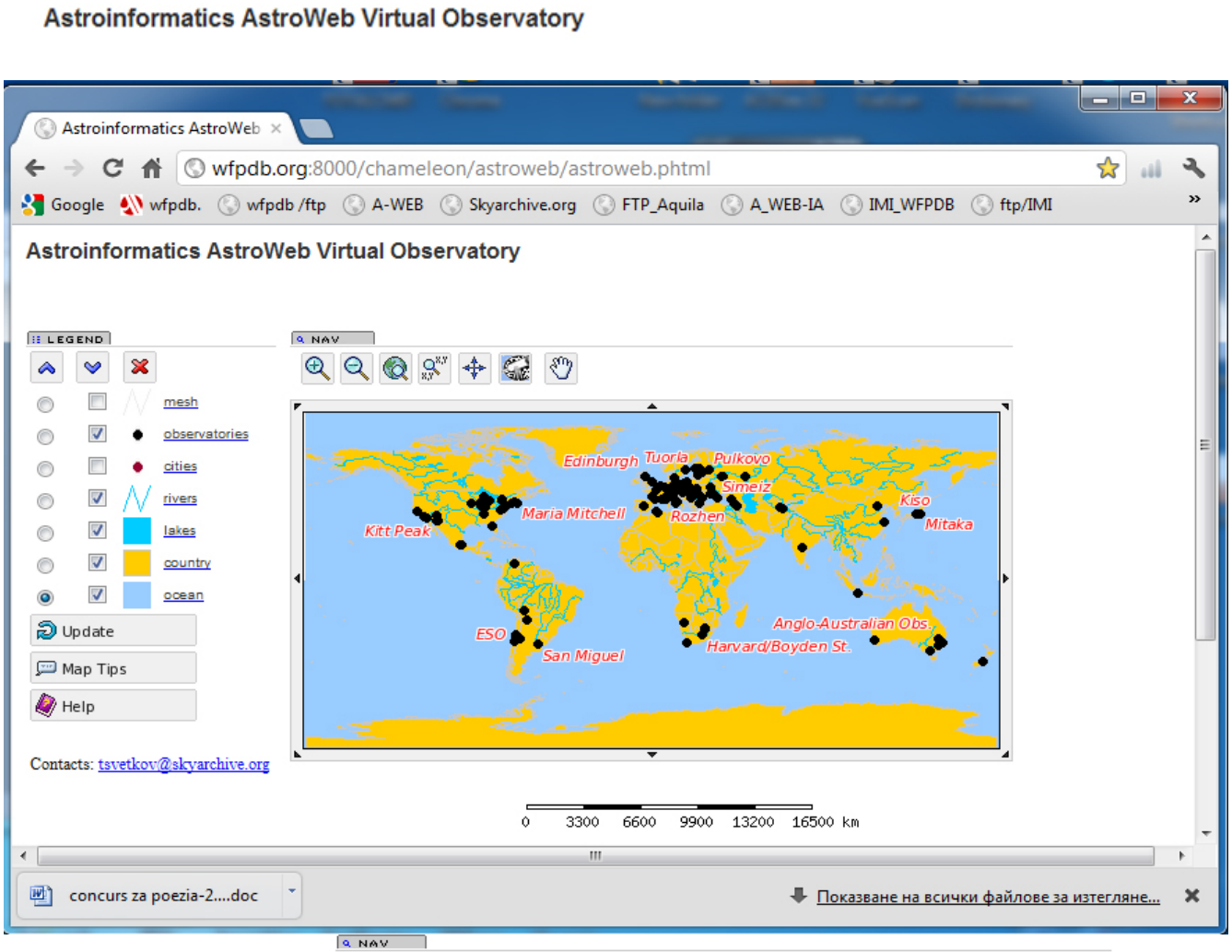
Plate Catalog Form	Code for Quality of the Pate Archiv	Astronomer in Charge	Status of the Plate Archive and Astronomer in Charge

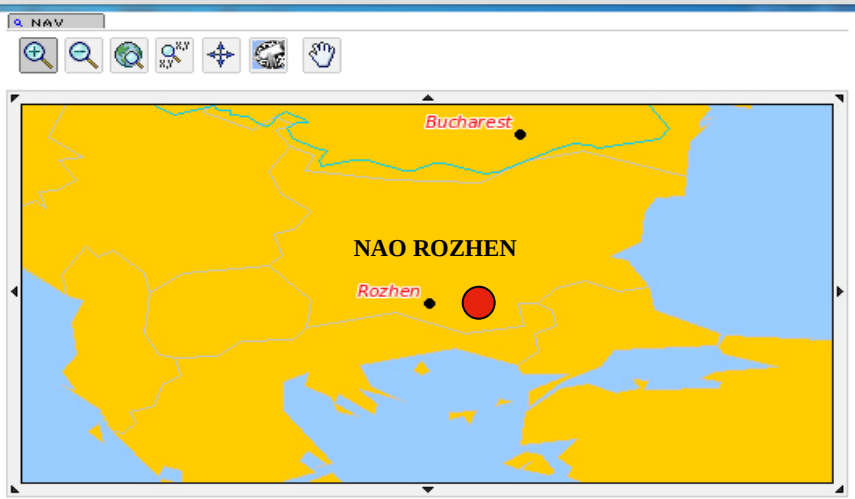
Note on Istrument Type: Ast - astrograph, Cam – camera, FEC - fish eye camera, Men - meniscus, RCr - Ritchey-Chretien, Rfl - reflector, Rfr - refractor, Sch - Schmidt

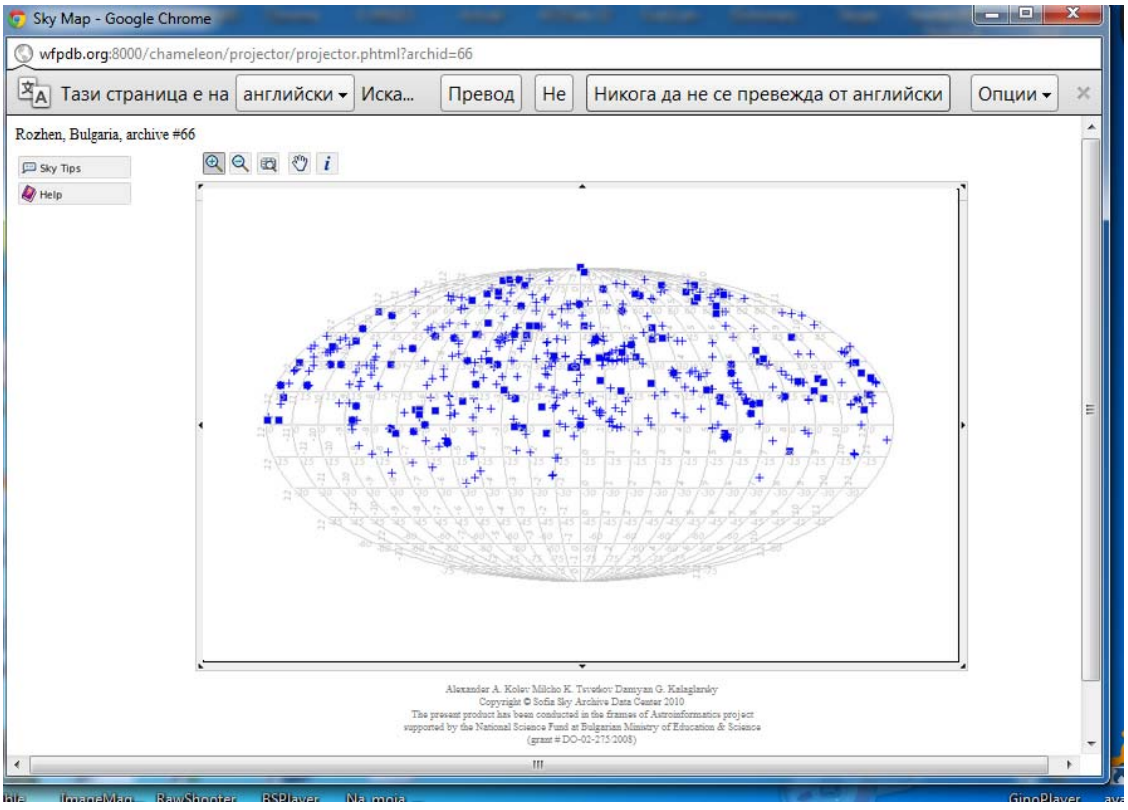
Note on CFORMc, CFORMT: C - computer-readable form, T - printed table form, TC - computer-readable form in preparation.

Note on QUAL: A - very good, B - good, D - distributed

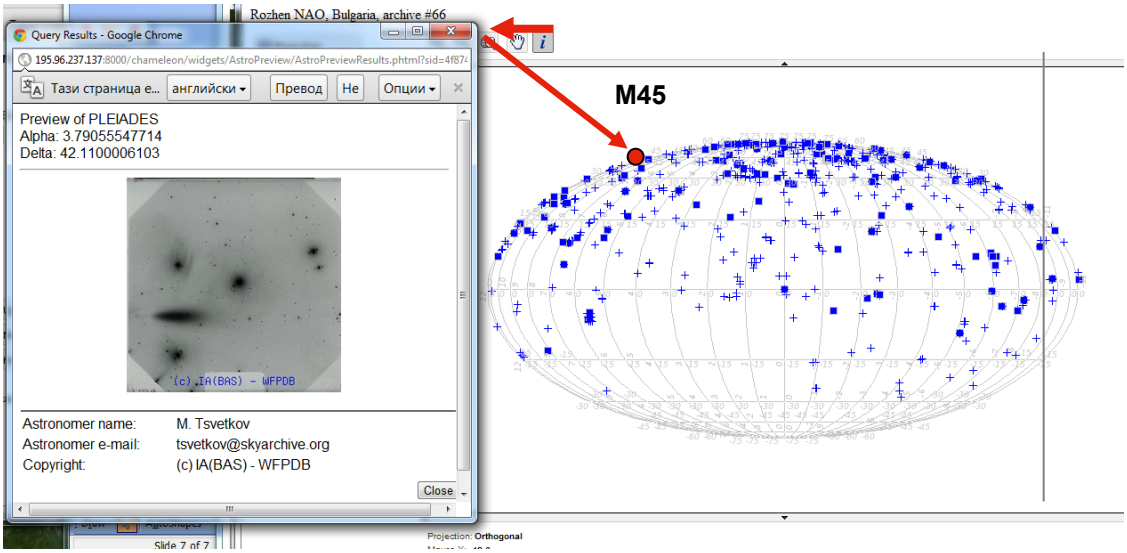
ASTROWEB – WFPDB APPLICATION

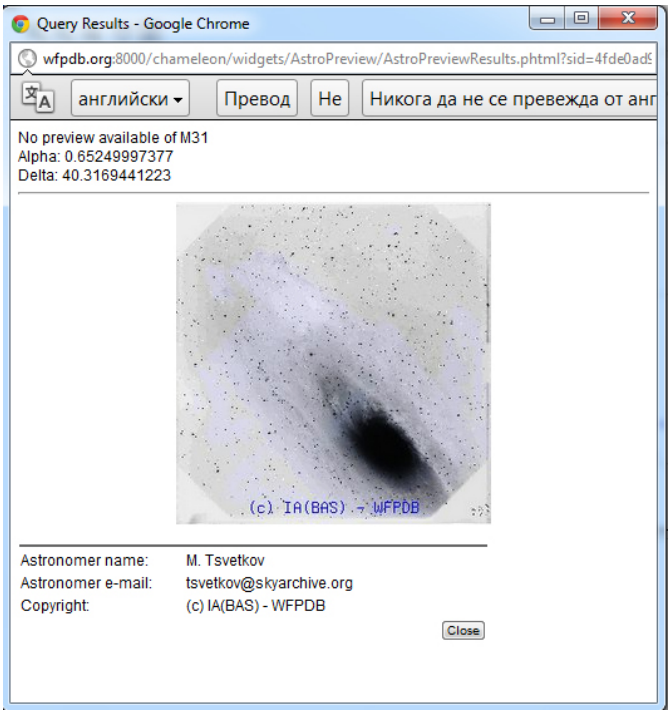


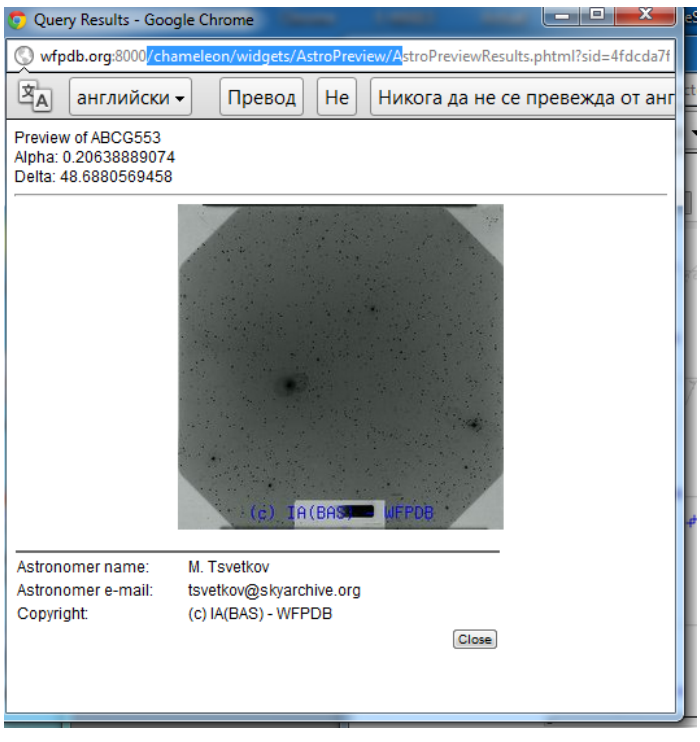




Active map of the distribution of separate plate archives







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Database SEARCH engines

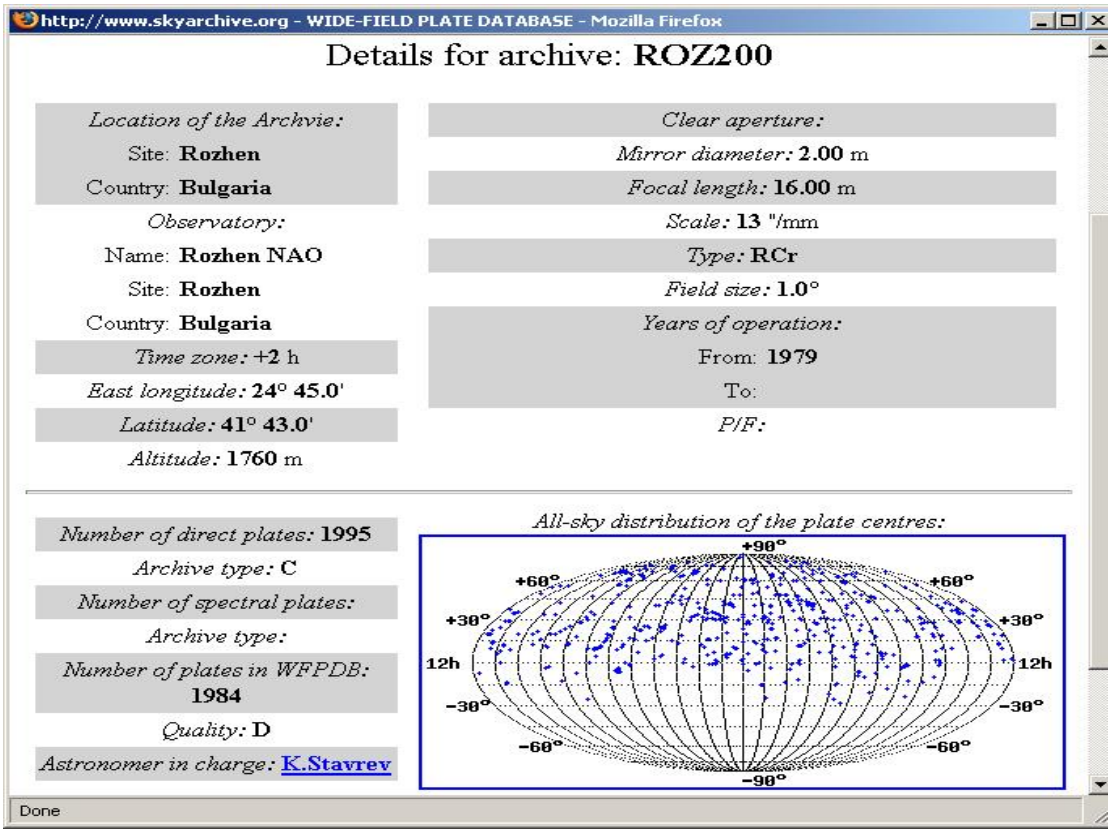
CDC –VizieR: Since August 1997 an on-line search in the WFPDB is possible via the VizieR catalogue browser in CDS - Strasbourg at http://vizier.u-strasbg.fr/cats/VI.htx - **VI/90.**

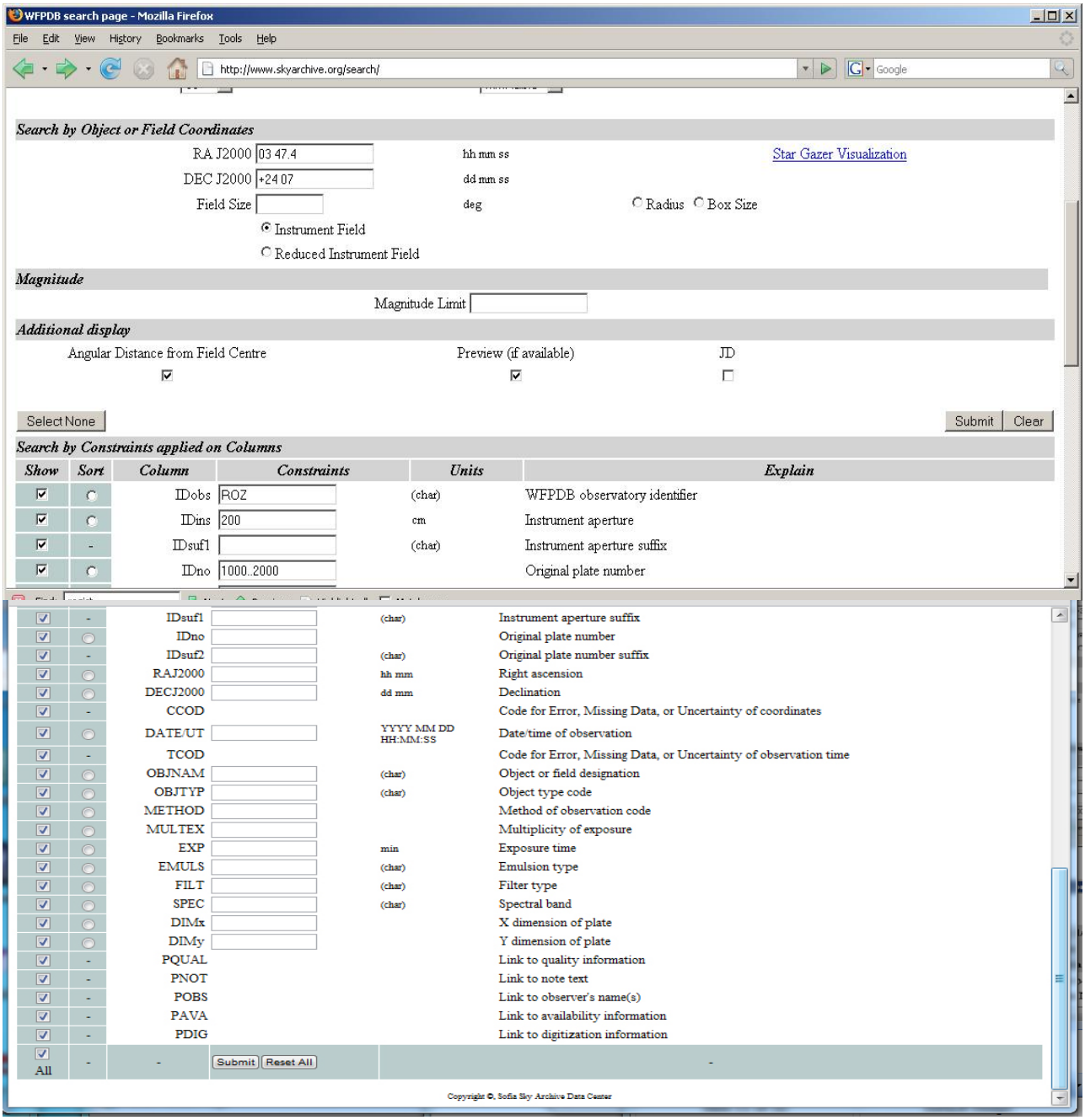
WFPDB-SOFIA: MAIN site since November 2001 http://www.skyarchiveb.org/search

AIP Potsdam – mirror since beginning of 2009
http://vodata.aip.de/WFPDBsearch/

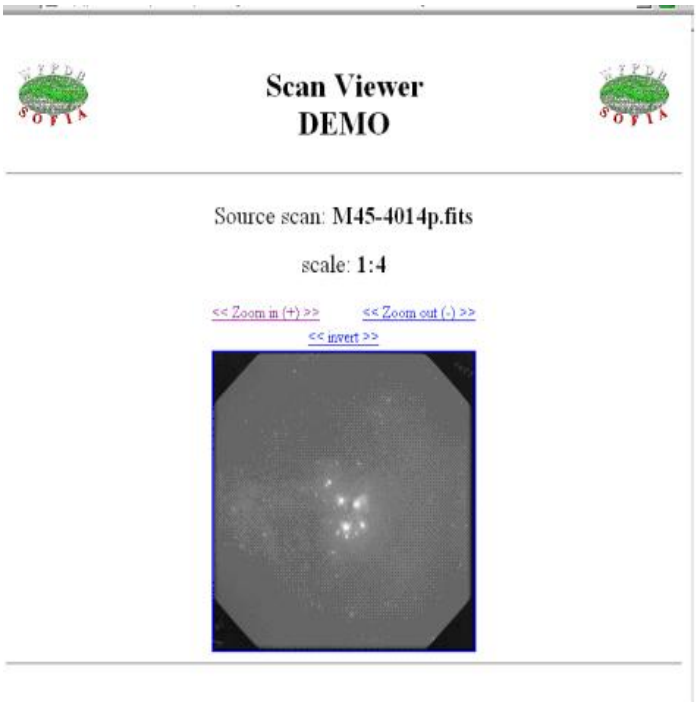
IMI - BAS mirror since April 2010
http://trillian.magrathea.bg:8080/search/

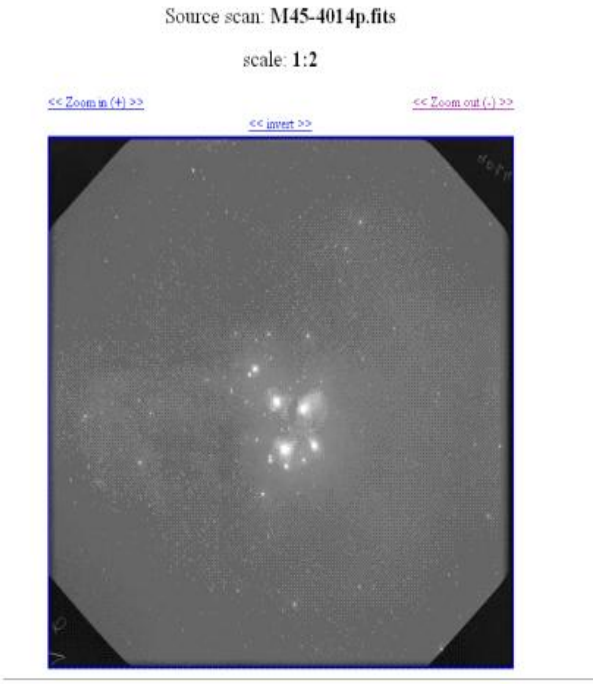
WFPDB-SOFIA: MAIN site since 2012
http://wfpdb.org/search




WFPDB search page - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://www.skyarchive.org/search/
Search by Object or Field Coordinates
RA J2000 03 47.4
hh mm ss
Star Gazer Visualization
DEC J2000 +24 07
dd mm ss
Field Size
deg
Radius
Box Size
Instrument Field
Reduced Instrument Field
Magnitude
Magnitude Limit
Additional display
Angular Distance from Field Centre
Preview (if available)
JD
Select None
Submit
Clear
Search by Constraints applied on Columns
Show
Sort
Column
Constraints
Units
Explain
IDobs ROZ (char) WFPDB observatory identifier
IDins 200 cm Instrument aperture
IDsuf1 (char) Instrument aperture suffix
IDno 1000..2000 Original plate number
IDsuf2 (char) Original plate number suffix
RAJ2000 hh mm Right ascension
DECJ2000 dd mm Declination
CCOD Code for Error, Missing Data, or Uncertainty of coordinates
DATE/UT YYYY MM DD HH:MM:SS Date/time of observation
TCOD Code for Error, Missing Data, or Uncertainty of observation time
OBJNAM (char) Object or field designation
OBJTYP (char) Object type code
METHOD Method of observation code
MULTEX Multiplicity of exposure
EXP min Exposure time
EMULS (char) Emulsion type
FILT (char) Filter type
SPEC (char) Spectral band
DIMx X dimension of plate
DIMy Y dimension of plate
PQUAL Link to quality information
PNOT Link to note text
POBS Link to observer's name(s)
PAVA Link to availability information
PDIG Link to digitization information
All
Submit
Reset All
Copyright ©, Sofia Sky Archive Data Center

Presenting scanned image at different scales





WIDE-FIELD PLATE DATABASE: FORMAT OF THE MAIN DATA FILE - PIPELINE STRUCTURE

Observatory Abreviation	Telescope Aperture (cm)	Original Plate Number	WFPDB Observatory Identifier (example: ROZ200_000604)

RA, Right Ascension Sign (hours, min, sec) (J2000.0	COD Error	Right Ascension; Error, Missing Data

DEC, Declination Sign (degrees, arcmin, arcsec (2000.0)	COD Error	Declination; Error, Missing Data

(UT) Observation Time	hh	mm	ss.0	Observation Time (UT)

Object/Field Designatio	Object Type CODE	Method	Object or Field Designation, Type Code, Method of Observation

EmulsionType	Filter Type	Spectral Band	Emulsion, Filter type and Spectral band

Plate X-Y dimensions	QUAL	NOT	OBS	AVA	DIG	Plate Dimensions and Pointers to file Quality Notes, Observer, Availability and Digitization

Object type in WFPDB is coded as follows: A1 - planet A2 - moon A3 – sun, A4 –asteroid, A5 - comet S1 – star, S2 - double star, S3 - variable star, S4 - star cluster, S5 - HII region, S6 - nebula S7 - planetary nebula, S8 - supernova S9 – fundamental star, SR - reference star around a radio source G1 - galaxy G2 - QSO G3 - group of galaxies G4 - cluster of galaxies G5 - supercluster G6 - void F - field

Method of observation in WFPDB is coded as follows: 1 - direct photograph, 2 - direct photograph, multiexposure, 3 - stellar tracks, 4 - objective prism, 5 - objective prism, 6 - Metcalf's method, 7 - proper motions, 8 - no guiding, 9 - out of focus, 10 - test plate, 11 - Hartmann test, 12 - with mask, 14 - sub-beam (Pickering) prism, 24 - objective grating,

WIDE-FIELD PLATE DATABASE PIPELINE STRUCTURE

Catalogue of Wide-Field Plate Archives

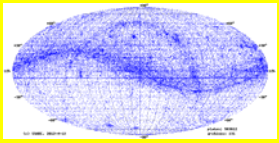
CWFPA, v. 5.7 Jan 2012,
http://www.wfpdb.org/data/Cat5.7.xls

485 wide-field plate archives, ~2.5x10^6 plates

Sources: The Strasbourg Astronomical Institutes Directory, The Nautical Astronomical Almanac, Observatory Years Reports, Observatories Webpages, Private Correspondence

WFPDB Plate Index Catalogue

http://www.wfpdb.org/search.html



133 Plate Archives,
536612 plates,
~22%

ARCHIVE DESCRIPTIONS
(doc, html)

LOGBOOKS
DIGITIZATION
CCD Imaging
JPG, 300 dpi

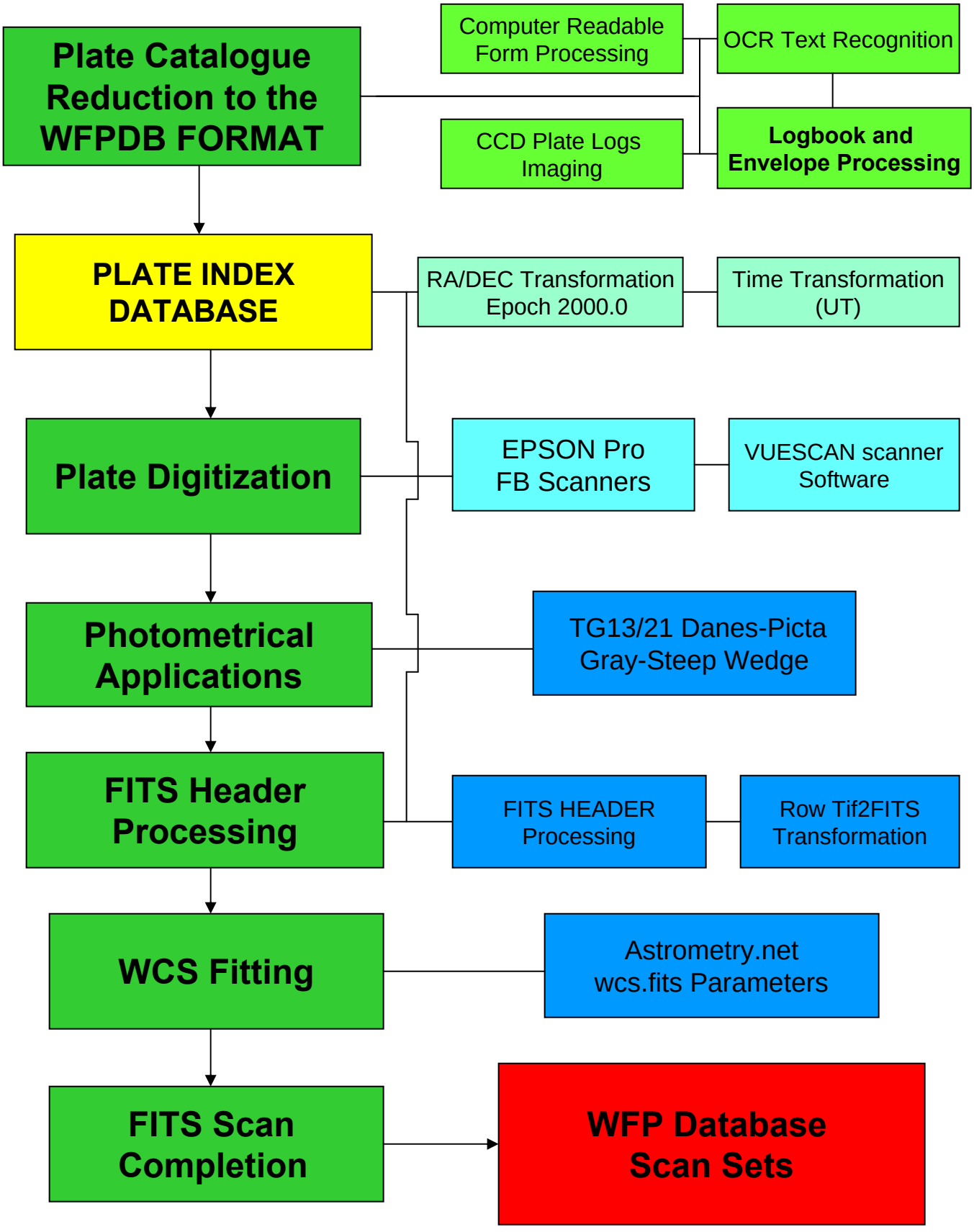
DEPOSITORY OF DIGITIZED PLATES
FROM 15 SELECTED PLATE COLLECTIONS

Single Plate Digitization Information:
Row tif,TIFF or Fits files, size of ~0.1-1 GB (16 bit-4096)

PLATE PREVIEWS,
Saving Marks,
Scans or CCD Imaging
Color, 8 bit (256) JPG,TIF
Size of 1~10 MB

Row tif, or TIFF, 16 bit	FITS, 16 bit
Tiff2FITS 16 bit,(4096) or FITS rotated, 16bit	FITS or FITS rotated, 16 bit, (4096)
Photometric grey wedge TG13/21S processing	Photometric grey wedge TG13/21S processing
FITS VO HEADERS	FITS VO HEADERS

WFPDB Data Processing Pipeline



WIDE-FIELD PLATE DATABASE FORMAT in ASCII

PLATE IDENT	RA/DECJ2000	DATE UT	OBJECT	KOD	EXP	EMULSION	FILER	C	SIZE POINTERS
ROZ200 000339	113445 490306	19820328214500	ABCG1314	1	1	120.0ZU21	GG385	B	303010120
ROZ200 000340	105534 063648	19820329201600	MRK268+270	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000341	145430 183844	19820518200000	ABCG1991	1	1	150.0ZU21	GG385	B	303000120
ROZ200 000342	175025 064109	19820518225000	IC4665	1	1	74.0ZU21	GG385	B	303000120
ROZ200 000343	160511 174510	19820519200000	ABCG2151	1	1	150.0ZU21	GG385	B	303000120
ROZ200 000344	175018 044346	19820519230000	IC4665	1	1	60.0ZU21	GG385	B	303000120
ROZ200 000345	175018 044346	19820520001500	IC4665	1	1	60.0ZU21	GG385	B	303000120
ROZ200 000346	164712-015651	19820523220000	M12	1	1	40.0ZU21	GG385	B	303000120
ROZ200 000347	175018 044346	19820523231000	IC4665	1	1	125.0ZU21	GG385	B	303000120
ROZ200 000348	191651 300956	19820525002000	M56	1	1	50.0ZU21	GG385	B	303000120
ROZ200 000349	164137 362701	19820524220500	M13	1	1	90.0I750	RAG1	R	161300120
ROZ200 000350	212847-010725	19820817210000	AKN547+548	1	1	120.0ZU21	GG385	B	303001120
ROZ200 000351	212847-010725	19820818211500	AKN547+548	1	1	20.0ZU21	GG385	B	303000120
ROZ200 000352	010529 402054	19821014211600	ANDROMEDA	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000353	004126 405708	19821014230000	ANDROMEDA	1	1	23.0ZU21	GG385	B	303000120
ROZ200 000354	004600 420907	19821109173200	M31	1	1	60.0ZU21	GG385	B	303000120
ROZ200 000355	004340 413208	19821109184900	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000356	004130 405708	19821109205000	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000357	031837 413043	19821109223000	ABCG426	1	1	120.0ZU21	GG385	B	303010120
ROZ200 000358	040827 694822	19821110012000	IC356	1	1	60.0ZU21	GG385	B	303010120
ROZ200 000359	003905 401909	19821110190500	M31	1	1	90.0ZU21	GG385	B	303001120
ROZ200 000360	004130 405708	19821110210000	M31	1	1	60.0ZU21	GG385	B	161601120
ROZ200 000361	004600 420907	19821110224300	M31	1	1	60.0ZU21	GG385	B	303001120
ROZ200 000362	054205 692252	19821111010000	NGC1961	1	1	120.0IIaO	GG385	B	303010120
ROZ200 000363	070859 483819	19821111033500	ABCG569	1	1	105.0IIaO	GG385	B	303010120
ROZ200 000364	233817 270242	19821111190900	ABCG2634	1	1	150.0ZU21	GG385	B	303011120
ROZ200 000365	013349 303917	19821111220200	M33	1	1	120.0ZU21	GG385	B	303001120
ROZ200 000366	061851 782134	19821112013100	NGC2146	1	1	120.0ZU21	GG385	B	303010120
ROZ200 000367	073703 653604	19821112042400	NGC2403	1	1	90.0ZU21	GG385	B	303011120
ROZ200 000368	172459-174953	19821112181000	NEW COMETS	1	1	20.0ZU21	GG385	B	303001120
ROZ200 000369	003914 401909	19821112165400	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000370	004340 413207	19821112190000	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000371	043052 645011	19821113002000	NGC1569	1	1	90.0ZU21	GG385	B	303010120
ROZ200 000372	072856 691301	19821113023600	NGC2366	1	1	90.0IIaO	GG385	B	303010120
ROZ200 000373	172459-174953	19821113160600	NEW COMETS	1	1	20.0ZU21	GG385	B	303010120
ROZ200 000374	004308 412327	19821113164700		1	1	90.0ZU21	GG385	B	303000120
ROZ200 000375	004340 413207	19821113172000		1	1	67.0ZU21	GG385	B	303000120
ROZ200 000376	004240 411608	19821113184000		1	1	100.0ZU21	GG385	B	303000120
ROZ200 000377	004051 404640	19821113203100		1	1	97.0ZU21	GG385	B	303000120
ROZ200 000378	003905 401908	19821121165500	M31	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000379	004051 404640	19821121193000	M31	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000380	013348 303917	19821121214000	M33	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000381	180801-201249	19821122154500	NEW COMETS	1	1	25.0ZU21			303000120
ROZ200 000382	003905 401908	19821122171500	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000383	004051 404640	19821122181500	M31	1	1	90.0ZU21	GG385	B	303000120
ROZ200 000384	004308 412327	19821122205000	M31	1	1	60.0ZU21	GG385	B	303000120
ROZ200 000385	013348 303917	19821122223500	M33	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000386	074953 564823	19821123010000	AKN145+147	1	1	120.0ZU21	GG385	B	303000120
ROZ200 000387	075002 564823	19821123030500	AKN145+147	1	1	30.0ZU21	GG385	B	303000120

Plate Digitization

Rozhen Plate Digitization Laboratory: (RPDL) EPSON 10000XL

DIGITIZATION OF ROZHEN PLATE COLLECTION – DIGITIZED IMAGES WITH HIGH &LOW RESOLUTION AND THEIR INCORPORATION IN WFPDB

Plate scanners of this type were successfully used in many observatories in Europe:
Bulgaria, Germany, Italy, Hungary, Serbia, Romania, Ukraine, Armenia, Estonia, Czech Rep., Slovakia, etc. Most of them use the technology for plate digitization developed at the Sofia Sky Archive Data Center.

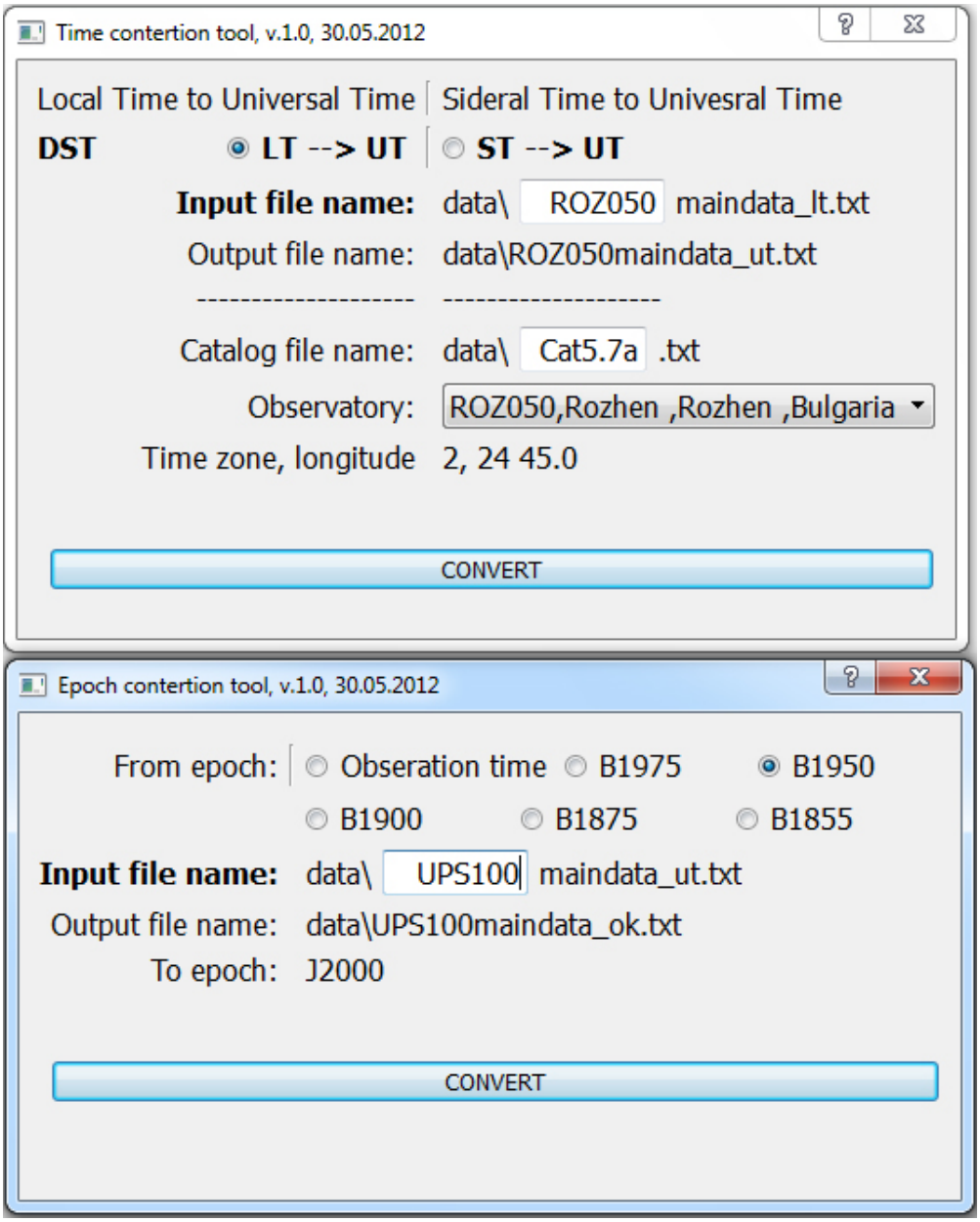
Image Data in WFPDB

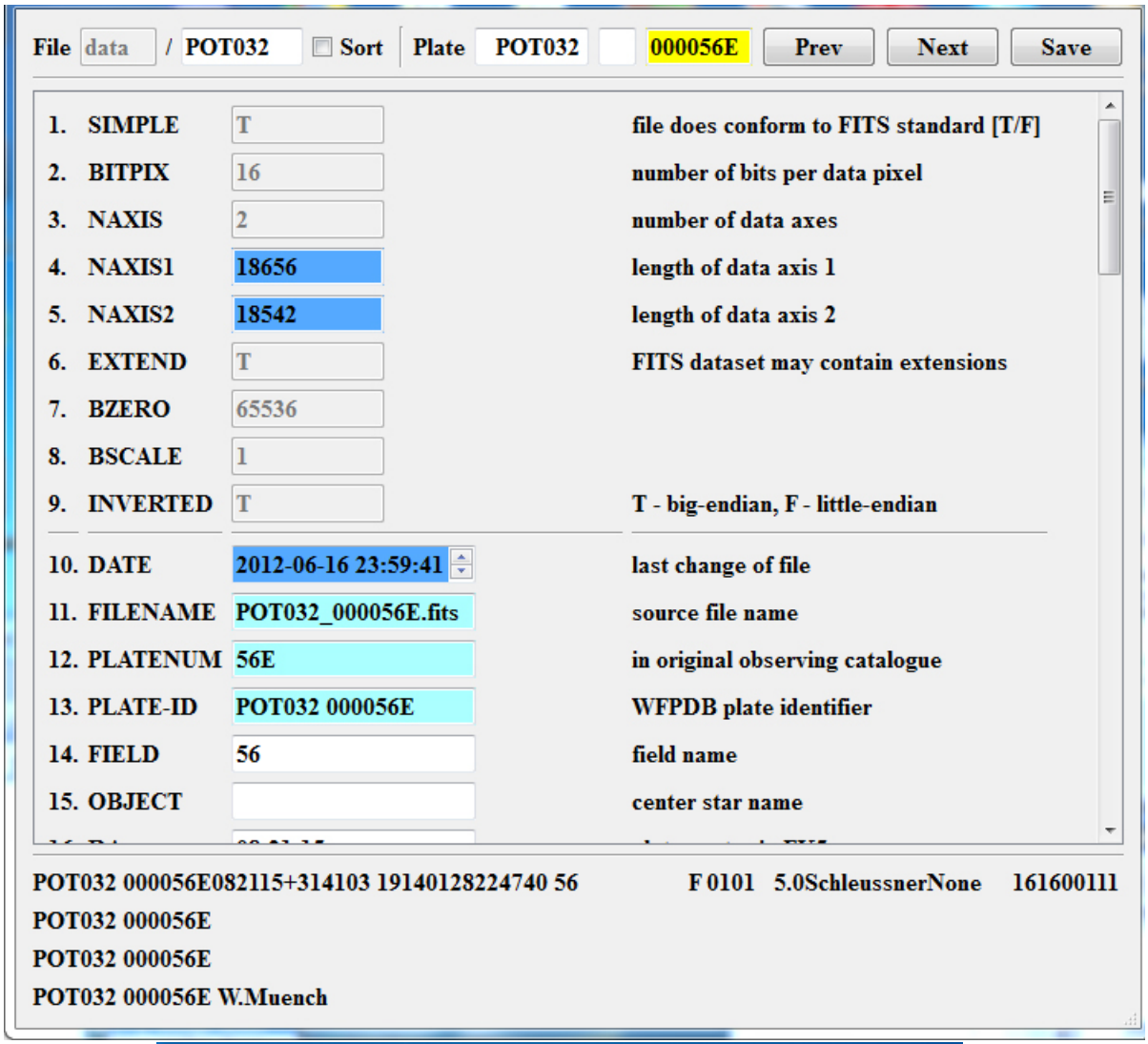
Two types of image data are supported in the WFPDB currently:

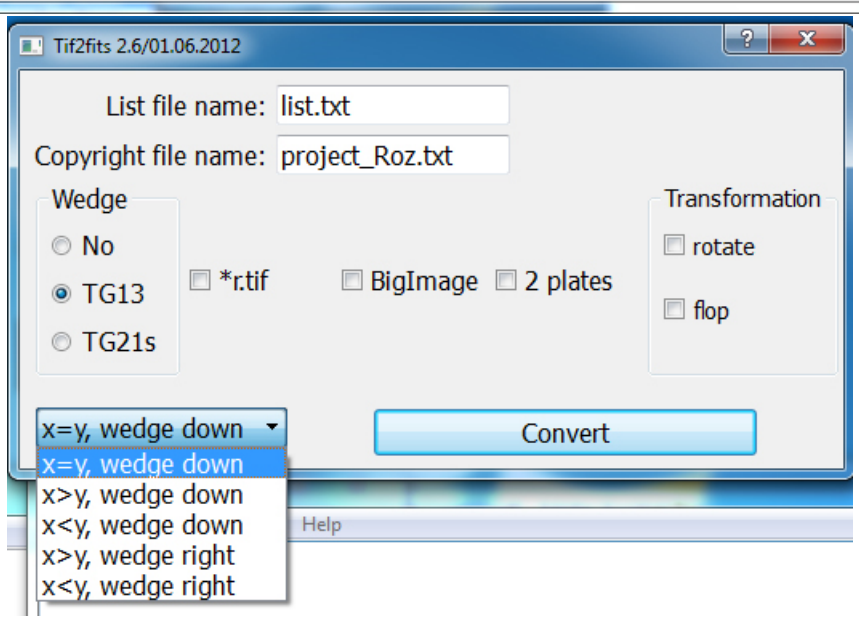
- The full-colour previews tiff and jpg are either low-resolution colour scans, or simply digital camera photos. They are useful for the user to get an idea of the plate quality, note and remarks made on the plate, without downloading a huge amount of scanned data. They are currently available through the WFPDB search engine.

- The plate row scans are intended to be high-resolution digitization of the plates. Plates are digitised mainly with flatbed commercial scanners in fits/row-tiff format.

- At present about 300 000 plates are digitised and their online access is under discussion. The system for accessing them is still under development. The basic idea is to build an engine, based on Multiresolution Analysis (MRA) techniques, which can effectively present the image scan at different resolutions, as well as accessing only parts of the image.


Time contertion tool, v.1.0, 30.05.2012
Local Time to Universal Time
Sideral Time to Univesral Time
DST
LT --> UT
ST --> UT
Input file name:
data\ ROZ050 maindata_lt.txt
Output file name:
data\ROZ050maindata_ut.txt
Catalog file name:
data\ Cat5.7a .txt
Observatory:
ROZ050,Rozhen ,Rozhen ,Bulgaria
Time zone, longitude
2, 24 45.0
CONVERT
Epoch contertion tool, v.1.0, 30.05.2012
From epoch:
Obseration time
B1975
B1950
B1900
B1875
B1855
Input file name:
data\ UPS100 maindata_ut.txt
Output file name:
data\UPS100maindata_ok.txt
To epoch:
J2000
CONVERT





A new reduction of old observations in the Gaia era
Paris Observatory, June 20-22, 2012

ASTROMETRY.NET

http://nova.astrometry.net/

Signed in as Milcho Tsvetkov (milcho.tsvetkov@gmail.com) | Sign Out

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Images > ROZ200 000001C.jpg

Edit Image

Submitted by Milcho Tsvetkov (291)
on *2012-04-11T20:51:42Z*
as " ROZ200 000001C.jpg" (Submission 12884)
under *Attribution 3.0 Unported*

publicly visible: **yes** | no

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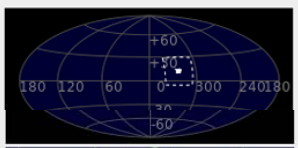

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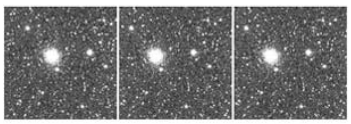

Comments

No comments.

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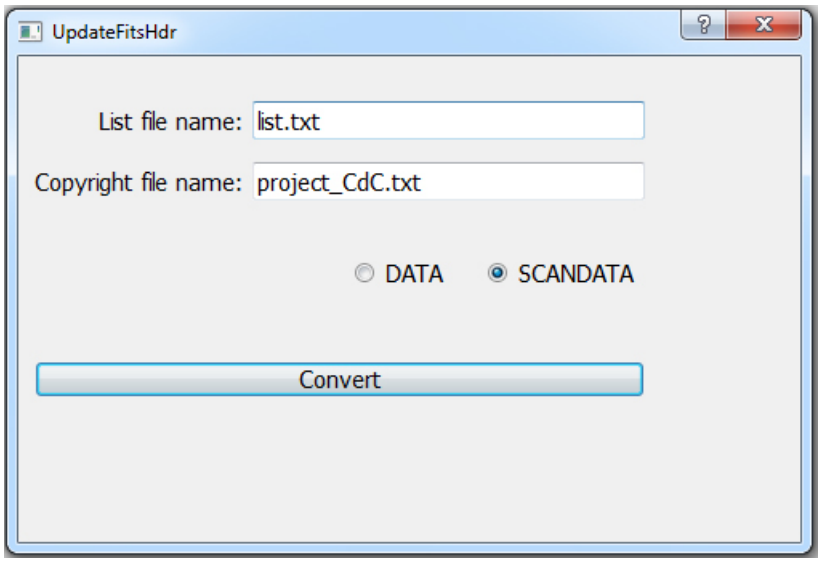

DISCUSSIONS

- International collaboration for digitizing plates
- criteria and parameters for digitization
- possible photometry on digitized plates
- databases for files of digitized plates
- selection of plates for a new reduction

Integration with the Virtual Observatory

Our priority is to integrate the WFPDB system into the VO structure and thus utilize our experience and efforts in astronomical archives processing, data reduction, etc. We intend to implement the major protocols, necessary to turn the WFPDB into a fully featured VO service. The priorities for the moment are **VOtable, SIA** and **ADQL** [4].

DEMO: Pluto query in the WFPDB example, etc.

THANKS FOR THE ATTENTION!

F I N

Wide-Field Plate Database: Structure and Data Access

amyan Kalaglarsky [1], Milcho Tsvetkov [2]

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I. Introduction

The Wide-Field Plate Database (WFPDB) project started in the Institute of Astronomy, Bulgarian Academy of Sciences, about 15 years ago. Its aim is to collect data from wide-field astronomical plates (> 1°) [1]. The project collects catalogue data (extracted from the log books), describing the plates, as well as digitised images, obtained from scanning the plates.

Currently the WFPDB system, which is maintained at the Sofia Sky Archive Data Centre (SSADC) contains catalogue data for > 500 000 plates (Fig. 1), as well as ~1 TB of image data.

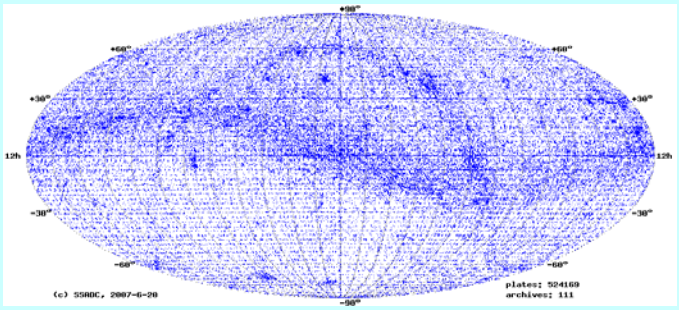

Figure 1. *All-sky distribution of the plate centres in Mollweide projects.*

II. Catalogue Data Access

The WFPDB is accessible via an on-line system, which provides powerful means for searching plates in the database. Searching is possible by all of the original plate attributes, e.g. date of observation, plate No, filter, plate emulsion, etc. It is also possible to search for plates within a specified region on the sky, by supplying a pre-defined radius of the region, or using the field of the instrument, to which the plates belongs (Fig. 2).

Also criteria about the magnitude limit of the desired plates can be specified. It means, that the user can limit his search only to plates, which may contain objects as faint, as the specified magnitude. To determine this, a heuristic formula, based on the work of Klimishin [2] is used:

$\mathbf{m_{lim} = 4^m + 5log(D) + 2.1log(E)}$, where D is the aperture if the instrument, E is the exposure time.

The results of the query page contain data for the plates found, as well as links to the description of the archive, to which each plate belongs, where a graphical representation of the archive distribution can be seen (Fig. 3).

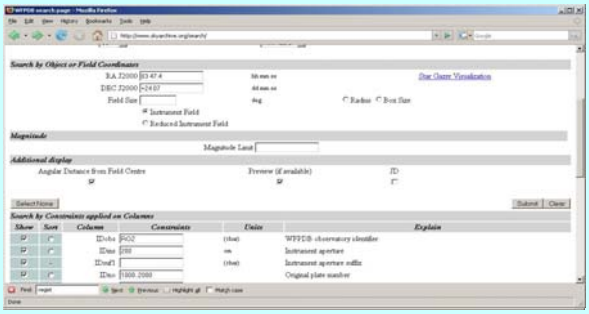

Figure 2. *WFPDB main search page*

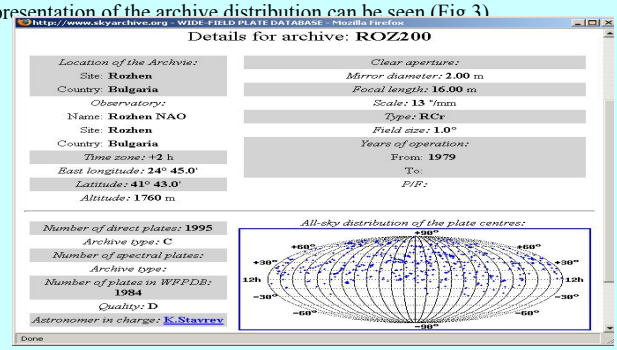

Figure 3. *ROZ200 archive details*

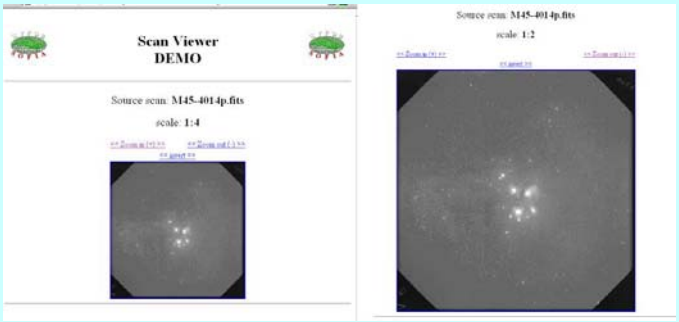

Figure 4. *Presenting an scanned image at different scales*

III. Image Data in WFPDB

Two types of image data are supported in the WFPDB currently.

The full-colour previews tiff and jpg are either low-resolution colour scans, or simply digital camera photos. They are useful for the user to get an idea of the plate quality, note and remarks made on the plate, without downloading a huge amount of scanned data. They are currently available through the WFPDB search engine.

The plate row scans are intended to be high-resolution digitization of the plates. Plates are digitised mainly with flatbed commercial scanners in fits/tiff format.

At present about 200 000 plates are digitised and their online access is under discussion. The system for accessing them is still under development. The basic idea is to build an engine, based on Multiresolution Analysis (MRA) techniques [3], which can effectively present the image scan at different resolutions, as well as accessing only parts of the image (Fig. 4).

IV. Integration with the Virtual Observatory

Our priority is to integrate the WFPDB system into the VO structure and thus utilize our experience and efforts in astronomical archives processing, data reduction, etc. We intend to implement the major protocols, necessary to turn the WFPDB into a fully featured VO service. The priorities for the moment are **VOtable, SIA** and **ADQL** [4].

References:

1. Tsvetkov, M., 2006, "Wide-Field Plate Database: a Decade of Development", Virtual Observatory: Plate Content Digitization, Archive Mining and Image Sequence Processing, iAstro workshop, Sofia, Bulgaria, 2005, ISBN-10 954-580-190-5, p. 10-41.
2. Klimishin, I.A 1980, "Astronomia nashih dnei", Nauka, Moscow, p.456.
3. Starck, J.L., Murtagh, F., Astronomical Image and Data Analysis, Springer, 2002. 2nd Edition, 2006.
4. http://www.ivoa.org

June, 25-29, 2007, Madrid,
e-mail: damyan@skyarchive.org,
e-mail: milcho@skyarchive.org

BAMBERG PLATE ARCHIVES: Digitization and On-Line Access

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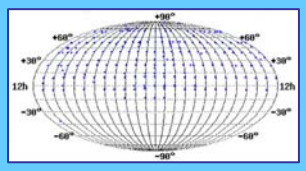
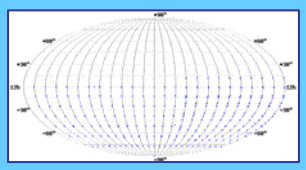
[1)] Institute of Astronomy, Bulgarian Academy of Sciences, 72 Tsar. Shosse Blvd. Sofia 1784
[2)] Space Research Institute, Bulgarian Academy of Sciences, 6 Moskovska Str. Sofia 1000
[3)] Dr. Remeis-Sternwarte Bamberg, Astronomical Institute of the University of Erlangen-Nuernberg, Germany

I. Introduction

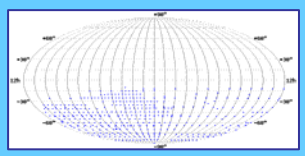
The Bamberg Northern and Southern Sky Surveys are a part of an observational programme for investigation of variable stars in Dr. Remeis Observatory (see Strohmeier 1977). An initiator and one of the main observers was E. Zinner in 1928. This programme continues up to 1976 when Bamberg observatory southern station in Blumfontain (South Africa) was closed. The project of the Bamberg Southern Sky Survey was chaired by Prof. W. Strohmeier and it was supported by the Deutsche Forschungsgemeinschaft (DFG) and successfully executed in the period 1963-1976. As a result more than 22 000 monitoring plates covering the whole southern sky were received, now well stored in the Bamberg Observatory. The value of the Bamberg Southern Sky Survey (BSSS) rises as a unique one in this period as the Harvard sky patrols in South Africa were stopped that time and other observatories were not still active. The total amount of Bamberg plate collection is about 29000 plates and they were carefully stored in the observatory. Since 1995 a joint programme between Wide-Field Plate Database (WFPDB, http://www.skyarchive.org, Tsvetkov 2006) developed in the Institute of Astronomy, Bulgarian Academy of Sciences and Bamberg observatory was supported by the Alexander von Humboldt Siftung and DFG. According to this programme the total plate inventory of Bamberg plates took a place and since 2003 we have started the plate digitization and incorporation into the WFPDB in Sofia.



Figures 1-2. The BNSS astrograph (right): Ernostar aperture is 13.5 cm, focal length 24 cm, scale 859"/mm, FOV 28^0. BAM014B Plate centers distribution for 5845 plates included in the WFPDB (left).



Figures 3-4. The BSSS astrograph at Boyden Station with 6 Kodak AERO-EKTAR 10 cm objectives (right). The Bamberg Observatory staff astronomer R. Knigge was the main observer. BAM010 plate centers distribution for 18588 plates included in the WFPDB (left).



Figs 5-6. The BSSS Harvard Metcalf 25 cm telescope at Boyden Station (right).Plate centers distribution for HAR025B 2138 Metcalf plates included in the WFPDB (left)

II. Bamberg Northern Sky Survey

The Bamberg Northern Sky Survey (BNSS) was part of the observational programme of the Dr. Remeis-Observatory in Bamberg, started in 1928 by E. Zinner. The aim was to study variable stars in the Northern hemisphere in collaboration with the observatories in Babelsberg and Sonneberg covering the sky divided in 30^0 zones with identical Ernostar telescopes (Fig. 1) and 16x16 cm photographic plates with 30 min exposures. Sky zones at declinations -4º, 10º, 24º, 40º, 53º, 70º and 90º were covered by more than 6500 Bamberg plates obtained in the period 1928 - 1939 (Zinner 1939). The Ernostar archive (with WFPDB identifier BAM014B) comprises the information about 5845 plates, stored in the observatory (the distribution of the plate centers is shown in Fig. 2, the time distribution is present in Fig. 7). More than 10% of the originally obtained plates are missing. 60% of the available plates have limiting magnitudes between 12.5 - 13.5. The maximum limiting magnitude for the best plates is 14.5.

170 new variable stars with maximum brightness up to 12 mag were discovered (Strohmeier 1958) using solely the Ernostar plates up to 1958. Combinig the Ernostar plates with others obtained at other Bamberg telescopes the number of new Bamberg variables (BV) went up to 410 (including the suspected variables) according to Strohmeier (1962). The results are published mainly in Astronomische Nachrichten, Kleine Veroeffentlichungen der Remeis-Sternwarte Bamberg and Veroeffentlichungen der Remeis-Sternwarte Bamberg.

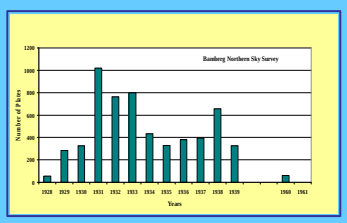


Figure 7. Time distribution of 5845 BNSS plates in the period 1928 – 1939 and 1960 – 1961.

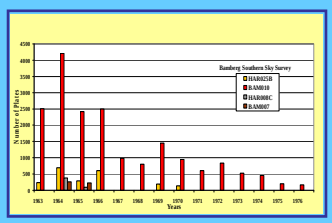


Figure 8. Time distribution of 21671 BSSS plates in the period 1963 – 1976.

Bamberg telescopes	Number of plates fully scanned	Amount of scanned data (GB)	Number of plates partly scanned	Amount of scanned data (GB)
BAM010	494	98.80	499	6.5
BAM014B	66	13.20	107	1.4
HAR025B	39	7.80		
HAR008C	2	0.40		
BAM09A	3	0.30	3	0.04
BAM09B	34	2.9	34	0.40
BAM035	10	0.7	10	0.10
DOGMAR	78	6.70	78	1.01
TESSAR1	1	0.01	1	0.01
TESSAR2	11	0.10	11	0.10
XENON	17	1.4	17	0.20
Totally	755	132.1	760	9.76

Table1. Present status of the Bamberg plate digitization.

Figure 9. The Bamberg A3 Epson Expression 1640XL scanner.

Figure 10. An example of WFPDB search result for BAM010B002158 plate from BSSS with the plate preview.

III. Bamberg Southern Sky Survey

For the period 1963 – 1976 the Bamberg astronomers executed a project of monitoring the southern sky with several 10 cm Aero-Ektar Kodak multiple astrograph placed at the Boyden Station (South Africa), later on Mount John University Observatory - Lake Tekapo (New Zealand) and San Miguel Observatory (Argentina) were involved too. More than 22 000 monitoring plates of the Bamberg Southern Sky Survey (BSSS) were received, now in good condition and well stored in the Bamberg Observatory. 23 archives were made with the following instruments: 20 Kodak cameras with diameter 10 cm (Fig. 3 and Fig. 4 with the distribution of the plate centers), 7 cm Zeiss camera, and the Harvard telescopes: 10" Metcalf and 3" Ross B (Fig. 5 and Fig. 6 with the distribution of the plate centers). The WFPDB identifiers are BAM010A, ..B, ..C, ...T for the 10 cm astrograph, BAM007 for the 7 cm Zeiss camera, HAR025B for the Harvard 10" Metcalf and HAR008C for 3" Ross B Harvard telescope. The plate size is usually 16x16 cm^2 (20x25cm^2 for HAR025B) covering respectively of 13 sq. deg each. Emulsions used for the survey were Perutz (1963-1964) and AGFA- Astro (in the rest of the period of the monitoring). In 1973-1976 some Kodak emulsions were used mainly for the observations in New Zealand. Among the BSSS plates there are 300 plates in the LMC region. Exact number of the plates index information included in the WFPDB is 18588 for BAM010 astrograph, 2138 for HAR025B, 464 for HAR008C and 481 for BAM007 Zeiss camera (the time distribution is shown in Fig. 8). There are 568 more HAR025B plates not yet described.

IV. Bamberg Image Data in the WFPDB and link to GAVO

An opportunity for on site plate digitization with Epson Expression 1640XL flatbed scanner (Fig. 9) is offered in the observatory since May 2003. Digital CCD preview images of the plates by observational zones are included into the WFPDB providing access to them. Two types of image data are supported in the WFPDB currently. The full-colour previews **tiff** and **jpg** are either low-resolution scans, or simply digital camera photos (Fig. 10). They are useful for the user to get an idea of the plate quality, note and remarks made on the plate, without downloading a huge amount of scanned data. They are currently available through the WFPDB search engine (www.skyarchive.org/search). The Bamberg plate row scans are with high-resolution (16 μ/pix) in **FITS** format. At present 1155 Bamberg plates are digitised (755 fully and 400 partly scanned, from the 755 fully scanned plates 360 are scanned partly too). Their online access is under discussion (Table 1). The system for accessing them is still under development. The basic idea is to build an engine, based on Multiresolution Analysis (MRA) techniques (Stark and Murtagh 2002), which can effectively present the image scan at different resolutions, as well as accessing only parts of the image (as in Fig. 8).

Our priority is to integrate the WFPDB into the VO structure and thus utilize our experience and efforts in astronomical archive processing, data reduction, etc. We intend to implement the major protocols, necessary to turn the WFPDB into a fully featured VO service. The priorities for the moment are VOtable, SIA and ADQL (http://www.g-vo.org/portal/).

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Strohmeier W. 1977, Veroeff. der Remeis-Sternwarte Bamberg, V. XII, No. 129.
Strohmeier W. 1958, Kleine Veroeffentlichungen der Remeis-Sternwarte Bamberg, No. 23.
Strohmeier W. 1962, Kleine Veroeffentlichungen der Remeis-Sternwarte Bamberg, No. 34.
Tsvetkov, M., 2006, Virtual Observatory: Plate Content Digitization, Archive Mining and Image Sequence Processing, ISBN-10 954-580-190-5, p. 10.
Zinner, E. 1939, Veroeff. Remeis-Sternwarte zu Bamberg ; Bd. 4, : J.M. Reindl, 96 p.

Acknowledgements: **This work is supported by Alexander von Humboldt Stiftung and the project 436 BUL 113 between BAS/DFG. K.T. and M.T acknowledge travel grant from the Euro VO Data Centre Alliance, and the support of the Armenian LOC of JENAM 2007.**

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JENAM 2007, EAS S8: Science with Virtual Observatories, 20-25 August 2007, Yerevan, Armenia

Potsdam Carte du Ciel Plates: Present Inventory and Future Potential

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[2] Astrophysikalisches Institut Potsdam, Germany

[3] International Earth Rotation and Reference Systems Service, Central Bureau

I. Introduction

The Potsdam Astrophysical Observatory (AOP) had been involved in the Carte du Ciel (CdC) project - the first photographic all-sky survey with maps (CdC charts) to 15 mag and measured positions for stars to 12 mag (AC catalogue) - since the establishment of the project in 1887. The zone between +31 to +40 degrees was assigned to the AOP. The observations were carried out with a double Repsold refractor having 2 Steinheil objectives - a 32 cm photographic one and a 24 cm visual one.

The information stored in the CdC plates and having good potential to see the astronomical objects of interest back in time, was the reason for the undertaken digitization of these plate collections (in Bordeaux, Toulouse, Cordoba, Uccle, Sydney observatories). Having in view the present and future use of the CdC plates we present here the inventory of Potsdam CdC plates (see Figs. 1-2) stored in the Astrophysical Institute Potsdam (AIP). The lack of funds and man power forced the Potsdam observatory to stop the CdC observing programme in 1924. In 1932 at the Fourth IAU GA an official decision was taken to complete the Potsdam zone - the part concerning the CdC sky atlas - by the Uccle Observatory.

Figure 1. Storage of the Potsdam CdC plates.

Figure 2. Potsdam CdC plates from the first epoch.

II. The Potsdam CdC Zone

The Potsdam CdC zone covered the sky region between +31 to +40 degrees divided of some fields overlapping each other in order to assure good sky coverage - the corner of one plate to be in the center of the next one, it means that about 1226 plates to be obtained were foreseen. The observing programme (known in Potsdam observatory as Potsdamer Himmelskarte), as well as the plate measurements were chaired by J. Scheiner. Exactly 1232 plates were obtained and 402 plates were fully measured - the results were published in 7 volumes (Publicationen des Astrophysikalischen Observatorium zu Potsdam, Photographische Himmelskarte, Catalog, Band I, Potsdam 1899; Band II, 1901; Band III, 1903; Band VI, 1907; Band V, 1910; Band VI, 1912; Band VII, 1915). Among the first observers were J. Scheiner, A. Schwassmann, G. Eberhard, E. Hertzsprung, H. Ludendorff, K. Schwarzschild. After the death of J. Scheiner the work had been continued mostly by W. Muench and O. Birck.

III. The Potsdam CdC plate inventory

The total number of all CdC plates obtained in Potsdam is estimated to be about 2160 (from the first and second epoch). Now only 45% of these plates are stored in the AIP, namely - 963 plates (their distribution with years is shown in Fig. 3). The other plates were lost mainly during the World War II.

The first epoch plates had been obtained during the period June 1893 - August 1902. As a rule these plates have a single exposure of one field with short exposure duration. Only 32 first epoch plates are now available. On some of these plates the emulsions are already detached from the glass or have begun to detach, or yellow spots with different sizes appear.

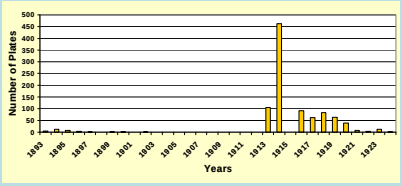


Figure 3. Distribution of the number of available Potsdam CdC plates with years.

The second epoch plates obtained between August 1913 and February 1924 can be separated into two time intervals according to the main observer and the observing method, i.e. different number of fields and exposures per plate (see Fig. 4). The first time interval is from August 1913 till July 1914 with observer W. Muench and plates (now available 568 plates) each with 1 or 2 exposures of one field with different exposure duration less than 10 min (Fig. 5). After July 1914 W. Muench interrupted his work because he went to the front. The second time interval is from February 1916 - February 1924 with main observer O. Birck and plates with 2 exposures of every field with different exposure duration, sometimes on the plate from 1 to 5 fields had been exposed on one day or even 2 different days (Fig. 6). The reason was lack of plates in the post WW I years. Now 363 from these plates are available. Fig. 4 shows the plate distribution versus number of exposures with years.

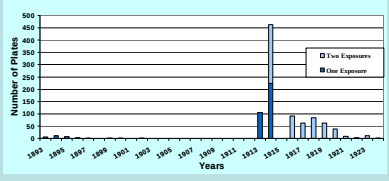
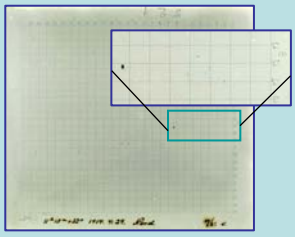


Figure 4. Distribution of the number of available Potsdam CdC plates versus number of exposures with years.

The Potsdam CdC archive is included in the Catalogue of the Wide-Field Plate Archives (CWFPAs) of the Wide-Field Plate Database (WFPDB, http://www.skyarchive.org) and can be found with the WFPDB instrument identifier POT032. The computer-readable catalogue is ready, on the way is its reduction to the needed format of the WFPDB.



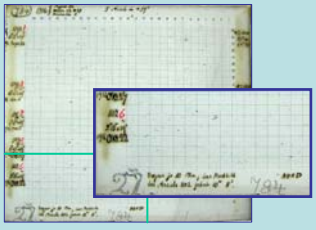


Figure 5. Digitized image of POT032 plate No. 76e (R.A.=11h15m, D.=+32, 1900) taken on April 29, 1914 with two exposures by W. Muench.

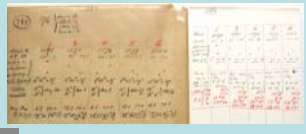


Figure 6. Digitized image of POT032 plate No. 784 with first exposure on August 26, 1916. Four more exposures of four more fields had been done on October 22, October 27 and November 1, 1916 by O. Birck. A part of the plate envelope with more information on the observations is shown below.

Figure 7. The AIP EPSON 10000XL flatbed scanner complex.

IV. The CdC plate potential and future plans

The CdC plates continue to be used for proper motion determinations of stars in CdC zones (with standard errors of about 100 to 120 mas on the positions according to Rapaport et al. 2006, and the positional precision at the mean epoch ranges from 50 to 70 mas according to Ducourant et al. 2006), as well as in stellar clusters (with astrometric accuracy ranges from 100 to 200 mas, Geffert et al. 1996) or for discoveries of quick brightness changes (time scales up to 20 min and amplitudes larger than 0.5 mag in stars with brightness in the photographic range 10 – 14 mag, Fresneau et al. 2001).

According to the project working programme we started in 2006 the EPSON 10000XL flatbed scanner installation (Fig. 7), test scans, scanning of selected CdC plates (for visual examination with 600 dpi resolution and for photometric processing - with 2400 dpi resolution = 10μ/pix), and the Potsdam CdC plate inventory. Up to the end of 2007 we intend a completion of the Potsdam CdC plate inventory, replacement of the old damaged plate envelopes with new ones, inclusion of the POT032 catalogue and the plate previews to the WFPDB, i.e. on-line access to the information, and continuation of the CdC plate scanning. In 2008 the completion of the plate scanning, the installation of the Potsdam CdC plate scans on the GAVO Potsdam server, as well as mirror of the WFPDB at the AIP are foreseen.

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Rapaport M., Ducourant C., Le Campion J. F., Fresneau A., Argyle R. W., Soubiran C., Teixeira R., Camargo J. I. B., Colin J., Daigne G., Périé J. P., Réquième Y. 2006, AAp, 449, 435

Geffert M., Bonnefond P., Maintz G., Guibert J. 1996, AAp Suppl. 118, 277.

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Digital Plate Archive for Supernovae Search in the Konkoly Observatory

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I. Introduction

The wide-field photographic observations in Konkoly Observatory were performed with the 60/90/180cm Schmidt telescope (scale: 115"/mm, circular field size: 5^0) in Piszkéstetõ, Mátra Mountain Station in the period 1962 - 1997. The archive of the telescope contains more than 13 000 observations (direct or done with 2^0 or 5^0 objective prisms) described in the Konkoly plate catalogue. The catalogue is incorporated in the Wide-Field Plate Database (WFPDB) installed in the Sofia Sky Archive Data Center with a possible on-line search at http://www.skyarchive.org/search/. One of the main observing programmes was Supernova Search programme, with which Konkoly Observatory at the end of 1963 took part in the international campaign initiated by F. Zwicky (Detre 1974). Two successive plates were taken for every controlled field with exposure duration 15min. 50 supernova stars (Table 1) were discovered on Konkoly plates according to The Asiago Supernova Catalogue - 10 years after (Barbon et al., 1999), Sternberg Supernova Catalogue (Tsvetkov et al., 2004), Harvard List of Supernovae (http://www.cfa.harvard.edu/iau/lists/Supernovae.html).

Having in view the tasks of the IAU project for Virtual Repository (VAMP, Virtual Astronomy Multimedia Project), as well as the idea, that for the statistics of the supernova frequency important are also the SN observations where no supernovae were discovered, we undertook creation of Konkoly Supernovae Search Digital Plate Archive. For plate data archiving Konkoly Observatory has at disposal flatbed scanner UMAX Power Look 3000. With resolution 1600dpi (16μm) one Konkoly plate (16x16cm) can be scanned with total volume of the digitized information about 173Mb.

Table 1. Konkoly Supernova Data

SN	Host Galaxy	Date	R.A. (2000)	D. (2000)	Discoverer
1955L	Anon.	1955 03 23	11 04.9	+30 02	Lovas
1964E	UGC 6983	1964 03 12	11 59.2	+52 42	Lovas
1965O	Anon.	1965 01 08	12 02.6	+49 55	Lovas
1966G	NGC 521	1966 08 16	01 24.6	+03 44	Reaves, Lovas
1967C	NGC 3389	1967 02 28	10 48.4	+12 32	Chuadze, Lovas
1968A	NGC 3275	1968 01 25	10 52.8	+41 31	Lovas
1968aa	NGC 4975	1968 04 23	13 08.0	-05 01	Mnatsakanian
1968I	NGC 4981	1968 04 23	13 08.7	-06 47	Lovas
1968J	Anon.	1968 05 16	14 05.9	+53 08	Jankovitch
1968S	Anon.	1968 09 28	21 44.8	+03 05	Jankovitch
1969B	NGC 3556	1969 02 06	11 11.4	+55 40	Wild, Balazs
1969C	NGC 3811	1969 02 09	11 41.3	+47 41	Roslino, Jankovitch
1970G	NGC 5457	1970 07 30	14 03.3	+54 21	Lovas
1970M	Anon.	1970 11 26	10 48.3	+14 03	Lovas
1972F	Anon.	1972 05 18	12 02.1	+53 44	Lovas
1972I		1972 03	13 20.3	+31 31	Lovas
1974D	NGC 3916	1974 03 20	11 50.8	+55 08	Lovas
1974E	NGC 4038	1974 03 21	12 01.9	-18 52	Lovas
1975B	Anon.	1975 04 01	03 19.7	+41 38	Lovas
1975G	Anon.	1975 06 11	14 01.3	+54 26	Lovas
1975R	Anon.	1975 12 07	01 39.9	+32 18	Lovas
1976A	NGC 5004	1976 02 28	13 11.1	+29 34	Lovas
1976B	NGC 4402	1976 03 28	12 25.1	+13 06	Lovas
1976C	IC 1231	1976 06 01	16 46.9	+58 27	Paparo
1976G	NGC 488	1976 10 21	01 21.8	+05 16	Lovas, Wild
1976H	IC 1801	1976 10 24	02 28.2	+19 34	Lovas
1976I	Anon.	1976 10 24	01 00.7	-07 05	Lovas
1976M	Anon.	1976 07	16 44.9	+58 19	Lovas
1976N	Anon.	1976 10	07 32.0	+65 13	Lovas
1977B	NGC 5406	1977 03 18	14 00.3	+38 55	Lovas
1977E	Anon.	1977 12 18	07 58.9	+85 42	Lovas
1978F	Anon.	1978 11 02	07 52.9	+73 19	Lovas
1980A	UGC 7195	1980 02 22	12 20.4	+31 10	Lovas
1980B	Anon.	1980 02 22	11 19.8	+54 28	Lovas
1980C	Anon.	1980 02 22	13 45.4	+47 45	Lovas
1980E	Anon.	1980 04 18	13 19.7	+34 14	Lovas
1981G	NGC 4874	1981 06 02	12 59.6	+27 58	Lovas
1982C	NGC 4185	1982 03 22	12 13.3	+28 30	Lovas
1982G	NGC 521	1982 08 19	01 24.6	+01 44	Lovas
1982W	NGC 5485	1982 12 14	14 02.1	+55 00	Lovas
1982X	UGC 4778	1982 02	09 07.1	+50 43	Lovas
1982Y	UGC 5449	1982 02	10 02.9	+68 21	Lovas
1984M	IC 121	1984 08 29	01 28.4	+02 31	Lovas
1985J	Anon.				Lovas
1985O	UGC 511	1985 09 09	00 50.1	+31 44	Lovas
1986A	NGC 3367	1986 02 04	10 46.7	+13 45	Evans et al., Lovas
1987M	NGC 2715	1987 09 21	09 08.1	+78 05	Lovas
1988U	MCG09-23-9	1988 08 18	13 48.2	+54 48	Lovas
1989X	Anon.	1989 11 30	07 28.3	+63 54	Lovas
1995am	Anon.	1995 10 22	00 47.8	+29 58	Lovas

II. WFPDB KON060 Catalogue

The WFPDB instrument identifier of the Konkoly 60/90/180 cm Schmidt telescope is KON060; 12000 direct and 800 spectral plates were obtained in the period 1962 – 1997 with size 16x16cm and limiting magnitude 19m (B); filters used are standard Johnson photographic UBV(RI): UG1,2, GG13, GG14, RG1, RG5, with combination of the KODAK emulsions: 103aO, IIaO, OaO (U, B, J, pg, O); IIIaJ, 103aD,IIaD, OaD (V); 103aF,103aE,098, IIIaF (R); IN, IVN (I); exposures mainly up to 30min were used; astronomer in charge for the archive is L. G. Balazs (balazs@konkoly.hu).

Some results of the catalogue analysis based on data retrieval from the WFPDB and concerning the SN observations are shown in Figs. 1 – 5.

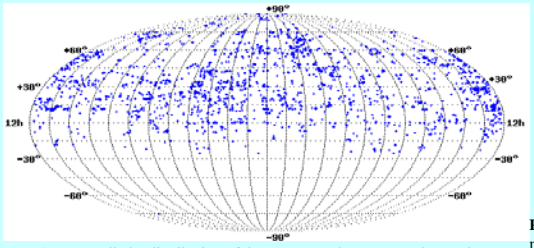

Figure 1. All-sky distribution of the KON060 plate centres observations

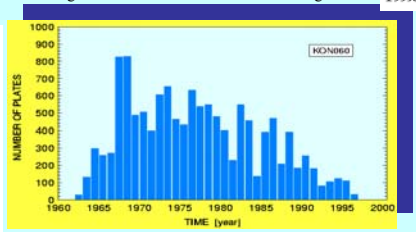

Figure 2. Time distribution of the number of plates: There is a maximum of observational activity for the period 1967-1968 when 6 SN were discovered in Konkoly.

Figure 3. Distribution of the selected fields according to the name of the constellation. Ursa Majoris, Leo and Virgo are the most observed regions on the sky.

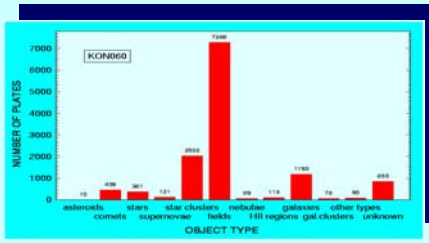

Figure 4. Number of plates versus object type: Because very often the observers did not give the name of the individual object of interest (for about 60%) the SN plates are spread among those with assigned object type code Supernova (121 plates), Field (7288 plates, see for more details Fig. 3), Galaxy (1193 plates).

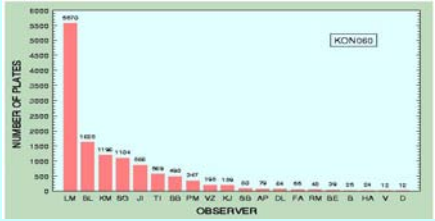

Figure 5. Distribution of the number of plates versus name of the observer. The most productive observer with more than 5500 plates is Miklos Lovas (SN discoverer), the next observer Lajos G. Balazs (mote than 1600 plates) in addition to his main observational topic discovered also one SN, the other SN discoverers as Istvan Jankovitch and Margit Paparo obtained more than 860 and 340 plates respectively.

III. Konkoly Supernova Digital Plate Archive

The selected SN plates were scanned with the UMAX PowerLook 3000 FB scanner with resolution 100 dpi for quick plate visualization (with data volume 6MB), with 1600dpi (20μm) allowing maximal area for photometric tasks (in average 173MB) and with maximal resolution 3048dpi (8μm) only the region around the SN (30MB).

In Fig. 6 a part of KON060 004585 plate with discovery of SN 1972 F and the same region from POSS-I Blue are shown.

The final database (in preparation now) contains the following information: plate meta-data, plate quick-look scan, plate large resolution scan (full plate or partial), SN data and discovery information, publication bibliographic data (bibcode), other plates on the same field, POSS image link.

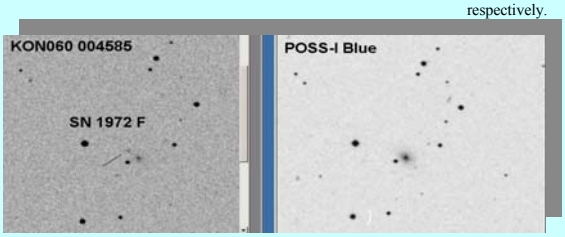

Figure 6. Part of KON060 004585 plate with discovery of SN 1972F and the same region from POSS-I Blue.

References:

Detre 1974, in Supernovae and Supernova Remnants, Ed. C.B.Cosmovici, D.Reidel Publishing Company, p. 51.

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Tsvetkov D.Yu., Pavlyuk N.N., Bartunov O.S., 2004, The Sternberg Astronomical Institute Catalog of Supernovae and radial distributions of Supernovae of various types in Galaxies, Pis'ma Astron. Zh., 30, 803.

Harvard List of Supernovae, http://www.cfa.harvard.edu/iau/lists/Supernovae.html.

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Uccle Carte du Ciel Plate Catalogue

Present in the WFPDB

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I. Introduction

The Carte du Ciel project is the very first photographic all-sky survey, started in 1887 and accomplished with the efforts of 20 observatories: Greenwich, Vatican, Catania, Helsingfors, Nizamiah, Uccle, Oxford, Potsdam, Paris, Bordeaux, Toulouse, Algiers, San Fernando, Tacubaya, Cordoba, Perth, Cape of Good Hope, Sydney, Melbourne and Edinburgh (for measurements of the Perth plates only). The aim was to map the entire sky up to the 14th photographic magnitude (later on the limiting magnitude turned out to be 15), to produce an atlas, known as the Carte du Ciel (CdC), and to catalogue all the stars up to the 11th magnitude (later on extended to the 12th magnitude), known as the Astrographic Catalogue (AC).

The involvement of the Royal Observatory of Belgium (ROB) in Uccle in the CdC project (the part concerning the CdC sky atlas) started in 1907 (zone $+32^0$ – $+39^0$), the official decision to complete the Potsdam zone was taken at the Fourth IAU GA in 1932 (*Chinnici 1999, La Carte du Ciel, Palermo, p. 475*). A photographic equatorial telescope of type Henry-Gautier (Diameter = 33 cm, Focal Length = 3.43 m, Field = 2^0 x 2^0, Scale = 60”/mm) was chosen. According to the plan some 1232 plates had to be collected. The Uccle CdC plates were taken using triple exposures with a duration of 15 to 30 minutes (*Smedts 1910, Annal. l’Obs. Royal de Belgique, Nouv. Sér., 12, 1*). For the measurements of the stellar positions, a grid of lines called *réseau* with a step size of 5 arcmin was printed on the plate before its development.

Figure 1. Uccle Carte du Ciel Equatorial Gautier Astrograph.

II. Preparation of the Computer-Readable Catalogue and Plate Preview Images

We present and analyse the contents of the Uccle CdC catalogue as retrieved from the WFPDB.

The preparation of the computer-readable catalogue started in March 2002. The plate information was retrieved from the plate itself as well as from the stored paper chart because no logbook could be found. The Uccle CdC plate collection comprises 682 plates of good to very good quality. The plate previews were made with the flatbed scanner AGFA (model DUOSCAN HiD) with a resolu 250 dpi and in TIFF format (of size 2.5 MB).

III. Incorporation in the WFPDB

The ROB CdC catalogue is the first CdC catalogue with a complete inventory accessible through the WFPDB. In the Wide-Field Plate Database - Sofia Search Page (http://www.skyarchive.org), the information on every plate from the catalogue can be retrieved using the WFPDB observatory identifier (ROB) followed by the instrument aperture (033), plus the original plate number.

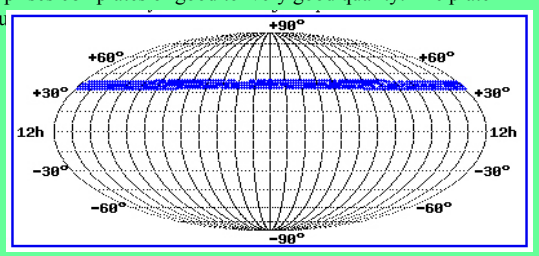

Figure 2. All-sky distribution of the WFPDB ROB033 plate centers. The sky coverage is better for the declination zones $+33^0$ and $+35^0$ whereas the coverage for the zones $+37^0$ and $+39^0$ is poorer (decreasing number of plates). Also, there is a gap in the all-sky distribution at R.A.= 16^h-17^h (with 10% less plates than the mean value) and a very dense coverage around R.A.= 20^h - 22^h (with 37% more plates than the mean value).

IV. Analysis of the WFPDB ROB033 Catalogue

The presented analysis of the catalogue’s contents aims to illustrate and to facilitate a possible repeated use of these 682 plates (Figs. 2 – 8).

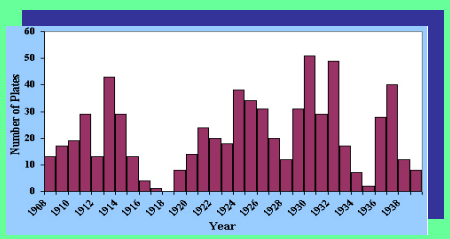

Figure 3. Time distribution of the ROB033 CdC plates. As for all other wide-field plate archives, the gap in the distribution caused by WWI (1914 - 1919) is well visible.

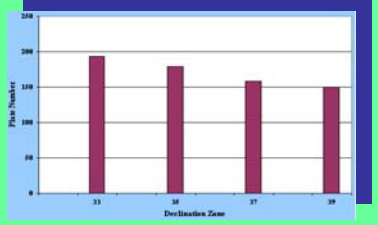

Figure 4. Distribution of the plate number versus the declination zone. There is better sky coverage for the declination zones $+33^0$ and $+35^0$.

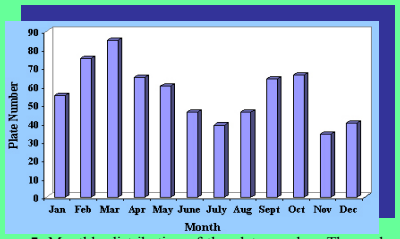

Figure 5. Monthly distribution of the plate number. The peaks are due to the duplicated plates taken for improving the plate quality.

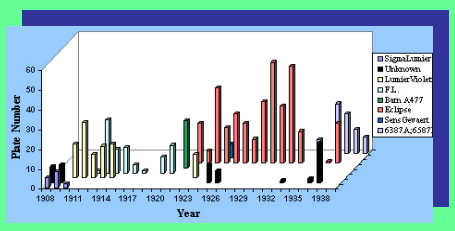

Figure 6. Time distribution of the plates by the used emulsion. The most used emulsion in the period from 1922 until the end of 1939 is the one called ***Eclipse*** (46% of all plates).

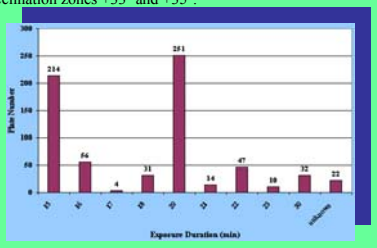

Figure 7. Time distribution of the plates according to exposure duration. In the beginning, an exposure duration of 30 min was used, but later on the observers turned to shorter exposures. The most used exposure durations were 20 min (37%) and 15 min (31%), while all other exposure durations (in range of 16min up to 30 min) represent 32%.

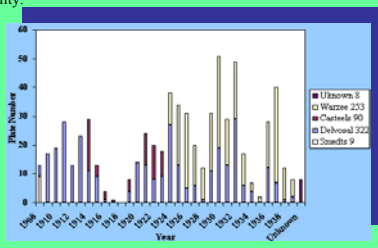

Figure 8. Time distribution of the plates according to observer’s name. J. Delvosal took more than 47% of all the plates. He worked from the beginning onward until the end of the Uccle CdC project. J. Warzee who joined in 1924 took about 37% of all the plates until the end in 1939.

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Wide-Field Plate Database: Included Ukrainian Plate Catalogues

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I. Introduction

The last version of the Catalogue of Wide-Field Plate Archives (CWFPAs, June 2007) contains 43 archives stored in the observatories located in Ukraine - Crimean Astrophysical Observatory (Nauchny and Simeiz), Kyiv University Observatory, L'viv University Observatory, Main Astronomical Observatory of the National Academy of Sciences of Ukraine (Golosiiv), Nikolaev Observatory and Odessa University Observatory. Except the archives made with their own telescopes some of the observatories store plate archives made in other observatories, e.g. in Nikolaev Observatory - a plate archive made in Pulkovo Observatory (Russia); in Main Astronomical Observatory - archives from Byurakan (Armenia), Quito Observatory (Ecuador), Quito Comet Station (Ecuador), Tashkent Observatory - Kitab Station (Uzbekistan).

About 151 000 plates were obtained in the period 1898 - 2004 in the frames of the observing programmes: Small Solar System Bodies Observations, Investigations of the Emission Nebulae and Connected Stars, Spectral Classification of the Stars and Determination of the Stellar Absorption in the Direction of the Emission Nebulae, Photographic Survey of the Northern Sky (Fotografichny Ohlyad Neba, FON), Investigation of the Kinematics and the Structure in the Main Meridian Section of the Galaxy (MEGA), Selection of Reference Stars, Artificial Satellites Observations.

II. Wide-Field Plate Database: Ukrainian Wide-Field Plate Archives

The information about 43 Ukrainian wide-field plate archives and used telescopes is given in Table 1 as an excerpt from the CWFPAs (June 2007).

The number of stored plates in the Ukrainian observatories is shown in Fig. 1.

The information about the telescope aperture and number of plates of the Ukrainian plate archives as well as about the time coverage of every archive is given in Figs. 2 - 4.

Table 1. Ukrainian Plate Archives and Telescopes Used

WFPDB Identifier	Archive Location	Observatory	Telescope Type	Aperture (m)	F.L. (m)	Scale ("/mm)	Field (deg)	Years of operation	Plate (direct	Number spectral)
CRI017A	Crimea	Crimean Obs.-Simeiz	Cam	0.17	0.75	276	13	1948-1965	516	54
CRI017B	Crimea	Crimean Obs.-Nauchny	Cam	0.17	0.75	276	13	1951-1953	49	
CRI040A	Crimea	Crimean Obs.-Simeiz	Ast	0.4	1.6	129	10	1947-1948	59	159
CRI040B	Crimea	Crimean Obs.-Nauchny	Ast	2x0.4	1.6	129	10	1951-1965	211	296
CRI040C	Crimea	Crimean Obs.-Nauchny	Ast	2x0.4	1.6	129	10	1963-1998	9781	
BYU053	Kyiv	Byurakan,Armenia	Sch	0.53/0.53	1.83	113	5	1985-1985	28	
GUA010A	Kyiv	Main Astron. Obs.,Kyiv	Ast	0.1	0.5	412	20	1957-1961	438	
GUA010B	Kyiv	Main Astron. Obs.,Kyiv	Ast	0.1	0.5	412	20	1957-1961	277	
GUA011A	Kyiv	Main Astron. Obs.,Kyiv	Ast	0.11	1.2	172	8	1955-1957	35	
GUA011B	Kyiv	Main Astron. Obs.,Kyiv	Ast	0.11	1.2	172	8	1955-1957	55	
GUA012A	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.12	0.7	295	20	1949-1990	2041	
GUA012B	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.12	0.7	295	20	1949-1978	2143	7
GUA015	Kyiv	Main Astron. Obs.,Kyiv	Ast	0.15	1.7	121	6	1955-1961	162	
GUA040A	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.4	5.5	38	3	1949-1986	9500	
GUA040B	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.4	5.5	38	3	1949-1986	1000	
GUA040C	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.4	2	103	8	1976-1998	4276	
GUA040D	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.4	2	103	8	1976-1997	1834	
GUA040E	Kyiv	Main Astron. Obs.,Kyiv	Ast	2x0.4	2	103	6	1981-2005	3657	
GUA070	Kyiv	Main Astron. Obs.,Kyiv	Rfl	0.7	3.15	66	1	1960-1973	566	
KYI020	Kyiv	Kyiv University Obs.	Ast	0.2	0.43			1898-2004	21515	
QUI021A	Kyiv	Quito Obs.,Ecuador	Cam	0.21	0.74	281	16	1986-1986	100	
QUI021B	Kyiv	Quito Comet Station,Ecuador	Cam	0.21	0.74	281	16	1986-1986	50	
TAS040A	Kyiv	Tashkent Obs.,Kitab,Uzbekistan	Ast	2x0.4	3	69	6	1981-1989	96	
TAS040B	Kyiv	Tashkent Obs.,Kitab,Uzbekistan	Ast	2x0.4	3	69	6	1981-1989	5	
LA0010A	L'viv	L'viv University Obs.	Ast	0.10	0.50	37	19	1939-1976	8339	
CRI01Z	Mykolayiv	Crimean Obs.-Simeiz	Ast	2x0.12	0.25	352	35	1909-		
MYK012	Mykolayiv	Nikolaev Obs.	Ast	0.12	2.04	101	5	1961-1999	8500	
PUL012	Mykolayiv	Pulkovo Obs.,Russia	Ast	0.12	2.04	101	5	1929-1931		
CRI01Z	Odessa	Crimean Obs.-Simeiz	Ast	2x0.12	0.25	352	35	1909-1953	10000	
ODE006A	Odessa	Odessa	Ast	0.06	0.12		30	1945-1957	2000	
ODE006B	Odessa	Odessa	Ast	0.06	0.12		30	1945-1957	2000	
ODE007	Odessa	Odessa	Ast	0.07	0.3		30	1945-1957	2000	
ODE010A	Odessa	Odessa	Ast	0.1	0.5		22	1945-1957	2000	
ODE010B	Odessa	Odessa	Ast	0.1	0.5		22	1945-1957	2000	
ODE010C	Odessa	Odessa	Cam	0.1	0.25	288	35	1957-1990	7100	
ODE010D	Odessa	Odessa	Cam	0.1	0.25	288	24	1957-1990	7100	
ODE010E	Odessa	Odessa	Cam	0.1	0.25	288	25	1957-1990	7100	
ODE010F	Odessa	Odessa	Cam	0.1	0.25	288	12	1957-1990	7100	
ODE010G	Odessa	Odessa	Cam	0.1	0.25	288	12	1957-1990	7100	
ODE010H	Odessa	Odessa	Cam	0.1	0.25	288	22	1957-1990	7100	
ODE010I	Odessa	Odessa	Cam	0.1	0.25	288	18	1957-1990	7100	
ODE015	Odessa	Odessa	Ast	0.15	1	204	12	1945-1957	2000	
ODE020	Odessa	Odessa	Sch	0.2/0.4		474	6	1969-1980	2000	

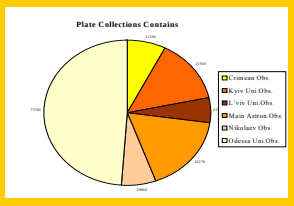

Figure 1. Number of plates stored in the Ukrainian observatories.

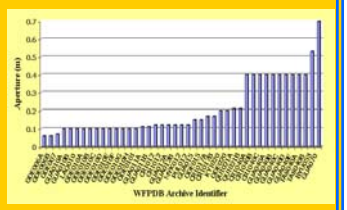

Figure 2. Ukrainian plate archive distribution versus telescope aperture.

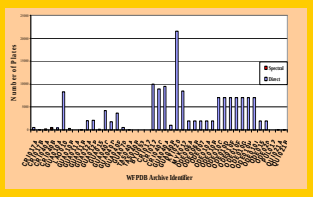

Figure 3. Plate archive distribution versus number of plates.

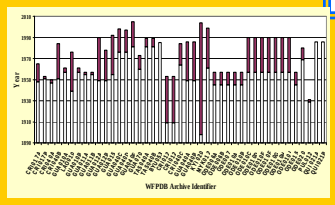

Figure 4. Ukrainian plate archive time period.

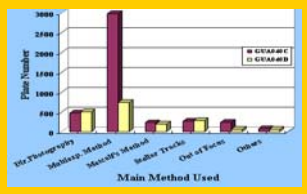

Figure 5. GUA040C and GUA040D plate number versus method used.

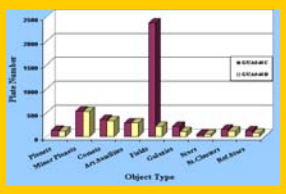

Figure 6. GUA040C and GUA040D plate number versus object type.

Table 2. Ukrainian Wide-Field Plate Catalogues Included in the WFPDB

WFPDB Identifier	Plate Storage	Time Coverage	Number of Plates	Astronomer in Charge
CRI017A	Crimean Obs.-Simeiz	1948-1965	570	N.Bondar'
CRI017B	Crimean Obs.-Nauchny	1951-1953	49	N.Bondar'
CRI040A	Crimean Obs.-Simeiz	1947-1948	218	N.Bondar'
CRI040B	Crimean Obs.-Nauchny	1951-1965	511	N.Bondar'
GUA010A	Main Astron. Obs.	1957-1961	438	V.Golovnya
GUA010B	Main Astron. Obs.	1957-1961	277	V.Golovnya
GUA011A	Main Astron. Obs.	1955-1957	35	V.Golovnya
GUA011B	Main Astron. Obs.	1955-1957	55	V.Golovnya
GUA012A	Main Astron. Obs.	1949-1990	2041	L.Kizyun
GUA012B	Main Astron. Obs.	1949-1978	2150	L.Kizyun
GUA015	Main Astron. Obs.	1955-1961	162	V.Golovnya
GUA040C	Main Astron. Obs.	1976-1998	4276	V.Golovnya
GUA040D	Main Astron. Obs.	1976-1997	1834	E.Yizhakevych
Total: 13 catalogues		1948-1998	12609	

III. How the information for the included Ukrainian plate catalogues and their contents can be found in the WFPDB

In the WFPDB – Sofia Search Page the descriptive information for the archive, as well as for the plate can be found using the WFPDB archive/instrument identifier. This identifier is composed by the name of the observatory (for the Crimean Observatory – CRI, for the Main Astronomical Observatory – GUA), respective instrument aperture, instrument aperture suffix (in the case with existing instruments with the same aperture) plus the original plate number.

At http://www.skyarchive.org you can find more details for the location of the archives, for the observatory, for the parameters of the telescope, and the period of its operation, the coordinates of the plate center in epoch 2000.0, the date and beginning of the observation in UT, object name and type, method of observation, number of exposures and their duration, type of emulsion, filter and spectral band, the size of the plate, the quality of the plate, some notes with specific contains, the name of the observer, the place of plate storage (availability) and the status of plate digitization, as well as the name of astronomer in charge.

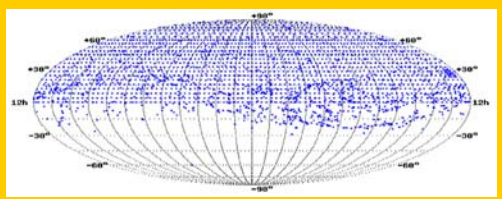

Figure 7. All-sky distribution of the GUA040C plate centers.

At the moment the plate digitization is just started with MICROTEK ScanMaker 9800 XL with Transparent Media Adapter-1600 with resolution 1200 dpi.

Up to June 2007 the basic information for 13 plate catalogues of the Main Astronomical Observatory (Golosiiv, Kyiv) and Crimean Astrophysical Observatory (Nauchny and Simeiz) are included into the Catalogue of Wide-Field Plate Indexes with 12609 plates (Table 2).

On the basis of data retrieval from the WFPDB illustrations of the potential of two catalogues (with WFPDB identifiers GUA040C and GUA040D) for future plate re-usage are present in Figs. 5 - 7. The plates were obtained with the Double Wide-angle Astrograph (DWA, D=0.40m; F.L.=2m; Scale=103.16 arcsec/mm) of the Main Astronomical Observatory of the National Academy of Sciences of Ukraine in Golosiiv, Kyiv. For the both tubes the number of plates is respectively 4276 and 1834. These plates were the basis for determination of positions, proper motions and photometric data for more than 2,000,000 stars from the FON Astrographic Catalogue (FONAC), as well as for determination of the absolute proper motions for more than 14,000 stars.

Acknowledgements: This work is supported by the bilateral cooperation between the Bulgarian Academy of Sciences and the National Academy of Sciences of Ukraine.

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ODESSA ASTRONOMICAL PLATE COLLECTION

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I. Introduction

The Astronomical Institute with the observatory of the Odessa National University is one of the oldest in Ukraine, established in 1871 with observational stations in Russia, Turkmenistan and Armenia. National property of Odessa observatory is the large collection of photographic plates from the Northern sky surveys obtained as result of executed Small Planets and Variable Stars monitoring programs during 20th century. The Odessa plate collection with about 104000 plates is the second largest European collection after the Sonneberg plate collection. About 300 astronomers took part in the observations. Here we present two of the largest plate archives from the Odessa plate collection: the 7-camera astrograph archive and the oldest plate archive of the Simeiz observatory, stored in Odessa observatory. These plate archives cover period of observations 1909 - 1999 and can be very useful for brightness behavior investigations of great number of sky objects.

The first plate inventory in the Odessa observatory was made by Pikhun and Yushchenko (2002). They made a computer-readable catalogue of the 7-camera astrograph plates with online access at http://www.konkoly.hu/cgi-bin/IBVS?5215 . The catalogue contains number of the observations, date, Julian date, name of the guiding star, duration of the exposure in minutes, average moment of the exposure, name of the observer. There are other files containing list of guiding stars and their coordinates in epoch 1950.0, number of observations of a certain region, as well as list of observers and number of their observations.

The Odessa plate archives are included in the Catalogue of Wide-Field Plate Archives (CWFPAs, version 5.0, Tsvetkova and Tsvetkov, 2006), which is a part of the IAU Commission 9 Wide-Field Plate Database being developed at the Institute of Astronomy, Bulgarian Academy of [illegible] tkov, 2006).

Figure1. The 7-camera astrograph in Mayaki station, Odessa observatory.

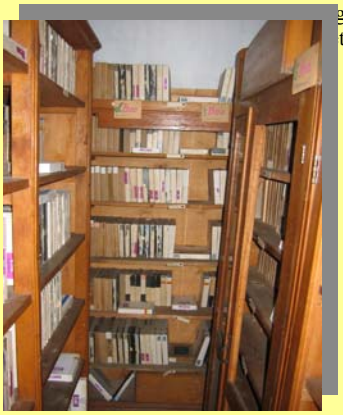


Figure 2. Part of the plate stacks in Mayaki station of the Odessa observatory

II. Contents of the Simeiz observatory oldest plate archive stored in Odessa

In 1966 the oldest Simeiz plates obtained according to the programme for small planets observations in the period 1909-1953 was given to Odessa observatory to be stored (Fig. 3). This archive contains about 6900 plates with about 10 types different emulsions. The distribution of the number of plates versus years is shown in Fig. 4. On-line access to the plate data will be provided through WFPDB soon.

Figure 3. Storage of the oldest Simeiz observatory plates in Odessa observatory

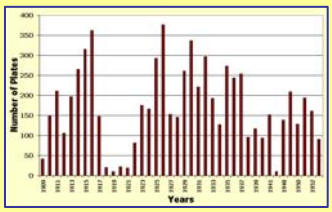


Figure 4. Time distribution of the number of the oldest Simeiz plates.

III. Contents of the 7-camera astrograph archives

For a period of operation 1957-1998 about 85000 plates (with sizes 18x24cm and 13x18cm, see Fig. 5-6) with limit 15mag (pg) were obtained with the 7-camera astrograph. The distribution of the number of plates versus years is shown in Fig. 7. The sky coverage is present in Figs. 8-9. All plates can be divided into three series: old (1957-1959), new (1959-1966) and the III-plate series (1966-1998). The plates are with Agfa Astro and ORWO emulsions: ZU-1, ZU-2, ZU-21 and ZP-1, ZP-3. Investigations of the realized photometric systems can be found in Rudenko (1988). The main observing programme was patrol observations of variable stars. Also observations of comets, asteroids, quasars, artificial satellites, optical analog of Gamma ray bursters were observed. On the basis of these observations about hundred papers were published. Soon the plate catalogues will be searchable through WFPDB.

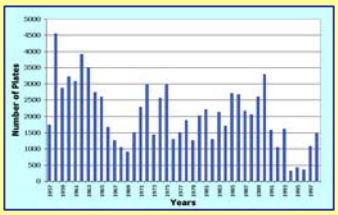


Figure 7. Time distribution of the number of the 7-camera astrograph plates.

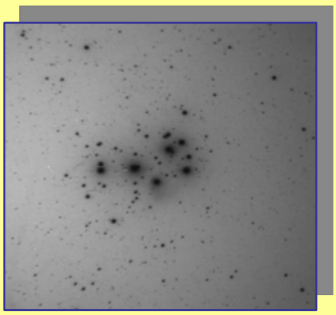


Figure 5. Part of the 7-camera astrograph plate containing the Pleiades stellar cluster.

Figure 6. The 7-camera astrograph plate samples.

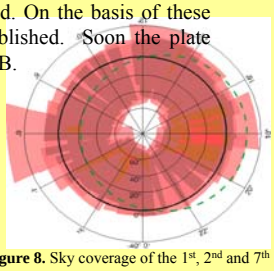


Figure 8. Sky coverage of the 1st, 2nd and 7th cameras of the 7-cameras astrograph used for III-plate series.

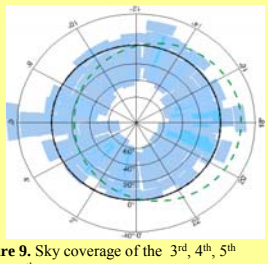


Figure 9. Sky coverage of the 3rd, 4th, 5th and 6th cameras of the 7-cameras astrograph used for III-plate series.

References:

Pikhun A.I., Yushchenko A.V. 2002, IBVS, No 5215 (http://www.konkoly.hu/cgi-bin/IBVS?5215)

Rudenko N. 1988, Kinematics and Physics of the Sky Objects, v.4, 34.

Tsvetkov M. 2006, "Wide-Field Plate Database: a Decade of Development", Virtual Observatory: Plate Content Digitization, Archive Mining and Image Sequence Processing, iAstro workshop, Sofia, Bulgaria, 2005, ISBN-10 954-580-190-5, p. 10.

Tsvetkova K. and Tsvetkov M., 2006, ibid. p. 45.

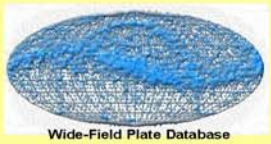
Wide-Field Plate Database – Sofia: http://www.skyarchive.org.

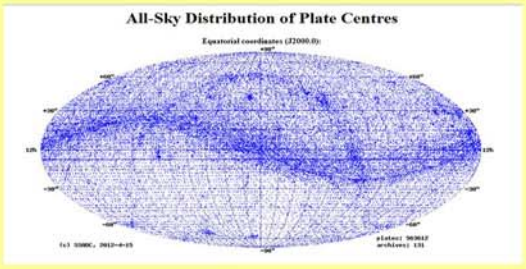
Contact:
Sergei Andrievsky: scan@deneb1.odessa.ua

WIDE-FIELD PLATE DATABASE: DEVELOPMENT RESULTS

Milcho Tsvetkov[1] and Katya Tsvetkova[1,2]

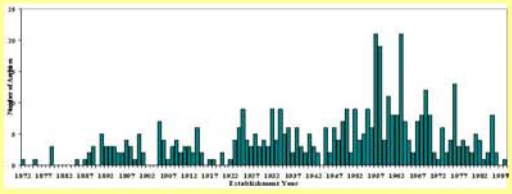
[1] Institute of Astronomy, Bulgarian Academy of Sciences,
[2] Institute of Mathematics and Informatics, Bulgarian Academy of Sciences



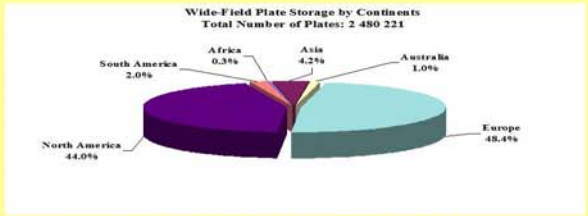


The Wide-Field Plate Database project (WFPDB, http://wfpdb.org) started at the Institute of Astronomy, Bulgarian Academy of Sciences in 1991, has been collecting data from the photographic plate libraries at European astronomical observatories, including plate archives, plate index catalogue data extracted from the log books, and digitized plate images. Developing further the WFPDB project, we propose to accomplish the high-resolution digitization of the plates (in standardized FITS file format), and suitable digitization of the catalogues, logbooks, and relevant scientific research papers (in JPEG and TIFF), with flatbed scanners. At present, about 250,000 plates (25% of all European plates) are digitized awaiting online access implementation. The basic idea is to build an Astro-Multimedia Library, based on the latest Computer Science methods, in particular, on Multiresolution Analysis techniques, which allow for efficient representation of image scans at different resolutions.

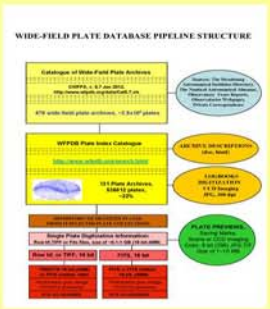
WFPDB.ORG



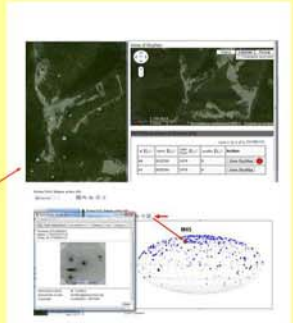
Time distribution of the number of all known plate archives



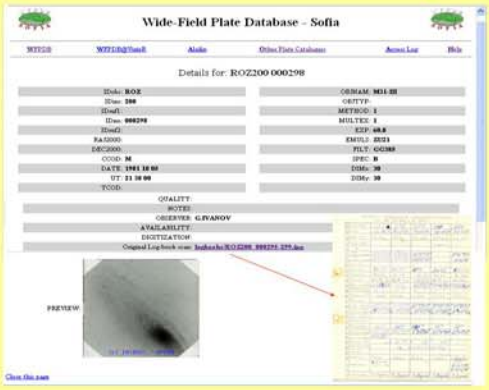
WFPDB plate distribution - CWFPA v 5.7



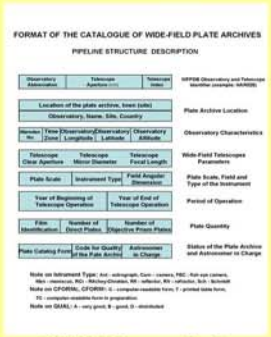
Present Structure of WFPDB



WFPDB: Astroweb application



An example for a selected plate search (ROZ200 00298) in WFPDB - with plate preview and logbook data

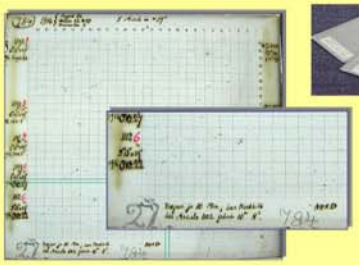


WFPDB Formats: Catalogue of Wide-field Plate Archives and Main Data File – PIPELINE STRUCTURE

Catalogues and Plate Processing Pipeline

Flatbed scanner EPSON V750 of the Konkoly Observatory

Plate scan of the Rozhen Observatory taken with the 2m RCC telescope (ROZ200 00601) digitized with Professional EPSON 10000XL flatbed scanner using the VUESCAN driver and 13 step grey wedge TG13 from DANES-PICTA.COM



Preserved logbooks and observers notes from the archives and plate envelopes

Plates as detectors of astronomical observations and information storage (Potsdam Observatory Carte du Ciel plate)

References:

Tsvetkov M., 2012, (WIDE-FIELD PLATE DATABASE: DEVELOPMENT AND ACCESS VIA INTERNET IN THE PERIOD JANUARY 2009 - JUNE 2010) Proceedings of the VII Bulgarian-Serbian Astronomical Conference (VII BSAC) Chepelare, Bulgaria, June 1-4, 2010, Editors: M. K. Tsvetkov, M. S. Dimitrijevic, K. Tsvetkova, O. Kounchev, Z. Mijajlovic Publ. Astron. Soc. "Rudjer Boskovic" No 11, 2012, 25-40 http://www.fpdb.org/ftp/7_BSAC/pdfs/02.pdf

Tsvetkov, M, 2009, (MAKING ASTRONOMICAL PHOTOGRAPHIC DATA AVAILABLE: THE EUROPEAN PERSPECTIVE), "Preserving Astronomy's Photographic Legacy: Current State and the Future of North American Astronomical Plates", ASP Conference Series, Vol. 410, Edited by Wayne Osborn and Lee Robbins. San Francisco: Astronomical Society of the Pacific, pp.15-29 ISBN: 978-1-58381-700-1, e-Book ISBN: 978-1-58381-701-8 http://wfpdb.org/ftp/AstroInformatics_2011/ASPC_2009/410-0015-MTS.pdf

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Workshop: A Plan for Preserving Astronomy's Archival Records, April 18-19, 2012, College Park, Washington DC, USA

EUROPEAN NETWORK: PRESERVATION AND ONLINE ACCESS TO ASTRONOMY'S ARCHIVAL RECORDS

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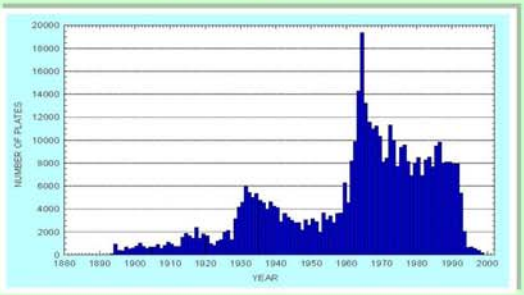
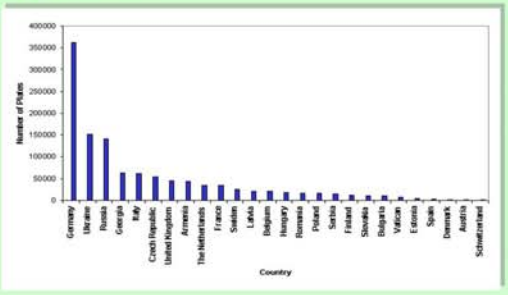
Here we present the idea of a European network aiming to coordinate the processing and link to European portals of digitized archived astronomical photographic observations. At present these observations are clarified as data-at-risk on the basis of ageing of photographic emulsions that have been used for130 years when photography was the used method of recording the astronomical observations. At present in Europe and the USA the interest of using the historical astronomical observations increased for two purposes – to follow the long term behavior of variable stars and to watch hazardous small bodies in the Solar System crossing the Earth orbit. In the last years our efforts concentrated on establishing contacts with the most important astronomical professional institutes in Europe and observatories possessing practically 50% of the world's astronomical plate collections – about 300 000 digitized astronomical plates. (See: http://www.aip.de./groups/plate_archive/meetings.html). The data volume is about 30 TB and it continues to increase. The online data access to this great amount of data - practically invisible for the social and scientific community – will direct our future astronomical observations and help mining for new relations in stellar activity and evolution.



Number of the wide-field plates versus time of observation

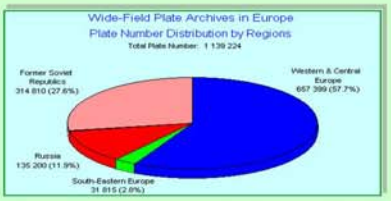


Number of the European photographic plates versus country

The richest plate collections are in:
Germany: Sonneberg, Bamberg, Potsdam, Heidelberg, Hamburg, Bonn, etc.;
Italy: Asiago, Catania, Rome, Bologna;
France: Paris, Toulouse, Bordeaux, etc.;
UK: Edinburgh, Cambridge;
Russia: Pulkovo, Moscow;
Ukraine: Odessa, Kiev, Lviv;
Hungary: Budapest;
Sweden: Stockholm and etc.

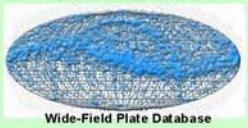
The Sonneberg Photographic Plate Library stacks: More than 220 000 plates are digitized without online access

Participants in the Potsdam (www.aip.de) meeting in 2009 discussing the way to establish a European Network aiming at astronomical plates salvaging and online access



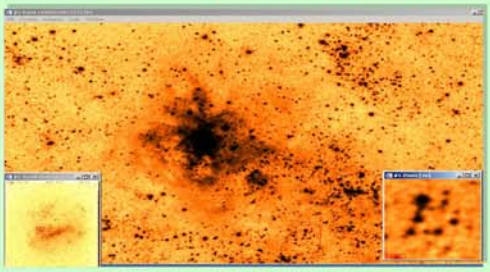
Wide-field plate archives in Europe: Plate numbers versus region

Logo of the Wide-Field Plate Database in Sofia (Bulgaria)
www.wfpdb.org



The Pulkovo Observatory stacks with data (on CD) of about 30 000 digitized plates

Contents of the plate libraries: the plates as detectors of astronomical observations and information storage: preserved logbooks (top-left) and observers notes from the archives and plate envelopes (bottom-left); Potsdam Observatory historical Carte du Ciel plates – (in the middle); Bamberg Observatory – reproduction from the plate taken in the field of the Large Magellanic Cloud region, Tarantula Nebulae – right



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ICT PSP Work Programme and Call for Proposals 2012 Information Day: 29 February 2012, Luxembourg

LINK to the poster: http://wfpdb.org/ftp/Astroinfromatics_2012/LUX_infoDAY/LUXposter-2012.jpg