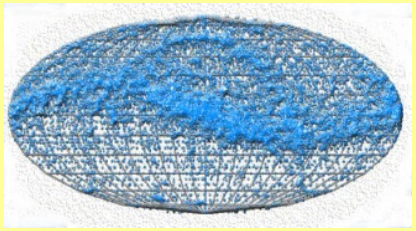

astroPLATE

Wide-Field Plate Database in a context of the development of the Astroinformatics

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AstroPlate 2016, Prague 15 – 18 March 2016

Abstract

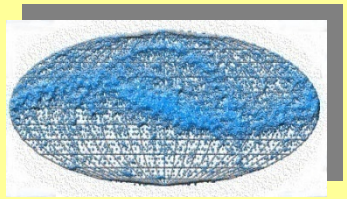
We describe the Wide-Field Plate Database (WFPDB www.wfpdb.org) as a basic source of data for the wide-field astronomical photographic plates obtained with professional telescopes worldwide in a context of the development of the Astroinformatics recourses. The WFPDB consists of four parts: Catalogue 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. A special attention on the plate archiving is paid on some plate collections in Germany, USA (HCO), Ukraine, Romania, Hungary, Armenia, Belgium, Serbia, 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.

We describe also an attempt for creating links between databases (Wide-Field Plate Database, WFPDB) and electronic journals (Information Bulletin on Variable Stars, IBVS). The project aims closer connections between scientific papers and the data they are based upon. The merits of a paper can be evaluated better (both before and after publication) if the data used is accessible, which gives a possibility of its re-use - one of the goals of the Virtual Observatory. Our priority is to integrate the WFPDB system into the VO structures (f.e. GAVO) 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 forthcoming steps of the WFPDB development should be summarized as well as: International collaboration for plate catalogues inventory (only about 25% from all existing plates are visible via WFPDB) - the main aim of the project Humboldt_Astroinfromatics.net; digitizing plates according to the VO standards in FITS format as well development of the equal criteria and parameters for plate digitization and preprocessing and the photometry of digitized plates; free access to the files of digitized photographic plates by the VO instruments.

Wide-Field Plate Database: Home Page

http://www.wfpdb.org



WFPDB SOFIA

WIDE-FIELD PLATE DATABASE

Institute of Astronomy and
Institute of Mathematics and Informatics
Bulgarian Academy of Sciences
Acad. Georgi Bonchev Str., Block 8,
BG-1113 SOFIA, Bulgaria
Telephone: +359 (0)2 9792812
GSM: +359 (0)887249280
E-mail: milcho at skyarchive.org

March 6th, 2016

- About the WFPDB
- Catalogue of WFPA
- Search in the WFPDB
- Digitization
- WFPDB Team
- Publications
- WFPDB Sponsors

News & Updates

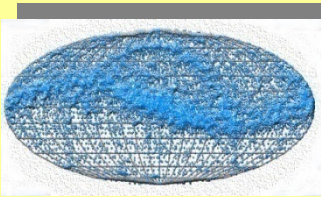
ASTROWEB-WFPDB

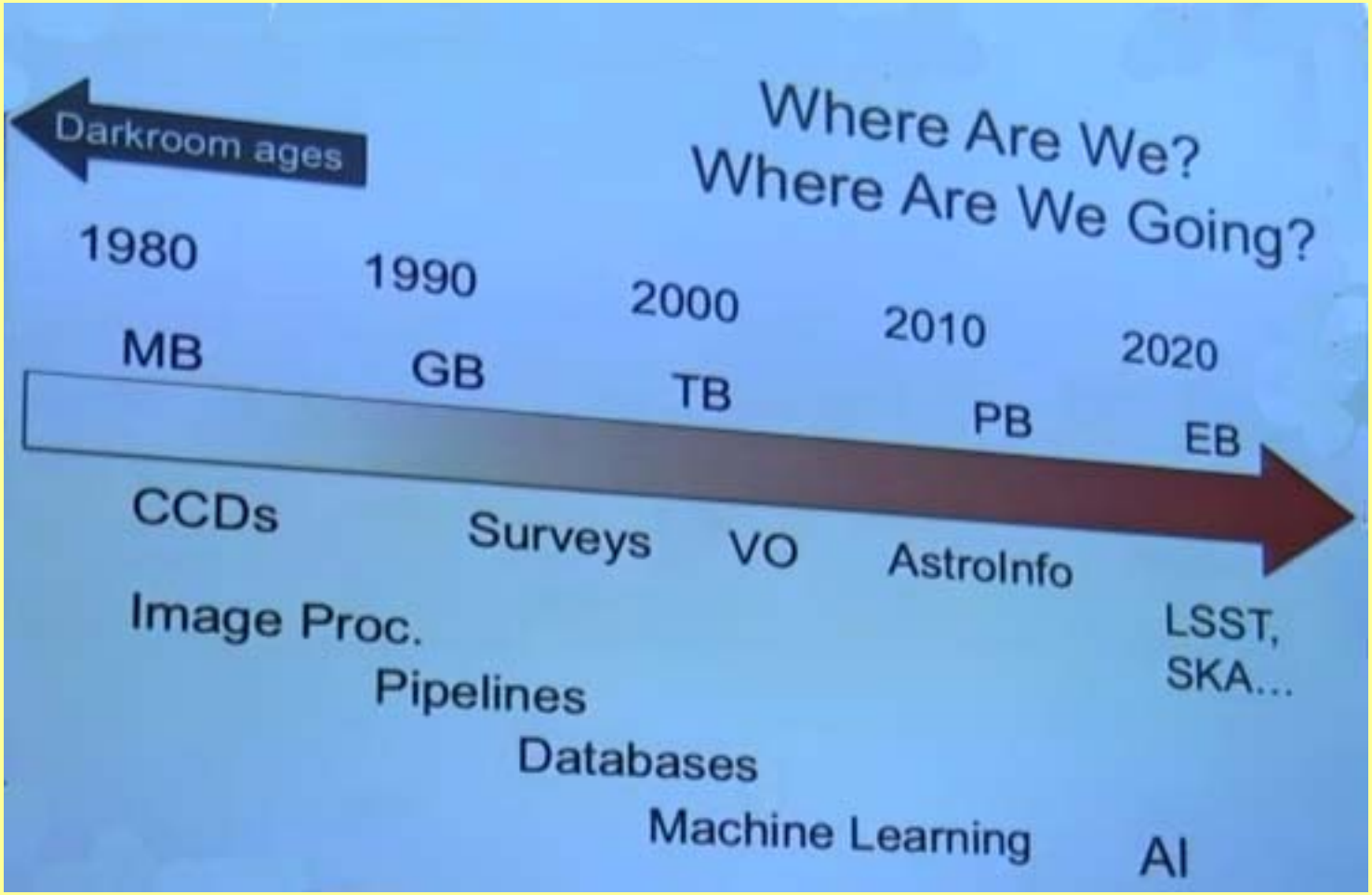
STARGAZER

Web based generator for sky maps drawing.

MORE: DOCUMENTS & LINKS

ASTROINFORMATICS:
The processing of large amount of astronomical data

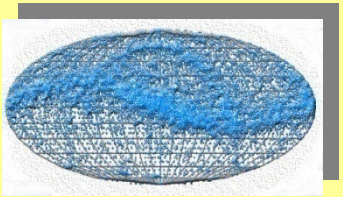




After G. Gjorgovski, Astoinformatics 2015, Dubrovnik, 5-6 October 2015

https://www.youtube.com/watch?v=hFUUGO7lQGo&index=1&list=PLCCgeB_u3DRrnw6SXJPQpTmmIil9N0teJ

Wide-Field Plate Database: VO and Astroinformatics

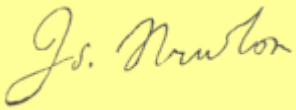


DATABASE (DB): is an organized collection of data

VIRTUAL OBSERVATORY (VO): is a collection of interoperating data archives and software tools which utilize the internet to form a scientific research environment in which astronomical research programs can be conducted.

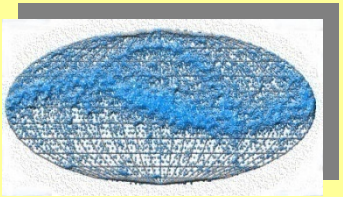
ASTROINFORMATICS (AI): The processing of large amount of astronomical data

If I have seen further it is by standing on the shoulders of giants.



Isaac Newton
Through a letter to Robert Hooke, 5 February 1676

Wide-Field Plate Database Project

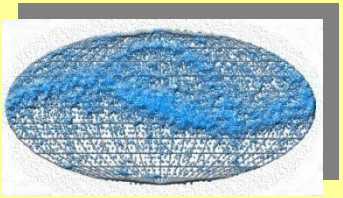


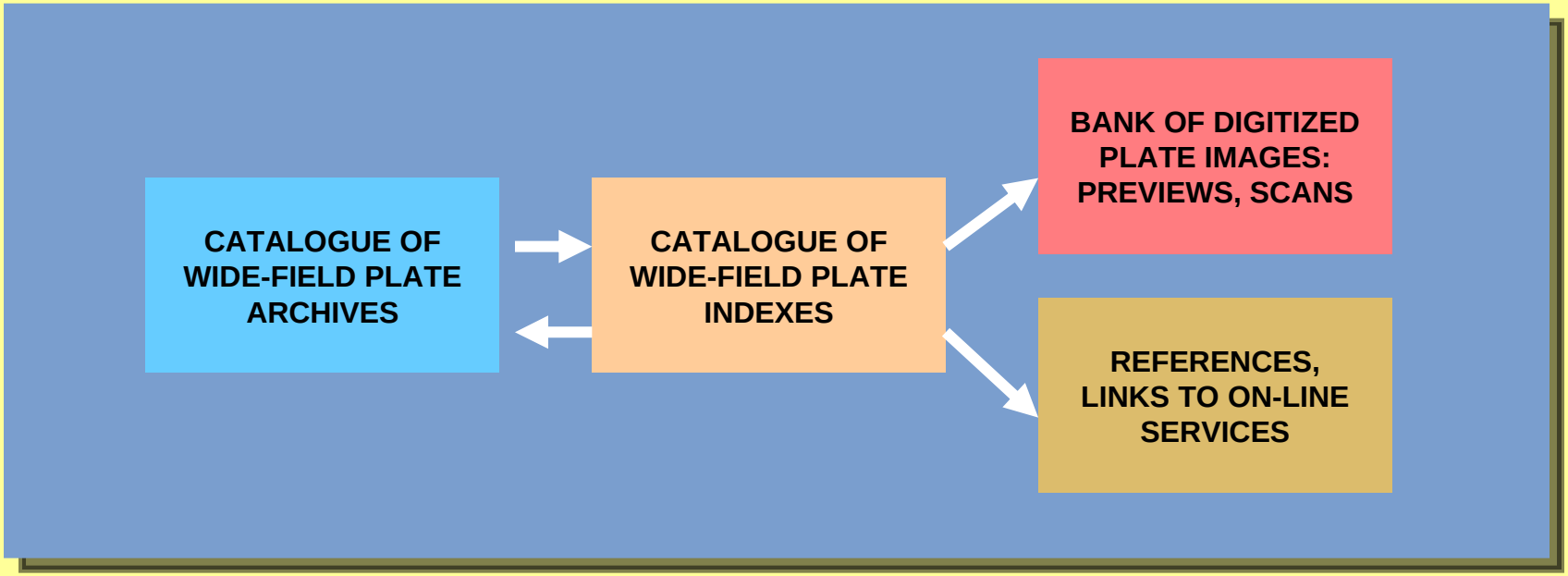
What is the WFPDB?

This is one wide-field unique telescope, giving access to unique photographic astronomical observations, done systematically in the period 1880 ~ 2000!

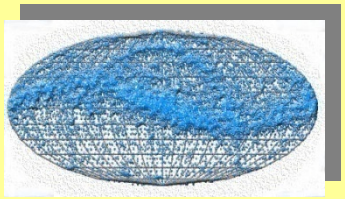
- **Content: wide-field plate archives metadata from all over the world.**
- **Data included:Trying to present the most precise data for the wide-field plate archives and their contents:**
- **There are metadata for ~ 600 000 plates, some plate previews (jpg), plate logs and envelopes.**

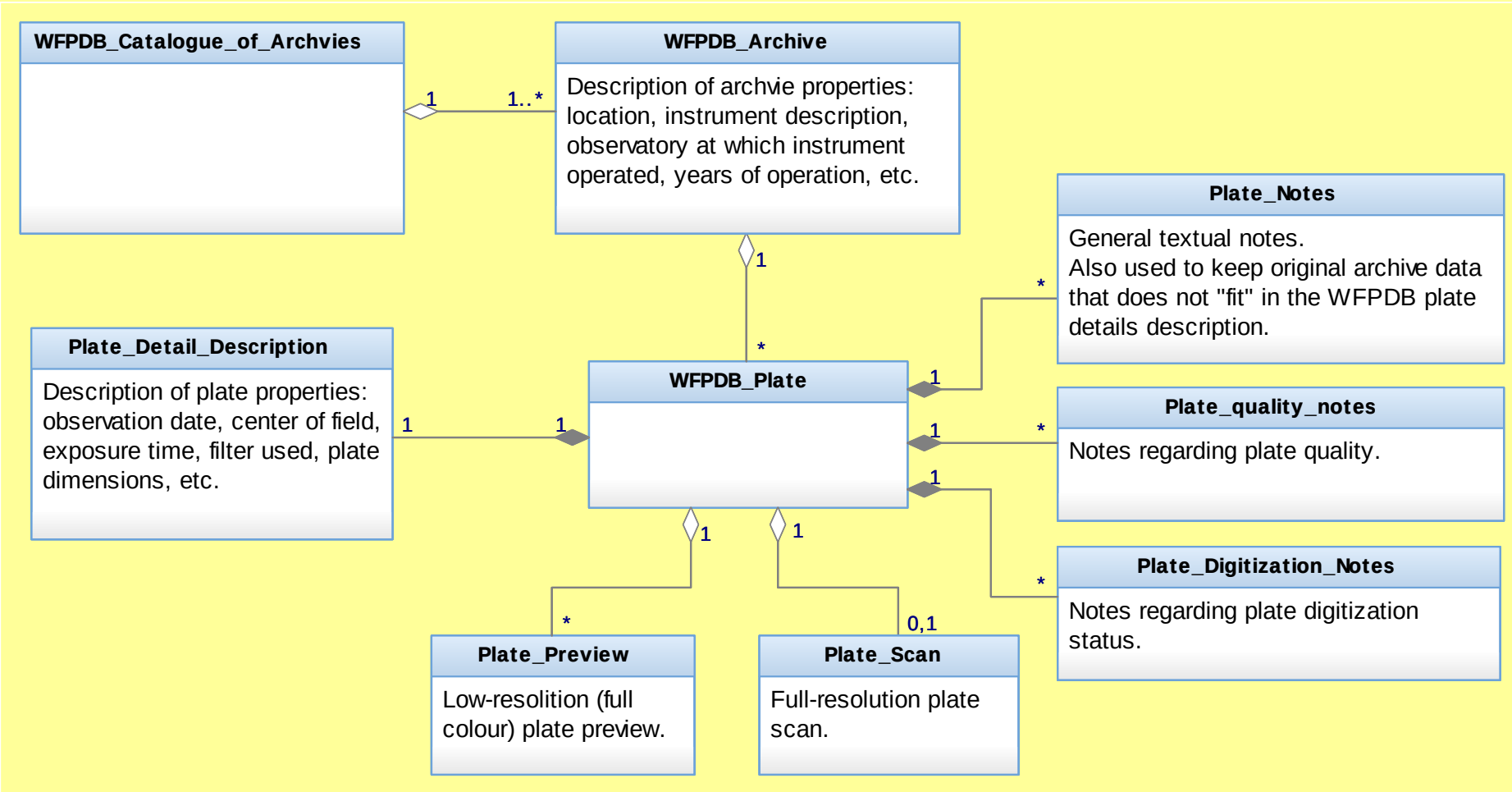
Wide-Field Plate Database: Main Characteristics





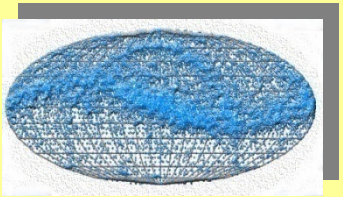
Wide-Field Plate Database: WFPDB meta-model





http://www.math.bas.bg/~nkirov/zip/nkirov_boston_updated.pdf

RETURN TO THE WFPDB HISTORY: WFPDB Plate Identifier Definition (Tsvetkov 1992)



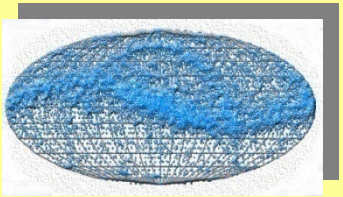
A			B	
XXX	XXX	X	XXXXXX	X
1	2	3	4	5

It occupies a field of 14 bytes and consists of two parts: A instrument identifier and B plate number. The instrument identifier (A) is in its turn a unique identifier for each instrument in file INSTRUMENTS. It consists of 1) a unique identifier of the observatory/institute (3 bytes, usually the first 3 letters of the observatory or site name are used), followed by 2) a number (3 bytes), showing the clear aperture of the instrument in cm and 3) if necessary, a suffix (1 byte, letter A, number from the source plate catalogue, followed by 5) a suffix (1 byte, letter A, B, C, ..., or blank), if necessary, in the case of duplicate plate numbers.

Some examples of plate identifiers are: HAROO4A023968, SON013C001425, ROZ200 001823B.

http://www.skyarchive.org/wgss_newsletter/issue2/wfpa.pdf

WFPDB: Main Data File and Pointers



MAIN DATA FILE

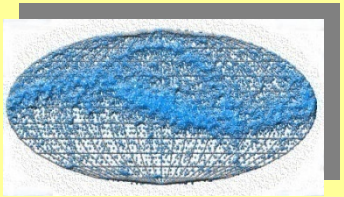
↓

- – plate identifier (including instrument identifier)
- – coordinates of plate centre (R.A., DEC.) for equinox J2000
- – observation date (UT)
- – object or field designation
- – method of observation
- – emulsion
- – filter
- – spectral band
- – plate dimensions X and Y, cm
- – observation time (UT)
- – duration of exposure, min
- – pointers to files QUALITY, NOTES, OBSERVERS, AVAILABILITY and DIGITALIZATION

↓ ↓ ↓ ↓ ↓ ↓

FILE INSTRUMENTS	FILE QUALITY	FILE NOTES	FILE OBSERVERS	FILE AVAILABILITY	FILE DIGITIZATION

Wide-Field Plate Database: Catalogue of Wide-Field Plate Indexes (CWFPIs)



Example: ROB033maindata.txt

ROB033 000008 233256+333308 19081019214619

Positions		Description	Format	Example	
1-6	6	Instr. Identier	[LLLDDD]	ROB033	
7	1	Suffix	[ ] or [L]		
8-13	6	Plate number	[DDDDDD]	000008	8
14	1	Suffix for dupl.	[ ] or [L]		
15-20	6	RA	[hhmmss]	233256	23h32m56s
21-27	6	DEC	[ggmmss]	+333308	+33°33'8"
28	1	Missing data	[ ] or M		
29-36	8	Date	[yyyymmdd]	19081019	19.10.1908
37-42	6	Time	[hhmmss]	214619	21:46:19
43	1	Missing data	[ ] or M		

L denotes a capital letter; D denotes a digit.

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 Designation	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

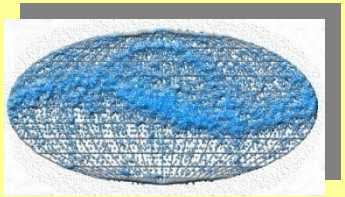
Object type in WFPDB is coded as follows: A1 - planet A2 - moon A3 – sun,
A4 –asteroid, A5 - comet S1 – star, S2 - double star, S3 - variable star, S4 - star cluster,
S5 - HII region, S6 - nebula S7 - planetary nebula, S8 - supernova S9 – fundamental star, SR - reference star around a radio source G1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

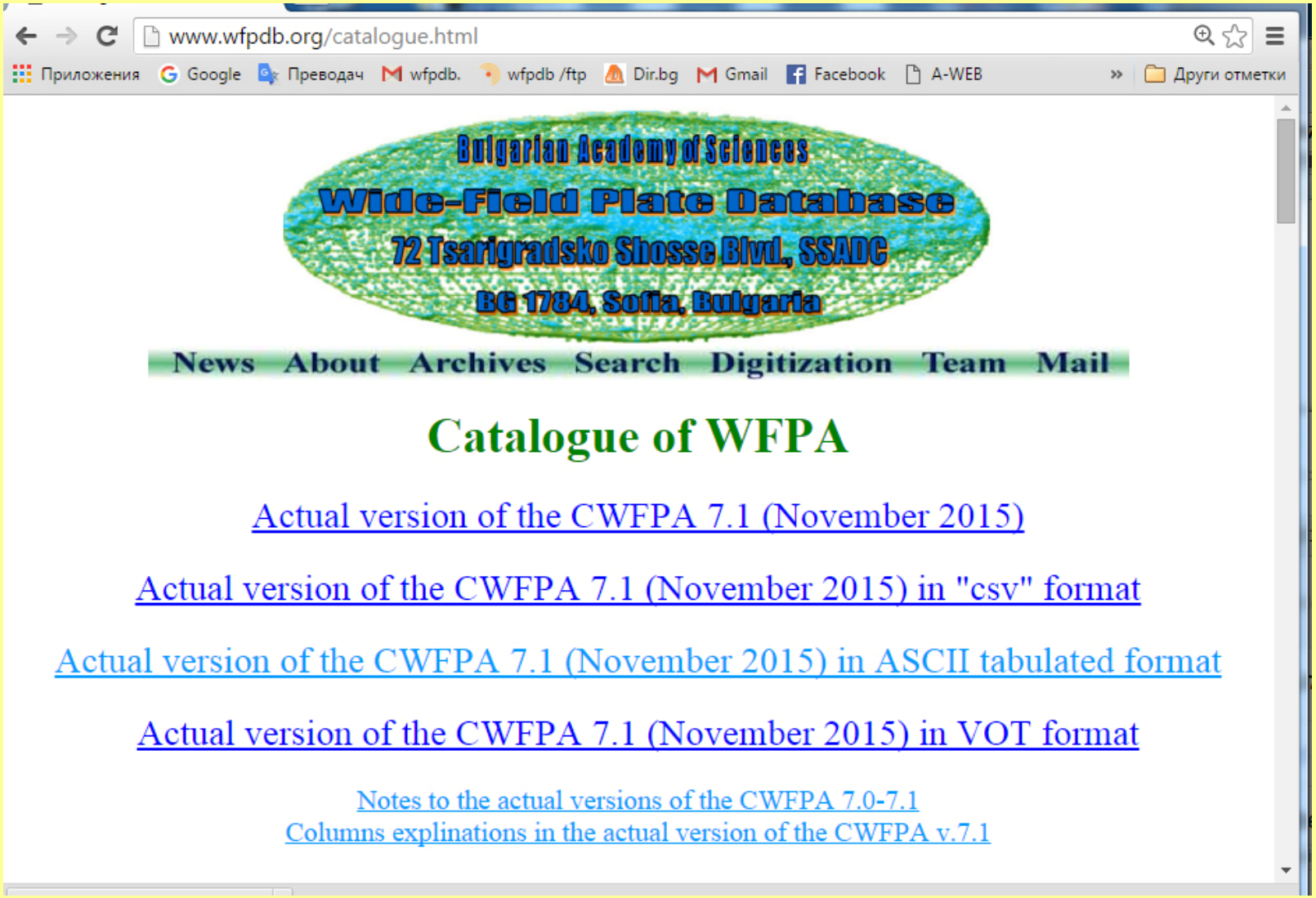
Method of observation in WFPDB is coded as follows: 1 - direct photograph,
2 - direct photograph, multiexposure, 3 - stellar tracks, 4 - objective prism, 5 - objective prism,
6 - Metcalf's method, 7 - proper motions, 8 - no guiding, 9 - out of focus, 10 - test plate,
11 - Hartmann test, 12 - with mask,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

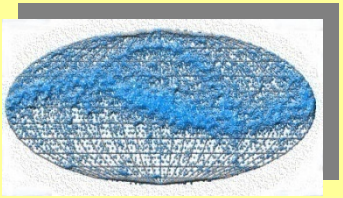
WIDE-FIELD PLATE DATABASE FORMAT in ASCII

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	

Wide-Field Plate Database: CATALOGUE OF WIDE-FIELD PLATE ARCHIVES (CWFPA v.7.1)







Catalogue of WFPA v.7.1 with new codes:

Archive code and Site code

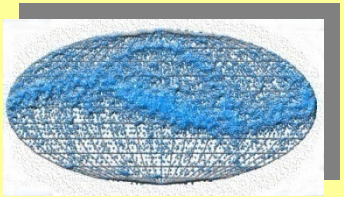
A1 | Catalogue of Wide-Field Plate Archives (version 7.1 November 2015)

	A	B	C	D	E	F	G	H	I	J	K	L
1	Catalogue of Wide-Field Plate Archives (version 7.1 November 2015)											
2	WFPDB Instrument Identifier		Original Name of the Instrument	Location of the Archive			Observatory					Obs.Code
3				Site	Arch Code	Country	Name	Display Name	Site Code	Site	Country	
4	1a	1b	1c	2a	2b	3	4a	4b	4c	5	6	7
5	AAO390	***	Anglo-Aus	Coonabara	1	Australia	Anglo-Aus	Anglo-Aus	a	Coonabara	Australia	413
6	AAO390	***	Anglo-Aus	Hamburg	2	Germany	Anglo-Aus	Anglo-Aus	a	Coonabara	Australia	413
7	ABA020			Kyiv	2	Ukraine	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
8	ABA020			Mt. Kanob	1	Georgia	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
9	ABA036		Abastumar	Kyiv	2	Ukraine	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
10	ABA036		Abastumar	Mt. Kanob	1	Georgia	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
11	ABA040A		Zeiss Refr	Mt. Kanob	1	Georgia	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
12	ABA040B		Zeiss Doul	Mt. Kanob	1	Georgia	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
13	ABA070		Meniscus	Mt. Kanob	1	Georgia	Abastumar	Abastuma	a	Mt. Kanob	Georgia	119
14	ALG033	**		Bouzareah	1	Algeria	Alger Obs.	Alger Obs	a	Bouzareah	Algeria	8
15	AOT020		Zeiss Astr	Turin	1	Italy	Astr.Obs.T	Turin Obs	a	Pino Torine	Italy	22
16	AOT038		38 cm Phc	Turin	1	Italy	Astr.Obs.T	Turin Obs	a	Pino Torine	Italy	22
17	ASI040	***	40/50 cm S	Asiago	1	Italy	Asiago	Asiago	a	Asiago	Italy	43
18	ASI067	***	67/92 cm S	Asiago	1	Italy	Asiago	Asiago	a	Asiago	Italy	43
19	BAL080		Baldone S	Riga	1	Latvia	Baldone A	Baldone O	a	Baldone	Latvia	69

Cat7.1csv (2)

Wide-Field Plate Database: CWFPAs

CWFPAs attributes changes in version 7.0 (February 2014)



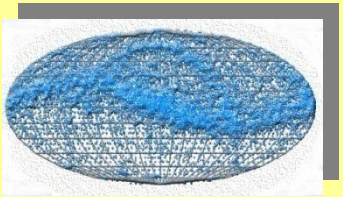
- **Archive code** (coded as 1,2,3,…) – needed when parts of archive plates are stored in different observatories.
- **Site code** (coded as a,b,c,..) – needed when the instrument operated at different locations.

These codes complement the WFPDB instrument identifier (<observatory name><instrument aperture><suffix>, e.g. HAR020A) to form the unique identifier of the archive.

Examples:

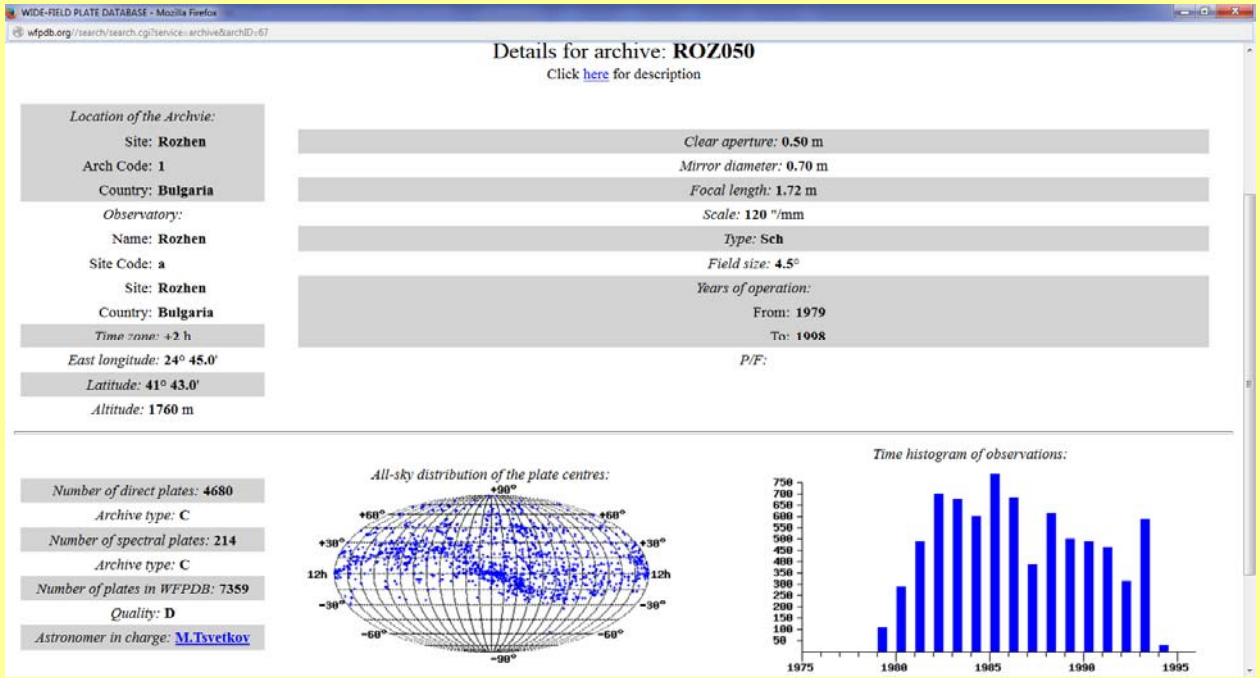
- HAR020A archive was made when the telescope operated in Cambridge, Arequipa, Bloemfontein, so Site code of a, b, c, etc. is applied.
- ROZ050 archive plates are located at 3 locations: Sofia, Rozhen, Brussels, so Arch code of 1, 2, 3 is applied.

Wide-Field Plate Database: CWFPAs

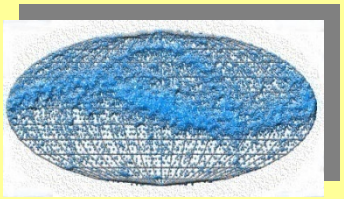


CWFPAs attributes

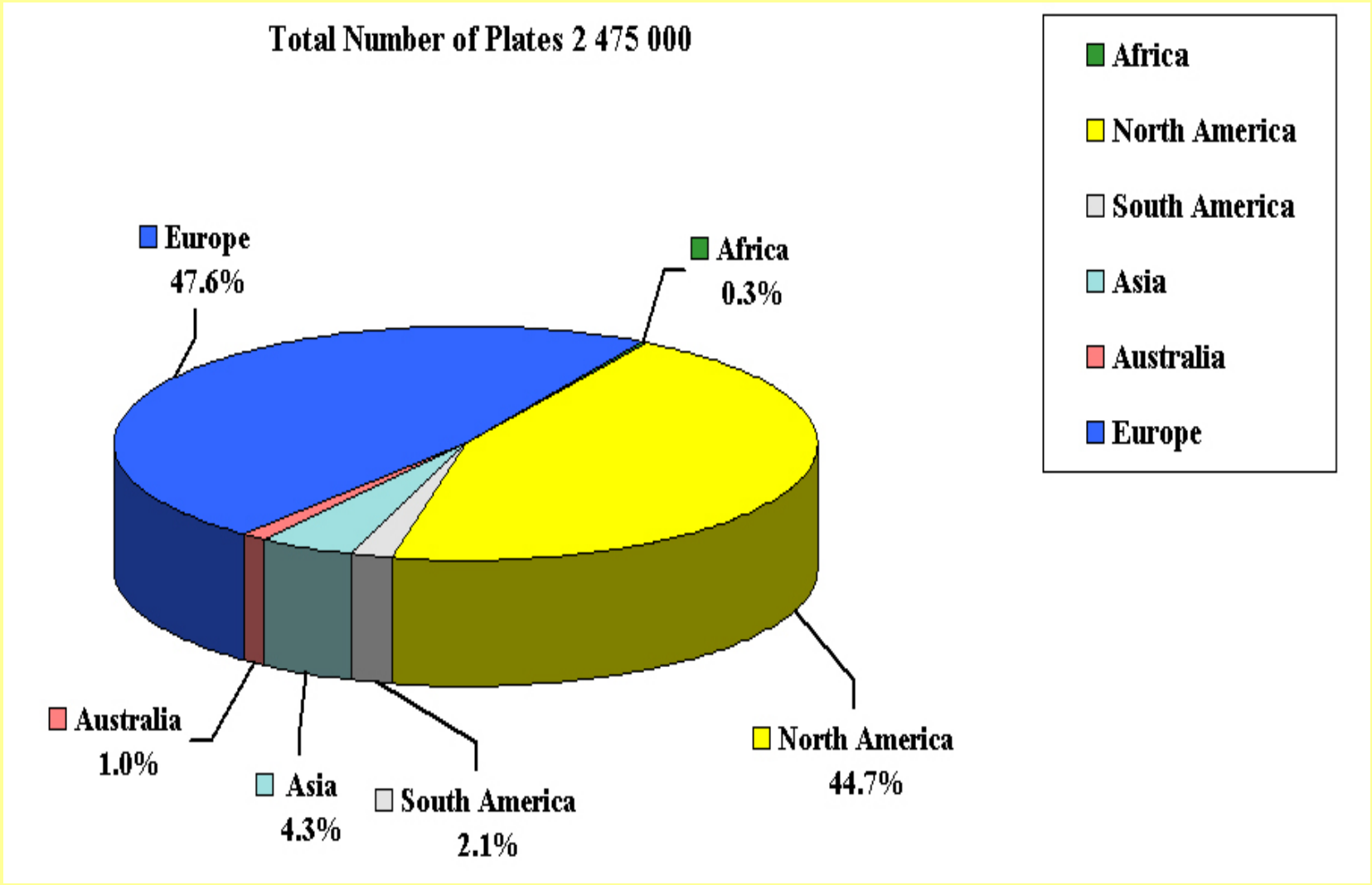
- Archive Information (from the CWFPAs)
- All sky distribution of the plate centres
- Time histogram of the archive observations (built on-the-fly):



Wide-Field Plate Database: Main Characteristics

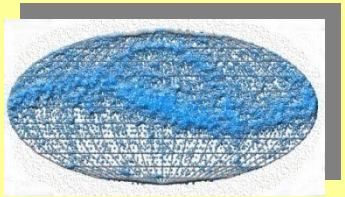


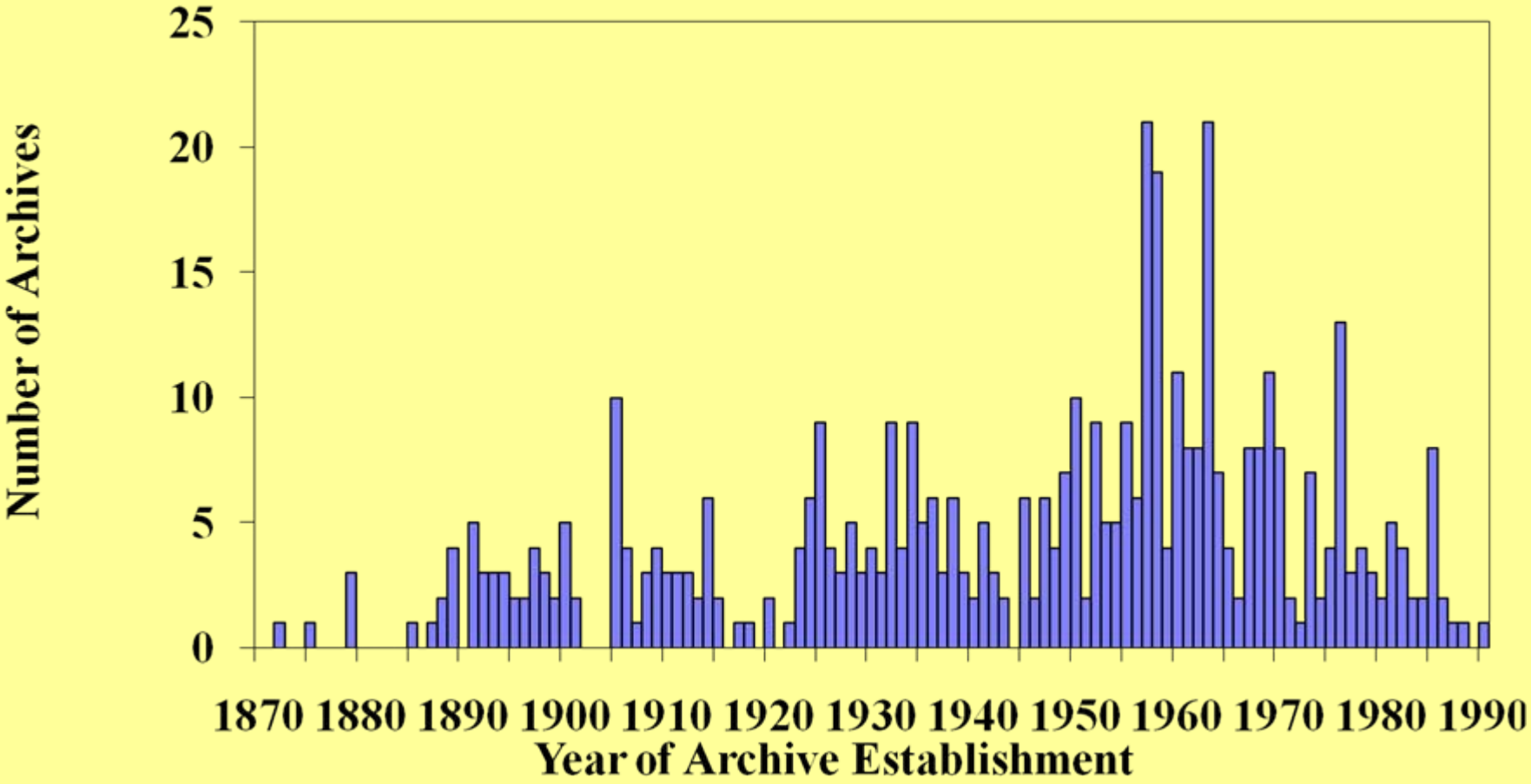
Worldwide Wide-Field Plate Distribution



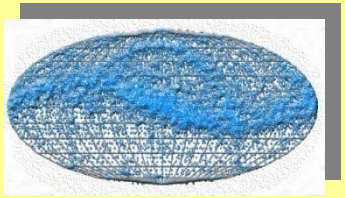
Wide-Field Plate Database: Main Characteristics

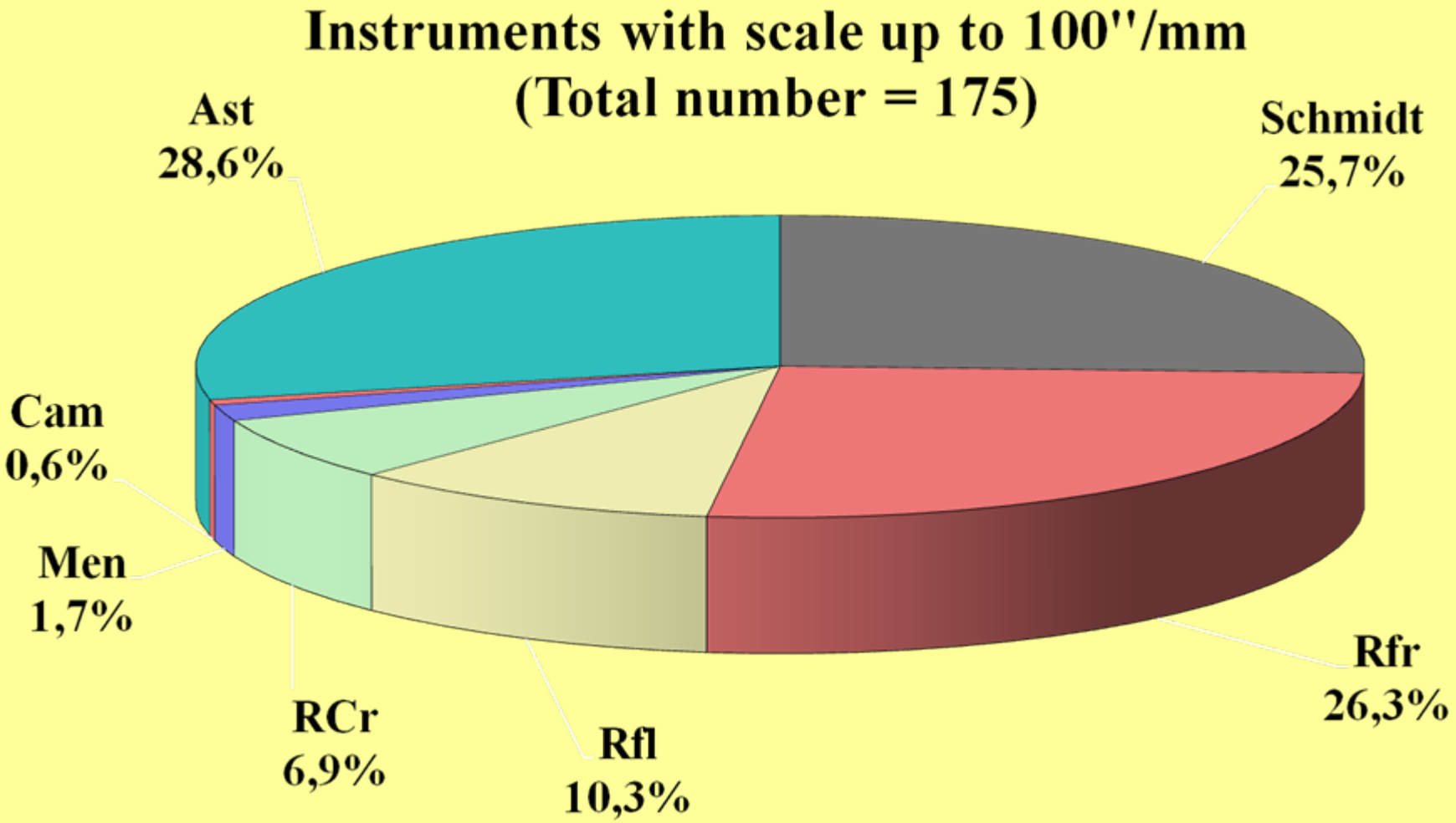
Time Distribution of the Wide-Field Plate Archives



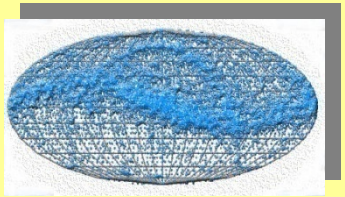


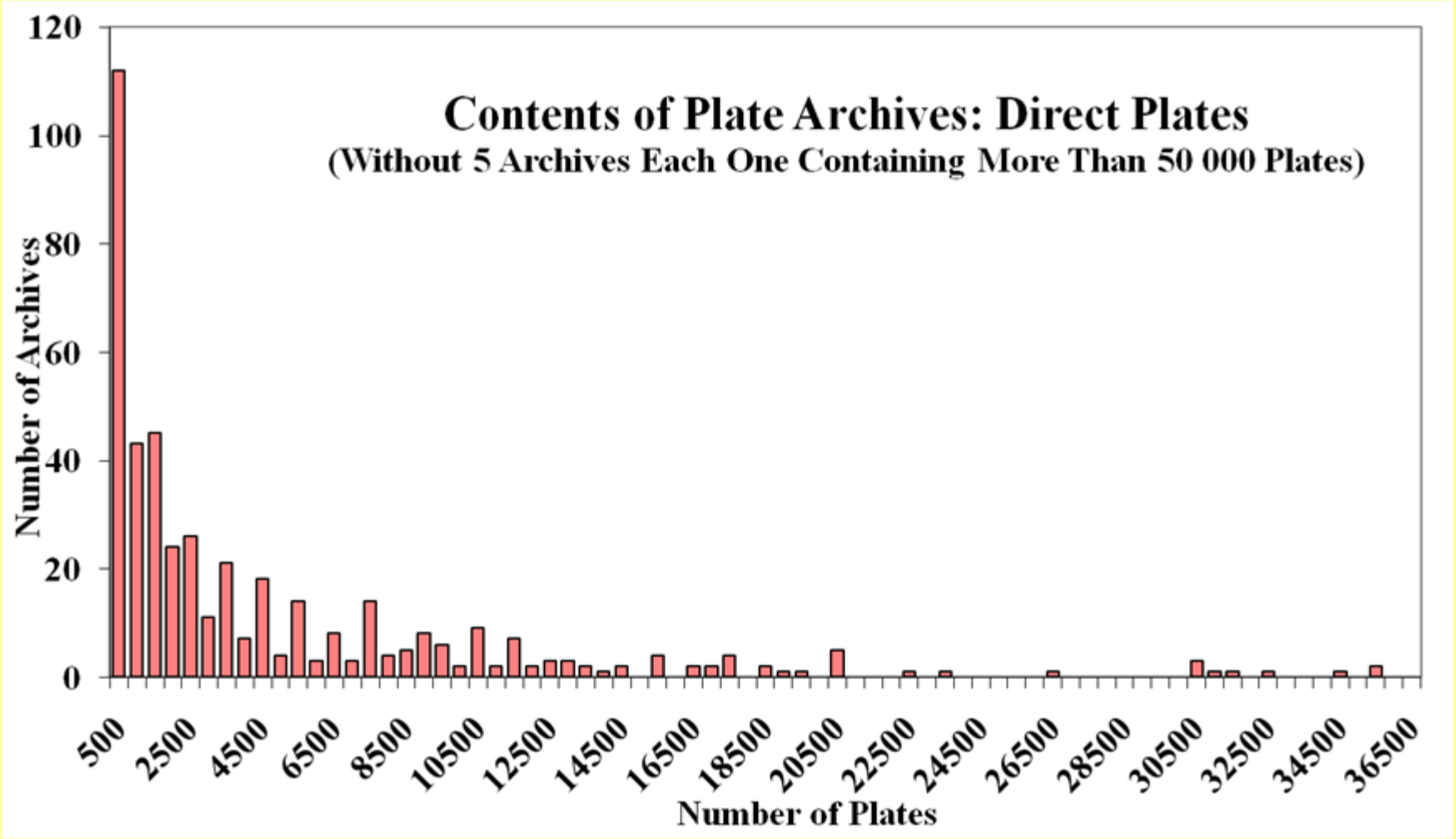
Wide-Field Plate Database: Main Characteristics



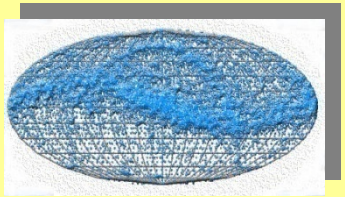


Wide-Field Plate Database: Main Characteristics





Wide-Field Plate Database: Main Characteristics



The Biggest European Wide-Field Plate Collections

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

The Scanning Project: DASCH

http://dasch.rc.fas.harvard.edu/status.php

Currently performed **139,709** plate scans of **139,386** unique plates. Click on the thumbnails to the left to view the current sky coverage in equatorial and galactic coordinates. These plots are truncated to 6,000 plates at the galactic North Pole because 19,140 plates include the North Pole Sequence for photometry calibration. We have successfully performed accurate World Coordinate Systems (WCS) fits for **137,741 (~99%)**of these plates. Multiple exposure fitting provides us with 153,841 sets of WCS coordinates. As of June, 2008 the WCS fitting procedure procedure was upgraded to use the astrometry.net software in conjunction with Jessica Mink's WCSTools

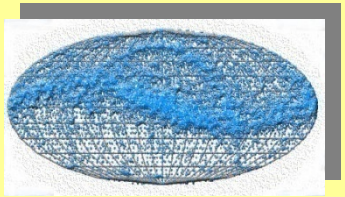
The Scanning Projects: DASCH

HCO-Plate index cards cupboard

Menzel Gap?

HCO Plate Stacks, 500 000 plates

The Digital European Plate Collections



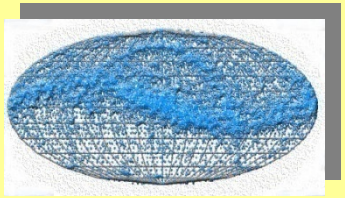
Sonneberg Observatory Digital Plate Collection

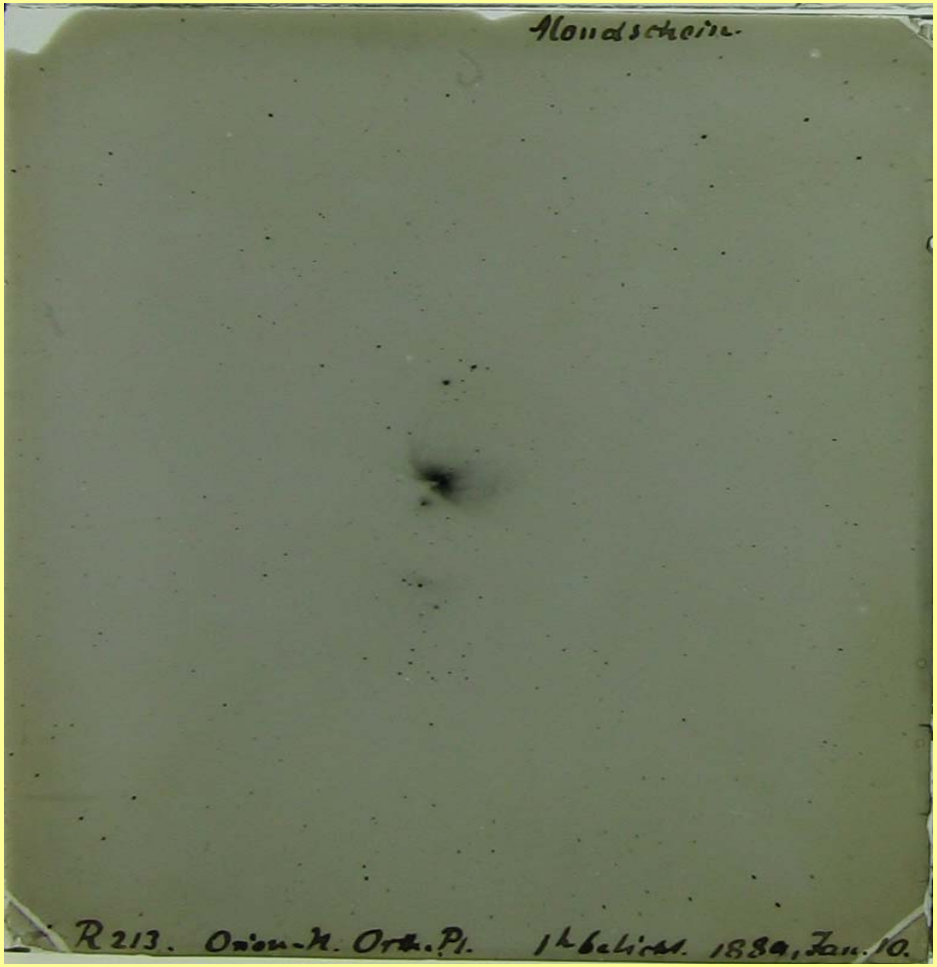
Peter Kroll presentation Astroplate 2016

Pulkovo Observatory Digital Plate Collection

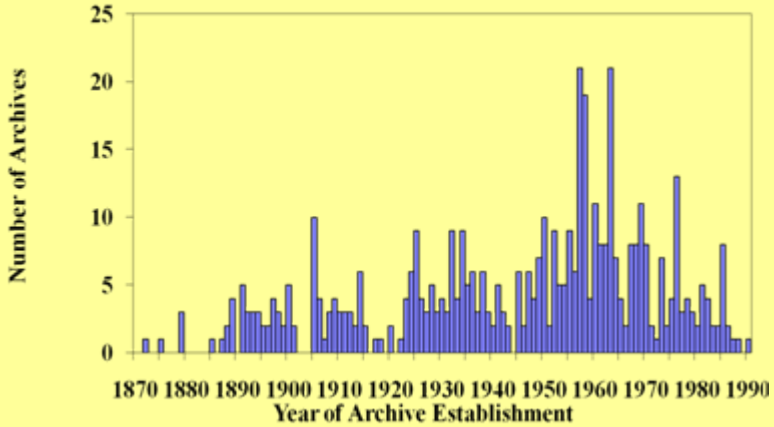
Elena Roshchina –Astroplate 2016

Digital Historic Wide-Field Plates

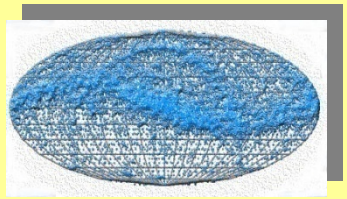


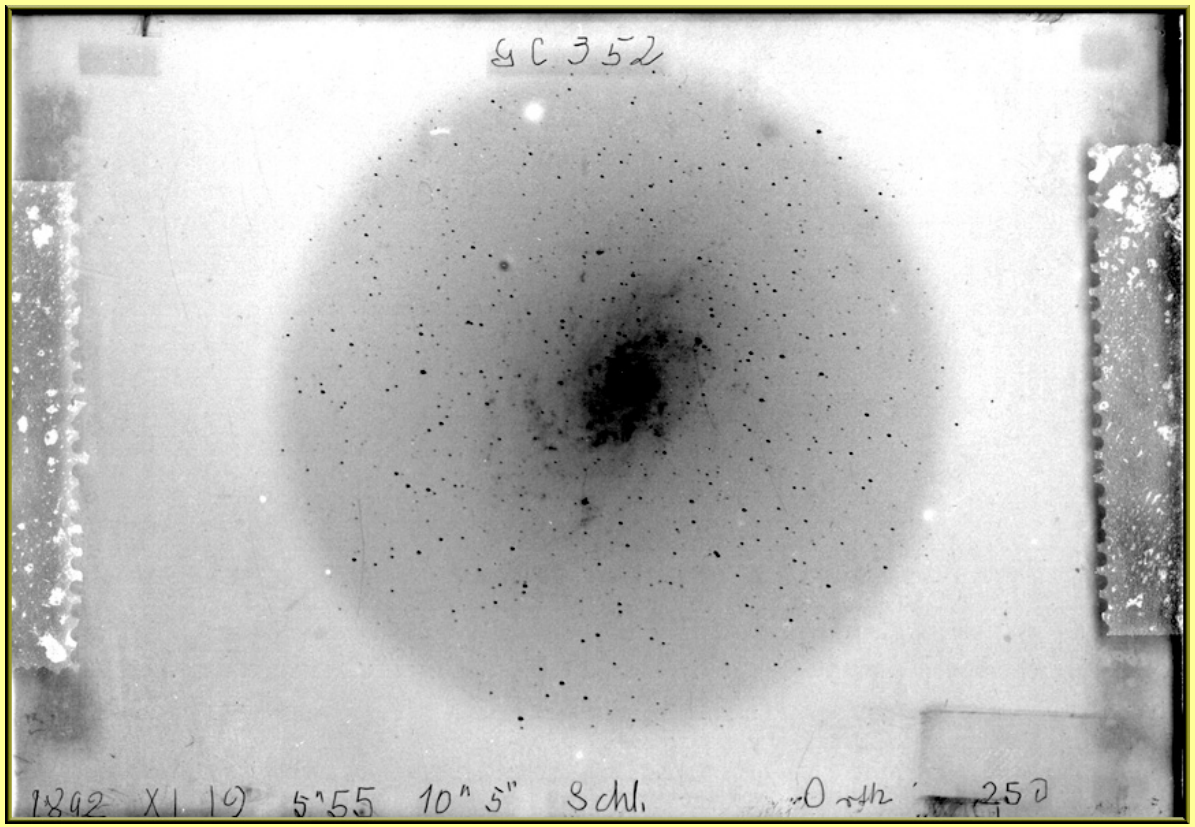


Potsdam plate from the Oswald Lohse archive, Orion Nebula, 1880.



Digital Historic Wide-Field Plates

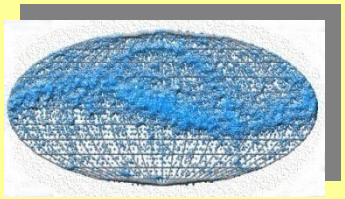




Sombathelly Observatory
Galaxy M33 (from 1892)

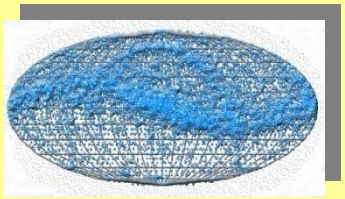
Digital Historic Wide-Field Plates

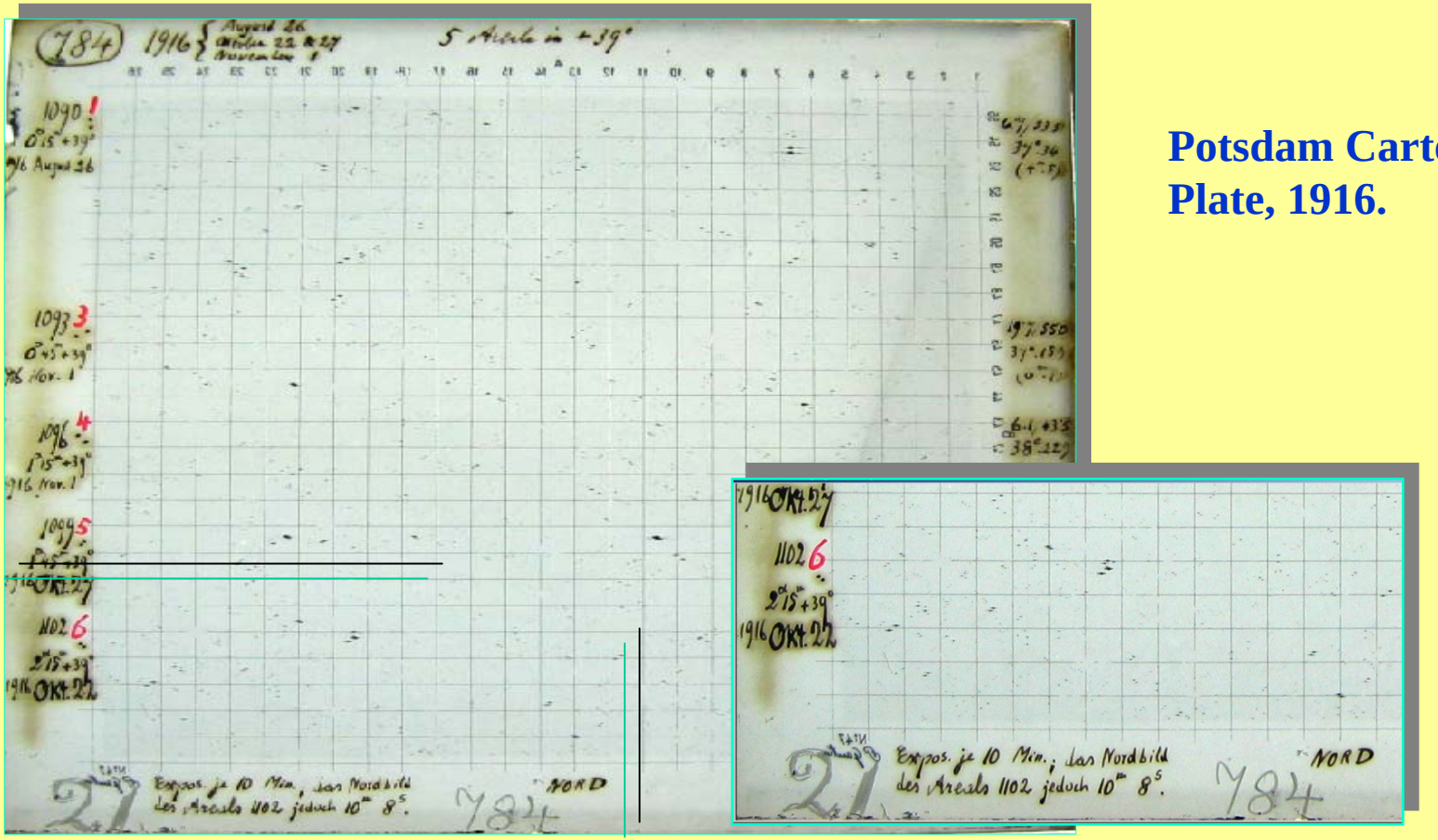
http://nautil.us/issue/32/space/these-astronomical-glass-plates-made-history



Mount Wilson Observatory, Orion Nebula, from the Ritchey 60-inch telescope made in 1908.

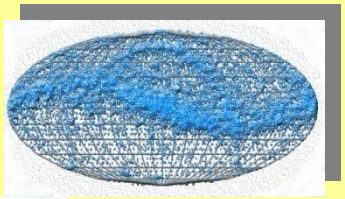
Digital Historic Wide-Field Plates

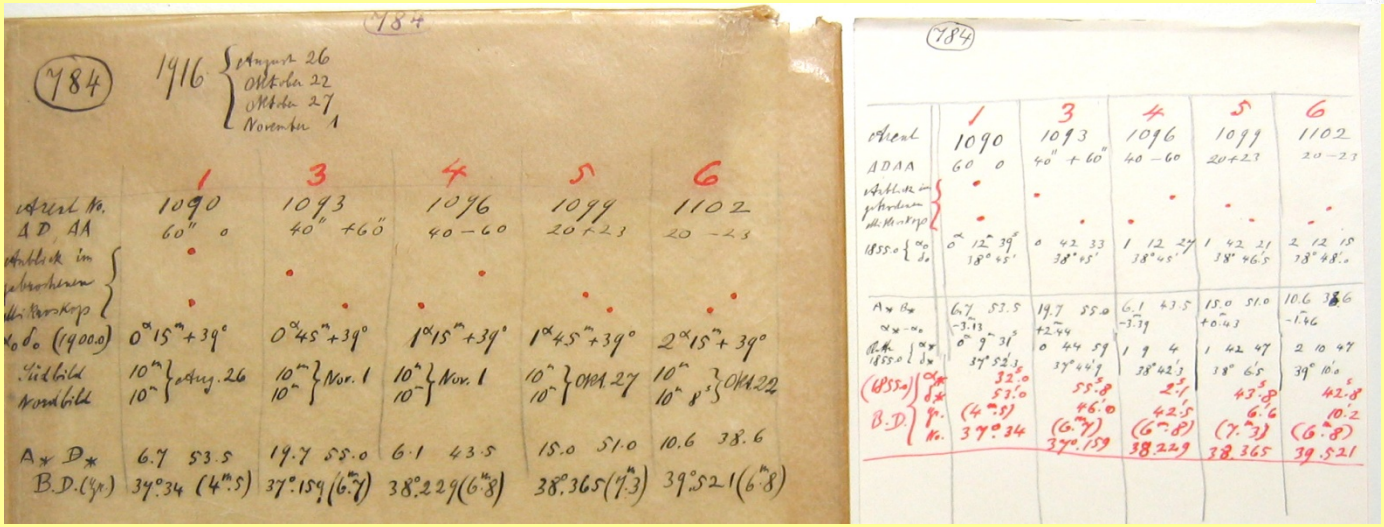




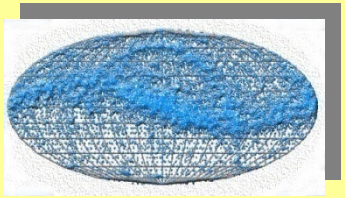
Potsdam Carte du Ciel Plate, 1916.

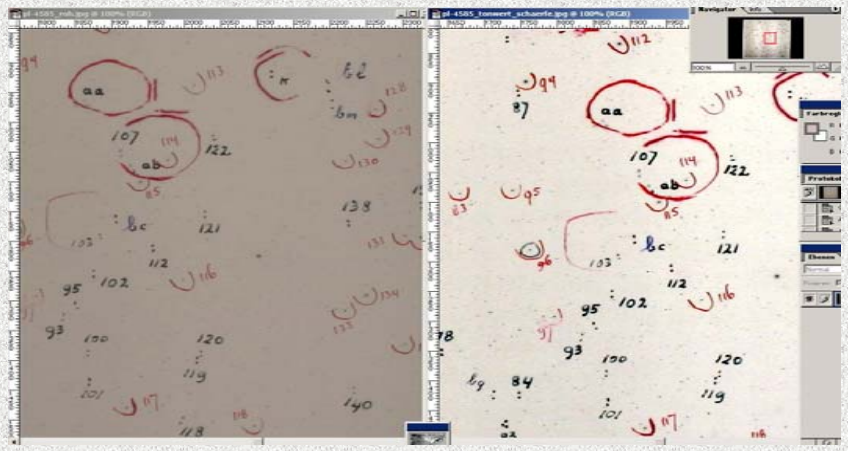
Digital Wide-Field Plate Logbooks



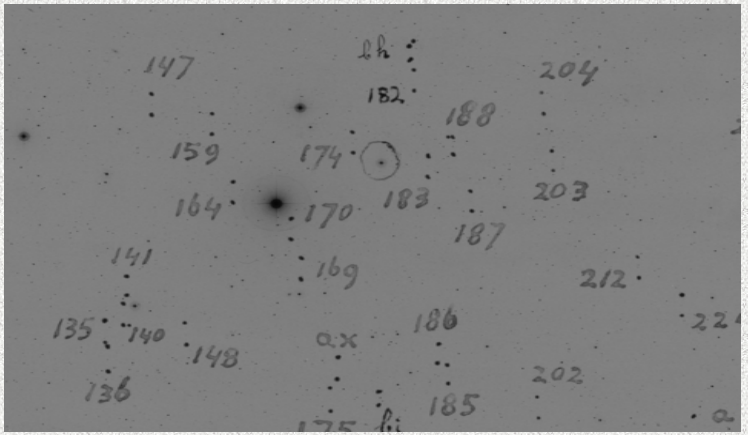


Wide-Field Plate Previews





Documentation: image processing



P-L plate detail as seen from the glass side

Plate Digitization: Flatbed Scanners Paradigma

Dark ages: Plate scanning using:
PDSs, Super Cosmos,
USNO Monet scanner, LAMA's STScI
MAMA, APM, etc.

NEW:Flatbed Scanners:
EPSON 1640XL, UMAX, etc.

CCD Previews – plate logbooks

Sofia Sky Archive Data Center: FB Scanners

EPSON EXPRESSION 1640XL
Scanning platform: A3 310x437 mm;

Resolution: 1600x3200dpi,
Duration: 15min

Plate size: 30x30 cm;

Plate Storage: FITS/TIFF with volume ~650 MB.

Sofia Sky Archive Data Center: Epson Flatbed Scanners

EPSON V700 Photo Pro PERFECTION
Scanning platform: A4 200x250 mm;

Resolution: 2400x3200dpi, Duration: 5min 16x16 cm plate;

Plate Storage: FITS/TIFF with volume 400 MB.

The Novel EPSON V800 is used

at Bosscha Obs., Lembang, (Indonesia) for Schmidt Plate Archive digitization.

Rozhen Observatory: FB Scanners

EPSON EXPRESSION 10000XL

Scanning platform:A3 310x437 mm

Resolution: 1600x3200dpi

Duration: 5min 16x16 cm

Plate Storage: FITS

2m RCC plates 30x30 cm

Previews:Adobe Photoshop

600dpi, 24bit colour

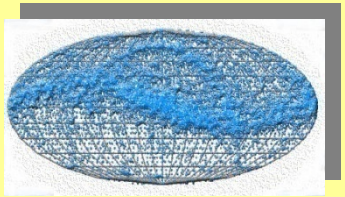
TIFF; JPEG

Scans: Scanfits

1600dpi, 16bit grayscale

FITS (612MB)

Wide-Field Plate Database: Future Plans



WFPDB development could be summarized as:

•International collaboration for plate archives inventory and their upgrading (only about 25% from all existing plates are visible via WFPDB) - the main aim of the project Humboldt_Astroinfromatics.net;

•Digitizing plates according to the VO standards in FITS format, as well development of the equal criteria and parameters for plate digitization;

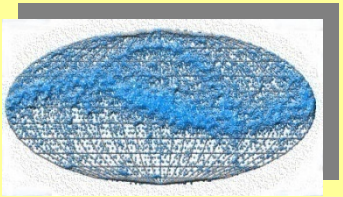
•Preprocessing and photometry of digitized plates;

•Free access to the files of digitized photographic plates by the VO instruments

.

• Processing of the special cases as a multiple exposure plates – Flare star and CdC plates and their link to the VO

Wide-Field Plate Database: CWFPAs

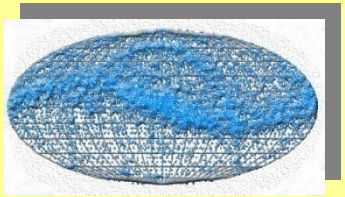


- CWFPAs current version - 7.1, November 2015 http://www.wfpdb.org/catalogue.html) currently contains description of 509 archives from **163** observatories.
- Updating the Plate index catalogue as a basic tool fo the WFPDB: http://www.wfpdb.org/seach.html
- Observatory geographical location, visualized by AstroWeb, using the exact data-set as the WFPDB search system (update).

http://wfpdb.org:8000/chameleon/astroweb/astroweb.phtml

WFPDB – AstroWeb

Wide-Field Plate Database: Integration into VO



Integration of the WFPDB into the VO structures

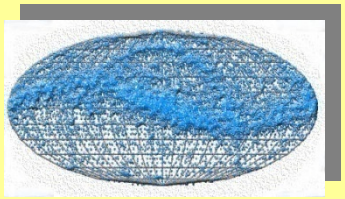
Link WF-Plates->Publications f.e.:

“Interlinking between IBVS (Information Bulletin on Variable Stars and WFPDB”

A pilot project for creating links between databases (Wide-Field Plate Database, WFPDB) and electronic journals (Information Bulletin on Variable Stars, IBVS). The project aims to create closer links between scientific papers and the data they are based upon. The merits of a paper can be evaluated better (both before and after publication) if the data used is accessible, which in turn, gives a possibility of re-use - one of the goals of the Virtual Observatory.

Holl, A.; Kalaglarsky, D. G.; Tsvetkov, M. K.; Tsvetkova, K. P.; Stavrev, K. 2006, Virtual Observatory: Plate Content Digitization, Archive Mining and Image Sequence Processing, iAstro workshop, Sofia, Bulgaria, 2005 proceedings, Editors: Tsvetkov, M.; Golev, V.; Murtagh, F.; Molina, R., Heron Press Ltd., ISBN-10 954-580-190-5, p. 374-378

Wide-Field Plate Database: Integration into GAVO



Integration of the WFPDB into the VO structures (e.g. GAVO).
To turn the WFPDB into a fully featured VO service:
Presentation of **Florian Rothmaier** in AstroPlate 2016!:
The Wide-Field Plate Database in the Virtual Observatory

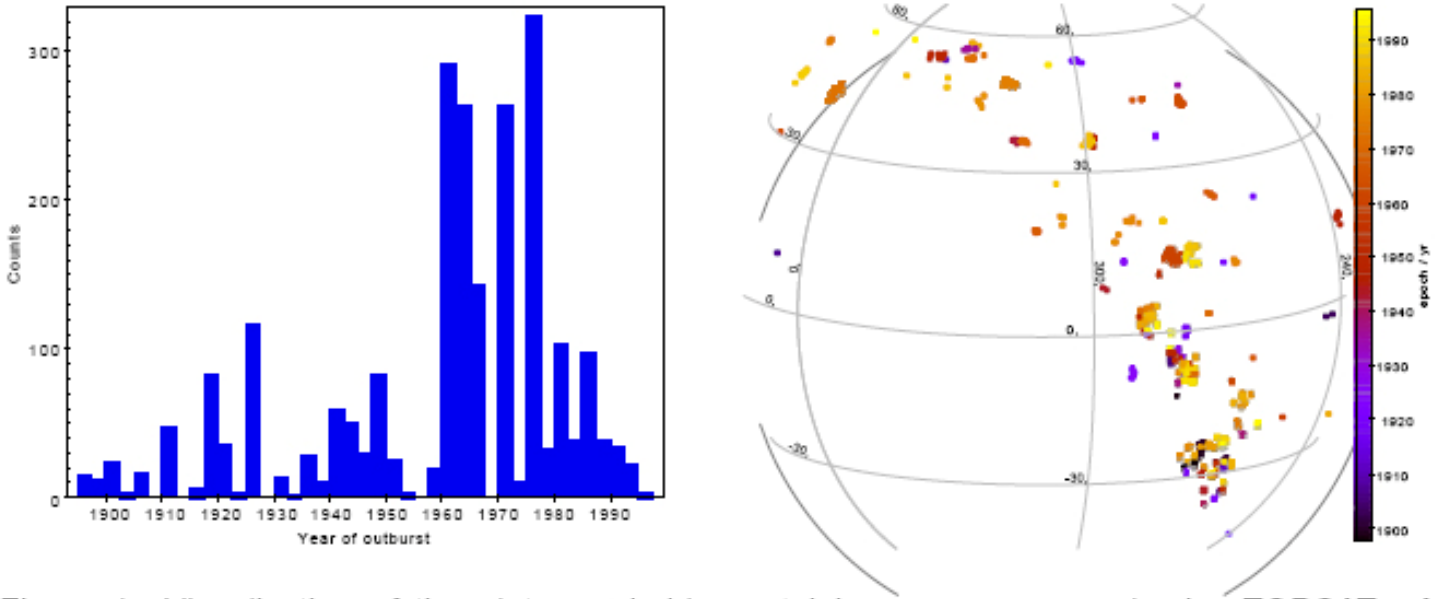


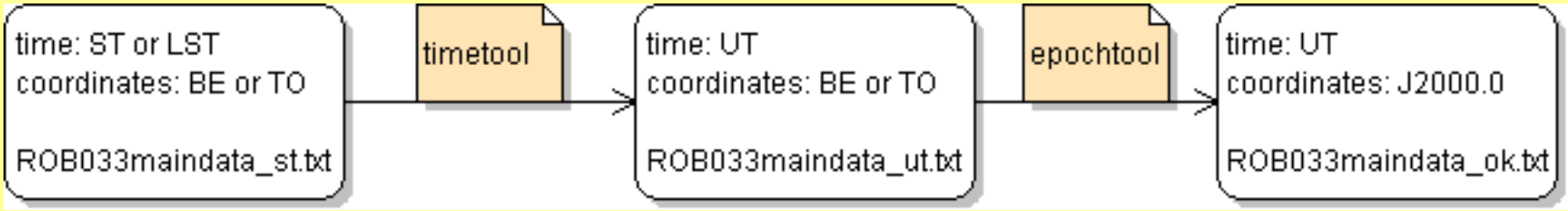
Figure 1: Visualisation of the plates probably containing novae, prepared using TOPCAT: A histogram of the epochs and a sky plot showing locations and color-coded epochs for the plates found for a part of the sky.

Wide-Field Plate Database: Astroinformatics

Standard WFPDB requirements for content and data structure:
WFPDB Software tools:

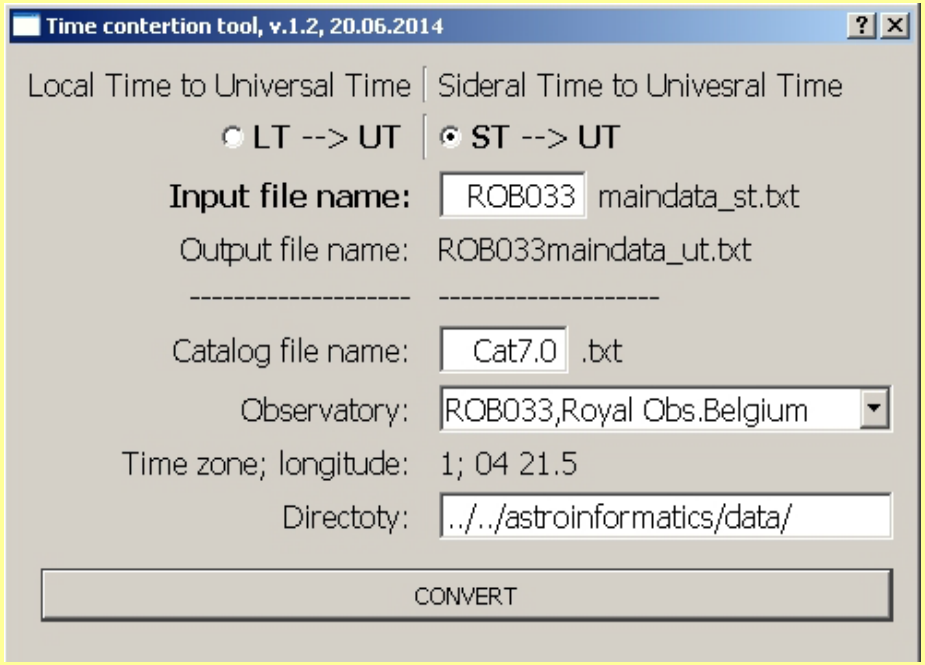
- **Time Conversion: Local sidereal time (LST) or local time (local daylight saving time DST) to universal time (UT);**
- **Coordinates Conversion: Equatorial coordinates to J2000.**

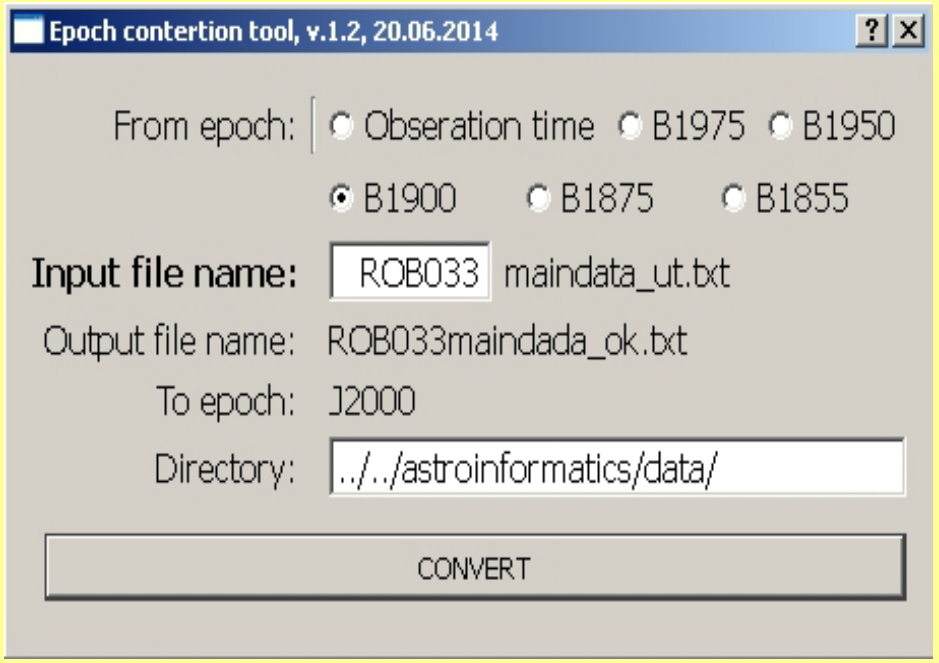
Conversion Diagram



http://serdica-comp.math.bas.bg/index.php/serdicajcomputing/article/view/144/147

Wide-Field Plate Database: Astroinformatics





The software is written in C++ using Qt cross-platform application and UI development framework (http://qt.digia.com/).

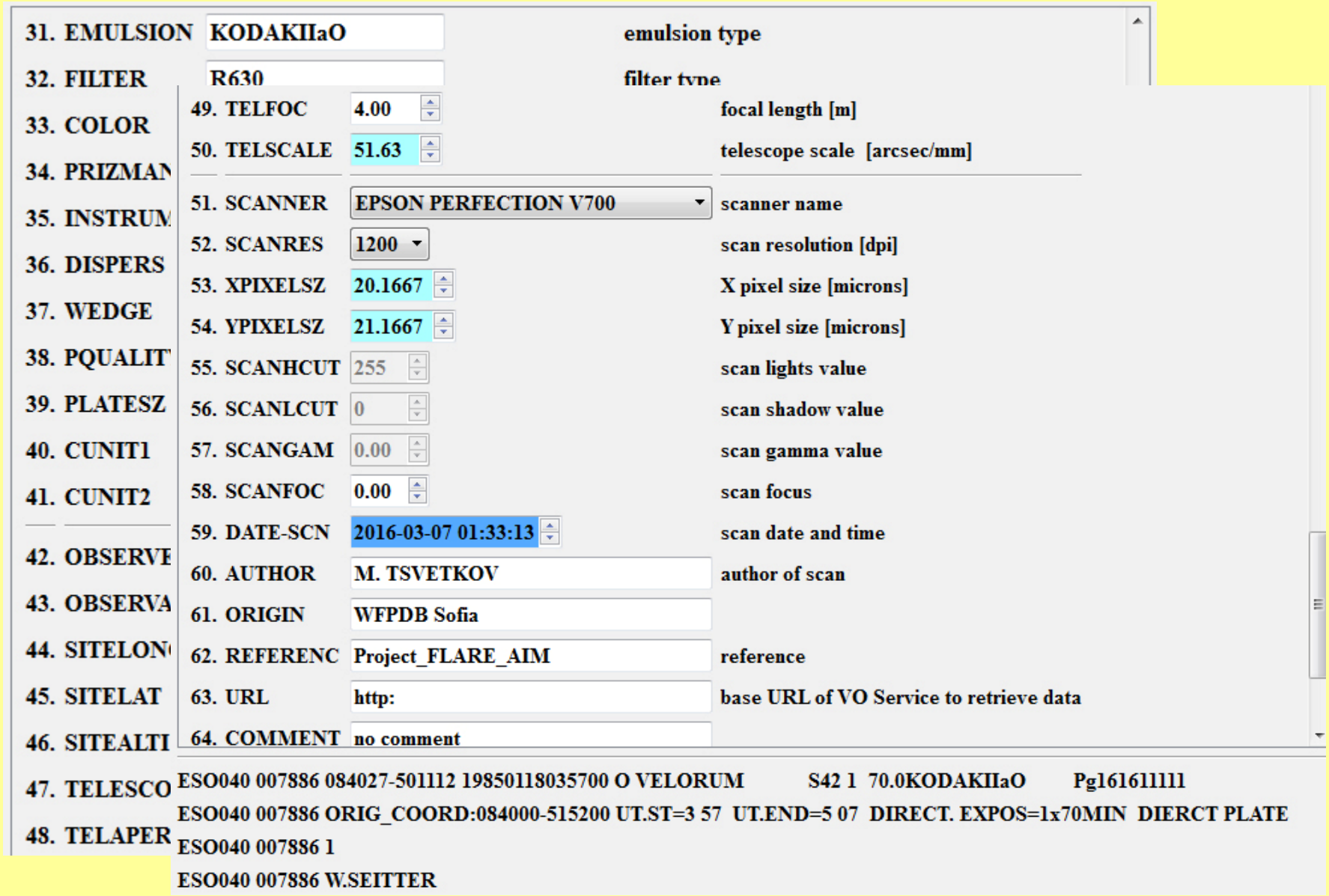
https://github.com/nkirov/timetool
https://github.com/nkirov/epochtool

Wide-Field Plate Database: Astroinformatics

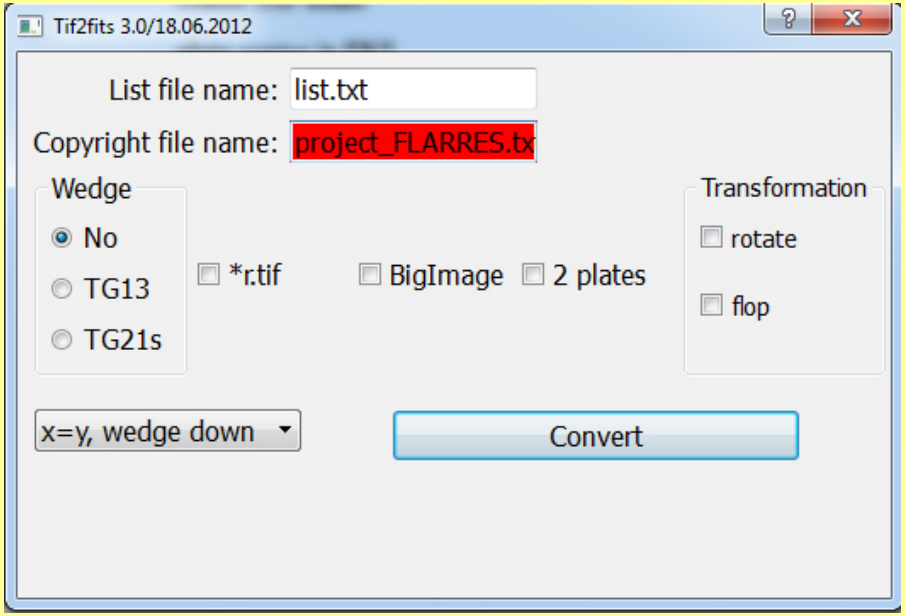
File data / ESO040 Sort Plate ESO040 007886 Prev Next Save

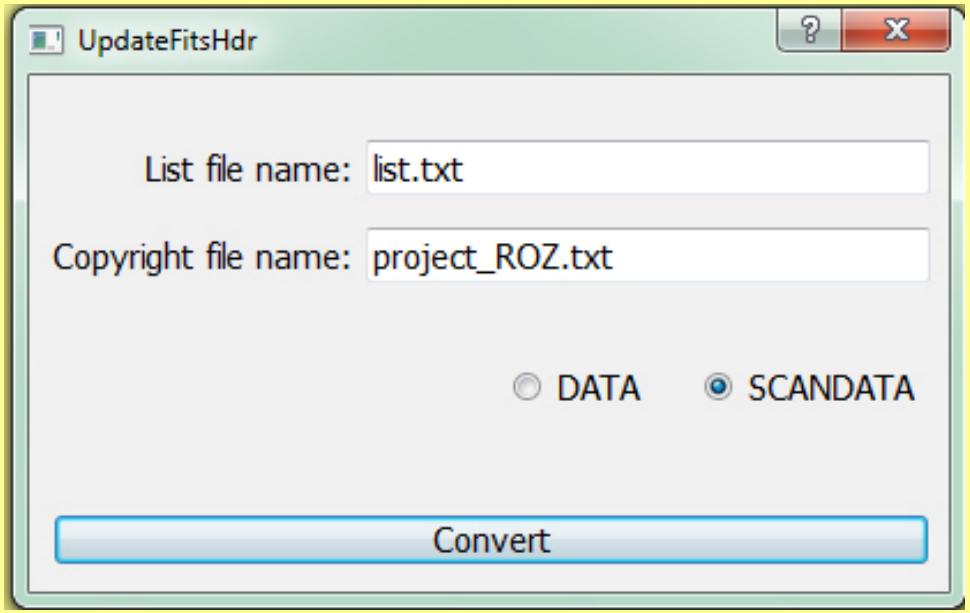
15. OBJECT	O VELORUM	center star name
16. RA	08:40:27	plate center in FK5
17. DEC	-50:11:12	plate center in FK5
18. EQUINOX	2000.00	FK5
19. RAEPOBS		plate center in the epoch of observation
20. DECEPOBS		plate center in the epoch of observation
21. EPOCH	1985.047009	epoch of observation [years]
22. DATE-OBS	1985-01-18	date of observation
23. TIME-OBS	3:57:00 AM	UT at start of observation
24. EXPTIME	70.00	exposure time [minutes]
25. TIME-END	5:07:00 AM	UT at end of observation
26. UT	1985-01-18 04:32:00	date and UT at mean epoch
27. JD	2446083.688889	JD at mean epoch
28. ST	7:04:07 AM	ST at start of the observation
29. MULTIEXP	2	number of exposure of the plate
30. DETNAM	Photographic Plate	

Wide-Field Plate Database: Astroinformatics



Wide-Field Plate Database: Astroinformatics





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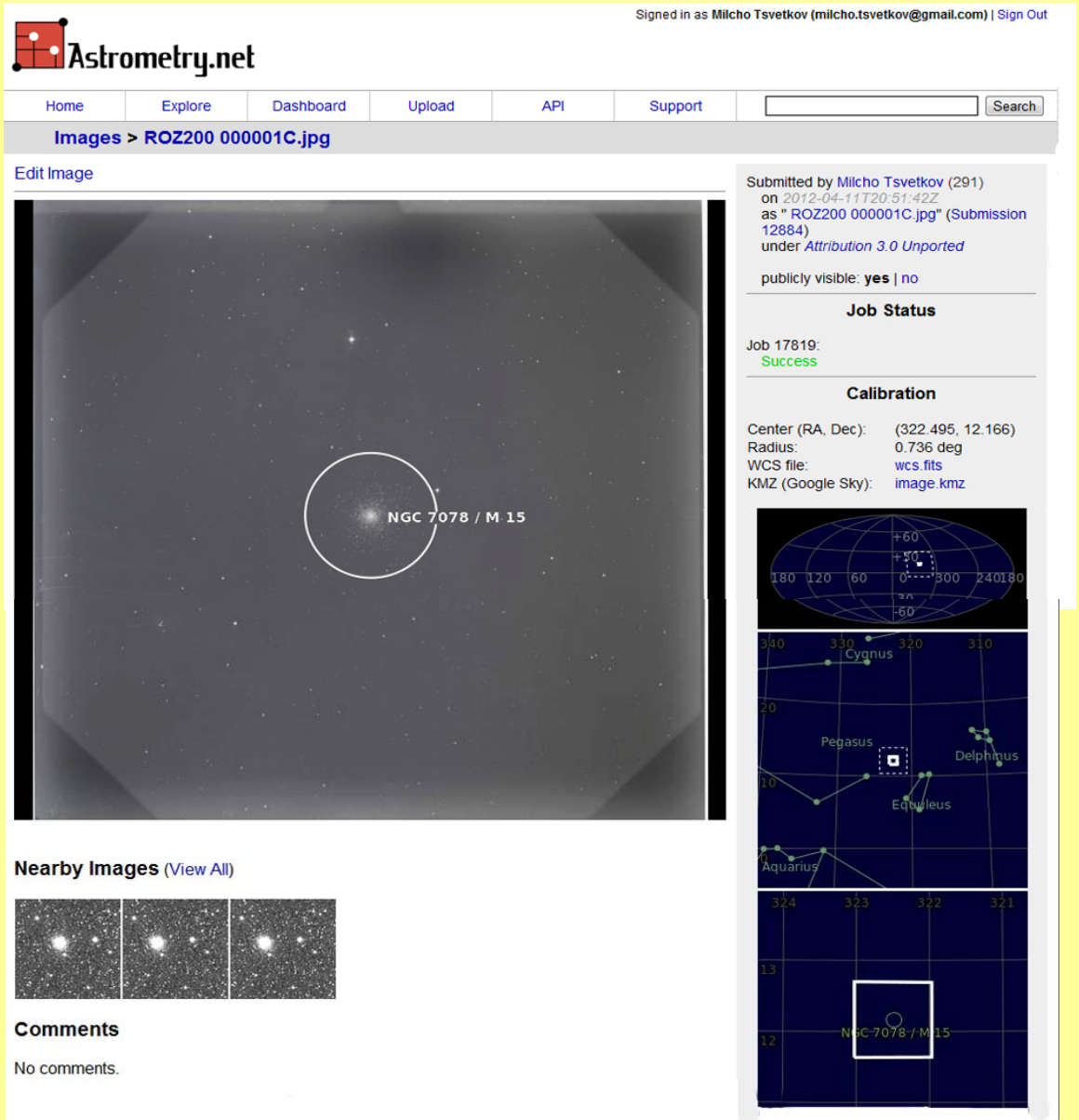
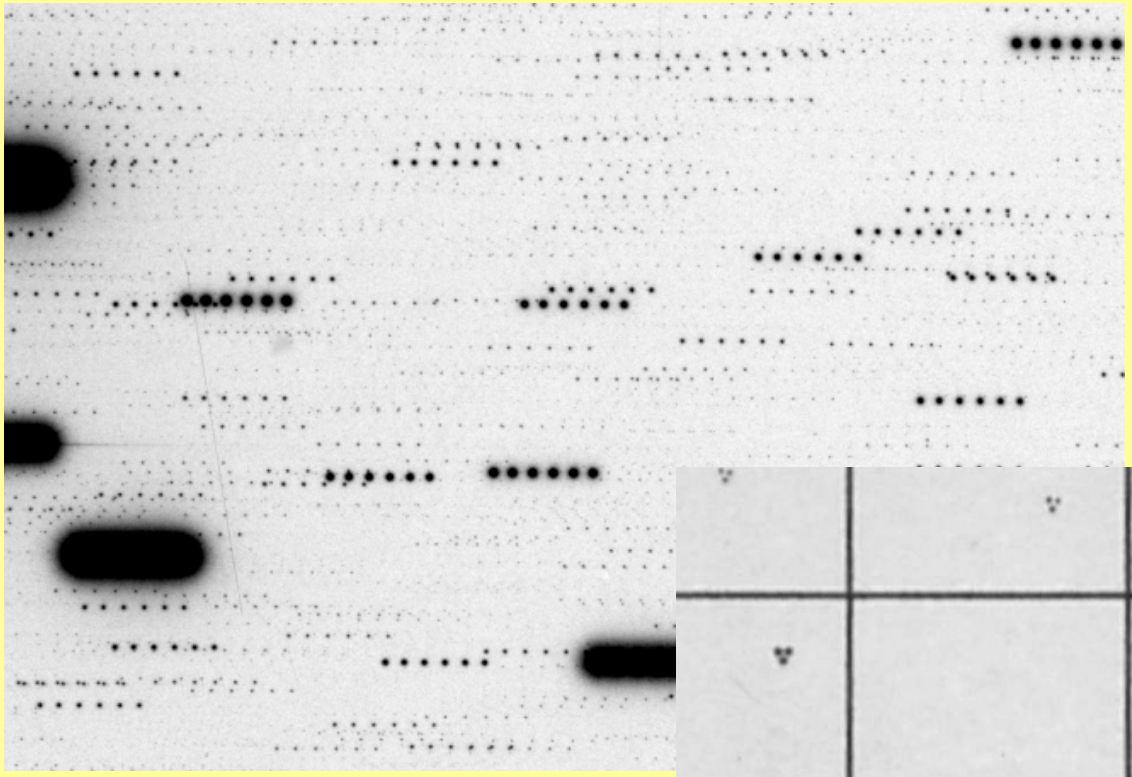
https://github.com/nkirov/epochtool

ASTROMETRY.NET

http://nova.astrometry.net/





Flare star search monitoring plates

CdC triple images

Wide-Field Plate Database: Astroinformatics

Humboldt Astroinformatics Networking

Establishment of a web portal - Humboldt Astroinformatics Web Portal

Aims:

- **Starting point at any searches, presentations, retrievals publishing preservation and dissemination of information concerning Astroinformatics in Bulgaria and Germany;**
- **Computational education ;**
- **To facilitate the historical and cultural heritage research in both countries;**
- **Social networking, combining Science Portal and Public Portal;**
- **Citizen Science (done by voluntary contributors together with professional scientists) ;**
- **Links to other existed portals:**

- by scientific organizations (e.g. with Astrostatistics and Astroinformatics Portal at http://asaip.psu.edu at Penn State University, USA, established in 2012; with South African Astroinformatics Alliance or SA3 at http://www.sa3.ac.za/, established in 2013)

- or to self-referential portals which are rather personal home pages (e.g. astroinformatics.de

- some astronomical image processing home page as well as DASCH website

- to wikispaces (e.g. Astroplate Wiki at: https://www.plate-archive.org/wiki/index.php/Main_Page

- a space to further the exchange of knowledge, software and archival procedures, as well as to improve the standardization of metadata, catalogue data and scientific tools).

- to other web-portals (e.g. "Alumniportal Deutschland").

Humboldt Astroinformatics web site: to be completed

astro PLATE

HUMBOLDT ASTROINFORMATICS NETWORK

News: Plate 2016 - Prague: http://www.a

Actuel information: lation.de/web/humboldt-alumni-award-initiatives-2015.html

- Home
- Project outline
- Introduction
- Existed Astroinformatics scientific groups
- Presentation of the basic articles
- Science Portal
- Public Portal
- Links
- Interactive blog
- Dictionary
- News
- Events
- Contacts

The network initiative "Humboldt Astroinformatics Networking" created by the astronomer and computer scientist Milcho Kirilov Tsvetkov aims to network scientists from his home country and the neighbouring Balkan States as well as from Armenia, Germany and the Ukraine who conduct research in the astroinformatics field. Plans foresee members of the network developing research tools and sharing information about innovations in the IT field. The network is also to act as a platform for initiating collaborative research. This web portal is set up for exchanging information and networking in the field of Astroinformatics.

The head of the project Professor Dr Milcho Tsvetkov finished Sofia University, Faculty of Physics and completed his doctorate in Physics and Mathematics at Yerevan State University, Armenia, in 1976. He conducted research as a Fellow of the Alexander von Humboldt Foundation at the University of Muenster from 1988 to 1990. Milcho Tsvetkov has been founder of the Sofia Sky Archive Data Center and associate member at the Institute of Mathematics and Informatics at

END