Libraries and Research Data

Toruń University's Open Access Data Project

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New resources

- electronic books
- electronic journals
- electronic articles
- audio / video
- digital research data

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Nicolaus Copernicus University
Toruń, Poland

Digital research data could be a little problematic...

Is there a place here for a library?

Whether the academic libraries are sufficiently competent institution to take part in such projects?

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Digital research data – (our?) new tasks

Toruń University Library has observed new trends

- Do other libraries in Europe deal with raw data?
- How do they do it?
- Who does it?
- Who do they collaborate? etc.

OK, lets try!

We moved into testing phase and we looked for a test task which can be the first implementation of the idea of raw data in our library.

1 Check who produces and collects research data.	2.Contact with researchers and ask if they need help of librarians.
3. Discuss what researchers expect.	4. Start the collaboration and take the first steps towards the realization of the test task.

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First steps – test task

- Group of researchers collect data or store archival data.
- Some of them are willing to cooperate with the library.

What do they need? Common question:

- Where the digital data can be stored?
- Where to get the money to organize, describe, digitize, archive, store the data?

In 2015 Library started to collaborate with geographers, conservators, archaeologists and astronomers.

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Result of the analysis

- show/find a repository to storage the data
- what's better: our new repository or ready-made solution?
- new platform for raw data (in Poland OMEGA PSIR)
- does any standard exist?
- EU recommendations
- tests of Horizon 2020
- define availability conditions (regulations, contracts, etc.)
- how to write a grant?
- preservation of analog forms of data (astronomical glass plates, maps, images, research reports, etc.)

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How can library help?

Libray got a grant from Ministry of Science and Higher Education:

The online repository of raw astronomical data

- 348 000 zł (~81 000 euro)
- 01.04.2016 – 30.12.2017
- Partner: Toruń Centre for Astronomy

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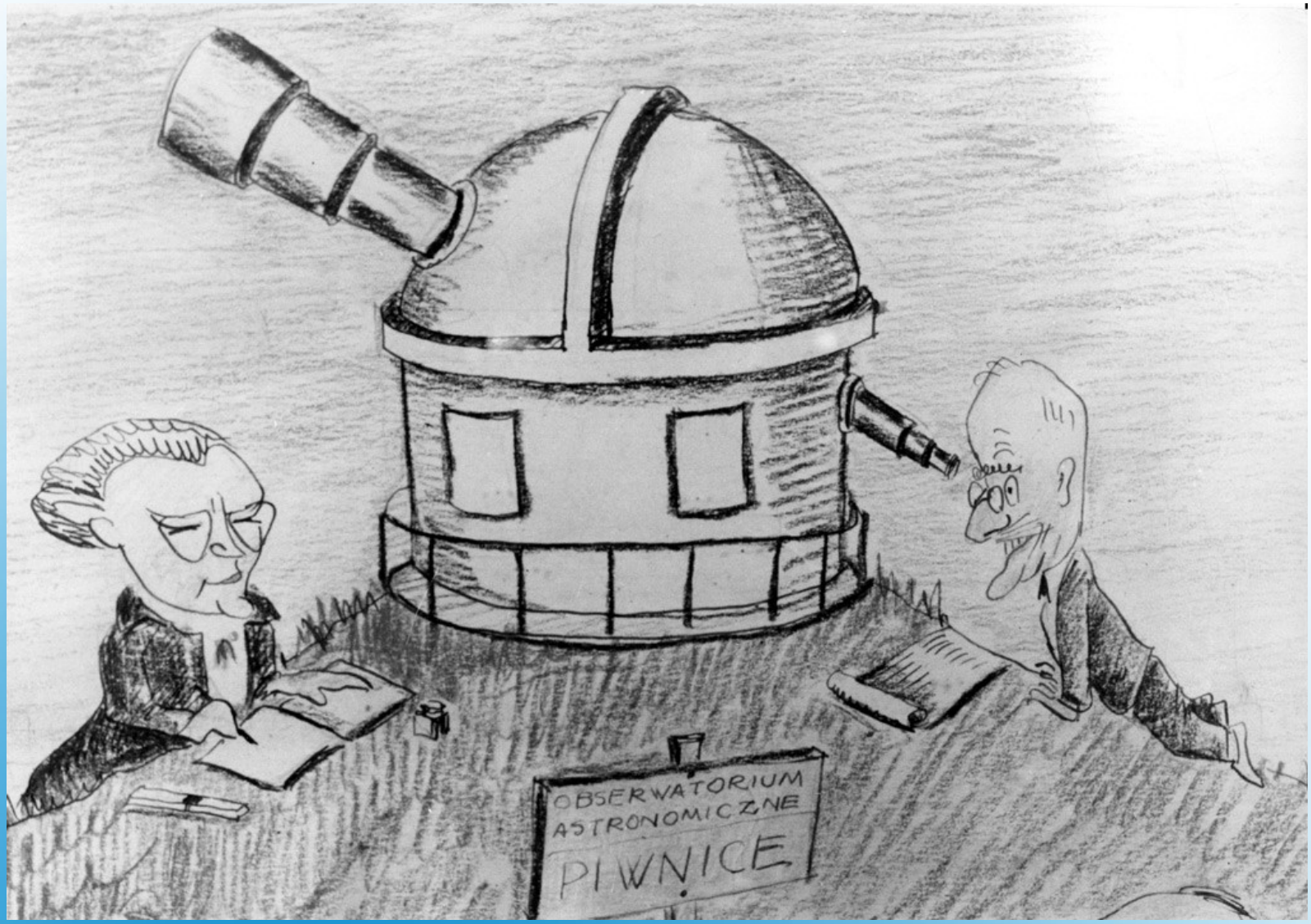
Astronomical archival data



Leon Jeśmanowicz (1950)

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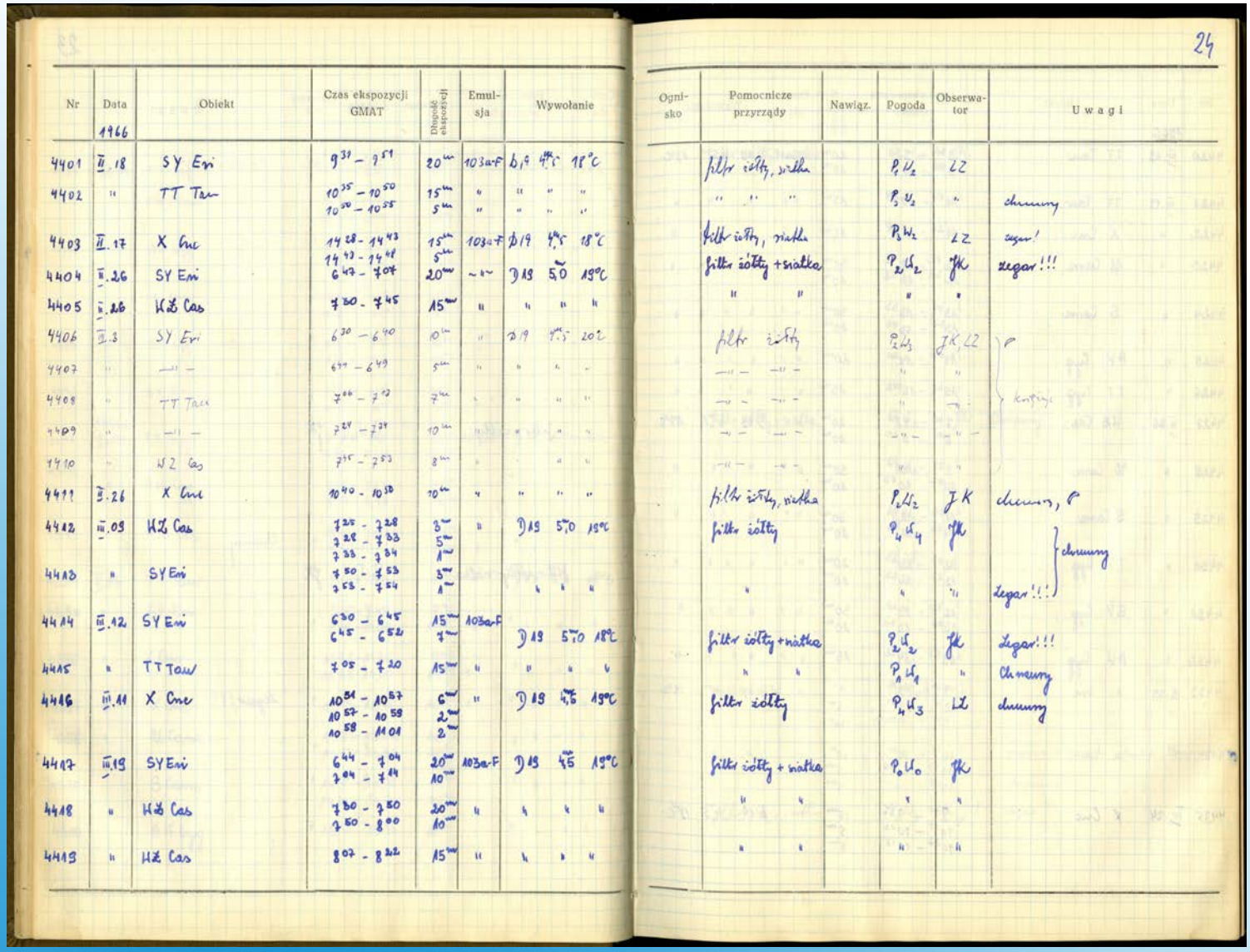
W TORUNIU

Astronomical observations 70 years ago



Nr	Data 1966	Obiekt	Czas ekspozycji GMAT	Długość ekspozycji	Emulsja	Wywołanie
4401	II.18	SY Eri	9^{31} – 9^{51}	20^{m}	103a-F	D19 4^{m},5 18°C
4402	"	TT Tau	10^{35} – 10^{50} 10^{50} – 10^{55}	15^{m} 5^{m}	"	" " "
4403	II.17	X Cnc	14^{28} – 14^{43}	15^{m}	103a-F	D19 4^{m},5 18°C
4404	II.26	SY Eri	14^{43} – 14^{48} 6^{47} – 7^{07}	5^{m} 20^{m}	~ "	D19 5,0 19°C
4405	II.26	HŽ Cas	7^{30} – 7^{45}	15^{m}	"	" " "
4406	III.3	SY Eri	6^{30} – 6^{40}	10^{m}	"	D19 4^{m},5 20°
4407	"	— " —	6^{44} – 6^{49}	5^{m}	"	" " "
4408	"	TT Tau	7^{00} – 7^{12}	7^{m}	"	" " "
4409	"	— " —	7^{24} – 7^{34}	10^{m}	"	" " "
4410	"	HZ Cas	7^{35} – 7^{53}	8^{m}	"	" " "
4411	II.26	X Cnc	10^{40} – 10^{50}	10^{m}	"	" " "
4412	III.09	HŽ Cas	7^{25} – 7^{28} 7^{28} – 7^{33} 7^{33} – 7^{34}	3^{m} 5^{m} 1^{m}	"	D19 5,0 19°C
4413	"	SY Eri	7^{50} – 7^{53} 7^{53} – 7^{54}	3^{m} 1^{m}		" " "
4414	III.12	SY Eri	6^{30} – 6^{45} 6^{45} – 6^{52}	15^{m} 7^{m}	103a-F	D19 5,0 18°C
4415	"	TT Tau	7^{05} – 7^{20}	15^{m}	"	" " "
4416	III.11	X Cnc	10^{51} – 10^{57} 10^{57} – 10^{59} 10^{58} – 11^{01}	6^{m} 2^{m} 2^{m}	"	D19 4,5 19°C
4417	III.19	SY Eri	6^{44} – 7^{04} 7^{04} – 7^{14}	20^{m} 10^{m}	103a-F	D19 4^{m},5 19°C
4418	"	HŽ Cas	7^{30} – 7^{50} 7^{50} – 8^{00}	20^{m} 10^{m}	"	" " "
4419	"	HŽ Cas	8^{07} – 8^{22}	15^{m}	"	" " "

Ognisko	Pomocnicze przyrządy	Nawiąz.	Pogoda	Obserwator	Uwagi
	filtr żółty, siatka		$P_1 W_2$	LZ	
	" " "		$P_3 U_2$	"	chmury
	filtr żółty, siatka		$P_3 W_2$	LZ	zegar!
	filtr żółty + siatka		$P_2 U_2$	JK	zegar!!!
	" "		"	"	
	filtr żółty		$P_2 W_3$	JK, LZ	P
	— " — " —		"	"	
	— " — " —		"	"	} koniec
	— " — " —		"	"	
	— " — " —		"	"	
	filtr żółty, siatka		$P_2 U_2$	JK	chmury, P
	filtr żółty		$P_4 U_4$	JK	} chmury
	"		"	"	zegar!!!
	filtr żółty + siatka		$P_2 U_2$	JK	zegar!!!
	" "		$P_0 U_1$	"	Chmury
	filtr żółty		$P_4 U_3$	LZ	chmury
	filtr żółty + siatka		$P_0 U_0$	JK	
	" "		"	"	
	" "		"	"	

Draper Telescope, 1964

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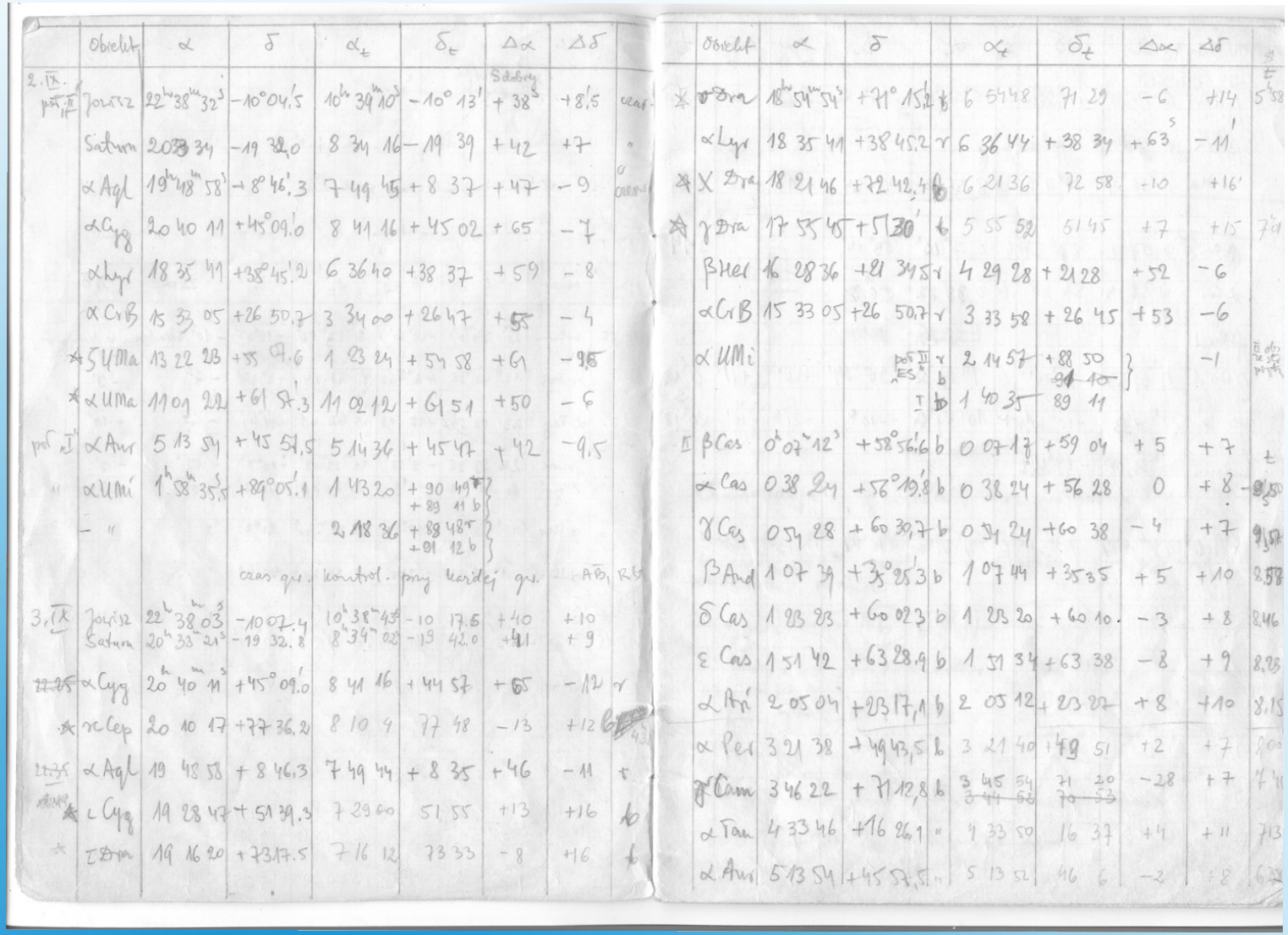
Observation log



	Obiekt	α	δ	α_t	δ_t	Δα	Δδ	
2.IX.	Jowisz	$22^h38^m32^s$	−10°04.5	$10^h39^m10^s$	−10° 13′	Sdobry +38	+8.5	czas
	Saturn	20 33 34	−19 32.0	8 34 16	−19 39	+42	+7	"
	α Aql	$19^h48^m58^s$	−8° 46′.3	7 49 45	+8 37	+47	−9	"
	α Cyg	20 40 11	+45°09.0	8 41 16	+45 02	+65	−7	
	α Lyr	18 35 41	+38°45.2	6 36 40	+38 37	+59	−8	
	α CrB	15 33 05	+26 50.7	3 34 00	+26 47	+55	−4	
☆	54 Ma	13 22 28	+55 9.6	1 23 24	+54 58	+61	−9.5	
☆	α UMa	11 01 22	+61 51.3	11 02 12	+61 51	+50	−6	
pos I	α Aur	5 13 54	+45 51.5	5 14 36	+45 47	+42	−9.5	
"	α UMi	$1^h58^m35^s$.5	+89°05.1	1 43 20	+90 49 / +89 11 b			
– "				2 18 36	+88 48 / +91 12 b			
				czas gw.	kontrol.	przy kierdej gw.		AB₁ RS
3.IX	Jowisz	$22^h38^m03^s$	−10 07.4	$10^h38^m43^s$	−10 17.6	+40	+10	
	Saturn	$20^h33^m21^s$	−19 32.8	$8^h34^m02^s$	−19 42.0	+41	+9	
22.25	α Cyg	$20^h40^m11^s$	+45°09.0	8 41 16	+44 57	+65	−12	r
☆	κ Cep	20 10 17	+77 36.2	8 10 4	77 48	−13	+12	
22.35	α Aql	19 48 58	+8 46.3	7 49 44	+8 35	+46	−11	t
☆	ι Cyg	19 28 47	+51 39.3	7 29 00	51 55	+13	+16	b
☆	ι Dra	19 16 20	+73 17.5	7 16 12	73 33	−8	+16	b

	Obiekt	α	δ		α_t	δ_t	Δα	Δδ	
☆	κ Dra	$18^h54^m54^s$	+71° 15.2	b	6 54 48	71 29	−6	+14	5^h58^m
	α Lyr	18 35 41	+38 45.2	r	6 36 44	+38 34	+63	−11′	
☆	χ Dra	18 21 46	+72 42.4	b	6 21 36	72 58	+10	+16′	
☆	γ Dra	17 55 45	+51 30′	b	5 55 52	51 45	+7	+15	7′21
	β Her	16 28 36	+21 34.5	r	4 29 28	+21 28	+52	−6	
	α CrB	15 33 05	+26 50.7	r	3 33 58	+26 45	+53	−6	
	α UMi		pos II ES*	r	2 14 57	+88 50 / ~~91 10~~		−1	
				b					
			I	b	1 40 35	89 11			
☆	β Cas	$0^h07^m12^s$	+58°56.6	b	0 07 17	+59 04	+5	+7	t
	α Cas	0 38 24	+56°19.8	b	0 38 24	+56 28	0	+8	
	γ Cas	0 54 28	+60 30.7	b	0 54 24	+60 38	−4	+7	
	β And	1 07 39	+35°25′3	b	1 07 44	+35 35	+5	+10	
	δ Cas	1 23 23	+60 02.3	b	1 23 20	+60 10	−3	+8	
	ε Cas	1 51 42	+63 28.9	b	1 51 34	+63 38	−8	+9	
	α And	2 05 04	+28 17.1	b	2 05 12	+28 27	+8	+10	
	α Per	3 21 38	+49 43.5	b	3 21 40	+49 51	+2	+7	
	γ Cam	3 46 22	+71 12.8	b	3 45 54 / ~~3 44 58~~	71 20 / ~~70 53~~	−28	+7	
	α Tau	4 33 46	+16 26.1	"	4 33 50	16 37	+4	+11	
	α Aur	5 13 54	+45 51.5	"	5 13 52	46 6	−2	+8	

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Observation logs

Draper Telescope (glass plate: 1949 - 1990)

Schmitd-Cassegrain Telescope
(glass plate:1949 - 1993)

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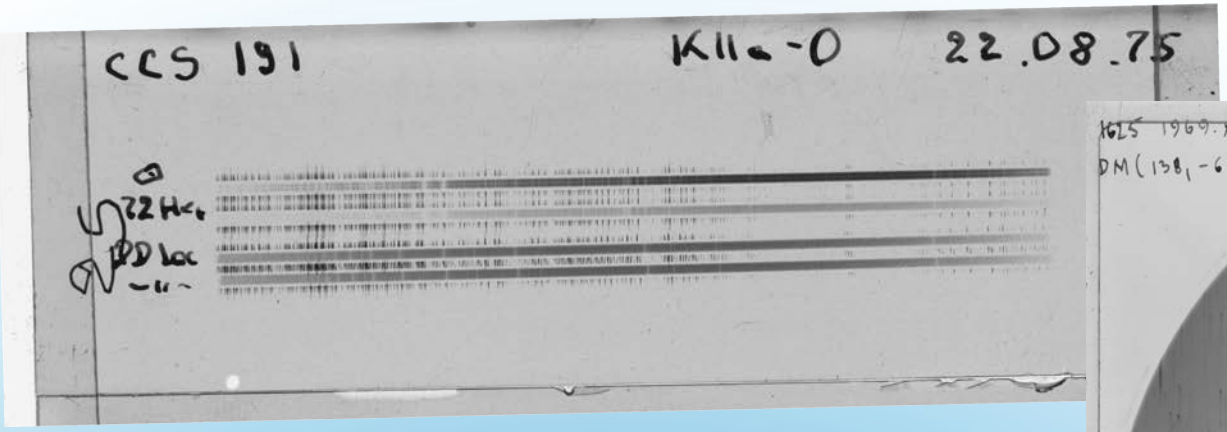
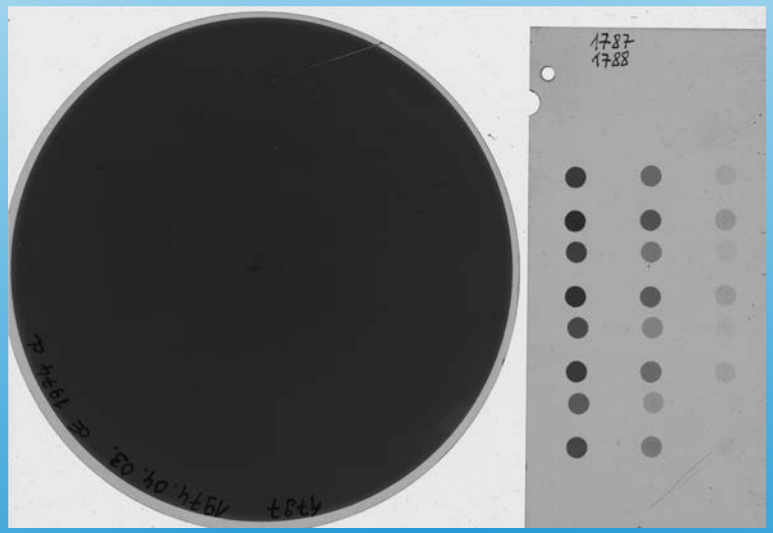
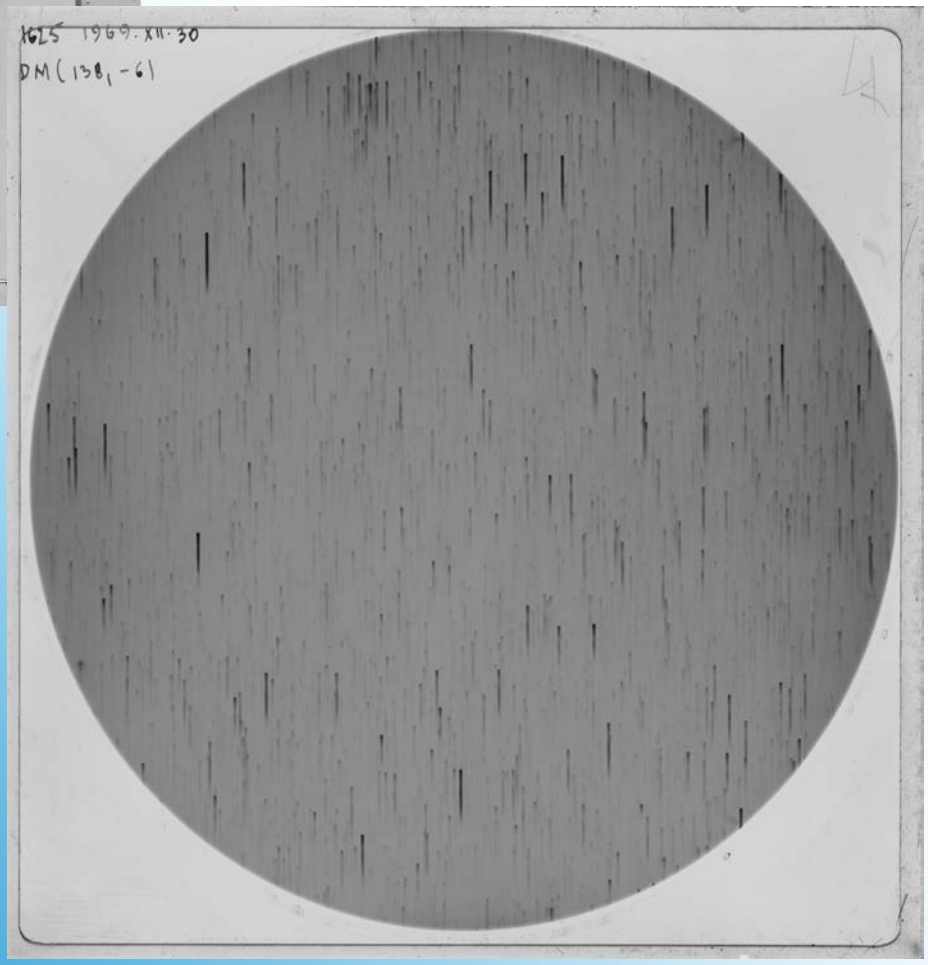
Observations



Schmidt-Cassegrain Telescope (+prism) spectrum, 1975



Schmidt camera, 1974



Schmidt-Cassegrain Telescope (+prism) spectrum, 1969

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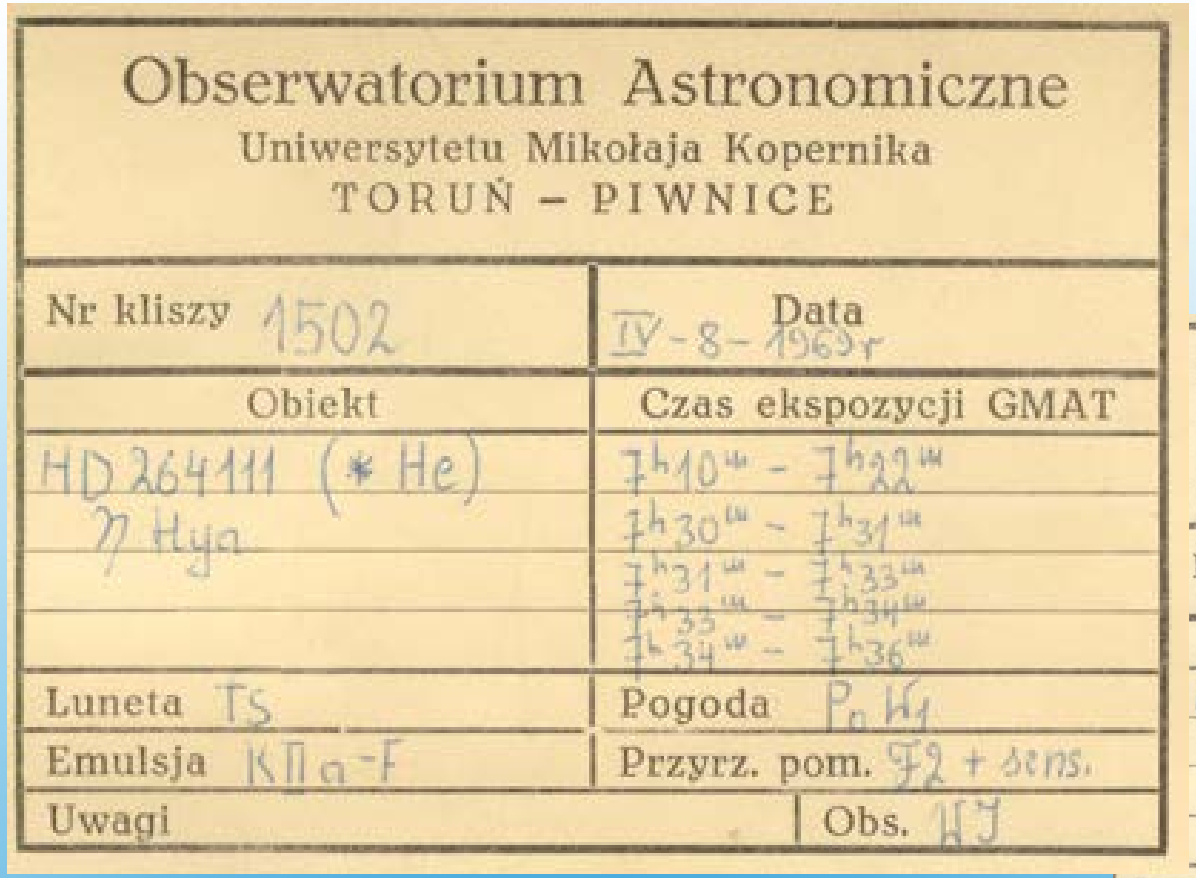
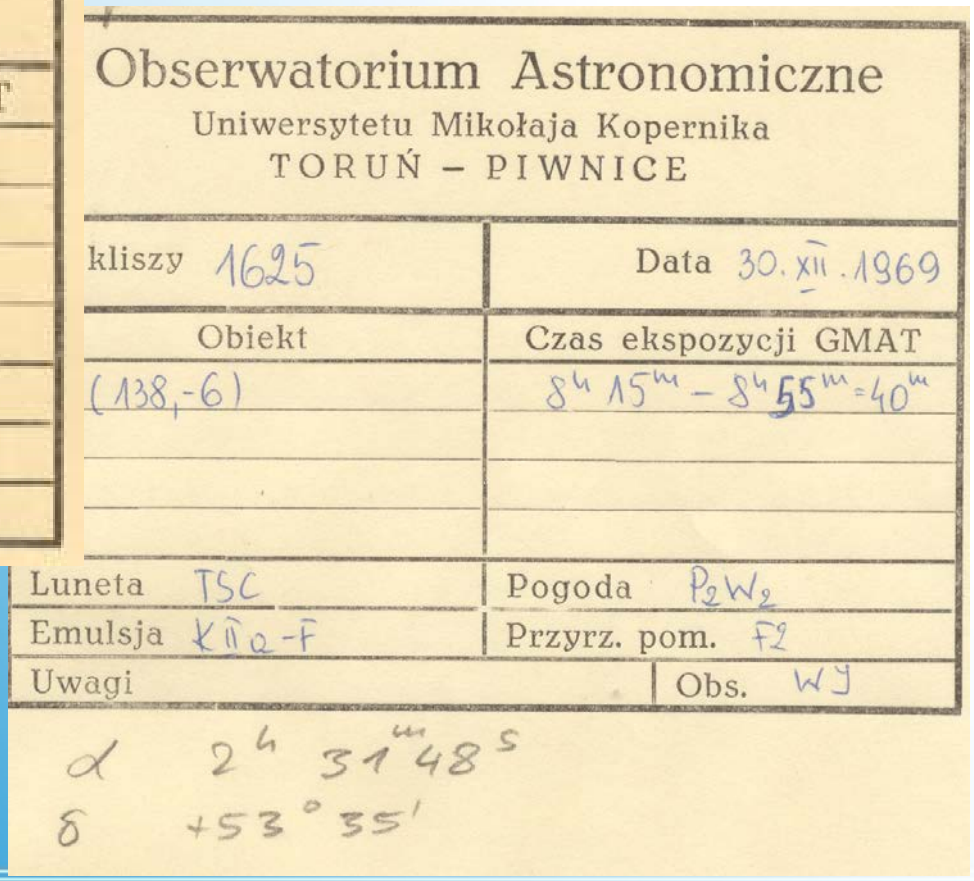
12 000 glass plates



Obserwatorium Astronomiczne
Uniwersytetu Mikołaja Kopernika
TORUŃ – PIWNICE

Nr kliszy 1502	Data IV-8-1969 r
Obiekt	Czas ekspozycji GMAT
HD 264111 (* He) 77 Hya	$7^h10^m - 7^h22^m$ $7^h30^m - 7^h31^m$ $7^h31^m - 7^h33^m$ $7^h33^m - 7^h34^m$ $7^h34^m - 7^h36^m$
Luneta TS	Pogoda $P_0 W_1$
Emulsja KIIa-F	Przyrz. pom. F2 + sens.
Uwagi	Obs. WJ



Obserwatorium Astronomiczne
Uniwersytetu Mikołaja Kopernika
TORUŃ – PIWNICE

kliszy 1625	Data 30.XII.1969
Obiekt	Czas ekspozycji GMAT
(138,-6)	$8^h15^m - 8^h55^m = 40^m$
Luneta TSC	Pogoda $P_2 W_2$
Emulsja KIIa-F	Przyrz. pom. F2
Uwagi	Obs. WJ

α $2^h31^m48^s$
δ $+53^\circ35'$

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Plates were stored in paper sleeves

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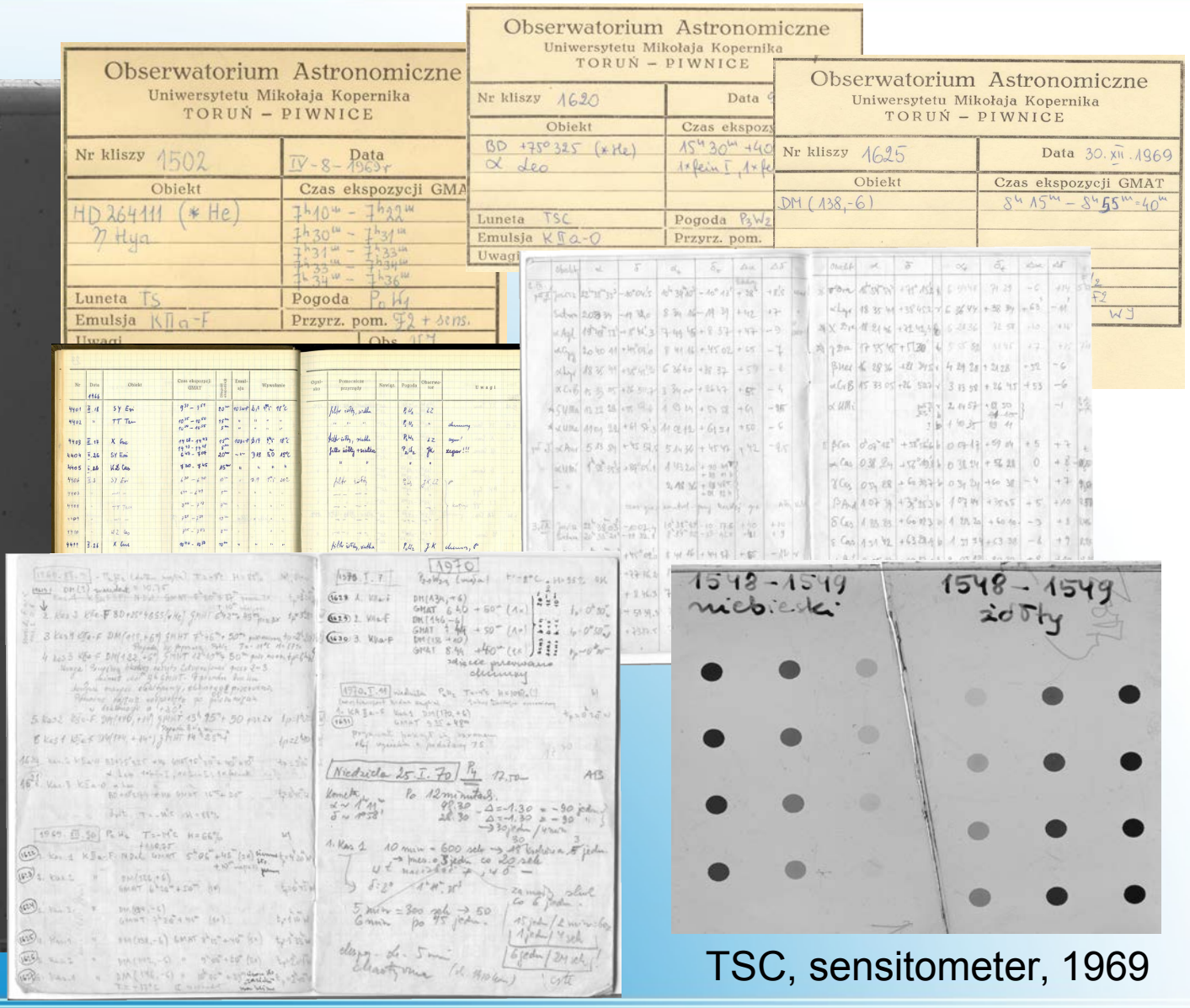
1949 – 1993, The glass plates collection at Toruń Centre for Astronomy

Draper Telescope, 1974, comet



TSC, sensitometer, 1969

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What we have...

plates
logs
sleeves

```
SIMPLE  =                    T / Fits standard
BITPIX  =                  -32 / Bits per pixel
NAXIS   =                    3 / Number of axes
NAXIS1  =                 2048 / Axis length
NAXIS2  =                 2048 / Axis length
NAXIS3  =                    1 / Axis length
EXTEND  =                    T / File may contain extensions
ORIGIN  = 'NOAO-IRAF FITS Image Kernel July 2003' /
FITS file originator       DATE    = '2016-07-10T10:34:11' /
Date FITS file was generated
IRAF-TLM= '2016-07-10T11:33:57' / Time of last modification
COMMENT   FITS (Flexible Image Transport System) format
is defined in 'Astronomy
COMMENT   and Astrophysics', volume 376, page 359;
bibcode: 2001A&A...376..359H
HEAD    = 'DZ936_BV'           / Head model
ACQMODE = 'Single Scan'        / Acquisition mode
READMODE= 'Image    '          / Readout mode
IMGRECT = '1, 2048, 2048, 1'   / Image format
HBIN    =                    1 / Horizontal binning
VBIN    =                    1 / Vertical binning
SUBRECT = '1, 2048, 2048, 1'   / Subimage format
XTYPE   = 'Pixel number'       / Calibration type
XUNIT   =                    0 / Calibration units
RAYWAVE =                422. / Rayleigh Wavelength
CALBWVNM=                    1 / Wave calibration
TRIGGER = 'Internal'           / Trigger mode
```

```
CALIB   = '0,1,0,0 '           / Calibration
DLLVER  = '4.23.30003.0'       / Software Version
EXPOSURE=                300. / Total Exposure Time
TEMP    =                -85. / Temperature
READTIME=             1.0E-06 / Pixel readout time
OPERATN =                    0 / Type of system
EMREALGN=                    0 / EM Real Gain
VCLKAMP =                    0 / Vertical Clock Amplitude
VSHIFT  =           3.855E-05 / Vertical Shift Speed
PREAMP  =                   4. / Pre Amplifier Gain
SERNO   =                15685 / Serial Number
UNSTTEMP=                -999. / Unstabilized Temperature
BLCLAMP =                    F / Baseline Clamp
PRECAN  =                    0 / Prescans
FLIPX   =                    0 / Horizontally Flipped
FLIPY   =                    0 / Vertically Flipped
CNTCVTMD=                    0 / Count Convert Mode
CNTCVT  =                    0 / Count Convert
DTNWLGTH=                550. / Detection Wavelength
SNTVTY  =                   0. / Sensitivity
SPSNFLTR=                    0 / Spurious Noise Filter Mode
THRSHLD =                   0. / Threshold
PCNTENLD=                    0 / Photon Counting Enabled
NSETHSLD=                    0 / Number of Photon Counting Th
PTNTHLD1=                   0. / Photon Counting Threshold 1
PTNTHLD2=                   0. / Photon Counting Threshold 2
PTNTHLD3=                   0. / Photon Counting Threshold 3
```

What we want to have...

Example of metadata

- FITS format
- metadata
- verification (record of skies, metadata)
- standards in astronomy
- Repositories:
  International Virtual Observatory Alliance
  http://ivoa.net
  The European Virtual Observatory EURO-VO
  http://www.euro-vo.org,
  Polish Virtual Observatory https://astrogrid-pl.org/vo
- Administrations of the project, preservation of material

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Work in progress

Explore
Our Science

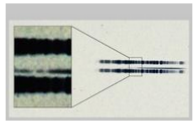
ASTRONOMY | EARTH & PLANETARY SCIENCE | GENETICS & DEVELOPMENTAL BIOLOGY | GLOBAL ECOLOGY | MATTER AT EXTREME STATES | PLANT SCIENCE | SCIENCE EDUCATION

You Are Exploring

1917 ASTRONOMICAL PLATE HAS FIRST-EVER EVIDENCE OF EXOPLANETARY SYSTEM

- Press Releases
- Carnegie News
- Publications/Permissions
- Media Coverage
- Multimedia (video and audio)
- Media Contacts
- Expert Listing
- Yearbooks
- Carnegie Newsletter
- Carnegie Legacy Project
- Image Database

Tuesday, April 12, 2016



Pasadena, CA— You can never predict what treasure might be hiding in your own basement. We didn't know it a year ago, but it turns out that a 1917 image on an astronomical glass plate from our Carnegie Observatories' collection shows the first-ever evidence of a planetary system beyond our own Sun. This unexpected find was recognized in the process of researching an article about planetary systems surrounding white dwarf stars in *New Astronomy Reviews*.

Here's what happened: about a year ago, the review's author, Jay Farihi of University College London, contacted our Observatories' Director, John Mulchaey. He was looking for a plate in the Carnegie archive that contained a spectrum of van Maanen's star, a white dwarf discovered by Dutch-American astronomer Adriaan van Maanen in the very year our own plate was made.

Stellar spectra are recordings of the light emitted by distant stars. Spectra spread out all of the component colors of light, like a rainbow from a prism, and the chemical composition. They can also tell them how the light e of the things it passes through before reaching us on Earth.

Stellar spectra images allowed 19th century astronomers to still used today. Modern astronomers use digital tools to imag glass photographic plates both to take images of the sky, and

As requested, the Observatories located the 1917 plate, mac Adams at Mount Wilson Observatory, which was then part of plate's sleeve indicating that the star looked a bit warmer tha ordinary.

However, when Farihi examined the spectrum, he found some

Credit: carnegiescience.edu
arxiv.org/abs/1604.03092
jstor.org/stable/40711478

Jay Farihi
London University

The historical records were supplied by Carnegie Observatories, who maintains the Mt. Wilson archives

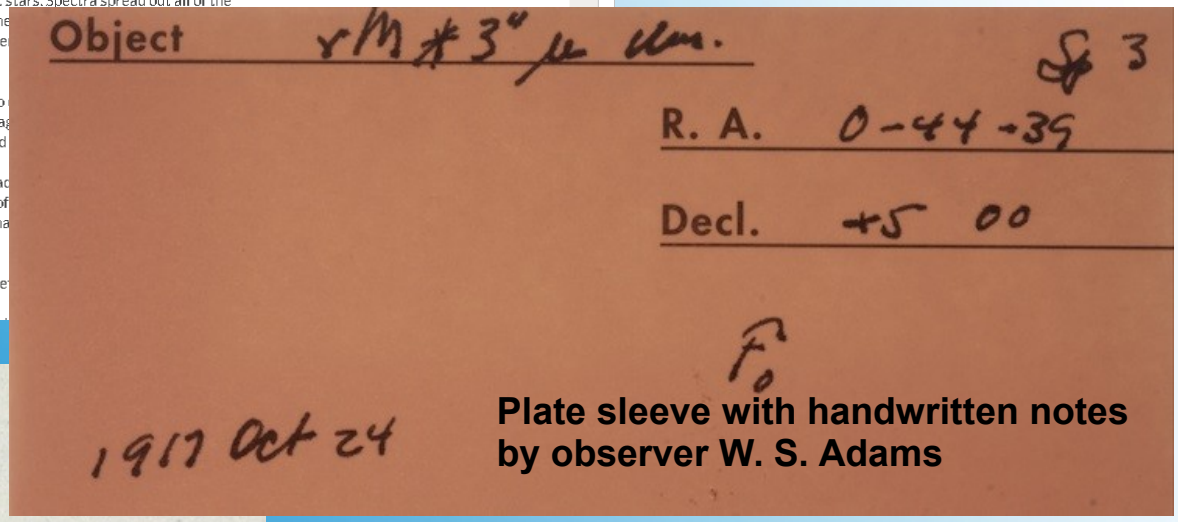
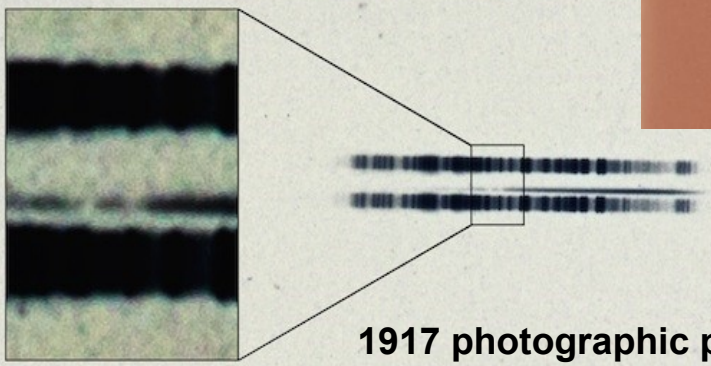


Plate sleeve with handwritten notes by observer W. S. Adams



1917 photographic plate spectrum of van Maanen star

Is it worth to do?

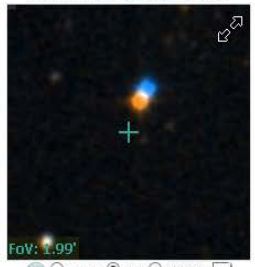
Basic data :

Wolf 28 -- White Dwarf

Other object types:	* (AC,ASCC,...), PM* (Ci,G,...), WD* (EGGR,LAWD,...), IR (2MASS)
ICRS coord. *(ep=J2000)* :	00 49 09.90175 +05 23 19.0117 (Optical) [46.32 28.06 90] A 2007A&A...474..653V
FK5 coord. *(ep=J2000 eq=2000)* :	00 49 09.902 +05 23 19.01 [46.32 28.06 90]
FK4 coord. *(ep=B1950 eq=1950)* :	00 46 30.72 +05 09 13.9 [264.49 165.61 0]
Gal coord. *(ep=J2000)* :	121.8796 -57.4785 [46.32 28.06 90]
Proper motions *mas/yr* :	1236.90 -2709.19 [5.26 3.18 0] A 2007A&A...474..653V
Radial velocity / Redshift / cz :	V(km/s) 263.00 [4.9] / z(~) 0.000878 [0.000016] / cz 263.12 [4.90] C 2006AstL...32..759G
Parallaxes *(mas)*:	234.60 [5.90] A 2007A&A...474..653V
Spectral type:	DZ7.5 C 1993PASP..105..761W
Fluxes (8) :	U 12.984 [~] C 2010MNRAS.403.1949K B 12.92 [~] C 2010MNRAS.403.1949K V 12.374 [~] C 2010MNRAS.403.1949K R 12.106 [~] C 2010MNRAS.403.1949K I 11.854 [~] C 2010MNRAS.403.1949K J 11.688 [0.022] C 2003yCat.2246....0C H 11.572 [0.024] C 2003yCat.2246....0C K 11.498 [0.025] C 2003yCat.2246....0C

SIMBAD query around with radius 2 arcmin

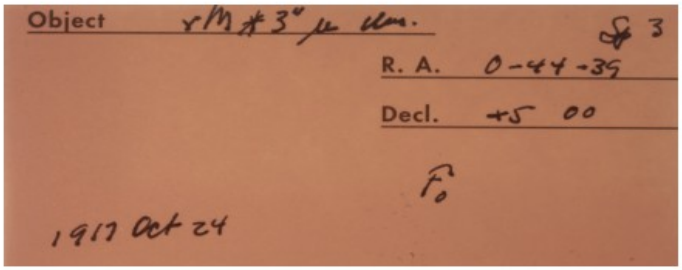
Interactive AladinLite view

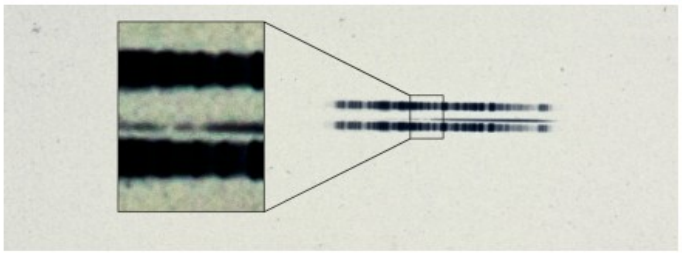


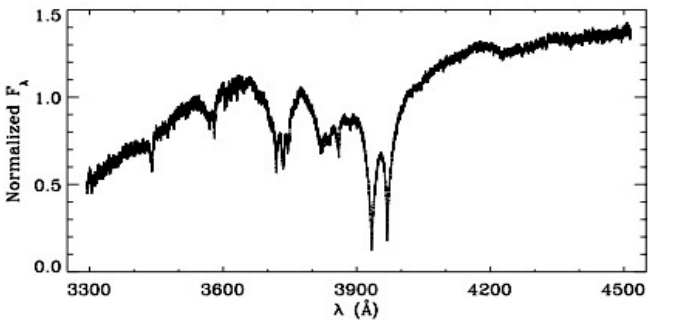
VizieR photometry viewer

Search within radius Max 30 arcsec

Credit:
simbad.u-strasbg.fr/simbad
arxiv.org/abs/1604.03092







arXiv.org > astro-ph > arXiv:1604.03092

Astrophysics > Earth and Planetary Astrophysics

Circumstellar Debris and Pollution at White Dwarf Stars

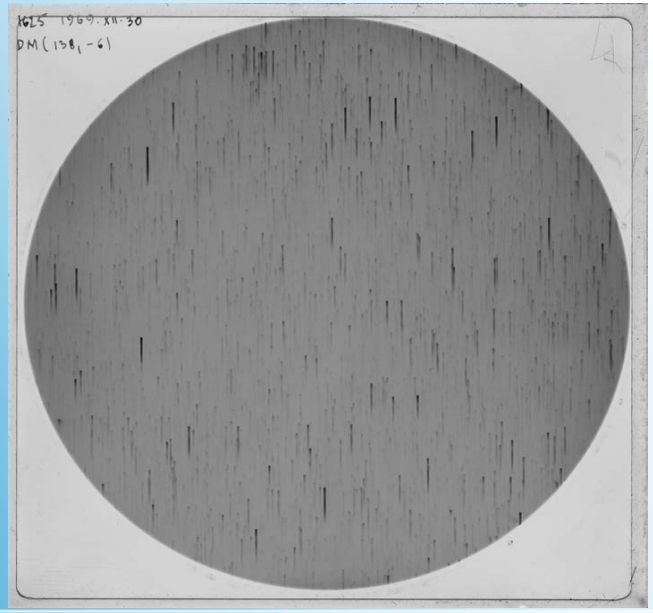
J. Farihi

(Submitted on 11 Apr 2016)

Circumstellar disks of planetary debris are now known or suspected to closely orbit hundreds of white dwa
support disks that are entirely contained within the preceding giant stellar radii, and hence must have bee
This picture is strengthened by the signature of material falling onto the pristine stellar surfaces; disks are
heavy elements. The physical link between this debris and the white dwarf host abundances enables unic
extrasolar planetary systems via their remnants. This review summarizes the body of evidence supporting
large fraction of all white dwarfs, the remnants of first generation, main-sequence planetary systems, and
well as long-term dynamics and evolution.

New and archive data gives new results

The online repository of raw astronomical data



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Is there a place here for a library?

Project team

- Michał Hanasz, prof. dr hab. – project manager, Toruń Centre for Astronomy (TCfA)
- Dominik Wóltański, PhD – astronomer at TCfA, member of AstroGrid.pl team
- Bogdan Wikierski, M.Sc. – observer, technician at TCfA
- PhD students from TCfA
- Bożena Bednarek-Michalska, M.Sc. – project manager, Library
- Liliana Lewandowska, PhD – Library, project administration
- Barbara Wojdyła, M.Sc. – Library – conservation
- Elżbieta Milkiewicz, M.Sc. – Library – preservation
- Karolina Zawada, PhD – Library – project promotion

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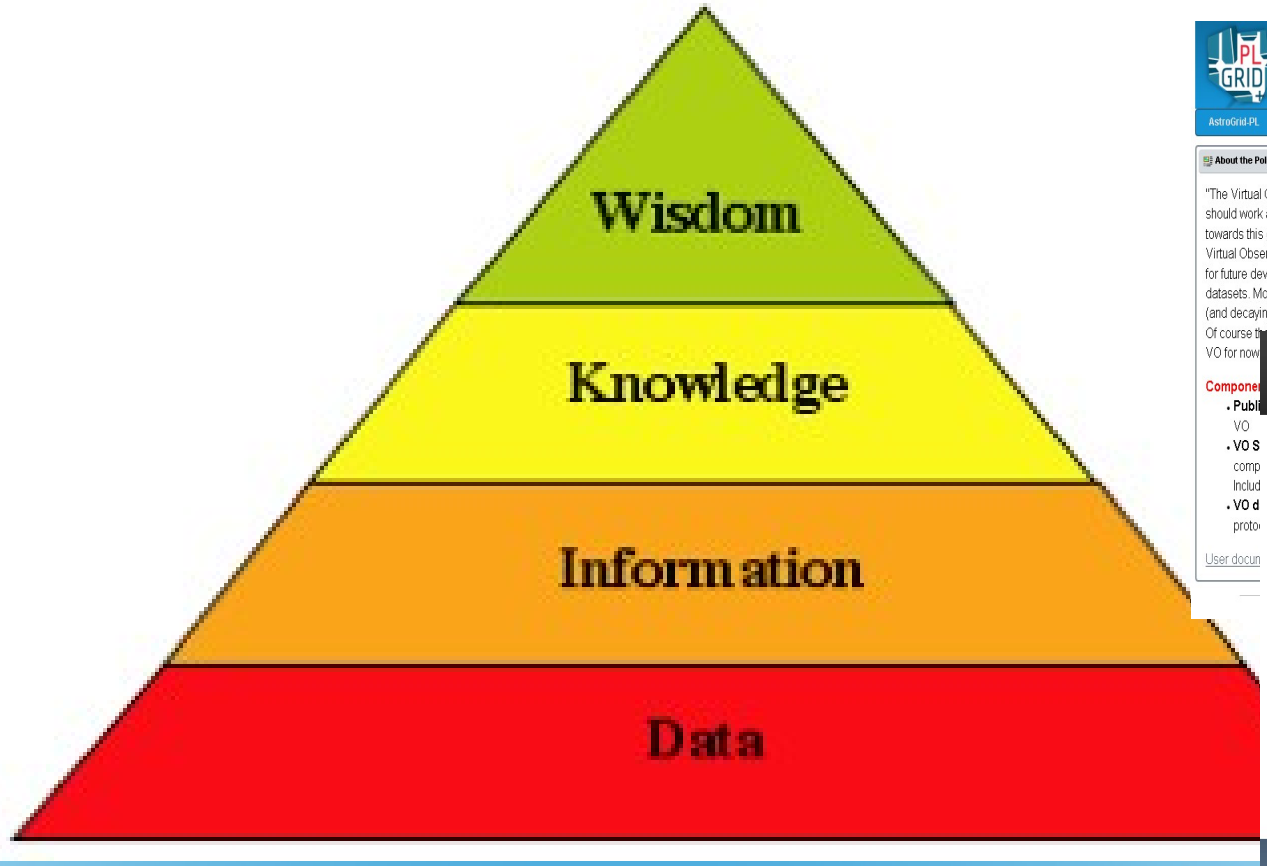

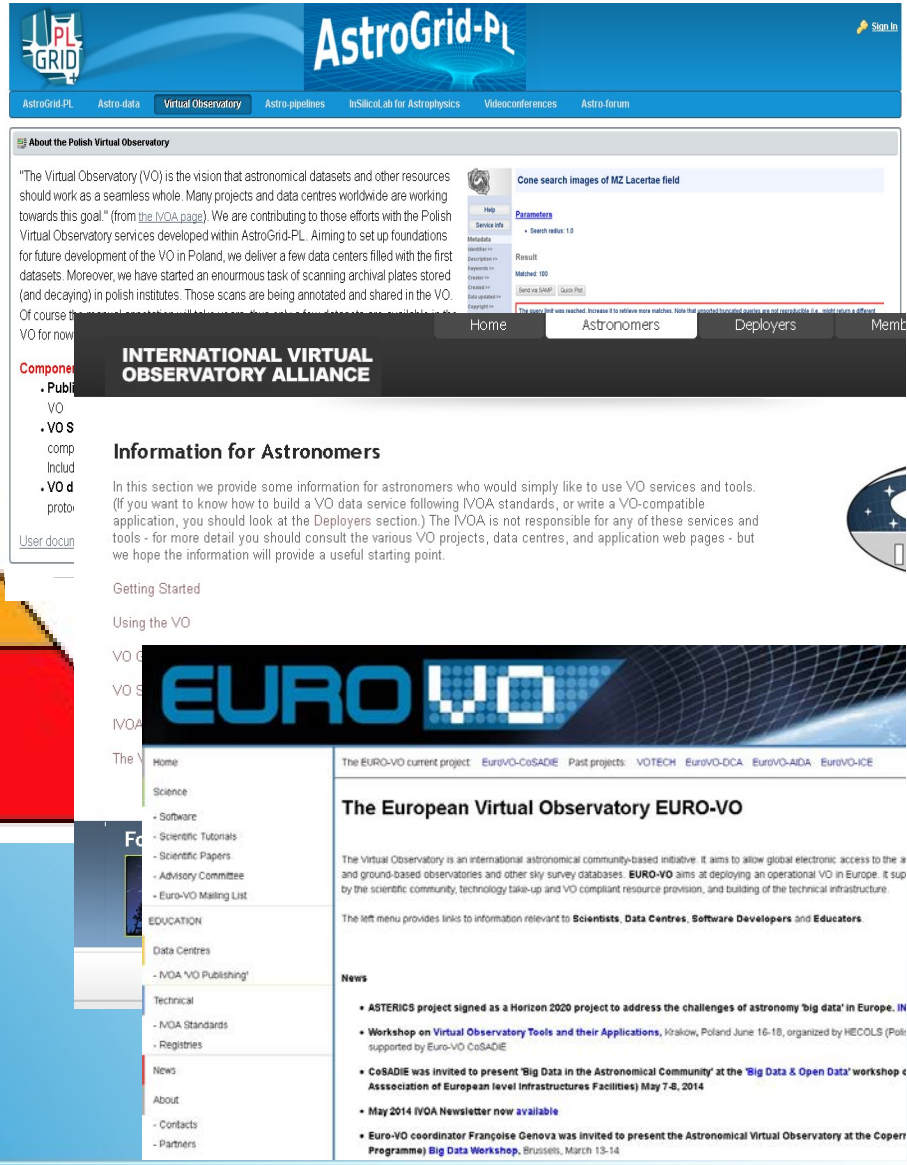

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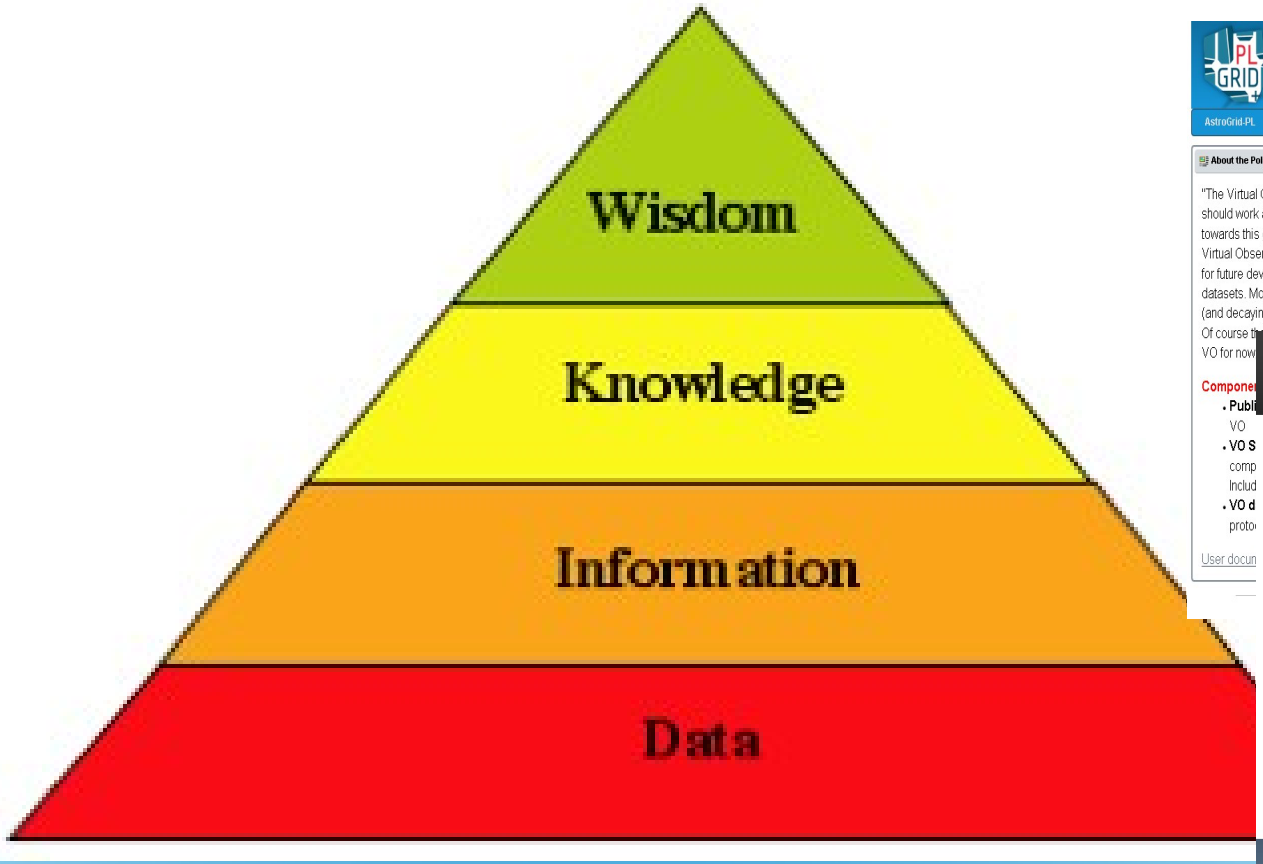

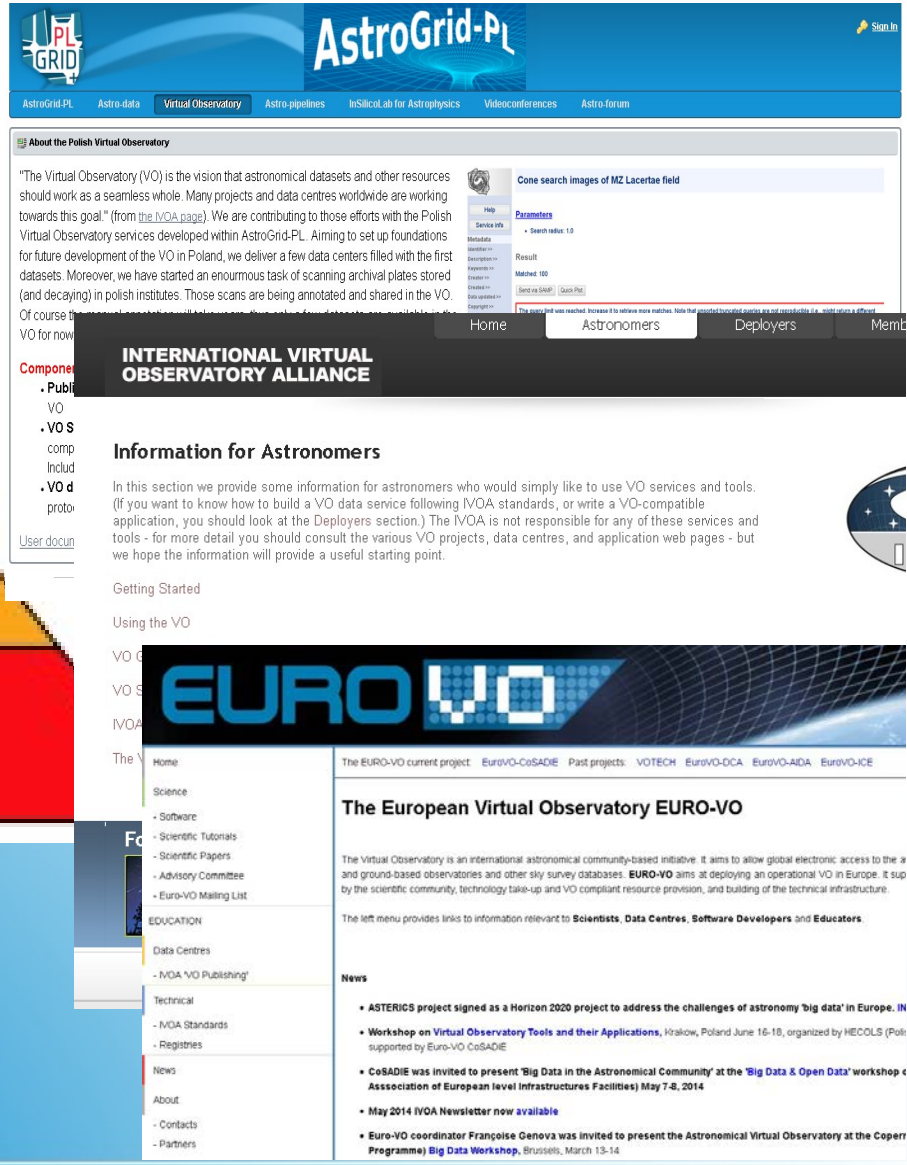

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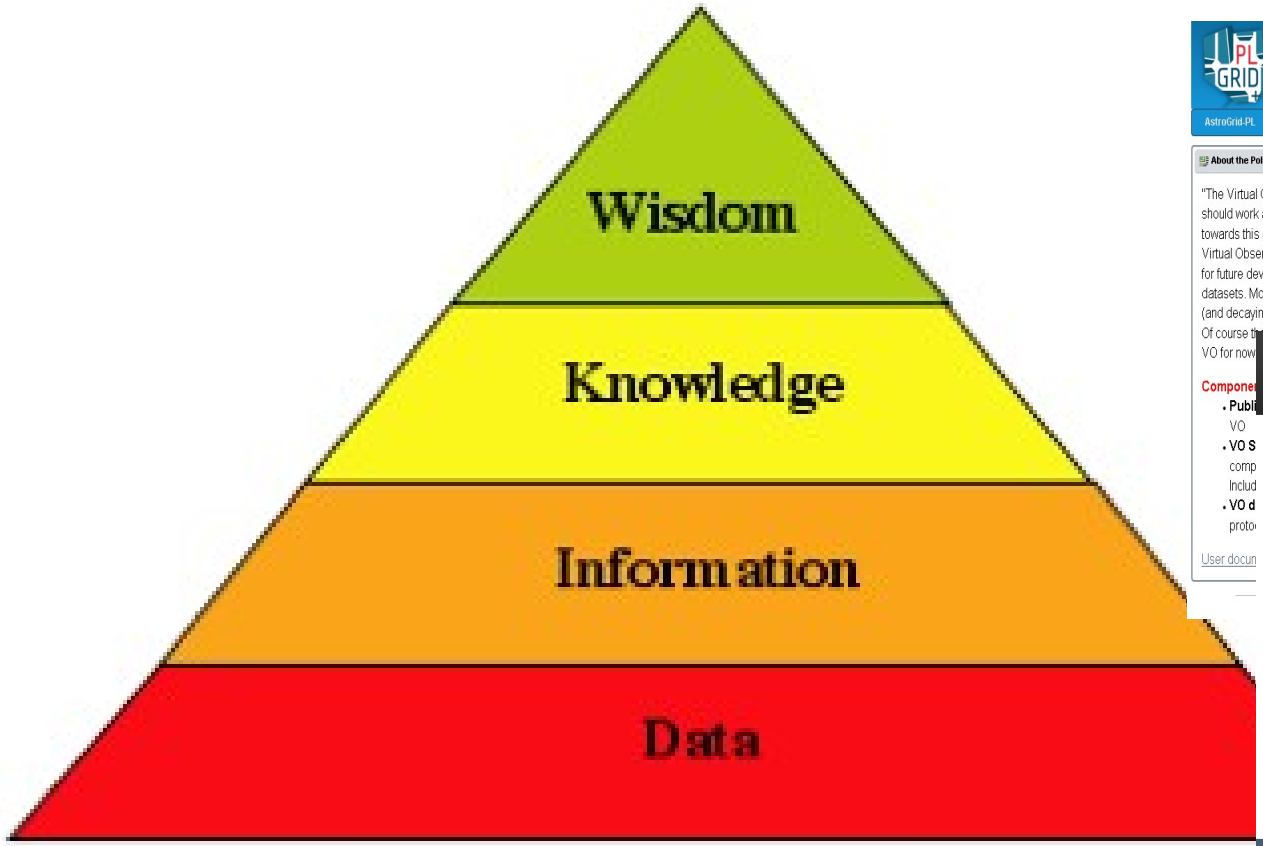

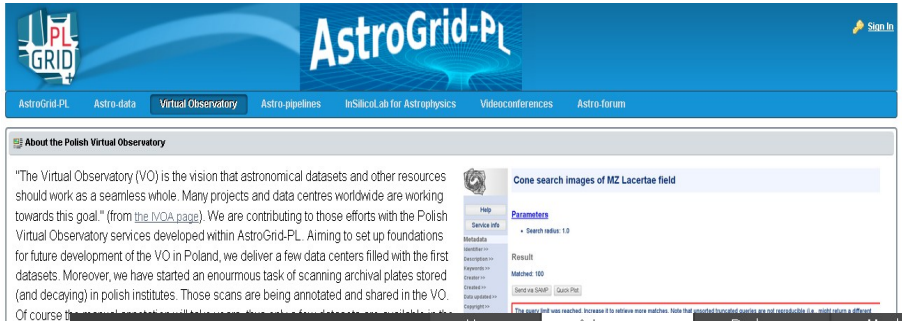

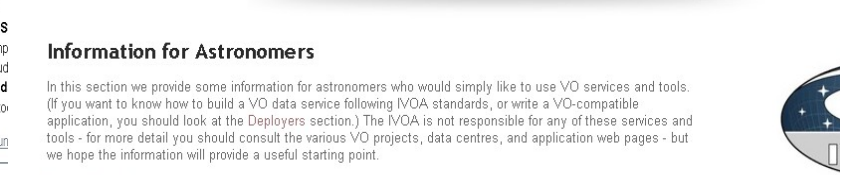

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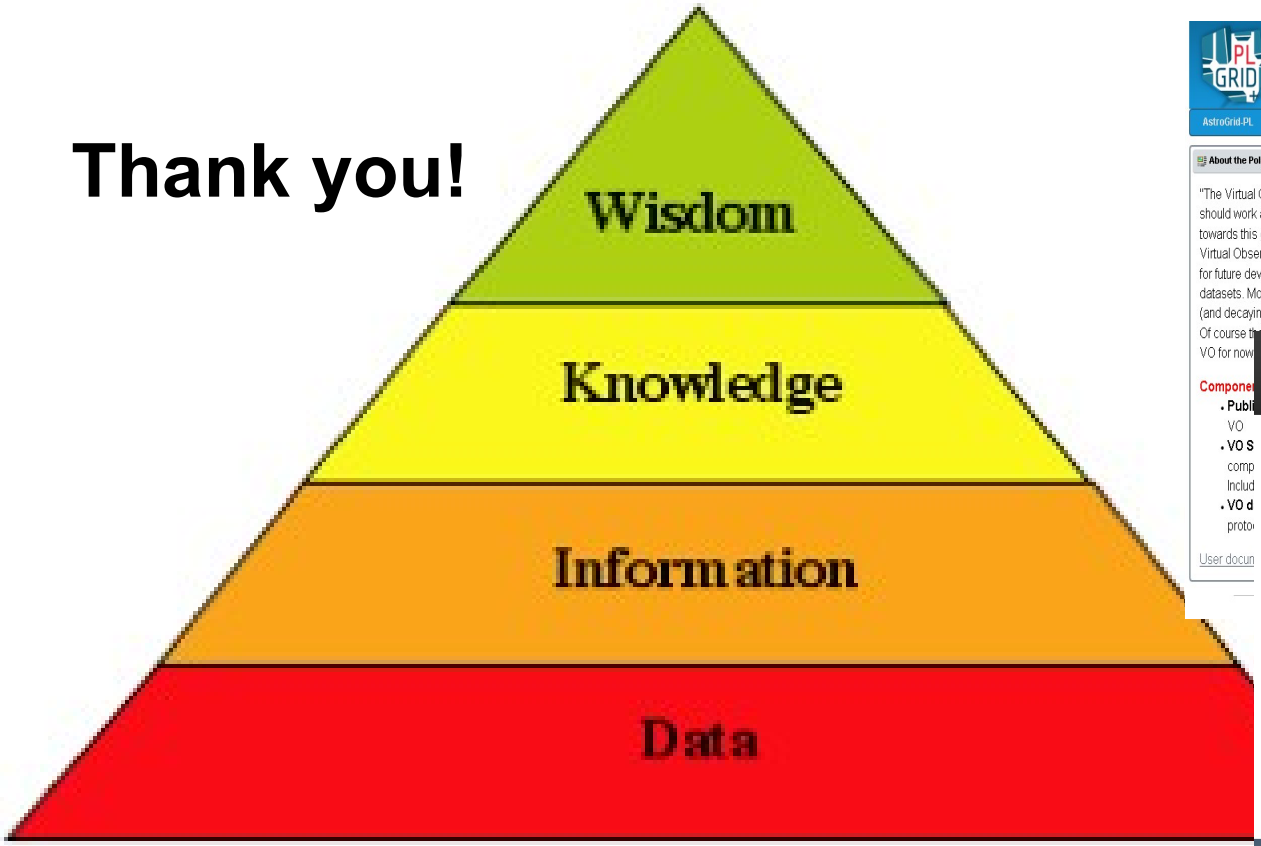
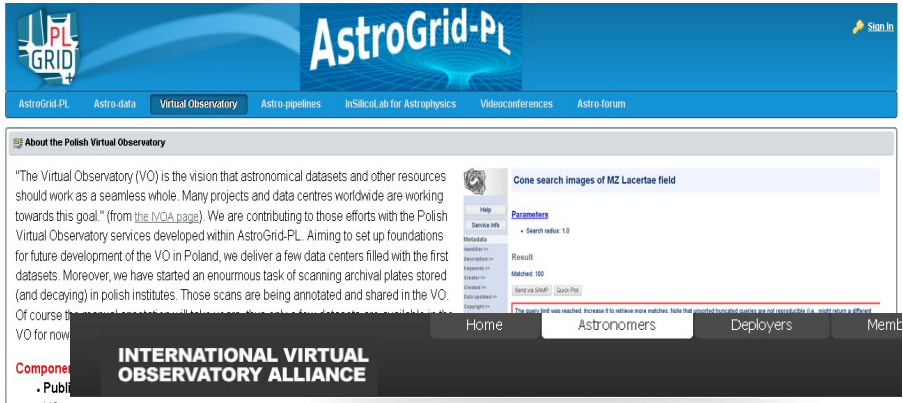
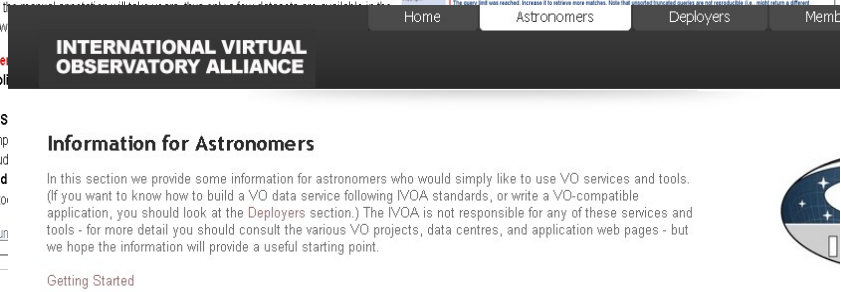
Thank you!







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