On the “Solar system small bodies” astroplate project of the Ukrainian Virtual Observatory

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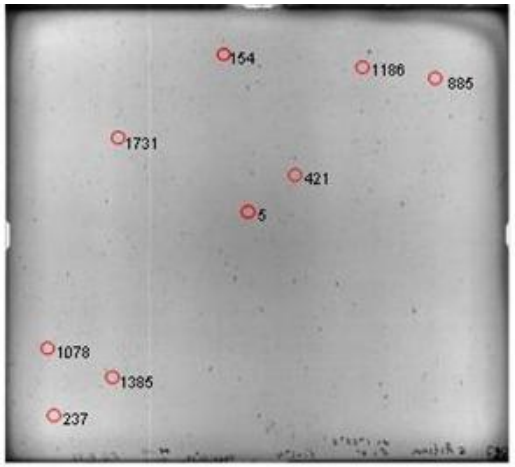
A new approach for creation of the catalogs of astrometric and photometric characteristics of small bodies of the Solar system

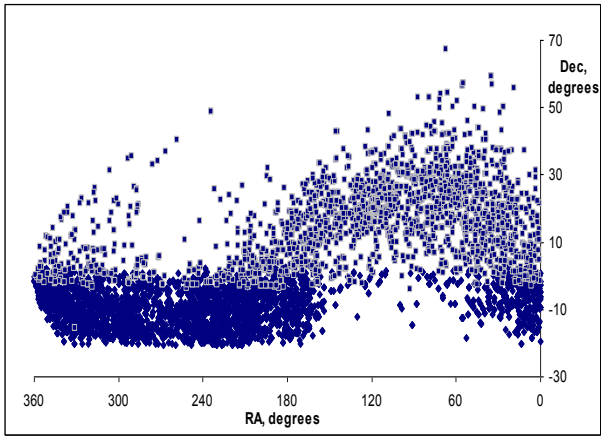
We obtained from digitized photographic observations of the UkrVO Joint Digital Archive and newest digitized data processing services:

- **Catalogs of coordinates and magnitudes of asteroids**
- **Catalog of positions and B-values of Pluto**
- **Catalogs of the satellites of Saturn, Jupiter, Uranus, and Neptune**

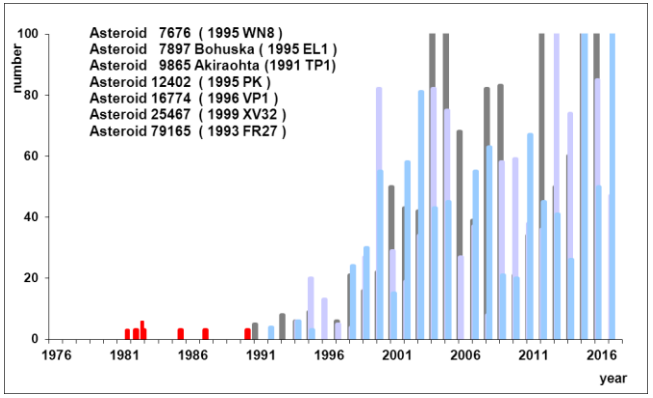
Catalogs of coordinates and magnitudes of asteroids



Images of 9 asteroids on scan of the plate GUA040C000887B



Distribution of coordinates RA, Dec of 4591 identified asteroids from Kitab part (dark points) and 2292 asteroids from Kyiv part (light points) of the FON project



Time distribution of global observations of 7 asteroids according to MPC (http://www.minorplanetcenter.net) in comparison with observations of these asteroids from FON-Kyiv, FON -Kitab (red markers)

Survey	Number of plates	Number of identified asteroids/ comets	Number of identified positions of asteroids that have no other observations earlier 1981-1996
FON-Kyiv (1981-1994)	2260	2282/10	10
FON-Kitab (1981-1989)	2000	4589/2	~280
Baldone (1967-1996)	152	87/2	12

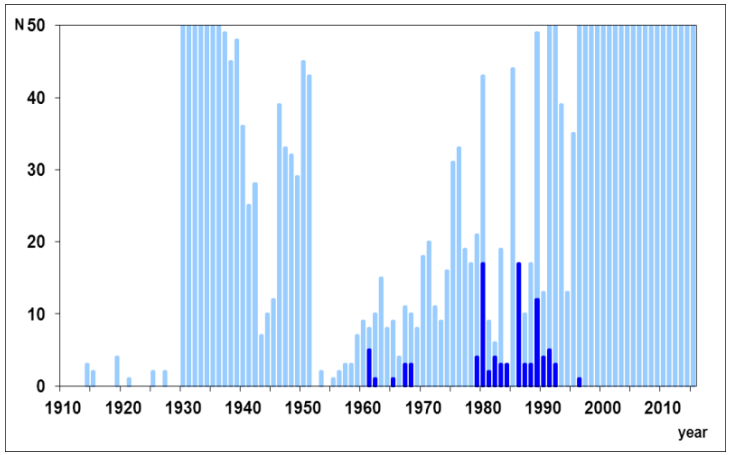
Numbers of identified positions of asteroids and comets in catalogues

Catalog of 90 positions and B-values of Pluto from digitized photographic observations from the collections of UkrVO

Code according Marsden's list	Telescope D/F (cm)	Location	Size of plate (cm)	Scale of image ("/mm)	Scale of scan ("/px)	Number of plates (positions)	Period of observation
083	Double Long Focus Astrograph DLA, 40/550	MAO NASU (Goloseevo, Kyiv)	24 x24	38	0.79	4 (5)	1961-1984
083	Double Wide Angle Astrograph DWA, 40/200	MAO NASU (Goloseevo, Kyiv)	30 x30	10 3	2,17	29 (37)	1979-1992
085	Double Astrograph Merts-Repsold DAMR, 20/426	AO Kyiv Shevchenko National University	16 x16	48	1,06	24 (28)	1986-1990
585	Astronomical Mirror Telescope AZT-8, 70/280	AO Kyiv Shevchenko National University (Lisnyky)	13 x13	91	2,14	2 (2)	1987
089	Zonal Astrograph ZA, 12/204	Research Institute "Mykolaiv Astronomical Observatory", Mykolaiv, Ukraine	20 x20	10 1	2,13	12 (12)	1961-1991
069	Schmidt Telescope ST, 80/120/240	Baldone Observatory, Institute of Astronomy, University of Latvia	24 x24	72	0.91 1.81	4 (6)	1984-1996

Observations and resulting positions of Pluto from UkrVO astroplate collection and Baldone Observatory

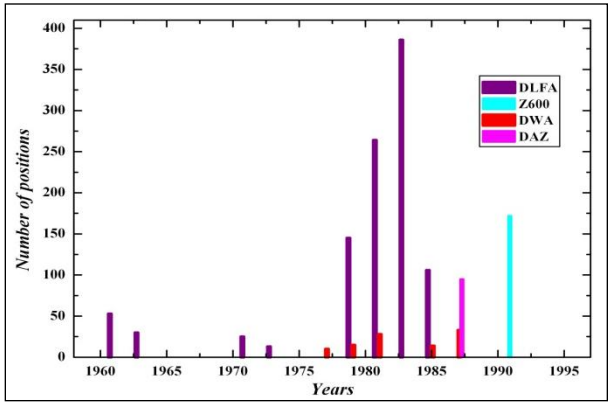
- period of observations - 1961–1996
- 6 telescopes from 4 observatories



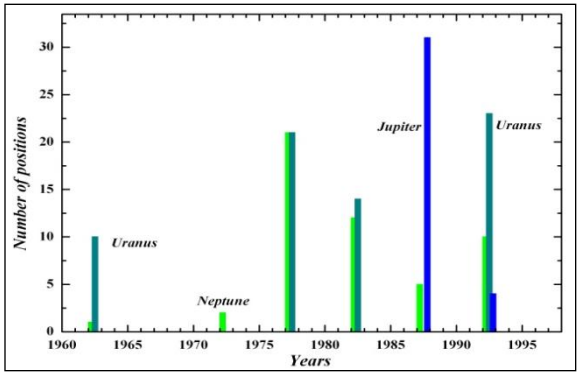
The number of positions of Pluto, observed in the world in 1914-2015 years, according to the MPC data (UkrVO astroplate collection - dark blue, all - blue)

Positional catalogues of the satellites of Saturn, Jupiter, Uranus, and Neptune

period – 1963 - 1993 (290 original plate images)
Telescopes – two astrographs DLFA and DWA in Golosiiv (Kyiv, Ukraine), DAZ astrograph in Kitab and 60-cm Zeiss reflector on Maidanak (Uzbekistan)



The distribution of observations of **Saturn's satellites** by year



The distribution of observations of **Uranus, Neptune, Jupiter**, and their families by year

Object		Bmg	number	(o-c), RA, csec	(o-c), Dec, arcsec	s_α	s_δ
Uranus sattellites	U1 Ariel	12.1	2	-0.95	0.64	0.43	0.64
	U2 Umbriel	14.4	9	-0.12	0.27	0.63	0.46
	U3 Titania	13.2	33	-0.09	0.44	0.12	0.44
	U4 Oberon	13.2	33	0.06	0.51	-0.17	0.35
Neptune sattellites	N1 Triton	13.0	9	0.65	0.38	0.57	0.46
Jupiter sattellites	J6 Himalia	15.2	27	0.17	-0.18	0.36	0.50
	J7 Elara	15.7	7	-0.10	-0.09	0.27	0.17
	J8 Pasiphae	15.9	1	0.58	0.08	-	-
Saturn sattellites	S2 Enceladus	11.7	12	0.48	0.16	0.68	0.48
	S3 Tethys	10.3	20	-0.01	0.10	0.62	0.45
	S4 Dione	10.4	40	0.07	0.07	0.44	0.43
	S5 Rhea	9.7	57	0.15	0.07	0.41	0.38
	S6 Titan	8.3	84	0.09	-0.03	0.35	0.37
	S7 Hiperion	14.2	8	-0.04	0.10	0.01	0.46
	S8 Japetus	12	78	0.11	0.04	0.41	0.38
	S9 Phoebe	16.4	1	0.44	-0.27	-	-

Accuracy of coordinates determinations of satellites of outer planets from processing of digitizing photographic observations