Spacewatch plus the "Bok V00" collaboration with the Catalina Sky Survey have observed 82.5% of all the PHAs that have ever been observed by anybody between 1984 May and 2022 Mar 14. In that interval Spacewatch observed 14890 different NEOs and 1877 different PHAs. Furthermore, referencing the "NRPHAV" column below, the Spacewatch 1.8-meter telescope was used to observe more PHAs while they were faint than any other station.

Worldwide overall, 1984 May 01 - 2022 Apr 14, 28765 different NEOs and 2274 different PHAs were observed.

Output of program SITESORT on 2022 04 19 18:40:07
Operating on file: ../../Input/AllObs_220414.txt

Input data from the IAU Minor Planet Center.

First observation in the input file is from 1801.0023.
Date range analyzed = 1984.3313 to 2022.2847.
333686233 observation records included.

Site code (COD) groupings:
SW291 = Spacewatch 1.8-m on Kitt Peak.
SW691 = Spacewatch 0.9-m on Kitt Peak.
SW695 = Spacewatch w Bok 2.3-m & Mayall 4-m.
BokV00= 90Prime on Bok 2.3-m with CSS.

CSS = Catalina = G96+703+E12+I52+693+413+V06.
LINEAR= Lincoln (Socorro, NM) 704.
Lowell= CODs 699+688+G37.
McDonl= McDonald Obs. COD 711.
MKObs = Mauna Kea Obs. CODs 568+T12+T14.
TablMt= JPL Table Mtn CODs 673+U68.
CTIO = Cerro Tololo, CODs 807+W84.
PALOMR= Mt. Palomar, CODs 644+675+I41.
MtJ_NZ= Mt. John, NZ, COD 474.
J95_UK= Peter Birtwhistle, UK COD J95.
J04ESA= Teide Obs., ESA on Tenerife.
Holmes= ARO CODs H21 + H55 + (807 non-4-m).
GEMINI= COD I11 Gemini South 8-m.
ATLAS = ATLAS 0.5-m COD T05+T08+M22+W68.
G.Hug = Gary Hug, CODs 734 + H36.
H01_NM= Magdalena Ridge, NM 2.4-m, COD H01.
WISE = NEOWISE spacecraft, COD C51.
J75 = OAM 0.36-m La Sagra, Spain.
ISON__= ISON H15,D00,Q60.
Czechs= CODs 046+106+246+541+557+616+I47.
PanSTR= Pan-STARRS, Haleakala, CODs F51+F52.
KittPk= Non-Spacewatch Kitt Peak, COD 695.
LCOGT = Many CODs, N & S.
D29Pur= D29 Purple Mt. Obs., XuYi_Station.
J43Ouk= J43 Oukaimeden Obs., Marrakech.
VLT_8m= 309 VLT Cerro Paranal 8.2-m
SOAR33= I33 SOAR 4.1-m
CODZ84= COD Z84 Calar Alto 0.8-m
CODW16= COD W16 0.36-m Pleasant Groves, AL

Other = Others not named above.

NREC = # of obs. records by observing site.
NRNEO= # of NEO obs. records by observatory.
NDNEO= # of different NEOs by observatory.
NRPHA= # of PHA obs. records by observatory.
NDPHA= # of different PHAs by observatory.
NRPHAV = # of records of PHAs w/ mag .GE. VLIM

VLIM = 22.50 mag.

Sorting all observations, 1984 May 01 - 2022 Apr 14 by "NDPHA" count:

Site	NREC	NRNEO	NDNEO	NRPHA	NDPHA	NRPHAV	
CSS___	94038143	567454	23390	81107	2017	29	
Holmes	354891	279374	18932	40796	1799	698	
PanSTR	72140530	221287	16825	32517	1676	32	
SW_291	922031	86543	11567	20632	1633	1026	(Spacewatch)
MK_Obs	341809	35808	7525	6467	1052	1218	
SW_691	14158417	52908	6901	10975	1051	82	(Spacewatch)
Czechs	682794	71681	5177	16999	892	0	
LINEAR	32848229	119011	4491	26380	891	0	
ATLAS_	42127703	178807	3947	37666	745	0	
J95_UK	55921	34701	7370	4343	732	0	
G.Hug_	55407	23620	5512	3583	699	3	
MtJ_NZ	47564	35457	5508	4218	611	2	
PALOMR	18296822	53549	3307	8413	584	0	
WISE__	3683895	45061	2044	10870	548	0	
SW_695	9159	7667	1647	2499	467	693	(Spacewatch)
D29Pur	10248941	17941	2325	3582	467	2	
McDonl	22288	12082	2551	2501	439	3	
H01_NM	37071	27357	5237	2307	400	50	
TablMt	66207	9738	1981	1838	334	0	
Lowell	5426687	13749	1637	2722	328	0	
LCOGT_	67795	13985	1690	4261	277	11	
J04ESA	626041	8801	2437	1140	270	12	
KittPk	156574	1874	464	737	172	46	
ISON__	1341959	4135	827	867	161	0	
CTIO__	3457413	11630	1109	1459	153	91	
J43Ouk	2288635	3334	511	749	108	0	
BokV00	657252	3375	705	456	105	0	(CSS+Spacewatch)
J75___	1170146	2736	425	630	94	0	
CODZ84	9083	1537	390	143	31	0	
VLT309	249922	1329	232	165	23	24	
GEMINI	320	134	24	50	8	0	
SOAR33	143	89	8	5	1	0	
CODW16	33236	289	52	6	1	0	
Others	28063205	1128095	22039	296495	2076	189	
Sums	333686233	3075138	28765	627578	2274	2410	

"Delta-T" is the number of days between an observation and the most recent previous observation. It is a measure of the usefulness of observations to improve knowledge of an object's orbit.

FIRST= Date of first observation counted.
 LAST = Date of last observation counted.

 AVDT_PHA2 = Average delta-T in days for PHAs with absolute magnitude H fainter than 17.75.

Sorting by "AVDT_PHA2" to rank the stations:

Site	FIRST	LAST	AVDT_PHA2 (days)	
J75___	2004.3831	2014.7311	401.91	(Note end date)
BokV00	2019.8796	2022.2478	300.77	(CSS+Spacewatch)
CTIO__	1984.5531	2022.1810	294.80	
MK_Obs	1984.6773	2022.2718	277.98	
SW_695	2010.2308	2022.2831	238.25	(Spacewatch)
PanSTR	2008.8311	2022.2809	190.81	
J04ESA	2009.3201	2021.6823	172.32	
SW_291	1992.8829	2022.2805	131.21	(Spacewatch)
Lowell	1984.3375	2022.2502	130.81	
KittPk	1984.7351	2020.0331	118.32	
CSS___	1984.3789	2022.2833	100.88	
TablMt	1996.6173	2022.2804	99.02	
VLT309	1999.3731	2022.2663	96.15	
GEMINI	2007.9285	2021.4463	82.13	
PALOMR	1984.3323	2022.2824	80.14	
MtJ_NZ	1984.3379	2022.2728	76.29	
Holmes	2004.0637	2022.2829	76.07	
SW_691	1984.3346	2022.2805	70.71	(Spacewatch)
LINEAR	1985.0528	2013.3652	65.55	
McDonl	1984.9808	2021.2090	51.17	
J43Ouk	2007.5397	2022.0252	46.20	
D29Pur	2006.9602	2022.0865	40.54	
LCOGT_	1997.4977	2022.2731	32.77	
J95_UK	2002.4106	2022.2820	28.16	
G.Hug_	1997.6768	2022.2824	26.56	
Others	1984.3313	2022.2820	20.22	
H01_NM	2007.4413	2022.2696	19.18	
ATLAS_	2014.1514	2022.2809	18.97	
WISE__	2010.0169	2022.2805	17.66	
ISON__	2010.0753	2021.8592	15.91	
Czechs	1984.3363	2022.2639	11.00	
CODZ84	2015.7307	2022.1648	1.64	
CODW16	2019.9640	2021.8954	0.96	
SOAR33	2007.2830	2021.7429	0.21	

More usefully, the arc extension relative to the length of previous series of observations shows the value of the given observation to the improvement of knowledge of the orbit.

 AVAE_PHA2 = Average arc extension for PHAs w/ H .GT. 17.75

Arc extensions in fractions of the original arc:

Site	AVAE_PHA2	
J75___	48342.23	(Last observation in 2014)
CTIO__	6248.38	
PanSTR	2551.71	
LINEAR	1456.16	
CSS___	1078.06	
Lowell	953.08	
PALOMR	799.08	
SW_691	215.16	(Spacewatch)
WISE__	189.81	
MK_Obs	112.81	
J04ESA	103.18	
Others	85.07	
ATLAS_	38.21	
BokV00	30.88	(CSS+Spacewatch)
TablMt	16.46	
KittPk	15.99	
ISON__	8.75	
VLT309	3.35	
H01_NM	2.57	
J95_UK	2.33	
SW_291	2.02	(Spacewatch)
G.Hug_	1.99	
LCOGT_	1.38	
MtJ_NZ	1.28	
McDonl	1.08	
SW_695	0.95	(Spacewatch)
Holmes	0.80	
CODZ84	0.77	
GEMINI	0.77	
Czechs	0.73	
CODW16	0.28	
D29Pur	0.13	
J43Ouk	0.05	
SOAR33	0.00	

The distribution of counts of observed arc extensions versus the relative delta-T shows more clearly how the stations contribute to the improvement of orbital elements. The dependent variable here means, for example, "10-30x" that the observed arc was lengthened from 10 to 30 times its previous span. A typical useful extension is to recover an object discovered the previous night on the basis of an original series of 30 minutes' duration. Thus a recovery the next night at the same clock hour could be an extension 48 times as long as the original arc. On the other hand, short fractional extensions show responsiveness to recent discoveries.

Histograms of Fractional Arc Extensions for PHAs with H > 17.75 mag:

Station	<0.2	.2-.5	0.5-1x	1-3x	3-10x	10-30x	30-100x	100-300	300-1d3	1d3-3d3	>3000x
SW_291	4546	903	481	302	215	84	31	13	0	1	1
SW_691	2482	161	81	48	27	27	12	16	3	2	7
SW_695	489	77	49	68	46	9	3	0	0	0	0
BokV00	61	11	5	1	0	0	0	0	0	2	0
CSS___	11755	824	458	318	221	110	75	59	49	30	70
LINEAR	2195	171	64	28	11	86	42	14	15	9	26
Lowell	281	16	12	11	4	5	1	4	1	6	6
McDonl	409	52	23	16	4	2	2	0	1	0	0
MK_Obs	1388	162	109	128	171	147	86	13	9	1	5
TablMt	208	32	22	7	4	6	3	0	0	0	1
CTIO__	144	11	15	8	5	7	6	3	2	3	8
PALOMR	1218	57	33	22	13	9	28	20	20	6	12
MtJ_NZ	701	130	54	44	41	12	7	1	0	0	0
J95_UK	689	166	85	45	38	40	13	2	1	0	0
J04ESA	224	32	12	16	19	22	8	0	0	0	1
Holmes	6184	966	461	247	101	49	27	3	3	0	0
GEMINI	3	1	3	3	0	0	0	0	0	0	0
ATLAS_	4417	36	10	10	5	5	5	8	3	4	1
G.Hug_	560	81	47	26	9	16	7	2	1	0	0
H01_NM	257	36	29	31	26	15	6	1	0	0	0
WISE__	5933	145	62	44	8	4	7	6	1	7	7
J75___	82	5	1	1	3	1	1	3	2	1	3
ISON__	123	6	1	2	0	1	0	0	0	1	0
Czechs	1891	184	86	37	35	45	7	1	0	0	0
PanSTR	5660	352	185	103	85	62	77	109	101	42	67
KittPk	141	19	13	9	6	3	1	0	0	1	0
Others	33741	2022	941	441	259	253	88	27	19	10	20
LCOGT_	493	16	19	7	3	10	7	1	0	0	0
D29Pur	735	10	4	0	2	2	1	0	0	0	0
J43Ouk	112	2	1	0	1	0	0	0	0	0	0
VLT309	13	2	2	2	1	2	1	0	0	0	0
SOAR33	1	0	0	0	0	0	0	0	0	0	0
CODZ84	36	1	1	1	2	1	0	0	0	0	0
CODW16	0	2	0	0	0	0	0	0	0	0	0