Pan-STARRS update

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IAWN meeting, Knoxville TN

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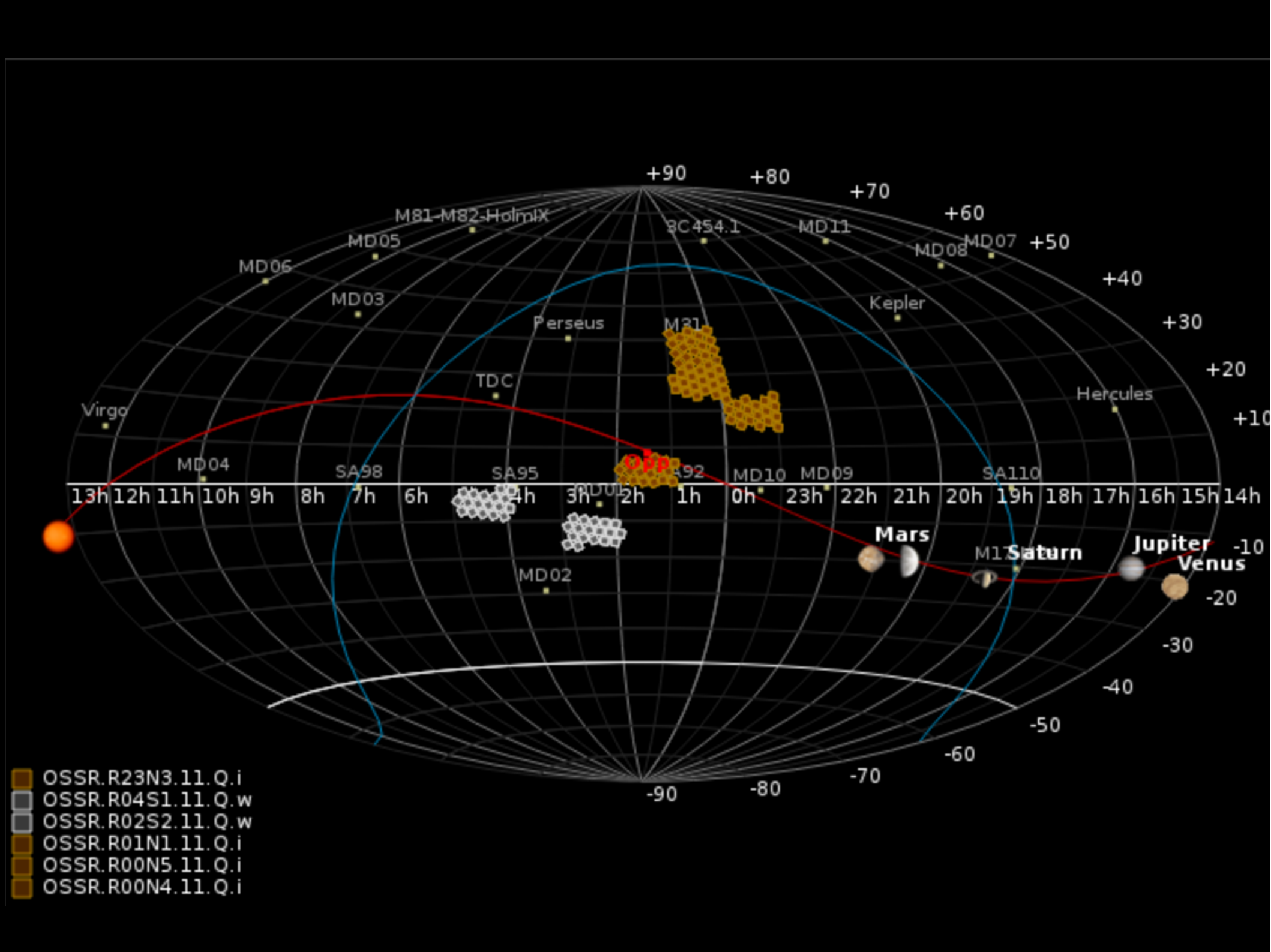
Pan-STARRS

- Twin 1.8 metre telescopes on Haleakalā, Maui
- 3 degree field-of-view, 22.5 magnitude limit
- 1.4 billion pixel cameras, 0”.25 pixels
- *w*-band or *i*-band depending on the moon
- 90% funded for NEO surveying
  - Still very dependent on follow-up telescopes
- Also finds comets, and one interstellar object


+90
+80
+70
+60
+50
+40
+30
+20
+10
-10
-20
-30
-40
-50
-60
-70
-80
-90
M81-M82-HolmIX
3C454.1
MD11
MD07
MD08
MD05
MD06
MD03
Perseus
M31
Kepler
TDC
Hercules
Virgo
MD04
SA98
SA95
Opp
MD10
MD09
SA110
13h 12h 11h 10h 9h 8h 7h 6h 5h 4h 3h 2h 1h 0h 23h 22h 21h 20h 19h 18h 17h 16h 15h 14h
Mars
Saturn
Jupiter
Venus
MD02
OSSR.R23N3.11.Q.i
OSSR.R04S1.11.Q.w
OSSR.R02S2.11.Q.w
OSSR.R01N1.11.Q.i
OSSR.R00N5.11.Q.i
OSSR.R00N4.11.Q.i

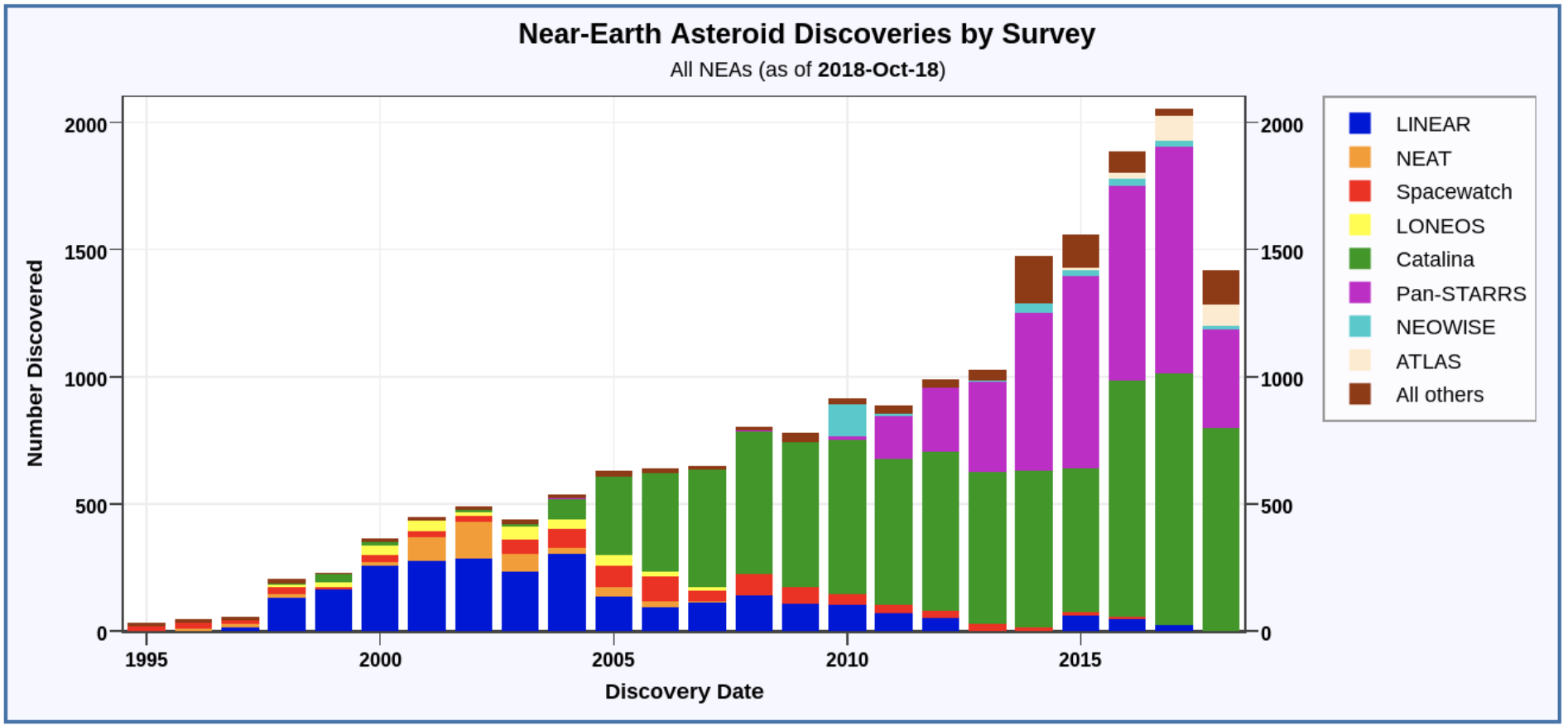
Discovery Counts

	R23	R22	R21	R20	R19	R18	R17	R16	R15	R14	R13	R12	R11	R10	R09	R08	R07	R06	R05	R04	R03	R02	R01	R00
N7	0	0	2	2	1	2	2	2	1	2	0	1	1	1	4	2	1	6	2	2	1	0	1	0
N6	1	0	0	0	2	2	4	3	2	0	1	4	1	3	7	3	3	13	0	0	0	1	3	0
N5	1	5	0	0	0	4	5	0	3	0	0	2	5	4	10	26	17	8	0	0	7	5	6	1
N4	5	10	1	0	0	2	5	9	2	2	9	5	25	19	10	21	13	1	2	4	15	11	10	4
N3	6	3	2	0	0	0	7	8	8	3	12	9	37	20	27	41	20	4	6	35	28	21	10	15
N2	17	15	7	1	0	0	17	12	9	3	19	18	25	35	29	21	5	0	4	32	31	19	21	18
N1	33	25	24	29	0	0	20	27	18	23	20	30	22	12	41	27	0	0	30	12	52	29	41	55
S1	63	48	32	44	0	1	14	43	30	27	34	26	24	26	24	23	0	1	25	27	17	25	26	27
S2	46	32	63	33	1	0	3	52	25	40	11	25	19	9	11	3	0	0	13	16	8	10	24	24
S3	17	37	50	47	18	0	1	25	20	28	5	13	10	9	10	0	1	4	6	12	6	7	14	21
S4	7	34	21	31	17	1	0	6	8	13	3	8	1	4	2	0	0	3	6	5	7	5	10	9
S5	4	8	9	15	13	0	0	0	6	7	7	2	3	3	1	0	0	2	1	2	3	5	3	1
S6	1	0	0	6	4	1	0	0	0	0	1	0	2	1	0	0	0	2	0	1	1	0	1	1

Visit Counts

	R23	R22	R21	R20	R19	R18	R17	R16	R15	R14	R13	R12	R11	R10	R09	R08	R07	R06	R05	R04	R03	R02	R01	R00
N7	2	5	11	21	38	36	34	31	24	24	22	21	19	21	21	25	25	24	17	11	10	6	7	6
N6	5	3	3	2	29	43	37	32	30	26	22	26	28	21	18	23	24	21	5	1	0	6	7	7
N5	33	36	0	0	8	54	46	37	27	37	28	27	22	20	31	46	41	12	2	3	17	22	27	33
N4	26	33	8	0	1	43	38	36	30	24	23	21	26	29	28	36	27	7	4	16	23	19	20	25
N3	23	27	17	0	0	2	34	25	29	20	22	24	31	29	35	34	25	6	13	38	35	27	18	18
N2	27	22	26	5	0	0	28	32	27	21	27	31	39	35	31	29	15	0	10	39	36	34	33	28
N1	55	45	44	53	0	1	67	53	42	38	38	44	32	40	43	44	2	0	47	43	52	48	55	56
S1	57	46	43	43	1	2	27	58	44	40	42	42	34	35	38	31	1	2	39	39	36	28	40	44
S2	35	51	49	51	3	0	10	62	38	42	32	30	28	25	22	11	0	2	29	24	23	22	24	28
S3	27	41	47	63	42	0	4	52	34	39	22	21	23	16	20	1	1	14	26	28	24	26	20	26
S4	27	32	23	42	42	2	0	14	23	30	18	18	15	16	19	9	6	25	26	29	27	20	18	17
S5	15	23	23	26	26	5	3	5	19	15	19	16	14	14	9	6	9	21	21	22	20	16	22	14
S6	12	11	11	14	15	4	1	2	4	11	17	13	12	8	6	6	13	20	14	16	15	12	12	13

Yearly Statistics … uh oh



Pan-STARRS1 (F51) status

- a large part of this year had poor weather
  - Lower number of new NEOs
- Shut down Aug 22 for Hurricane Lane
  - upon restarting, problems with mirror support
    - original telescope manufacturer no longer exists
  - Now issues with the dome shutters
    - Also used for moon shielding
  - No current ETA for resuming operations ...

Pan-STARRS2 (F52) status

- Had some problems, but ...

- Began survey operations in Sept 2018
  - Already 45 MPECs in October
  - But still very much in the commissioning phase
    - On sky engineering time to fully characterise it
  - Not going as faint as we could → baffles
  - Tolerances on a wide-field telescope is difficult
  - Different detectors than F51 → software changes
  - Will have a press release when fully ready

Missed Tracklets – 2015 TL_{178}

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K15TH8L  C2018 10 10.51712902 33 22.418-05 42 56.32          20.1 GVEU016F52
K15TH8L  C2018 10 10.53033102 33 22.328-05 43 14.96          20.2 GVEU016F52
K15TH8L  C2018 10 10.54352102 33 22.237-05 43 33.51          20.1 GVEU016F52
K15TH8L  C2018 10 10.55669902 33 22.149-05 43 52.11          20.3 GVEU016F52
K15TH8L  C2018 10 18.46802 02 32 18.460-09 45 08.19          19.4 wUEU016F52
K15TH8L  C2018 10 18.48065 02 32 18.015-09 45 38.13          19.5 wUEU016F52
K15TH8L  C2018 10 18.49322 02 32 17.563-09 46 07.95          19.5 wUEU016F52
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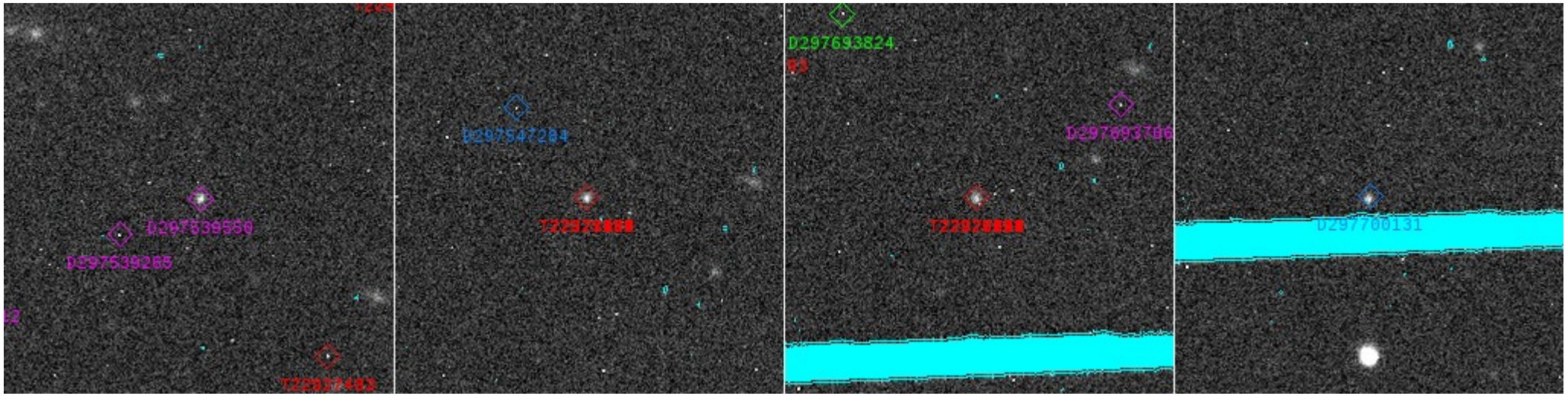

DPS Presentations

- 304.03 – Wed 10:20 AM – Weryk
  - On-going work to link the Isolated Tracklet File
- 304.08 – Wed 11:10 AM – Ramanjooloo
  - The Pan-STARRS search for Near-Earth Objects
- 310.P – Wed 4:10 PM – Chambers
  - The Pan-STARRS2 facility and the Wide Area Survey for NEOs with Pan-STARRS