ObsLocTAP status report

Jesús Salgado[1],

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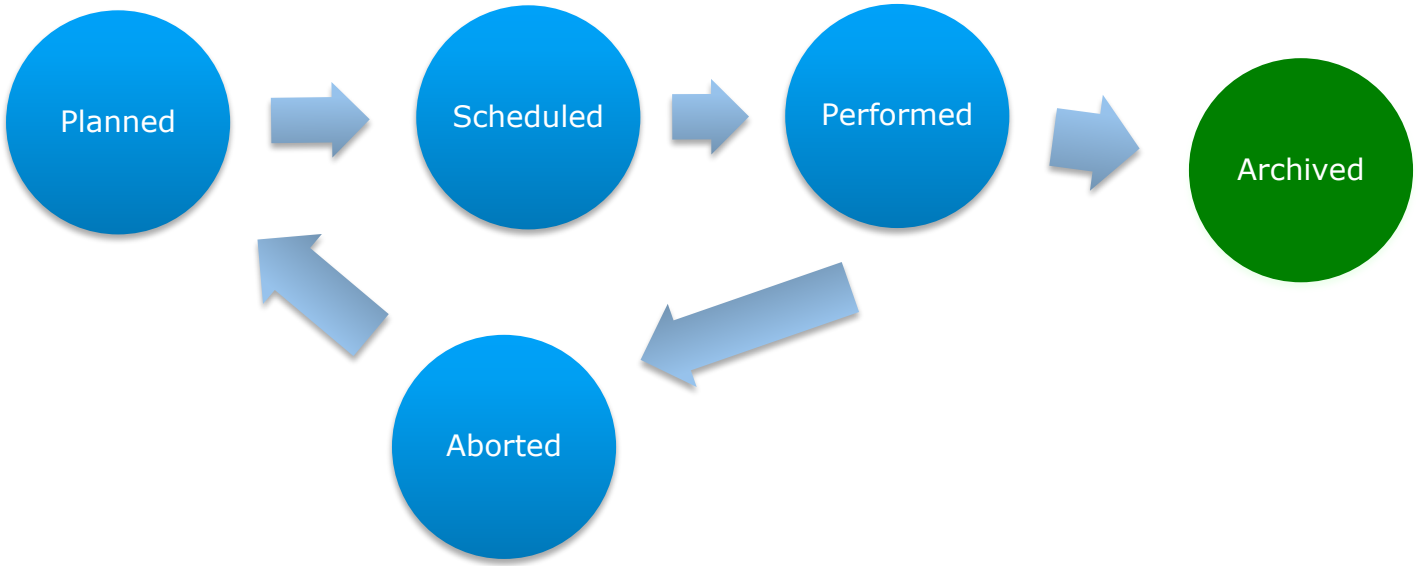
1 Quasar for ESA - 2 TPZ-VEGA for ESA - 3 ATG for ESA - 4 ESA 5 NuSTAR

Observations Life cycle



Planned Observations Services

Schedule for revolution 1872

(this list is also available in csv-format, click here to download)

Rev	Start time (UTC)	E	ion	Notes
1872	2017-10-10 13:29:15	2	/ 0022	Public
1872	2017-10-10 17:13:34	2	/ 0011	
1872	2017-10-11 08:16:46	2	/ 0039	
1872	2017-10-11 12:26:36	2	/ 0038	
1872	2017-10-11 13:27:21	2	/ 0040	
1872	2017-10-11 15:00:12	2	/ 0040	
1872	2017-10-11 18:41:00	2	/ 0008	
1872	2017-10-12 09:06:18	2	/ 0041	
1872	2017-10-12 13:16:06	2	/ 0042	

09-Oct-2017 18:48:29 --- Preliminary HST Observing Timeline Report for SMS: 172888A4 --- Page 1
SMS Start: 2017.288:22:10:00 (15-OCT-2017 22:10:00), End: 2017.296:00:00:00 (23-OCT-2017 00:00:00)

Scheduling Begin	Unit UT	End UT	SU Id	Principal Investigat	Exp #	Target	Science Instrume	Mode	Apertures	Spectral Elements	Exposure Time(sec)	OB	AL	EX
2017.288	23:00:00	23:35:07	1483521	Lockwood	E1-001	DARK	STIS/MA2	TIME-T	F28X50LP	MIRVIS	1300.00	E1	01	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-001	WASP-69	COS/NUV	ACQ/SE	PSA	G230L	12.00	35	01	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-002	WASP-69	COS/NUV	ACQ/PE	PSA	G230L	12.00	35	02	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-003	WASP-69	COS/NUV	ACQ/PE	PSA	G230L	12.00	35	03	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-004	WASP-69	COS/FUV	TIME-T	PSA	G130M	1917.00	35	05	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-005	WASP-69	COS/FUV	TIME-T	PSA	G130M	2706.00	35	07	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-006	WASP-69	COS/FUV	TIME-T	PSA	G130M	2706.00	35	09	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-007	WASP-69	COS/FUV	TIME-T	PSA	G130M	2706.00	35	0B	01
2017.288	23:14:45	06:30:55	1476735	Sing	35-008	WASP-69	COS/FUV	TIME-T	PSA	G130M	2706.00	35	0D	01
2017.289	00:00:00	00:28:32	1481937	Riley	JF-001	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	1100.00	JF	01	01
2017.289	00:00:00	00:28:32	1481937	Riley	JF-002	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JF	01	02
2017.289	00:00:00	00:28:32	1481937	Riley	JF-003	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JF	01	03
2017.289	00:00:00	00:46:10	145333B	Bourque	3B-001	DARK-NM	WFC3/UVI	ACCUM	UVIS	F373N	900.00	3B	01	01
2017.289	00:00:00	00:46:10	145333B	Bourque	3B-001	DARK-NM	WFC3/UVI	ACCUM	UVIS	F373N	900.00	3B	02	01
2017.289	00:39:46	01:08:18	1481937G	Riley	JG-001	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	1100.00	JG	01	01
2017.289	00:39:46	01:08:18	1481937G	Riley	JG-002	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JG	01	02
2017.289	00:39:46	01:08:18	1481937G	Riley	JG-003	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JG	01	03
2017.289	00:46:10	01:32:20	145333C	Bourque	3C-001	DARK-NM	WFC3/UVI	ACCUM	UVIS	F467M	900.00	3C	02	01
2017.289	00:46:10	01:32:20	145333C	Bourque	3C-001	DARK-NM	WFC3/UVI	ACCUM	UVIS	F467M	900.00	3C	02	01
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	01
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	02
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	03
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	04
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	05
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	06
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	07
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	08
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	09
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0A
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0B
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0C
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0D
2017.289	01:27:12	01:56:24	148219U	Riley	9U-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0E
2017.289	01:27:12	01:56:24	148219U	Riley	9U-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0F
2017.289	01:27:12	01:56:24	148219U	Riley	9U-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0G
2017.289	01:27:12	01:56:24	148219U	Riley	9U-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	9U	01	0H
2017.289	01:40:00	02:09:22	14518F0	Golimowski	F0-001	BIAS	ACS/WFC	ACCUM	WFC	F502N F660N	0.00	F0	01	01
2017.289	01:40:00	02:09:22	14518F0	Golimowski	F0-002	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	1000.50	F0	01	02
2017.289	02:09:22	02:38:56	14518F1	Golimowski	F1-001	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	0.50	F1	01	01
2017.289	02:09:22	02:38:56	14518F1	Golimowski	F1-002	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	1000.50	F1	01	02

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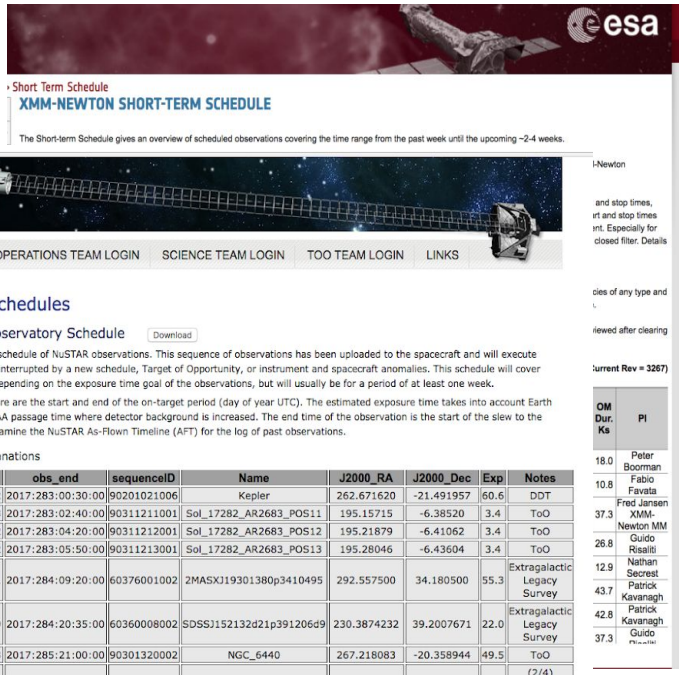
Scheduling Begin	Unit UT	End UT	SU Id	Principal Investigat	Exp #	Target	Science Instrume	Mode	Apertures	Spectral Elements	Exposure Time(sec)	OB	AL	EX
2017.289	02:38:56	03:08:18	14518F2	Golimowski	F2-001	BIAS	ACS/WFC	ACCUM	WFC	F502N F660N	0.00	F2	01	01
2017.289	02:38:56	03:08:18	14518F2	Golimowski	F2-002	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	1000.50	F2	01	02
2017.289	03:10:31	03:40:05	14518F3	Golimowski	F3-001	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	0.50	F3	01	01
2017.289	03:10:31	03:40:05	14518F3	Golimowski	F3-002	DARK	ACS/WFC	ACCUM	WFC	F502N F660N	1000.50	F3	01	02
2017.289	03:46:00	04:48:35	1483582	Lockwood	E2-001	DARK	STIS/MA2	TIME-T	F28X50LP	MIRVIS	1300.00	E2	01	01
2017.289	03:49:34	05:01:49	1454639	Shanahan	39-001	TUNGSTEN	WFC3/UVI	ACCUM	UVIS1-M512-S	F645N	60.00	39	01	01
2017.289	03:49:34	05:01:49	1454639	Shanahan	39-002	TUNGSTEN	WFC3/UVI	ACCUM	UVIS	F814W	2.00	39	01	02
2017.289	03:49:34	05:01:49	1454639	Shanahan	39-003	TUNGSTEN	WFC3/UVI	ACCUM	UVIS	F438W	360.00	39	01	03
2017.289	03:49:34	05:01:49	1454639	Shanahan	39-004	TUNGSTEN	WFC3/UVI	ACCUM	UVIS	F438W	360.00	39	01	04



obs_start	obs_end	sequenceID	Name	J2000_RA	J2000_Dec	Exp	Notes
2017:281:19:05:02	2017:283:00:30:00	90201021006	Kepler	262.671620	-21.491957	60.6	DDT
2017:283:01:11:23	2017:283:02:40:00	90311211001	Sol_17282_AR2683_POS11	195.15715	-6.38520	3.4	ToO
2017:283:02:40:32	2017:283:04:20:00	90311212001	Sol_17282_AR2683_POS12	195.21879	-6.41062	3.4	ToO
2017:283:04:20:32	2017:283:05:50:00	90311213001	Sol_17282_AR2683_POS13	195.28046	-6.43604	3.4	ToO
2017:283:06:55:11	2017:284:09:20:00	60376001002	2MASXJ19301380p3410495	292.557500	34.180500	55.3	Extragalactic Legacy Survey
2017:284:09:45:09	2017:284:20:35:00	60360008002	SDSSJ152132d21p391206d9	230.3874232	39.2007671	22.0	Extragalactic Legacy Survey
2017:284:21:10:03	2017:285:21:00:00	90301320002	NGC_6440	267.218083	-20.358944	49.5	ToO
2017:285:21:20:06	2017:286:08:20:00	30302020004	GRS_1915p105	288.79813	10.94578	21.9	(2/4) coordinated with XMM and VLT
2017:286:08:35:06	2017:286:19:30:00	60160701002	2MASXJ18560128p1538059	284.00210000	15.63200000	23.3	BAT AGN
2017:286:20:05:11	2017:287:15:05:00	60376007002	UGC06728	176.316800	79.681500	61.4	Extragalactic Legacy Survey
2017:287:15:50:11	2017:288:03:20:00	60368001002	NGC_1144	43.80083	-0.18361	22.0	
2017:288:04:05:09	2017:288:23:00:00	60301004002	ESO_103m35	279.58458	-65.4275	50.3	
2017:288:23:30:08	2017:290:05:45:00	30301026002	AX_J1841d0m0536	280.25179	-5.59625	59.7	phase constrained
2017:290:06:00:04	2017:290:17:00:00	60160670002	2E1739d1m1210	265.47600000	-12.19700000	23.5	BAT AGN
2017:290:17:15:01	2017:291:04:20:00	30363001002	GX_3p1	266.98333	-26.56361	21.8	

Long Range Observatory Schedule

Download

This is the latest NuSTAR long-term schedule. Observations have been sorted into one-week intervals, taking into account Sun, Moon, required exposure time, and other constraints. So the date is the Monday of the week in which the observation is scheduled to begin.

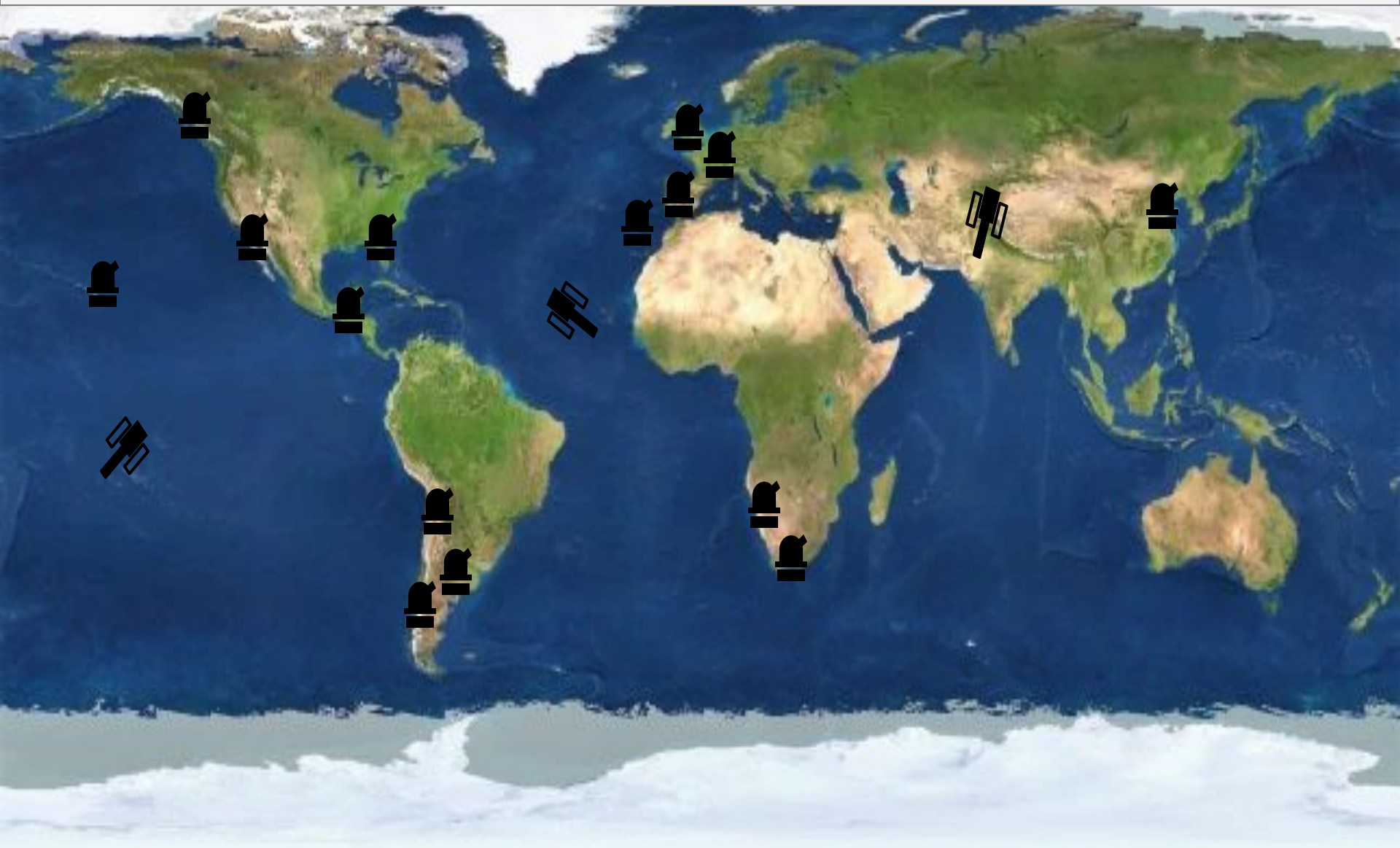
E.g. An observation with a date **2017-12-18** in this table is scheduled to have the observation ***starting*** sometime between **2017-12-18 0000Z** and **2017-12-25 0000Z**.

Currently the schedule is driven by the large number of observations coordinated with other observatories and the need to complete the NuSTAR Guest Observer programs. The exposure goal for targets allotted within one week may appear to fill more then the available NuSTAR exposure time in that week (average is 330 ks per week) but many observations start in one week and complete in the following week.

Targets of opportunity and any instrument or spacecraft anomalies may also cause the observing times of targets to shift. This long-term schedule is our present estimate of the future order of observations. Please be aware of the uncertainties.

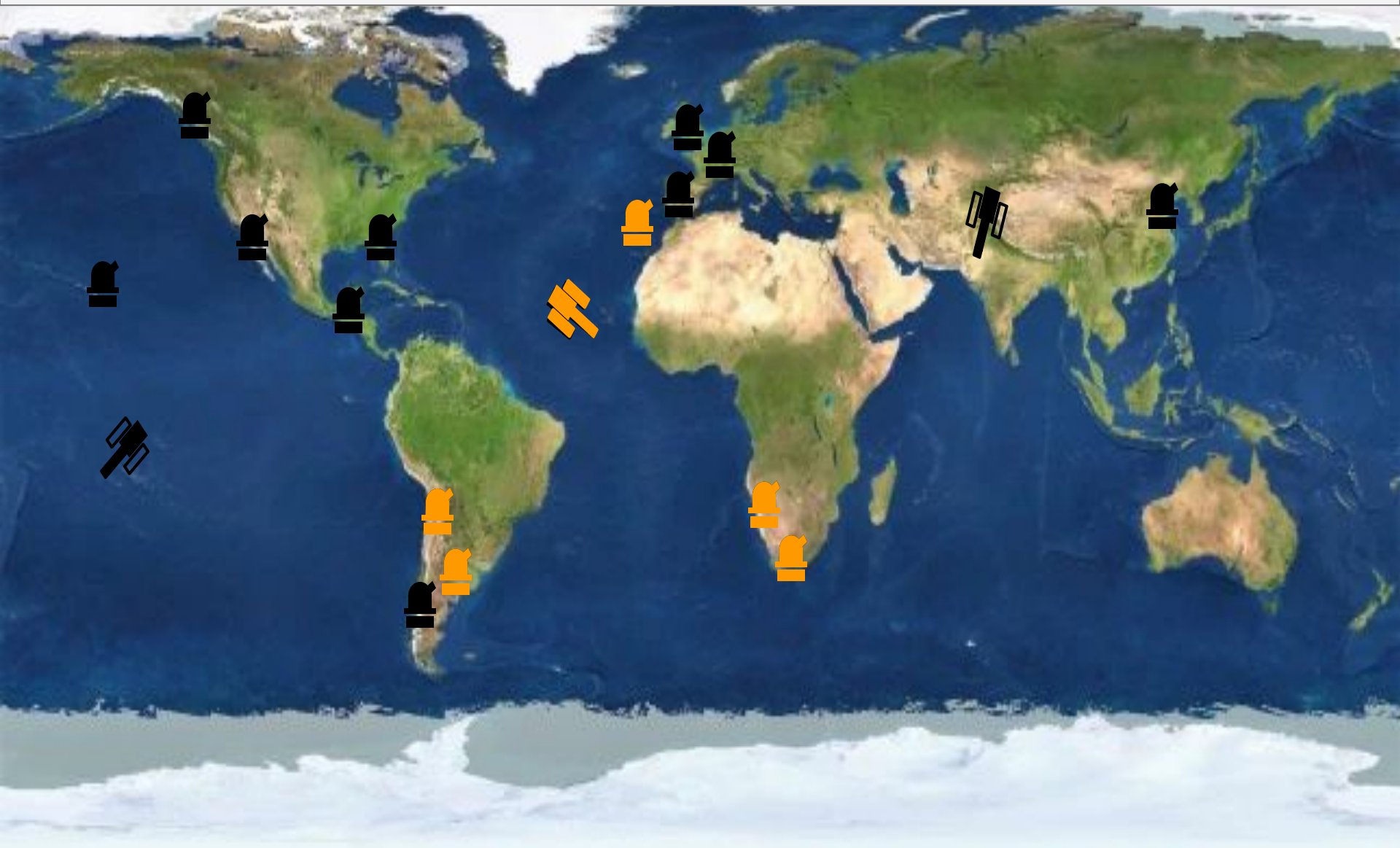
ToO = Target of Opportunity **DDT** = Directors Discretionary Time **N03** = NuSTAR GO cycle-3 **I15** = INTEGRAL GO cycle-15
X16 = XMM-Newton GO cycle-16 **C18** = Chandra GO cycle-18 **ELS/GLS** = Extragalactic/Galactic legacy surveys

Astronomical event identified/foreseen: <ra,dec> and a certain time range



Step 1: ObjVisSAP (Object Visibility Simple Access Protocol) call for <ra,dec>, time range:

Is visible the target for your observatory during this period?

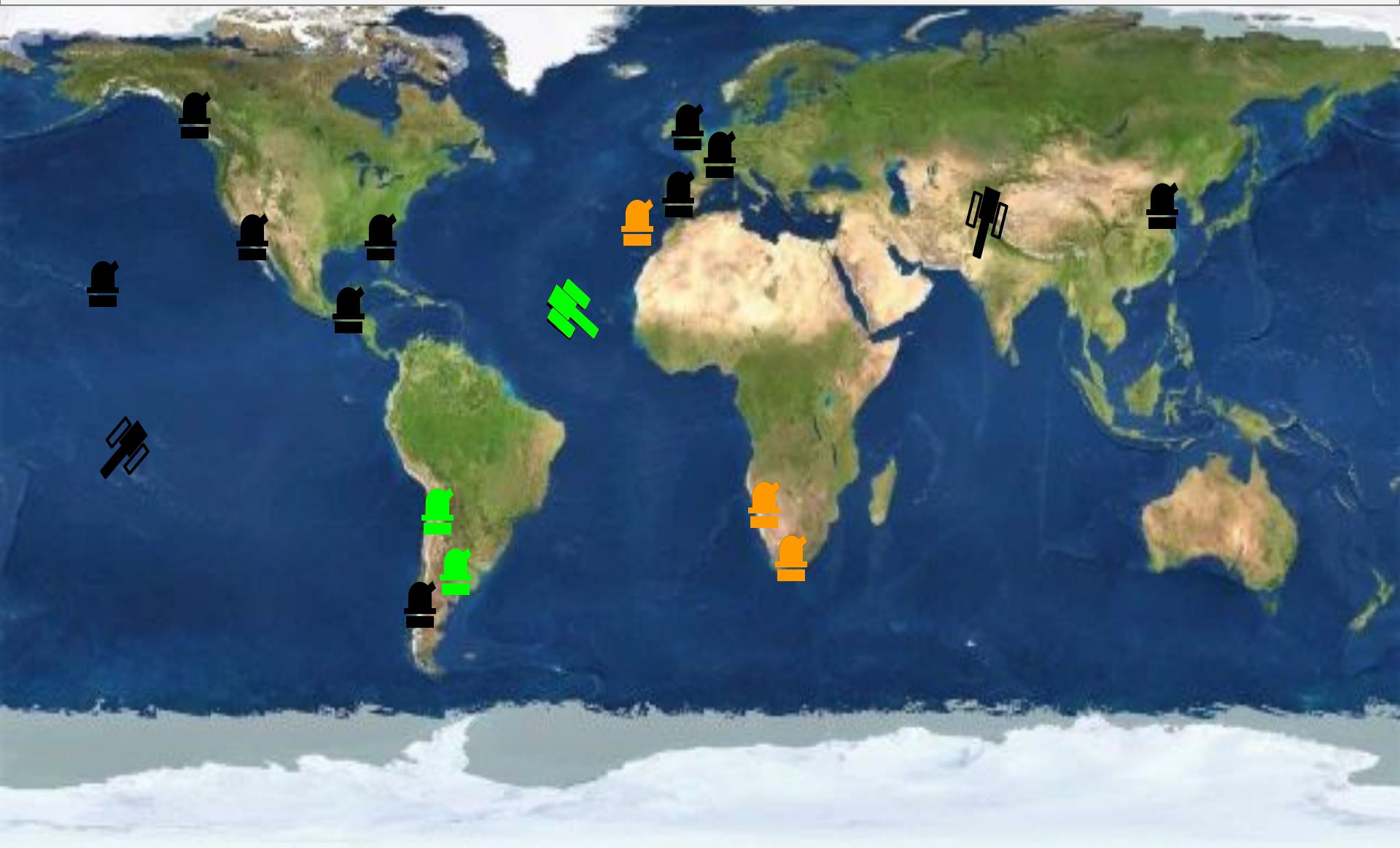


Step 1: ObjVisSAP (Object Visibility Simple Access Protocol) call for <ra,dec>, time range:

Is visible the target for your observatory during this period?

Step 2: ObsLocTAP (Observation Locator Tabular Access Protocol) call on this time range for this list of observatories:

Is this period available? If not, could observations be rescheduled?



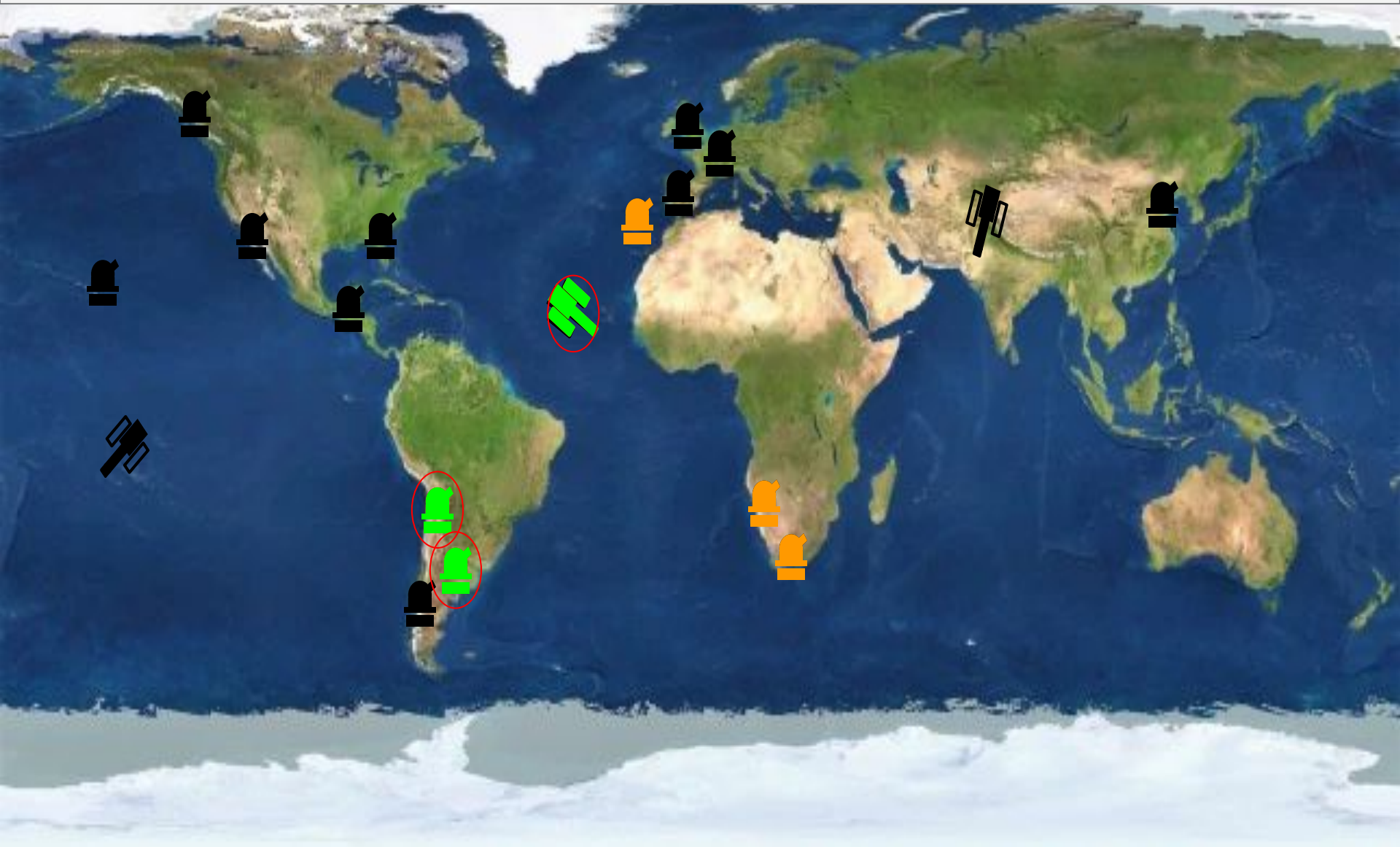
Step 1: ObjVisSAP (Object Visibility Simple Access Protocol) call for <ra,dec>, time range:

Is visible the target for your observatory during this period?

Step 2: ObsLocTAP (Observation Locator Tabular Access Protocol) call on this time range for this list of observatories:

Is this period available? If not, could observations be rescheduled?

Step 3: Propose observation/coordinated observation on selected observatories



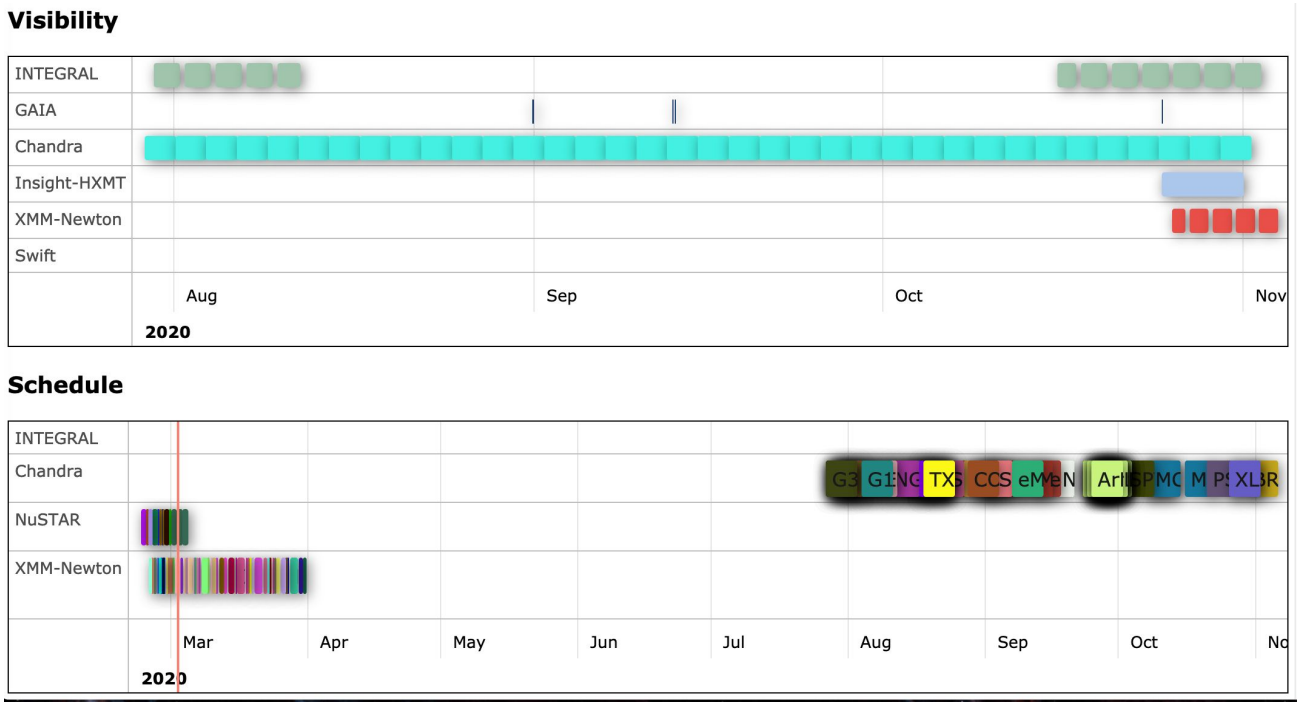
ObsLocTAP RFC Status

- TCG revision of PR 1.0
  - 2020-10-19 - 2020-11-27
  - https://wiki.ivoa.net/twiki/bin/view/IVOA/ObsLocTAP10RFC
  - No comments yet (please, review it!)
  -
- Server reference implementations:
  - Integral Science Archive
    - https://ila.esac.esa.int/tap/tap/
  - Chandra CFA
    - https://cda.cfa.harvard.edu/cxctap/
  - Docker implementation

Reference implementation client

TOBY, reference client implementation (E. Salazar)

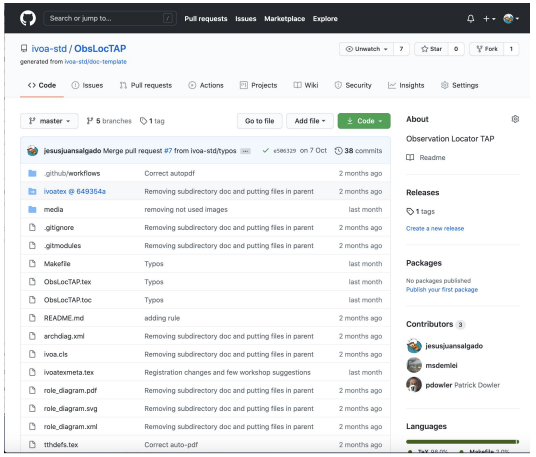
http://integral.esa.int/toby/



Other clients expected: MySpaceCal (calendar for many missions), ESASky, etc

RFC status comments

- Few comments received during community review
  - Comments from Markus Demleitner on formatting and typos issues (thanks!)
    - github integration comments
    - ivoatex discrepancies
    - Limitation of size of lines for github
    - Misspelling

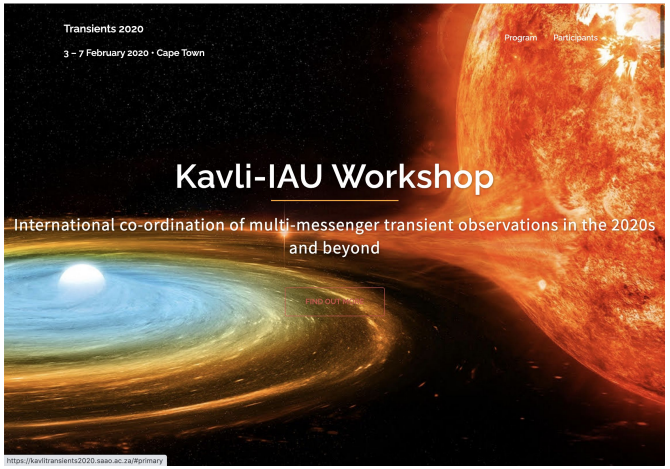


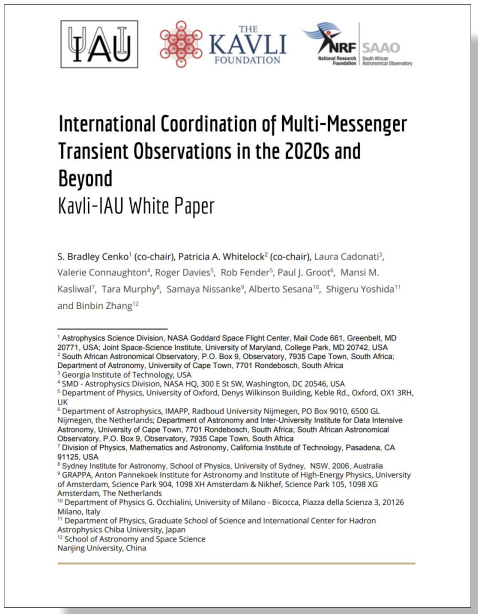
https://github.com/ivoa-std/ObsLocTAP

- No problems or changes related with the content

ObsLocTAP IAU endorsement proposal

- Multi-messenger and Transient Astronomy White Paper
  - (Thanks to Ada Nebot for representing IVOA on this forum!) https://arxiv.org/abs/2007.05546
- "***Telescope Coordination Recommendation 1**: We recommend the IAU endorse a common format for all observatories to report previous and planned observations, namely the standard developed by the IVOA **(ObsLocTAP)**."*
- Proposal to endorse this white paper recommendations by IAU during next XXXI IAU General Assembly (Busan, South Korea, August 2021)





International Coordination of Multi-Messenger Transient Observations in the 2020s and Beyond

Kavli-IAU White Paper

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[12] School of Astronomy and Space Science Nanjing University, China

ObsLocTAP community dissemination

- Two hands-on workshops organized by ESA to promote the implementation of ObsLocTAP and ObjVisSAP (focused on implementation)
  - Friday 18 September 12UT, Monday 28 September 12UT
  - Around 20 participants each
- https://www.cosmos.esa.int/web/vovisobs_protocols/demonstrator-workshop

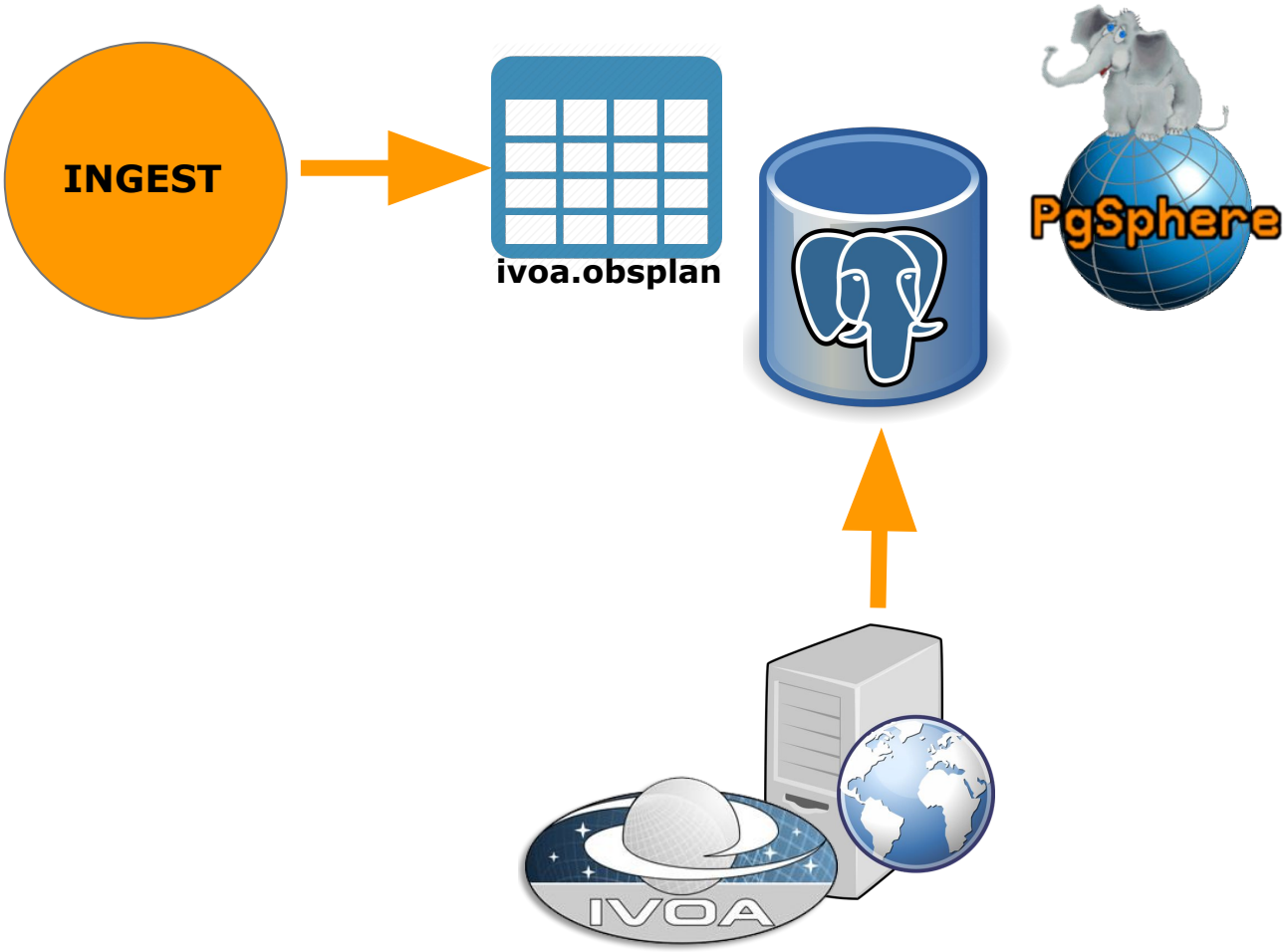
AGENDA

1. Welcome, short update of latest developments (20 minutes)
2. ObjVisSAP (1 hour)
   1. Demonstration of implementing ObjVisSAP for NuSTAR (30 minutes)
   2. Discussion (30 minutes)
3. ObsLocTAP (1 hour)
   1. Demonstration of implementing ObsLocTAP for NuSTAR (30 minutes)
   2. Discussion (30 minutes)
4. General discussion (40 minutes)

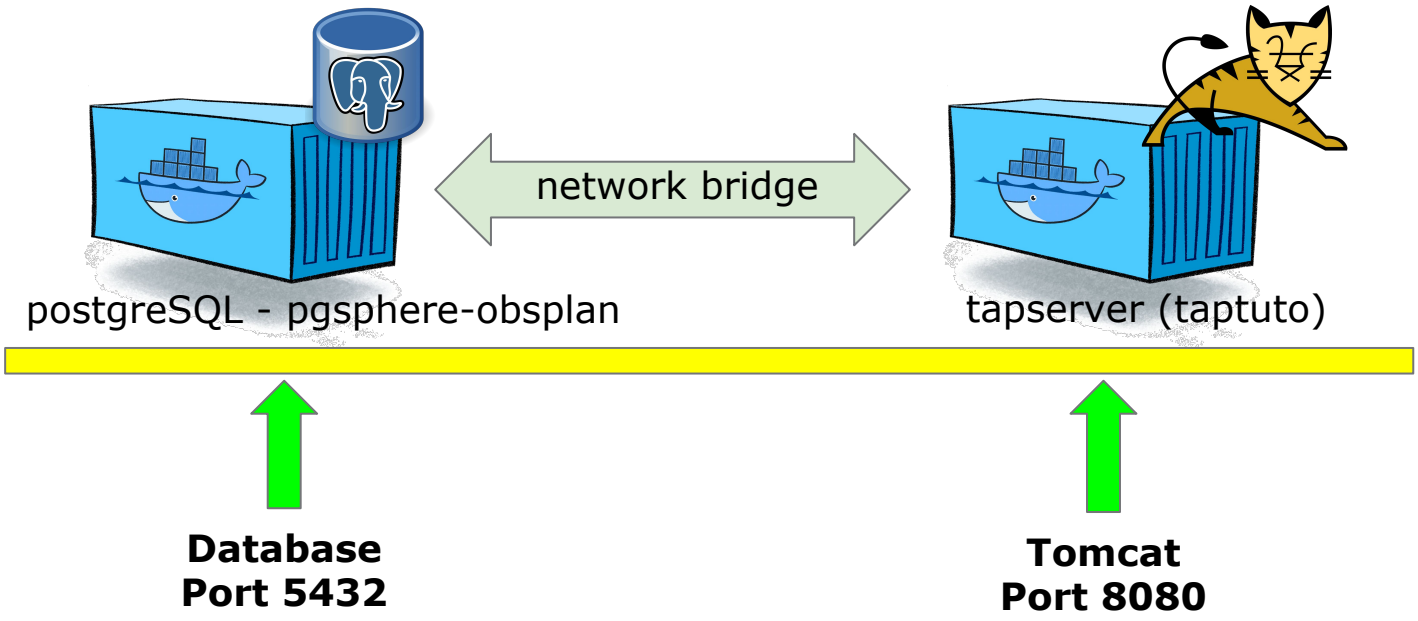
ObsLocTAP presentation (30 min)

- Short description of the exercise purpose
  - https://www.cosmos.esa.int/web/vovisobs_protocols/implementation-guides
- Architectural diagram of the elements needed
  - PostgreSQL
  - PgSphere
  - TAP instance
  - ObsLocTAP DM
- ADQL concepts
- TAP toolkit
  - Taptuto used. All known toolkits also mentioned
- Database preparation
- Docker option
- **NuSTAR feedback**
- General discussion

ObsLocTAP architecture



ObsLocTAP by Docker start-up




```
docker pull jsalgadodocker/pgsphere-obsplan:latest
docker pull jsalgadodocker/tapserver:latest

docker network create --driver=bridge db-network
docker run -p 8080:8080 --net=db-network --name tap jsalgadodocker/tapserver:latest
docker run -p 5432:5432 --net=db-network --name db jsalgadodocker/pgsphere-obsplan:latest
```

ObsLocTAP implementation problems

- **Technical background**
  - Not all the observatories have the resources or expertise to implement a TAP server
  - **Answer: Toolkits, Dockers, support (IVOA members could help)**
- **Not good knowledge of future observations**
  - **Answer: Even a short term knowledge is quite relevant for the community for, e.g. ToO follow-up**
- **Proprietary metadata**
  - **Answer: Even to know that one time slot is reserved (or not) and to know if this is a must-done observations or something that could be done is quite relevant for multi-messenger astronomy**
- **Summary**
  - Most (all?) the community considers that this effort has a strong positive impact
  - **Question: Why this has not been done before?**

Next RFC Steps

- Wait for comments on PR 1.0 version from TCG members (community comments are also welcome)
  - End of November!
- If everything is OK or can be corrected without major changes, promote as IVOA Recommendation
- Chase for IAU endorsement in August 2021
- Of course continue with dissemination and implementation support of the protocol for other observatories

Thanks!