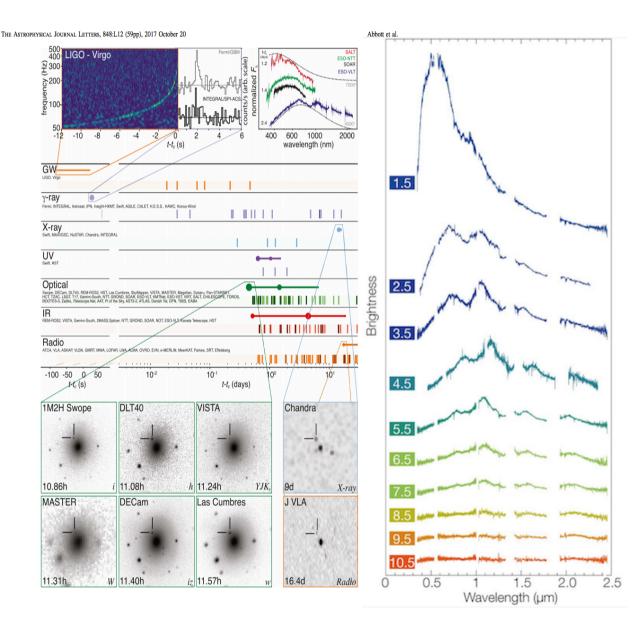
Extensions of VO standards for time domain astronomy

Ada Nebot for the CDS team



(Some) identified needs of the multimessenger transient community

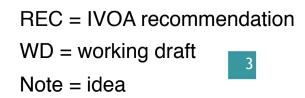


- Multi-wavelength / messenger approach is needed
- Follow-up observations and reaction time for that can be crucial
- Visualisation & navigation through the data
- Coordination & transmission of information

The VO & IVOA should match user's needs

Related recent IVOA developments

- 1. **VOTable** REC for tabular data with <u>time metadata included</u>
- 2. Search by time:
 - **Cone search** REC ongoing: extended to <u>temporal search</u>
 - MOC REC dev: <u>spatial and temporal indexing</u> (todo: std)
- 3. Get the photometric history of a source (Note)
- 4. Planning of observations:
 - ObjVisSAP WD visibility of object to plan observations
 - ObsLocTAP WD to facilitate coordination of observations
- 5. Transmission of alerts:
 - VOEvents REC
 - VOEvent Transport protocol REC



11/03/2020

1 - VOTable time medatada

KEY POINT: IVOA Standardisation of time annotation

Time Scale: UTC, TT, TAI, TCB,...

Format: JD, MJD, ISO, truncated ISO,...

Offset: e.g. JD-XXX (e.g. Gaia...)

Reference position: Topocentre, Geocentre, Barycentre,... (light-travel correction)

TIMESYS element in VOTables (Demleitner, M., Nebot, A., Bonnarel, et al. 2018)

2 - Search: know where & when

Cone search extension to add a time interval for search in cats

- Extend the protocol to query catalogs by an interval of time
 - Align definition with DALI (time interval = UTC, ref. position unknown)
- The response returns a list of astronomical sources from the catalog whose time values lie within the time interval, formatted as a VOTable.

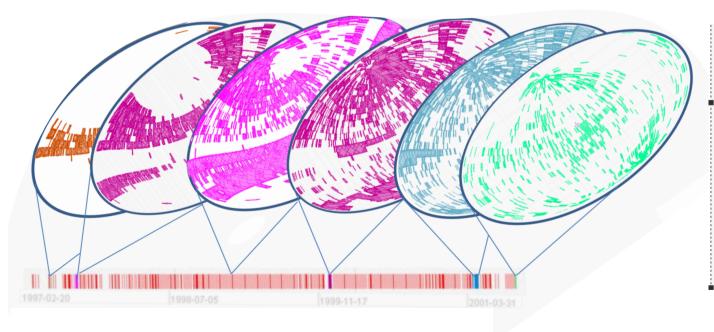
For complicated large areas in the sky (GWs, neutrinos) a cone search is not representative of the sky localisation...

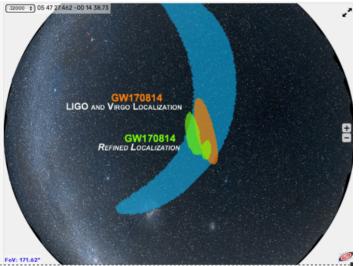
2 - Search: know where & when

Search by temporal+spatial coverage of surveys for the more complicated areas : **ST-MOC = space-time multi-order coverage map**

http://www.ivoa.net/documents/stmoc/index.html

https://github.com/cds-astro/mocpy





2 - Search: know where & when

Video Aladin + mocpy & Notebook

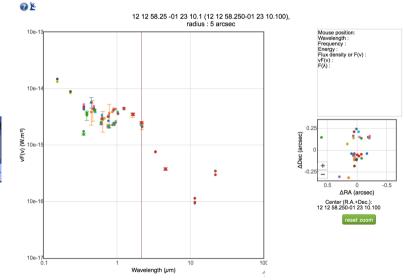
https://github.com/cds-astro/mocpy/tree/master/notebooks

https://github.com/cds-astro/mocpy/blob/master/notebooks/ Space%20%26%20Time%20coverages.ipynb

□ 3 - Get the history of a source

- History of a source (around a position)
 - Build on the fly "SED-like" photometric viewer
 - Build on the fly the "light-curve"
- Need to annotate:
 - Position
 - Time
 - Photometric band





Very first draft: https://wiki.ivoa.net/twiki/bin/view/IVOA/TimeSeries2020

11/03/2020

4 - Visibility of an object

+ES+ Southern Observatory	ESO — Reaching New Heights in Astronomy	XMM-NEWTON MULTI-T	ISAAC	NEWTON GROUP OF TELESCOPES
Ť vy		YOU CAN LOOKUP SIMBAD OR NED AGAIN, OR RUN THE VISIBILITY CHECKER US	About ING	Astronomy ▼ Developments ▼ Public Information ▼ Search:
Public Science	User Portal Contact Site Map Search Go!	Target Name M31 (ec: Abell 1750)	Home > Astron	nomy > Object Visibility
Science Users Information > Observi	g with ESO Telescopes > Observing Tools and Services > Calendars and Calculators > Observability 12 Oct 2017	SIMBAD Lookup NED Lookup		
Science Users Information Observing Facilities	Object Observability	Please note: there is a 30 second timeout should SIMBAD or NED not respond.		Object Visibility – STARALT
Future Facilities and Development Observing with ESO Telescopes Policies and Procedures	See also: Object Observability - Armanses - Daily Almanac - Sity Calendar This tool provides object observability tables based on site, object coordinates and observing period. Times are given for the local time, including daylight saving times when applicable.	SIMBAD LOOKUP RESULTS:	altitude agains a particular nig	ogram that shows the observability of objects in various ways: either you can plot time for a particular night (Staratl), or plot the path of your objects across the sky for ht (Startrack), or plot how altitude changes over a year (Starobs), or get a table with ving date for each object (Starmult). For further information, click on the "heip" button of the page.
Telescope Time Allocation	Select site, object coordinates and observing period; then press Compute.	If you are happy with these results, complete the "Visibility Details" and Submit	0	ENTON SENTON SENTON
Phase 1 Proposals Phase 2 Preparation	More detailed information is provided is a separate document Notes for Skycaic by John Thorstensen.	TARGET DETAILS	Mode	Staralt •
Phase 3	Site: Paranal Observatory (VLT)	Target Name M31 Target name or identifier for output (eg; Abell 1750) RA ID0:42:44.330 Decimal degrees or HH MM:SS:S (eg: 13:30:52.5)	Night	12 October V 2017 V or date when the local night starts. Staralt, Startrack only.
Public Surveys Observing Tools and Services ES0 ETC's Instrumental Characteristics	Dates (yyyy mm dd): Form: 2017 10 20 To: 2017 11 15 Object Coordinates (J2000)	Dec H41:16:07:50 Decimal degrees or DD.MM.SS.S (eg -01:50:27.0) VISIBILITY DETAILS Select either	Observatory	La Silla Observatory (Chile) Select one above or specify your own site with this format: Longitude(°East) Latitude(°) Altitude(metres) UTC offset(hours) Ex: 289.2767 - 30.2283 2725 - 4
Archives and Catalogues Calendars and Calculators Weather Images Astroclimatology Meteo Information Visiting Astronomes Science Software	RA (05 23 34.5 Dec: -69 45 22 compate SkyCaic provided by courtesy of John Thorstensen, Dartmouth College.John Thorstensen@dartmouth edu	Revolution Range @First Revolution 3359	Coordinates	Formats can be any of these: name hh mm ss ±dd mm ss name hh mm ss ±dd mm ss name ddd.ddd dd.ddd name must be a single word with no dots, avoid using single numbers. Every entry must be ain the same format, do not use different formats with different entries. We recommend a maximum of 100 targets per submission. 50.0 -70.2
Data Handling and Products Science Archive Facility Science Activities		XMM-NEWTON A017 TARGET VISIBILITY CHECKER	,	Silla Observatory 289,2700E - 29,2567N, 2347 m above sea level
+ES+ 0		VIEWING CONSTRAINTS FOR XXMM-NEWTON Valida comer (Bin Sain Xistin Apper) Alt four 2° x 2° 70°-110° 42°	8 ⁿ 4 ^m +18°15` Illumination: 42% Quarter: 4 Numbers below cu	70°
+		SEARCH CRITERIA FOR ALL TARGETS	are Moon distance (in degrees) at th	
ee also <u>Object Obser</u>	vability - Airmasses - Daily Almanac - Ephemerides	Min Vis Start Orbit Start Date End Date (n) 3540 3541 01-May-2016 28-Ap-2019	corresponding times.	
Observability	for 05 23 34.5 -69 45 22		40 1	
aranal Observatory		Targets that are only visible for a small faction of an orbit are only visible at the start or end of a revolution (see columns Visibility RantEnd Phase) and therefore to IEARCH RESULTS PER TARGET	14	40° 101 9
	3 34.5, -69 45 22, epoch 2000.0 1 36.8 (h.m.s) West, -24 37 30 North.	EARCH RESULT FR. FANGE Impet Name 24 A. Dec USI 10.5047 [41.3057		30 ⁴ 100 2
hown: local eve. da 2) natural center o ighttime hours duri ight (and twilight)	f night, an The ESO Sky Calendar Tool r of	Rev. Wrs. Start Win Moders Win. End Randfed Vis. (b) Weakling 328 269.65-83 02:66 27056 2016.62:81 02:96 20000 0.78 339 269.65-82 02:66 27056 2016.62:81 02:96 20000 0.78 359 2016.62:61 02:46 770126 2016.62:81 02:31 75000 0.47		20 ⁰ 100 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
017 Nov 3 F -6	eve cent morn night hrs@sec.z: HA sec.z HA sec.z HA sec.z (3 <2 <1.5 52 3.1 - 2.45 1.6 + 121 1.5 8.0 6.0 3.3 44 2.4 -1 49 1.5 +2 07 1.5 7.8 6.7 3.8	SMD D016-07-01125 7709 D016-07-01144 77000 0.47 SM1 D016-07-01105 77000 0.47 0.47 0.47 SM2 D016-07-0105 70000 0.47 0.47 0.47 SM2 D016-07-0105 70000 0.47 0.47 0.47 SM2 D016-07-0105 70000 0.47 0.47 0.47		ur - 12 - 23 - 24 - 1 - 2 - 3 - 4 - 5 - 3 - 4 - 5 - 3 - 4 - 5 - 5 - 6 - 6 - 6 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7

 $\underline{\mathit{SkyCalc}} \text{ provided by courtesy of John Thorstensen, Dartmouth College.} \\ \underline{\mathit{John.Thorstensen@dartmouth.edu}}$

Different services have different inputs / outputs

Facilitate the work by having some level of standardisation inputs / outputs/

Object Visibility Simple Access Protocol, Aitor Ibarra, Richard Saxton, Jesús Salgado et al. 2019 http://www.ivoa.net/documents/ObjVisSAP/index.html

4 - Coordination of observations

Integral Target and Scheduling Information

nation

ule: All executed Current revolution (1872) Future schedule Revolution 1872 to 1872 🧮 Show... show plot 🖸

Schedule for revolution 1872

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

									_
Rev	Start time (UTC)	End time (UTC)	Exp. time (s)	Target	Ra (J2000)	Dec (J2000)	Pattern	PI	Propo
1872	2017-10-10 13:29:15	2017-10-10 17:10:51	12600	Gal. Bulge region	17:45:36.00	-28:56:00.0	HEX	Erik Kuulkers	14200
1872	2017-10-10 17:13:34	2017-10-11 07:55:55	50000	Galactic Center	17:52:11.21	-25:21:49.7	5x5 Seq	Joern Wilms	14200
1872	2017-10-11 08:16:46	2017-10-11 11:58:32	12600	Galaxy (I=0, b=0)	17:42:23.76	-29:38:02.4	HEX	Rashid Sunyaev	14200
1872	2017-10-11 12:26:36	2017-10-11 12:56:36	1800	Galaxy (I=0, b=-30)	20:02:16.80	-41:20:31.2	HEX	Rashid Sunyaev	14200
1872	2017-10-11 13:27:21	2017-10-11 14:29:17	3600	Galaxy (I=0, b=-30)	19:59:40.80	-41:05:16.8	HEX	Rashid Sunyaev	14200
1872	2017-10-11 15:00:12	2017-10-11 17:38:07	9000	Galaxy (I=0, b=-30)	19:59:40.80	-41:05:16.8	HEX	Rashid Sunyaev	14200
1872	2017-10-11 18:41:00	2017-10-12 08:01:56	45000	GRS 1915+105	19:15:11.79	+10:56:45.7	5x5 Seq	Jerome Rodriguez	14200

Short Term Schedule XMM-NEWTON SHORT-TERM SCHEDULE

The Short-term Schedule gives an overview of scheduled observations covering the time range from the past week until the upcoming ~2-4 weeks.

Background: The planning and scheduling procedure is described in Sect. 8.2 of the Policies and Procedures. In addition, the process of scheduling XMM-Newto observations is described in A guided tour to the scheduling of an XMM-Newton orbit.

Description: Each rev lists the revolution number (FEV/W), Observation identifier (DobD), target name, prioring coordinates plus position angle (PA), start and stop times, prime instrument, accumulated exposure times (in kiloacouted) for each instrument (without overhead), and mare of the Principal investigator (PI). The start and stop times refer to its instrument achildres required to perform the observation. The exposure times are accumulated over all exposures taken with the manner. Expecially for OW, the observation can be split in shorter exposures with different filter/mode. EPIC exposure times in trackets indicate that one of the above: use the closed filter. Details can be seen when clicking on the ObaD. The row marked in the Indicates the target that is scheduled for the time of the last table update. The oreation date is given at the too of the table.

Caveats: The scheduling of an XMM-Newton revolution may have to be revised (see Sects. 8.2, 8.3, and 5.2.2 of the Policies and Procedures). Contingencies of any type ar solar flaring activity may impact at different levels the scheduled programme. The Observation Log Browser can be checked to see what was actually done.

Update frequency: Every 8 hours or when the schedule is updated (new revolution planned or any existing updated). The latest available version can be viewed after clearing the browser buffer from the contents of any previous sessions.

Last updated on: 2017-10-10 12:42:00 UT (Current Rev = 3267)

Cesa

HEX

Revn #	Obs Id.	Target Name	RA hh:mm:ss	DEC dd:mm:ss	PA ddd.dd	UTC Obs Start yyyy-mm- dd hh:mm:ss	UTC Obs End yyyy-mm- dd hh:mm:ss	Prime Instr.	PN Dur Ks	MOS1 Dur. Ks	MOS2 Dur. Ks	RGS1 Dur. Ks	RGS2 Dur. Ks	OM Dur. Ks	PI
3276	0805150401	ESO 018-G009	08:24:07	-77:46:57	88.63	2017-10-29 19:34:26	2017-10-30 00:54:26	EPIC	16.7	18.1	18.1	18.2	18.2	18.0	Peter Boorman
3276	0801870801	HD 81809	09:27:46	-06:04:17	92.00	2017-10-29 15:00:13	2017-10-29 18:20:13	EPIC	9.5	10.9	10.9	11.0	11.0	10.8	Fabio Favata
3276	0561381201	zeta Puppis	08:03:40	-40:00:36	112.00	2017-10-29 01:21:41	2017-10-29 14:08:21	RGS	44.5	44.9	44.9	45.0	45.0	37.3	Fred Janse XMM- Newton MI
3276	0803950401	SDSS 102714.77+35431	10:27:14	+35:43:17	119.93	2017-10-28 15:44:35	2017-10-28 23:31:15	EPIC	25.5	26.9	26.9	27.0	27.0	26.8	Guido Risaliti
3276	0803240201	J072637.95+394558.0	07:26:37	+39:45:58	91.37	2017-10-28 11:02:32	2017-10-28 14:55:52	EPIC	11.5	12.9	12.9	13.0	13.0	12.9	Nathan Secrest
3275	0801990201	0457-6739	04:57:33	-67:39:06	136.67	2017-10-27 12:22:47	2017-10-28 01:07:47	EPIC	43.4	44.8	44.8	44.9	44.9	43.7	Patrick Kavanagh
3275	0801990401	0449-6903	04:49:34	-69:03:34	138.62	2017-10-26 23:32:47	2017-10-27 12:02:47	EPIC	42.5	43.9	43.9	44.0	44.0	42.8	Patrick Kavanagh
3275	0803952601	SDSS	08:26:19	+31:48:48	101.78	2017-10-26	2017-10-26	EPIC	36.0	37.4	37.4	37.5	37.5	37.3	Guido

SOC HOME OPERATIONS TEAM LOGIN SCIENCE TEAM LOGIN TOO TEAM LOGIN LINKS

Observing schedules

Short Range Observatory Schedule Download

This is the confirmed schedule of NuSTAR observations. This sequence of observations has been uploaded to the spacecraft and will execute automonously unices interrupted by a new schedule. Target of oppositivity, or instrument and spacecraft annuals. This schedule will cover various time ranges depending on the exposure time gaid of the observations, but will usually be for a period of at least one week. The times reported here are be start and are of the on starget period (day of year UTC). The estimated exposure time tasks into account Earth occutation and the SAA passage time where detector background is increased. The end time of the observations is the start of the slew to the net target. Researce among the NuSTAA Are horm Timiting (ATT) for the (og of pan closervation.

Table Header Explanations

Rashid Sunyaev

Rashid Sunvaev

14200

14200

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	GR5_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 2011-11-11 is this table is scheduled to have the observation attempt schemet power 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 neet to complete the %USTAR (scate Observer programs. The exocure gal for trapted silicities within one week may appear to fill more that waikable KASTAR 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 = Extrapolactic/Galactic legacy surveys

ctic/Galactic legacy surveys	2017.289	03:

		06:30:55				WASP-69	COS/NUV			C230L	12.00			
17.288	23:14:45	06:30:55	1476735	Sing	35-002	WASP-69	COS/NUV COS/NUV	ACQ/PE	PSA	G230L	12.00	35	02	01
							COS/NUV	ACQ/PE	PSA	G230L	12.00	35	03	01
17.288	23:14:45	06:30:55	1476735	Sing	35-004	WASP-69	COS/FUV		PSA	G130M	1917.00			
17.288	23:14:45	06:30:55	1476735	Sing	35-005	WASP-69	COS/FUV	TIME-7	PSA	G130M	2706.00			
17.288	23:14:45	06:30:55	1476735	Sing	35-006	WASP-69	COS/FUV	TIME-7	PSA	G130M	2706.00			
				Sing			COS/FUV	TIME-7	PSA	G130M	2706.00			
		06:30:55			35-008	WASP-69	COS/FUV	TIME-7	PSA	G130M	2706.00	35	0D	01
17.289	00:00:00	00:28:32	14819JF	Riley	JF-001	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	1100.00	JF	01	01
		00:28:32				DARK					60.00			
		00:28:32				DARK					60.00			
		00:46:10			3B-001	DARK-NN	WFC3/UVI				900.00	3B	01	01
		00:46:10				DARK-NN	WFC3/UVI	ACCUM		F373N	900.00	3B	02	01
17.289	00:39:46	01:08:18	14819JC	Riley	JG-001	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	1100.00	JC	01	01
17.289	00:39:46	01:08:18	14819JG	Riley	JG-002	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JG	01	02
17,289	00:39:46	01:08:18	14819JC	Riley	JG-003	DARK	STIS/CCD	ACCUM	F28X50LP	MIRVIS	60.00	JC	01	03
17.289	00:46:10	01:32:20	145333C	Bourgue	3C-001	DARK-NN	WFC3/UVI	ACCUM	UVIS	F467M	900.00			
17.289	00:46:10	01:32:20	145333C	Bourgue	3C-001	DARK-NN	WFC3/UVI	ACCUM	UVIS	F467M	900.00	3C	02	01
17.289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	01
17.289	01+27+12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	02
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	03
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	04
17.289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	05
17.289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	06
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	07
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	08
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	09
17.289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	0A
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	0B
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	00
17,289	01:27:12	01:56:24	1482190	Riley	90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	0D
		01:56:24			90-001	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	OE
17,289	01:27:12	01:56:24	1482190	Riley	90-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	OF
17,289	01:27:12	01:56:24	1482190	Riley	90-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	00
17,289	01:27:12	01:56:24	1482190	Riley	90-002	BIAS	STIS/CCD	ACCUM	F28X50LP	MIRVIS	0.00	90	01	OH
17.289	01:40:00	02:09:22	1451870	Golimowski			ACS/WFC	ACCUM	WEC	F502N	0.00	FO	01	01
										F660N				
17.289	01+40+00	02.09.22	1451870	Golimowski	F0-002	DARK	ACS/WFC	ACCUM			1000.50	FÖ	01	02
										F660N				
17.289	02:09:22	02:38:56	14518F1	Golimowski	F1-001	DARK	ACS/WFC	ACCUM		F502N	0.50	P1	01	01
										F660N				
17.289	02+09+22	02:38:56	14518F1	Golimowski	F1-002	DARK	ACS/MEC	ACCUM	WEC		1000.50	P1	01	02
										F660N				

-Oct-2017 18:48:29 --- Preliminary HST Observing Timeline Report for SMS: 172888A4 ---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 Unit Principal Science Spectral Exposure Begin UT End UT SU Id Investigat Exp # Target Instrume Mode Apertures Elements Time(sec) OB AL EX

I-Oct-2017 18:48:29 --- Preliminary HST Observing Timeline Report for SMS: 172888A4 ---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 Unit Begin UT End UT	SU Id	Principal Investigat	Evo d	Target	Science	Node	Apertures	Spectral Elements	Exposure Time(sec)	0.2	AT.	FV
	begin of blid of	50 14	invescigue	nyh t	Turder	Allo CL GING	noure	Aber cares	D'YOHOHO G	1100(000)	00	nu	
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	1483522	Lockwood	22-001	DARK	STIS/MA2	TIME-7	F28X50LP	MIRVIS	1300.00	22	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	WEC3/UVT	ACCUM	UVIS	F438W	360.00	39	01	04
hbpla	•												

What object has been (or will be) observed when and in which wavelength?

Observation Locator Table Access Protocol, Aitor Ibarra, Jesús Salgado et al. 2019 http://www.ivoa.net/documents/ObsLocTAP/ Page 2



International

Virtual

Observatory

Alliance



International

Virtual

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Observation Locator Table Access Protocol

Version 1.0 IVOA Working Draft 11 February 2020

This version:

http://www.ivoa.net/documents/ObsLocTAP/20200211/

Latest version: http://www.ivoa.net/documents/ObsLocTAP/ Previous version(s): http://www.ivoa.net/documents/ObsLocTAP/20190909/

Working Group: http://www.ivoa.net/twiki/bin/view/IVOA/IvoaDAL

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Object Visibility Simple Access Protocol

Version 0.5 IVOA Working Draft 19 March 2019

This version: ObjVisSAP-0.5-20190319 Latest version: ObjVisSAP-0.4-20180912

Previous version(s):

Working Group: http://www.ivoa.net/twiki/bin/view/IVOA/IvoaDAL

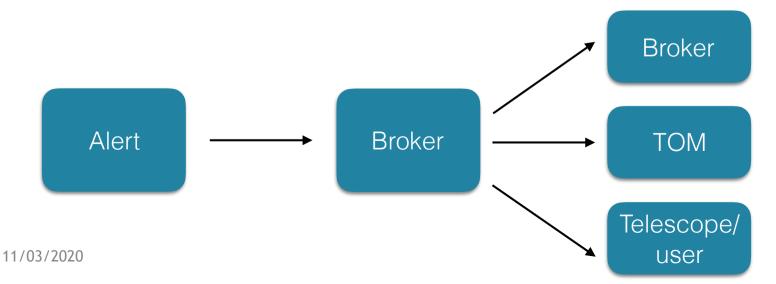
Editor(s): Aitor Ibarra, Richard Saxton, Jesús Salgado

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5 - Alerts

- 1. VOEvent (REC):
 - 1. Container -> XML
 - 2. Content —> defined by the community: FRB, (GRB, SN, Neutrino,...)
- 2. VOEvent Transport protocol (REC):
 - 1. Works for low rates (10 Hz)
 - 2. Might not scale well for very high rates (10³Hz)
- 3. Open questions:
 - 1. A VOEvents validation library is missing
 - 2. How to find who distributes alerts? Register in the registry



What next?

- How to find distributed timeseries in the VO?
 - Obscore "*dataproduct_type = timeseries*"
 - Conesearch extension to time interval
 - *timeseries* distributed as *SSA products*
 - Registry : adding "dataproduct_type = timeseries" as metadata to SSA capability — SimpleDALRegExt
 - Datalink: align with Obscore "dataproduct_type = timeseries"