Observation Facilities in the VO

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Why

- **ObsTAP** / **EPN-TAP** have “facility” / “instrument_host_name” keywords respectively. For efficient data mining, a standardization of such nomenclature is needed.

- *The same is true for target names: EPN-TAP is requiring that IAU names are used for bodies in the solar system.*

- There is no official standard for “observation facilities” names. We propose to build such list.

- The goal is to have that list endorsed by a long-lived international alliance, to ensure its sustainability (such as IAU, IVOA, IPDA…).

What

- Facilities are the spacecraft/telescopes:

Grouping of Facilities	Facilities
Institute/Observatory	Telescope
Space Mission	Spacecraft
Institute/University	Experiment Facility
Institute/Project	Field Analogue
Institute/University	Numerical Experiment/Model

- We focus here on “Telescopes” and “Spacecraft” types of facilities

- Grouping of facilities may not always be present, or may not represent a group of colocated facilities (e.g. the LOFAR international stations all over Europe, or the VLA network)

Spacecraft

- Several spacecraft name lists available:
  - NASA/NAIF (Navigation and Ancillary Information Facility)
  - NASA/NSSDC (National Space Science Data Center)
  - NASA/PDS (Planetary Data System)
  - SPASE/SMWG (Solar and Magnetospheric Working Group)
  - SANA (Space Assigned Numbers Authority)

- Not the same names (upper/lower case, but not only) nor same IDs, although most are compiled by NASA entities.

- Spacecraft may also be part of a Mission.
  E.g.: *The Cassini-Orbiter and Huygens-Probe are two spacecraft of the Cassini-Huygens Mission.*

Available Lists

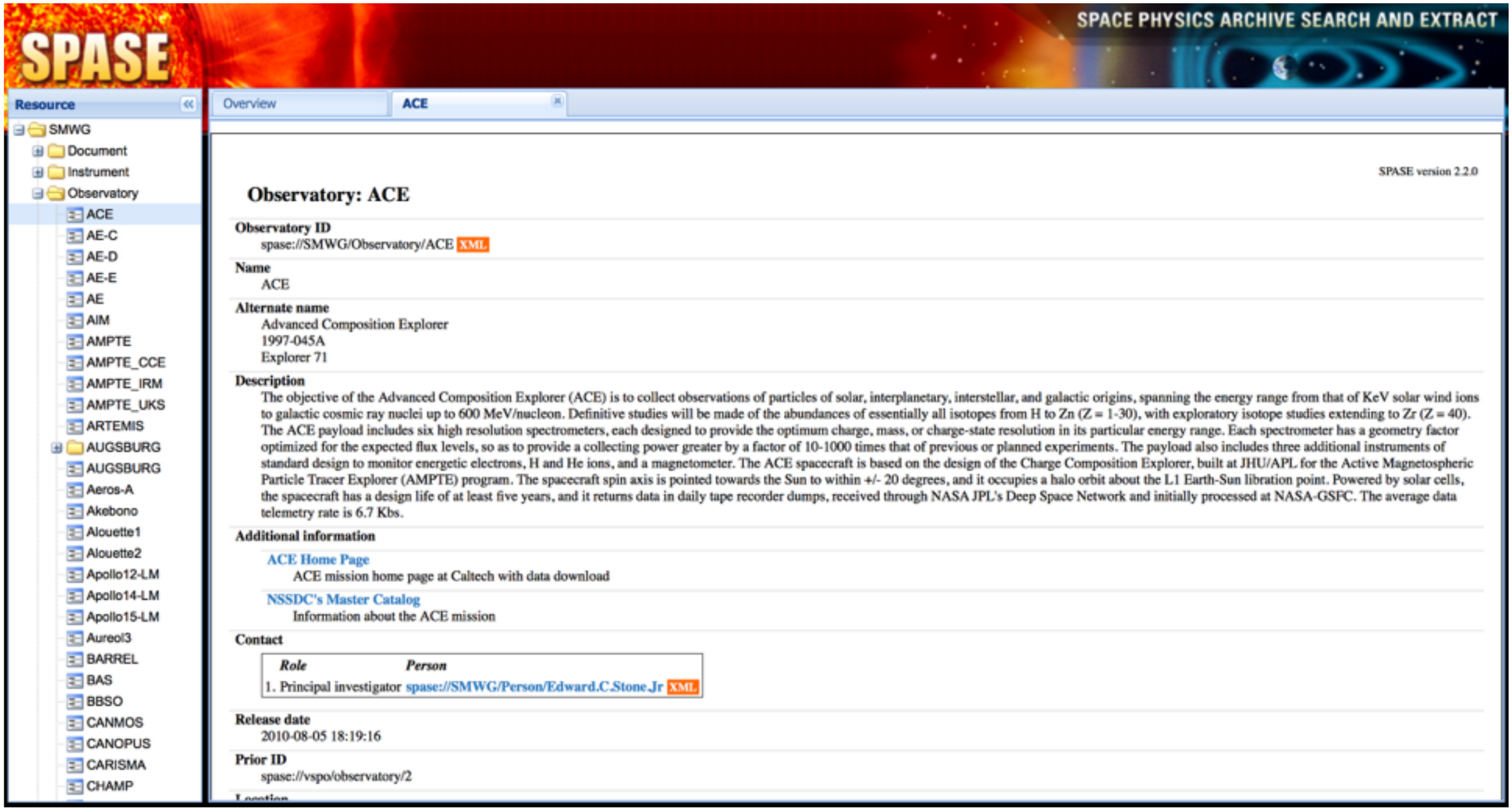
List	Facility Type	number of Records
NSSDC	space	7203
NASA/NAIF	space	196
NASA/PDS	space	50+
SPASE	space + ground	215
SANA	space	1053
AAS	ground	417
Harvard/ADS	ground	257
IRAF	ground	58
IAU/MPC	ground	1864
Xephem	ground	461

Available Information

List	Name	ID	Alt Name	Desc	Contact	Location	Launch	URL	Target	WL Range
NSSDC	x	x					x	x		
NASA/NAIF	x	x								
NASA/PDS	x	x			x				x	
SPASE	x	x	x	x	x	x		x	x	x
SANA	x	x			x					
AAS	x	x								x
Harvard/ADS	x	x								
IRAF	x	x				x				
IAU/MPC	x	x				x				
Xephem	x	x				x				

Spacecraft lists SPASE/SMWG

http://www.spase-group.org/smwg/explorer/



Spacecraft lists
SANA

1053 items

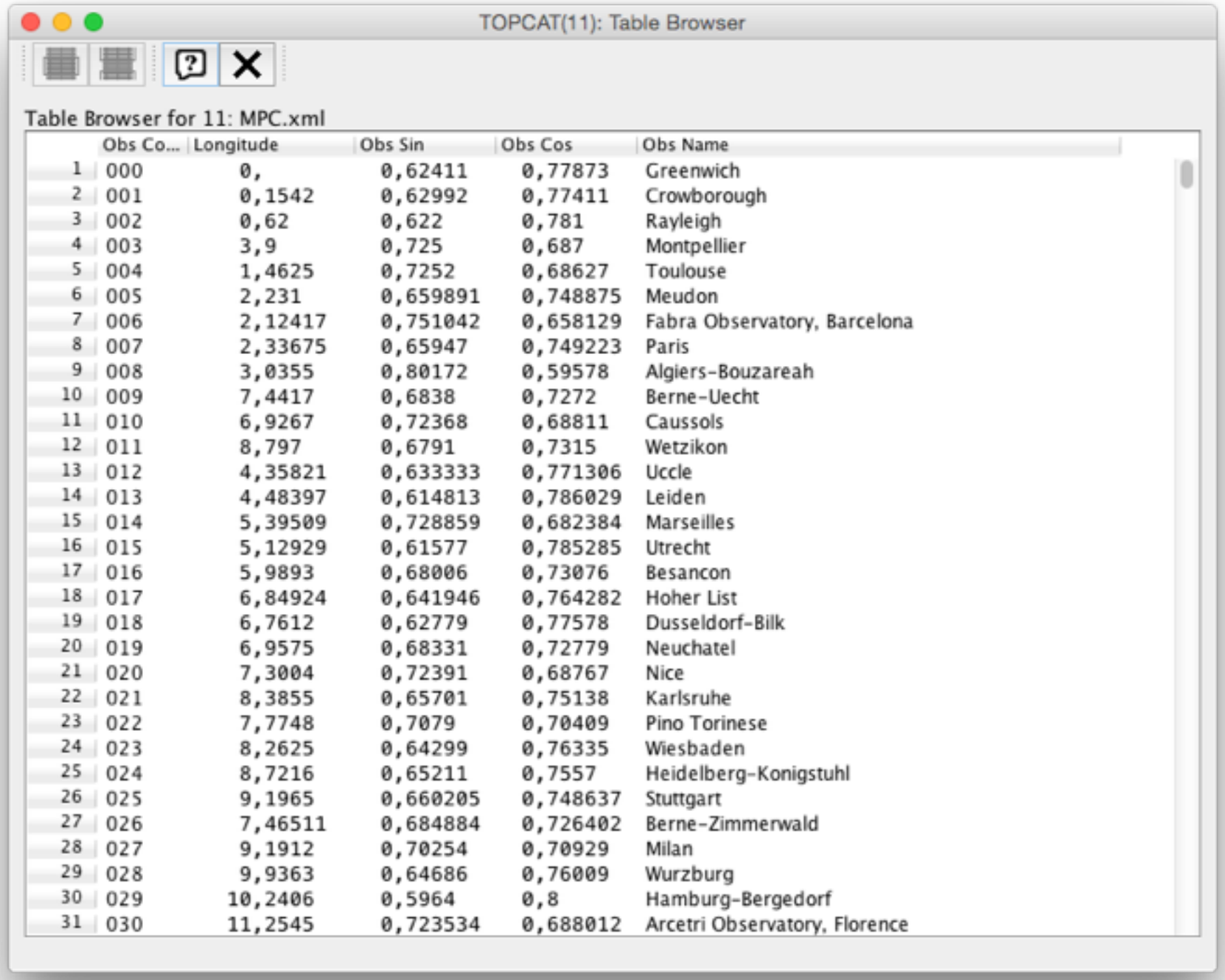
TOPCAT(7): Table Browser

Table Browser for 7: SANA.xml

	Name	SANA ID	Requestor Name	Requestor Affiliati...	Request...	Creation Date	Assigne...	Version	Status	Channels
51	MSP 01-Orbiter Flight	035	Badri Younes	NASA GSFC	US	1998-11-30	RP	1	Assigned	TC,TLM
52	GENESIS Simulator	036	Badri Younes	NASA GSFC	US	1998-11-30	RP	1	Assigned	TC,TLM
53	MARS-EXP-ORB	037	Nicolas Bobrinsky	ESA	EU	1999-05-05	RP	1	Assigned	TC,TLM
54	SLATS	038	Tsutomu Shigeta	JAXA	JP	2011-08-18	JGG	1	Assigned	TC
55	NEMO-A	039	Badri Younes	NASA GSFC	US	1999-04-11	RP	1	Assigned	TC,TLM
56	Space Telescope	03A	G.M. Levin	NASA GSFC	US	1980-03-21	JIV	1	Assigned	
57	MSL98 (SIM)	03C	Joseph Deskevich	NASA	US	1996-12-16	RP	1	Assigned	TC,TLM
58	INTELSAT K-TV	03D	Erhard Jabs	ESA	EU	1997-10-23	RP	1	Assigned	TC,TLM
59	JUNO	03D	Roger D. Porter	NASA GSFC	US	2006-11-04	RP	1	Assigned	TC
60	OCO-2	03E	Roger D. Porter	NASA	US	2010-02-23	JGG	1	Assigned	TC
61	JUNO,sim	03F	Roger D. Porter	NASA GSFC	US	2006-11-04	RP	1	Assigned	TC
62	NEMO-B	040	Badri Younes	NASA	US	1999-04-11	RP	1	Assigned	TC,TLM
63	ATV-7	041	Nicolas Bobrinsky	ESA	EU	1999-09-09	RP	1	Assigned	TC,TLM
64	ATV-8	042	Nicolas Bobrinsky	ESA	EU	1999-09-09	RP	1	Assigned	TC,TLM
65	W1R	043	Nicolas Bobrinsky	ESA	EU	1999-04-04	RP	1	Assigned	TC,TLM
66	NILESAT 2	044	Nicolas Bobrinsky	ESA	EU	1999-04-04	RP	1	Assigned	TC,TLM
67	WORLDSTAR 4	045	Nicolas Bobrinsky	ESA	EU	1999-04-04	RP	1	Assigned	TC,TLM
68	DI-IMPACTOR	046	Badri Younes	NASA GSFC	US	2001-02-17	RP	1	Assigned	TC,TLM
69	GRAVITY PROBE-B	047	Joseph Deskevich	NASA GSFC	US	1996-06-25	RP	1	Assigned	TC
70	PICASSO-CENA	048	Roland Ivarnez	CNES	FR	1999-03-11	RP	1	Assigned	TC,TLM
71	PICASSO-CENA,SIM	049	Roland Ivarnez	CNES	FR	1999-03-11	RP	1	Assigned	TC,TLM
72	MRO	04A	Roger D. Porter	NASA	US	2002-08-12	RP	1	Assigned	TC,TLM

Telescope lists IAU/MPC

1864 items



	Obs Co...	Longitude	Obs Sin	Obs Cos	Obs Name
1	000	0,	0,62411	0,77873	Greenwich
2	001	0,1542	0,62992	0,77411	Crowborough
3	002	0,62	0,622	0,781	Rayleigh
4	003	3,9	0,725	0,687	Montpellier
5	004	1,4625	0,7252	0,68627	Toulouse
6	005	2,231	0,659891	0,748875	Meudon
7	006	2,12417	0,751042	0,658129	Fabra Observatory, Barcelona
8	007	2,33675	0,65947	0,749223	Paris
9	008	3,0355	0,80172	0,59578	Algiers-Bouzareah
10	009	7,4417	0,6838	0,7272	Berne-Uecht
11	010	6,9267	0,72368	0,68811	Caussols
12	011	8,797	0,6791	0,7315	Wetzikon
13	012	4,35821	0,633333	0,771306	Uccle
14	013	4,48397	0,614813	0,786029	Leiden
15	014	5,39509	0,728859	0,682384	Marseilles
16	015	5,12929	0,61577	0,785285	Utrecht
17	016	5,9893	0,68006	0,73076	Besancon
18	017	6,84924	0,641946	0,764282	Hoher List
19	018	6,7612	0,62779	0,77578	Dusseldorf-Bilk
20	019	6,9575	0,68331	0,72779	Neuchatel
21	020	7,3004	0,72391	0,68767	Nice
22	021	8,3855	0,65701	0,75138	Karlsruhe
23	022	7,7748	0,7079	0,70409	Pino Torinese
24	023	8,2625	0,64299	0,76335	Wiesbaden
25	024	8,7216	0,65211	0,7557	Heidelberg-Konigstuhl
26	025	9,1965	0,660205	0,748637	Stuttgart
27	026	7,46511	0,684884	0,726402	Berne-Zimmerwald
28	027	9,1912	0,70254	0,70929	Milan
29	028	9,9363	0,64686	0,76009	Wurzburg
30	029	10,2406	0,5964	0,8	Hamburg-Bergedorf
31	030	11,2545	0,723534	0,688012	Arcetri Observatory, Florence

VOFacility
as an extension of VOResource

- Extension of VOResource with addition of:
  <alternateName> + “namingAuthority” attribute

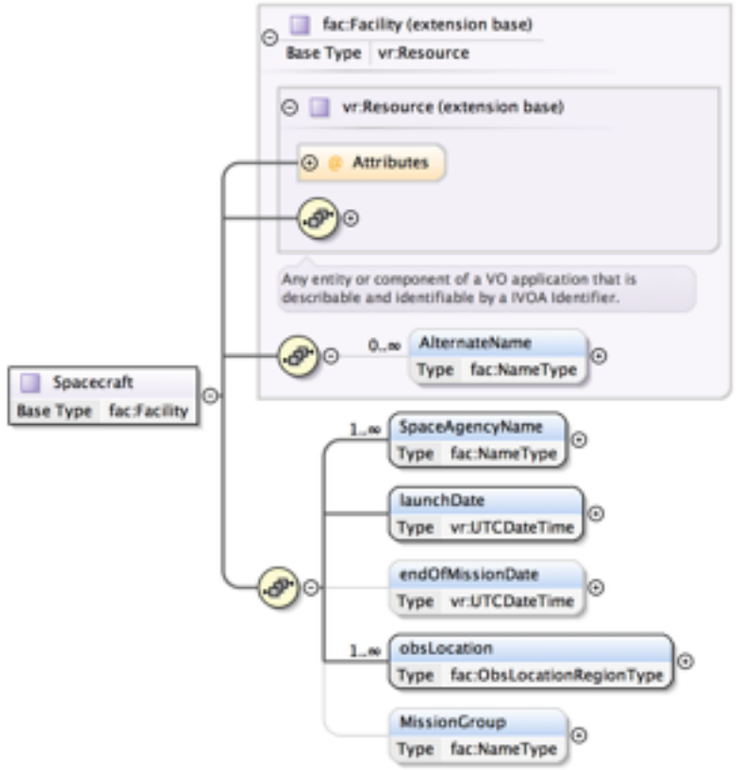
```
<title>Cassini</title>
<alternateName>CASSINI</alternateName>
<alternateName>Cassini Orbiter</alternateName>
<alternateName namingAuthority="naif">-82</alternateName>
<alternateName namingAuthority="nssdc">1997-061A</alternateName>
<alternateName namingAuthority="pds">co</alternateName>
```

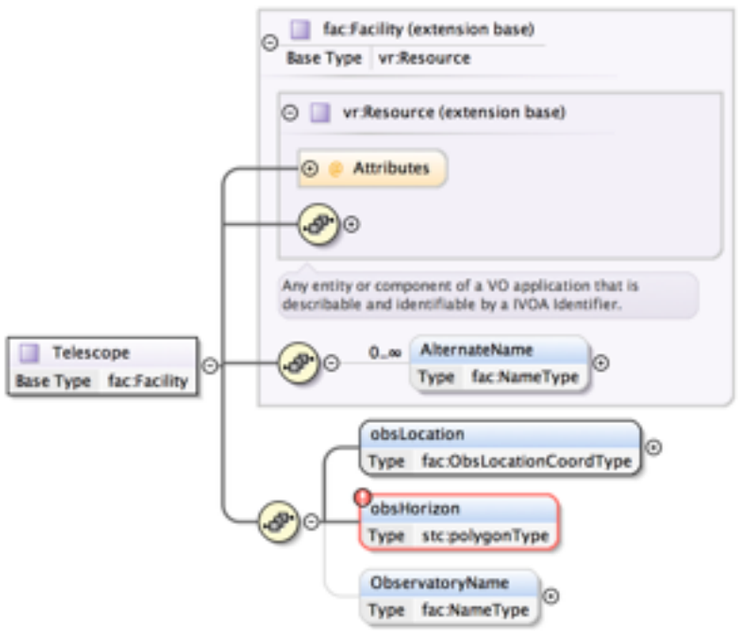
- **Spacecraft** = extension of Facility with:
  + LaunchDate + EndOfMissionDate
  + SpaceAgencyName + MissionGroup +
  + ObsLocation [ObsRegion + TimeInterval [StartTime + StopTime]]

- **Telescope** = extension of Facility with:
  + ObservatoryName
  + ObsLocation [long,lat,alt]
  + ObsHorizon [polygon]

- Next: Add Instruments with references to Facilities.

- Next-next:FieldAnalog, Laboratory Experiment and Numerical Experiment





List Compilation

- Compilation using match functions of TOPCAT is possible, but not very efficient: a lot of things to be fixed by hand.

- Definition of adequate list format needed:
  - JSON formatted record will be created for name-resolver (CouchDB at IMCCE, same as SSODnet)
  - Other: VOFacility XML records ? VOTable ?

- Once standard list is compiled in adequate form: propose list for endorsement to IPDA/IAU/IVOA