mp3c

The minor planet physical properties catalogue

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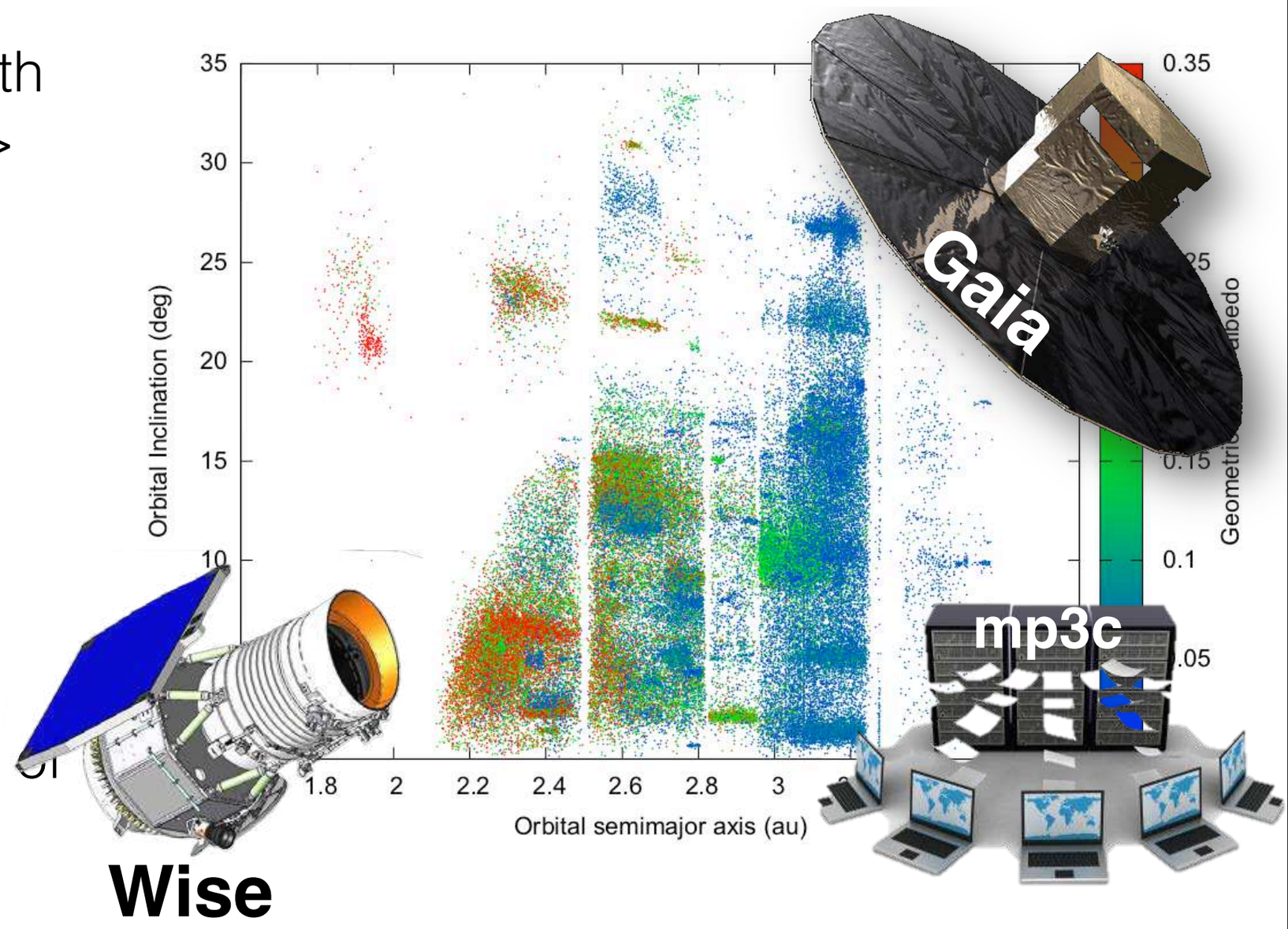
The aim of mp3c

- Combining results from different space missions and telescopes, along with ground based survey —> data fusion and provisioning by a unique portal: the **mp3c**

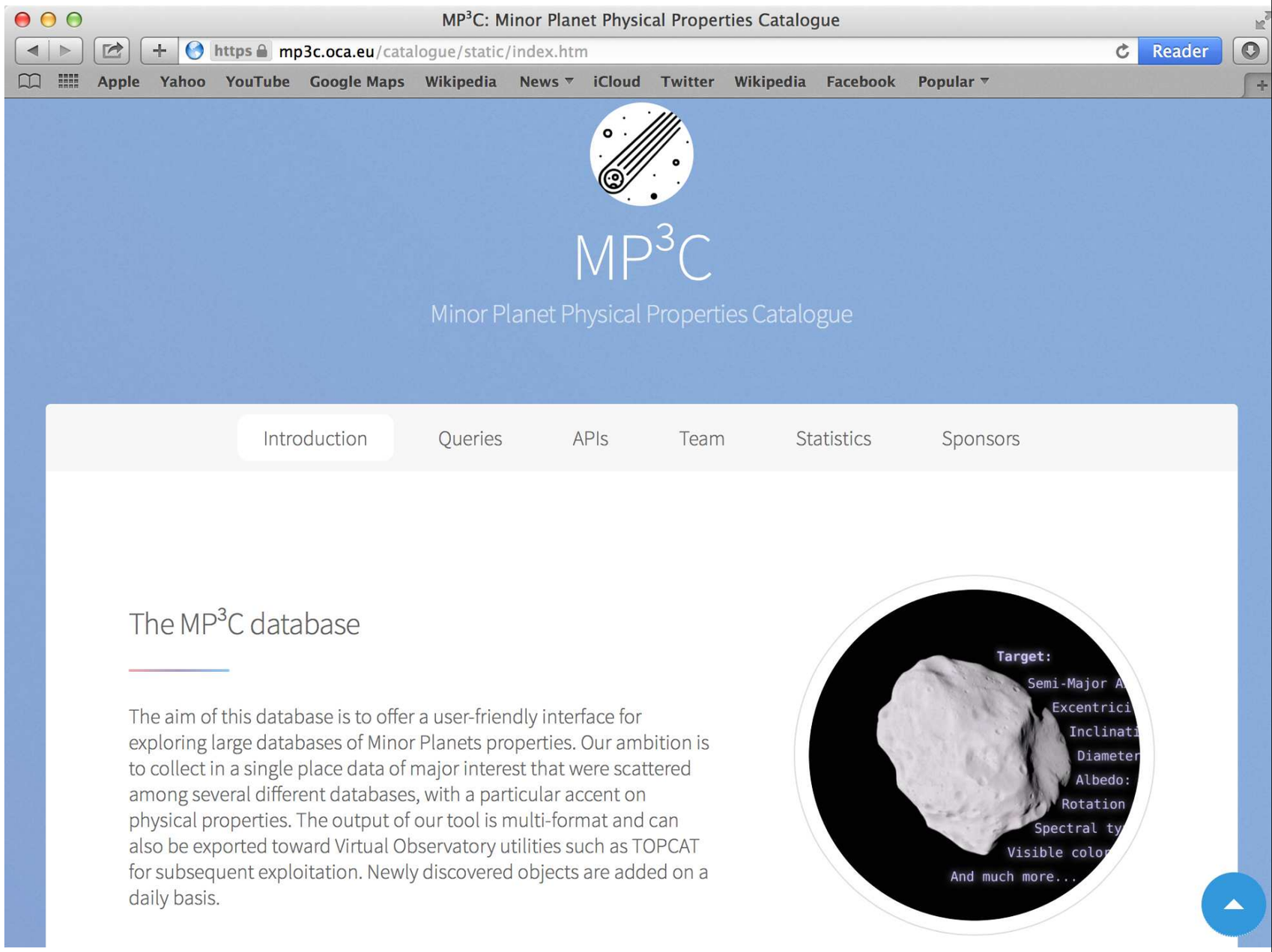
- … to build a new understanding of the asteroid population

- mp3c is one of the ANOs of the INSU



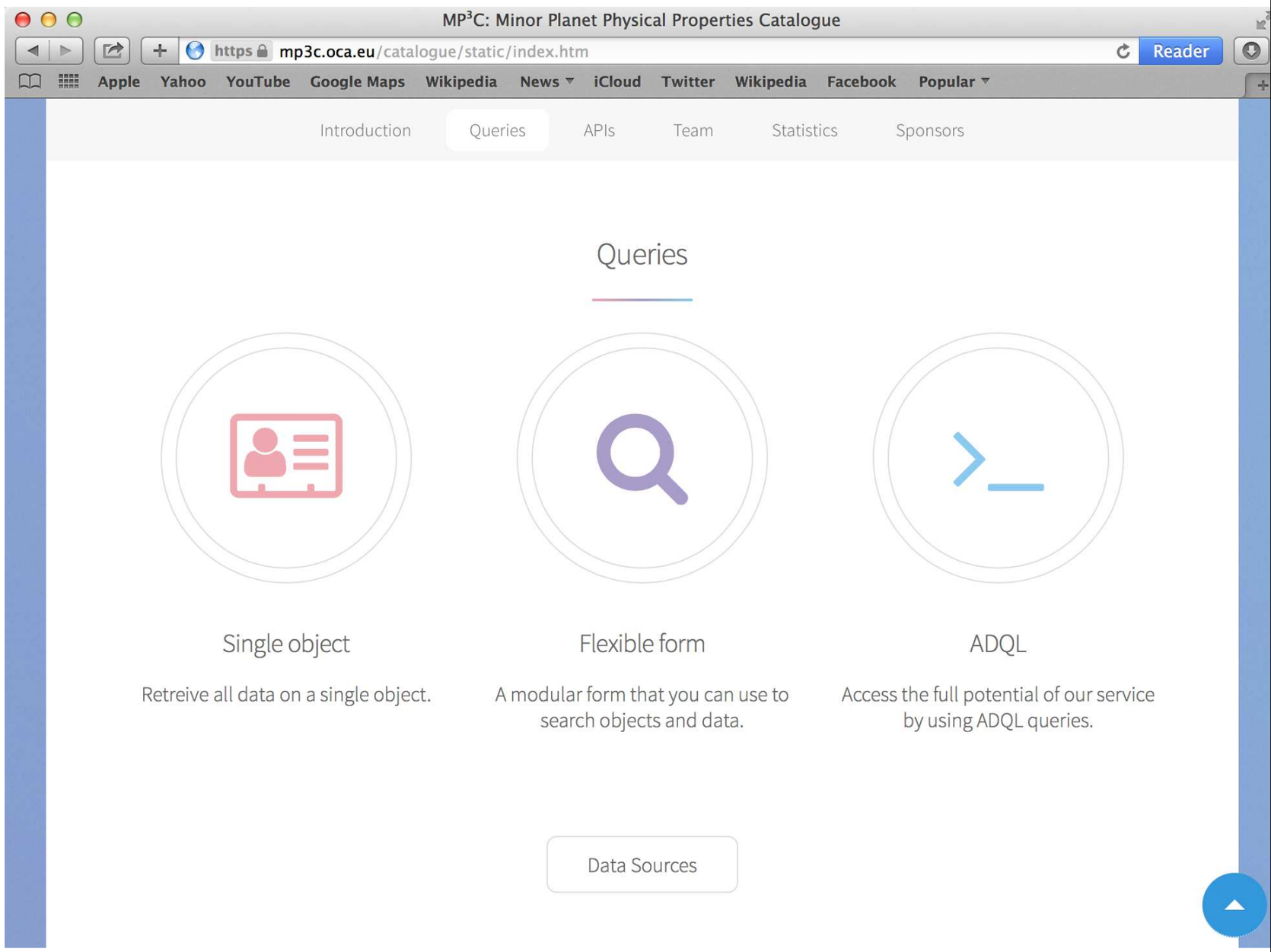
The new mp3c

- mp3c has been completely redesigned
- new look, new database engine
- new interfaces



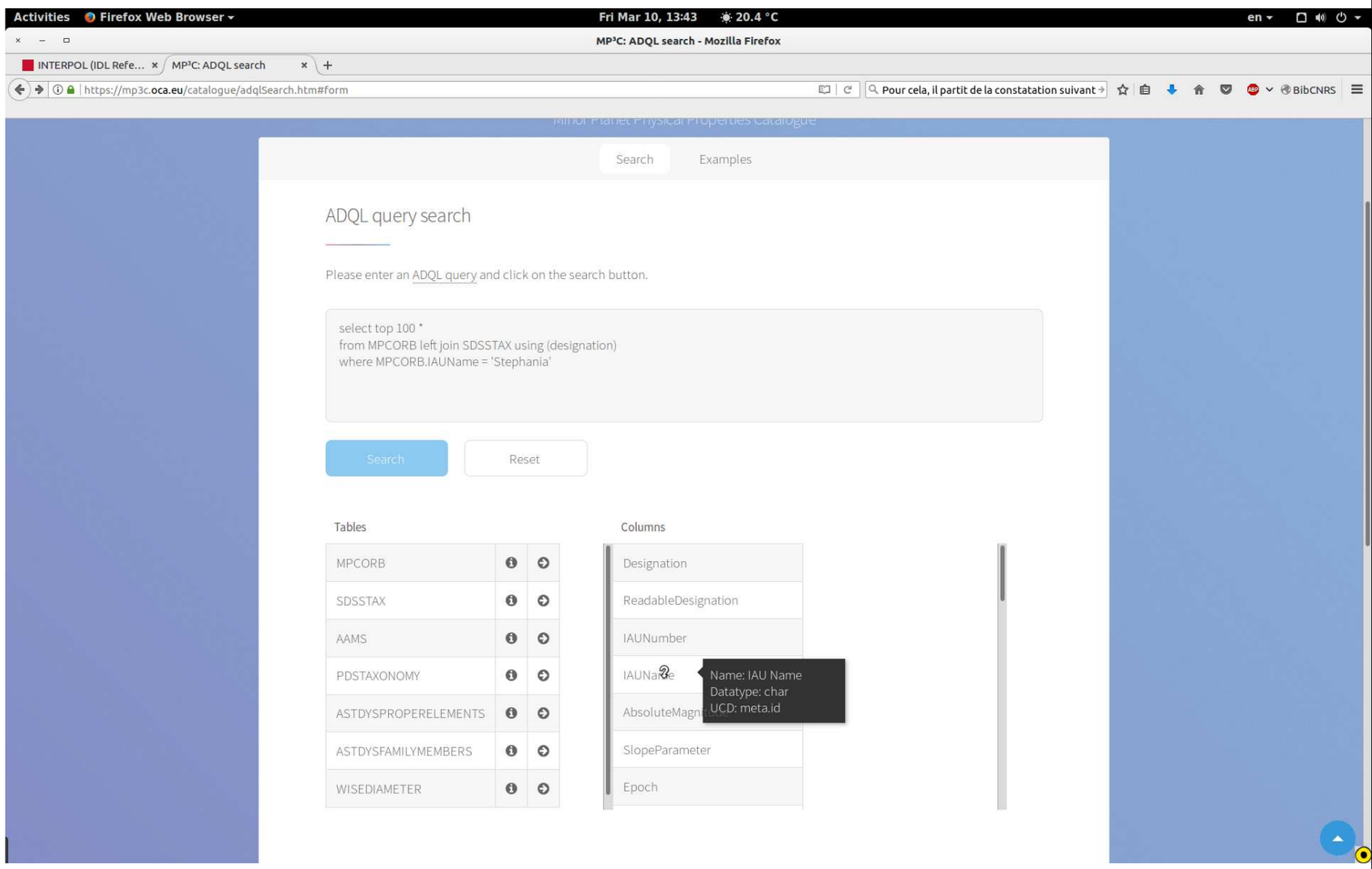
The new mp3c

- New query forms: simple (information about a single object), and more sophisticated interfaces including ADQL



ADQL interface @ mp3c

- The ADQL interface allows users to formulate complex queries using this database language



Example of result output

MP3C - Metadata

MP3C.RESULTS

Provided by Lagrange/OCA/CNRS

Absolute Magnitude	Slope parameter	Epoch	Mean anomaly	Argument of perihelion	Longitude of the ascending node	Inclination	Eccentricity	Mean daily motion	Semimajor Axis	Uncertainty parameter	Reference	Number of observations	Number of oppositions	Orbital arc	Residuals	Coarse list of perturbers	Precise list of perturbers	Computer name	Orbital flag	Readable Designation	Date of the last observation	Epoch	IAU Number	IAU Name	Cl
			deg	deg	deg	deg		deg/day	AU						arcsec										
9.49	0.15	K172G	320.22067	316.64377	302.0142	5.43202	0.1722988	0.28463347	2.2888223	0	MPO394991	1695	43	1899-2016	0.48	M-v	38h	MPCLINUX	000	(376) Geometria	2016-12-31	2017-02-16	376	Geometria	
11.6	0.15	K172G	284.64485	179.04607	292.12424	1.59553	0.1071028	0.29989703	2.2104869	0	MPO394992	2007	37	1898-2016	0.44	M-v	38h	MPCLINUX	000	(440) Theodora	2016-12-24	2017-02-16	440	Theodora	
12.53	0.15	K172G	10.20165	264.29384	203.41107	5.99538	0.1021301	0.29300618	2.2450096	0	MPO394993	1762	34	1908-2017	0.47	M-v	38h	MPCLINUX	000	(525) Adelaide	2017-01-03	2017-02-16	525	Adelaide	
12.5	0.15	K172G	335.75277	17.70367	41.01992	1.71191	0.128577	0.29796727	2.2200206	0	MPO394994	1716	34	1907-2016	0.44	M-v	38h	MPCLINUX	000	(641) Agnes	2016-12-22	2017-02-16	641	Agnes	
11.1	0.15	K172G	61.81185	101.68585	96.8239	6.78972	0.1038101	0.29611507	2.2292685	0	MPO394995	1838	33	1910-2016	0.45	M-v	38h	MPCLINUX	000	(700) Auravictrix	2016-07-16	2017-02-16	700	Auravictrix	
12.9	0.15	K172G	15.72848	55.4298	82.65868	4.25629	0.0877282	0.29129044	2.2538166	0	MPO394995	1645	26	1912-2017	0.48	M-v	38h	MPCLINUX	000	(728) Leonisis	2017-01-08	2017-02-16	728	Leonisis	
12.0	0.15	K172G	243.63164	306.31112	333.16286	4.8979	0.1421394	0.30255551	2.1975191	0	MPO394996	1961	37	1904-2017	0.45	M-v	38h	MPCLINUX	000	(819) Barnardiana	2017-01-11	2017-02-16	819	Barnardiana	
13.2	0.15	K172G	335.53882	179.76639	199.80642	4.84743	0.1769925	0.30413353	2.1899112	0	MPO389582	1509	26	1903-2016	0.48	M-v	38h	MPCLINUX	000	(836) Jole	2016-10-14	2017-02-16	836	Jole	
13.8	0.15	K172G	88.58935	317.13246	4.09325	8.00125	0.2099426	0.28647992	2.2789769	0	MPO394997	1228	23	1916-2017	0.51	M-v	38h	MPCLINUX	000	(843) Nicolaia	2017-01-04	2017-02-16	843	Nicolaia	
11.8	0.15	K172G	245.76182	234.02565	17.13359	10.88573	0.1791322	0.27158969	2.3615322	0	MPO394997	1631	31	1916-2017	0.46	M-v	38h	MPCLINUX	000	(855) Newcombia	2017-01-09	2017-02-16	855	Newcombia	
11.2	0.15	K172G	106.99016	348.18447	181.80684	23.47751	0.1584365	0.2698582	2.3716229	0	MPO389584	1517	31	1904-2016	0.45	M-v	38h	MPCLINUX	000	(950) Ahrensa	2016-09-13	2017-02-16	950	Ahrensa	
12.7	0.15	K172G	36.27773	59.65882	290.33003	4.05608	0.2778328	0.28264626	2.2995378	0	MPO394999	1712	23	1922-2017	0.43	M-v	38h	MPCLINUX	000	(985) Rosina	2017-01-11	2017-02-16	985	Rosina	
12.7	0.15	K172G	133.40389	84.79015	221.13425	5.91898	0.2023469	0.29448126	2.2375063	0	MPO395000	1647	32	1925-2017	0.47	M-v	38h	MPCLINUX	000	(1060) Magnolia	2017-01-08	2017-02-16	1060	Magnolia	
11.7	0.15	K172G	187.14923	151.09428	147.13545	4.34485	0.1984576	0.29256956	2.2472426	0	MPO395000	1942	40	1930-2017	0.46	M-v	38h	MPCLINUX	000	(1117) Reginita	2017-01-10	2017-02-16	1117	Reginita	
12.22	0.15	K172G	6.18054	306.76516	58.23011	5.37639	0.1879223	0.30495972	2.1859542	0	MPO395001	1469	33	1929-2016	0.48	M-v	38h	MPCLINUX	000	(1133) Lugduna	2016-11-23	2017-02-16	1133	Lugduna	
12.1	0.15	K172G	176.87929	28.80277	280.55484	3.33493	0.1609289	0.30297937	2.1954692	0	MPO395001	1774	31	1930-2017	0.49	M-v	38h	MPCLINUX	000	(1153) Wallenbergia	2017-01-09	2017-02-16	1153	Wallenbergia	
12.7	0.15	K172G	112.45362	133.45743	60.05832	5.65849	0.1200558	0.29248991	2.2476506	0	MPO395003	1866	29	1933-2016	0.42	M-v	38h	MPCLINUX	000	(1344) Caubeta	2016-09-14	2017-02-16	1344	Caubeta	
13.4	0.15	K172G	44.98681	60.98796	302.56094	5.29426	0.2787519	0.29198381	2.250247	0	MPO395004	1546	25	1935-2017	0.46	M-v	38h	MPCLINUX	000	(1374) Isora	2017-01-09	2017-02-16	1374	Isora	
12.25	0.15	K172G	202.47633	70.89618	277.55781	7.28699	0.1793252	0.29646064	2.2275358	0	MPO395004	1392	33	1935-2016	0.47	M-v	38h	MPCLINUX	000	(1401) Lavonne	2016-12-05	2017-02-16	1401	Lavonne	
12.5	0.15	K172G	253.93239	95.84851	312.08277	7.03068	0.1465761	0.29178719	2.2512578	0	MPO389590	1524	23	1936-2016	0.47	M-v	38h	MPCLINUX	000	(1405) Sibelius	2016-09-13	2017-02-16	1405	Sibelius	
12.3	0.15	K172G	145.5768	14.05172	66.11764	4.71784	0.1128259	0.29904816	2.214668	0	MPO384760	1654	32	1929-2016	0.5	M-v	38h	MPCLINUX	000	(1412) Lagrula	2016-06-29	2017-02-16	1412	Lagrula	
13.42	0.15	K172G	291.17939	171.14599	201.61136	2.68091	0.1678772	0.29263306	2.2469175	0	MPO384760	1773	27	1936-2016	0.48	M-v	38h	MPCLINUX	000	(1422) Stromgrenia	2016-08-01	2017-02-16	1422	Stromgrenia	
13.2	0.15	K172G	0.64045	51.85881	175.28774	5.10875	0.1176332	0.30135994	2.2033274	0	MPO374860	1667	24	1938-2016	0.51	M-v	38h	MPCLINUX	000	(1451) Grano	2016-04-02	2017-02-16	1451	Grano	
12.9	0.15	K172G	201.09847	81.364	137.80624	6.05763	0.1163786	0.3076607	2.1731416	0	MPO395005	1729	28	1938-2017	0.49	M-v	38h	MPCLINUX	000	(1492) Oppolzer	2017-01-03	2017-02-16	1492	Oppolzer	
13.06	0.15	K172G	114.47923	16.96407	19.92423	7.43745	0.1894814	0.29340605	2.2429693	0	MPO395005	1367	24	1938-2017	0.45	M-v	38h	MPCLINUX	000	(1500) Jyvaskyla	2017-01-09	2017-02-16	1500	Jyvaskyla	
11.88	0.15	K172G	14.87691	51.1122	94.88643	11.04755	0.1576847	0.26517653	2.3994553	0	MPO395005	1216	28	1939-2017	0.5	M-v	38h	MPCLINUX	000	(1504) Lappeenranta	2017-01-09	2017-02-16	1504	Lappeenranta	
12.0	0.15	K172G	144.63376	304.51733	16.13298	5.19396	0.1987421	0.29659125	2.2268817	0	MPO395006	1601	34	1929-2017	0.5	M-v	38h	MPCLINUX	000	(1527) Malmquista	2017-01-09	2017-02-16	1527	Malmquista	
11.7	0.15	K172G	138.09522	59.36772	139.39158	8.51351	0.1439362	0.26269837	2.4145218	0	MPO395006	1735	29	1940-2016	0.46	M-v	38h	MPCLINUX	000	(1528) Conrada	2016-12-13	2017-02-16	1528	Conrada	
12.7	0.15	K172G	235.66167	170.70936	195.68754	1.5342	0.1951316	0.30114527	2.2043744	0	MPO384761	1950	33	1903-2016	0.47	M-v	38h	MPCLINUX	000	(1536) Pielinen	2016-07-03	2017-02-16	1536	Pielinen	
12.0	0.15	K172G	66.22161	216.56593	327.92323	3.19124	0.1339797	0.2667289	2.3901363	0	MPO384762	1900	33	1935-2016	0.46	M-v	38h	MPCLINUX	000	(1559) Kustaanheimo	2016-07-13	2017-02-16	1559	Kustaanheimo	
12.7	0.15	K172G	213.61008	266.5148	123.55308	4.35527	0.1664877	0.2959138	2.2302792	0	MPO384762	1854	28	1931-2016	0.48	M-v	38h	MPCLINUX	000	(1577) Reiss	2016-07-14	2017-02-16	1577	Reiss	
13.1	0.15	K172G	255.24309	185.24104	120.04991	9.97966	0.2813281	0.29694535	2.2251111	0	MPO395006	1315	22	1951-2017	0.48	M-v	38h	MPCLINUX	000	(1593) Fagnes	2017-01-09	2017-02-16	1593	Fagnes	
12.15	0.15	K172G	307.15636	328.211	61.4957	6.21415	0.1765142	0.29383442	2.2407889	0	MPO389593	1679	35	1931-2016	0.48	M-v	38h	MPCLINUX	000	(1619) Ueta	2016-09-14	2017-02-16	1619	Ueta	
11.63	0.15	K172G	13.98218	238.14073	181.88491	3.17292	0.1188963	0.29596096	2.2300423	0	MPO395007	1764	37	1926-2017	0.48	M-v	38h	MPCLINUX	000	(1621) Druzhba	2017-01-03	2017-02-16	1621	Druzhba	

Bibliography is now fully embedded

MP3C.BIBLIOGRAPHY — Provided by Lagrange/OCA/CNRS

Minor Planet Center Orbits

Full bibliographic reference	Acknowledgment
	This research has made use of data and services provided by the Minor Planet Center (MPC) of the International Astronomical Union (IAU).

SDSS-based Asteroid Taxonomy

Full bibliographic reference	Acknowledgment
Carvano et al. (2010, A&A, 510)	
Hasselmann et al. (2011, PDS)	The asteroid taxonomy classification based on Sloan Digital Sky Survey (SDSS) observations was obtained from the Planetary Data System (PDS).

Funding for the Sloan Digital Sky Survey IV has been provided by the Alfred P. Sloan Foundation, the U.S. Department of Energy Office of Science, and the Participating Institutions. SDSS acknowledges support and resources from the Center for High-Performance Computing at the University of Utah. The SDSS web site is www.sdss.org. SDSS is managed by the Astrophysical Research Consortium for the Participating Institutions of the SDSS Collaboration including the Brazilian Participation Group, the Carnegie Institution for Science, Carnegie Mellon University, the Chilean Participation Group, the French Participation Group, Harvard-Smithsonian Center for Astrophysics, Instituto de Astrofisica de Canarias, The Johns Hopkins University, Kavli Institute for the Physics and Mathematics of the Universe (IPMU) / University of Tokyo, Lawrence Berkeley National Laboratory, Leibniz Institut für Astrophysik Potsdam (AIP), Max-Planck-Institut für Astronomie (MPIA Heidelberg), Max-Planck-Institut für Astrophysik (MPA Garching), Max-Planck-Institut für Extraterrestrische Physik (MPE), National Astronomical Observatories of China, New Mexico State University, New York University, University of Notre Dame, Observatório Nacional / MCTI, The Ohio State University, Pennsylvania State University, Shanghai Astronomical Observatory, United Kingdom Participation Group, Universidad Nacional Autónoma de México, University of Arizona, University of Colorado Boulder, University of Oxford, University of Portsmouth, University of Utah, University of Virginia, University of Washington, University of Wisconsin, Vanderbilt University, and Yale University.

Asteroid Absolute Magnitude and Slope

Full bibliographic reference	Acknowledgment
Muinonen et al. (2010, Icarus, 209)	
Oszkiewicz et al. (2011, JQSRT, 112)	

Asteroid Taxonomy

Full bibliographic reference	Acknowledgment
Neese, C. (2010, PDS)	The asteroid taxonomy classification was obtained from the Planetary Data System (PDS).

Proper elements from AstDyS

Full bibliographic reference	Acknowledgment
Milani (1993, CeMDA, 57)	
Knevezic, Lemaintre, and Milani (2002, Asteroids III)	
Knezevic and Milani (2003, A&A, 403)	

AstDyS Family membership

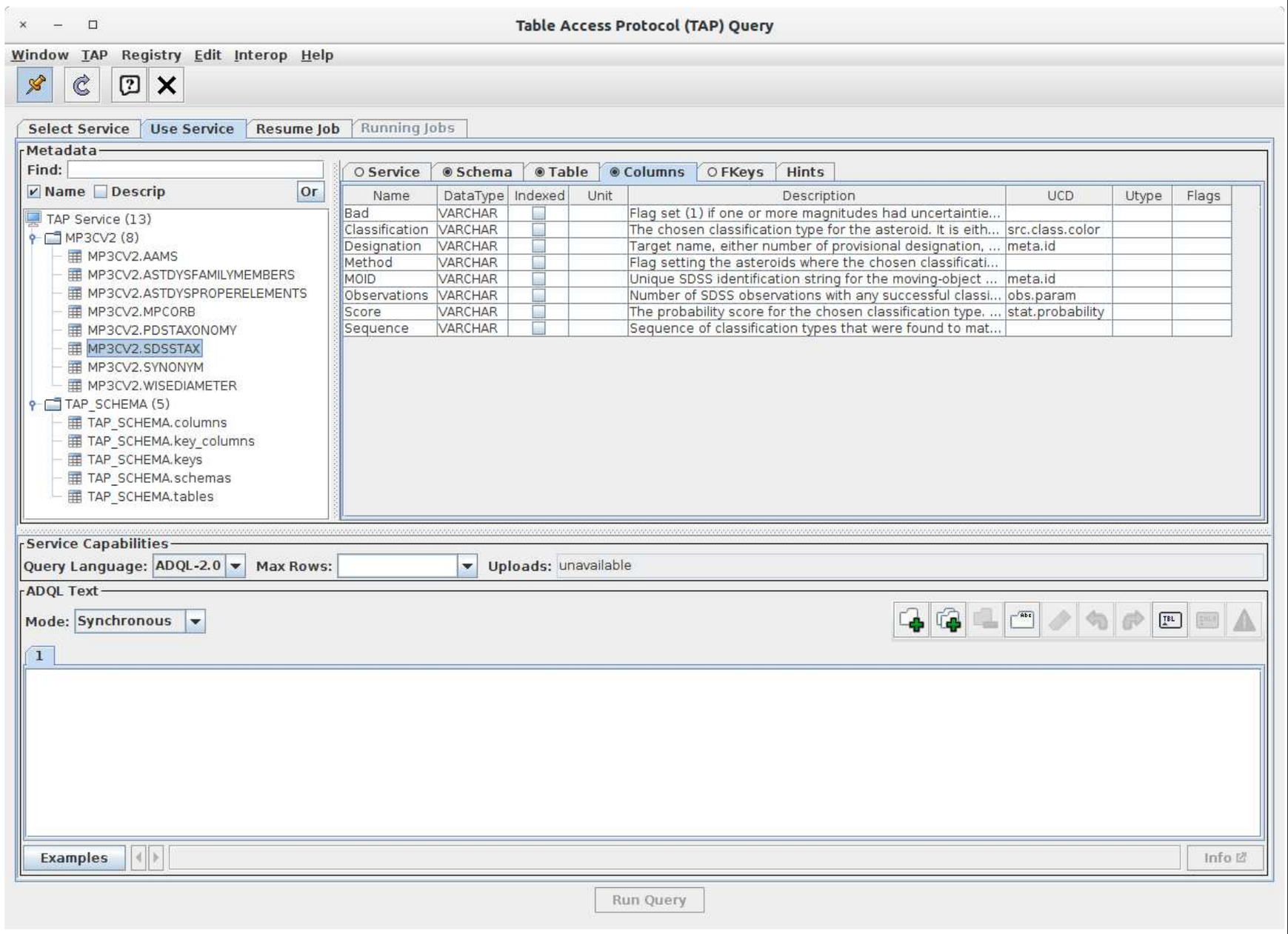
Full bibliographic reference	Acknowledgment
Milani et al. (2014, Icarus, 239)	
Knežević & Milani (2003, A&A, 403)	

WISE Diameter and albedo

Full bibliographic reference	Acknowledgment
Bauer et al. (2012, ApJ, 747)	

mp3c TAP service

- Table Access Protocol (TAP) implemented



Perspectives

- We will participate to the VESPA Implementation Workshop, in Graz Austria — March 27-31, 2017.

- The project DIstributed Asteroid MOdeling by Networked Databases (DIAMOND) has been submitted to EU under the call for the H2020 COMPET program (PI Tanga)

- Gaia DR2 which will contain asteroids -> mp3c in spring 2018.

Perspectives (2) longer term

- Retirement of A. Milani and Z. Knezevic in the next year, will stop the update of AstDys for proper orbital elements and asteroid family identification and catalogue.

- Milani offered support to us to migrate these services (and related scientific works) to the mp3c.