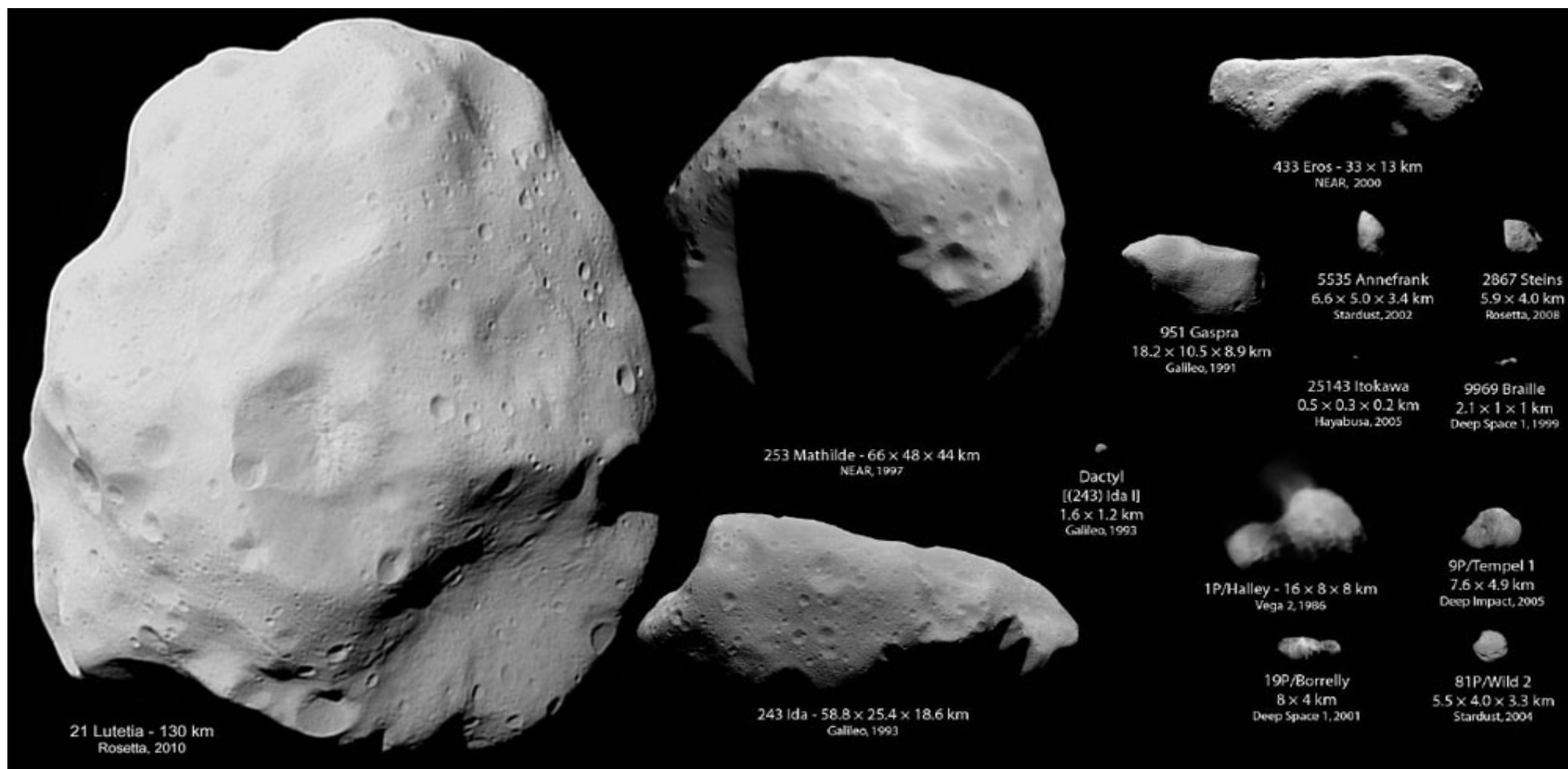


Fizičke i hemijske karakteristike asteroida

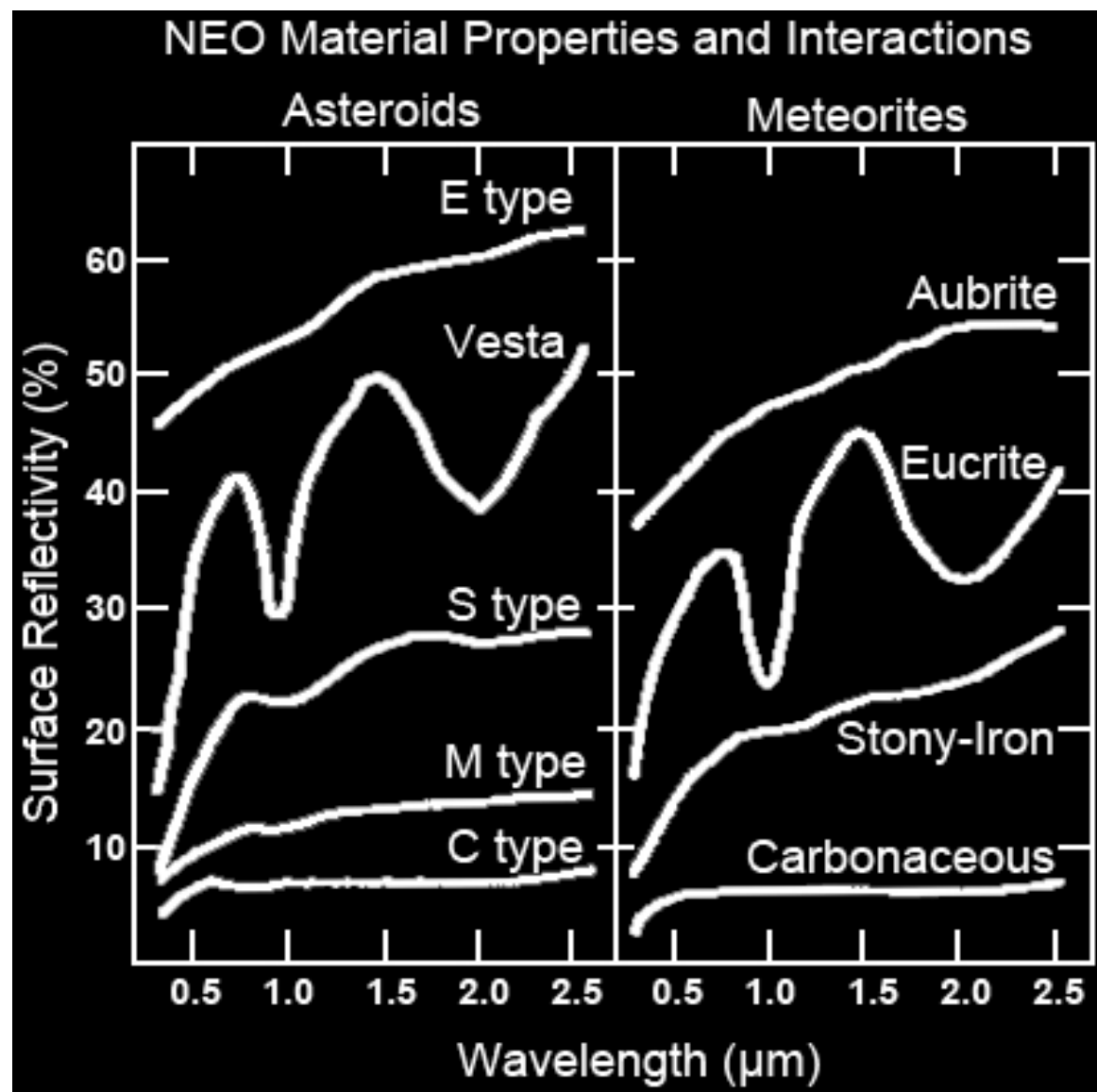


Spektralni tipovi i sastav asteroida

Taksonomija asteroida predstavlja podelu asteroida na klase na osnovu njihovog sastava, tj. spektra i albeda.

Spektar asteroida predstavlja raspodelu količine svetlosti reflektovane sa površine asteroida po talasnim dužinama. Opseg talasnih dužina vidljive svetlosti je 400-700 nm. Na dužim talasnim dužinama svetlost nazivamo **infra-crvenom**, a na kraćim **ultra-ljubičastom**.

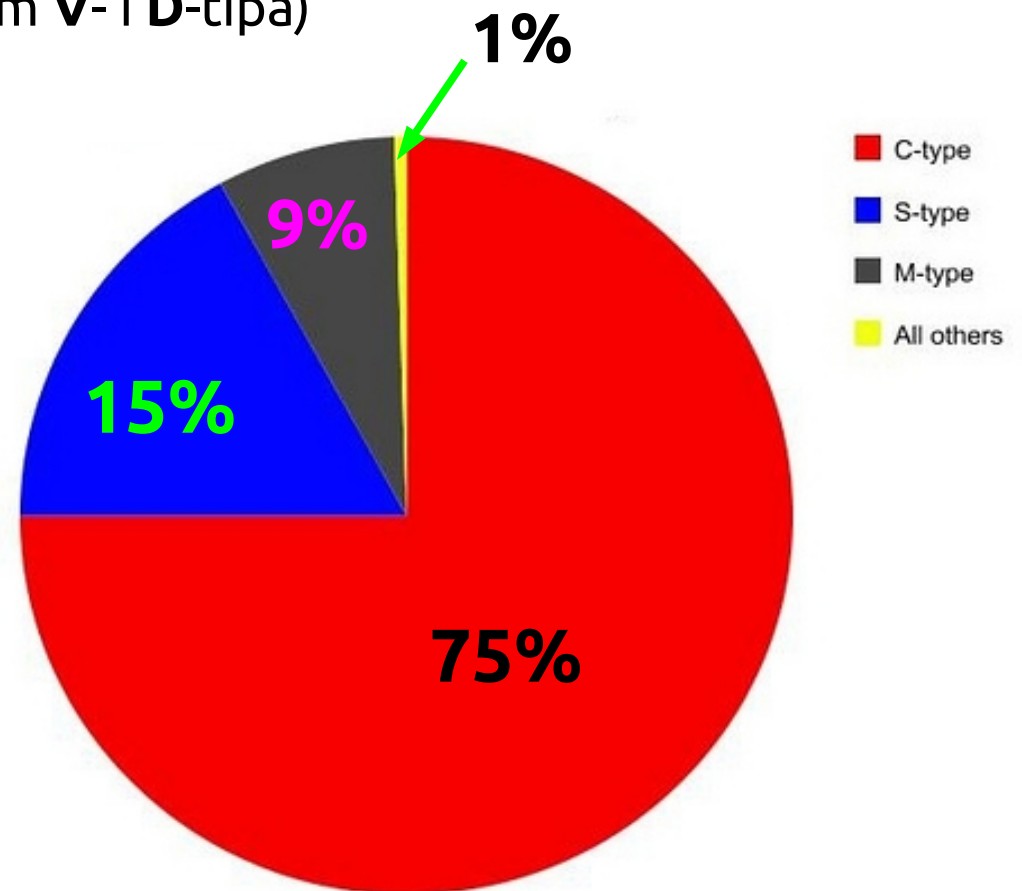
Albedo predstavlja procenat svetlosti sa Sunca koja se reflektuje (odbije) sa površine asteroida.



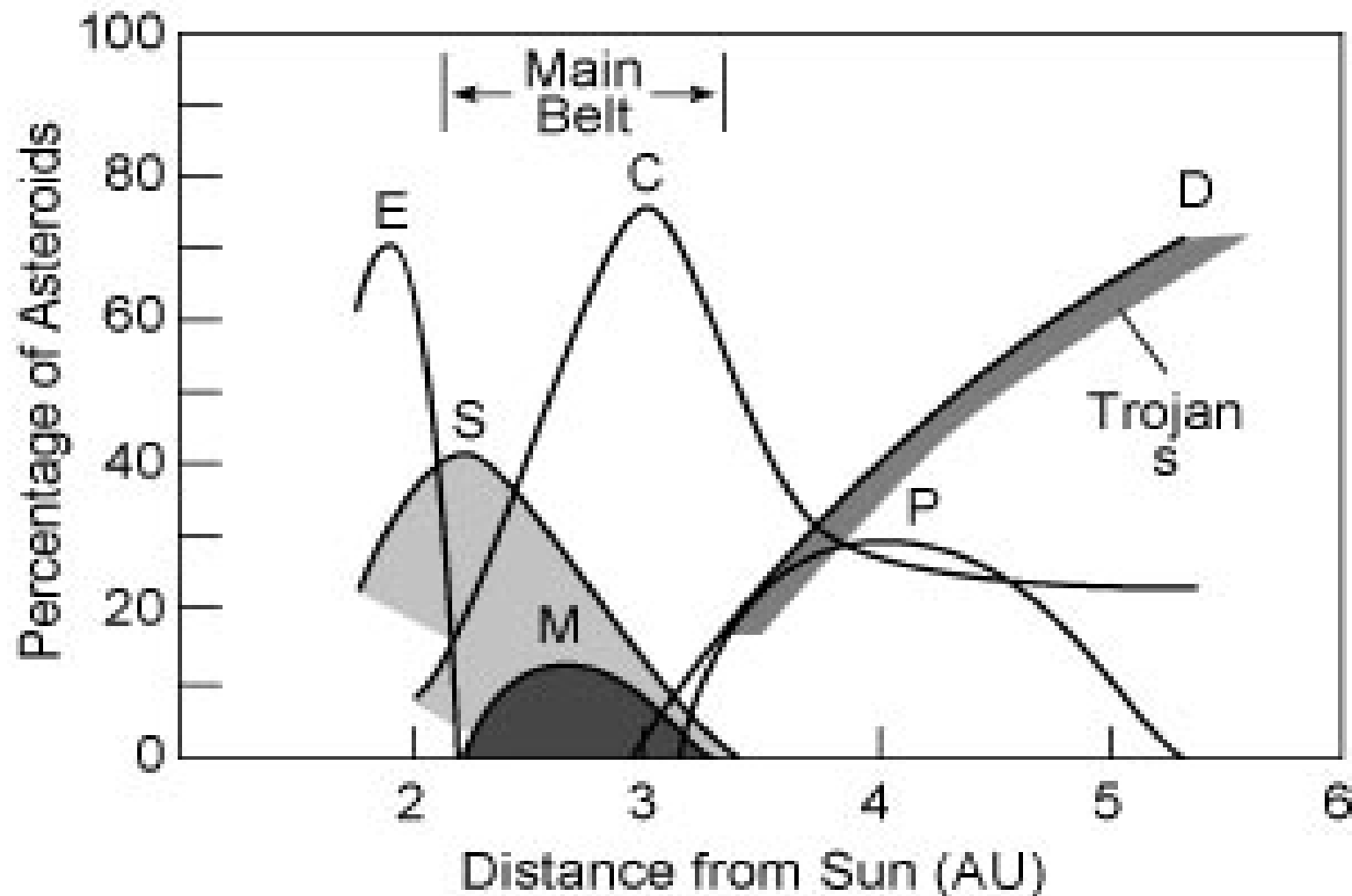
Spektralni tipovi i sastav asteroida

Tri velika taksonomska (spektralna) kompleksa asteroida su:

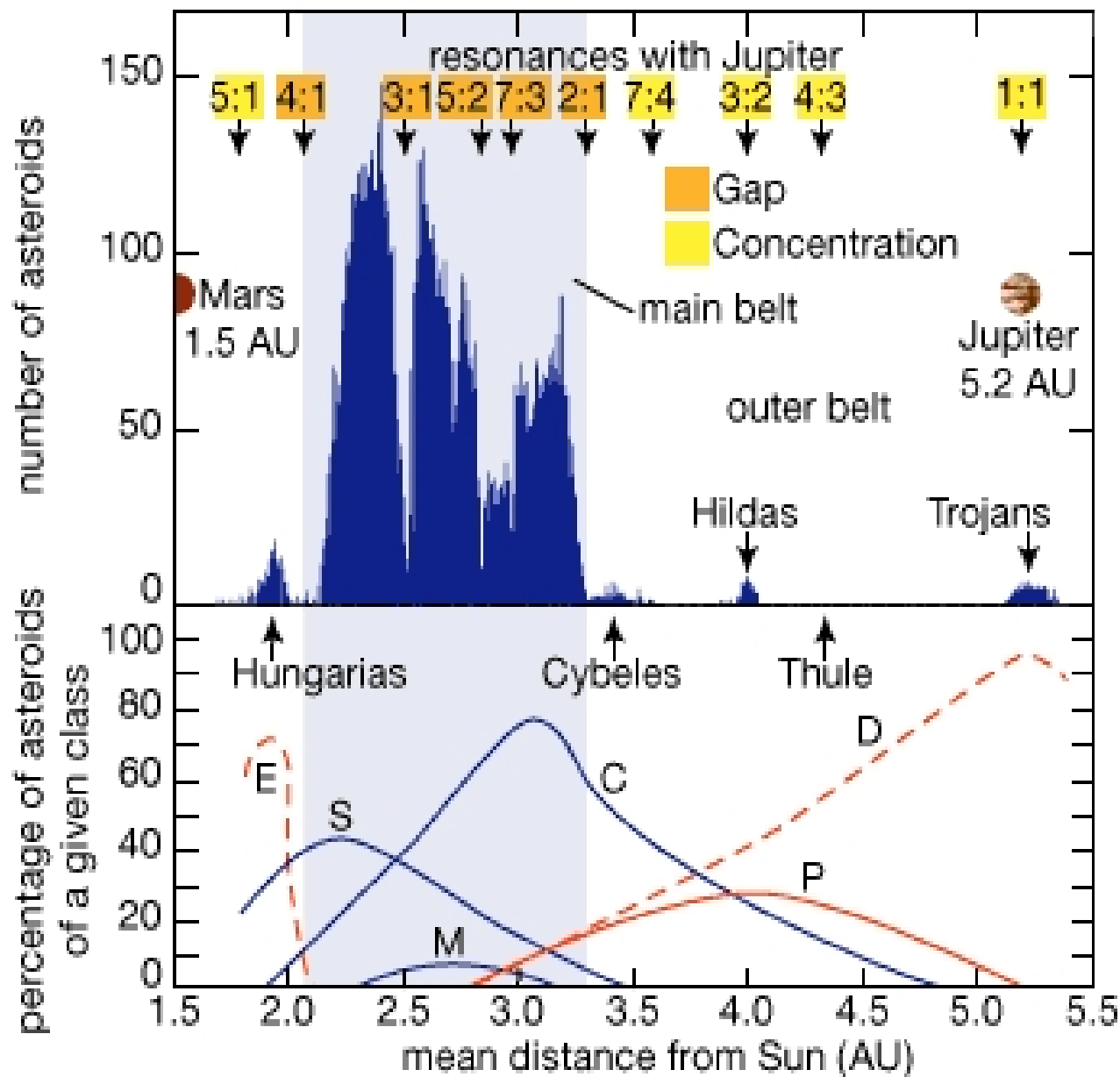
- **C**-kompleks: tamni, ugljenični objekti
 - **S**-kompleks: svetli, kameni asteroidi
 - **X**-kompleks: svi ostali asteroidi (osim **V**- i **D**-tipa)
-
- **V**-tip: spektar kao kod asteroida Vesta (Vestoidi)
 - **D**-tip: veoma primitivni objekti



Raspodela asteroida po spektralnim tipovima

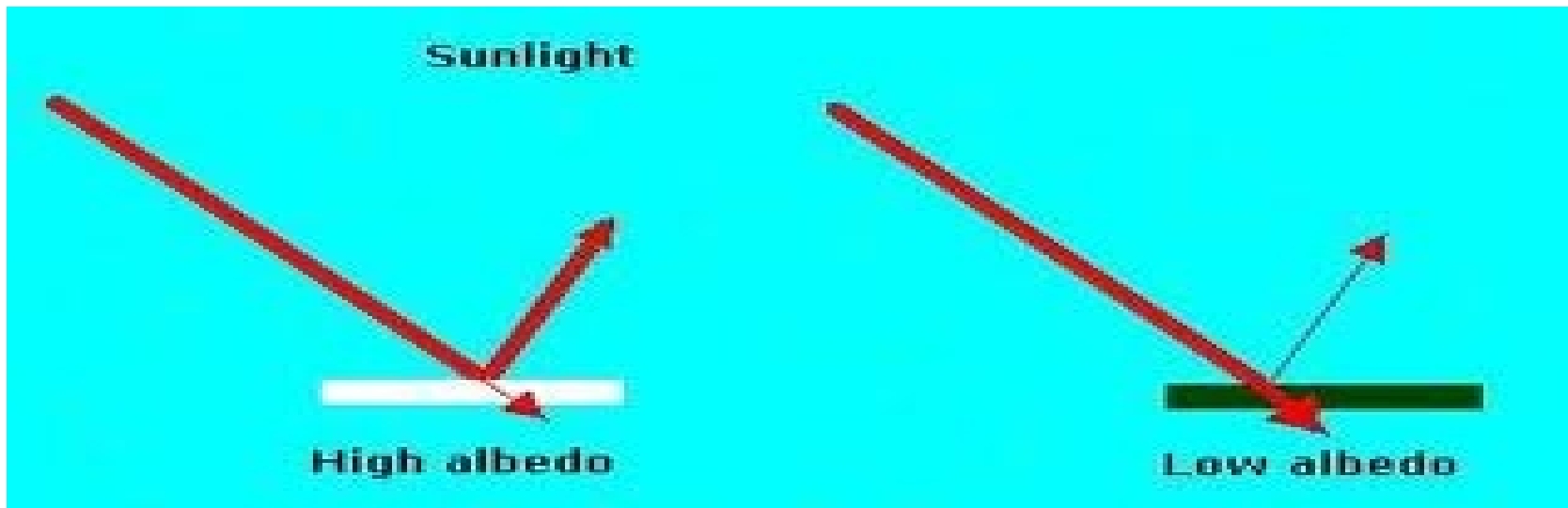


Asteroid distribution

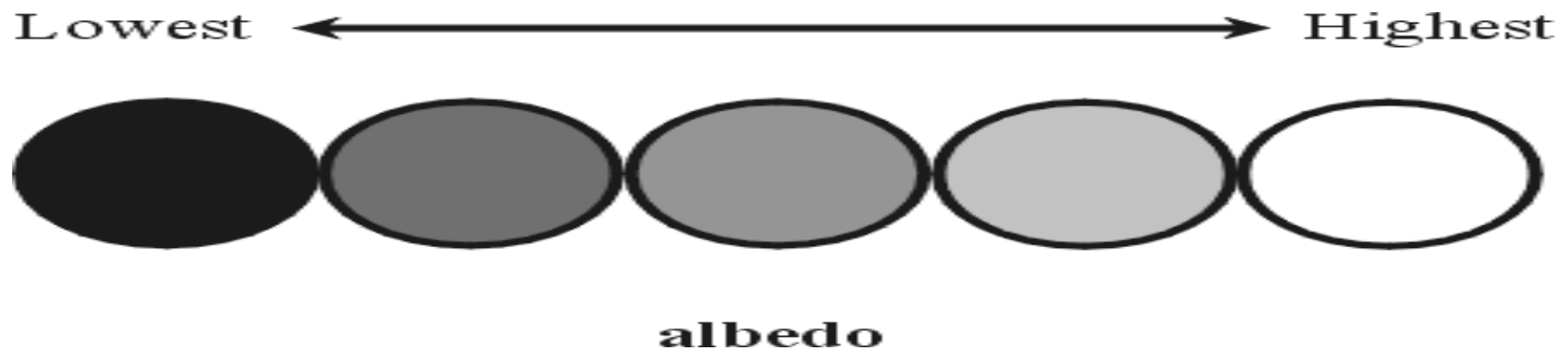


- **E-tip:** dominantan u populaciji Hungarija asteroida
- **S-tip:** dominantan u unutrašnjem delu GAP-na
- **C-tip:** dominantan u središnjem i spoljašnjem delu GAP-na
- **D-tip:** dominantan među Jupiterovim trojancima i Hilda grupi

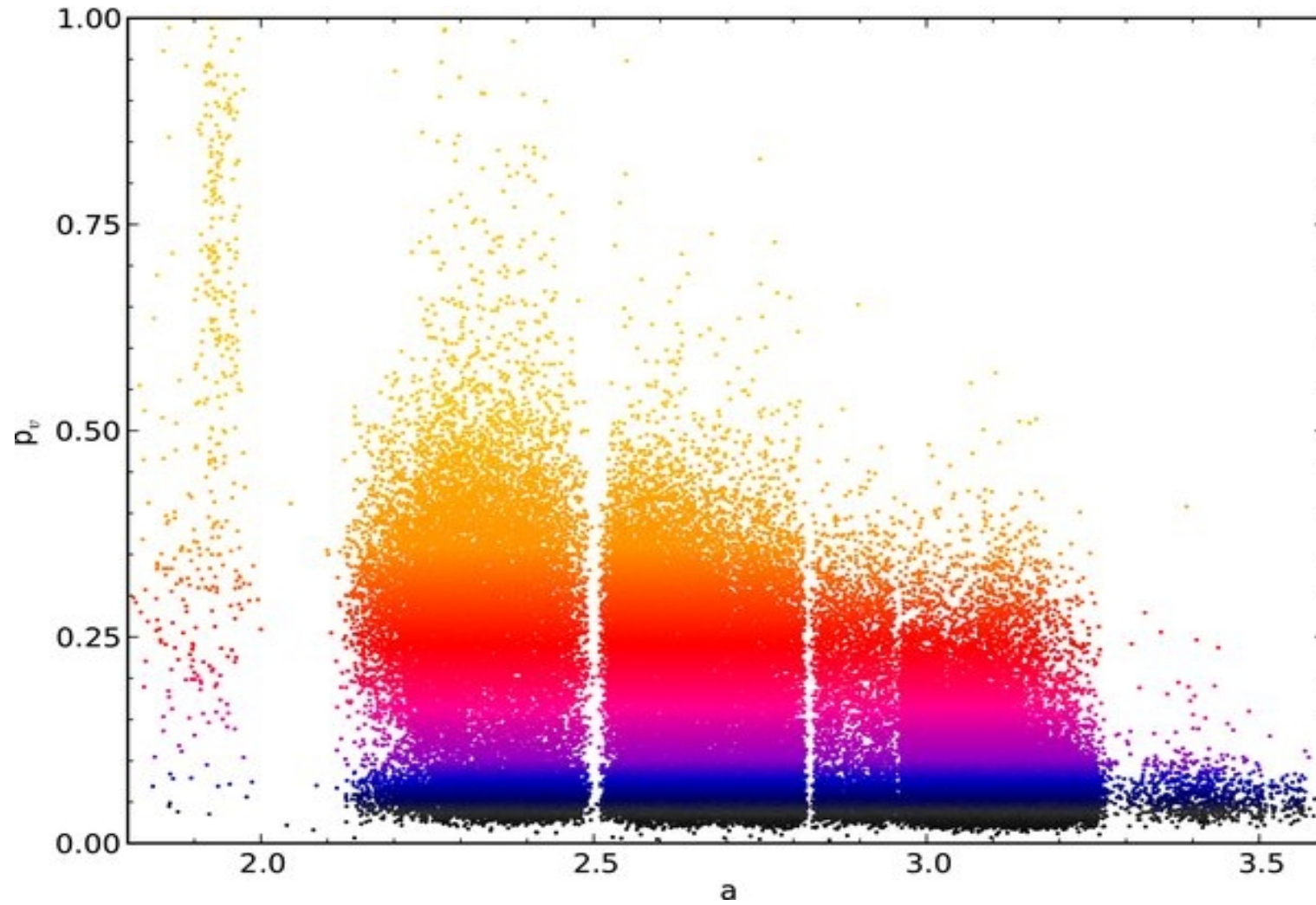
Albedo



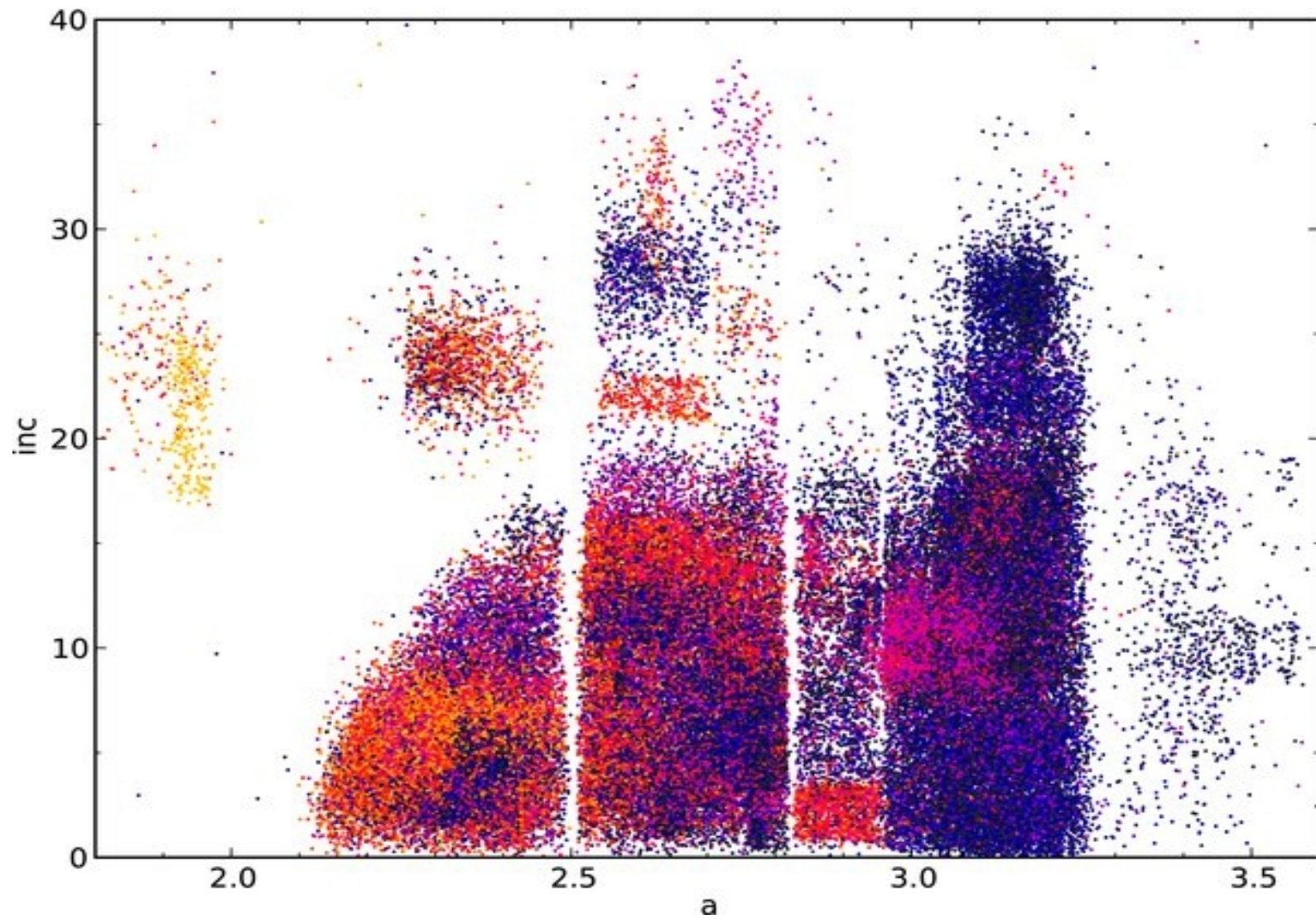
- **C-tip:** nizak albedo (0.03 – 0.09)
- **S-, V-tip:** srednje vrednosti albeda (0.1 – 0.25)
- **D-tip:** veoma nizak albedo (manji od 0.05)
- **E-tip:** visok albedo (preko 0.25)



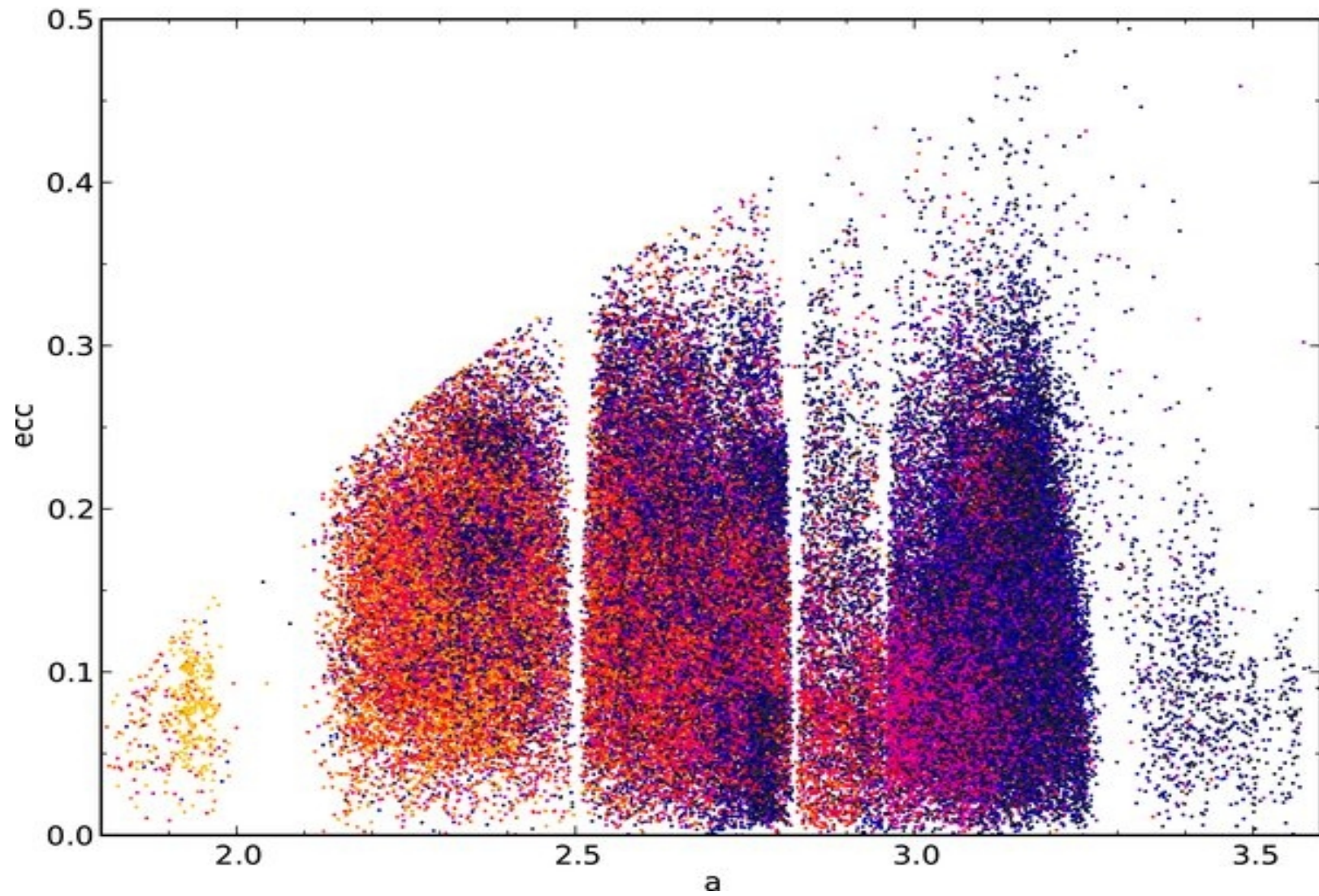
Albedo



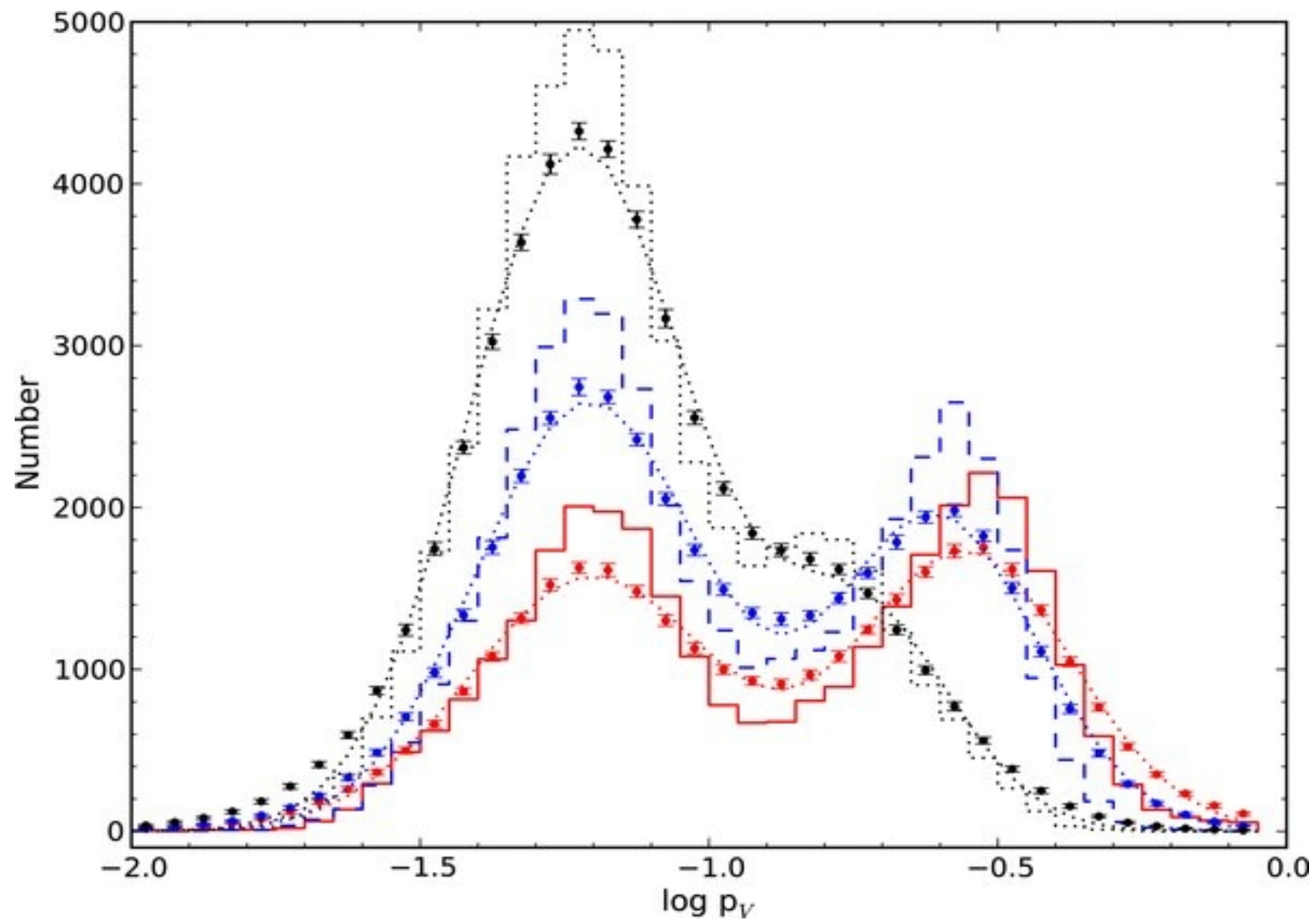
Albedo



Albedo

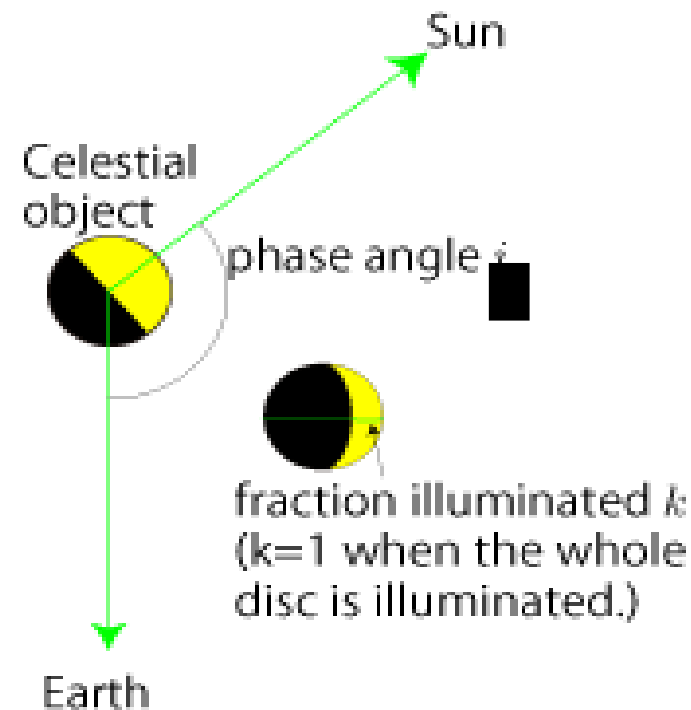


Albedo



Apsolutne magnitude

Apsolutna magnituda (H) odgovara vizuelnoj magnitudi koju bi posmatrač izmerio kada se objekat nalazi na udaljenosti od 1 AJ, kako od Sunca tako i od posmatrača, pri nultom faznom uglu.



Konverzija apsolutnih magnituda u prečnike:

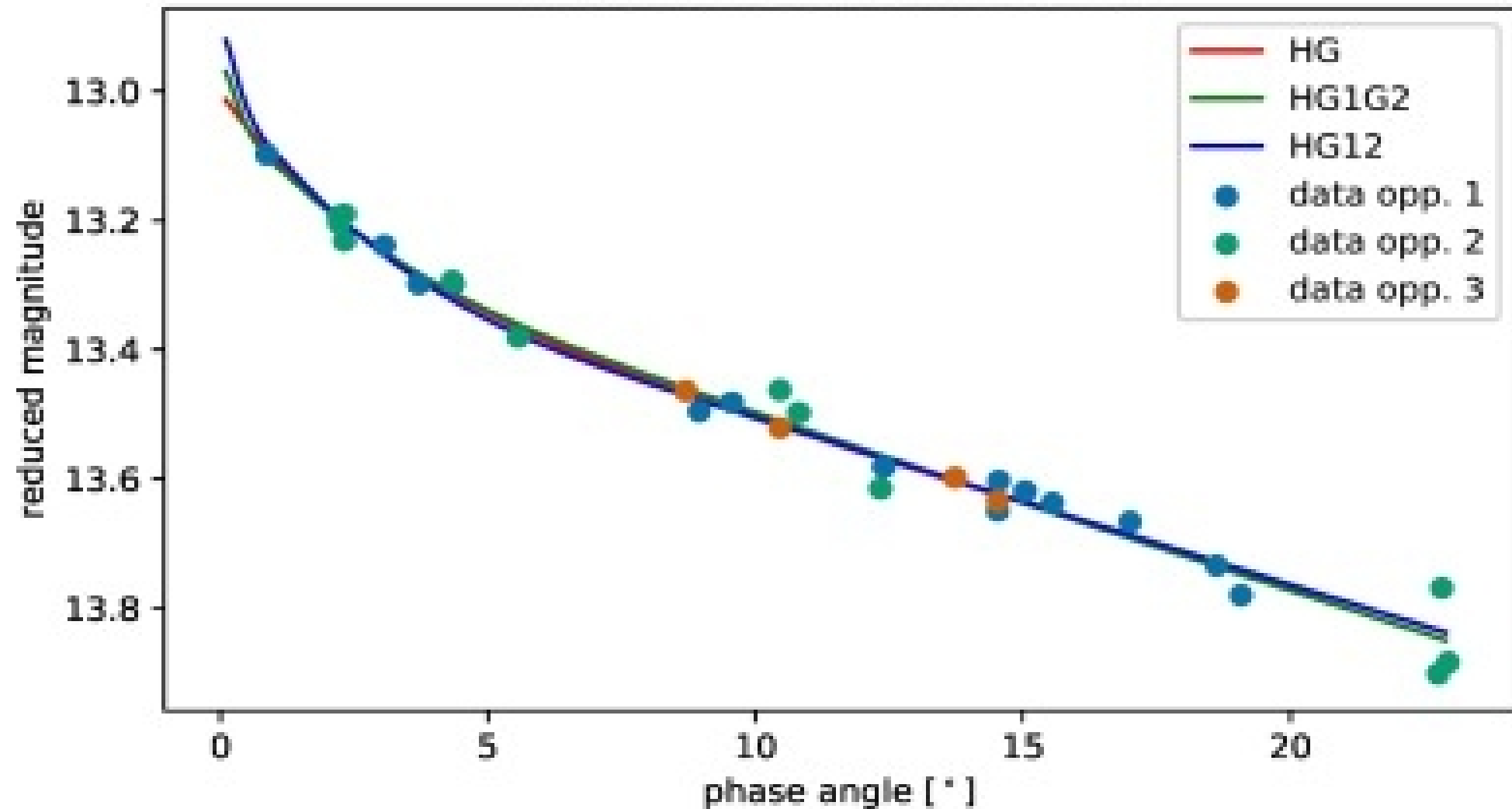
$$D = 1329 \frac{10^{-H/5}}{\sqrt{P_v}}$$

Prečnik [km]
Albedo

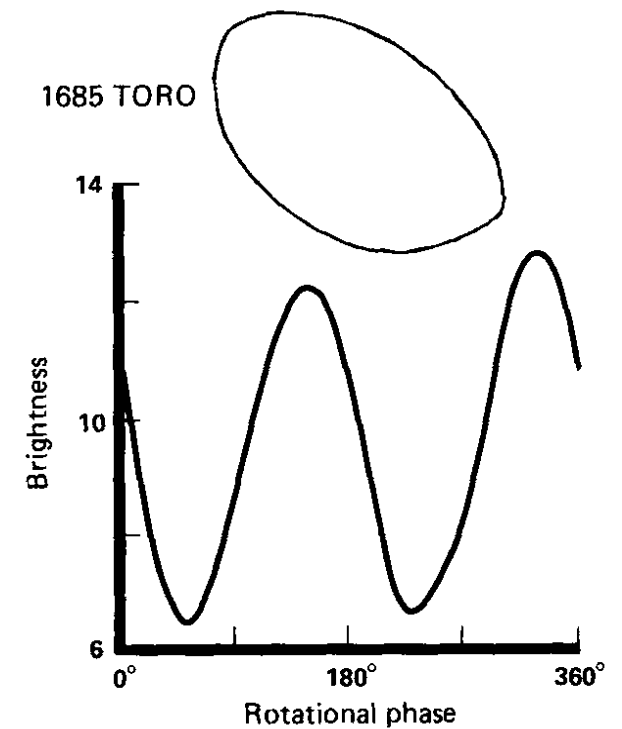
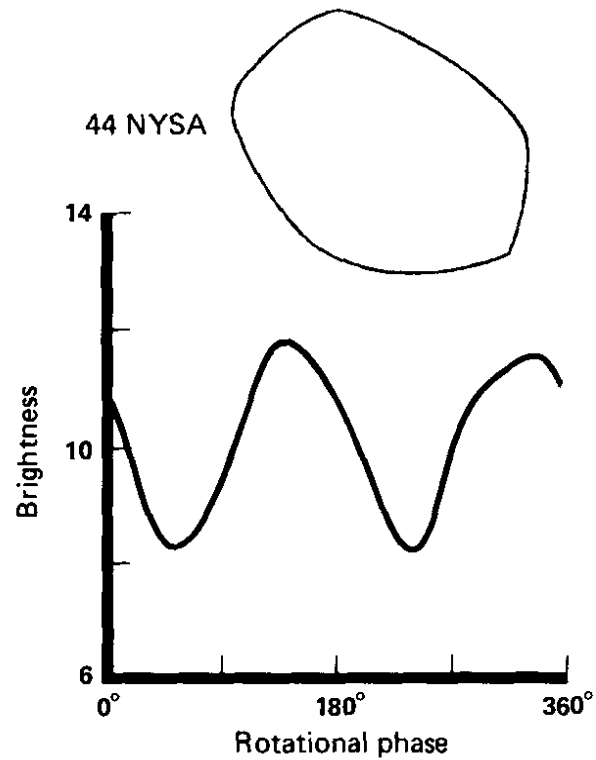
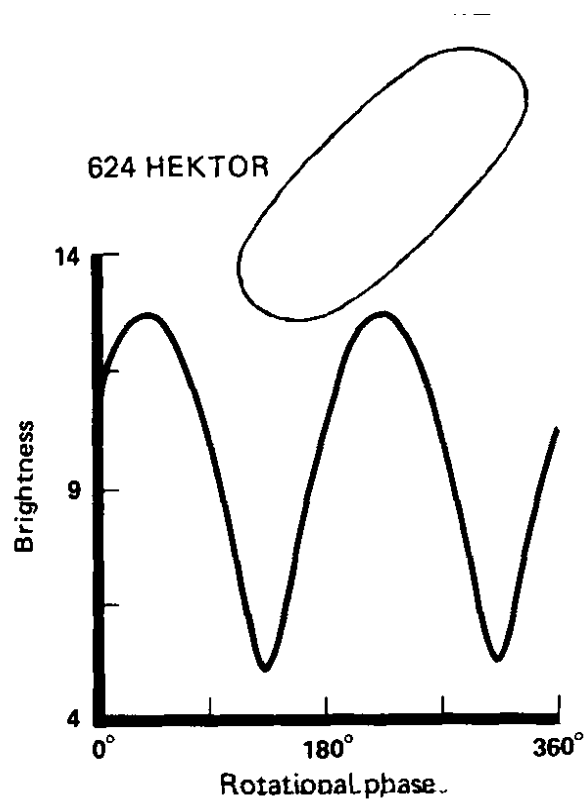
Apsolut. mag.

Fazna kriva asteroida

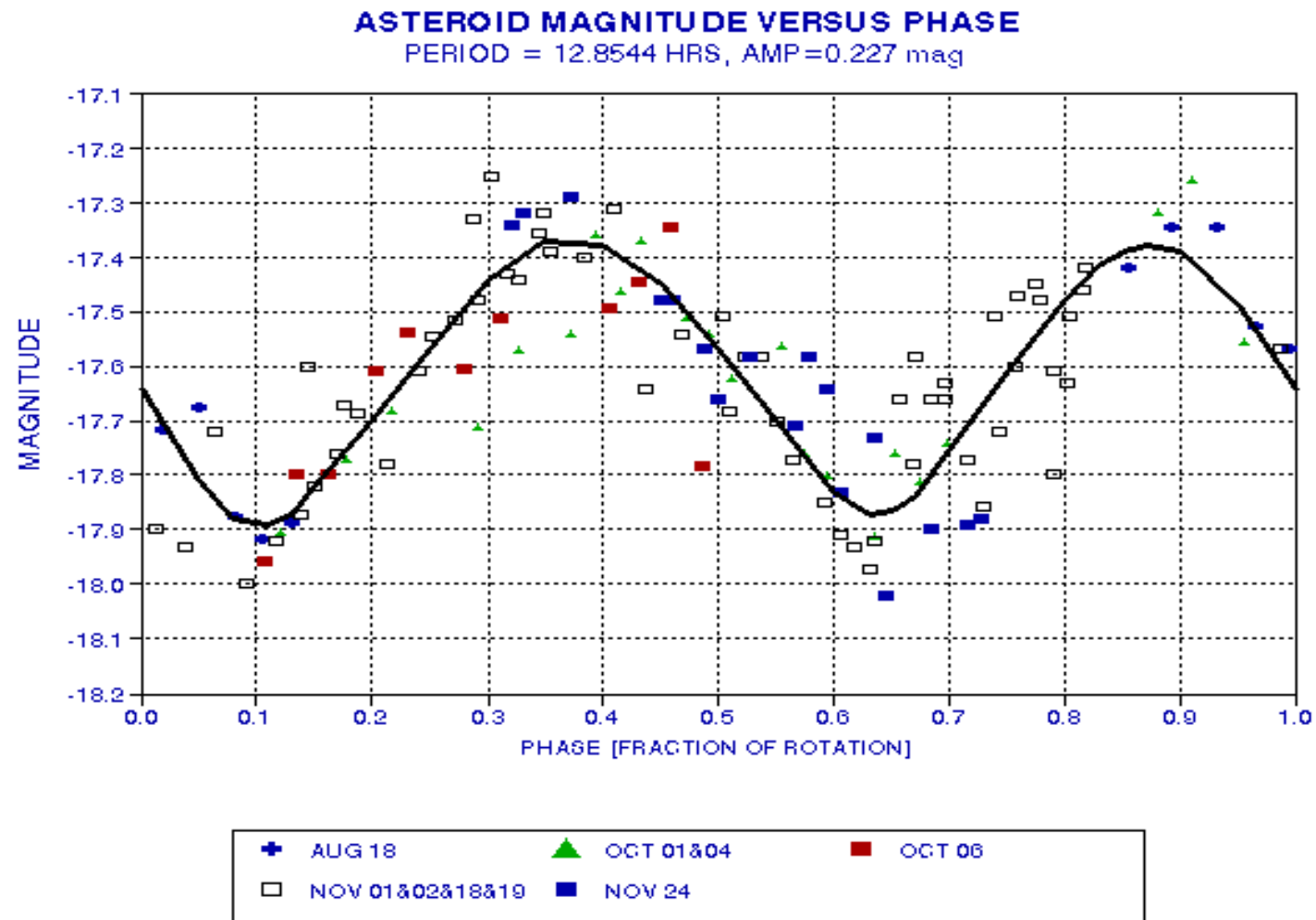
Phase Curves of 5525 1991TS4



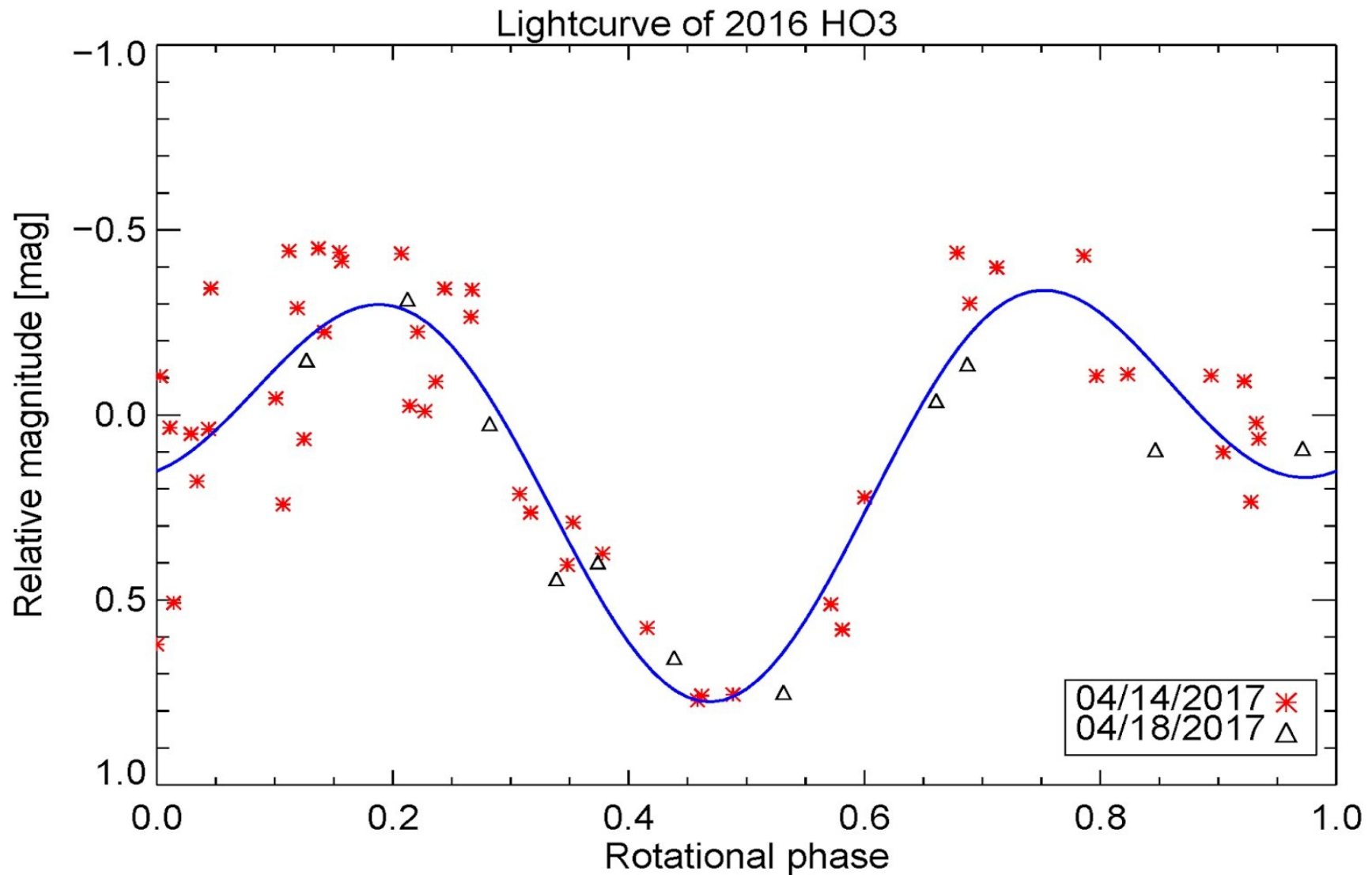
Period rotacije



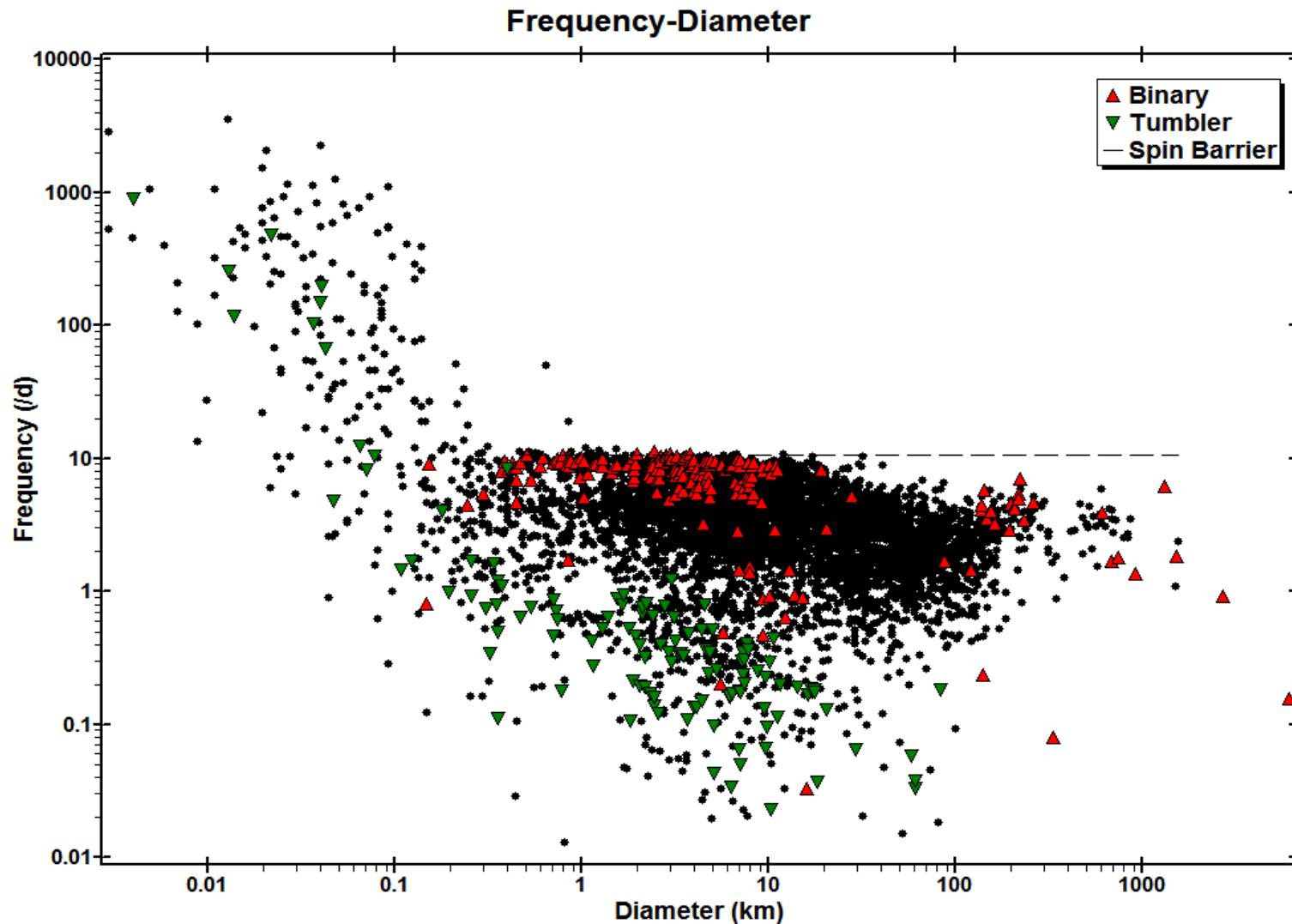
Određivanje perioda rotacije



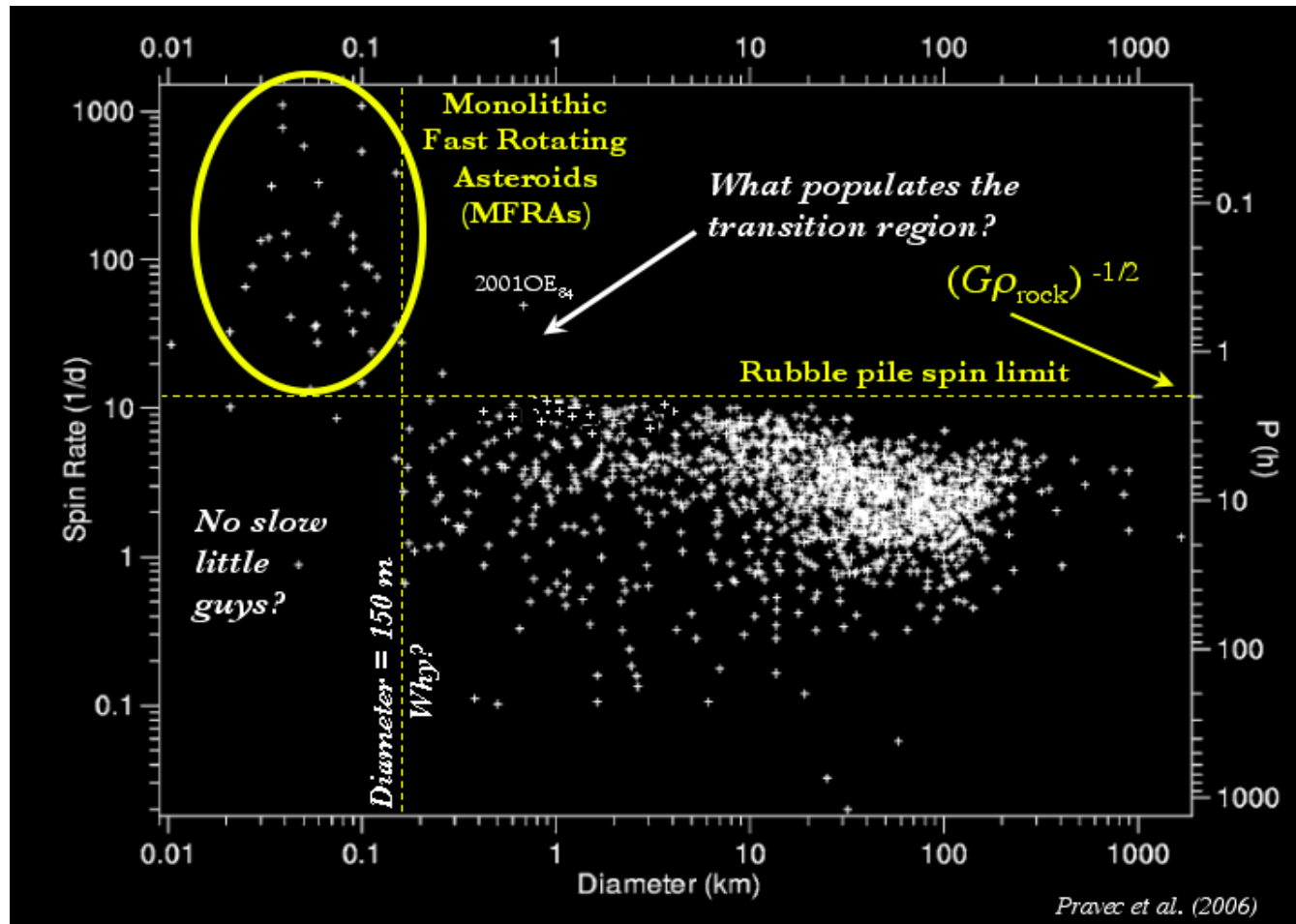
Određivanje perioda rotacije



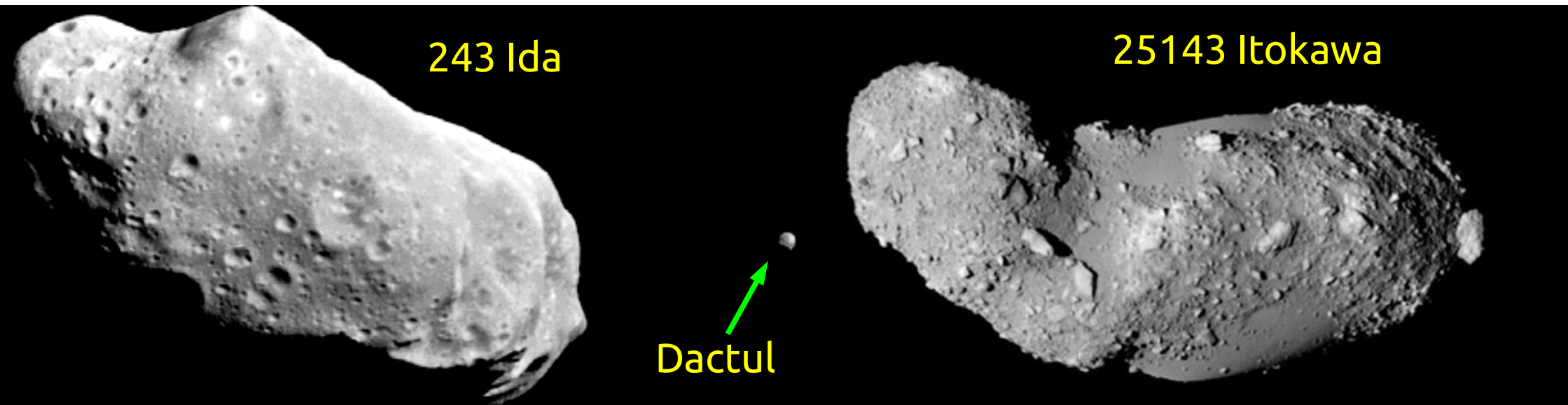
Period rotacije



Period rotacije



Oblik asteroida



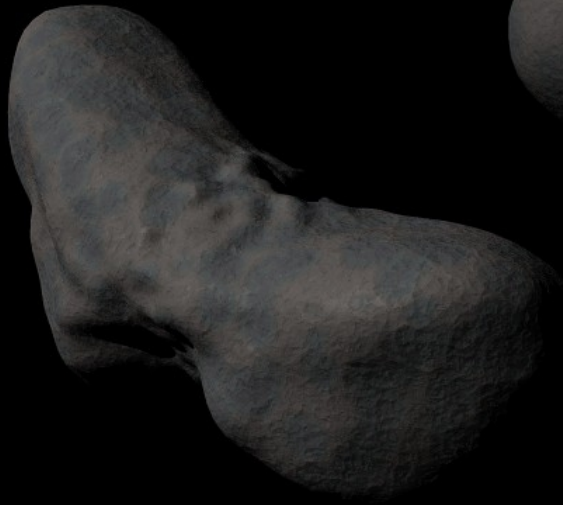
Asteroidi mogu biti različitih, uglavnom **nepravilnih** oblika!

To je posledica njihovih čestih međusobnih sudara!



21 Lutetia

433 Eros



216 Kleopatra



1620 Geographos



6489 Golevka



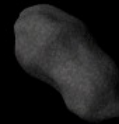
1998 Ky26



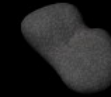
4179 Toutatis



2063 Bacchus



4769 Castalia



Gustina i poroznost asteroida

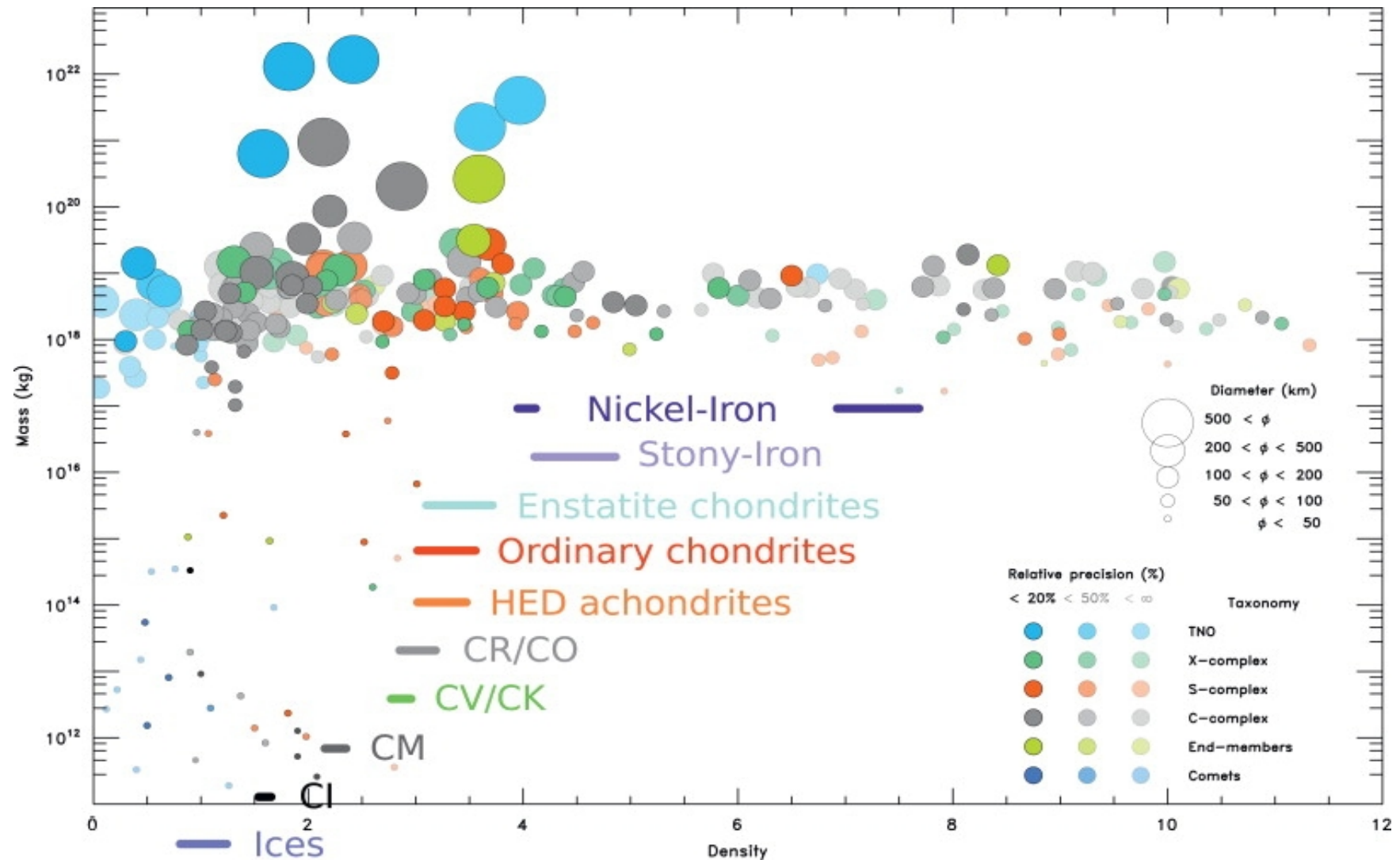
TABLE 7-4 Asteroid Densities

Asteroid	Density kg/m ³	Taxonomic Class	Notes
1 Ceres	2400 ± 200	C	Largest asteroid; data from Millis and others, 1987; Yeomans and others, 1997
2 Pallas	2800 ± 500	B (subclass of C)	Data from Millis and Elliot, 1979; Yeomans and others, 1997
4 Vesta	3300 ± 500	V	Data from Millis and Dunham, 1989; Yeomans and others, 1997
243 Ida	2000 to 3100	S	Spacecraft measure of mass; Chapman, 1996
253 Mathilde	1300 ± 200	C	Spacecraft measure of mass; Yeomans and others, 1997
Phobos	ca. 1900	P or D?	Spacecraft measure of mass; Veverka and Farquhar, 1997
Deimos	ca. 1800	P or D?	Veverka and Farquhar, 1997
Statistical average for class C asteroids	1200 ± 100	C	E. M. Standish, cited by Yeomans and others, 1997

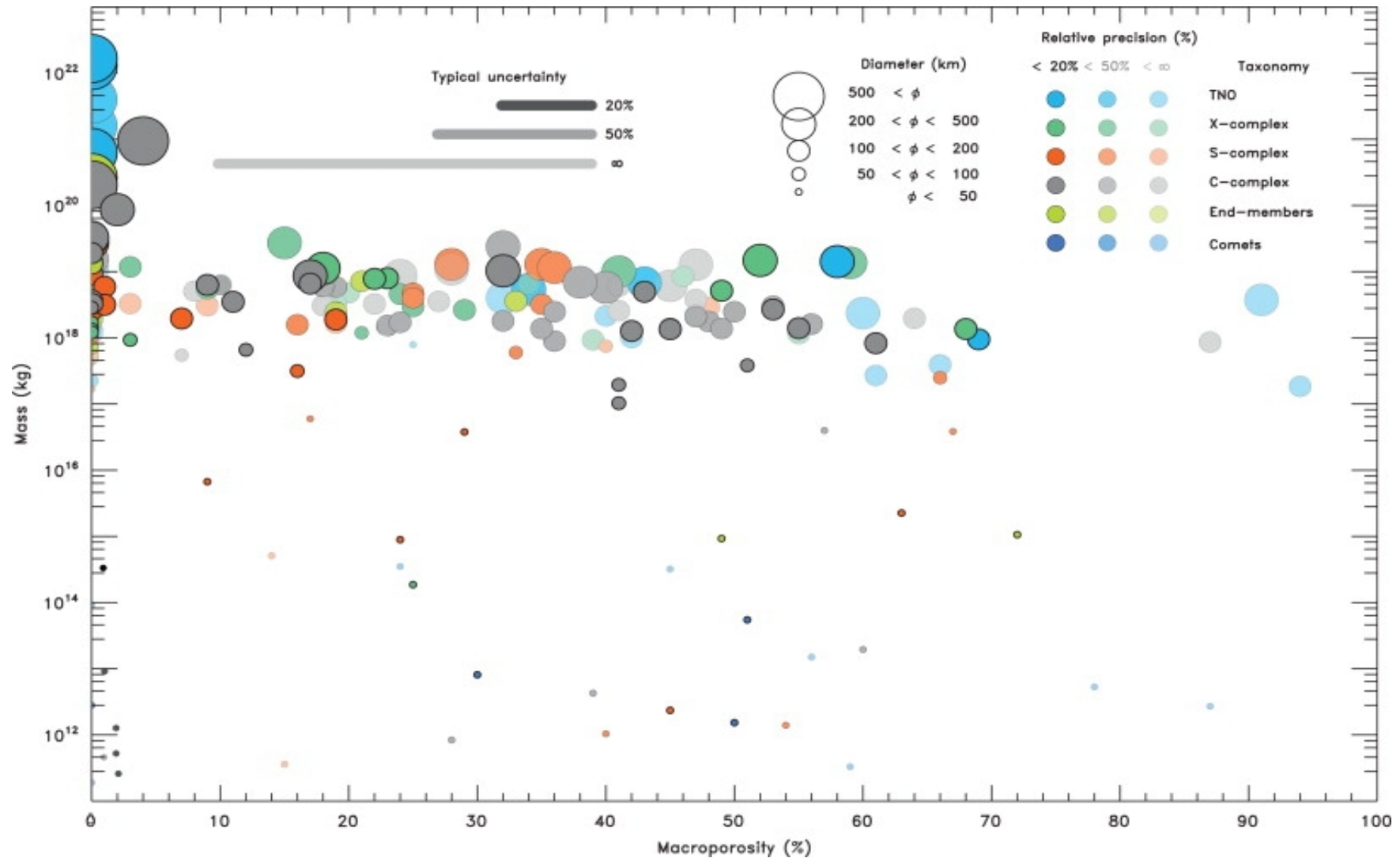
Table 3: Average density ρ_i for each asteroid taxonomic type (DeMeo et al. 2009), based on N_i estimates. The i indices stand for the level of accuracy considered: more accurate than 20%, 50%, and no restriction on precision (∞). For each class, the associated meteorite (Met., see Table 2) and number of asteroids observed by DeMeo et al. with the corresponding fraction represented by the class are reported. The average density for transneptunian objects and comets are also reported.

Type	Met.	Taxonomy		Average density for each class					
		(#)	(%)	N_∞	ρ_∞	N_{50}	ρ_{50}	N_{20}	ρ_{20}
S	OC	144	38	50	2.66 ± 1.29	28	2.70 ± 0.69	11	2.72 ± 0.54
Sa	OC	2	<1	1	1.07 ± 0.25	1	1.07 ± 0.25		—
Sq	OC	29	7	5	2.78 ± 0.85	4	2.78 ± 0.81	2	3.43 ± 0.20
Sr	OC	22	5		—		—		—
Sv	OC	2	<1		—		—		—
B	CV	4	1	10	2.19 ± 1.00	4	2.15 ± 0.74	2	2.38 ± 0.45
C	CM	13	3	33	1.57 ± 1.38	19	1.41 ± 0.69	5	1.33 ± 0.58
Cb	CM	3	<1	13	1.88 ± 2.09	6	1.43 ± 0.74	3	1.25 ± 0.21
Cg	CM	1	<1	1	0.96 ± 0.27	1	0.96 ± 0.27		—
Cgh	CM	10	2	5	2.64 ± 1.35	1	3.48 ± 1.06		—
Ch	CM	18	4	47	1.96 ± 1.65	27	1.70 ± 1.10	9	1.41 ± 0.29
X	CV	4	1	26	2.87 ± 2.59	15	1.99 ± 0.99	8	1.85 ± 0.81
Xc	Mes	3	<1	9	4.96 ± 2.39	3	4.63 ± 0.76	2	4.86 ± 0.81
Xe	EH	7	1	4	2.94 ± 0.85	2	2.91 ± 0.65	1	2.60 ± 0.20
Xk	Mes	18	4	13	3.85 ± 1.27	9	3.79 ± 1.18	3	4.22 ± 0.65
D	CM	16	4	3	9.56 ± 0.22		—		—
K	CV	16	4	2	4.25 ± 2.03	1	3.54 ± 0.21	1	3.54 ± 0.21
L	CO	22	5	4	3.24 ± 1.03	3	3.22 ± 0.97		—
T	Ata	4	1	1	2.61 ± 2.54		—		—
A	Pal	6	1	1	3.73 ± 1.40	1	3.73 ± 1.40		—
O	OC	1	<1		—		—		—
Q	OC	8	2		—		—		—
R	OC	1	<1	1	2.23 ± 1.02	1	2.23 ± 1.02		—
V	HED	17	4	3	1.93 ± 1.07	3	1.93 ± 1.07	3	1.93 ± 1.07
Transneptunian objects				22	0.77 ± 0.80	10	1.06 ± 0.80	6	1.06 ± 0.75
Comets				12	0.47 ± 0.25	4	0.56 ± 0.14	3	0.54 ± 0.09

Gustina i poroznost asteroida



Gustina i poroznosc asteroida



Gustina i poroznost asteroida



Solid



**Solid with
Major Fracture**



**Rubble Pile
(Covered
with Dust)**



**Gravel
Conglomeration**

- Kompatni
- Kompaktni frakturisani
- “Krš na gomili”
- Konglomerati

Gustina i poroznosc asteroida

