

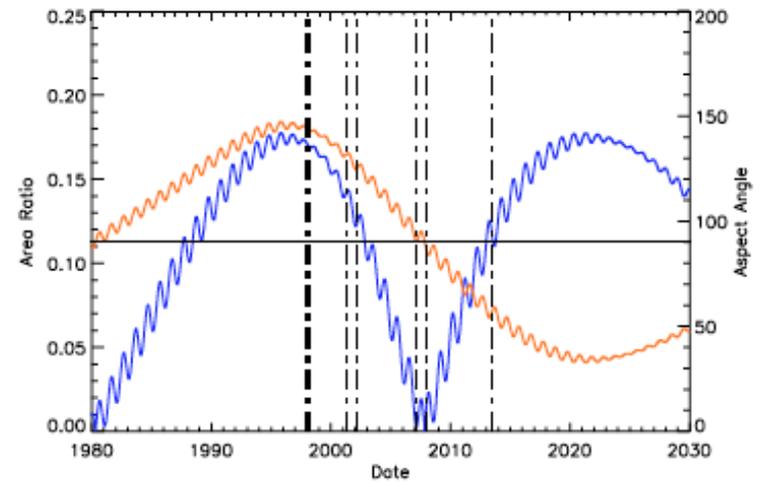
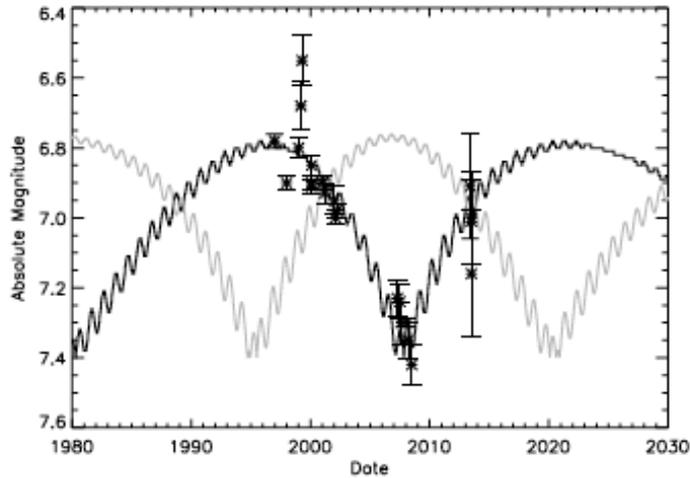
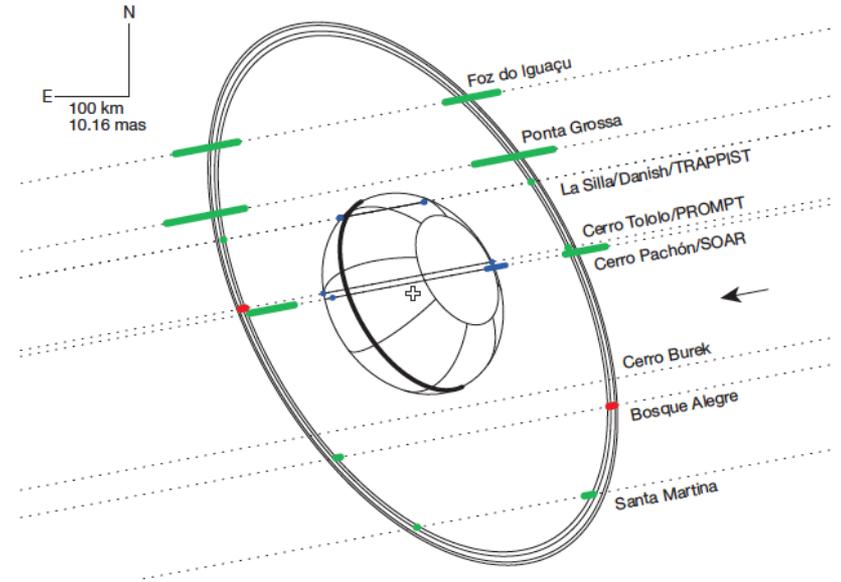
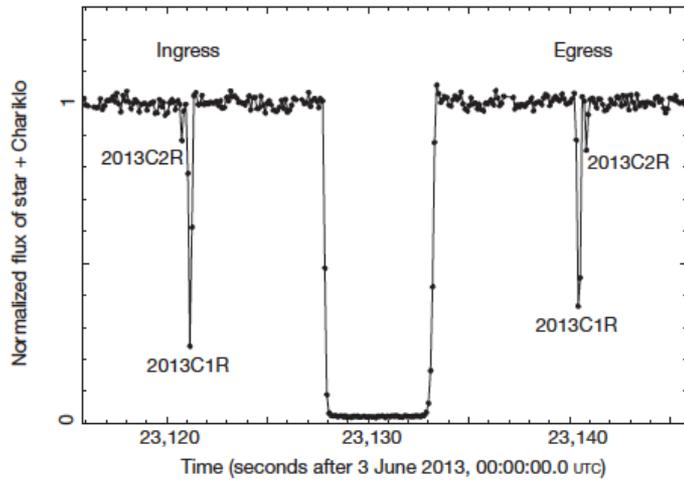


# **Anillos y actividad en los cuerpos menores: características particulares en objetos curiosos**

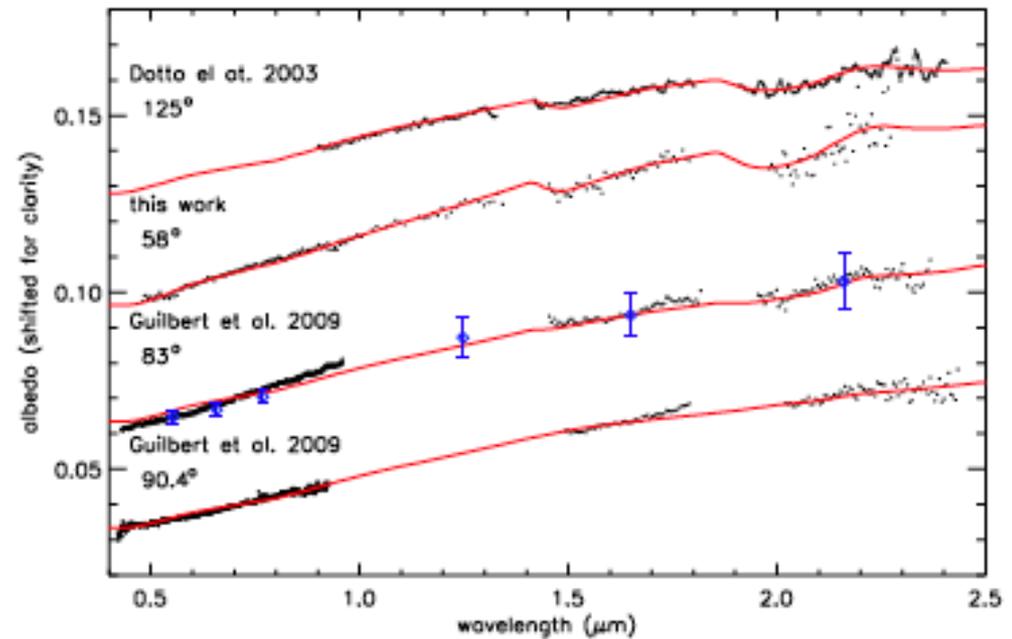
R. Duffard, J. L. Ortiz, P. Santos-Sanz, N. Morales

Instituto de Astrofísica de Andalucía – CSIC  
Granada

# Cómo comenzó todo ?



# Chariklo



Outreach video produced on the occasion of  
the publication in Nature  
of the paper entitled

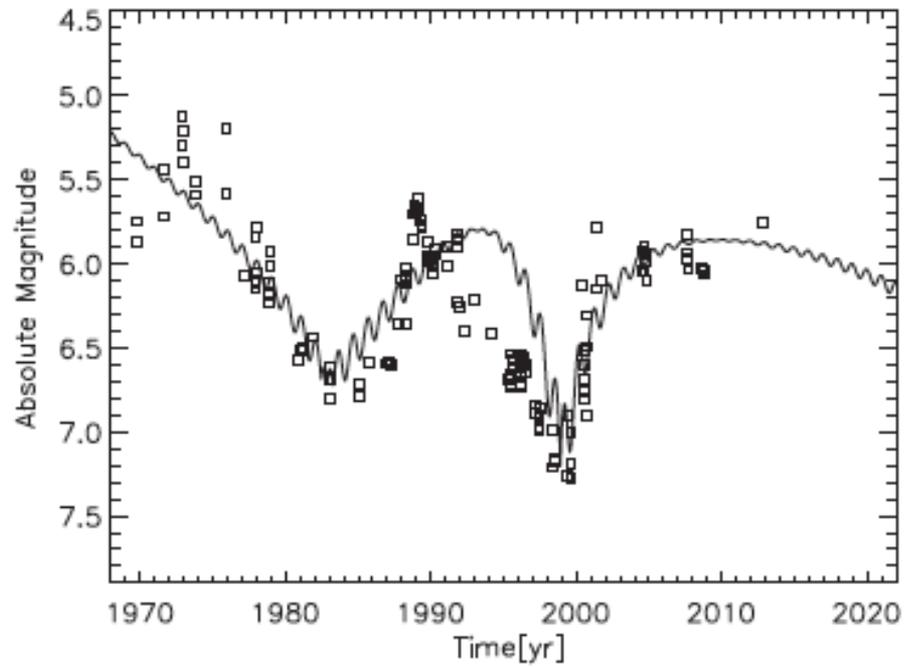
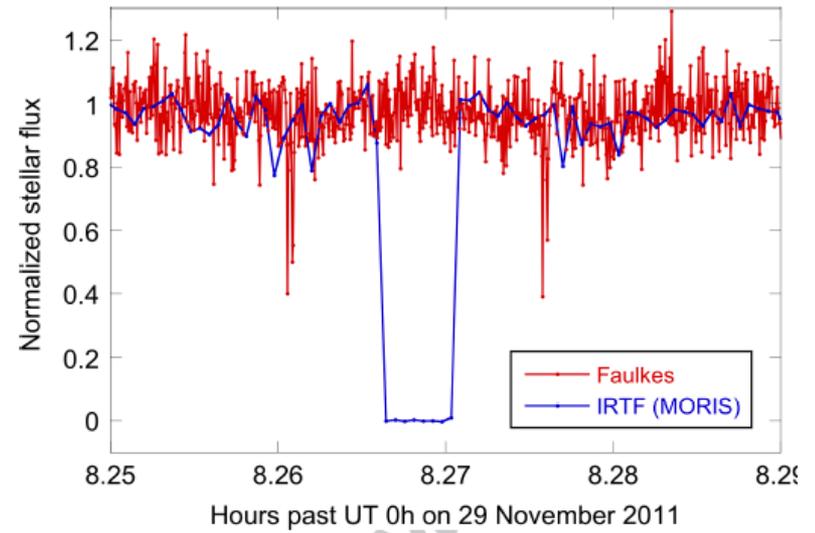
"A ring system detected around the minor planet (10199) Chariklo"

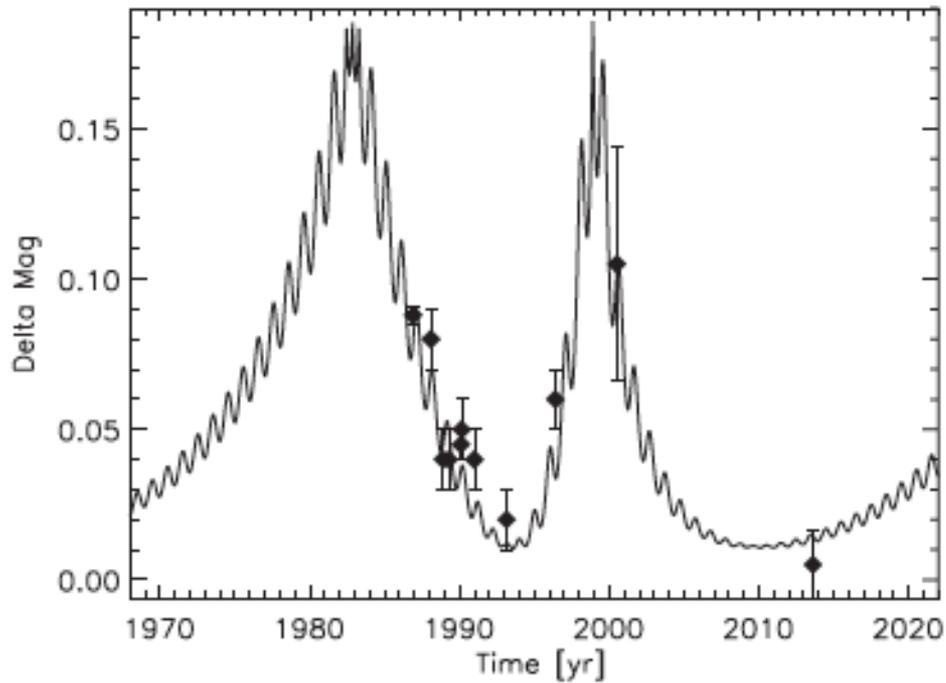
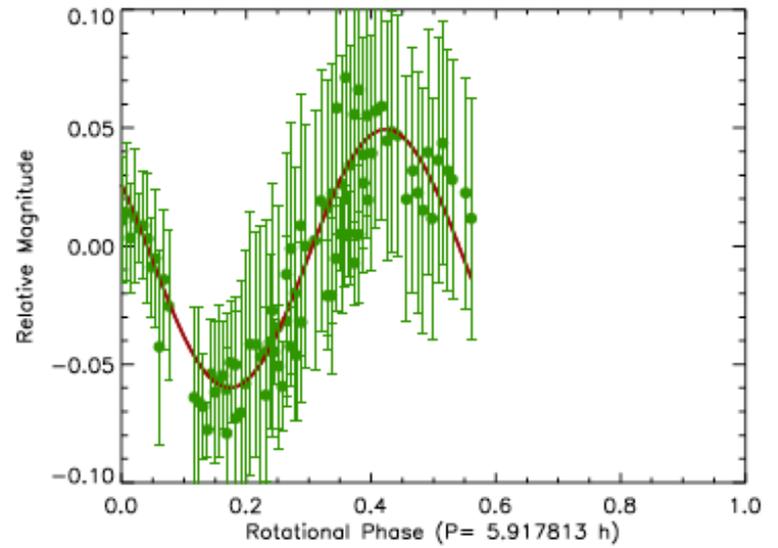
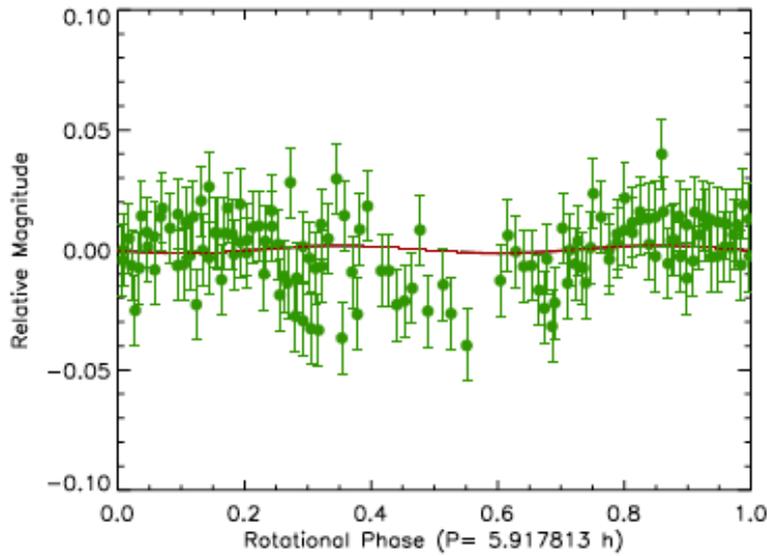
by

F. Braga-Ribas, B. Sicardy, J.L. Ortiz, R. Duffard, N. Morales et al. (2014).

This video contains a 3D computer animation of  
Chariklo's ring system based on the results of the paper.

# Chiron





$$a/c = 1.43$$

$$b/c = 1.20$$

(100, 84, 70) km

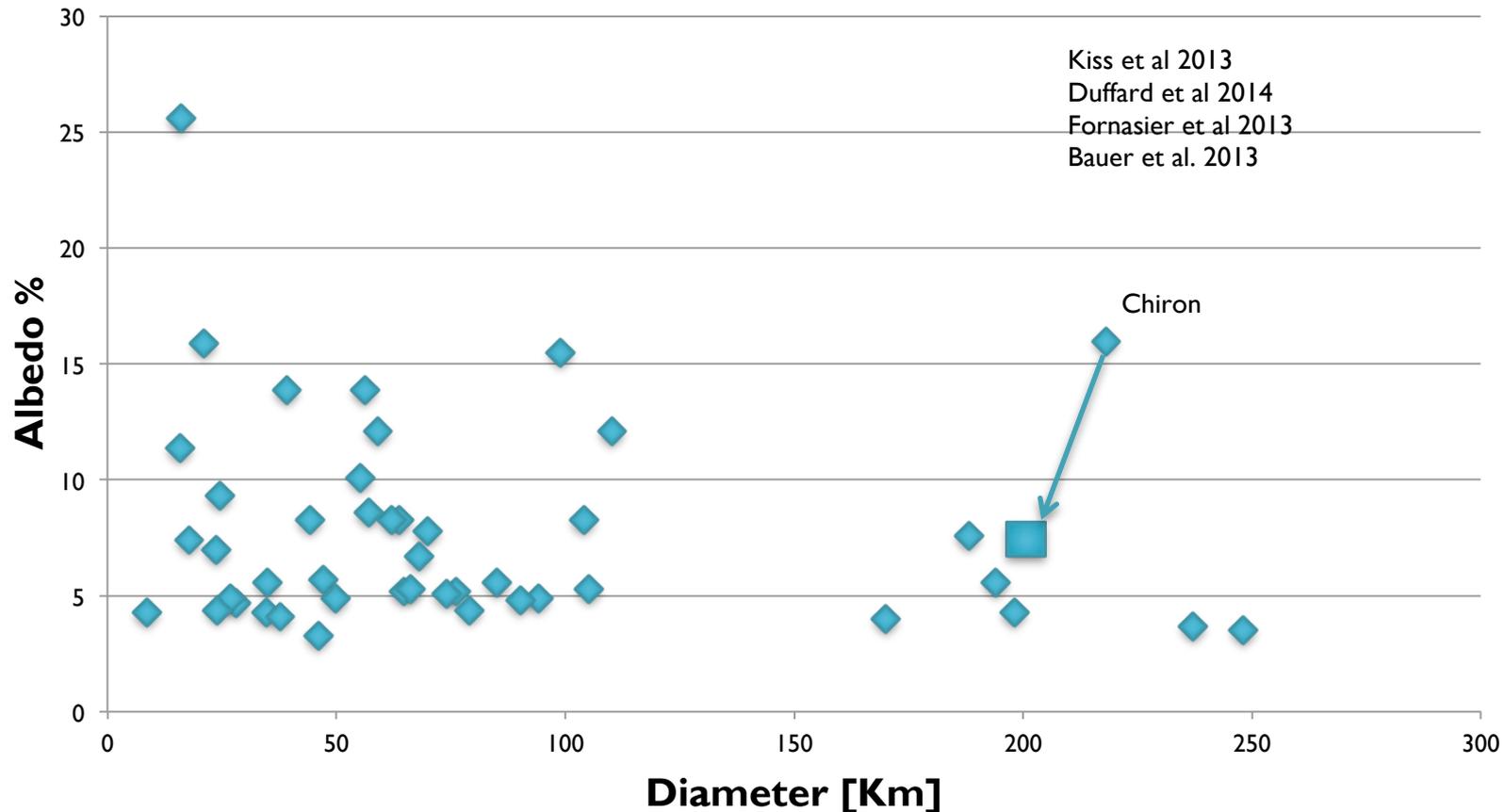
Radio anillo = 324 km

# Datos térmicos - Centauros

**El Hv usado es crítico para calcular el D y Albedo**

Chariklo (Fornasier et al. 2013):  $248 \pm 18$  km,  $3.5 \pm 1$  %,  $H_v = 7.40 \pm 0.25$

Chiron (Fornasier et al 2013) :  $218 \pm 20$  km,  $16.0 \pm 3.0$  %,  $H_v = 5.92 \pm 0.20$



- **Y sobre el origen de los anillos?**
- Colisión en la superficie
- Colisión en un satélite
- Fuerzas de marea
- Otros.....

**Hay mas objetos curiosos?**

# Asteroides activados

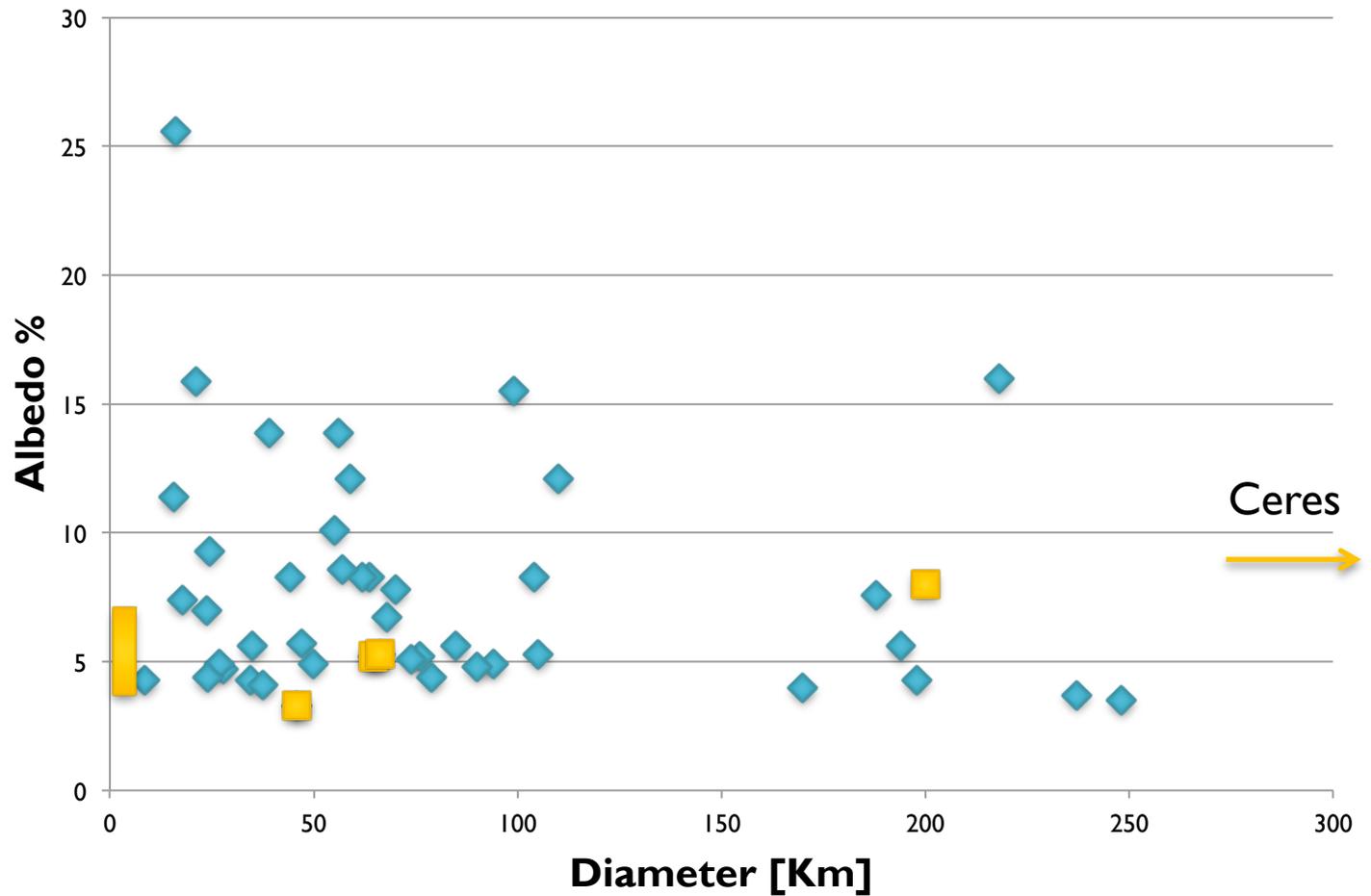


TABLE 3  
SUMMARY OF MECHANISMS<sup>a</sup>

Name	Sublimation	Impact	Electrostatics	Rotation	Thermal
(3200) Phaethon	×	?	?	?	✓
311P/PANSTARRS (P/2013 P5)	×	×	×	✓	×
P/2010 A2 (LINEAR)	×	✓	×	✓	×
(1) Ceres	✓	×	×	×	×
(2201) Oljato	?	?	?	?	×
P/2012 F5 (Gibbs)	×	✓	×	✓	×
259P/Garradd (P/2008 R1)	?	?	?	?	×
(596) Scheila	×	✓	×	×	×
288P/(300163) 2006 VW <sub>139</sub>	✓	?	?	?	×
(62412) 2000 SY <sub>178</sub>	?	✓	?	✓	×
P/2013 R3 (Catalina-PANSTARRS)	?	×	×	✓	×
133P/(7968) Elst-Pizarro	✓	×	?	✓	×
176P/(118401) LINEAR	✓	?	?	×	×
238P/Read (P/2005 U1)	✓	×	×	?	×
P/2012 T1 (PANSTARRS)	✓	×	×	?	×
313P/Gibbs (P/2014 S4)	✓	×	×	?	×
P/2010 R2 (La Sagra)	✓	?	?	?	×
107P/(4015) Wilson-Harrington	?	?	?	×	×

<sup>a</sup>✓ - evidence exists consistent with the process, × - evidence exists inconsistent with the process, ? - insufficient or mixed evidence exists

# Asteroides activados + Centauros





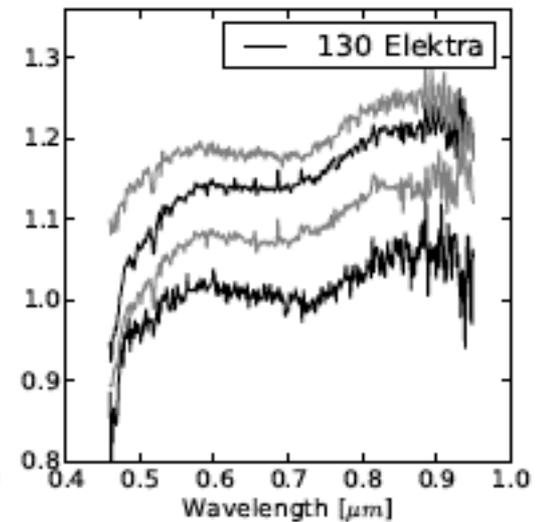
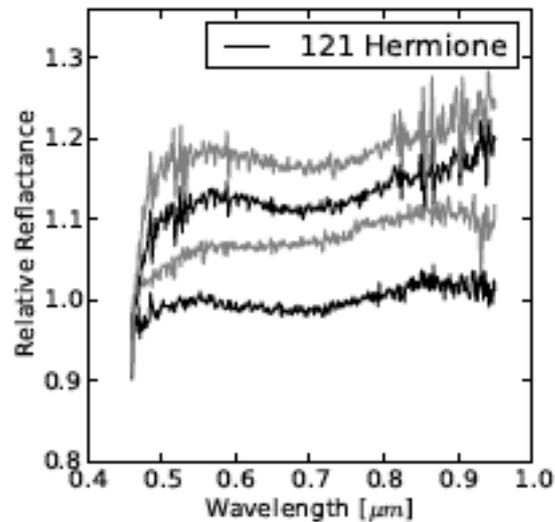
**Alguno mas?**

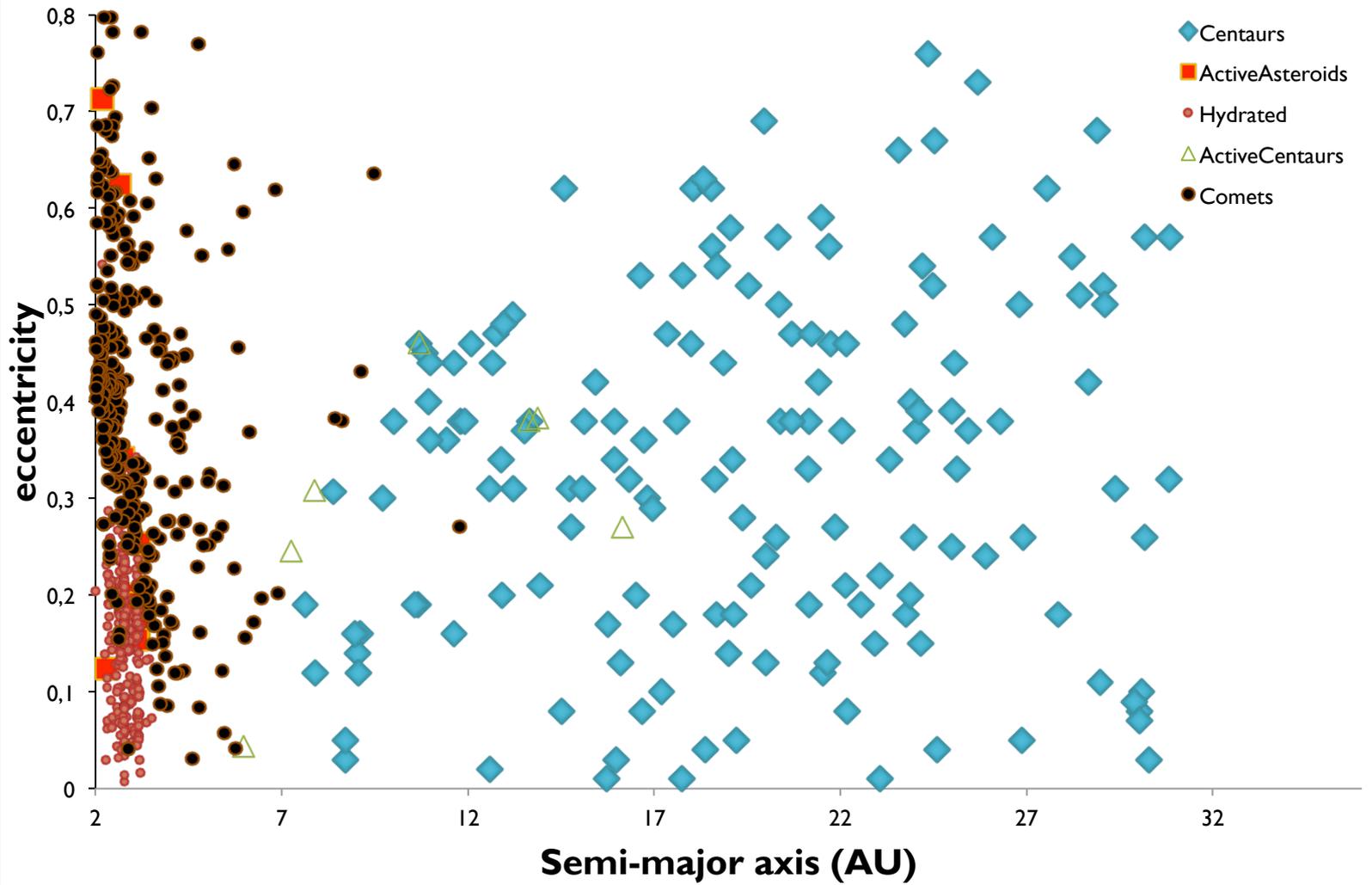
# Asteroides Hidratados

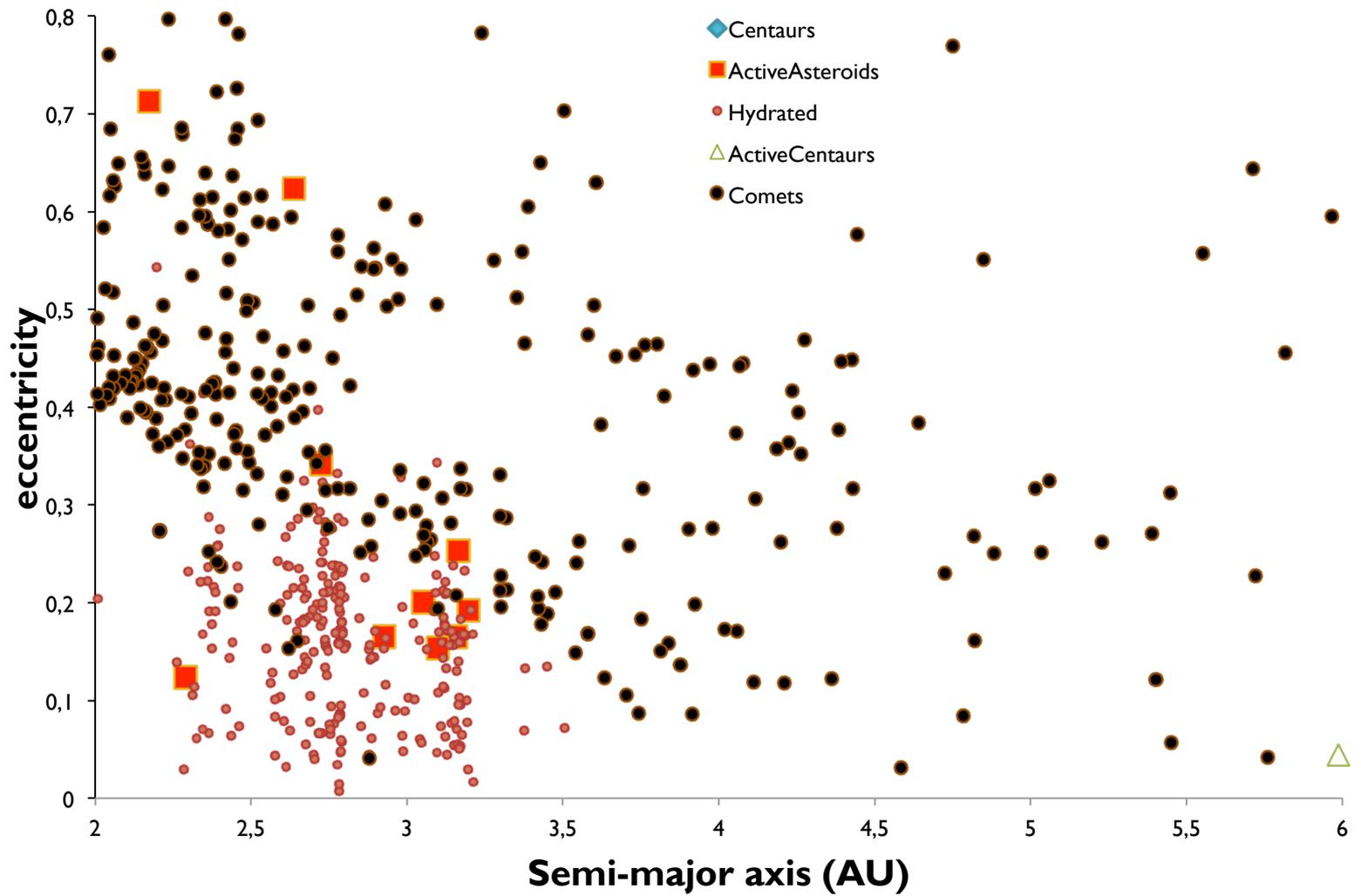
Minerales hidratados = contacto con agua líquida

En todo el cinturón de asteroides

No hay indicios de familias







# Colocando todo junto

- Los hidratados serian muy antiguos, desde los inicios del SS
- Centauros grandes no presentarían actividad cometaria, se explica solo con anillos.

# Trabajo a realizar

- Buscar y encontrar mas anillos
- Caracterizar los hidratados
- Buscar y caracterizar más asteroides activos
- Modelos del interior de centauros (podrían explicar los hidratados?)