The intriguing Tina asteroid family: a compositional investigation

Davide Perna\textsuperscript{(1,2)}, Cristina Fanasca\textsuperscript{(1,3)}, Simone Ieva\textsuperscript{(1)}, Valerio Carruba\textsuperscript{(4)}, Elisabetta Dotto\textsuperscript{(1)}, Elena Mazzotta Epifani\textsuperscript{(1)}, Sonia Fornasier\textsuperscript{(2)}, Massimo Dall’Ora\textsuperscript{(5)}, Pedro H. Hasselmann\textsuperscript{(2)} and Alvaro Alvarez-Candal\textsuperscript{(6)}

(1) INAF-OAR, Italy
(2) LESIA-Observatoire de Paris, France
(3) Università Tor Vergata, Italy
(4) UNESP, Brazil
(5) INAF-OACN, Italy
(6) ON, Brazil

European Planetary Science Congress
Berlin, 16-21 September 2018
The Tina asteroid family

The only family in the main belt to be completely embedded in a secular resonance (v6) stable island configuration.

- 96 members
- Age ~ 140-190 Myr
- Limited eccentricities, no planet crossings
  → Ideal case to study non-gravitational forces and/or original ejection velocity field

(1222) Tina:

- X-type spectrum (SMASH)
- $p_V = 0.202 \pm 0.045$
- $D = 25.78 \pm 0.14$ km (NEOWISE)

Metallic asteroid?
The Tina asteroid family

The only family in the main belt to be completely embedded in a secular resonance (ν6) stable island configuration.

- 96 members
- Age ~ 140-190 Myr
- Limited eccentricities, no planet crossings → Ideal case to study non-gravitational forces and/or original ejection velocity field

(1222) Tina:

- X-type spectrum (SMASS)
- $p_V = 0.202 \pm 0.045$
- $D = 25.78 \pm 0.14$ km (NEOWISE)

Metallic asteroid? BUT:

- Flat/solar NIR colours (2MASS)
- No physical infos about family members → spectroscopic (ESO/VLT, 7 targets) and photometric (TNG, 16 targets) observational campaign
Preliminary results (1/2)

7 visible spectra with VLT/FORS2

• Mix of X and C spectral types

• Meteorite comparison:
  o CV/CO/Iron (X-types)
  o C1/CM2 (C-types)

• Aqueous alteration?
Preliminary results (2/2)

7 visible spectra with VLT/FORS2

+ 

16 targets with BVRI photometry (TNG/LRS)

-------------------------------

Taxonomic classification:

14  X-complex
8   C-complex
1   C/X
Physical vs. dynamical properties
Colour-albedo plot
In summary: a very intriguing family!

- C-types are interlopers / background objects?
- C-types from a different parent body? The impactor?
- Common “Lutetia-like” and/or differentiated parent body?

I acknowledge financial support from the European Commission’s Horizon 2020 programme under the Marie Skłodowska-Curie grant agreement n. 664931