

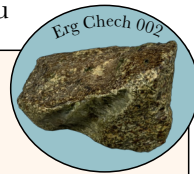
## ASTEROIDS AND METEORITES

### Gaia DR3 spectral dataset

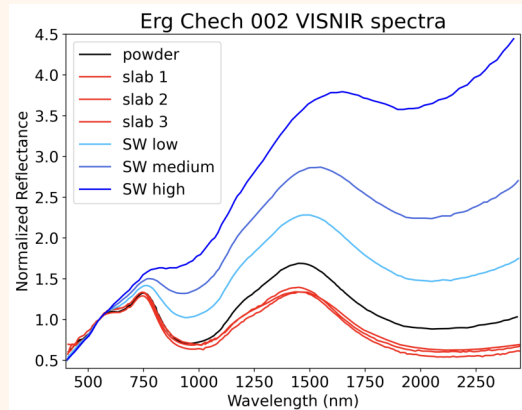
- Dataset of **60 518 reflectance spectra** in the **visible** wavelength range ([374,1034] nm) of Solar System small bodies.
- **Spectroscopy**: useful tool to probe the surface of asteroids and to deduce information about their **formation and evolution processes**.

### Erg Chech 002

- Oldest andesite meteorite of the Solar System
- Crystallization age: 4.565 My
- Formed in the crust of an early accreted and differentiated planetesimal: comes from a partially differentiated body



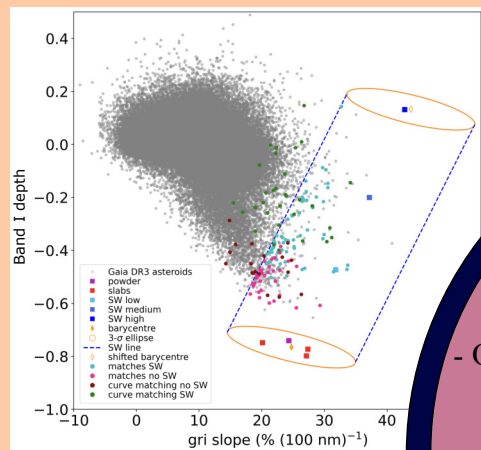
### Differentiation processes



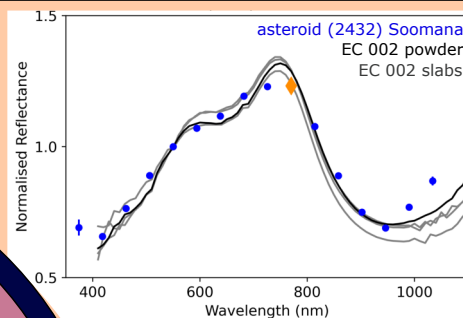
**Search for traces of asteroids differentiation in the main asteroid belt, using Gaia DR3 visible asteroids spectra: search for analogues of the meteorite Erg Chech 002 (EC002).**

## METHODS

### Spectral parameters analysis

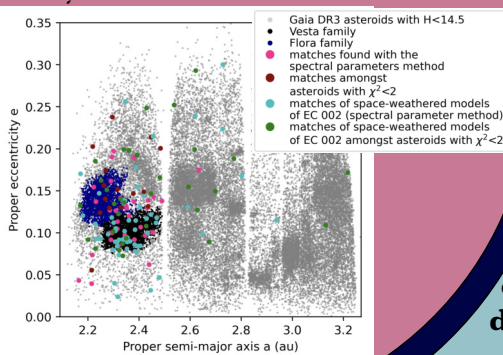


### Curve matching



## RESULTS

- **51 asteroids** match the samples spectra : **0.08%** of the dataset
- **91 asteroids** match the space-weathered modelled spectra: **0.15 %** of the dataset
- Objects mostly located in the **inner main belt**



-  $\chi^2$  coefficient to find asteroids with a visible spectrum the most similar to the spectra of the meteorite.

### Spectral parameters:

- **depth of the band around 1 micron** (Band I depth)
- **slope between 468.6 and 748 nm** (gri slope)

We measured these parameters for every meteorite sample spectra and modelled spectra. We compared these parameters to those of Gaia DR3 asteroids.

## CONCLUSIONS

- The asteroids matching EC002 are extremely rare: **the traces of the crusts of early formed planetesimals disappeared ?**

- The visible part of the spectrum alone is not diagnostic of an andesitic composition: we obtained telescope time to acquire **near-infrared spectra** of the asteroids with the IRTF to confirm or rule-out the matches found.

DPAC: analysis of Gaia DR3 asteroids spectra and **improvements** of processing methods to prepare **Gaia DR4**.

