

# Comets

## 53856 Small bodies in the Solar system I (Aurinkokunnan pienkappaleet I), comets

Lecturer is PhD Evgenij Zubko and assistant lecturer Lic. Antti Penttilä.

The course contains basic information almost on all important problems of cometary physics. In particular, we will consider principal results of space missions to the comets, structure and activity of cometary nuclei, motion of cometary dust particles, and photo-polarimetric properties of comets.

Recommended reading: M. C. Festou et al. (eds): Comets II, (Tucson: University of Arizona Press), 2004.

Course will be take place in Physicum D115, Wednesdays 10-12 during I and II period in 2010. First lecture is on Wed 8.9.2010.

The course includes 14 lectures, 6 exercises, and a project.

Lectures by Evgenij Zubko ([Evgenij.Zubko\(at\)helsinki.fi](mailto:Evgenij.Zubko(at)helsinki.fi))

Exercises by Antti Penttilä ([Antti.I.Penttila\(at\)helsinki.fi](mailto:Antti.I.Penttila(at)helsinki.fi))

We allow to miss 1 lecture and 1 exercise without a penalty. However, absence on the lecture is not an excuse at future exam. The same holds for home exercises – all of them have to be completed. An extra absence will lead to an additional task.

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### Course schedule

08.09.2010: 10-12 (D115)

— [Introduction into comets](#)

09.09.2010: 10-12 (D104)

— [In situ studies of comets \(1\)](#)

29.09.2010: 10-12 (D115)

— [In situ studies of comets \(2\)](#)

30.09.2010: 10-12 (D104)

— [In situ studies of comets \(3\)](#)

06.10.2010: 10-12 (D115)

— [Interaction of light with cometary dust particles \(1\)](#)

13.10.2010: 10-12 (D115)

— [Interaction of light with cometary dust particles \(2\)](#)

20.10.2010: 10-12 (D115)

— [Interaction of light with cometary dust particles \(3\)](#)

20.10.2010: 12-14 (D211) Exercise 1

— [Introduction to adda](#), fetch also [material](#), and, if needed, [adda source](#) or [source with modified Makefile](#) and [adda for Windows](#)

03.11.2010: 10-12 (D115)

— [Aperture-averaged photo-polarimetry of comets in visible](#)

03.11.2010: 12-14 (D211) Exercise 2

— [Create your own particle shape](#)

10.11.2010: 10-12 (D115)

— [Imaging photo-polarimetry of comets in visible](#)

10.11.2010: 12-14 (D211) Exercise 3

— [Continue from Ex. 2 and compute light scattering properties and trajectory](#). Other material: [orientation averaging file](#), [integration file for asymmetry parameter](#).

17.11.2010: 10-12 (D115)

— [Ejection and motion of dust particles and split comets](#)

17.11.2010: 12-14 (D211) Exercise 4

— [Continue from Ex. 2 and 3 and compute light scattering properties and trajectory](#)

24.11.2010: 10-12 (D115)

08.12.2010: 10-12 (D115)

— [Infrared studies of comets](#)

15.12.2010: 10-12 (D115)