

ESA/GTTP Teacher Training Workshop 2012 Provisional Programme

The ESA/GTTP Teacher Training Workshop 2012 will be held at the European Space Astronomy Centre, near Madrid, Spain, from Tuesday 14 February to Friday 17 January 2012. The programme for the workshop is given below.

	Tuesday 14 February
09:30 – 10:00	Arrival
10:00 - 10:45	Session 1: Welcome by ESA & GTTP, practical information
10:45 – 11:45	Session 2: Keynote speaker
11:45 – 12:30	Session 3: ESA Education materials
12:30 – 13:30	Session 4: ESA science data archives
13:30-14:30	Lunch
14:30 – 16:00	Session 5: ESA science data archives
16:00 – 16:30	Break
16:30 – 18:00	Session 6: GTTP classroom activity – Stellarium, Celestia and the WorldWide Telescope

	Wednesday 15 February
09:00 – 10:30	Session 7: Mars masterclass
10:30 – 11:00	Break
11:00 – 13:30	Session 8: GTTP classroom activity - Robotic Telescopes
13:30-14:30	Lunch
14:30 – 16:00	Session 9: GTTP classroom activity – Make your own spectrometer
16:00 – 16:15	Break
16:15 – 17:00	Session 10: Tour of ESAC
17:00 – 18:00	Session 11: The mysteries of Venus
Evening	Social event

Thursday 16 February	
09:00 – 11:30	Session 12: The mysteries of Venus
11:30 – 12:00	Break
12:00-13:30	Session 13: Mars Express classroom activities
13:30–14:30	Lunch
14:30 – 15:30	Session 14: GTTP classroom activity – Making craters
15:30 – 18:30	Session 15: Visit to Cebreros ground station

Friday 17 February	
09:00 – 11:30	Session 16: GTTP classroom activity – SalsaJ
11:30-12:00	Break
12:00-12:45	Session 17: ESA Science classroom activities
13:30-14:30	Lunch
14:30–15:30	Session 18: Keynote speaker
15:30–16:30	Discussion/Feedback
	End of workshop

Sessions 4 & 5: ESA science data archives

Much of the data return by ESA's fleet of Solar System and astronomy missions is public and available to use. During this session participants will explore the wealth of the ESA science data archives, learn how use the archive tool and find out how to utilise the data in the classroom.

Session 6: Stellarium, Celestia and the WorldWide Telescope

Stellarium and Celestia are both exceptional tools for teaching astronomy and can be used in the classroom to demonstrate various astronomical concepts. Stellarium shows a realistic sky in 3D and can be used to demonstrate, for example; the movement of the planets and stars, the constellations, the brightness of various objects and what objects can be seen from different geographical places at different times of the year. Celestia can be used, to discover the planets and moons of the Solar System, investigate the life cycle of stars and much more. Stellarium and Celestia can also be used as part of the preparation for an observing session, by allowing the user to carefully choose the objects to observe at the right time of the night.

The WorldWide Telescope is a planetarium software environment that enables your computer to function as a virtual telescope to explore the Universe, bringing together imagery from the world's best ground- and space-based telescopes. It allows pedagogical resources to be developed using telescope data and engages students in the exploration of the multi-wavelength Universe.

Session 8: Robotic Telescopes

Remotely operated telescopes enable students to make real observations without the problems that arise with a night out in the field. There are several remotely operated telescopes available around the world with different capabilities. The Faulkes Telescope Project for instance provides students with access to research-grade telescopes and instruments. With this session, participants will learn:

- How to use robotic telescopes
- About projects that can be accomplished with robotic telescopes.

Session 9: Make your Own Spectroscope

In this session participants will learn how to make a simple spectroscope that can easily be replicated in the classroom. Constructed from everyday material the spectroscope is a very powerful tool to help students realise that different sources of light do not shine in the same way. Using a diffraction grating, a spectroscope decomposes light received into its components in a form of spectrum. With these home-made spectroscopes it is possible to observe the different spectral lines produced by different light bulbs and the amazing Fraunhofer spectrum of the Sun.

Sessions 11 & 12: The Mysteries of Venus

Our nearest planetary neighbour, Venus presents a unique opportunity for scientists to improve their understanding of weather and climate on earth. In addition to a science background overview by a participating science team member, teachers will use actual spacecraft data from ESA's Venus Express mission in a hands-on activity that incorporates middle school math skills, to analyse Venus winds.

Session 14: Making craters

In this hands-on workshop participants will make craters using flour and cocoa powder and explore how this exercise can be used to teach basic laws of physics. In addition, the session will cover how this activity can be used as an introduction to the geology of different Solar System bodies, such as, Mars, Earth and the Moon.

Session 16: SalsaJ

SalsaJ is an image processing software that reads FITS files – a file format widely used in astronomy. With SalsaJ, one can manipulate and analyse astronomy images in a professional way. Raw astronomical images are not very useful - the information we can extract from an image is highly dependent on the operations we perform on it and on the analysis. SalsaJ has been developed to perform most of the tasks that astronomy images are subject to, including making wonderful colour images from single filter images. With this session participants will learn:

- How to get SalsaJ (it is free) and install it in their computer
- What a CCD image is
- How to look in different ways at an astronomy image
- How to perform operations with images
- How to analyse an image
- Some activities suitable for the classroom
- How to build a colour image

Session 17: ESA science classroom activity

During these session participants will find out and use a variety of the education resources available that relate to ESA Solar System and astronomy missions.