

## News-Archiv

### Rosetta's cometary lander Philae goes LEGO®

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What does a scientist do to help visualise a spacecraft's journey? Build a model of course. A model of Europe's Rosetta comet chaser constructed out of LEGO® blocks started out in this small way and has grown into a project to build a high-fidelity Rosetta Lander Education kit, supported by the German Aerospace Center, DLR, the European Space Agency, ESA, and the LEGO Group.

<http://player.vimeo.com/video/13581646?title=0&byline=0&portrait=0>

*'Rosetta's Comet Touchdown' is a 20-minute film that explains the scientific and technical aspects of the Rosetta mission. It is part of a set of teaching materials that will be tested in future at other schools and student labs in Europe. Video: Lightcurve Films/Maarten Roos, DLR, ESA, Europlanet, LEGO, CC-BY-ND.*



Test successful - students with the model of Rosetta's lander, Philae

Rosetta, launched in March 2004, is currently in its sixth year of its 10-year journey to comet 67P/Churyumov-Gerasimenko. This journey involves four planetary swingbys and two asteroid flybys. After it arrives at the comet and orbits and surveys its surface, Rosetta will release the lander, called Philae, onto the comet's icy surface in November 2014.

It was visible in the expression of the faces of students and professors that this was a rather unconventional first in the history of the ancient University of Rome. Engineering students of the University and arts students from the European Institute of Design gathered yesterday to test the prototype of the Rosetta Lander Education Kit. This exercise familiarised them with the European mission to the comet Churyumov-Gerasimenko as they were building specific functionality features of the lander using LEGO® MINDSTORMS®, while also working in the theme of cometary science from an artistic angle.

"Chasing comets allows us to look back into the history of our Solar System," said Detlef Koschny during the presentation of the Education Kit. "Comets and asteroids represent the leftovers from which the planets of our Solar System formed. Understanding their composition will teach about how our own Earth came into being and the ingredients that allowed the formation of Life," he added. Koschny works

as a space scientist for ESA in the Netherlands and has developed the very first model of Philae using LEGO® MINDSTORMS®, together with his son Julius.

[http://vimeo.com/moogaloop.swf?clip\\_id=8490997&server=vimeo.com&show\\_title=0&show\\_byline=0&show\\_portrait=0&color=00ADEF&fullscreen=1&autoplay=0&loop=0](http://vimeo.com/moogaloop.swf?clip_id=8490997&server=vimeo.com&show_title=0&show_byline=0&show_portrait=0&color=00ADEF&fullscreen=1&autoplay=0&loop=0)

So far comets have only been investigated from the distance. To fully understand a comet's composition it is essential to touch down on its surface. Only a real close-up can reveal the elements a comet is made of.



No easy task - building the lander with LEGO blocks

Recreating the lander's activities using LEGO MINDSTORMS blocks has not been an easy task. The lander has ice screws on its legs that drill into the surface using the energy of the touch down. It also has a harpoon that holds the lander on the surface and on top there is a small engine that provides some thrust to keep the lander in position while the screws and the harpoon are finishing their job fixating the lander.

Some of these features are reproduced on the model using LEGO MINDSTORMS components, which allow moving parts to be controlled by a simple home computer. As for the students, it has given them a chance to see how space engineers solve problems and to try to come to their own solutions using the kit.

Stefan Ulamec, Head of the Rosetta Lander Project at DLR said, "It has been fascinating to watch students from various disciplines work together to understand the Rosetta mission and to create a working model of Philae. I look forward to the kit being available for use in schools across Europe, hopefully soon."



Philae taking shape

Philae was developed and built by an international consortium led by the German Aerospace Center DLR. DLR's Microgravity User Support Center (MUSC) operates the Lander from the Cologne control centre.

The feedback provided by the engineering students on the Prototype Education Kit - a pilot project- will be used by the joint development team of ESA, the German Aerospace Center DLR, Europlanet,

Lightcurve Films and the LEGO Group to finalise the Education Kit and adapt it to the needs of European curricula. Interested teachers and students are invited to contact:

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