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Hook-up with Rosetta

ESA's mission to explore a comet and study their role in bringing life to Earth

A European Campaign brought to you by the Ecsite Space Group with the Support of the European Space Agency

Introduction

Hook-up with Rosetta is a European Campaign on the European Space Agency's Rosetta mission for science centres and museums. It is coordinated by Ecsite – the European Network of Science Centres and Museums – and supported by the European Space Agency (ESA). The campaign has been built by the Ecsite Space Group, a special interest group of institutions involved in space science communication.

The objective of the campaign is to raise awareness among the public, build understanding and provoke dialogue on:

- Rosetta – Europe's comet chaser.
- Did comets bring water to the Earth?
- Rosetta, revealing the nature of comets – the oldest building blocks of our solar system.
- Space Science, comet science and the exploration of the solar system.

All science centres and museums in the Ecsite network are invited to freely join the campaign.

Participating members will be able to enhance their public offer towards the general public while following the major space events of 2014. The campaign offers opportunities to exchange and collaborate at European level, building new connections with Ecsite members, space agencies, scientific institutions and Academia or the space industry. Rosetta, launched in 2004, will orbit the nucleus of comet 67P-Churyumov-Gerasimenko in 2014 to study its composition. Results from Rosetta and its Philae lander will provide scientists with a wealth of information about comets and asteroids that are essential for a better understanding of the formation of our Sun and its surroundings. Rosetta is a highly ambitious mission that will take on unprecedented operational, scientific and engineering challenges and that will capture the public imagination in 2014 and 2015.

All Ecsite members, science centres, museums and planetariums, will be able to participate in the campaign by using some of the offered tools:

1) An exhibit comprising panels and interactive devices.
    - A free kit with 2D files to download, drawings and instructions for a simple exhibit.
    - A kit+ to purchase, including program files of simple interactive games to be used on an interactive table or screen, to discover the key factors of the Rosetta mission and the comets.

2) Time Capsule: an educational activity.

3) A set of four participative events in 2014, sharing the key moments of the ESA's Rosetta mission at European level.

Several institutions within the Ecsite network are also considering mutualizing resources for planetariums.

These tools have been built by the Ecsite Space Group, on the basis of the workshop organised during the Ecsite 2013 Space Pre-Conference session. The development of each tool has been led by an Ecsite science centre, in collaboration with ESA and the whole Space Group.

This document will present the three tools offered to the Ecsite network. **All Ecsite members willing to take part in the Campaign can notify the Space Group by filling in an online questionnaire (http://goo.gl/3SeLn6) or notifying the Ecsite Space Group contact point (Didier Laval, dlaval@ecsite.eu).**

You may access here the background information on ESA's Rosetta mission. You are invited to read it to learn more about the mission, its objectives, milestones and timeline.

« Comets & ESA's ROSETTA » Exhibition

Development leader

Cité de l'espace, Toulouse, France.

Short description

With the help of ESA (European Space Agency) and the Ecsite Space Group, Cité de l'Espace has started to design an exhibition on "Comets & ESA's Rosetta mission" topics.

Aimed to be playful and "easy to use", this exhibition will present:

- **The comets & their exploration**: what are they (… and what they're not!)? Where do they come from? Why should I care?
- **The ESA Rosetta mission:** what for? An amazing journey, and a challenging mission.

Target

Adults & Teenagers

Required surface

From 30m² to 150m².

As the exhibition offers simple and modular displays (see below), several combinations for different surfaces are possible:

- **30m²:** presentation of the 7 panels in their classical version (2D without 3D "popup" interactions), pinned or hanged to the walls.

The Orbiter and lander silhouettes can be printed in a reduced scale, and also be presented on the walls. The orbiter can also be hanged to the ceiling.

- **An exhibition room between 100 & 150m²** allows the presentation of the 7 panels in their freestanding version, with 3D popup interactions. They can be spread all over the area, around the presentation of the scale 1 lander silhouette for example. A piece (or the entirety) of the scale 1 orbiter silhouette can also be hanged.

- **An intermediary surface can be set up with a mix** of 2D and 3D "popup" panels: 1 3D panel for each of thematic (comets & ESA Rosetta mission), surrounded by 2 classical panels for example.

Key aspect

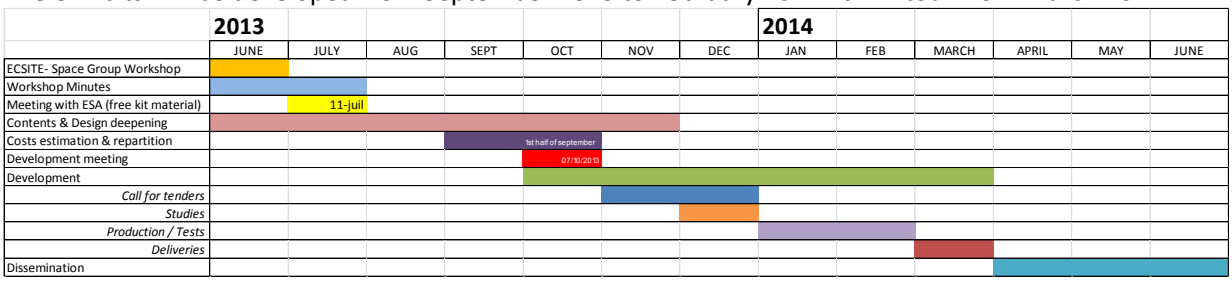
Comets science & knowledge, solar system exploration, immersive, docking, “Space archaeology”, challenges, outstanding of the mission…

Key messages

Comets, unknown neighbours: the oldest building blocks of our solar system
Rosetta & Philae, an explorer’s tandem: shedding light on the formation of the solar system to reveal comets secrets!

Timeline

The exhibits will be developed from September 2013 to February 2014. It will tour from March 2014.



The “Free kit” format

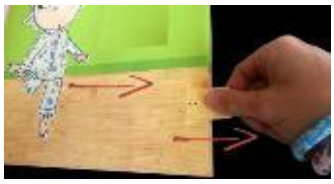
1. Interactive panels

The exhibition will mainly be made of 3D freestanding panels with simple interactions, like those used in "popups" books.




The popup world - ©all rights reserved, do not use!

The idea is to offer simple, instantaneous & playful interactions[1] to discover comets & Rosetta world by opening / turning / pulling / revolving (etc.!) identified parts of each panel.


Slide…


Turn…


Open…


Pull…

At the time, Cite de l'espace is designing 7 3D panels inspired from "popups books" world:

- **An introduction one,** "comets are time capsules!", presenting comets as remains of the origin of our solar system, our origins.

- **Three regarding comets in general:** "The bestiary of the little bodies of our solar system", "what is (not) a comet?", "where do those lonesome travellers come from?".

- **Three dealing with the ESA Rosetta mission:** "Rosetta/67-P comet: a ten years waltz", "Rosetta, the tireless orbiter", "Philae: a Swiss knife in space".

Each panel is about 190cm high for 100/120cm wide; the depth is about 30cm (for this 3D "popup" version).
They are freestanding, with the help of a simple base support if necessary (same for all panels).

The back of each panel is coated with a catching image linked to its topic (for the 3D panels version- visitors can turn around them).

⇨ **Available for free to centres**: Printing files of interactive panels

2. Standard panels

Panels described above will be printable in a 2D version (without interactions).
Same sizes - without depth – as 3D version, without "popup"' interactions.

ESA will also provide a set of panels forming an exhibition called "the enigma of life" (dedicated to the search of life in our solar system), including panels devoted to the Rosetta Mission.

⇨ **Available for free to centres**: Printing files of standard panels

[1] Those interactions will be adapted to repeated uses, and designed to be resistant.

2D models- scale 1
Printable files for Rosetta orbiter and Philae lander (scale 1) will be provided by ESA.
A notice will be added, summarizing the best technical ways to fix/hang the models in the exhibition.

- **ROSETTA (orbiter)** sizes: about 2,8x2x32m
    - 2,8x2m: orbiter body
    - 28m (2x14m): solar arrays length

Scale 1 – compared to an adult size

- **PHILAE (lander)** sizes: about 0,8x1x2,50m
    - 0,8x1m: lander body
    - 2,50m: distance between the lander "legs"

Scale 1 – compared to an adult size

Those 2D models can be printed in a reduced scale if needed.

⇨ **Available for free to centres**: Printing files of 2D models (not including fixing or hanging systems)

3. Audiovisuals

To complete panels set, ESA will provide 2 or 3 audiovisuals on comets & ESA Rosetta mission topics.

⇨ **Available for free to centres**: files to download (not including diffusion material & furniture on site: screen, player, speakers)

"KIT +" bonus

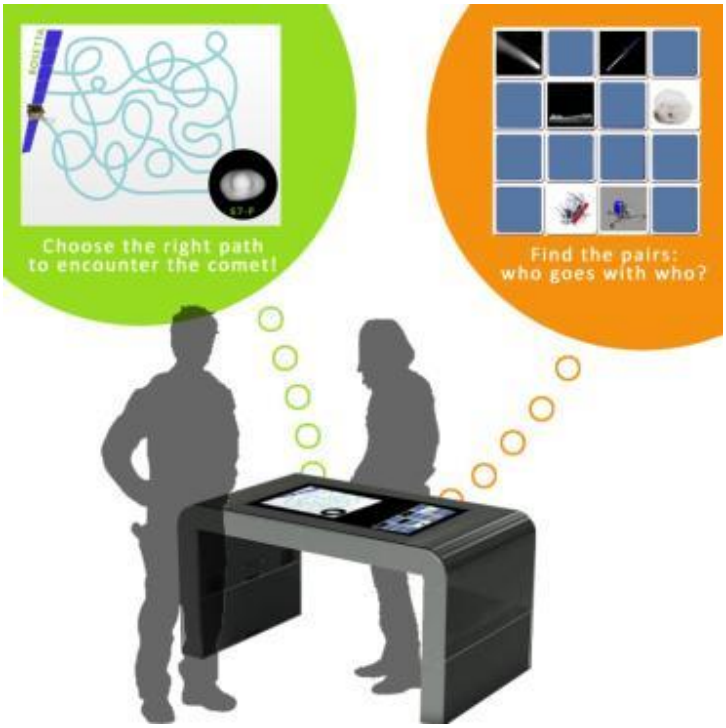
An engaging Interactive display

The development of some simple interactive games gathered in a computer programme is currently under study. It will be able to run on:
- Classical touchscreen (one user)
- Interactive table (several users)

Examples of interactions used in the mini-games: labyrinth, puzzle, sliding puzzle, memory, zoom-in, etc.

- ⇨ Very simple uses, known by everybody, in order to anchor key messages in public's mind for both topics (comets & ESA Rosetta mission).

A feasibility study is under process, and will help to define participation fees for interested centres.



Examples of simple games - ©All rights reserved, do not use!

- ⇨ **<u>Available with participation fees (to be define) to centres</u>**: program files will be delivered to the centres (not including diffusion material & furniture on site: interactive screen, or table, computer, speakers)

Time Capsule: an educational activity

Development leader

Science Center NEMO

Short description

A children's workshop with interactive lecture-elements that can run in a science center/museum for both school groups as well as recreational visitors.
The workshop will be based on the concept of a comet as a time capsule: comets consist of primitive matter from the time when the solar system formed 4.6 billion years ago. Rosetta left in 2004 with the mission to find out what information one of these time capsules, the comet 67P-Churyumov-Gerasimenko carries with it. The workshop will bring these two stories together. The audience will be taken on a swift time travel. Hands on activities, short presentations and/or demos will introduce aspects of the history, discovery, and exploration of comets. The workshop will last 60 minutes, but it will be possible to do certain activities on a stand-alone basis, also after the Rosetta campaign has ended.

Target

8-11 year old students, families

Key aspects

Time capsule, origin of the solar system, history, space exploration, hands on

Key message

Rosetta, revealing the nature of comets - the oldest building blocks of our Solar System.

Participation from science centres and museums

Science centres and museums will have free access and use of the resources. In order to organize the workshop, they will have to

- Use their own space as a venue for the activities, or find other external places.
- Provide the necessary materials for running the workshop
-

In terms of personnel, the main effort will be:

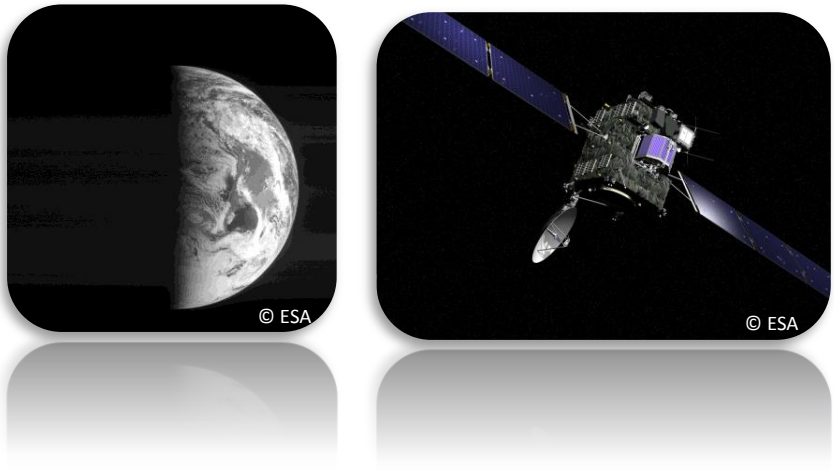
- Communication staff to promote the activity
- Education staff to run the activity in the science centre

Coordination at European level

- Dissemination of the workshop (Ecsite).
- Coordination of questions, additional information needed (Ecsite).
- Guidelines for the workshop and relevant material to be posted under Ecsite page and ESA portal (Ecsite, ESA).

Timeline

Feb 2014	Detailed description of the workshop
April 2014	Instructions and materials available
Spring 2014	Promotion of activity to schools
Autumn 2014	Promotion of activity to both schools and general public
Sept 2014-nov 2014	Implementation of the workshops in the science centres



Rosetta Events

Development Leader

Parque de las Ciencias, Granada, Spain.

Objective of the events

The events of the campaign aim to trigger interest towards the Rosetta mission and to foster exchanges about Rosetta and space science. The means will be a set of events with informal and festive settings, where scientific and technical knowledge will be exchanged in a very accessible and enjoyable environment. In at least two of the events, live operations will be watched and commented, and a teleconference with all the science centres and museums involved will stress the European dimension of the Rosetta mission.

Experts and partnerships

Science centres and museums will strive to gather experts from their national space agencies or from Space related companies – especially the ones linked with the Rosetta instruments. These experts, with the team of science communicators, will provide information and dialogue opportunities around the Rosetta events.

Local partnerships will also be looked for: association of amateur astronomers, space related companies or science laboratories may contribute with experts or with their own activities.

Communication

Social media and communication channels will be massively used by all science centres and museums. A facebook profile and a twitter account will communicate at European level all the events happening in the Ecsite network.

A communication kit will be offered to all participants; it will be built in agreement with ESA and will be in a digital template format, to be completed and printed by each participating institutions.

The coordination of the different events, as well as the communication at European level, will be handled by Ecsite.

Key events

Four main events are proposed, they will be adapted by each science centre or museum to fit its needs, possibilities and audience. At this stage, the four events foreseen will take place in 2014 on January 20th, during the summer and in November. Participating institutions may freely participate to all or part of the events. The main pieces of information and the suggested script for the first event are detailed below.

First event: Rosetta Day - The Awakening

On 20th January 2014 an internal wake-up signal will reactivate Rosetta, resulting in stabilizing the spacecraft, that shall confirm its operational status by sending a signal to the ESA's ESOC operation control centre in Darmstadt, Germany.

Type of activities

Synchronized "Wake-up Party". Whole day activity

Objectives

- Raise awareness on Rosetta mission
- Engage people in dialogue about Rosetta
- Build a strong European suspense about the awakening

Short description

Participants and media join together in a large auditorium or exhibition hall where they can watch a live broadcast from the operation control centre in Darmstadt (web streaming, satellite...), showing the specialists following the awakening process of Rosetta.
A teleconference with all the participating science centres and museums will be organized: each one will have a very short time of speech to communicate to the others a piece of information, some excitement or some fear: what if the device does not wake up? A strong suspense, as well as a palpable tension, should be made and shared at European level, through the teleconference. If Rosetta wakes up, the teleconference will enable to share the joy of the good ending. In the other case, it will help participants share their astonishment and desire of understanding!
Activities in different formats and aimed to different audiences will take place during the period needed to received Rosetta signal. The activities happening during the event will be organized by the science centre or museum, and may include:

- Specific event-related activities (teleconference, web streaming..)

- Activities brought up by the science centre or museum, related to space science (workshop, contests, lectures, speed-data, observations…)
- Activities brought up by local institutions or associations, related to space science (workshop, lectures, speed-data, observations…)
- Media coverage activities (radio and TV programs broadcasting from the museum)

Parque de las Ciencias will coordinate the collection and distribution of the activities proposed by the different museums. The main objective will be provide all the science centres and museums interested in join us to celebrate "Rosetta Day" with a wide range of activities so that they will be able to design a singular event appropriate to its specific audience.

Target

Students, teachers, researchers, amateur space lovers, general public and journalists

Link to Rosetta

ESA's Rosetta mission was launched on 2 March 2004 on an Ariane 5 from Kourou, French Guiana. After a flyby at Earth and Mars and yet another at Earth it encountered asteroid Steins in 2008. Rosetta gained more speed with its third flyby at Earth to meet up with asteroid Lutetia in 2010.

The long distance haul of its flight took Rosetta up to 800 million kilometres away from the Sun and despite its 30-metres long solar arrays there is not enough sunlight to produce enough electricity to power the spacecraft and all of its subsystems when it is more than 600 million kilometres from the Sun. Therefore Rosetta was put into hibernation on 8 June 2011. Only its computer and some heaters remained switched on to get it through the 'cold' and wake it up on 20 January 2014.

Key messages

At the forefront of science: Rosetta mission is pushing the limits of planetary science.

Driving Space Technology: ESA´s Rosetta mission to withstand 31 months of hibernation in the cold.

Rosetta, chasing the changing comet (P67).

Tools needed from science centres and museums

- Auditorium or Hall from where to follow the web streaming and the teleconferences
- Disseminations channels in order to spread the activity (website, newsletters, enews, training days, social networks…)
- Rooms for the workshops
- Optional: Planetarium, Astronomical Observatory, Astronomical Gardens…*

*Some of the activities need these facilities to be developed, but they are not essential for the general event.

Personnel needed from science centres and museums

The general event will required the participation of people from the following departments:

- Communication

- Education
- New technologies

Of course, the development of all the activities will required the participation of explainers or volunteers from local amateur space associations, university students, teachers, researchers…

Coordination at European level

- Registration all the museums interested in taking part in the event (Ecsite).
- Gathering of the scientific information regarding the mission (ESA).
- Teleconferences among participating institutions (Parque de las Ciencias).
- Event script and information required to develop suggested activities (Parque de las Ciencias).
- Collection of videos from participating institutions (Parque de las Ciencias).

Science centres and Museums possible additional contributions:

- Ideas about other workshops and activities.
- Planetarium demos regarding the mission, comets or any other related subject.
- Short videos with comments about the mission and space science by local astronomers or scientists.

Benefits for science centres and museums:

Participating to events will offer opportunities to:

- Establish bridges with ESA, National space agencies, industries, scientific institutions, research centres and universities.
- Strengthen collaboration among European science centres and museums.
- Offer their visitors “cutting-edge” science activities.
    - International projection and media attention.

Items included in the kit

- Script of the activity: Sequence of the activity including synchronize actions with the ESOC and among the centres and the rest of the activities proposed
- Suggestions on how to organize the event: Ideas on how to manage with the workshops, how to foster school and teachers participation and how to involve the rest of the actors in the activity
- Rosetta mission carnet: Parque de las Ciencias is designing the Rosetta mission carnet where the key mission steps will be shown. Every time that a visitor takes part in a workshop, or defined activity, he will have one of the mission steps stamped. At the end of the day any visitor having competed the carnet will received a planetarium ticket, some goodies…
- Instructions to develop the workshops: Parque de las Ciencias suggests several workshops to be distributed during the Rosetta Campaign, and will provide the necessary guidelines.

- Video shots: Parque de las Ciencias will record small video shots with scientist working on the Andalusian Astronomical Institute (IAA CSIC) and on the Sierra Nevada Observatory and, if possible, on the ESA national agency. These experts will answer three questions. Other institutions are encouraged to ask the same questions to their local scientist: a video showing the European experts from various countries would then be edited.

Timeline and process

Mid December:

- Workshops instructions
- Teacher training tips
- Template to announce the activity
- List of activities that can be teleconferenced
- Final schedule for ”inter-centres” teleconference
- Rosetta mission carnet
- List of science centres and museums taking part in the event

January 10th :

- Scientists video shots
- Planetarium demos-if possible- sent to the centres
- Suggestion of space films to be used during the Rosetta Campaign

January 20th : Rosetta Day!!! First event for the wake-up of Rosetta.

Main contributors and contacts

Coordination at European level

Ecsite Space Group

Chairs: Marc Moutin (Cité de l'Espace, France), Ana Noronha (Centro Cencia Viva, Portugal), Maria Menendez (ESA).

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European Space Agency

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Events : Markus Bauer

Education : Monica Talevi

Pilot projects

Exhibition - Cité de l'Espace (France)

Aude Lesty

Educational activities – NEMO Science Centre (The Netherlands)

Aliki Giannakopoulou

Marjolein Van Breemen

Wendy Van den Putte

Events – Parque de las Ciencias (Spain)

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