EUROPE and THE INTERNATIONAL SPACE STATION: Living and Working in Space

A ready-to-use kit brought to you by the Ecsite Space Group with the Support of the European Space Agency

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The International Space Station: Living and Working in Space

About the International Space Station

The International Space Station, ISS, is the world's largest-ever international scientific venture. The partnership includes the USA, Russia, Canada, Japan, and Europe. Orbiting 400 kilometres above us, the ISS offers unique opportunities to observe our planet, carry out research in space and prepare for human exploration of the Solar System.

ESA is responsible for two key elements of the International Space Station: the Columbus research laboratory, and the Automated Transfer Vehicle (ATV) that delivered precious supplies to the ISS during five flights from 2008 to 2015.

A European Service Module based on ATV technology will provide four major system functions to NASA's Orion spacecraft: propulsion, power, thermal control and vital resources for the astronauts, such as water and a breathable atmosphere.

Since 2001 ESA astronauts have been flying to the ISS to carry out essential assembly tasks and extensive programmes of experiments and human research.

About the Toolkit

Human spaceflight and the International Space Station are topics that have the ability to capture the imagination of citizens, children and adults alike. They represent excellent opportunities for educators to encourage their students to engage with science. The "International Space Station: Living and Working in Space" kit aims to inspire different target audiences, and contains a ready-to-use exhibition, developed by **Cité de l'Espace, Toulouse, France**
2. Learning activities, developed by **Tycho Brahe Planetarium, Copenhagen, Denmark** and
3. A set of **ESA exhibition panels** to further explore the topic

The kit has been built by the **Ecsite Space Group**, a special interest group made up of institutions involved in space science communication, supported by the **European Space Agency (ESA)** and coordinated by **Ecsite – the European Network of Science Centres and Museums.**

The exhibition design and concept has been developed by **Cité de l'Espace** and the educational activities by **Tycho Brahe Planetarium**.

The kit aims to build on the lessons learned from the **first Ecsite Space Group Pilot Project**, the **"Hook-up with Rosetta" campaign**, and its excellent results.

Objectives

The **objective of the toolkit** is to raise awareness among the public about the International Space Station and human spaceflight

The kit is aligned with the general objectives of the Ecsite Space Group. This ready-to-use resource will help to:

- Highlight the role and involvement of Europe in human spaceflight
- Relay the news concerning ESA astronauts on board the ISS
- Help the audience discover European science and work on board the ISS

All institutions interested in using the kit can contact Maria Zolotonosa, Ecsite Senior Project Manager and Space Group contact person, at mzolotonosa@ecsite.eu.

1. Exhibition "The International Space Station: Living and working in Space"

The exhibition "The International Space Station: Living and working in Space" presents the ISS, the world's largest-ever international scientific venture, and the ESA astronaut team in an unusual and casual way. It puts emphasis on the daily life on board the ISS; while astronauts are mostly involved in science and research, they also have to check and maintain the station. They also act as human research subjects since, during their missions, they are permanently subject to the conditions of this extreme environment we call space.

The exhibition consists of **11 panels** illustrated with data graphics and spectacular images from recent ISS European missions. Their design was inspired by the loss of reference points experienced during weightlessness.

Development Leader

Cité de l'Espace (Toulouse, France)

Target audience

General public

Description of the exhibition modules

Module 1 – EUROPEAN ASTRONAUTS IN SPACE (1 panel)

Panel 1: European Astronauts

- ESA's participation in ISS
- The team of ESA astronauts based at the ESA/European Astronaut Centre in Cologne, Germany
- Columbus, the European space laboratory

Module 2 - WHAT YOU MUST KNOW ABOUT SPACE (3 panels)

Panel 1: In Free Fall
Panel 2: Vacuum environment
Panel 3: Solo craft

Module 3 - ISS: THE LABORATORY & LIVING SPACE (3 panels)

Panel 1, 2 & 3: Welcome aboard

Module 4 - ON BOARD: LIVING & WORKING IN SPACE (4 panels)

Panels 1 & 2: Astronaut: "Jack of all trades"
Panels 3 & 4: In the body of an Astronaut

Description of the exhibition files

The panels are intended to be printed in a 180 cm x 80 cm format. The exhibition includes four types of files:

Vectorized "ready-to-print" files (vectorized, PDF format) are available in:
English (main language), *French & Spanish (translations)*
French (main language), *English & Spanish (translations)*

Low-resolution files (JPG format)
The 11 panels are also available as low-resolution .jpg format files to allow easy viewing before printing.

Non-vectorized files (AI format)
For language changes, non-vectorized files are available. It is possible to change the main text and one or both translations, as well as to remove one or both translations. Non-textual modifications (e.g. graphic design, images, pictograms, logos, etc.) are not permitted.

Please check the following table in order to locate the AI format file which corresponds to each panel.

PANELS NAME	Corresponding AI FORMAT FILE (FR)	No panels/file	Corresponding AI FORMAT FILE (EN)	No panels/file
Module 1 Panel 1	NEW - 80x180cm (Ech1) FR.ai	1	NEW - 80x180cm (Ech1) GB.ai	1
Module 2 Panel 1	FR6 - 80x180cm (Ech1) FR.ai	1	FR6 - 80x180cm (Ech1) GB.ai	1
Module 2 Panel 2	FR7 - 80x180cm (Ech1) FR.ai	1	FR7 - 80x180cm (Ech1) GB.ai	1
Module 2 Panel 3	FR8 - 80x180cm (Ech1) FR.ai	1	FR8 - 80x180cm (Ech1) GB.ai	1
Module 3 Panels 1, 2 & 3	V1.V2.V3 - 80x180cm (Ech1) FR.ai	3	V1.V2.V3 - 80x180cm (Ech1) GB.ai	3

Module 1: ESA'S PARTICIPATION IN ISS

European Astronauts

Module 2: WHAT YOU MUST KNOW ABOUT SPACE

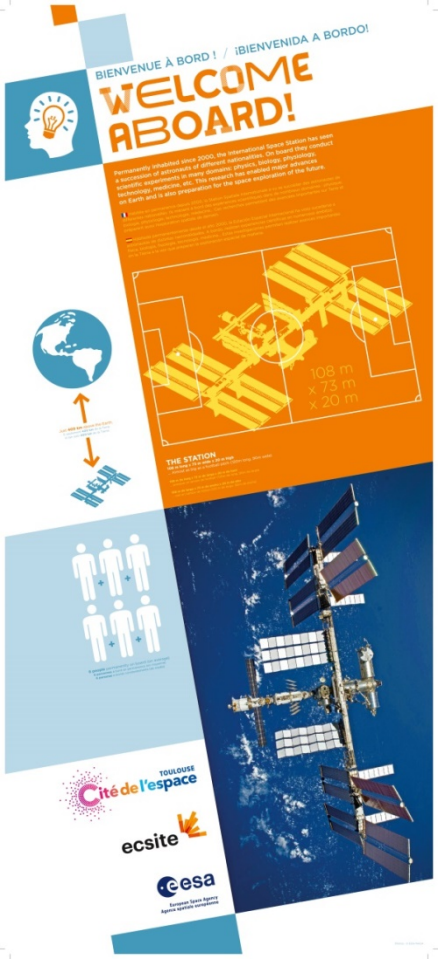
In free fall

Vacuum Environment

Solo craft

Module 3: ISS: THE LABORATORY AND WORKING SPACE

Welcome aboard



Module 4: ON BOARD: LIVING AND WORKING IN SPACE

In the body of an astronaut

Module 4: ON BOARD: LIVING AND WORKING IN SPACE

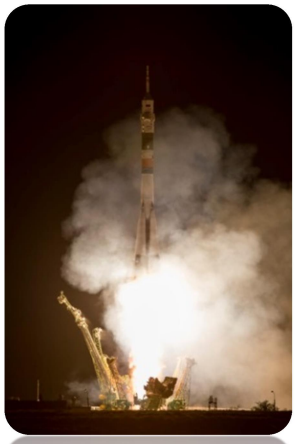
"Jack of all trades"

2. Learning activities

Development Leader

Tycho Brahe Planetarium (Copenhagen, Denmark)

2.1 Paper rockets



Description

"Paper Rockets" is an exciting hands-on activity directed towards secondary school students. It can be run in science centres and museums for school groups. The audience will learn how to make and launch their own paper rockets. By doing so, they will understand the physics and chemistry that are behind the launch of a rocket.

Target Audience

Secondary school students

Length

45-60 minutes

Key Message

The physics and chemistry behind the launch of a rocket
Newton's Third Law

2.2 Landing your Eggonaut safely

Description

The Eggonaut exercise is a fun and challenging exercise to illustrate landing procedures. In the course of this cooperative game, in groups, the participants will have to use the available materials to create a descent module for their Eggonaut. This activity is also an excellent team building exercise.

Target Audience

Children and adults

Length

90 - 120 minutes

Key Message

A demonstration of landing procedures
The landing of a spacecraft explained

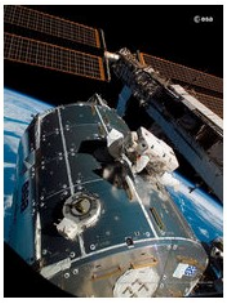
3. ESA Exhibition Panels

ESA has produced a set of images giving an overview of ESA's many activities. 7 of these images focus on the ISS, ESA astronauts and the next steps in space exploration.

The exhibition panels are available in **English, French and German**, and are designed to be printed in a **60x80cm** format.

To see the full set of ESA images, please visit: www.esa.int/About_Us/Exhibitions/ESA_in_images.

The International Space Station



Europe's Columbus laboratory

Building the ISS

The Automated Transfer Vehicle

The European Service Module for Orion

ESA astronaut Samantha Cristoforetti in the Cupola

Science and research on the ISS

ESA also offers an informative panel that presents Europe's involvement with the ISS.

The panel is available in **English** and **French**, and is designed to be printed in a **75x120cm** format.

To see the full "ESA Highlights" series, please visit:

(**English**) http://www.esa.int/About_Us/Exhibitions/ESA_highlights3

(**French**) http://www.esa.int/About_Us/Exhibitions/L_ESA_et_ses_activites

Access to the resources

Presentation

The kit includes ready-to-print files of the exhibition's 2D panels, instructions for two learning activities and a series of ESA images (also available online).

Access to the ISS kit is free of charge for Ecsite members.

Prices

Resources	Ecsite members	Non-members
Exhibition	Free	99€
Educational activities		

Access to the kit will be granted upon the signature of a kit order form. The form can be requested by emailing Maria Zolotonosa at mzolotonosa@ecsite.eu. Once the form is completed and returned, Ecsite will provide your organization with a download link.

Kit developers

Exhibition

Aude Lesty, **Cité de l'Espace, Toulouse, France**

Educational Activities

Tina Ibsen, **Tycho Brahe Planetarium, Copenhagen, Denmark**

The Ecsite Space Group

The Ecsite Space Group aims at improving and extending communication about space science by helping specialized science centres and space professionals work together with non-specialists and develop collaborative projects and events.

Joining the Ecsite's Space Group means you can get closer to space professionals and science centres willing to communicate about space. It also allows you to be better informed about space news, programs, and discoveries. The Space Group allows the sharing of experience, expertise, knowledge, and tools.

For the European Space Agency (ESA), national space agencies, industries, research institutions, and academia, the Space Group offers the possibility to build close collaborations with science communication professionals. The group benefits from the established European networks of Ecsite and the European Space network of ESA and its member states.

To take part in the Space Group and receive its latest updates, sign-up for the bi-monthly newsletter on Ecsite's Space Group webpage.

Ecsite Space Group Co-chairs

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