

ESA Education programme

Inspiring and Engaging the next generation !

Workshop – European Interparliamentary Space Conference
ESA/ESEC, 14 May 2018

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European Space Agency

ESA Education Programme

Objectives and Impact



Objectives: by using space as a learning, teaching and training context, to Motivate, Inspire and Engage the next generation of space scientists and Engineers; to Enhance the literacy & competence in sciences and technology (STEM disciplines); to Enable young people to consider pursuing a career in the STEM field, in the space domain in particular

Impact: Education plays a fundamental role in our society's growth and development.

1. It equips of the future workforce with the skills and competences which today's society needs in order to remain competitive,
2. It eventually enhances employability,
3. It stimulates creativity, innovation and entrepreneurship



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STEM Programme

School pupils & teachers

Space is the context

Formal education, right into the schools, with teacher training and classroom resources to support the curriculum in an innovative way ([ESERO](#))

Hands-on: learning to think, learning to do, as classroom project or extracurricular activity

Informal education, learning while having fun

ESA Academy

Universities

Space is the subject

Hands-on:

- Satellite projects
- Scientific instrumentation & experimentation
- Technology demonstration experiments

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Academic support:

- Courses and workshops
- Participation to conferences
- Lectures and seminars of ESA experts

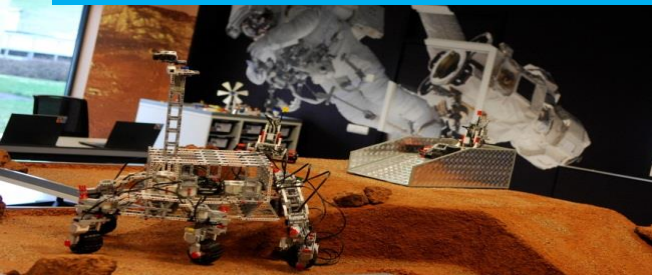


primary and secondary school education

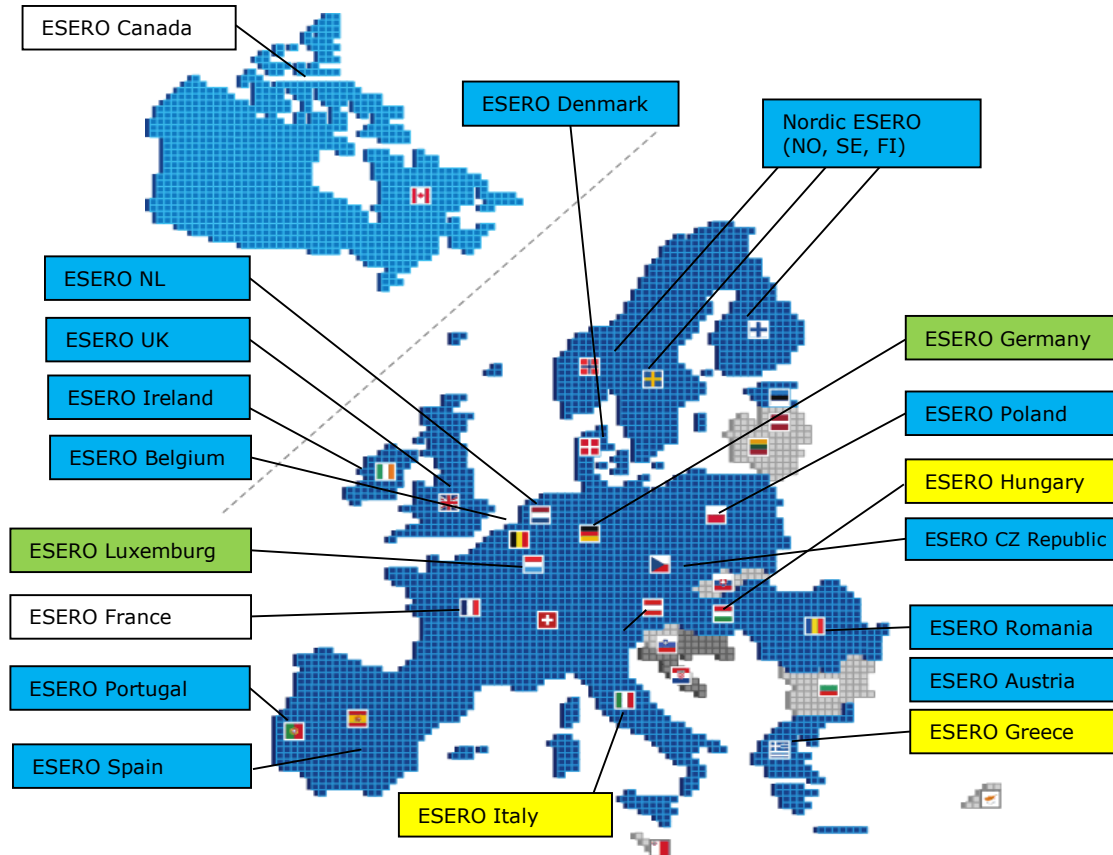
→ SPARKING INTEREST, NURTURING SKILLS



Using space as the context to teach and to learn



ESERO – the ever-growing network



Operational
Preparation on-going!
Interest received





ESA classroom resources

teach with space

Physics | P01 

teach with space

→ **WHOOOSH BOTTLE**
Newton's laws and rockets



teacher's guide with student activities European Space Agency

→ **WHOOOSH BOTTLE**
Newton's Laws and rockets

→ **FAST FACTS**

Level
10-14 years old

Type
Teacher demonstrations, student worksheets

Complexity
Easy/Medium/Difficult

Teacher preparation time
xx hours

Lesson time required
xx hours

Cost
€€€€€

Location
Indoor (small/large classroom)

Makes use of
open flame, alcohol

→ **You also need**

→ **You may also want to see**
ESA 'Mini whoosh bottle' chemistry teacher's guide

→ **Curriculum relevance**

Physics

- Newton's three laws
- Velocity
- Mechanics, equilibrium, inertia

Chemistry

- Combustion and oxidation reactions
- Writing balanced equations
- Activation energy and enthalpy

→ **Summary**

1. Whoosh bottle – teacher demonstration and discussions
2. Extension on activation energies and enthalpy – discussion and student activity
3. Student worksheets

→ **Learning outcome**

1. Newton's three laws and how they relate to rocket launchers.
2. Relationship between mass and thrust.
3. Some fuels contain their own source of oxygen, in space rockets need to carry their own oxygen supply.

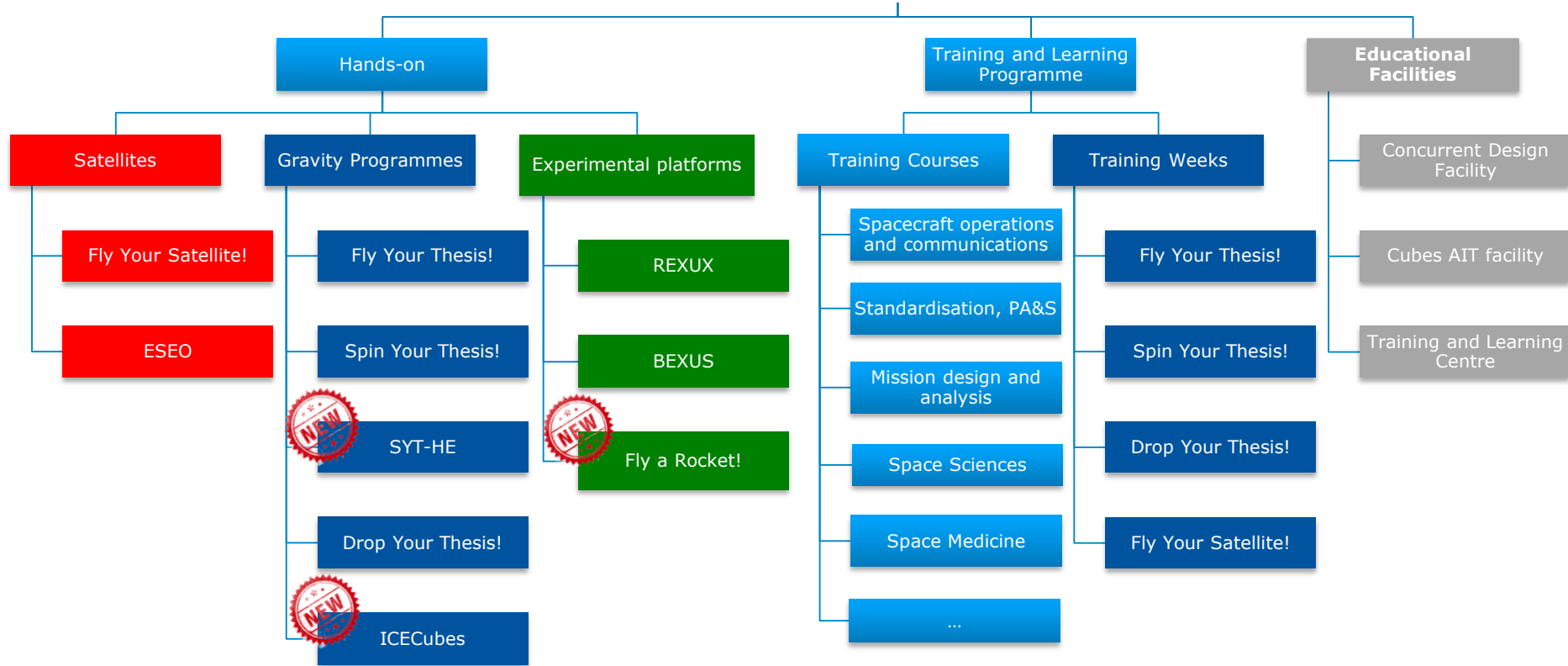
teach with space → whoosh bottle | P01 European Space Agency



A group of four young people, three men and one woman, are wearing blue flight suits with ESA patches. They are in a simulated space environment, possibly a training module, with white walls and various equipment. One man is seated at a desk with a laptop that has 'TSUNAMI COMPUTERS' on the lid. Another man is standing behind him, looking at the screen. A woman is leaning over the desk, pointing at the laptop. In the background, another man is working on a piece of equipment. A red emergency light is visible on the desk. The overall atmosphere is one of focused learning and teamwork.

esa academy

→ ENHANCING SKILLS, BOOSTING AMBITIONS



learning centre





esa academy

training & learning centre

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Florian Marmuse

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Alexander Mayer

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Serena Cam

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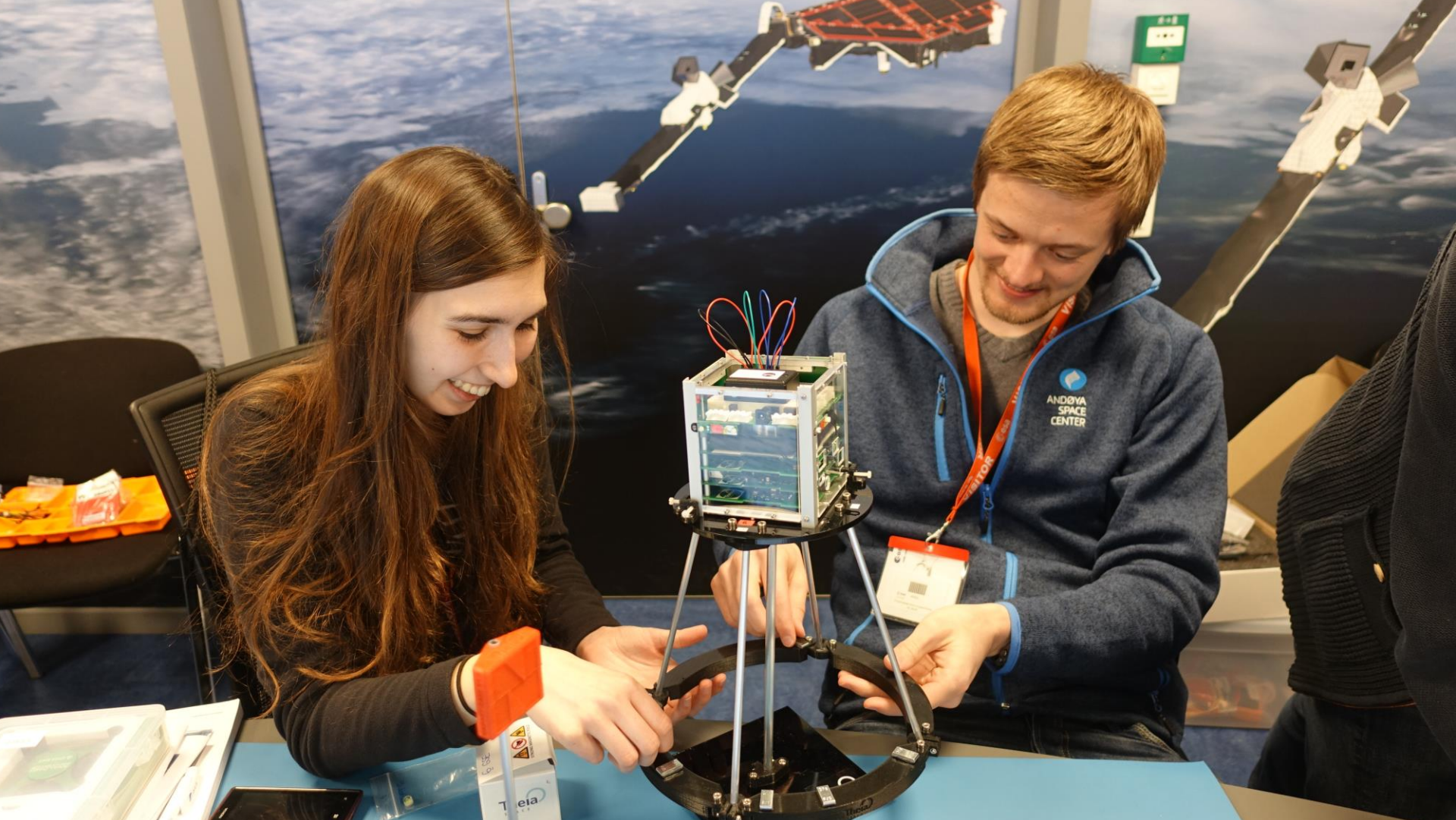
Daniel Singh Wilson Dutt

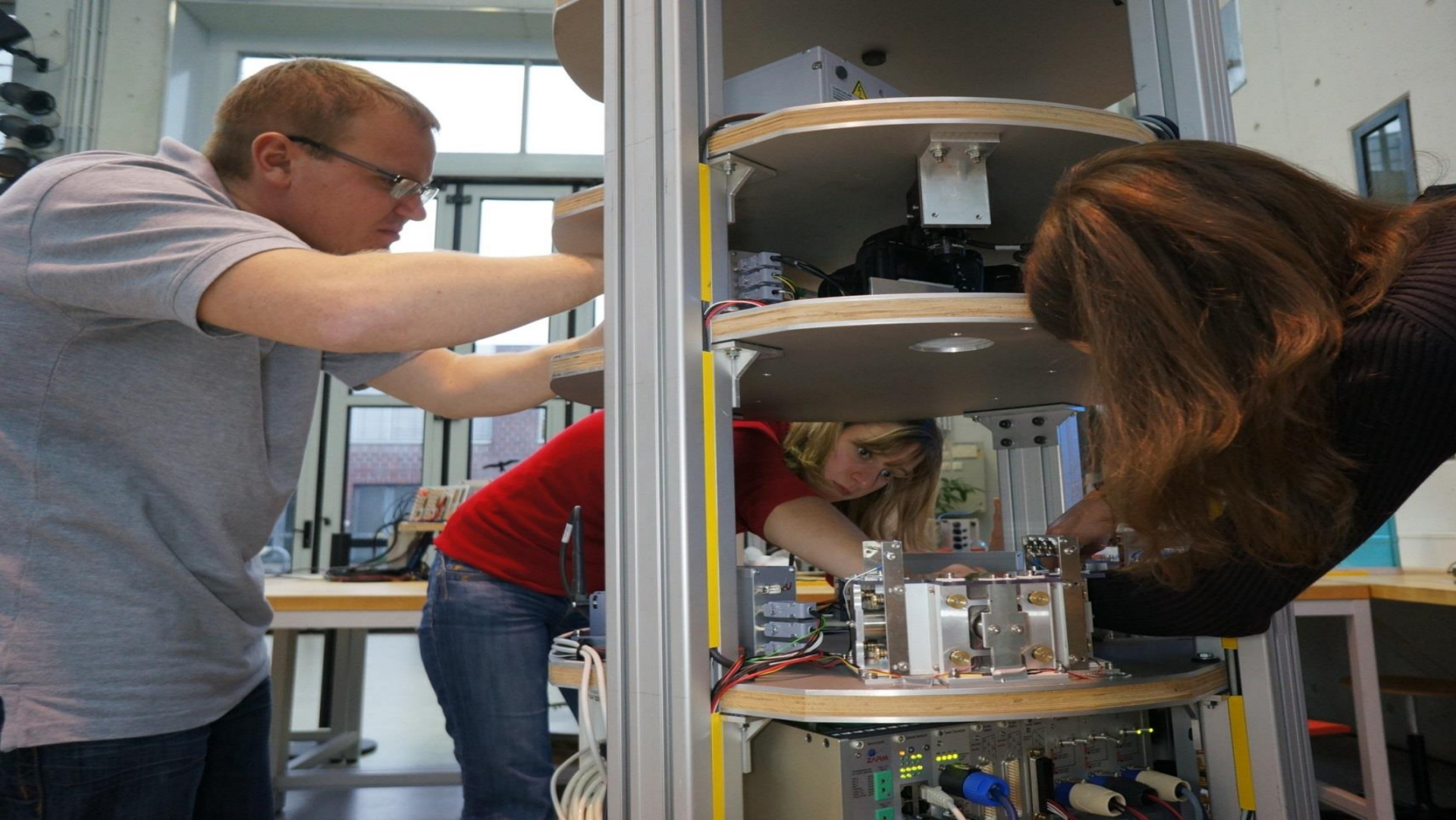
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Lopez

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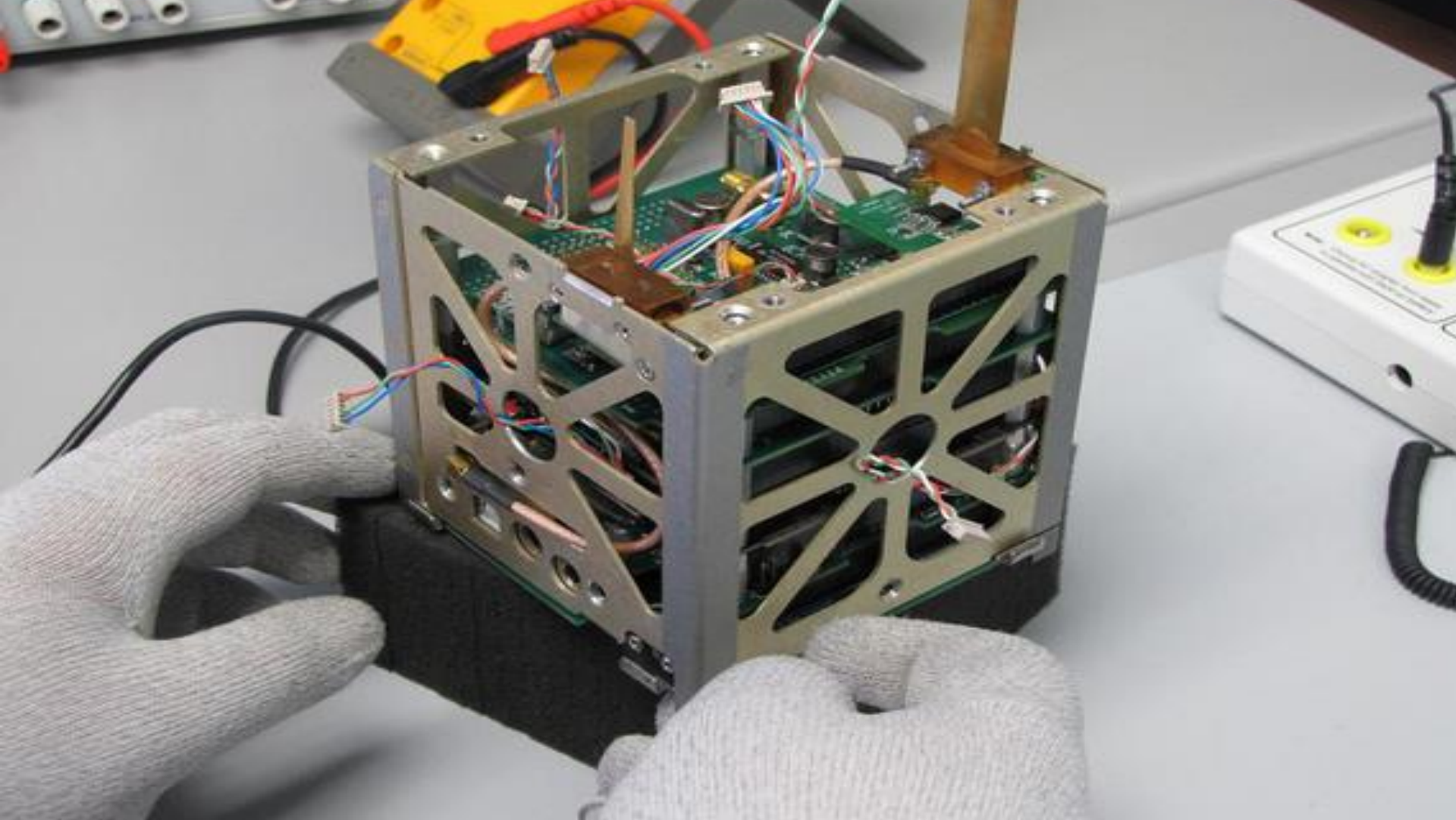




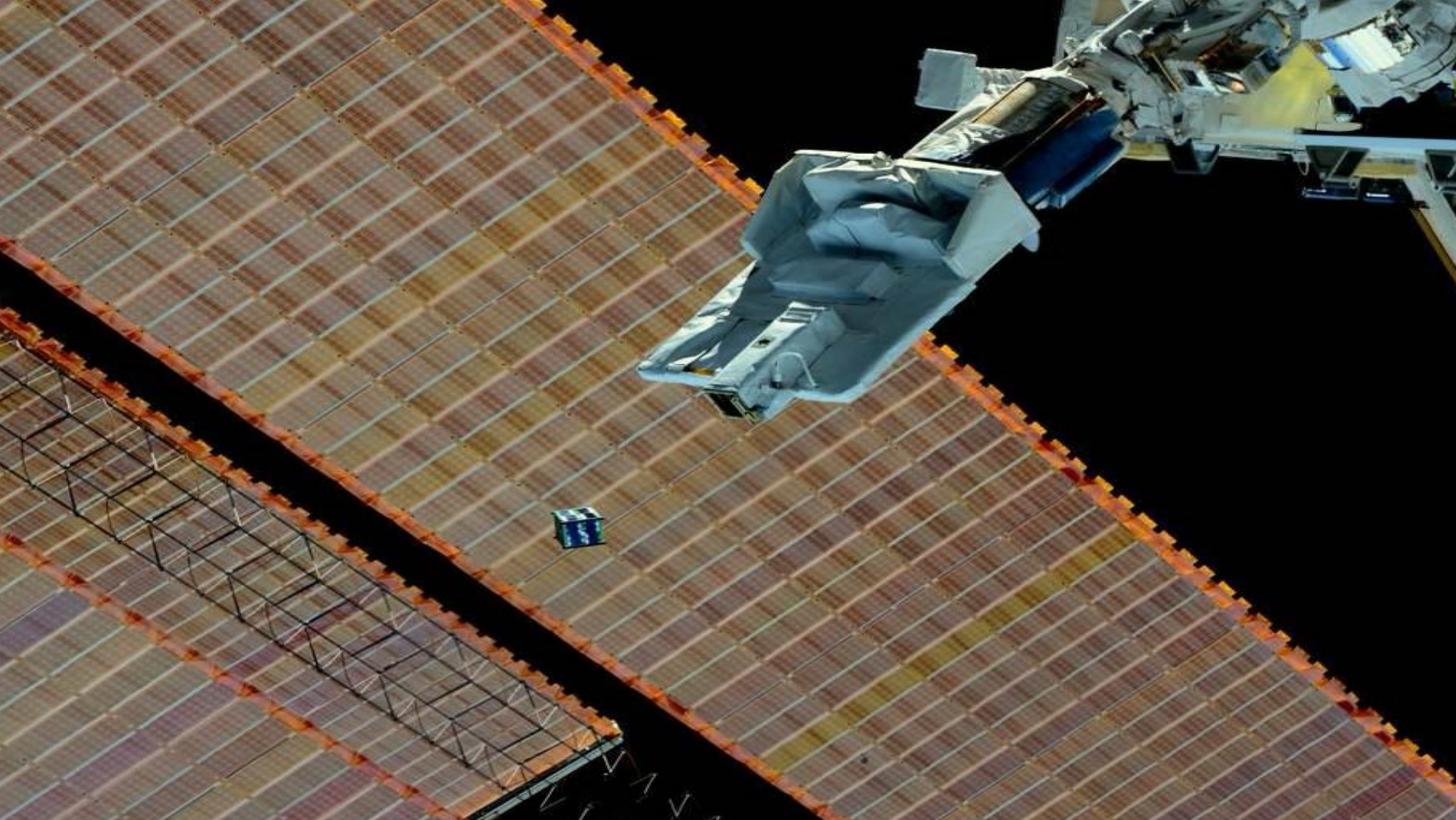












From ESA/ESEC...



...to **GALAXIA Space Business Park**







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Thank you for your attention !

www.esa.int.education

