

# STEM initiatives of the Brazilian Space Agency

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Thematic session: Current space exploration and innovation programs  
UN/Jordan Workshop 2019  
“Global Partnership in Space Exploration and Innovation”

# WORKSHOP CONTEXT

A review of recent initiatives of the Brazilian Space Agency towards a specific objective of this workshop, i.e. to build capacity in space exploration and innovation, with emphasis on STEM, as per the recommendation of the Action Team on Exploration and Innovation (A/AC.105/1168, para. 114).

# BRAZILIAN SPACE POLICY

Brazilian Development Policy for Space Activities (Issued in 1994).

1<sup>st</sup> objective: Establish national technical-scientific competence in space.

Guideline: Continuously promote human capacity-building for national space activities.



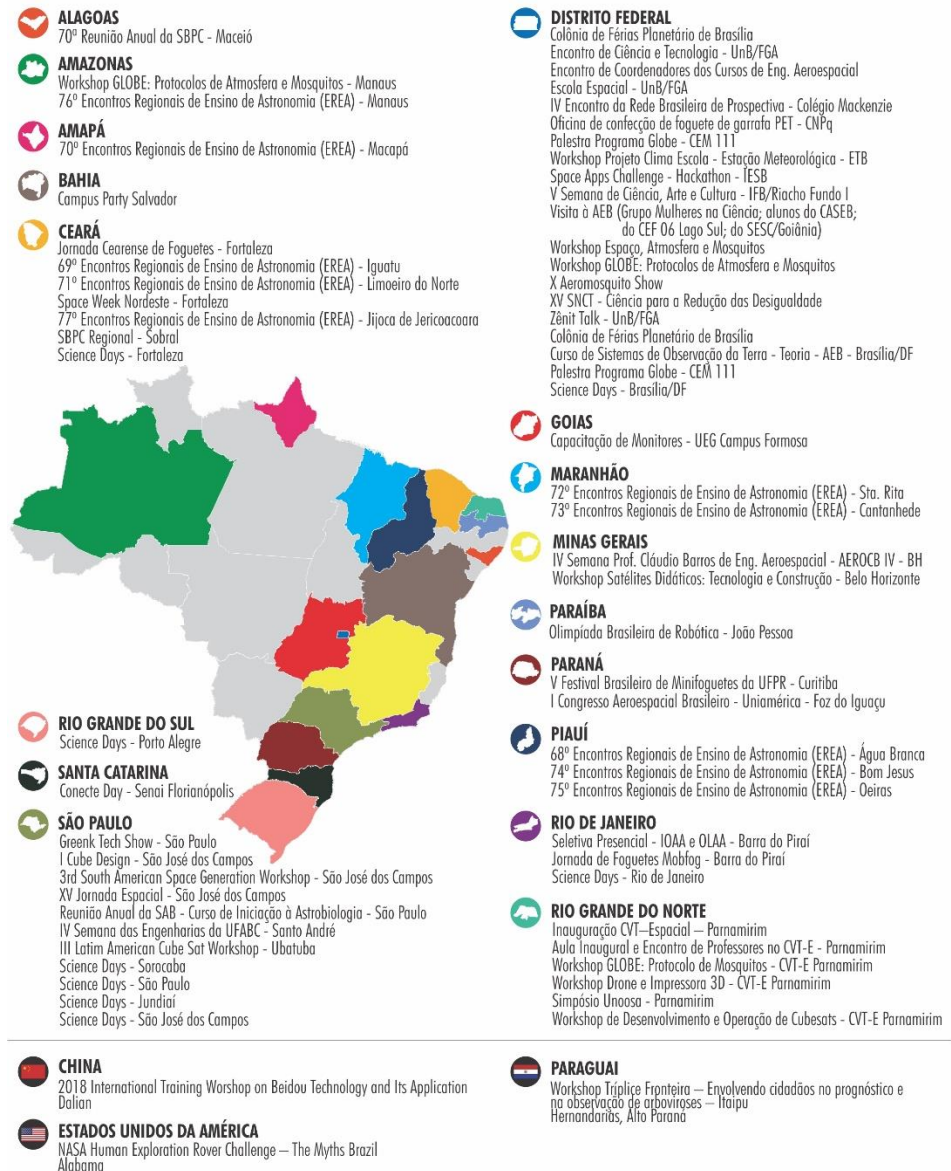
# STEM INITIATIVES: GENERAL-TO-SPECIFIC

- Space science outreach toward broad audience.
- Space science activities toward middle/high schools students and teachers.
- Space research toward university professors and students.
- Hands-on learning in Brazilian space projects toward fostering qualified professionals.

# BROAD AUDIENCE: E2T

Since 2018, more than 70 events reaching about 120,000 people, e.g.:

- Brazilian Olympiad on Astronomy and Astronautics
- Regional Meeting of Astronomy Teaching
- Global Learning and Observations to benefit the Environment
- Science Days
- National science and technology week
- Brazilian Society for the Advancement of Science
- And much more...



# MIDDLE/HIGH SCHOOL: SPACE CAMP CVT-E

CVT-E is operating in Parnamirim/Natal since November 2017. More than 1,500 students attended the space camp in 2018. On Sept 2018, CVT-E offered a hands-on workshop on nanosatellites to participants of the UN/Brazil Symposium on Basic Space Technology. Our 1<sup>st</sup> virtual science fair is scheduled for September 2019.



# UNIVERSITIES: NANOSATELLITES & SERPENS



Launched cubesats  
Latin America & The Caribbean  
17 objects  
Last updated: Dec 2018

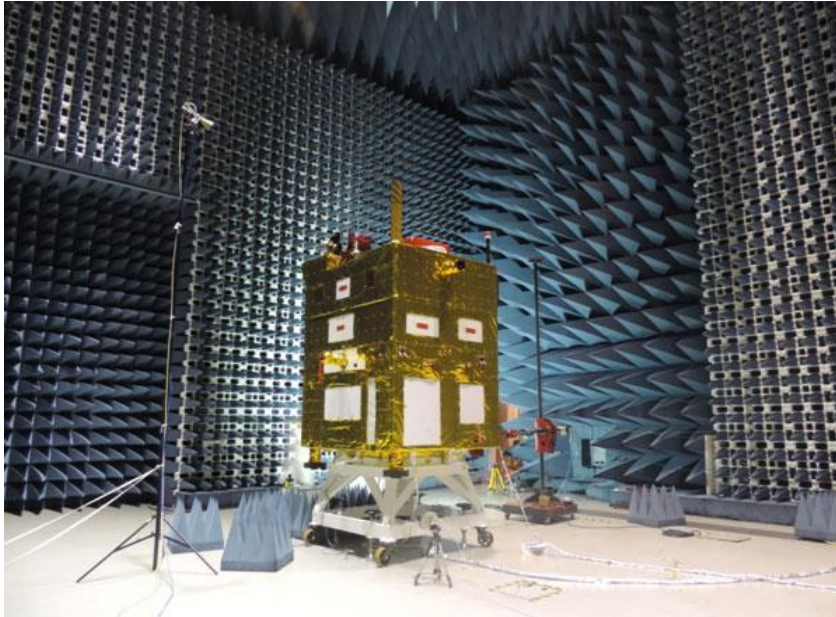
On-going AEB cubesat initiatives & partners:  
**SPORT, ITA**  
**NanoSatC-Br2, UFSC**  
**Floriposat, UFSC**  
**Serpens 2, UFSC**

Currently, there are eight graduate aerospace engineering departments in Brazil.

\*Ecuador/Russia, UTE-YuZGU

\*\* University of Vigo, Morehead State University, Università di Roma La Sapienza

# SPACE PROJECTS: HANDS-ON LEARNING



Since 2016, about 130 qualified professionals, average of 75 man-year.

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Integration and testing, 27%

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Space project management, 22%

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Service module, 13%

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Payload module, 11%

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Product Assurance, 11%

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Space segment, 10%

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Ground segment, 6%

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Satellites CBERS-4A (above) & Amazonia 1 (right) in the Laboratory of Integration and Testing, INPE, São José dos Campos, Brazil.





# CRECTEALC

On-going discussions about establishing in Brazil a Regional Centre for Space Science and Technology Education for Latin America and the Caribbean.



# BENEFITS OF STUDENT EXCHANGE

Some recent third-party initiatives with whom we engage.

On-going talks with ASI & CONIDA



# FINAL REMARKS

- The Brazilian Space Agency has put in place a set of initiatives to build capacity in space exploration and innovation, with emphasis on STEM. More can be done.
- Brazil must continuously promote human capacity-building for national space activities.
- We should coordinate efforts with UN toward a CRECTEALC Brazil.
- We are open to share our experience, learn with others and engage in exchange of students and professionals.

# THANK YOU!

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