



Founding Act

World CanSat/Rocketry Championship

(World CanSat/Rocketry Cup)

1. INTRODUCTION

A **World CanSat/Rocketry Championship** (hereinafter: **WCRC**) is generally an international competition open to elite competitors from around the world, representing their nations (as university student Teams or as independent student Teams), and winning this event will be considered the highest or near highest achievement in this field.

After holding *the International CanSat/Rocketry Competition* in Serbia in October 2019, as a pilot project, Serbia and India agreed to launch the initiative to establish CanSat/Rocketry Championship at the Global level, so that the CanSat/Rocketry program can be raised to a higher level, involving even more students and countries, i.e. to make this program got a place in the World that deserves, because there is a lot to be learned through it. Both countries believe that this is very important globally, primarily in terms of education, and in promoting Space engineering in general.

The **WCRC** was formulated and negotiated among the Organizations from 6 countries: Serbia, India, Italy, Tunisia, Canada and Peru (hereinafter: **Founders**) from October 2019 to January 2020 and they agreed on the aims, structure and functioning of the **WCRC**.

This event is important for everyone, and for each founder country and for organizations, institutions and companies, and most important for education and students because the CanSat/Rocketry program is a vertical type of education compared to the horizontal they have in their studies.

2. BACKGROUND

What is a CanSat?

A CanSat is a simulation of a real satellite. All components are housed inside a can up to 350 ml. CanSat provides an affordable way to gain basic knowledge and skills in Space engineering for teachers and students, as well as experience engineering challenges when designing Satellites. Students are able to design and build a small electronic payload that can fit into the cans to 350 ml. CanSat is launched by Rocket, Balloon, Plane or Drone and delivered in apogee. With the Parachute, the CanSat slowly descends to the ground and carries out its mission during descent (for example: measures air pressure and temperature and sends telemetry). By analyzing the data collected by CanSat, students will explore the reasons for the success or failure of its mission.

Space engineering learning, based on the CanSat/Rocketry concept, enables students to gain hands-on experience through a specific interdisciplinary project. Since this is a Space engineering project, teachers and students will gain experience from mission defining, conceptual design, through integration and testing, to launching and actual system operation, i.e. experience from the whole Space project cycle and then participate in the CanSat/Rocketry competition with their peers at home country and abroad. One of the main advantages of the CanSat/Rocketry concept is its interdisciplinary: combination of mathematics, physics, informatics/programming, mechatronics, telecommunications, aviation and rocketry, mechanics, etc. CanSat is a simulation of a real, large, Satellite and contains all the components as a real Satellite, but with limited complexity.

Benefits of CanSat/Rocketry Based Education:

CanSat/Rocketry is an effective educational tool for:

- Learning by doing;
- Involving students in technology and engineering as a practical complement to other, fundamental, subjects they study, such as mathematics and physics;
- Emphasizing teamwork where each student has a specific task/role that creates a sense of responsibility for him/her;
- Students gain experience of the complete process: defining the mission, design, development/constructing, programming, testing, launching and analysis;
- Conducting simple experiments with balloon/rocket/plane/drone;
- Learning methods can be adapted to the age level of students, or to their needs and abilities;
- Students are able to analyze the reasons for success or failure after descending CanSat and Rocket to the ground;
- Acquired knowledge and experience can be applied to other projects as this concept enables obtaining of ideas and stimulates students' thinking;
- Useful for a further education/career guidance process;
- Provide Opportunities and Network for Launching their Own Small Satellites (Pico/Nano Satellites/PocketQube/ UNITYsat) to Low earth Orbit in a frugal way!
- Provide Opportunities and Network for Sharing and Learning from each other teams from various countries.

Today, almost every country in the higher education system has a CanSat program, so the initiative to establish CanSat/Rocketry Championship at the Global level is additionally justified.

3. FOUNDERS

SERBIA	
Organization in Charge (OIC):	Committee for Space Programme Development (CSPD)
Address of OIC:	Republic of Serbia Autonomous Province of Vojvodina 21000 Novi Sad Ćirila i Metodija 130
Telephone and email of OIC:	+381658616339 cspd.office@gmail.com
Website of OIC:	2comnet.info/komsat/en/
Responsible for the Region:	1. European continent (<i>Together with Italy in Organization of Competition as Qualification for World Finals</i>); 2. World finals (<i>Organization</i>);
Person in Charge:	Dušan Radosavljević

INDIA	
Organization in Charge (OIC):	Indian Technology Congress Association (ITCA)
Address of OIC:	#3, First Main, BDA Layout, Kodihalli, HAL 2nd Stage, Bengaluru - 560008. Karnataka, INDIA
Telephone and email of OIC:	+91 91 80 6559 2501 president@itca.org.in / profgoki@yahoo.com
Website of OIC:	www.itca.org.in/
Responsible for the Region:	1. Asian and Australian Continents (<i>Organization of Competition as Qualification for World Finals</i>);
Person in Charge:	Dr. K. Gopalakrishnan

ITALY	
Organization in Charge (OIC):	University of Brescia Student Branch of IEEE
Address of OIC:	Italy Brescia 25133 Via Branze, 38
Telephone and email of OIC:	+39 3208110337 Stb1019_executive@googlegroups.com
Website of OIC:	ieeesb.unibs.it/
Responsible for the Region:	1. European Continent (<i>Together with Serbia in Organization of Competition as Qualification for World Finals</i>);
Person in Charge:	Yari Bussi

TUNISIA	
Organization in Charge (OIC):	Center for Research in Microelectronics and Nanotechnology (CRMN)
Address of OIC:	Sousse Technopole, Novation City, Sousse, Tunisia
Telephone and email of OIC:	+216 73 823 003 bo.gec@crmn.rnrt.tn / crmn.sousse@gmail.com
Website of OIC:	www.crmn.rnrt.tn
Responsible for the Region:	1. African Continent and Middle East (<i>Organization of Competition as Qualification for World Finals</i>);
Person in Charge:	Dr. Samer Lahouar

CANADA	
Organization in Charge (OIC):	Canada Branch of Committee for Space Programme Development
Address of OIC:	50 Riverdale Drive L8E1K3 Hamilton, Ontario
Telephone and email of OIC:	+19055127213 zaric.tihomir@gmail.com
Website of OIC:	
Responsible for the Region:	1. North American Continent (<i>Organization of Competition as Qualification for World Finals</i>);
Person in Charge:	Tihomir Zarić

PERU	
Organization in Charge (OIC):	AIDA - Asociación de Investigación y Desarrollo Aeroespacial
Address of OIC:	Perú Lima Avenida Tupac Amaru 210, Rímac 15333
Telephone and email of OIC:	+51970508521 aida.space.peru@gmail.com
Website of OIC:	
Responsible for the Region:	1. South American Continent (<i>Organization of Competition as Qualification for World Finals</i>);
Person in Charge:	Zaid Sanchez Escate

PORTUGAL	
Organization in Charge (OIC):	SPACEWAY LDA.
Address of OIC:	Rua Pedro Nunes, Instituto Pedro Nunes, Coimbra, Portugal
Telephone and email of OIC:	+351915757364 jbmonteiro@spaceway.pt
Website of OIC:	www.spaceway.pt
Responsible for the Region:	1. European Continent (<i>Together with Serbia in Organization of World Finals</i>);
Person in Charge:	Jorge Bordalo Monteiro

4. COMMON RULES

- a) India will be the organizer and host of the CanSat/Rocketry Competition for Asian and Australian Continents, as Qualification for World Finals. Which means that India sets all rules for organizing and holding the Competition (Competition propositions, number of Teams, Teams rules in general, participation fee, place, date, rules on site etc.).
- b) Italy and Serbia will organize together Competition for European Continent, as qualification for World Finals. Which means that Italy and Serbia set all rules for organizing and holding the Competition (Competition propositions, number of Teams, Teams rules in general, participation fee, place, date, rules on site etc.). The Competition will take place in Italy.
- c) Tunisia will be the organizer and host of the Competition for African Continent and the Middle East, as qualification for World Finals. Which means that Tunisia sets all rules for organizing and holding the Competition (Competition propositions, number of Teams, Teams rules in general, participation fee, place, date, rules on site etc.).
- d) Canada will be the organizer and host of the Competition for North American Continent, as qualification for World Finals. Which means that Canada sets all rules for organizing and holding the Competition (Competition propositions, number of Teams, Teams rules in general, participation fee, place, date, rules on site etc.).
- e) Peru will be the organizer and host of the Competition for South American Continent, as qualification for World Finals. Which means that Peru sets all rules for organizing and holding the Competition (Competition propositions, number of Teams, Teams rules in general, participation fee, place, date, rules on site etc.).
- f) Portugal and Serbia will organize together Competition for World Finals. Which means that Serbia and Portugal set all rules for organizing and holding the Competition based on its capacities and capabilities, and by adhering to a common document (*The basic rules for World Finals*). The Competition will take place one year in Serbia and second year in Portugal.

With the understanding that each founder country in particular is best aware of the situation on its continent and its own capacities and capabilities, this kind of independence in decision making and organizing is the best solution, with of course continuous mutual cooperation.

All founder countries have the adequate experience and the infrastructure, the necessary knowledge and skills. All founder countries will together define: *The basic rules of the qualification Competitions* and

all other details for the World Finals (*The basic rules for World Finals*) as separate documents which will change every year for the purpose of development and progress. When participating in the final Competition in Serbia the Teams from India, Tunisia, Italy, Canada and Peru will have a special status, which includes lower costs and participation in the jury for representatives of the country. Founder countries may propose and agree on additional benefits related to World Finals at any time. Founder countries may propose and agree on anything which is important for constant improvement of the Championship, cooperation and this field in general, at any time. Voting is by simple majority.

Each founder country is responsible for its Continent and the Organization of the Competition and has the opportunity, if it wishes, to organize the Competition on its continent and with another country from the same continent and on the soil of that country. So, the Competition may not always be in the same country, but the founder country from that continent must be co-organizer with another country on which the Competition is organized.

The responsibility of each founder country is to promote, organize and hold the Competition on its continent by the end of the current year, the World Finals will be held always next year.

More precisely, to invite all students from their Continents to the Competition, to find the adequate place for this event (outdoor and indoor), to decide what they will use for Launch (Rocket or Balloon or Drone or Plane) and provide launch permissions (if required) and safety measures, related equipment, staff and everything else that is necessary to hold the event safe and successful. All founder countries should assist one another in all these processes.

Material for CanSat assembling is set by India and will be placed on Amazon for sale. Also, all Video Manuals and Handbooks are prepared by India and will be available to every country. Launch equipment (Rocket or Balloon or Drone or Plane) is on each founder country. Each founder country has the right to make a surplus or profit from the event and has the right to use **WCRC** for its own promotion.

Each year all founder countries will agree on the basic rules (primarily for: **FLIGHT MISSION**), as a separate document (*The basic rules of the qualification Competitions*), for qualifying Competitions across continents, with the **aim** of making the Competitions as similar as possible to all participants Worldwide. Each founder country may make certain changes to these basic rules for the purposes of its Competition only if such changes will improve the Competition itself and will not deviate much from the mentioned **aim**.

Each founder country has the same status in this project. All founder countries are completely equal, therefore, all founder countries have the same rights and obligations and that makes **WCRC** stronger, unique and successful. Between founder countries must be completely openness and honesty in communication and cooperation. Also, it is necessary that every country makes efforts to create a sustainable beautiful and perspective atmosphere.

5. CHAMPIONSHIP PHASES

The WCRC consists of 3 phases:

1. Phase 1 – **National CanSat/Rocketry Competition** as qualification for **Continental CanSat/Rocketry Competition**.
In this Competition student Teams participate across their own state. If the state does not have a National Competition, then all student Teams can directly participate in the **Continental CanSat/Rocketry Competition** (i.e. Phase 2).
2. Phase 2 – **Continental CanSat/Rocketry Competition** as qualification for World Finals
(Based on document: *The basic rules of the qualification Competitions*)
3. Phase 3 – **World Finals CanSat/Rocketry Competition**
(Based on document: *The basic rules for World Finals*)

6. EVALUATION AND SCORING IN CHAMPIONSHIP PHASES 2 AND 3

6.1 The Jury

The Jury, appointed by founder countries, will be comprised of CanSat Experts, Education Experts, Engineers and Scientists who will evaluate the Teams' Performances during **Phases 2 and 3**.

The Jury will typically have 3-5 members, and their fields of expertise can vary from science to engineering or education. The Jury board will be usually comprised of:

- Space Science/Engineering Expert
- IT/Electronics Expert
- Education Expert
- Radio Communication Expert
- Rocketry Expert

6.2 Scoring

Performance in the following areas will be evaluated during **Phases 2 and 3**:

A. Technical Achievement

The Jury will take into account how the Teams obtained the results, how reliable and robust the CanSat was, visual appearance and how the CanSat performed. Innovative aspects of the project will be judged (e.g. the tools selected and the hardware/software used).

The aspects evaluated will be:

- Mission's Technical Complexity,
- Performance of the Mission.

B. Scientific value

The scientific value of the Teams' missions and the Teams' scientific skills will be evaluated. This includes the scientific relevance of the mission, the quality of the technical reporting (both written and oral) and the Team's scientific understanding that will be assessed from the Team's ability to analyze and interpret results appropriately.

The aspects evaluated will be:

- Scientific relevance,
- Scientific understanding,
- Technical reporting.

C. Professional competencies

The Jury will assess the Team's collaboration and coordination, adaptability and communication skills.

The aspects evaluated will be:

- Teamwork,
- Adaptability,
- Communication.

D. Outreach

The Team will be rewarded with additional points based on explanation: How the project is communicated to the local community, taking into account web pages, blogs, presentations, promotional material, media coverage etc.

6.3 Marking scheme

The overall balance between the items to be evaluated is as follows:

Technical Achievement 35%

Scientific Value 35%

Professional Competencies 20%

Outreach 10%

TOTAL 100%

6.4 Prizes for Phases 2 and 3

- 1st Prize
- 2nd Prize
- 3rd Prize

The following rule will apply:

- A Team can't receive more than one prize.

6.5 Quotas for World Finals

A total of 37 Teams can compete in the World Finals:

From Asian/Australian Continent 15 Teams
From African Continent 5 Teams
From North American Continent 5 Teams
From South American Continent 5 Teams
From European Continent 7 Teams

Each Team can consist of a minimum of 3 members and a maximum of 5 members.