



# Canadian Reduced Gravity Experiment Design Challenge

## CAN-RGX VII (2023 – 2024)

### Application Form

**Notice to Applicants:** Please read the Application Guide on the website in full before completing this application form. You must answer all fields as indicated. Your application may not be considered if there is missing or incomplete information. The application **MUST** be submitted by **11:59 PM EST on October 8**. If you have any questions, please contact [canrgx@seds.ca](mailto:canrgx@seds.ca).

#### SECTION 1 – TEAM INFORMATION

Team Name: \_\_\_\_\_

Institution: \_\_\_\_\_

#### Primary Point of Contact

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Email: \_\_\_\_\_ Phone number: \_\_\_\_\_

#### Faculty Advisor

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Institution: \_\_\_\_\_ Department: \_\_\_\_\_

Email: \_\_\_\_\_ Phone number: \_\_\_\_\_

On the following page, please complete the information for every student member on the team. **Proof of enrollment is required for each participant.** Please attach with the completed application. At least one member of the team must provide proof of active SEDS-Canada membership if accepted for the competition.

**Team Members.** A minimum of 4 team members is required. The majority of the team should be composed of undergraduate students with no more than 1/3 of the team composed of graduate or high school students.

First and Last Name	Institution	Degree in progress	Level of study	Department	Active SEDS Member?	Role on the team	Email

- Notes:
- Role on the team examples: team lead, electrical, structural, science, outreach, advisor, etc.
  - At least one team member must be identified as “Team Lead”

## SECTION 2 – PROJECT SUMMARY

Project title (max 10 words): \_\_\_\_\_

Project Field: \_\_\_\_\_  
e.g., life sciences, physics, technology demonstration

Lay abstract (150 words max):

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## Eligibility Requirements

We've reviewed and understood the experimental environment described in this section. In addition, we confirm that our design meets the following eligibility requirements (**review and check off all**):

- Be contained within a Pelican case as specified in Section 2.3 (except for laptops or tablets required for data collection and observation which can be mounted on top of the case). The case must remain closed during each parabola, but can be opened during level flight, if needed. There will also be a storage box available on board for storage of auxiliary equipment.
- Weight no more than 45 kg (not including the Pelican case).
- The experiment main power must be routed from the standard 115V/5A power supplied by the aircraft into the Pelican case power outlet.
- The sum of the maximum device currents contained in the experiment must not exceed the 5A rated current of the power source.
- Peak power consumption must be below 600 W.
- If applicable, use only dry cells, zinc-air, alkaline, or Ni-Cad batteries. Electrolyte or lithium-type batteries should be avoided whenever possible. When unavoidable, such as in commercial electronics, teams must be able to demonstrate batteries are in good health. It is best to purchase new brand name batteries; third party imitations should be avoided.
- The experiment must not contain free-floating items during the parabolas. All components must be tethered or contained within a secondary containment unit inside the Pelican case.
- Be free of materials classified as physical, health or environmental hazards under Canada's Hazardous Products Act such as high-pressure, toxic, corrosive, explosive and flammable materials. See Section 12.1. Note that any non-hazardous substance requiring secondary containment (e.g. water or dust) will need to be structurally tested for maximum loads experienced during the flight.
- Be free of hazardous radiation (e.g. Class 3 and 4 lasers).
- The experiment must fall to a safe configuration in the event of electrical power loss.
- Exclude the use of human and animal test subjects which would require Research Ethics Board approval. See note about biological specimens below.
- Not rely exclusively on automation to be actioned (e.g. using accelerometer data to begin a sequence). There must be a manual trigger to start your experiment.

- The experiment must demonstrate the ability to withstand 2g downwards loading with a safety factor of 1.5.
- The experiment must demonstrate the maximum current draw of all components powered by the aircraft supply does not exceed 5A.
- A minimum of two full-cycle ground tests of the experiment must be demonstrated prior to flight. The first demonstration will be submitted by video recording prior to integration. The second demonstration will be live at the campaign site at the time of integration.

**If biological specimens are used**, it must:

1. Not present any risk to experimenters, the flight crew and the aircraft. Specifically, the specimen must fall under **Biosafety Level/Risk Group 1**. You should submit a safety data sheet, or point to a database (e.g. <https://health.canada.ca/en/epathogen>) or other resource which shows the Risk Group (RG) classification of your specimen.
2. Be contained within a sealed space capable of withstanding the physical parameters of parabolic flight (g-forces, pressure, temperature, vibration). See Section 2.3.
3. Not be handled directly by experimenters during flight.

## SECTION 3 – PROPOSAL

The proposal must adhere to the following formatting guidelines:

- Standard 8 ½” x 11” pages
- 1” margins on the top, bottom and sides
- 12-point Times new Roman font
- Numbered pages on the bottom right corner
- Limited to 20 pages, not including appendices
- Submit application form, proposal, and supporting documents as a **single PDF file**

The proposal should contain the following sections:

- Section 1:**
  - Research Motivation
  - Novelty of experiment
  - Goals
  - Importance to Canada’s Space Sector
  - Relevance to the Reduced Gravity Environment
  - Research Hypothesis
- Section 2:**
  - Scientific Objectives
  - Science Traceability Matrix
  - System Architecture
  - Block Diagram
- Section 3:**
  - Equipment Requirements
  - Environmental Requirements
  - In-flight Operations
- Section 3:**
  - Funding Strategy
  - Outreach Strategy

Please refer to Application Guide for further details on what should be covered in each section and for the evaluation criteria.

## SECTION 4 – SUMMARY AND SIGNATURES

Submit a **single PDF file** containing the following items to [canrgx@seds.ca](mailto:canrgx@seds.ca) by **11:59 PM EST on October 8:**

- Completed and signed application form
- Completed proposal
- Proof of enrollment for each team member

Please name the PDF file using the following format: Teamname\_RGX\_Application\_year

### Team Lead

- Timeline Acknowledgement:** I certify that the team will adhere to the milestone timeline of the CAN-RGX competition. I certify that it is the responsibility of the Team Lead to monitor the CAN-RGX website ([seds.ca/can-rgx](http://seds.ca/can-rgx)) and monitor communications from SEDS-Canada for changes to the timeline.
- Funding Expectations:** I acknowledge that team is responsible to fully fund the development of our project and the logistics of travel to the Campaign site.
- Publicity Guidelines:** I shall acknowledge SEDS-Canada in the organization of this campaign and include SEDS-Canada as a contributor in external publicity, social media materials, outreach activities.
- I certify that I will serve as a team lead and a primary point of contact for the team. I agree to inform SEDS-Canada at [canrgx@seds.ca](mailto:canrgx@seds.ca) promptly of any changes to the team lead position and primary point of contact.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Faculty Advisor

- I certify that I will serve as a Faculty Advisor for this project, and I understand that I will be asked to provide guidance and support through some or all of the phases of the challenge, including submission of the project Proposal, Preliminary Design Review, Critical Design Review, and other milestones.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_