



# 2020 LASC ONLINE

## 2020 Latin American Space Challenge Challenges List

The 2020 **Latin American Space Challenge (LASC)** is being held online with a sprint-like event from 22th to 29th November 2020.

On **November 22th**, the LASC Team will live announce the Challenges on Youtube. Each Team will have 24 hours to pick their challenge(s) by submitting the Google Forms provided by LASC.

Each team should choose at least one challenge from the list and develop a solution to be presented on **November 29th, 2020**. The presentation will be up to 10 minutes in a pitch deck style. The LASC team strongly recommends the following presentation structure:

- Introduce the problem
- Agenda
- Brief Context (why tackle this problem, why it can and should be improved)
- Strategy recommendation and its impact
  - Market studies, execution of simulations, etc.
- Approach (Explain solution)
- Solution defense (Why use this solution and not others)
  - Technical analysis
- Financials (Budget and general costs)
  - Business plans
- Execution (How it will be implemented)
  - Production of programs, applications, creation of products or services
- Potential risks in implementing this solution
- Strategic model (Short review)
- Appendix (References)

Each challenge will have a description with an **“Overview”** and a detailed description of the Challenge **“The Challenge”**.





## Online Challenge 2020-01

**Code:** SC.M20-01

**Title:** Satellite Monitoring for the Northeast Brazil Oil Spill

**Overview:** The oil spill in northeastern Brazil is an ongoing spill of crude oil that has affected Brazilian jurisdictional waters in northeastern Brazil. The oil slick is located on 1°48'33.8"S 38°25'04.9"W. The spill was first reported on 22 November 2020. The origin of the oil spill is unconfirmed but stated to not be Brazilian. This oil spill could be the worst in Brazilian history and the largest environmental disaster ever recorded on the Brazilian coast or any tropical coastal region worldwide.

**The Challenge:** Your team is being appointed as a main task force for developing a small satellite solution for being launched in maximum six weeks for the monitoring of the affected area. Scientists are willing for a new image and/or sample of data at least every four hours for preventive environmental actions on Brazilian shores for protecting ecosystems and exposed populations. The task is to propose a small satellite, launch logistics & operations, orbital parameters and ground stations to collect and transmit data for the Federal Emergency Management Agency located in Brasilia, Brazil.

**Topics:** Satellite, Environment, Other

## Online Challenge 2020-02

**Code:** RC.LR20-02

**Title:** Responsive Launch Capability of Smallsats

**Overview:** Oil spill in northeastern Brazil, rainforest wildfires in the Amazonas and Pantanal, deforestation in Argentina's Gran Chaco, monitoring of Peruvian borders. These are examples of markets for satellite applications. However, many events are time sensitive for decision making based on data, then requiring ability to provide flexible and rapid launch services of satellites.

**The Challenge:** Your team is being appointed as a main task force for developing a launch vehicle of smallsats for Low Earth Orbital with a payload capability up to 150 kg. The launch vehicle shall be launched from Alcantara Launch Center (2°19'3.9"S 44°22'4.872"W) before August, 2021. The task is to propose a vehicle and its concept of operations, logistics, investments for the development and a business model.

**Topics:** Rocket, Launch Vehicle, Environment, Other





### **Online Challenge 2020-03**

**Code:** BC.O20-03

**Title:** Deforestation in the Amazon

**Overview:** The Amazon is the world's largest rainforest and the largest river basin on the planet. Today, the Amazon is facing a multitude of threats as a result of unsustainable economic development; 20% of the Amazon biome has already been lost and the trend will worsen if gone unchecked. Amazon is the biggest deforestation front in the world and interventions are urgently needed to prevent a large-scale, irreversible ecological disaster.

**The Challenge:** Your team is being appointed as a main task force for developing an infrastructure made of a small satellite constellation equipped with optical and infrared cameras, allowing for the real time surveillance of the Amazon biome. Imagine services this infrastructure may offer (applied video streaming, target tracking, area surveillance) and appoint the type of satellite and its payloads for the desired applications, quantity of satellites in your constellation, investments, ratio of launch, orbital parameters, ground station locations and total coverage of the Amazon biome.

**Topics:** Satellite, Environment, Other

### **Online Challenge 2020-04**

**Code:** BC.O20-04

**Title:** Moon Race and the Latin America

**Overview:** Who will be the first private company to set a lander on the moon? A new space race has broken out: in the past two years, spacecraft have been launched to the moon by China, Japan, India, and the US. South Korea has suddenly announced lunar plans. What about Latin American countries?

**The Challenge:** Your team is being appointed as a main task force for developing a Latin American mission for being carried to the Moon in 2024 by Artemis III. What could be developed to go to the Moon representing Latin America? Your solution shall be up to 5 kg. Imagine and develop a brand-new disruptive space mission concept. Find inspiration looking to state of the art new capabilities, ensure technical capability and sustainability to serve humanity expansion in space. Draft, elaborate and explain your value proposition with facts, analysis, prototypes and business models. Great ideas are cool, profitable ones are better!

**Topics:** Moon, Environment, Other





## **Online Challenge 2020-05**

**Code:** RC.LR20-05

**Title:** Reusable Rockets: Revolutionizing Access to Space

**Overview:** Circular economy isn't limited to within our atmosphere. It will also assist in enhancing our satellite systems and could also lead us into space tourism. SpaceX and Blue Origin are frontrunners in reusable rocket development. Recently, Rocket Lab also recovered their first stage Electron. Reusable parts drastically lower the costs of launch, in turn lowering the barrier of access to space. Although this reduction is caused by many factors, a significant component of the reduction can be attributed to the use of the reusable instead of expendable hardware. This will lower the costs for satellite launches and drive development of satellite mega constellations used for communication and Earth Observations.

**The Challenge:** Your team is being appointed as a main task force for developing a launch vehicle of smallsats for Sun Synchronous Orbit with a payload capability up to 400 kg. The launch vehicle shall be launched from Alcantara Launch Center (2°19'3.9"S 44°22'4.872"W) and recovered from a nearby site (land site or barge). The task is to propose a vehicle and its concept of operations, logistics, investments for the development and a business model.

**Topics:** Rocket, Launch Vehicle, Other

