30th Workshop on Space Technology for Socio-Economic Benefits:
"Challenges and Capacity-building Opportunities for Emerging Space Nations”

# BlincSat as Space Engineering Educational Program

Empowering the Future through space tech

# About Us

**Raghad Maraqa**
Mechanical Engineer, Frame and structure design

**Diana Aljbour**
Aeronautical Engineer, system engineering and architecture,Ground segment

Sofia Hill

Kaliyah Harris

**Mohammad Refaii**
Physicist, electronics and embedded systems, circuit designer

**Montaser Sallam**
Senior satellite and avionics engineer
Project mentor

## VISION

**Inspire the next space innovators, enthusiasts and scientists, by providing an accessible educational experience in space technology**

## MISSION

**Democratize space education and technology by developing cutting-edge cubesat simulator programs for hands-on learning experience, enabling diverse communities to become contributors to the evolving landscape of space technology**

## Values

**Accessibility, collaboration, innovation**

## Purpose

**Contribute to solving challenges in the Middle East and around the world through space technologies**

Animals among 59 species were killed in Jordan

**4,707**

**The Royal Society of conservation of nature (RSCN)**

Is Mandated to enforce regulations related to protecting wildlife

الجمعية الملكية لحماية الطبيعة
RSCN

**Tracking Hunters is Challenging**

AS the majority of endangered wildlife is distributed in out-of-network coverage.

# Mission Objective

- IoT D2S node connections with reserves in Out of Coverage areas
- Lower Powered: using  Low Power Long Range  - LORA -
- Feasible alternative for building Expensive  traditional  network infrastructure


# Case Study : Jane Goodall

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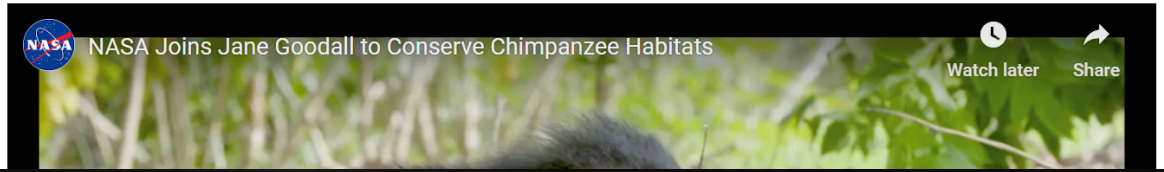
For decades, satellites have measured dramatic changes in the world's forests. These eyes in the sky provide timely information on environmental change and human activity in forests, especially in remote ones. The Jane Goodall Institute has been working with NASA and using Earth science satellite imagery and data in its chimpanzee and forest conservation efforts in Africa, particularly the Gombe region.

The observations and analyses from above aid Goodall's TACARE program -- a community-led approach to conserving the environment while improving and enriching the lives of people who live nearby. Such efforts are crucial to protecting the planet's biodiversity and achieving sustainable human development of the landscape. Learn more in this video.

The Jane Goodall Institute uses NASA data to empower local communities to drive chimpanzee habitat conservation.
***Credits: NASA/Jane Goodall Institute***



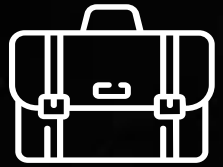
# Educational Objective

- Local designed and operated program, utilizing educational Kits of cubesat simulator
- Accessibility for Hands-on education
- Create Opportunities in Space Industry

“Don't wait for the right opportunity, create it ! ”

# Student- Led Project for Students!

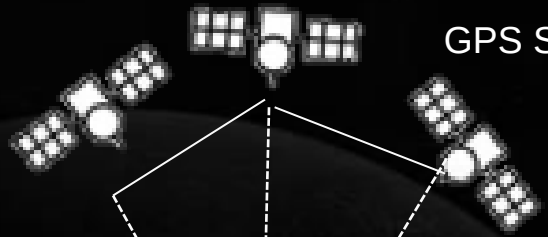
Low-Cost, low power and realistic Simulator



COTS Component

Open Source

# Mission Architecture



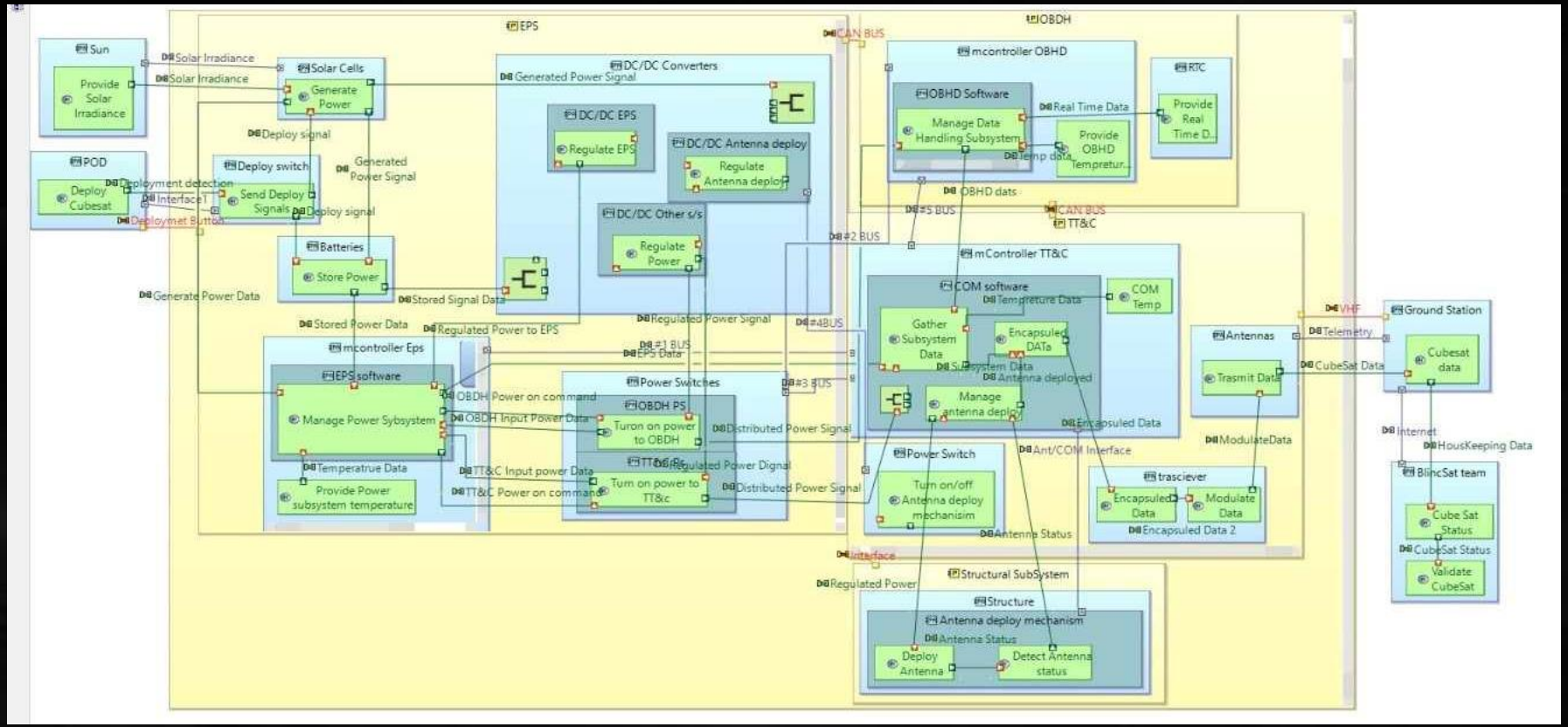
GPS Satellites

Satellite Operator

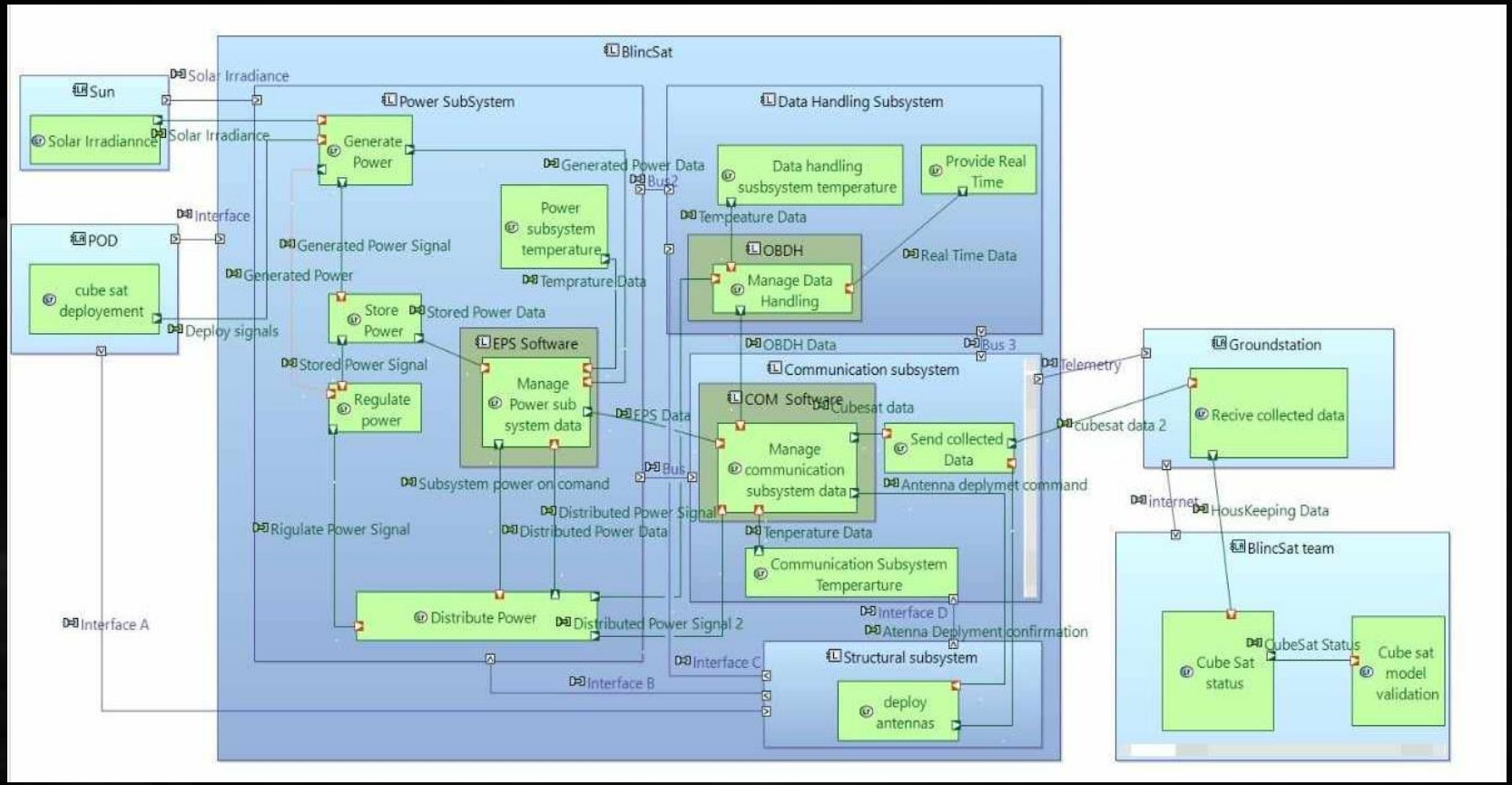
GPS Receiver

Ground Segment

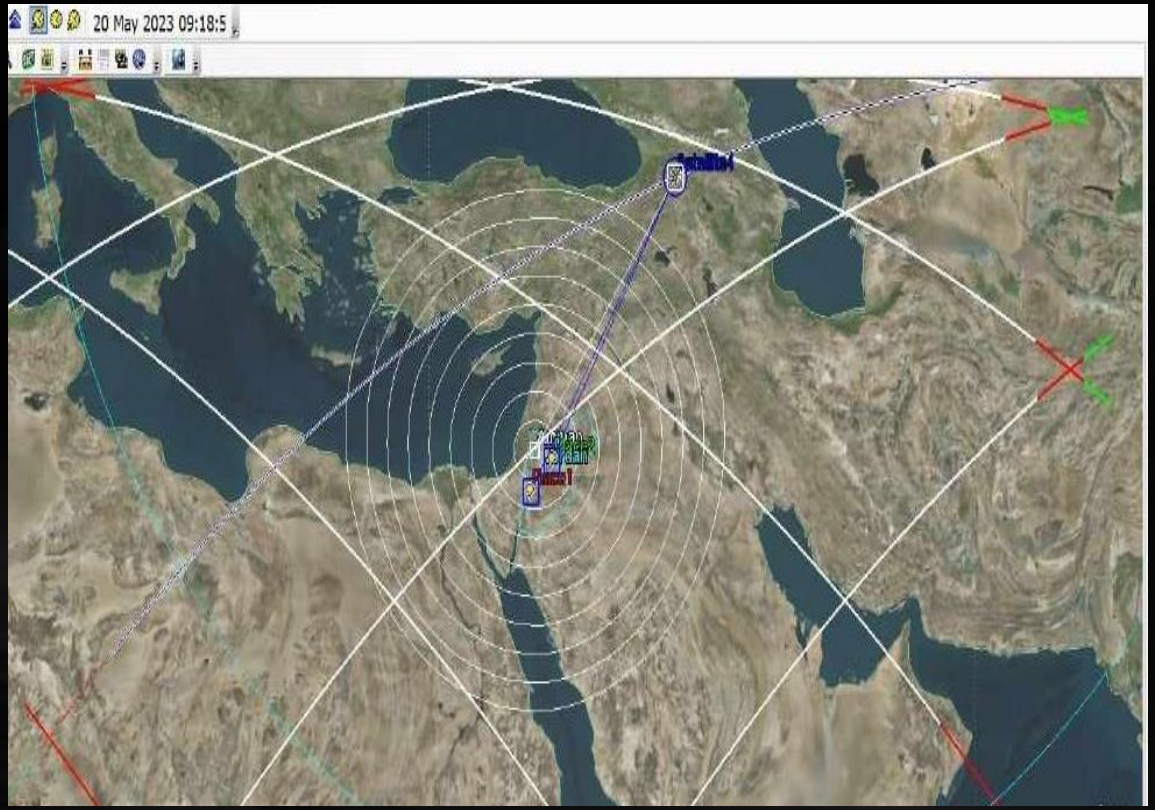
# Physical Architecture



# Logical Architecture

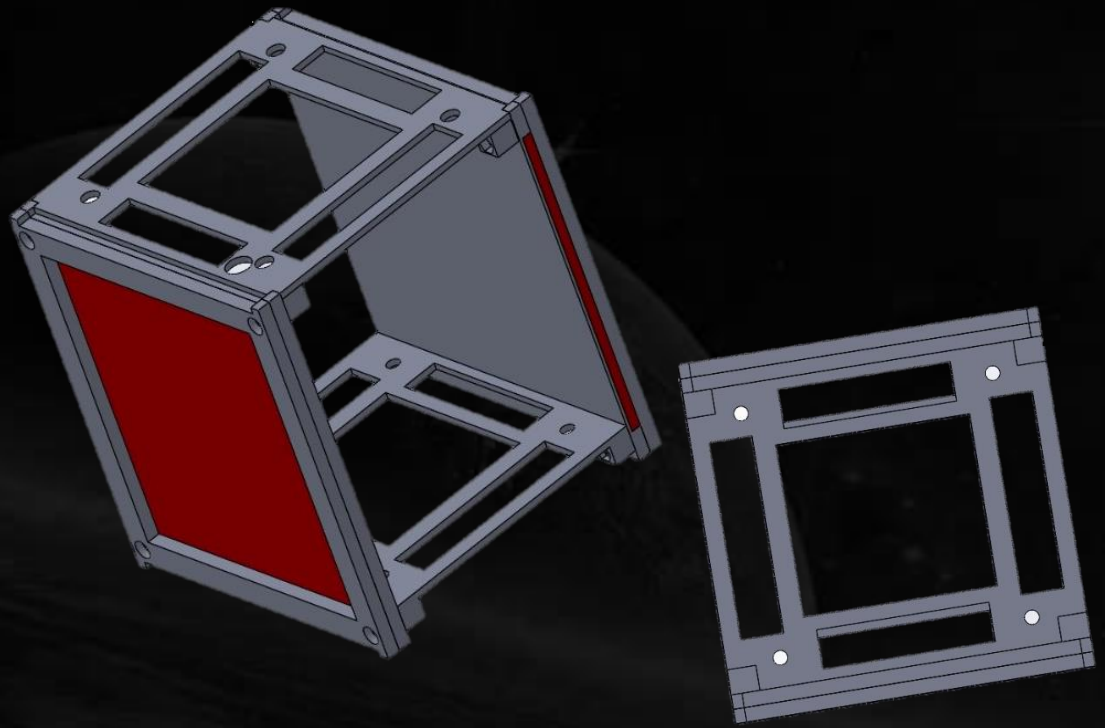


# Simulation



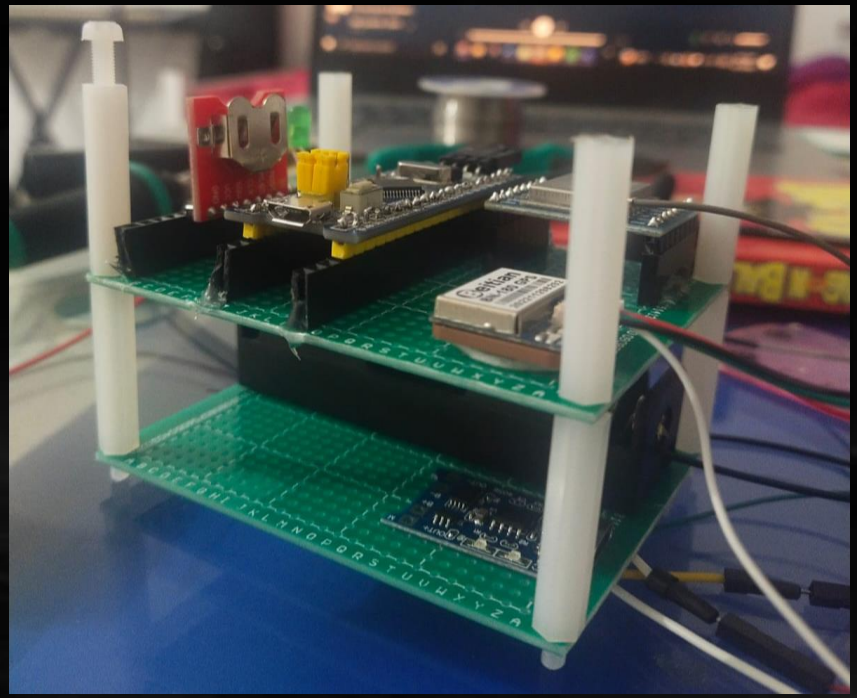

- Mission Scenario Simulated Using STK
- Calculations for coverage areas and CubeSat periods in orbit
- Power Budgeting
- Orbit (LEO)

# Frame Design



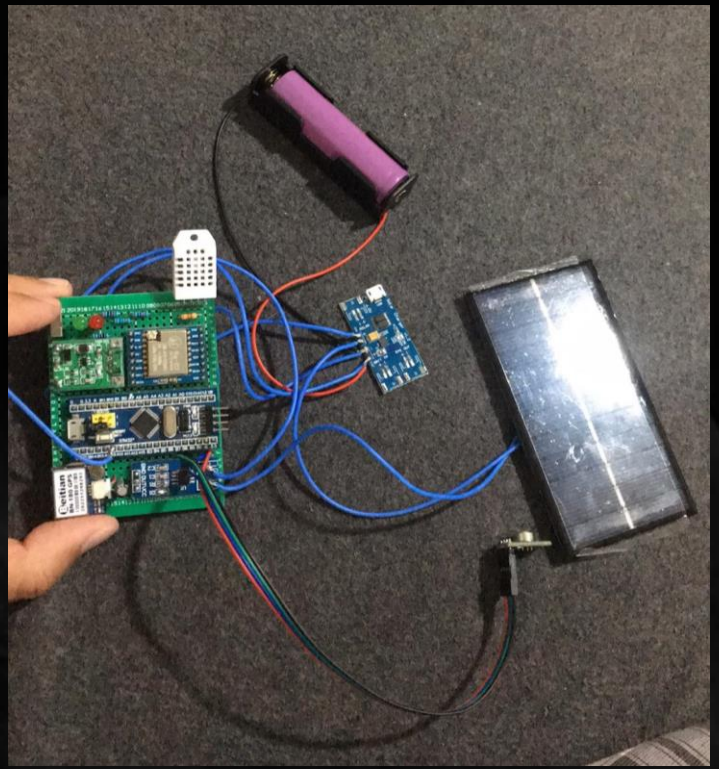
- Easy assembly
- 10*10 cm 1U Cube
- 3D printed (PLA)

# Electronics Prototype CubeSat



- COTS Components
- Boards: OBC, EPS boards
- MCU: STM32F103
- LoRa
- RTC, GPS, 9DOF IMU Sensors
- LI-ION, power monitoring circuit

# Electronics Prototype: Node



- Ultra Power saving (sleep mode, regular mode)
- Animal Tracking, Animal Health monitoring (heart pulse), temperature
- Solar powered
- Could be scaled to other applications, custom-designed

# Ground Segment


- Registered to Tiny GS open-source Lora community Ground stations tracking Lora Satellites
- Lora Ground Station ESP, Lora and 433 Mhz Antenna
- First Jordanian Lora Ground Station registered in Tiny GS

# Challenges

- Absence of space agency/programs
- Space science not offered in formal university/ school education
- lack of funds
- Legalities
- Facilities/ materials
- On-Site mentorship

# Next Steps

## Team members recruitment and project mentors

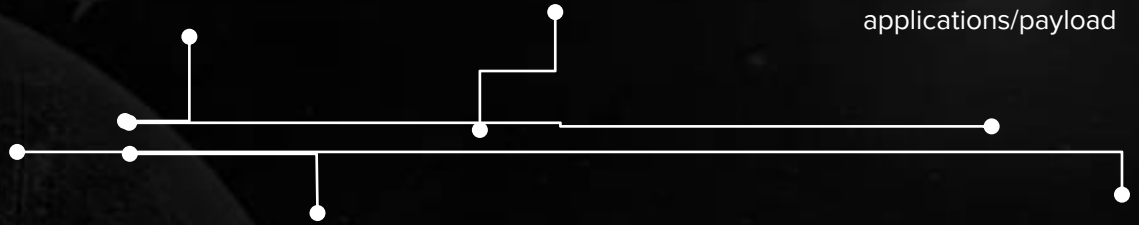
- Scale up the team and create access for the opportunity for talented and passionate people

## Outreach Event

- Satellite Building Workshops and outreach activites

## Kits production

- Custom-designed PCB  boards
- Costume frame,
- electronics and radio modules, flexible nodes to be used for different applications/payload



## Build Collaboration

- International and National level
- Talent exchange/ project-based  internship
- Secure Funding
- Kits/ Simulator production
- Facilities (university, research labs, testing facilities )

## Finalize and test MVP of our educational kit

- MVP testing with partners, animal reserves, educational institutions

## Work on launchable CubeSat opportunity

- If we got the right support we would love to  see the idea launching to orbit!!

# Current collaborators

# Connect with us and Support our mission of launching Educational CubeSat program in Jordan!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