

University of Nairobi – UNOOSA Partnerships:

Vega C and KiboCUBE Awardees

by

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University of Nairobi

16th May 2023

1st Access to Space for All Initiative Expert Meeting

Introduction: University of Nairobi (UoN)

❖ University of Nairobi

- Oldest and largest in Kenya
- Student Population: > 40,000

❖ 11 Faculties

- Engineering
- Health Sciences
- Science and Technology
- Social Sciences
- Education
- Agriculture
- Arts
- Built Environment & Design
- Business & Management Sciences
- Law
- Veterinary Medicine



1st Award: KiboCUBE [2016]

❖ Project: 1KUNS Project (2016 – 2018)

- 1st Kenyan University Nano Satellite (1KUNS)
- Collaboration: UoN & University of Rome, Sapienza
 - P.Is: Prof. Mwangi Mbuthia, Prof. Fabio Santoni
- 1st Beneficiary of Japanese KiboCUBE Launch Opportunity
- Deployed from ISS in May 2018

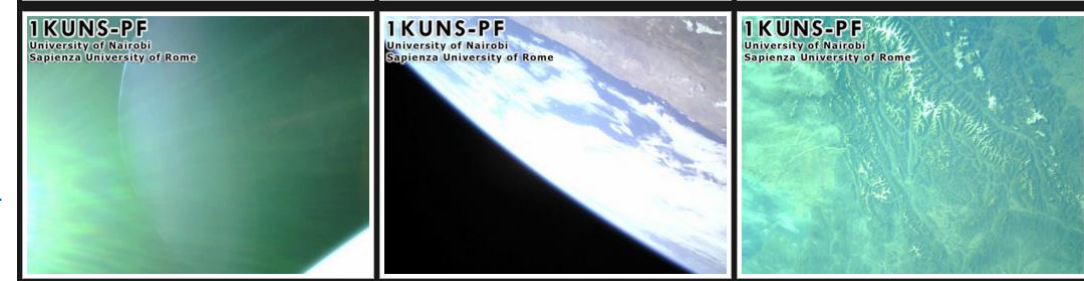


KiboCUBE: 1KUNS Results (i)



❖ 1KUNS Project Results

- Mission Success: Earth images (2018-2020)
 - Available: <https://www.s5lab.space/index.php/satellite-pictures/>
- Capacity Building



UNOOSA
PNST



Kiruki (MSc.), 1KUNS 2016

Kiruki (PhD),
Kyutech 2017-2021
PNST

Dr. Kiruki (Faculty), UoN 2021



Charles Mwangi, KSA

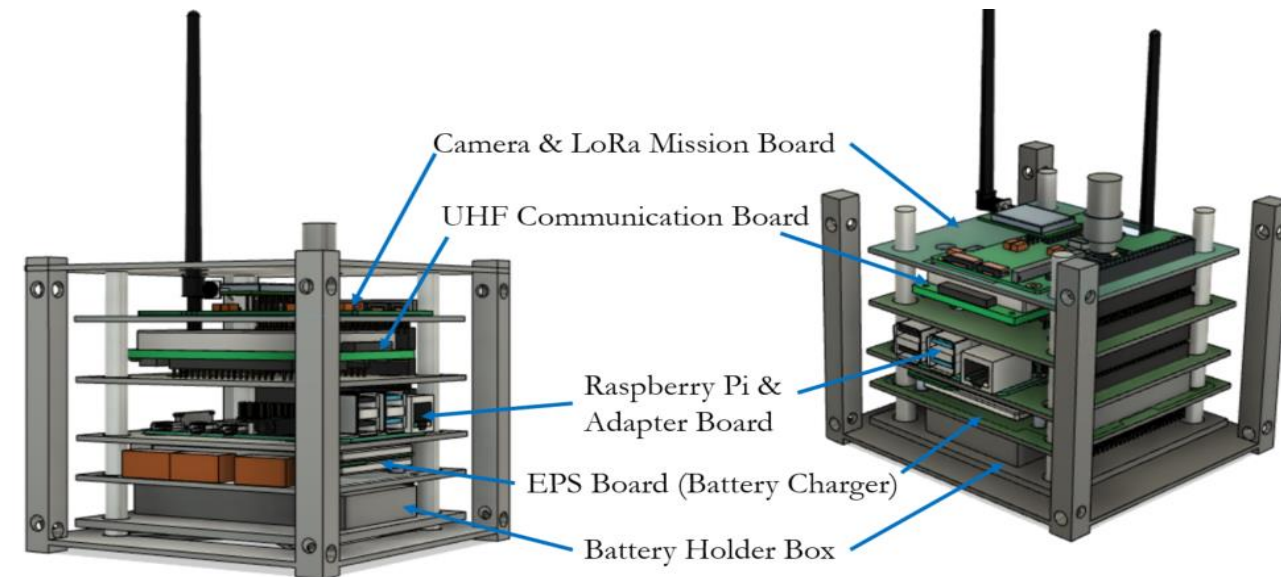
Charles Mwangi, 1KUNS 2017

❖ Project: NaSPUoN (Sept. 2020 – Nov. 2021)

- Kenya Space Agency Grant
 - NanoSatellite Research at Public Universities
 - USD 50,000 (5 universities @ USD 10,000)
- NaSPUoN – NanoSatellite Platform for the University of Nairobi
 - Project Kickoff – Oct 2020
 - Principal Investigator – Prof. Mbutia
 - Project Manager– Dr. Kiruki
- 1U Bench Model (Not space-grade)
- Emerged Overall Winners –Nov 2021
 - Out of 5 public universities



NaSPUoN Team



❖ Application - April 2021

- Submitted application in early April 2021
- Still working on the 1U NaSPUoN bench model
- Tri-partite Cooperation: [UoN, UofA, Space Trust] signed in March 2021



University of Nairobi



- Supported by Kenya Space Agency



- Proposed Project: NaSPUoN-0GPM2030

Accessing Space with Vega-C



NaSPUoN Zero Gravity Peace Mission 2030 (NaSPUoN-0GPM2030)

❖ Missions

- Primary: Zero-G Peace Mission 2030
 - Championed by Space Trust
 - Space Trust responsible for collection of messages
 - In form of videos & audio
- Secondary: Enhanced NaSPUoN & Tafiiti Missions
 - Camera Mission
 - LoRa Mission (For remote monitoring)



❖ Previous Experience

- Draw lessons from past satellite experiences
 - 1KUNS
 - CatSat (UofA)
 - NaSPUoN

❖ Transmission of Peace Messages

- In form of HD Videos & audio from world leaders
- Each message ~ 30 secs long (~40MB)
- Space Trust responsible for collection of messages
- Need of High-Gain Antenna for downlink
 - To be built/provided by UofA
 - Necessary for messages and images downlink

❖ Dissemination of Peace Messages

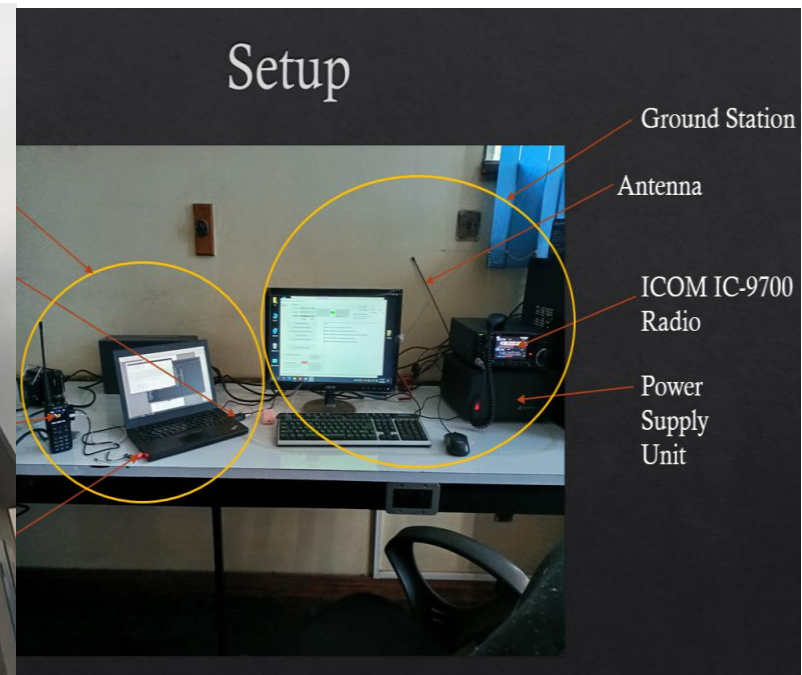
- Website
 - Platform to get messages to wider audience (streaming)
 - Real-time tracking of satellite
 - Try to couple messages with images from the camera mission

1. Broglio Space Centre, Malindi



UHF, VHF, S-band, X-band

2. University of Nairobi



UHF, VHF

3. Kenya Space Agency



KSA Ground Station, Nairobi

- Under construction, to be commissioned this year
- UHF, VHF, X-band



Thank You

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