

# The PNST Opportunity and Experience



PNST/SEIC Program



By  
**Mutugi Kiruki**

Dept. of Electrical & Information Engineering



**University of Nairobi**

- ❖ Home country - Kenya
- ❖ Pre-PNST
- ❖ PNST Experience & Life in Japan
- ❖ Post-PNST

## ❖ In East Africa



- ❖ Population: 55 million
  - ❖ GDP: 110 billion USD
- } 2021

- Google What is Kenya famous for?
- the world's best safari destination
  - tea, coffee, long-distance runners

## But...Some interesting tidbits involving Kenya



Eliud Kipchoge: 1<sup>st</sup> & only human to run marathon under 2 hrs



Barack Obama: Kenyan father



Queen Elizabeth II: Became queen while in Kenya, Feb 1952



Rishi Sunak: father (Yashvir) born and raised in Kenya

## ❖ Education Background (University of Nairobi)

- BSc. Electrical & Electronics Engineering (2009 – 2014)
- MSc. Electrical & Electronics Engineering (2014 – 2017)
- Supervisor & mentor: Prof. Eng. Mwangi Mbutia



## ❖ University of Nairobi

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

Dept. of Electrical & Information Engineering

## ❖ 1KUNS Satellite Project

- 1<sup>st</sup> Kenyan University Nano Satellite (1KUNS)
- Collaboration: UoN & University of Rome, Sapienza
  - P.Is: Prof. Mwangi Mbutia, Prof. Fabio Santoni
- 1<sup>st</sup> Beneficiary of Japanese KiboCUBE Launch Opportunity
- Deployed from International Space Station in May 2018



Prof. Mbutia receives the KiboCUBE Launch Award (Mexico, 2016)



University of Nairobi & University of Rome, Sapienza students (2016-2017)



## ❖ Awarded PNST PhD Fellowship 2017

- Under the Space Engineering International Course (SEIC)
- Based in Embedded Systems Lab, under Prof. Kenichi Asami
- Research area: FPGA-based inference / accelerators



26/09/2017 – Arrival in Japan (Fukuoka Airport)

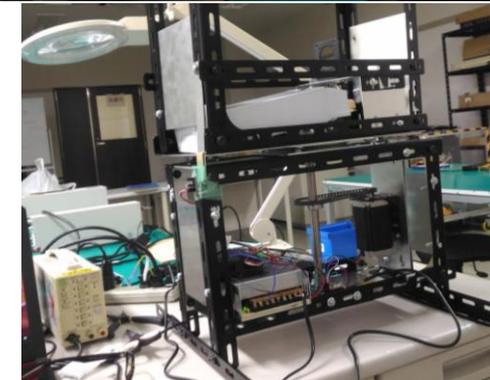
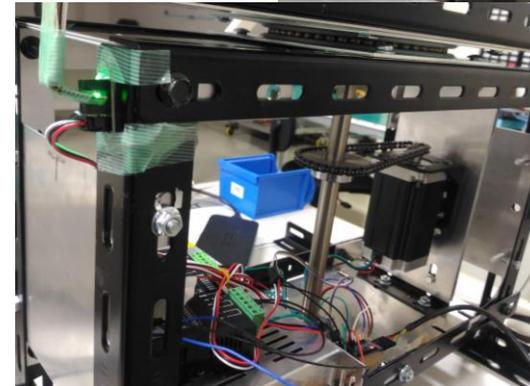
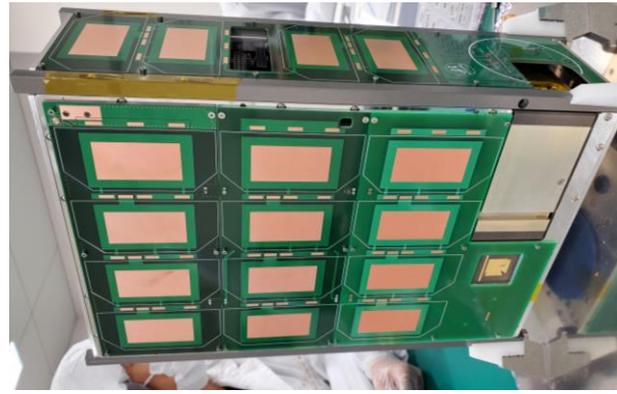
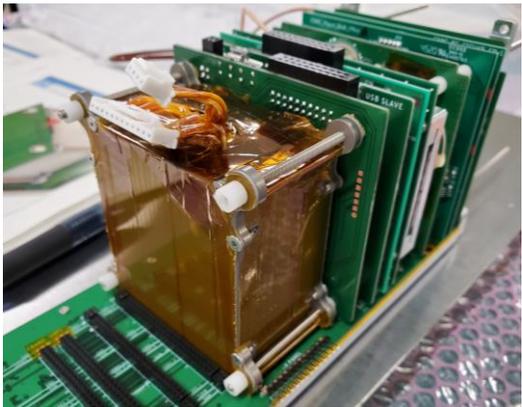
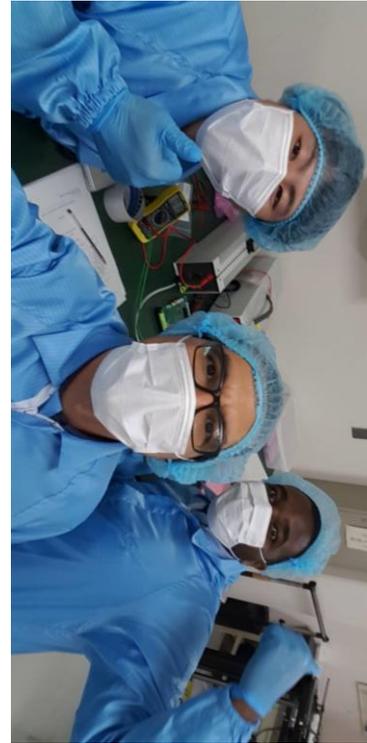
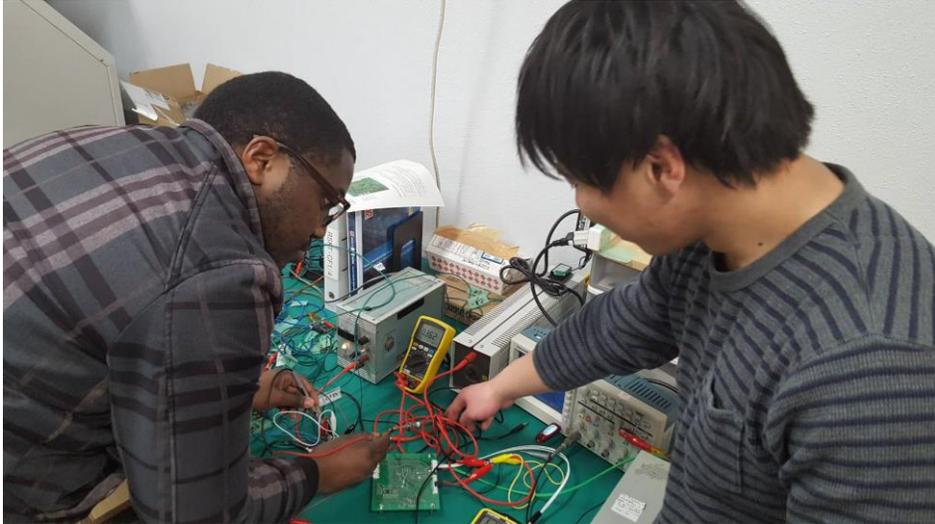


Arrival at my apartment



Welcome Party –  
Embedded systems lab

- ❖ Satellite projects
  - Tenkoh – Electrical Power Subsystem
  - Kitsune – Main Bus (and Mobile GS)



## ❖ Other opportunities

✓ Nov 2018: UNISEC-Global MIC



✓ Oct 2019: IAC Conference – Washington DC

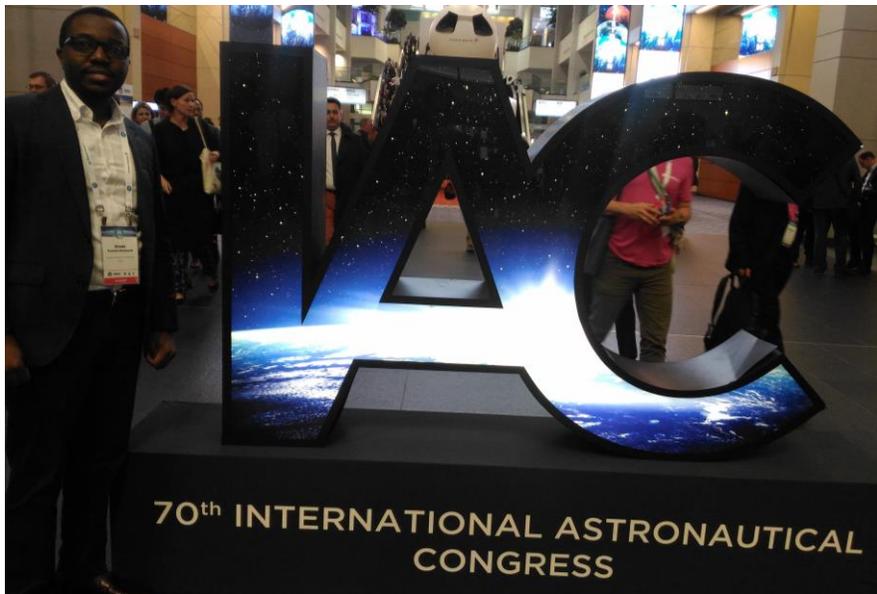
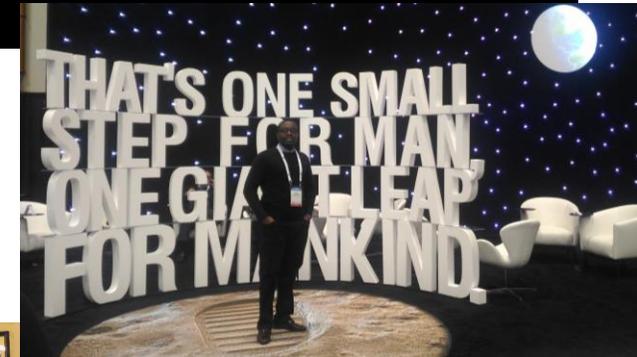
### WINNERS

#### 1st Place

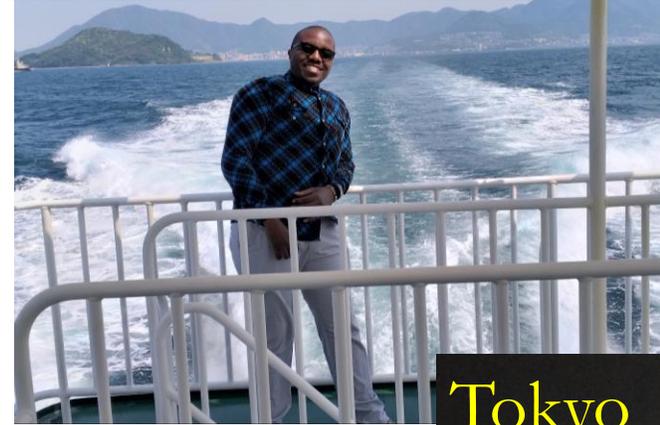
Smallsat Ionosphere Exploration at Several Times and Altitudes,  
William Evonosky, Duann Yi, Kandi Anand Kaustubh University of Colorado Boulder, National Central University, IIST

#### 2nd Place

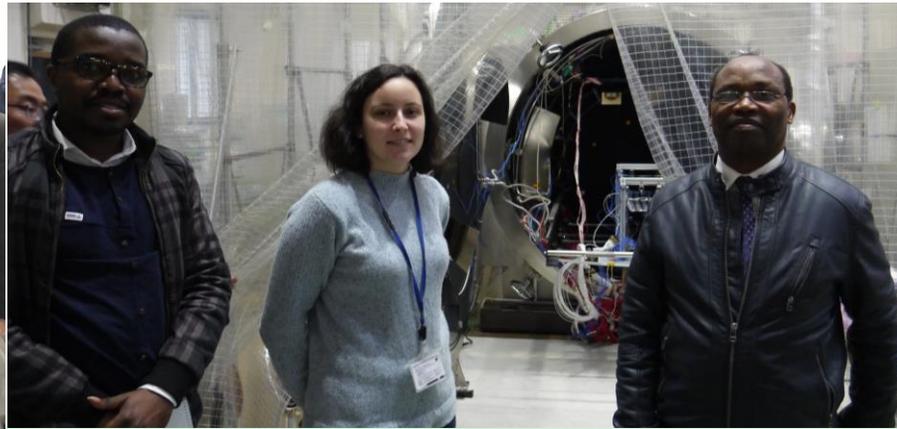
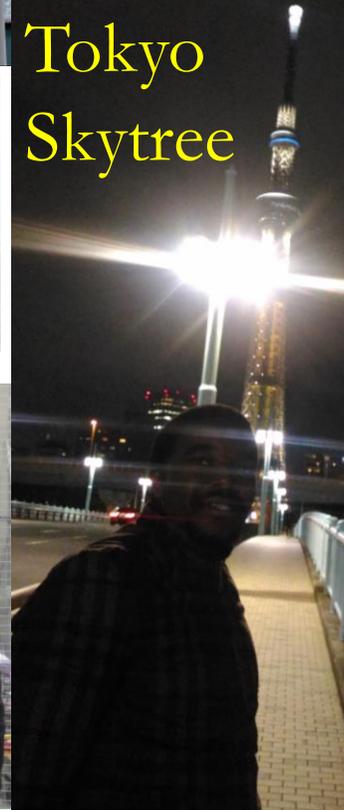
Arid and Semi-Arid Lands Satellite (ASAL-SAT): A LoRa ground sensor network for easing life in Sub-Saharan Africa ASAL areas,  
Kiruki Cosmas Kyushu Institute of Technology



## ❖ Japan Life in Pictures



Tokyo  
Skytree



- ❖ Lecturer, Dept Electrical & Information Engineering, UoN
- ✓ Project Manager - NaSPUoN Nanosatellite Project (Sept 2020 – Nov 2021)
- ✓ Asst. Principal Investigator - Tafiiti Nanosatellite Project (Jan 2022 - present)

## Kenya Space Expo & Conference 2022



- ❖ PNST: Life-changing opportunity
  - ✓ Technical capacity building
  - ✓ Global exposure & experience
  - ✓ Networking
  - ✓ Academic & professional growth