

# ALL NATIONS UNIVERSITY SPACE EDUCATIONAL PROGRAMMES IN GHANA AND EUROPEAN COOPERATION

**DR. BONSU BENJAMIN**

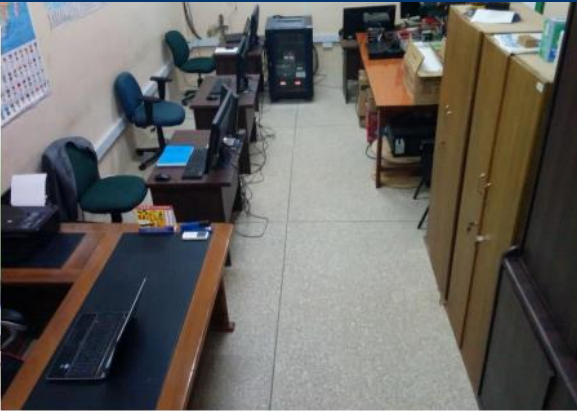
\* CO-FOUNDER OF SPACE SYSTEMS TECHNOLOGY LABORATORY , ALL NATINOS UNIVERSITY (ANU-SSTL)

\* SATELLITE COMMUNICATION SUBSYTEM ENGINEER , AXELSPACE, JAPAN

**DECEMBER 7,2022**

# ABOUT ANU-SSTL

- ▶ In 2012, I co-founded Space Systems Technology Laboratory (SSTL)
  - ▶ Under the auspices of the Electronic Engineering department at All Nations University in Ghana



**MISSION**  
 To promote and build **human capacity** in the area of **space science and satellite technology** through innovative **research and development of educative projects** for the **benefit of society**

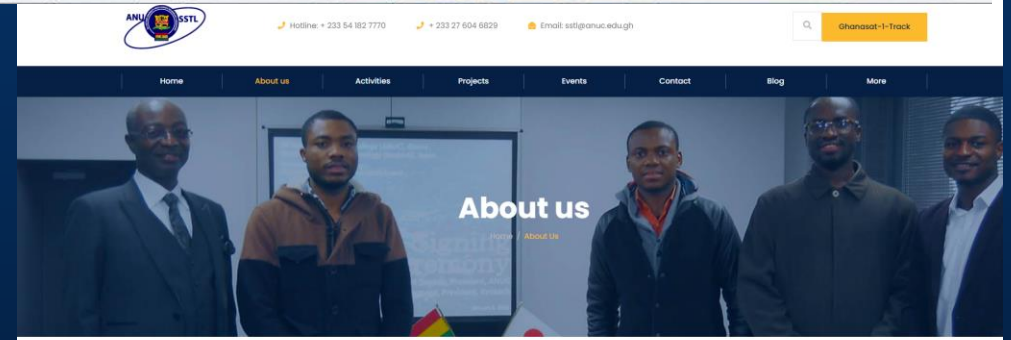




# ABOUT SPACE SYSTEM TECHNOLOGY LABORATORY(SSTL) HTTPS://SSTL.ANUC.EDU.GH/

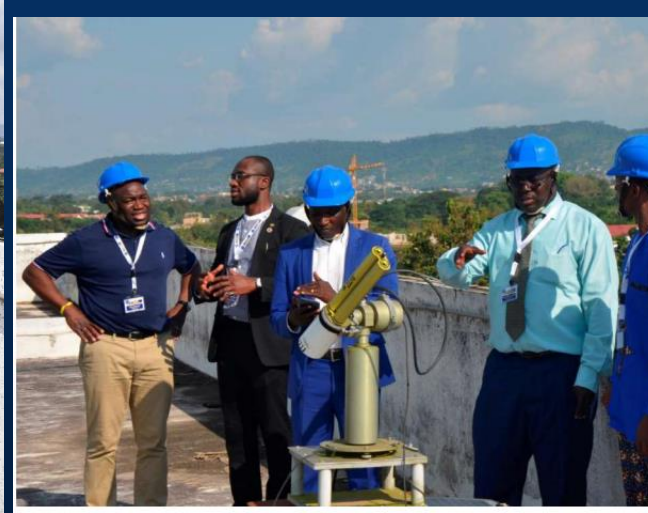
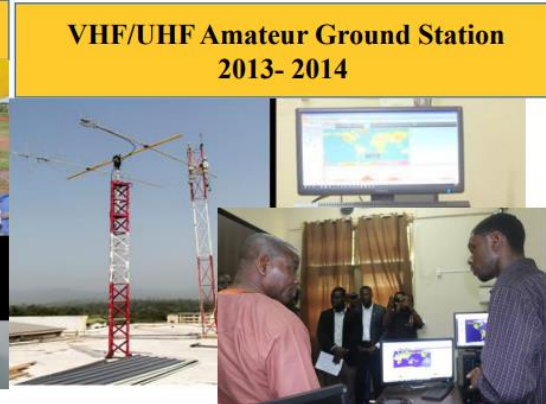


Big Thanks to the founder and President of All Nations University Dr. Samuel Donkor for making our dreams come true



11/27/2022

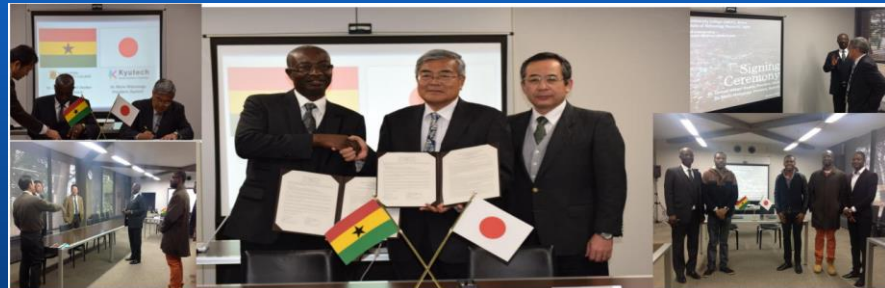
OUR STORY  
SPACE SYSTEMS TECHNOLOGY LABORATORY



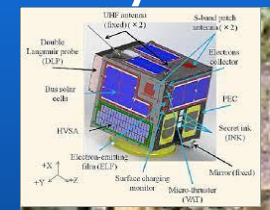
# ANU-SSTL CAPACITY DEVELOPMENT PROJECTS



# GHANA-JAPAN COLLABORATION : ABOUT GHANA'S FIRST SATELLITE (GHANASAT-1) INTO SPACE



- Official signing ceremony : January 6 ,2016
- Aim
  - To train ANU sponsored students studying at Kyutech to build their **capacity in satellite technology** and build the **first Ghana satellite** to contribute to the sustainable space activities in Ghana



▶ Professor Mengu Cho (middle)

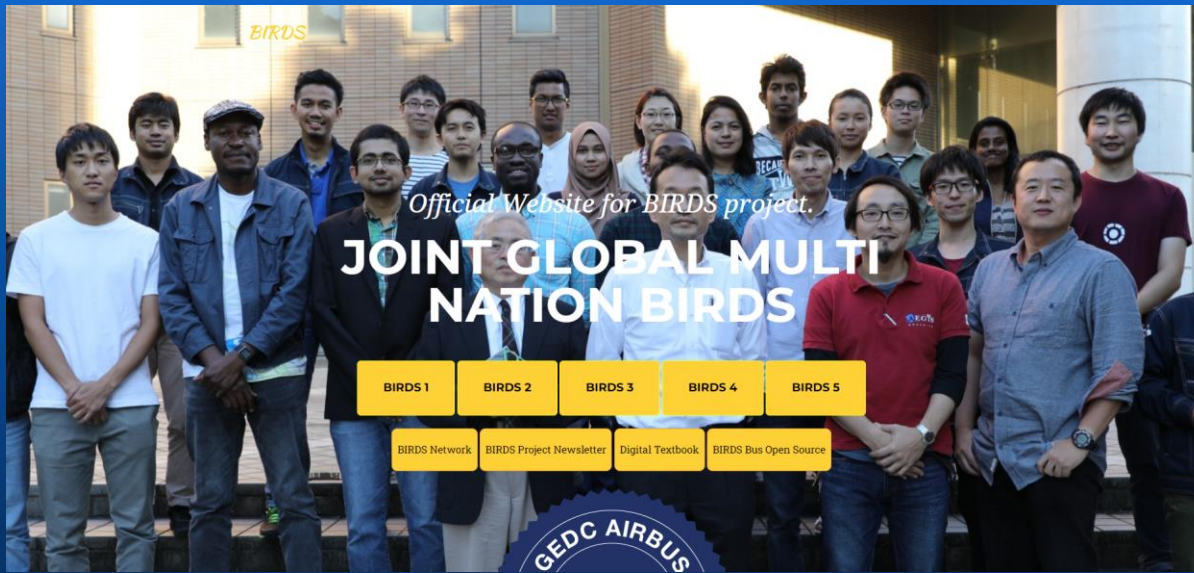


▶ HORYU-4 Nanosatellite funded by JAXA

- ▶ My first real satellite project in Japan
- ▶ The first Ghanaian student to join Japanese University satellite project

▶ 2013 Professor Nakasuka Shinichi and UNISEC-Japan invited me to Japan to share my space projects in Ghana

# BIRDS PROGRAM :GHANSAT-1 PROJECT



**Joint Global Multi-Nation Birds (JGMNB):** Satellite program for non-space faring countries. *Shortly called as "BIRDS Project"*

Birds Project is initiated by Kyushu Institute of Technology (Kyutech), Japan, through its Laboratory of Spacecraft Environment Interaction Engineering ( LASIENE).

Proposed Date : July 17 July , 2015

Kick Off: 22 October ,2015



Ghana was the first country in the world to sign up on the BIRDS Project"

**Mission Statement**

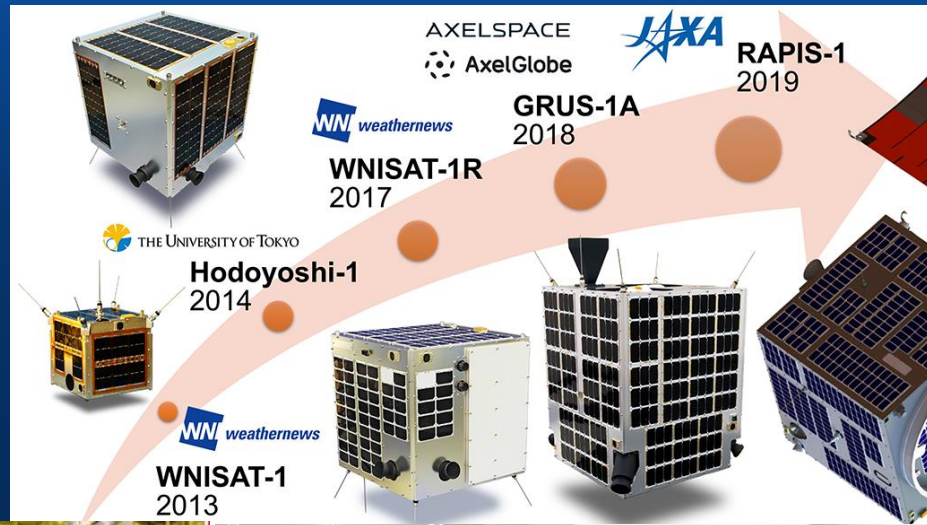
Successfully building and operating the first national Cubesat and making the foremost step toward indigenous space program at each nation.



The successful launch of Ghansat-1 has open a lot of opportunities for more than 10 universities in Africa to build their capacity in CubeSat design and development.

# AXELSPACE ACTIVITIES

- ▶ Opportunity to enhance my experience in the Microsatellite technology and also increase my networks in the Japan space industry
- ▶ Joined Axelspace in November 2020 as satellite RF engineer to design, develop and testing of communication subsystem for Microsatellites( 100~200kg)
- ▶ Projects
  - ▶ GRUS constellation Microsatellites (launched in 2021)
  - ▶ Pyxis Next generation Microsatellite technology ( To be launched in 2023)





# POSSIBLE AREAS FOR COLLABORATION AND PARTNERSHIP WITH ANUSSTL – GHANA

- ▶ GHANA-EU UNIVERSITIES GROUND STATION NETWORKS
  - ▶ Support Universities in Europe to track satellite passes over Ghana regions
- ▶ AEROSPACE ENGINEERING PROGRAM
  - ▶ All Nations University is a fully accredited private institution and soon to start Aerospace program in both the bachelor degree and masters degree.
- ▶ SPACE MUSEUM
  - ▶ Funding Opportunities to establish first state of the art space museum in Ghana.
- ▶ SATELLITE ENVIRONMENT TESTING CENTER
  - ▶ Funding opportunities to establish the first small satellite environment testing center in Africa
- ▶ GHANA –EU UNIVERSITIES CUBESAT CONSTELLATION PROJECT using BIRDS Bus Open Source
  - ▶ Build CubeSats ( using Birds Bus systems for more information visit <https://birds-project.com/open-source/> ) to monitor climate change's impact in the form of wildfires, melting ice, shifts in the seasons, growing floods and much more.
- ▶ FACULTY EXCHANGE PROGRAMS (especially in any area of Engineering )
  - ▶ Training opportunities, research grant opportunities, fellowship programs...etc

# THANK YOU

- ▶ Official email address
  - ▶ [\\_anusstl@anuc.edu.gh](mailto:_anusstl@anuc.edu.gh)
- ▶ ANU-SSTL Facebook
  - ▶ <https://www.facebook.com/ANUSSTL/>

# APPENDIX

# UNOOSA AND SPACE GENERATION ADVISORY COUNCIL (SGAC) MEMBERSHIP



- ▶ UNOOSA KiboCube Academy Seasons
  - ▶ <https://youtu.be/poNbkTVGd7o>
- ▶ Post Graduate Nanosatellite Technologies Fellowship
  - ▶ [https://youtu.be/Pcu93IP\\_JO4](https://youtu.be/Pcu93IP_JO4)

# ANU-SSTL GHANA – UNISEC GLOBAL

- ▶ UNISEC-Global's primary objective is to help create a world where space science and technology is used by individuals and institutions in every country, rich or poor, and offers opportunities across the whole structure of society - whether academic, industrial or educational - for peaceful purposes and for the benefit of humankind.
- ▶ UNISEC-GHANA has been established and we member of the UNISEC –Global Ground station Network



- ▶ Support the Cansat capacity development program in the Africa Region
  - ▶ HEPTASAT program

<http://www.unisec-global.org/>



# THE INTERNATIONAL ASTRONAUTICAL FEDERATION (IAF) MEMBERSHIP PLAN

- ▶ ANU-SSTL Ghana won the 2017 Space and Society Award and I was the recipient
- ▶ ANU-SSTL Ghana plans to join the IAF membership in the year 2023



The IAF is an outstanding network of 468 members from **75 countries**, including all leading space agencies, companies, societies, associations, museums and institutes worldwide