According to Bryce Space & Technology Co., among academic operators, Kyutech is No. 1 in number of small satellites launched

Members of BIRDS -1, -2, -3, and -4, on 29 Nov 2018 in front of the lab building

Archive website: http://birds1.birds-project.com/newsletter.html
All back issues are archived at this website.

Acknowledgment of support: This newsletter is supported, in part, by *JSPS Core-to-Core Program, B. Asia-Africa Science Platforms.*

ISSN 2433-8818

BIRDS Project Newsletter

Issue No. 43
(26 August 2019)

Edited by:
G. Maeda
Laboratory of Spacecraft Environment Interaction Engineering (LaSEINE),
Kyushu Institute of Technology (Kyutech)
Kitakyushu, Japan

Space Engineering International Course

All back issues of this newsletter can be easily downloaded.
Go to here: http://birds1.birds-project.com/newsletter.html and scroll down to the desired issue.

Table of Sections

1. Continuation: Prof. Cho wins major IAF award: Frank J. Malina Astronautics Medal
2. Poster session during "Rocket Propulsion" course of Summer 2019
3. News from Paraguay: CABURE+I 4S
4. "Africa Space Forum" during TICAD 7 ← **at the end of August**
5. New Kyutech brochure for 2019-2020
6. BIRDS-1 member Turo defends his Phd thesis in public hearing on 31 July 2019
7. Summer of 2019: Kyutech Open Campus, 2nd and 3rd August
8. Kyutech undertook a visit to Makerere University in Uganda
9. Kokura fireworks of 2 Aug 2019
10. Olayinka's World – Column #13
11. NARSSCube-2's first beacon was received at Kyutech Ground Station on 8 August 2019
12. Kyutech participates in "Small Satellite Conference" in Utah State, USA
13. Cal Poly intern students give presentations during Cho Lab weekly seminar
14. Angel David Arcia Gil (Panama) visited Kyutech on 19 July
15. Kyutech visit written up in JAMSAT Newsletter No.294 (01 August 2019)
16. International Workshop on Lean Satellite – 2019, 4-5 December

Continued on the next page

From Egypt **The Guest Box**

Egyptian Tanoura

Explanation on Page 4

Table of Sections [continued]

17. BIRDS-3: First photos of satellites revealed by the new media in Nepal
18. BIRDS-3: Update on the ground stations of BIRDS
19. BIRDS-3: Mission images
20. BIRDS-3 and -4: Mentioned in “CQ ham radio” magazine of Japan
21. BIRDS-4: A technical meeting with JAXA
22. BIRDS-4: Thermal testing
23. BIRDS-4: Outreach at a local elementary school
24. BIRDS-4: Update on the electrical power system (EPS)
25. BIRDS-4: Birthday celebrations for Izrael, Hoda, and Adolfo
26. BIRDS-4: Anechoic chamber activities in July 2019
27. Report from UiTM (Malaysia)
28. Report from UPD (Philippines)

END

JSPS Reminder

When you publish a paper on a topic related to BIRDS, please include this acknowledgement in the paper:

This work was supported by JSPS Core-to-Core Program, B. Asia-Africa Science Platforms.

Guest Box of Page 2: Explanation of "Egyptian Tanoura" by Hoda of BIRDS-4 Project

Tanoura Dance originated in Egypt but has evolved into a more commercial performing art form, also known as Sufi whirling. The Tanoura dance or spectacle is a mystic, Sufi, folkloric Egyptian type of dancing. The word may also refer to the dancer, traditionally a Sufi man. Tanoura means skirt in English; Tanoura is associated with Sufism and is performed at Sufi festivals, but because of its visual appeal, it is also performed by non-Sufis as a folk dance or concert dance. Today, females participate in the performance as the lead or even background dancers. The name Tanoura mentions the colorful circular skirt that the performer wears. The centrifugal force of whirling transforms the skirt into a colorful line. Similar to the modernization of everything else, the western belly dancers have adapted this performing art and transformed it with more visual effects.

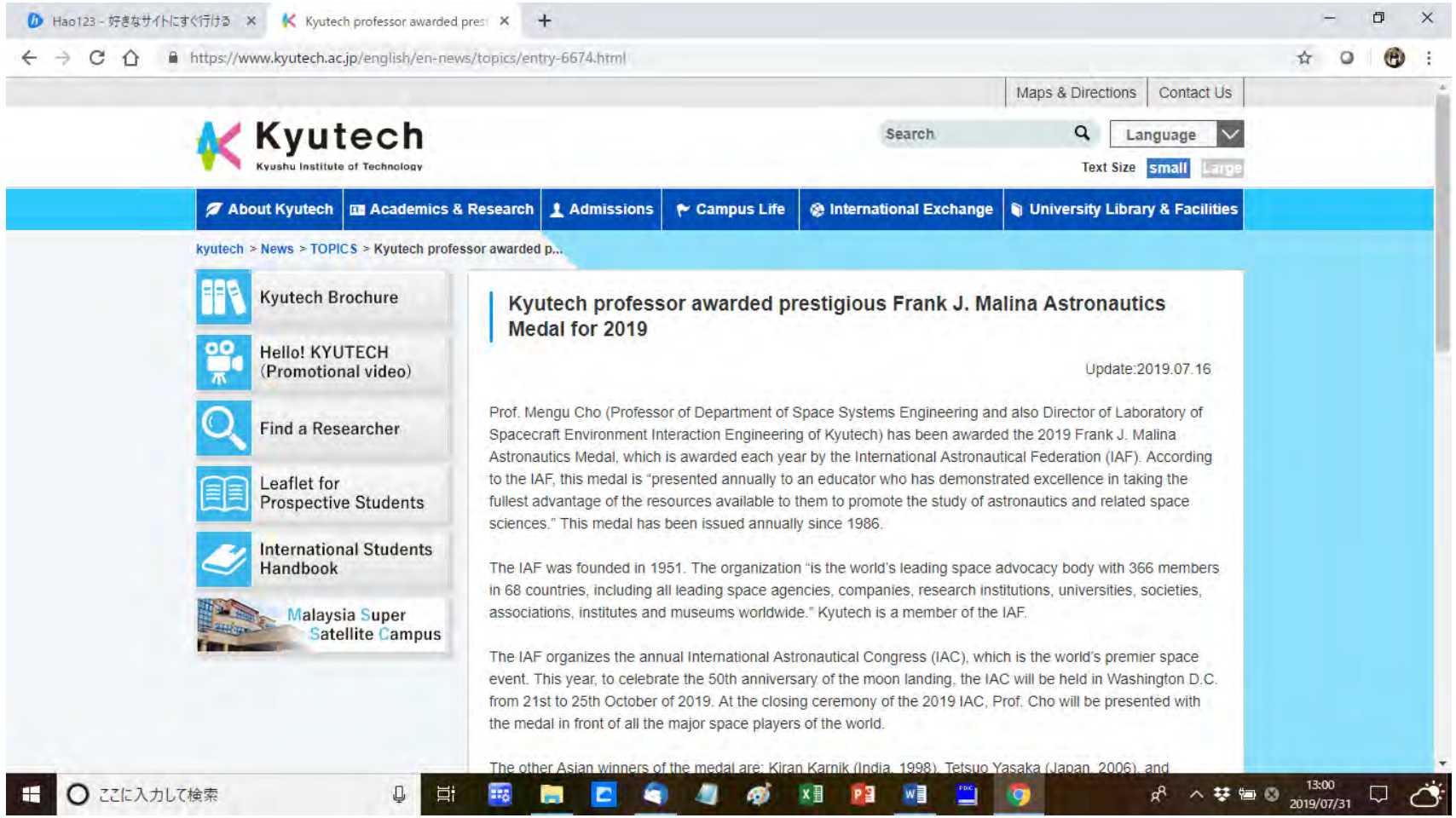
Every move tells its own story of a connection between Man and God or the relationship between land and sky. The circular movements are symbolic of the life cycle or the movements of the universe.

Philosophically, the world starts & ends at the same point which can only be represented by circular motions. The lead Tanoura dancer represents the sun and the background dancers represent planets. The dancer wears around 4 skirts which he unties throughout the performance to create different designs during the performance.

You will be mesmerized by the patterns created during the twirling of the colorful skirts. The dancers make use of lights as well to really enhance their show while stealing your breath away. You will be surprised by how gracefully the Tanoura dancer ends the show while the dancer not being dizzy. The desert setting provides a good backdrop for the performance. Aside from its mystic story, the colorful costumes that denote various human feelings and experiences, the mysterious sound of drums and the flute and the graceful movements throughout contribute to the almost-magical show that is sure to mesmerize audiences of all ages.

The different elements of 'Tanoura' stand for various messages. As told, it is a story that connects men to the divine; a dance that refers to the relationship of land and the sky, man and God. To be able to show this through the dance, the performers' round skirts and swirling actually refer to the circle of life or the universe. The specially-designed miniature light bulbs in their costumes that only come on at the middle of the dance refer to the new life and pure soul. The cloth that they put on their eyes and cover their faces symbolize their affinity towards spiritualism and their detachment from the world. **END**

01. Continuation: Prof. Cho wins major IAF award: Frank J. Malina Astronautics Medal

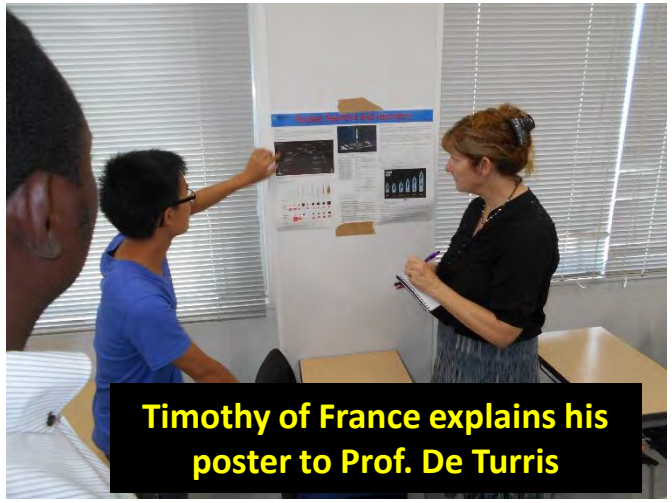


This is a continuation of the IAF news presented in Issue No. 42 of the BIRDS Project Newsletter.

See the entire posting: https://www.kyutech.ac.jp/english/en-news/topics/entry-6674.html

02. Poster session during “Rocket Propulsion” course of Summer 2019

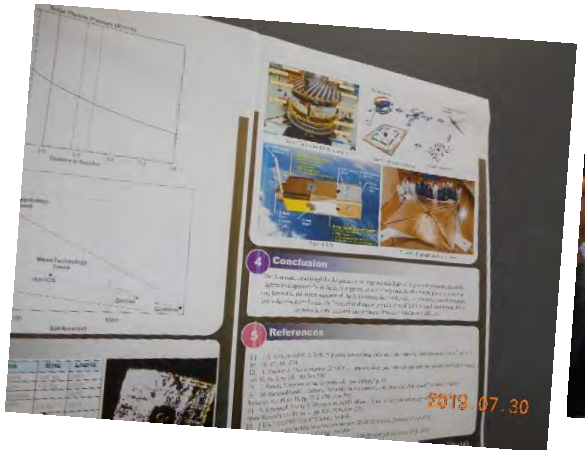
This article is a continuation of ***Prof. Dianne DeTurris of Cal Poly is teaching “Rocket Propulsion” for SEIC this summer*** published on pages 55-58 of **Issue No.42 of this newsletter.**



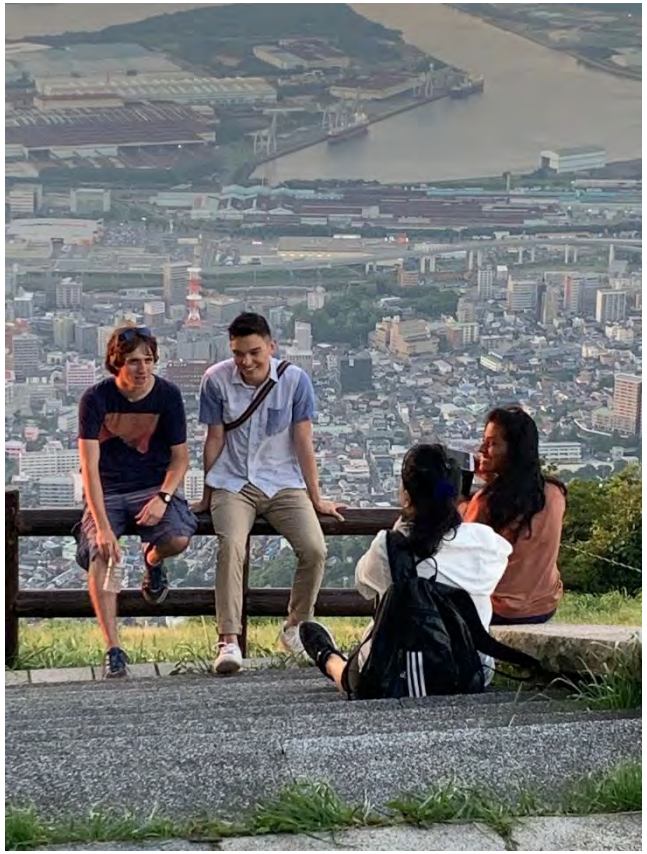
Timothy of France explains his poster to Prof. De Turris

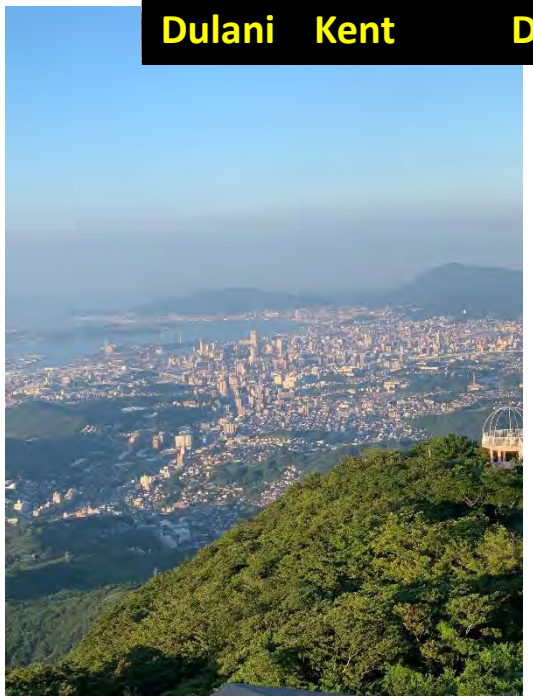
On 30 July 2019, Prof Dianne’s “Rocket Propulsion” class had its poster session in Room C2-F. It was outstanding. Students researched a topic and then created a poster. Each poster was then discussed at this poster session.

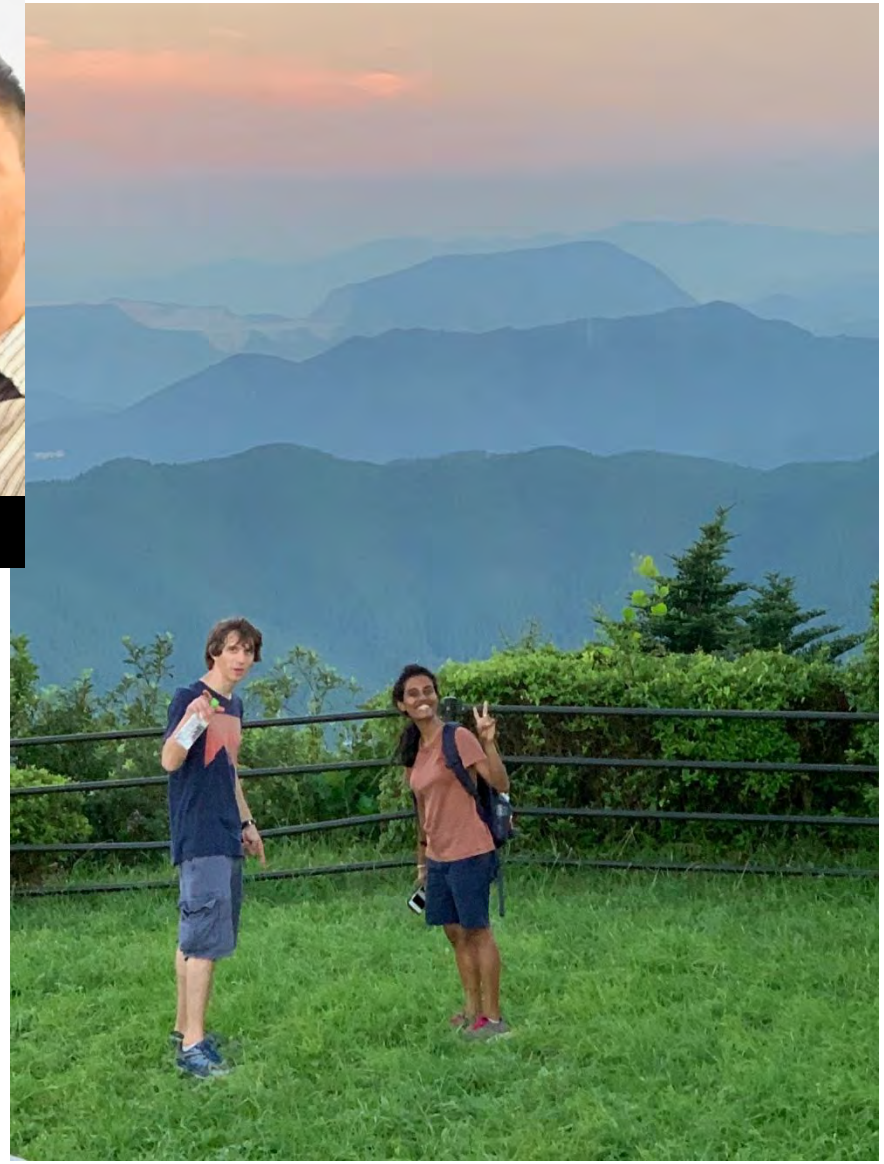
Phd student Muto of SEIC



In addition, on 5 August, Dianne Sensei climbed Mt. Sarakura with students of SEIC and Cal Poly:







03. News from Paraguay: CABURE+I 4S

CApacity BUilding in REsearch & Innovation - For Space

"CABURE+I 4S"

Project Newsletter

First semester 2019 Summary

Contributors:
Students and members of
The CABURE+I 4S Project Team

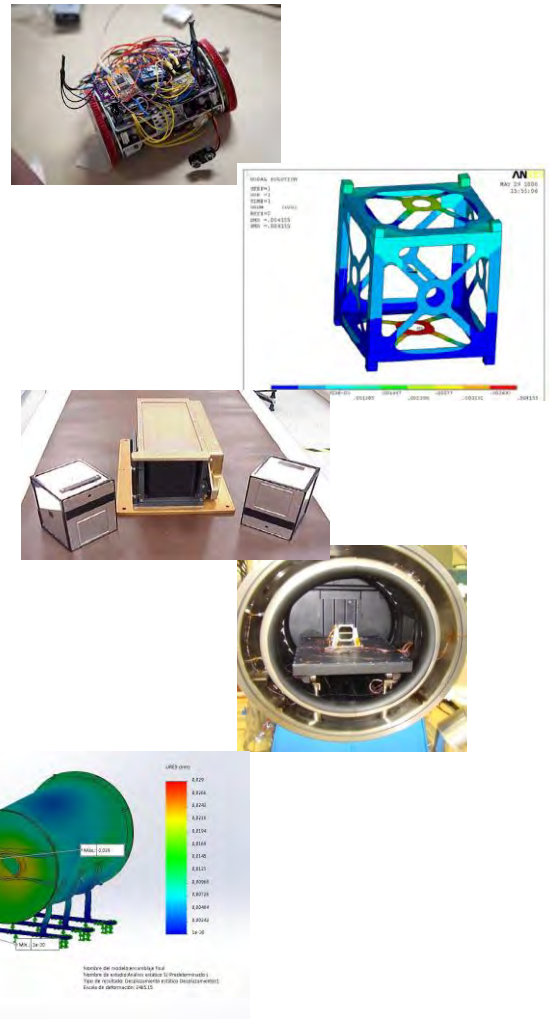
Edited by:
Cristhian Coronel

Agencia Espacial del Paraguay – Paraguay Space Agency (AEP)

Capacity-Building in Research & Innovation “CABURE+I 4S” Project

<u>Space Engineering Projects</u>

- *CanSat development*
- *Air Bearing based platform*
- *Attitude Control Using Reaction Wheels*
- *CUBESAT Training Kit development*
- *Thermal Vacuum Chamber*
- *APRS for remote sensing*



Capacity-Building in Research & Innovation
"CABURE+I 4S"
Project

About the Students

- Cristhian Coronel (The Nihon Gakko University – Electromechanics Department)
- Mayra Mosqueda (The Nihon Gakko University – Electromechanics Department)
- Guillermo Benitez (Asuncion National University - Polytechnic Faculty – Electronics Department)
- Lucas Moreira (Asuncion National University - Faculty of Engineering – Mechatronics Department)
- Jose Moreira (Asuncion National University - Faculty of Engineering – Mechatronics Department)
- Esteban Fretes (Asuncion National University - Faculty of Engineering – Mechatronics Department)
- Aldo Galeano (Asuncion National University - Faculty of Engineering – Mechatronics Department)
- Esteban Acosta (Asuncion National University - Faculty of Engineering – Electromechanics Department)
- Luis Miranda (Asuncion National University - Faculty of Engineering – Electronics Department)
- Guillermo Arguello (Asuncion National University - Faculty of Engineering – Mechatronics Department)
- Victor Cabrera (Asuncion National University - Faculty of Engineering – Mechatronics Department)

Capacity-Building in Research & Innovation "CABURE+I 4S" Project Newsletter

First semester 2019 Summary

Table of contents

1	Training week at CONATEL Paraguay	Page 5
2	Weekly meetings at AEP's Capacity Building Laboratory	Page 6
3	Air bearing based platform for ADCS ground tests	Page 7
4	The KurupiSat team is getting ready to compete	Page 8

See the next four pages for these items.

Training week at CONATEL Paraguay

On the week from April 22 to April 26 a selected group from the AEP where invited to participate of the ITU / ITSO TRAINING ON SATELLITE COMMUNICATIONS course. This was held in the training room on the 2nd floor of CONATEL PY's building located in downtown Asunción. CONATEL is our Paraguay FCC version.
The group was also accompanied by students members of the CABURE+I 4S team who where invited to be part of this amazing opportunity.

The course was about Satellite Communication Technologies and the importance of regulations that are needed for a correct and efficient management of signals from satellites.
One of the most interesting parts of the course was the amount of documentation and legal statements that involves the correct use of satellite signals. There are so many!, but not to worry, there are software developed exclusively for users to do all the process as easy as possible. The software as well as the Regulations are available for download on the ITU official web page.

From right to left. Lucas Moreira, AEP Research Director Dr. Diego Stalder, Prof. José Genes, Jesus Rivera (ITSO), AEP President, Cnel. (R) Liduvino Vielman, Pablo Palacios (ITU), Alvaro de Vega (ITU), AEP Director of Planning Dr. Jorge Kurita, AEP Director of Statistics Javier Ferrer, and Cristhian Coronel.

ITU (International Telecommunication Union) Logo

ITSO (International Telecommunications Satellite Organization) Logo

CONATEL (National Commission of Telecommunications) Logo

Engineers Álvaro de Vega (ITU) on the left and Jesús Rivera (ITSO) on the right, were the experts who made an outstanding and dynamic presentation during the intensive five days of training.
Photo: CONATEL PY

Page 5

Student Cristhian Coronel – The Nihon Gakko University. April 29, 2019

Weekly meetings at AEP's Capacity Building Laboratory

Every week the CABURE+I 4S Project Team gathers in the Technological Studies Center of the Asuncion National University (Aka CETUNA). The meeting is held in the AEP's Capacity Building Laboratory where all student members of the team attend to participate by presenting their progress on their assigned tasks and activities. This way, students obtain experiences and comments on their work from peers and invited faculties.

The meeting was held every week non stop since February. Even in the week where some members of the team were in the ITU / ITSO Training Course.
Here we see Dr. Jorge Kurita (left), one of the main promoters of this initiative, and the students Aldo Galeano (middle) and Esteban Acosta (right), one of the days of the training course. Dr. Kurita is even still wearing his name tag from the course!

The meetings often are scheduled every week on Wednesdays. However we created a new section of topics to talk about, therefore we now are reviewing the days of meeting. But it is still taken ahead every week!

One of the main topics discussed on the meetings are each student thesis works.
They talk about the activities, progress and comment about the task they have completed over the week.

Every meeting is taken very seriously. Academic advisors are invited to listen to the student's presentations that, last no more than 15 minutes each.
All meetings were similarly conducted, it all started with the greetings from the advisors. They also gave us a treat.
After all ends, the crew gathers to take a group picture.

Student Esteban Fretes on the right making the popular Selfie picture with the team behind.

(From right to left) Students Esteban Fretes, Christian Paniagua and Jorge Chaparro, Dr. Jorge Kurita, Cristhian Coronel, Dr. Diego Stalder, Aldo Galeano and Esteban Acosta, Eng. Javier Ferrer and Lucas Moreira.

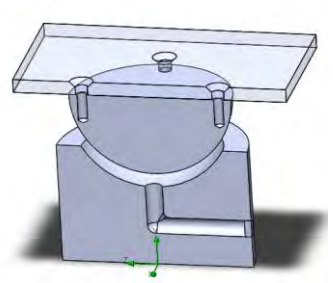
Photo: Esteban Fretes, May 3.

Air bearing based platform for ADCS ground tests

Aldo Galeano and Esteban Fretes are two students of Mechatronics Engineering at FIUNA (Facultad de Ingenieria – Universidad Nacional de Asunción) whose final degree project subject is the "Design and implementation of a frictionless platform for tests of Attitude Control Systems for satellites." The topic was selected according to AEP's research interest, this is, the development of CubeSats. This is a critical test bench in the ADCS validation process.
The project was presented and approved by FIUNA by the end of April.

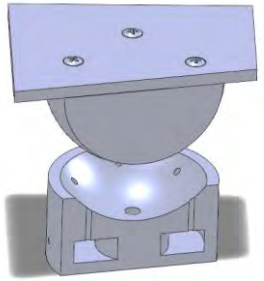
Initial designs

After an extensive literature review, the SolidWorks design of two configurations of spherical air bearings was started. The dynamic air flow was simulated as well as its effect on the platform. It is expected to revise the design continuously as identifying which design parameters are relevant.



Monoflow

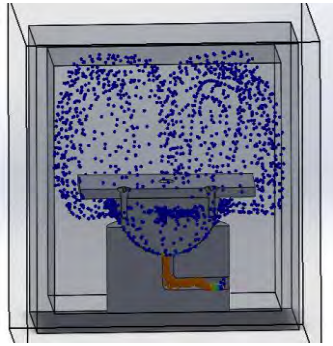
This configuration have the air inlet at the center of the cup (lower part of the spherical air bearing) and the air outlet on the periphery of the sphere.



Multiflow

This configuration has the air inlet in 6 capillary tubes equidistant from the center and the air outlet on the center of the cup and the periphery of the sphere.

Simulation results during the Computational Fluids Dynamics (CFD) analysis perform to the Monoflow design using the SolidWorks add-on "Flow Simulation."



Aldo Galeano on the left and Esteban Fretes on the right, holding the log notebook and the official final degree project title acceptance letter from FIUNA.

That is the first step of the final journey in order to graduate as Mechatronics Engineers.

Congratulations and keep up the good work!

Page 7

Aldo Galeano and Esteban Fretes – Students from the Asuncion National University. May 27, 2019

The KurupiSat team is getting ready to compete

After the success of the first edition CubeDesign competition in Brazil, the Group of Technological Capacitation in Space Engineering (CTEE) of the Post-graduation course in Space Engineering and Technology of INPE (Instuto Nacional de Pesquisas Espaciais), has announced the 2nd CubeDesign competition, which will be held between July 24th to July 27th, 2019, at INPE, in São José dos Campos, Brazil. We are the Paraguayan Team that is going to compete at the CANSAT category.

Wish us luck!

The team gathers several times a week to discuss topics related to the competition.

The group is made up of intern students from the Paraguay Space Agency.
The tasks are due according to the skill of each one.
Some of the objectives that we must fulfill are:

- Achieve a non-catastrophic landing for the payload
- Make an altitude measurement during the flight
- Perform a ground mission once landed.

The cansat will be launched through a water rocket.

We are doing tests on parachute fabrics and models for automatic deployment.

Students Cristhian Coronel (left) and Lucas Moreira (right) during the design of one of the parachutes prototypes

Prof. Miguel Angel Volpe, showing a type of parachute used in model rocketry

Fun Fact:
The name of our team “Kurupi” is taken from a very traditional creature in Guaraní mythology.
He is one of the seven monstrous children of “Tau” and “Kerana”, and as such is one of the central legendary creatures in the region of Guaraní speaking cultures.
He is also one of the few creatures still prominent in the modern culture of the region.

Lucas Moreira – Student from the Asuncion National University. May 30 2019

04. “Africa Space Forum” during TICAD 7

If you are attending **TICAD 7** in Yokohama during 28-30 August 2019, be sure to attend this side event: **“Africa Space Forum”** at the times and location shown in the block below. This block is from the “TICAD7 Official Side Events” shown at the right, which you can download from MOFA 外務省 website. It is 31 pages long and is 1.5 MB in size.

A central event during this forum is a **panel discussion**. Please note that Prof. Mengu Cho is a member of this panel. After the forum, there will be a reception for networking. See you at this forum.

Time	Name of Seminars and Symposiums	Name of the Main Organizer
18:00~19:30 Venue Annex Hall･F203	Africa Space Forum - space inclusion by applying space technology **28 Aug. 2019**	Cabinet Office, Ministry of Internal Affairs & Communication、Ministry of Foreign Affairs、Ministry of Education, Sports, Science & Technology、Ministry of Economy、Trade & Industry、Japan Aerospace Exploration Agency(JAXA)
This forum explores the potential of enhancing Japanese-African space cooperation, focusing on the examples of space utilization familiar to African people such as the use of micro-satellites which will lead to transfer of technology, and the application of space technology to solve social challenges in such areas transfer as global health, forestry, agriculture and infrastructure monitoring.		

You can download this 31-page brochure form :

https://www.mofa.go.jp/region/africa/ticad/ticad7/pdf/program_en.pdf

Africa Space Forum is organized by:

AFRICA SPACE FORUM

Language CONTACT US

PROGRAM

18:00 Open the "Africa Space Forum" @F203, Annex Hall

- Opening Remarks: TBD and **Mr. Tetsuro Yano**, President, AFRECO
- Keynote Presentation: Minister of Higher Education and Scientific Research, the Arab Republic of Egypt
- Introductory Presentation by Speakers:
  - **Prof. Shinichi Nakasuka**, University of Tokyo
  - **Dr. Koichi Wakata**, Japanese Astronaut and Director General, Human Spaceflight Technology Directorate, JAXA
  - African Development Bank Representative (TBD)
  - **Dr. Chiaki Mukai**, Senior Advisor to the Director General, JAXA
  - **Mr. Kenichi Shishido**, Director General of Rural Development Department, JICA
- Roundtable Discussion
- Closing Remarks: **Prof. Mengu Cho**, Kyushu Institute of Technology

GO TO THE SITE:

http://www.africaspaceforum.org/

05. New Kyutech brochure for 2019-2020

Download the new English-language **2019-2020 Kyutech brochure** by going here:

https://www.kyutech.ac.jp/information/publication.html#03

It is only 13.5 MB in size; 17 pages.

This→ is mentioned in the brochure

Smallsats by the Numbers by Bryce Space and Technology (2018, 2019)

Kyutech has been recognized 2 years in a row as having **the most launches of small satellites** among academic institutions of the world. This recognition is from a report published by Bryce Space and Technology. Kyutech deployed 5 smallsats into orbit in 2018 and 4 will be launched in 2019, and it is expected that the smallsat launch tally will reach 18 by the end of 2019.

06. BIRDS-1 member Turo defends his Phd thesis in public hearing on 31 July 2019

Title of Phd thesis:
Standardized, flexible interface design for a CubeSat bus system
Defender of thesis:
Turtogtokh Tumenjargal, NUM, Mongolia
Location of defense:
Room S-2A, Tobata Campus, Kyutech, Kitakyushu, Japan

07. Summer of 2019: Kyutech Open Campus, 2nd and 3rd August

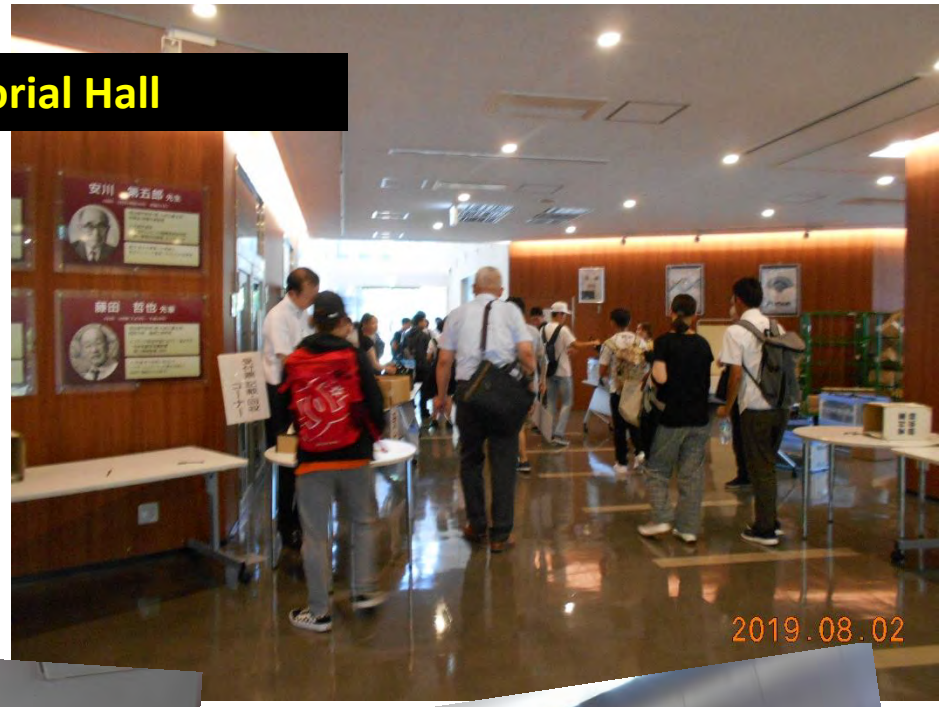
During **Open Campus**, the general public is invited to see the staff and facilities of this engineering college. On just the first day, 2 Aug, over 1600 parents and kids came to inspect Kyutech as a possible place for those kids to attend college.

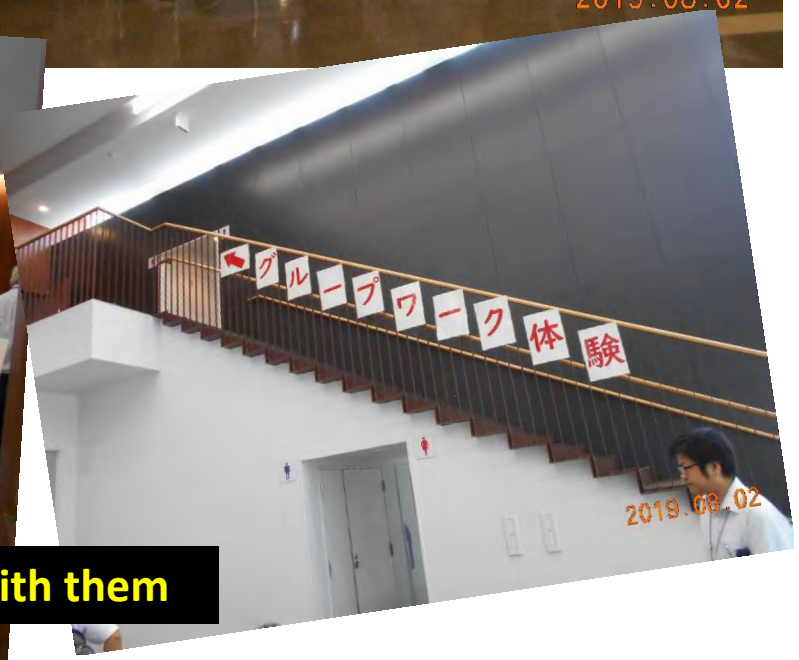
★ Continued on the next three pages ★

Reception area

Kyutech
Kyushu Institute of Technology

Nakamura Memorial Hall

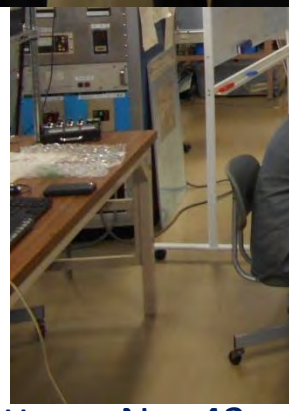




Kyutech prepared lots and lots of publications for parents/kids to take home with them

Introducing *space systems engineering* at Kyutech

Banner standing outside our building



Other areas . . .

Automotive engineering

Dormitory information for future students

Every lab opened its door for tours

Free cold tea … for very hot weather.

End of this report about Open Campus

08. Kyutech undertook a visit to Makerere University in Uganda

College of Natural Sciences (CoNAS)
Makerere University

Home About CoNAS Schools Academics Publications

Home ›

Old Space vs. New Space

PHOTO OF 24 JUNE 2019 ON THE CAMPUS OF MAKERERE UNIV. IN KAMPALA, UGANDA.

The Department of Physics hosted Mr. Maeda George from Japan on 24/06/2019 who gave a presentation on Space Science. The abstract below gives an account of old space vs new space.

You can visit the full website of Makerere Dept. of Physics: http://cns.mak.ac.ug/news/old-space-vs-new-space

G. Maeda gave a talk about small satellites to staff and students of the physics department in a very warm classroom

With the head of the department

With Prof. Florence

With some members of the physics department

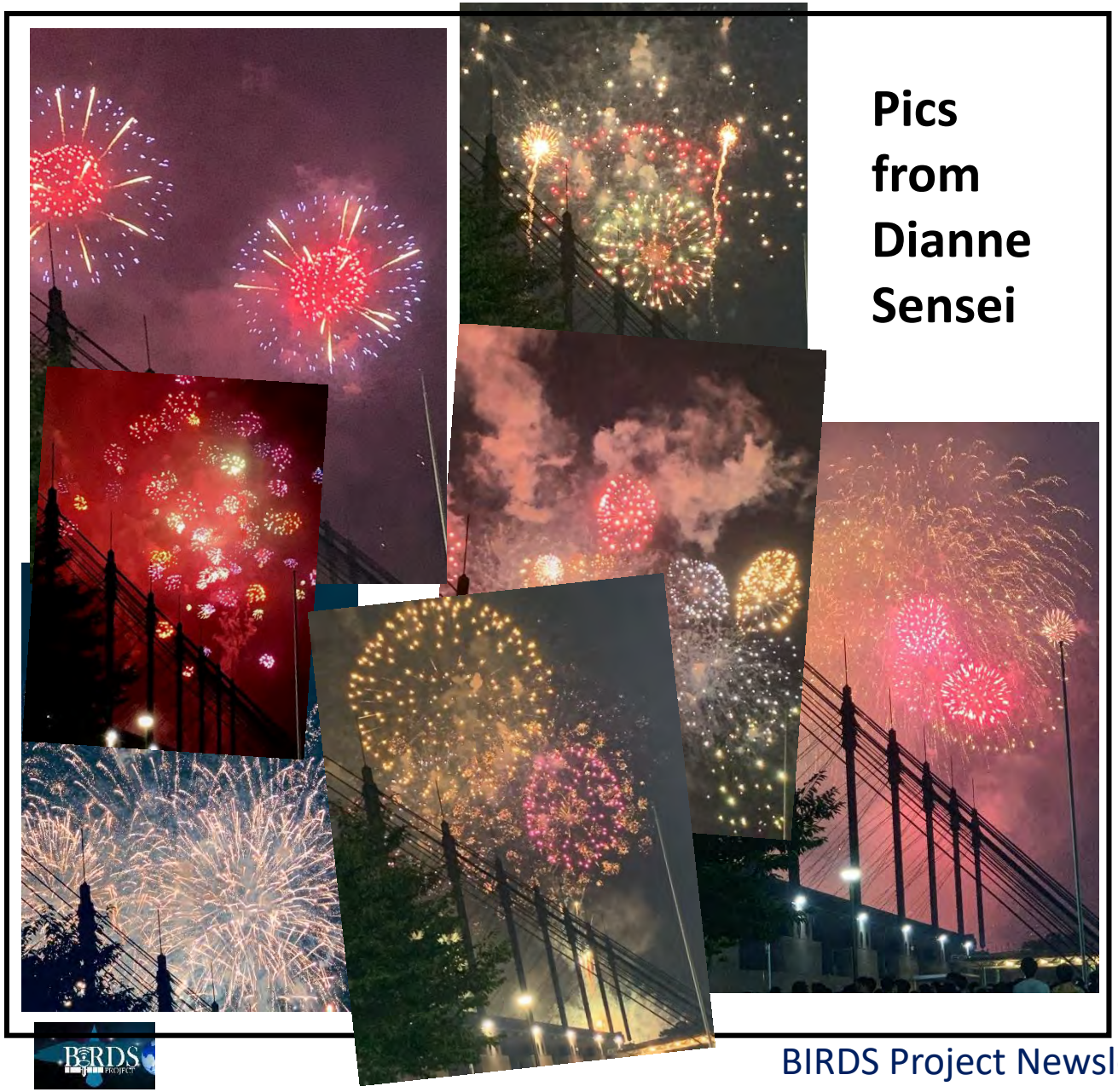
Uganda

With Prof. Florence, Stephen Taabu, and other members of the Makerere physics department, we visited *MoSTI, Ministry of Science, Technology & Innovation*

Shaking hands with the Minister of MoSTI.
I am giving him a gift (cakes and cookies) from Japan.

End of the report from Uganda

09. Kokura fireworks of 2 Aug 2019



Pics from Dianne Sensei

2019年(令和元年)8月3日(土曜日)

「わっしょい百万」開幕 北九州

北九州市の「わっしょい百万夏まつり」が2日、小倉北区で開幕した。初日は約1万発の花火が夜空を彩った=写真=。4日まで。

花火大会は、北九州港沿いのミクニワールドスタジアム北九州をメイン会場に実施。沖合から花火が大音量とともに打ち上げられるたびに、スタジアムの観客席を埋めた市民らから歓声が上がった。3日は「夏まつり大集合」と銘打ち、戸畑祇園大山笠や小倉祇園太鼓など市内の夏祭りが小倉城周辺に集結。4日は、浴衣や法被姿で通りを練り歩く「百万踊り」でフィナーレを飾る。

YOMIURI, 2019.8.4

北九州の夏 華やか共演

北九州市内の祭りが一堂に会する「夏まつり大集合」が3日、同市小倉北区の市役所前で行われ、豪華絢爛な山笠や山車の共演が大勢の見物客を楽しませた=写真、大野博昭撮影=。

開催中の「わっしょい百万夏まつり」の名物行事の一つ。ピラミッド形の提灯山笠で知られる「戸畑祇園大山笠」(戸畑区)、今年3月に国の重要無形民俗文化財に指定された「小倉祇園太鼓」(小倉北区)など九つの祭りの出し物が次々に披露され、見物客は大きな拍手を送っていた。

最終日の4日は、浴衣や法被姿の市民約1万人が通りを練り歩く「百万踊り」がフィナーレを飾る。

BIRDS/SEIC students busy doing SNS after the fireworks →

OLAYINKA'S WORLD

COLUMN NO 13

OLAYINKA FAGBEMIRO
ASSISTANT CHIEF SCIENTIFIC OFFICER,NATIONAL SPACE RESEARCH & DEVELOPMENT AGENCY(NASRDA), ABUJA. NIGERIA. HEAD, SPACE EDUCATION UNIT
NATIONAL COORDINATOR, ASTRONOMERS WITHOUT BORDERS (AWB) NIGERIA
PUBLIC RELATIONS AND EDUCATION OFFICER, AFRICAN ASTRONOMICAL SOCIETY (AfAS)

Olayinka's World
...in space to make a difference

AWBNigeria's Participation in the ASGARD IX EXPERIMENT

From the 10th to the 14th of June, 2019, the AWB Nigeria took a team High School students from the NAOWA College, Abuja, Nigeria to represent Nigeria at the ASGARD IX Project in Brussels, Belgium. The was coordinated to come up with a Science experiment, involving some selected food seeds which was flown to the edge of Space on a high-altitude Stratospheric Balloon at the Royal Meteorological Institute.

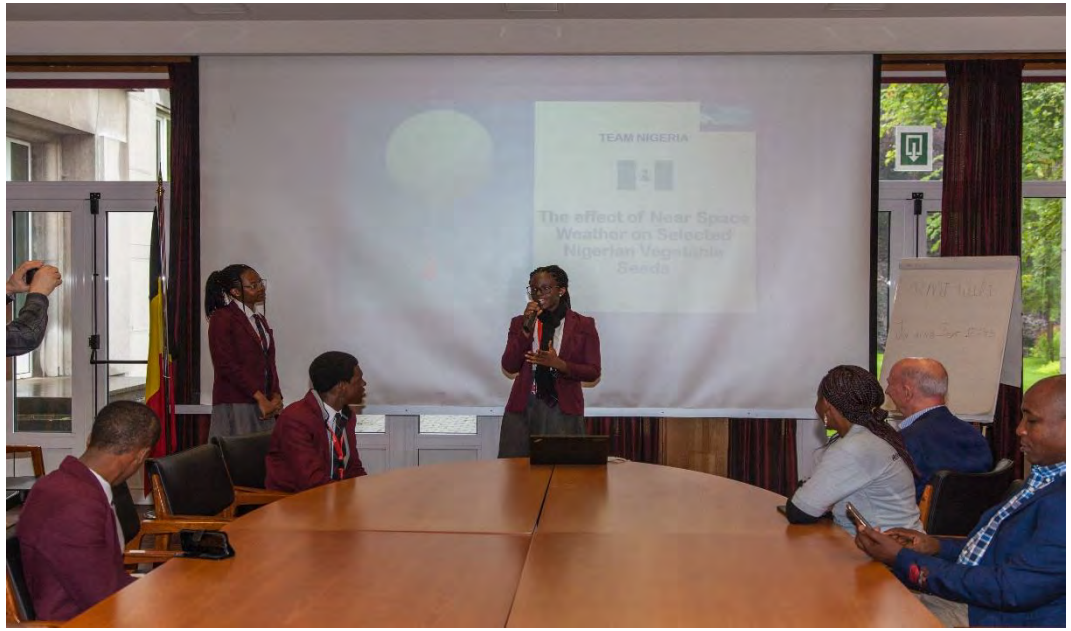
The team also participated in various space related activities during the course of their stay in Brussels, Belgium.

Activities such as a guided tour of MIRA Observatory; guided tour of Royal Belgian Institute of Natural Sciences; guided tour of Belgium Royal Observatory, among others.

The team also had the opportunity to meet with a foremost Belgian Astronaut, Dirk Frimout, who gave a lecture on his flight to the ISS and also the future of Space Exploration. A Professor of Astrophysics, Department of Physics, UAntwerpen , Prof. Katrien Kolenberg also gave a lecture on Stars. The team visited the Brussels Planetarium, where they had the privilege of listening to an Astronomy educational lecture.

See photos on the next page

Team Nigeria with Belgian Astronaut, Dirk Firmout, in the middle



The NAOWA College students making a presentation on their experiment

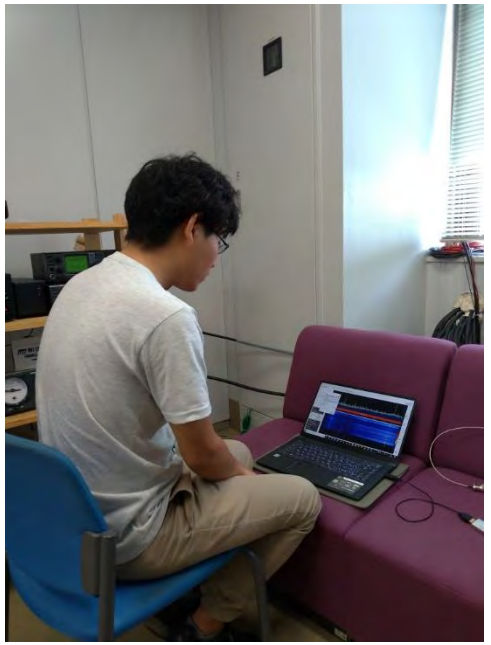
The team at the MIRA Observatory

11. NARSSCube-2's first beacon was received at Kyutech Ground Station on 8 August 2019

NARSSCube 1 & 2 Flight Models

NARSSCube-2 is the satellite built in-house by National Authority for Remote Sensing & Space Sciences of Egypt.

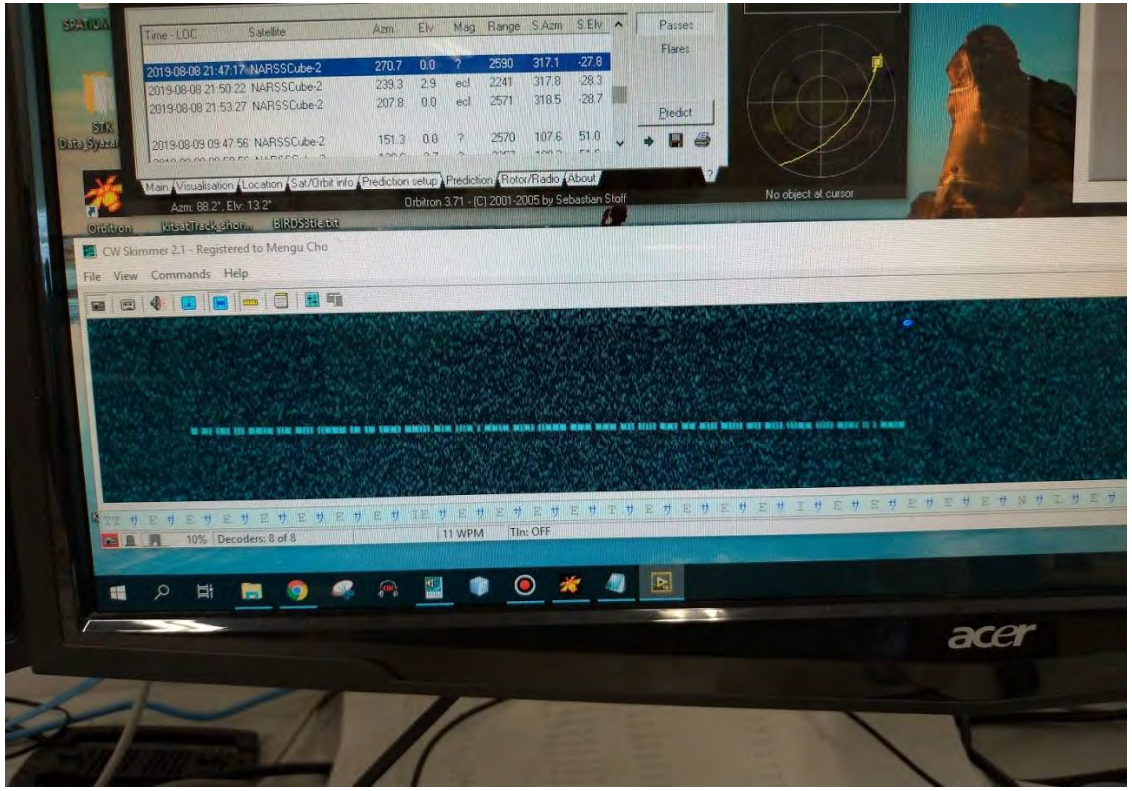
The goal of NARSSCube project is to demonstrate, in orbit, the capabilities of NARSS team to develop in house satellite subsystems. An the satellite has been tested at Kyutech. NARSSCube-2 has been built totally in-house and deployed from Cygnus module on Aug 7, 2019 at 1530 UTC.



Kyutech team operated the BIRDS and HORYU gnd stations for receiving NARSSCube-2 signal during August 8-10, 2019

Report by
Apiwat Jirawattanaphol (HS4SCI/JE6RJA), BIRDS-1

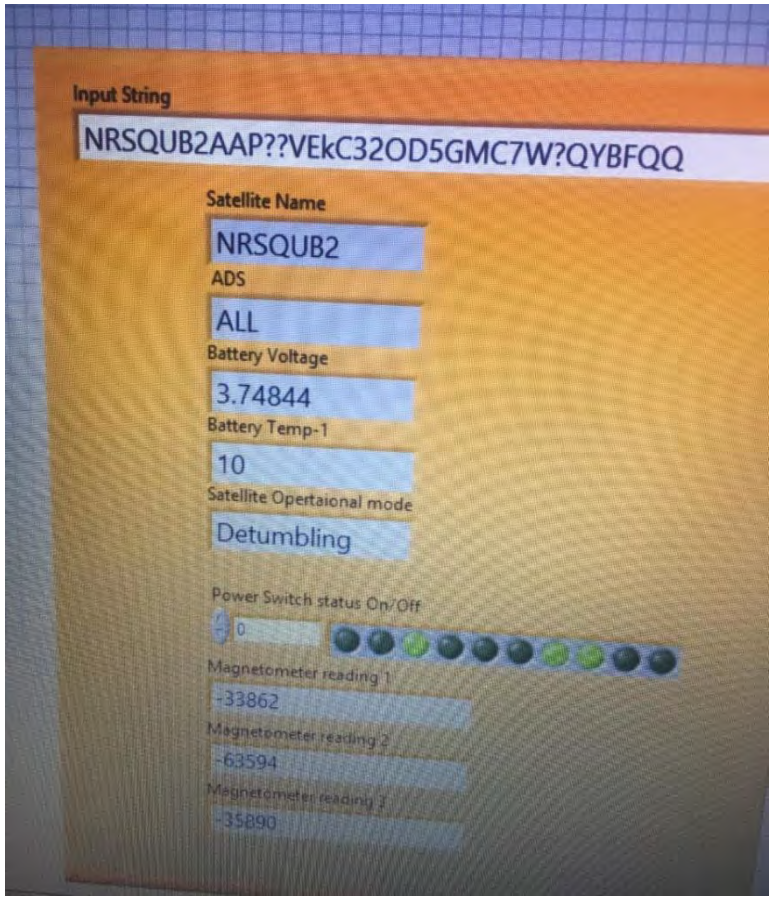
Continued on the next page



NARSSCube-2 beacon transmitting at 60 WPM speed. HORYU-4 GS at Kyutech able to capture the beacon signal as show in above photo. The satellite is transmitting beacon in 6 minutes interval.

The beacon contains

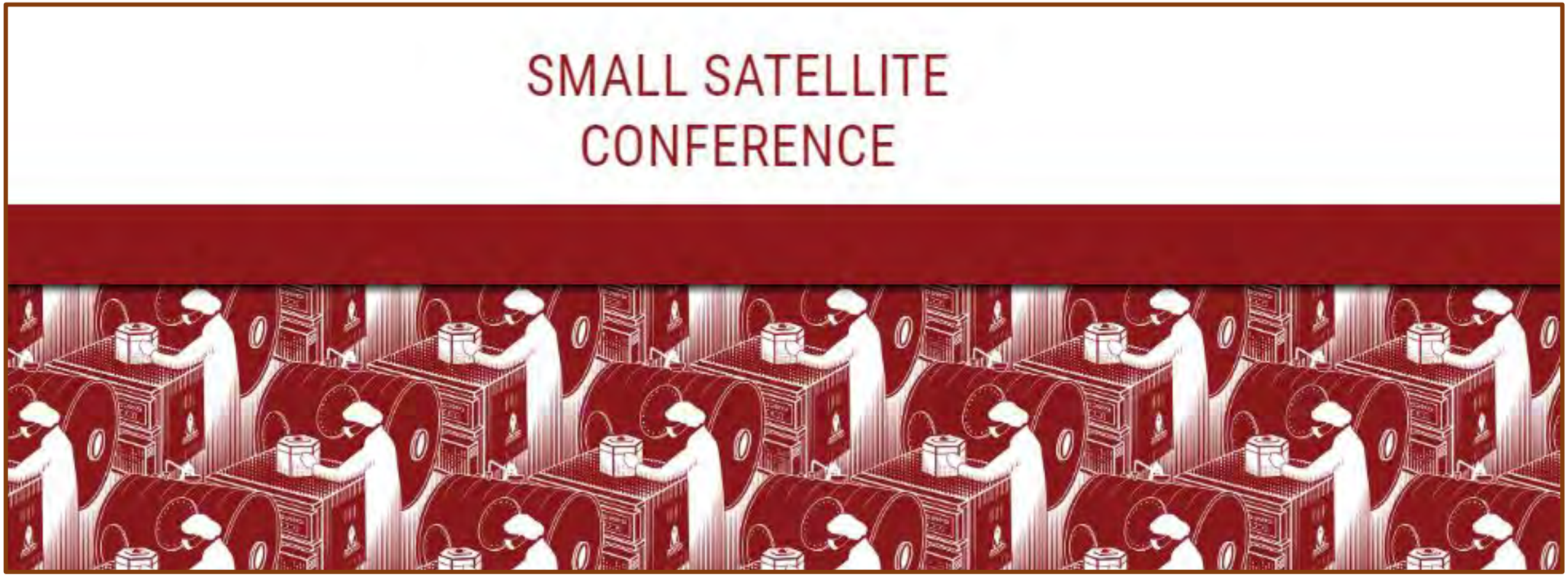
- **Satellite name**
- **Battery voltage**
- **Satellite operation mode**
- **Temperature**
- **Mission data**



NARSSCube-2 beacon after analyzed by NARSS team in Egypt. All data show satellite is in good condition. After receive beacon, **NARSS ground station success to sent tele-command to the satellite.** The satellite is responding to ground commands.

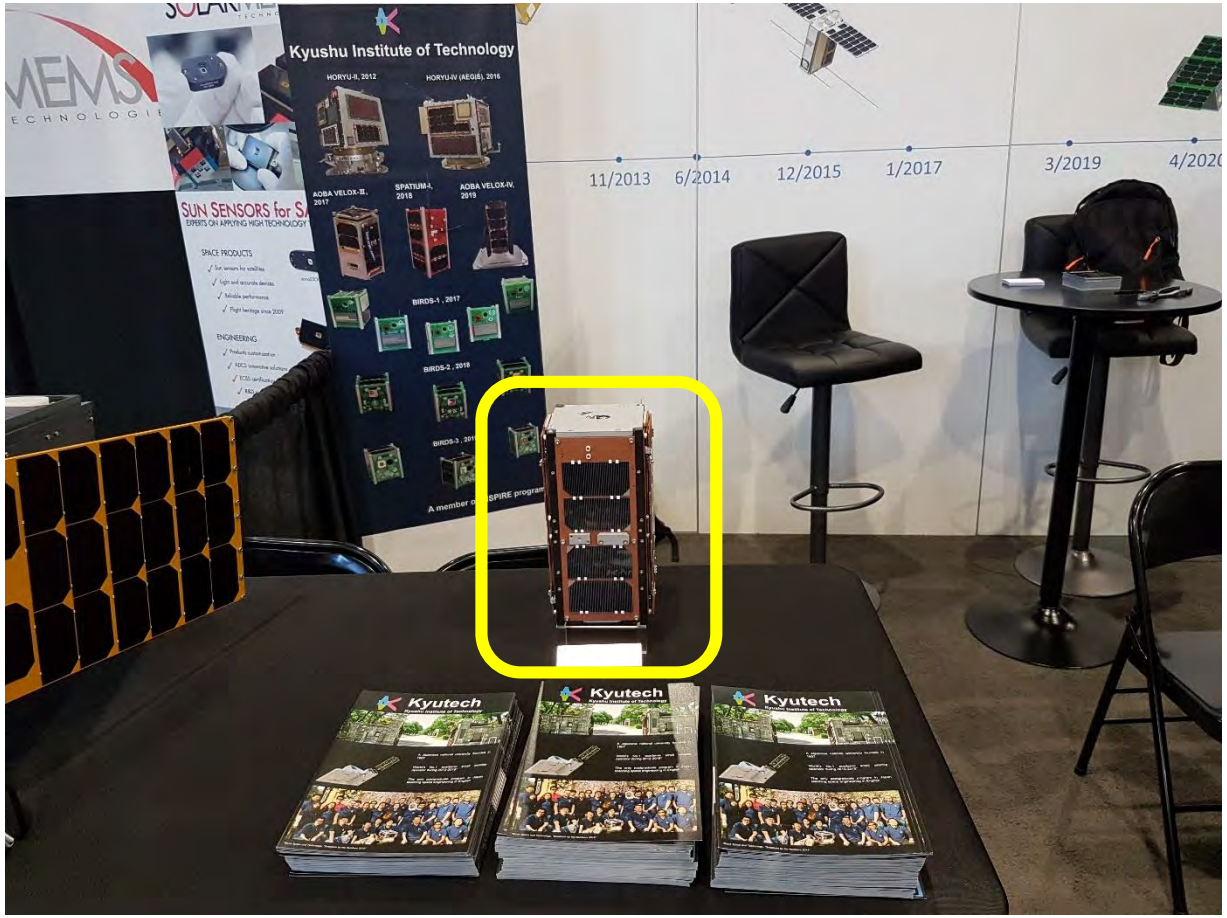
End of report

12. Kyutech participates in “Small Satellite Conference” in Utah State, USA

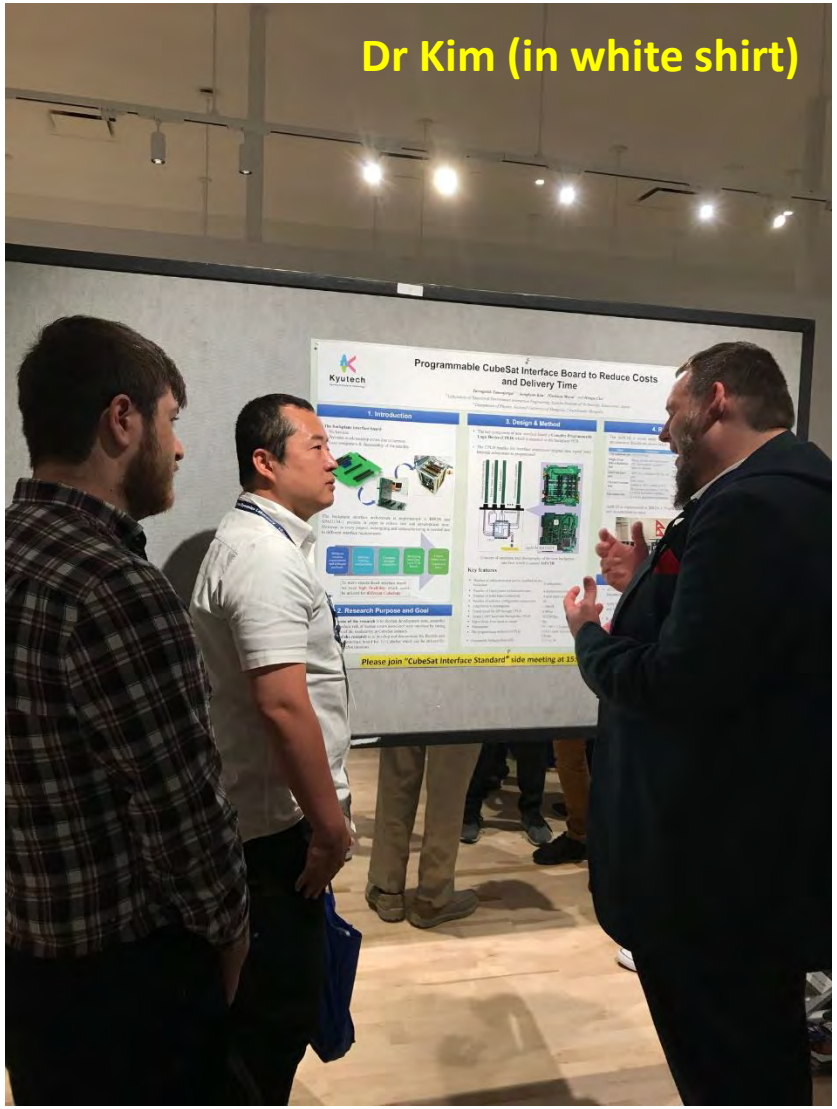


Homepage: https://smallsat.org/

Prof. Cho and Assistant Prof. Kim attended the 33rd AIAA/USU Conference on Small Satellites of August 3-8, 2019, in the State of Utah.



This is a mock up of AOBA VELOX-IV.



13. Cal Poly intern students gave presentations during Cho Lab weekly seminar

Kent Rush delivered the following presentation on 7 August

https://birds3.birds-project.com/wp-content/uploads/2019/08/Kent-Seminar-Presentation-.pdf

Bobby Reid delivered the following presentation on 7 August

https://birds3.birds-project.com/wp-content/uploads/2019/08/Bobby-seminar-presentation.pdf

Both presentations were well done !

14. Angel David Arcia Gil (Panama) visited Kyutech on 19 July

Angel David Arcia Gil is a lecturer at a private university in Panama called “Universidad Católica Santa María La Antigua“. We hope Panama will join BIRDS-5.

Dr. Rodrigo and Mr. Arcia Gil

15. Kyutech visit written up in JAMSAT Newsletter No.294 (01 August 2019)

On 16 July 2019, Mr Mikio Mouri (JA3GEP) visited Kyutech to give a talk to SEIC students about amateur radio and about QO-100.

His report (English version) is reprinted at the right and on the next page.

JAMSAT visited Kyutech BIRDS Project to promote QO-100

JA3GEP Mikio Mouri JAMSAT

I had a chance to visit Kyutech (Kyushu Institute of Technology) and gave a talk to BIRDS project members about amateur satellite and especially QO-100. In this project, Joint Global Multi Nation Birds, students from overseas are working hard to design, manufacture, test, launch and receive signals from satellite. This project was awarded 2017 Airbus Award for Diversity in Engineering for its achievement.

Apiwat-san, HS4SCI/JR6RJA, is an active JAMSAT member and played an important roll in setting up QO-100 ground station in Thailand with JAMSAT for years. He has reported HS0AJ and satellite JAISAT-1 progress every year at our JAMSAT Symposium. He prepared and witnessed first-ever QSO from Thailand to QO-100.

At last, Phase-4A was realized on Es'hail-2. I pushed Apiwat-san to introduce QO-100 to his project members if they have interest in QO-100. "Now new geo syncronous amateur satellite is realized, but unfortiunately we can not see it from Japan. But if you think of your home country, most of you can see QO-100 from your home! Why don't you try?"
Apiwat-san made a presentation to his members with JAMSAT Newsletter backnumbers and AMSAT-DL's material.

The first reaction from attendee was very positive. Students from more than 8 countries said "Yes, I will try".

To hear that, I asked if I can visit Kyutech and talk to them directly about amateur satellite. The instructor of the project approved the plan, and I was given an opportunity to make 90minute "special lecture" at Kyutech on 16th, July. It was an exciting experience.

I know they are working on artificial satellite and communication technology for their image and data gathering. Most satellites are on LEO (low earth orbit).

At this given opportunity, I want to introduce world of amateur satellite, which are designed and operated for worldwide radio amateur communications. Our pioneers had tried hard to get high earth orbit for more wide communication range. That was long eriptic/Molnya orbit (Phase-3) and geo syncronous orbit (Phase-4) satellite. Only 4 out of 100, AO-10, AO-13, AO-40 and QO-100, reached high earth orbit. It is hard indeed.

The story of QO-100 (Phase-4A, Es'hail-2) is well documented in AMSAT-DL's material, which I presented. I added a brief history of OSCAR (Orbiting Satellite Carrying Amater Radio) and our struggle to reach high orbit. I stressed AMSAT-DL's hard work before a prince came to a rescue on white horse (or on white camel?!).
I added the details of our ground station prepared for Thailand. It is now working well even in edge of Es'hail-2's footprint.

To my pleasure, more than 20 students from over twelve countries joined the lecture. They are from: Thailand, Malaysia, Bhutan, Nepal, Bangladesh, Sri Lanka, Sudan, Egypt, Indonesia, Ghana, Nigeria, Philippines ....
I have heard some has aleredy own his/her homeland callsign.

After my presentation, they asked me a lot of questuons very aggressively. "What equioment do we need?", "How much the necessary cost?",

JAMSAT Newsletter No.294(2019-Aug-01) Page25

Cont'd on next page

"Where can we get equipment?", "How can I establish our AMSAT?", and …
As for me, QO-100 is a little bit "another world", even though I have read and translated many Phase-4A materials. But for them, QO-100 is very familiar and they want to start preparation work immediately. It is only natural. I promissed them to consult our Board members, and propose some basic model station, blockdiagram and rough cost estimate soon.

Such model may include,
1. Commercial U/V all-mode transceiver + LNB and down-converter + up-converter and PaowerAmp
2. Use PC and SDR(Soft Ware Radio) for some portion

I am very glad to receive positive words from project leaders after my visit. Amateur radio is a little bit different from academic use. But make friends with satellite communication must be a very exciting experience not only for students, but also for junior highschool students or his/her parents, I believe. I hope this activity may help younger people show interests in science and technology.

I plotted the countries the students come from on world atlas with QO-100 footprint. I am amazed how wide the coverage is, and so many countries students are from to join Kyutech BIRDS projects.
I think we must enjoy full advantage of QO-100's worldwide communication opportunity.

After lecture I have a chance to visit the Center for Nanosatellite Testing, Kyushu Institute of Technology (CeNT). This is the first test facility in Japan for nanosatellite, and it can conduct all the required tests except radiation test. I also visited antenna farm on the rooftop. It was impressive.

I must say thank you to Professor Cho-sensei, Assistant Professor Maeda-sensei, Apiwat-san and all others who gave us this opportunity. We hope to continue co-work to advance worldwide communications via atellite.

JAMSAT

QO-100 Footprint and Countries the students come from

With Kyutech BIRDS Project members

JAMSAT

End of reprint

16. International Workshop on Lean Satellite – 2019, 4-5 December

International Workshop on Lean Satellite – 2019

A “lean satellite” is a satellite that utilizes non-traditional, risk-taking development and management approaches – with the aim to provide value of some kind to the customer at low-cost and without taking much time to realize the satellite mission. These approaches differ significantly from traditional approaches to satellite development. The term “lean satellite” was born during the activities related to the international standardization of small/micro/nano/pico satellite testing starting from 2011. There was no clear definition of the terms “small”, “micro”, “nano”, “pico” that was agreeable to all concerned. So to capture the essence of development and management philosophy -- rather than categorizing based on mass or size -- the term “lean satellite” was adopted.

Every year since 2011, an international workshop to discuss various aspects of lean satellites. This international effort has led to the publication of ISO-19683 “Space systems — Design qualification and acceptance tests of small spacecraft and units” in July, 2017 and ISO-TS-20991 “Space systems -- Requirements for small spacecraft” in August, 2018.

The purpose of this two-day workshop in December 2019 is to further promote the study on lean satellites. To deliver the satellites’ value to stakeholders with affordable cost and permissible waiting time, there are various issues to be examined further, such as standards, testing, operation, manufacturing, interface, project management, etc. This year’s workshop puts an emphasis on CubeSat interface standardization. In June 2019, a new initiative to make an ISO standard of CubeSat electrical interface started. There is a strong need to standardize the interface to shorten the satellite delivery time by assuring compatibility among CubeSat components and also to promote international trade and collaboration. During the workshop, the issues related to CubeSat interface will be discussed in depth.

Full text is here: https://lean-sat.org/2019_nets-regist/

Nepalese Media covered Nepalisat-1's First Photos of Space

Hari Ram Shrestha

BIRDS-3

13 August 2019

News focused on Nepalisat-1's Pictures

Written by: Hari Ram Shrestha

अन्तरिक्षमा पुगेको नेपालको पहिलो भू-उपग्रह 'नेपाली स्याट-१' डेढ महिनादेखि पृथ्वीको कक्षमा घुमिरहेको छ। तर, स्याटलाइटबाट तथ्यांक लिने र विश्लेषण गर्ने ग्राउन्ड स्टेसन भने अझै तयार भएको छैन। ग्राउन्ड स्टेसन नहुँदा भू-उप्रगहले पठाउने तथ्यांक नेपालबाट विश्लेषण हुन सकेको छैन।

नेपाल विज्ञान तथा प्रविधि प्रज्ञा प्रतिष्ठान (नास्ट)ले ग्राउन्ड स्टेसन बनाउन आव ०७५/७६ मा छुट्याएको बजेट नै फ्रिज भएको हो। ग्राउन्ड स्टेसन बनाउन १९ चैतमा बोलपत्र आह्वान गरेको नास्टले सप्लायर्स डिकेड इन्टरनेसनलसँग १९ लाख १५ हजारमा सम्झौता गरेको थियो। तर, समयमै सामान खरिद गरेर कागजात पूरा नगरेकाले बजेट खर्च नभएको नास्ट प्रवक्ता डा. सुरेश ढुंगेलले बताए।

तर, साउन मसान्तभित्रै ग्राउन्ड स्टेसन तयार हुने प्रवक्ता ढुंगेलको दाबी छ। 'सबै काम सकिएको छ, अब एन्टेनाको पिलर उठाउने काम मात्रै बाँकी छ,' उनले भने, 'निःसर्त अनुदान रोकिएको छ, ससर्त अनुदानका लागि योजना र बजेट पठाइसकेको छौं। यसवर्ष ग्राउन्ड स्टेसनका लागि पुनः २० लाख विनियोजन भएको छ।' ग्राउन्ड स्टेसनका लागि ट्रान्समिटर, रिसिभर, एन्टिना, कम्प्युटर,

'नेपाली स्याटलाइट अन्तरिक्षमा छ, तर ग्राउन्ड स्टेसन तयार नहुदा स्याटलाइटबाट तथ्यांक लिएर विश्लेषण गर्न पाइएको छैन,' स्याटलाइट निर्माणमा संलग्न नास्टका वैज्ञानिक हरिराम श्रेष्ठले भने। २ असारमा अन्तर्राष्ट्रिय अन्तरीक्षकक्ष (आइएसएस)बाट नेपाली स्याटलाइटसँगै श्रीलंकाको 'राभाना' र जापानको 'उगिसु' नामक नानो स्याटलाइट पृथ्वीको कक्षमा छाडिएका थिए। स्याटलाइट निर्माणमा सहयोग गर्ने जापानको आफ्नै ग्राउन्ड स्टेसन छ। श्रीलंकाले पनि आफ्नो स्याटलाइटले लिएका तथ्यांक आफ्नै ग्राउन्ड स्टेसनबाट विश्लेषण गर्न थालिसकेको छ।

नेपाली वैज्ञानिक आभाष मास्के र हरिराम श्रेष्ठले जापानी क्युटेक युनिभर्सिटीको बर्ईस-थ्री परियोजनाअन्तर्गत बनाएका नेपाल, श्रीलंका र जापानका तीनवटै स्याटलाइट ५ जेठमा अमेरिकाको भर्जिनियाबाट अन्तर्राष्ट्रिय अन्तरीक्ष कक्ष (आइएसएस) पठाइएको थियो।

#नेपाली स्याटलाइट # तस्बिर प्राप्त

Link: sharesansar

Summary

Naya Patrika, a Nepal news publication, printed this news. It highlighted the first two official photos captured by Nepalisat-1, Nepal's first nanosatellite under BIRDS-3 Project of KyuTech, Japan. Other published photos can be found at BIRDS-3 Project's official website: BIRDS-3 The news also covered Nepal's ground station: its status, key point person, contractor, among others. *Link:NayaPatrika*

News highlighted on BIRDS-3 Pictures

Written by: Hari Ram Shrestha

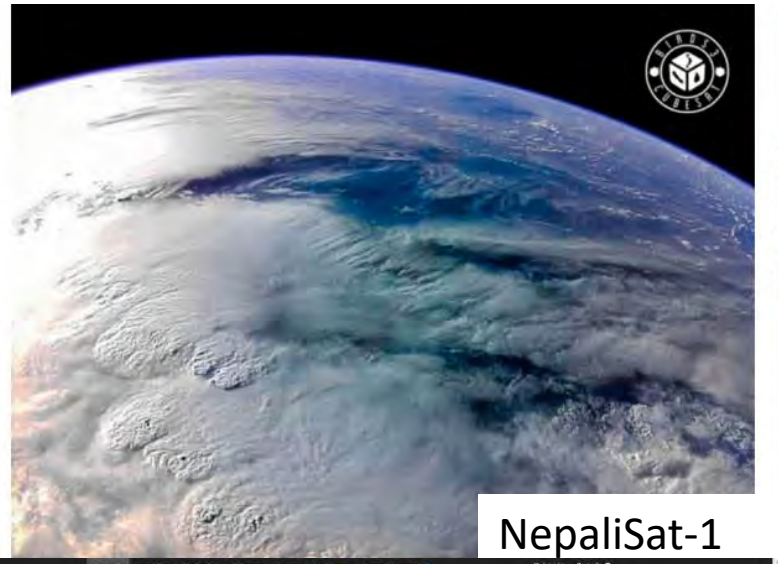
MAKWANPUR, August 3: Two photos captured by Nepal's first satellite, NepaliSat-1, were made public on Friday.

The satellite that went into Earth orbit on June 17 made the photos public via the website and social media under the United Nations Federation BIRDS 3 Project.

Hariram Shrestha, one of the scientists involved in launching the satellite, informed that photos captured by the satellites of Sri Lanka and Nepal were sent to the National Academy of Science and Technology via email on Friday.

"The first picture captures the sun while the other shows clouds drifting in the sky over Japan. Of the six photos captured, three are of the sun and the rest are of Earth," said Shrestha.

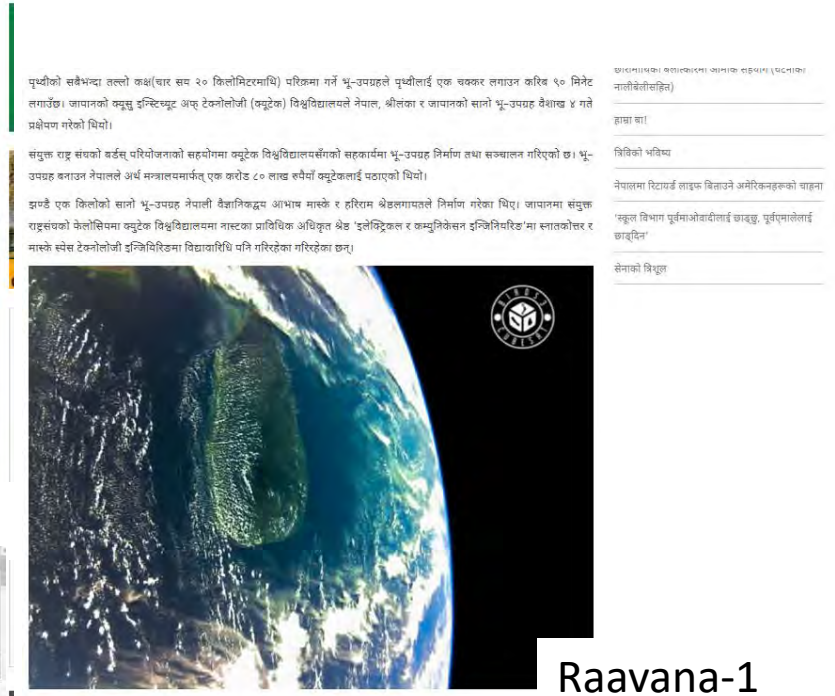
He further informed that the satellite is carrying out four other technical testings besides capturing the photos. "Since the BIRDS 3 and 4 Project is worked on by many other divisions, it was hard to take any additional pictures," he added.



NepaliSat-1

Link:my Republica

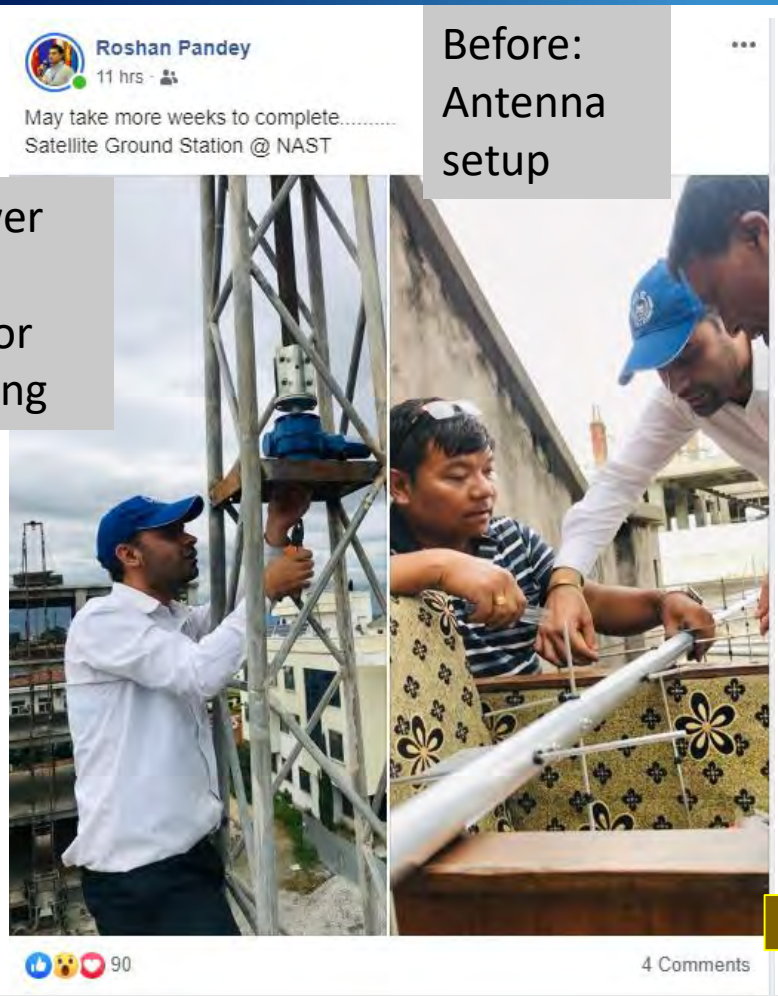
Link: Nagarik dainik



Raavana-1

The "my Republica" has published in English version and "Nagarik Dainik" has published in the Nepali Version inn Paper as well as "nagariknews" as in online portal.

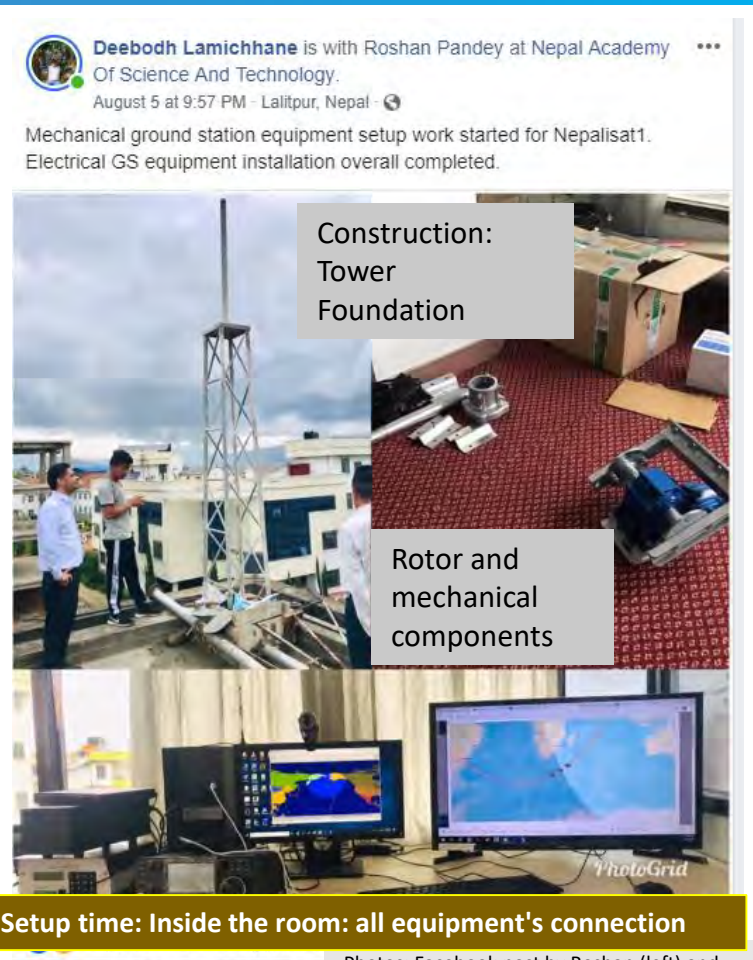
Work in Progress : NAST Ground Station



Before: Antenna setup

Tower and Rotor Fitting

Er. Roshan Pandey, NAST has been supervising GS set up and construction

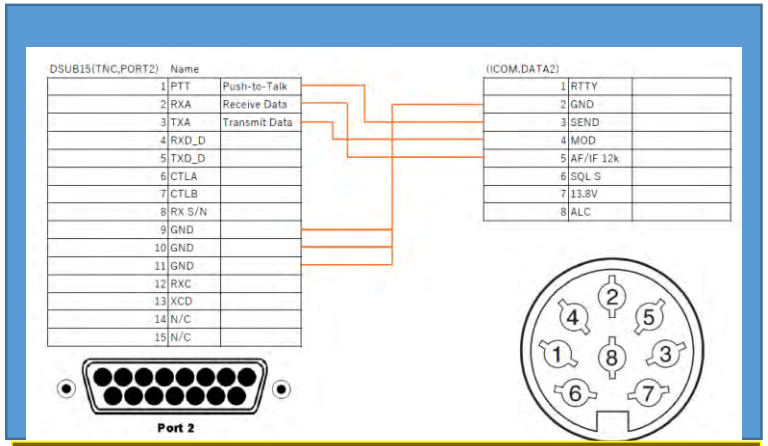


Construction: Tower Foundation

Rotor and mechanical components

Setup time: Inside the room: all equipment's connection

Photos: Facebook post by Roshan (left) and Deebodh(right)



Designed by : Nakayama, BIRDS-4

Apiwat and Nakayama, students from KyuTech, have been helping NAST team to setup the ground station.

Photos show the base of antenna tower has been set along with rotator. They finished the electronic and electrical works. Next is mechanical work, and UHF antenna. They will start mounting the antenna soon.

Newly appointed GS operation member at NAST

Self Introduction:

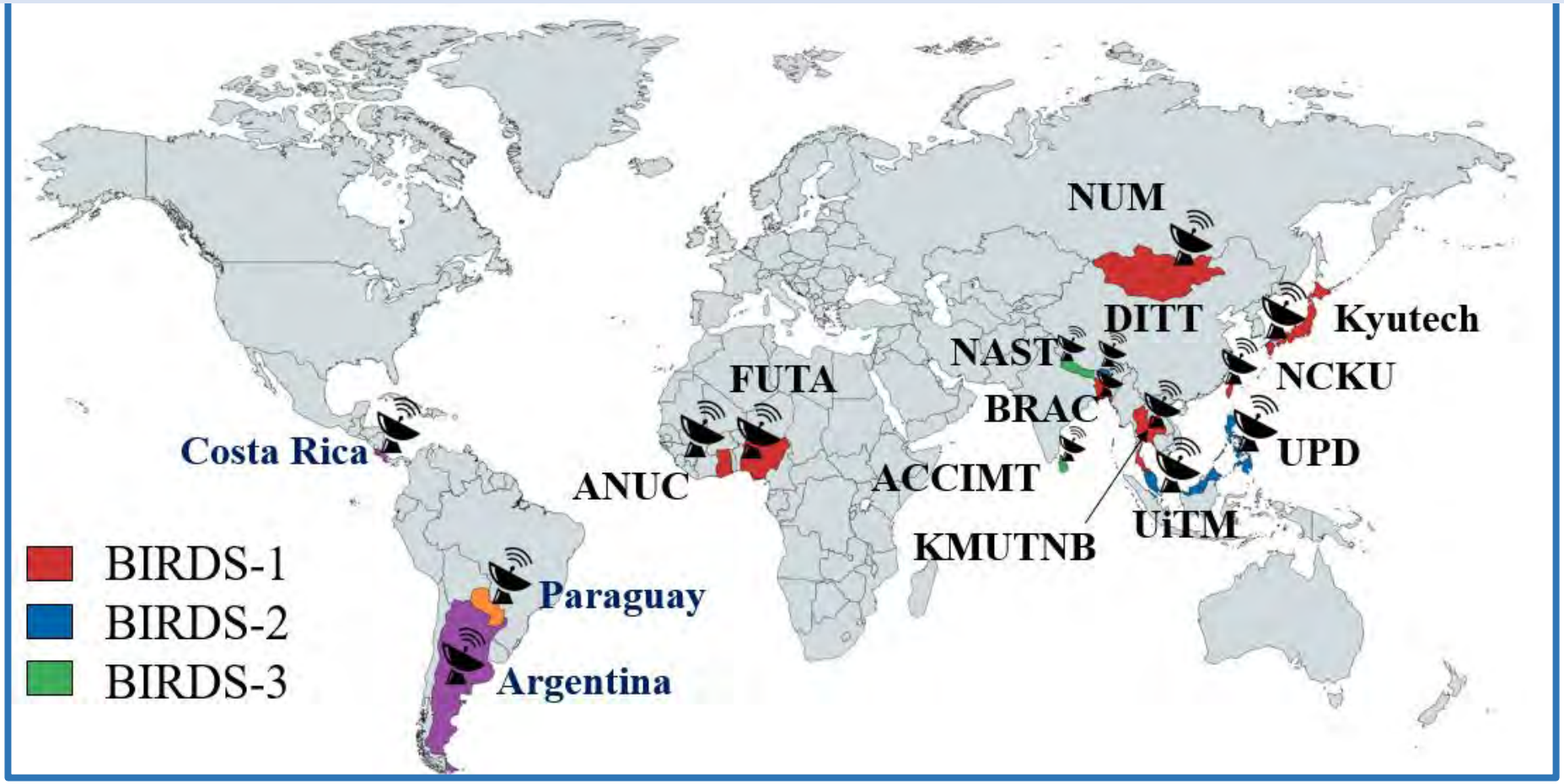
I am **Dibodh Lamichhane**, Graduated in Mechanical Engineering in 2014 from Biju Patnaik University of Technology Odisha India. At the last year of my Engineering I was attracted by CubeSat Technology. I gathered a lot of technical information on different aspects of CubeSat along with the Simulation software (STK). Debris Risk & Mitigation analysis
(DRAMA) software for orbital decay calculation and reentry analysis of CubeSat.

As my interest on Space Technology, I am a Research Assistant (RA) at Nepal Academy of Science & Technology (NAST). Recently I am working as Ground station setup & GS Operation member in Nepal for BIRDS project.

Thank you.
Email: dibodh63@gmail.com

End of report by Hari, Nepal, BIRDS-3

18. BIRDS-3: Update on the ground stations of BIRDS



15 GROUND STATION MEMBERS
(15カ国で構成される地上局ネットワークメンバー)

BIRDS Ground Station Update, by Abhas

BIRDS-3 Nepal Ground Station Update

Establishing Structure

Fixing Rotator

Assembling Antenna

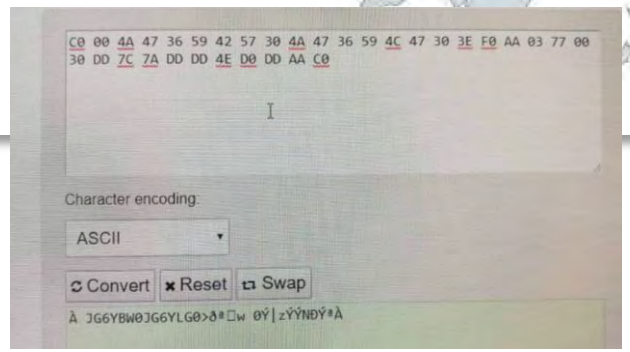
Ground Station construction in Nepal at *Nepal Academy of Science and Technology* is in full swing.
Should be operational by the end of August 2019

BIRDS-3 Winners of GS Competition

Award will be handed at the next GS Workshop

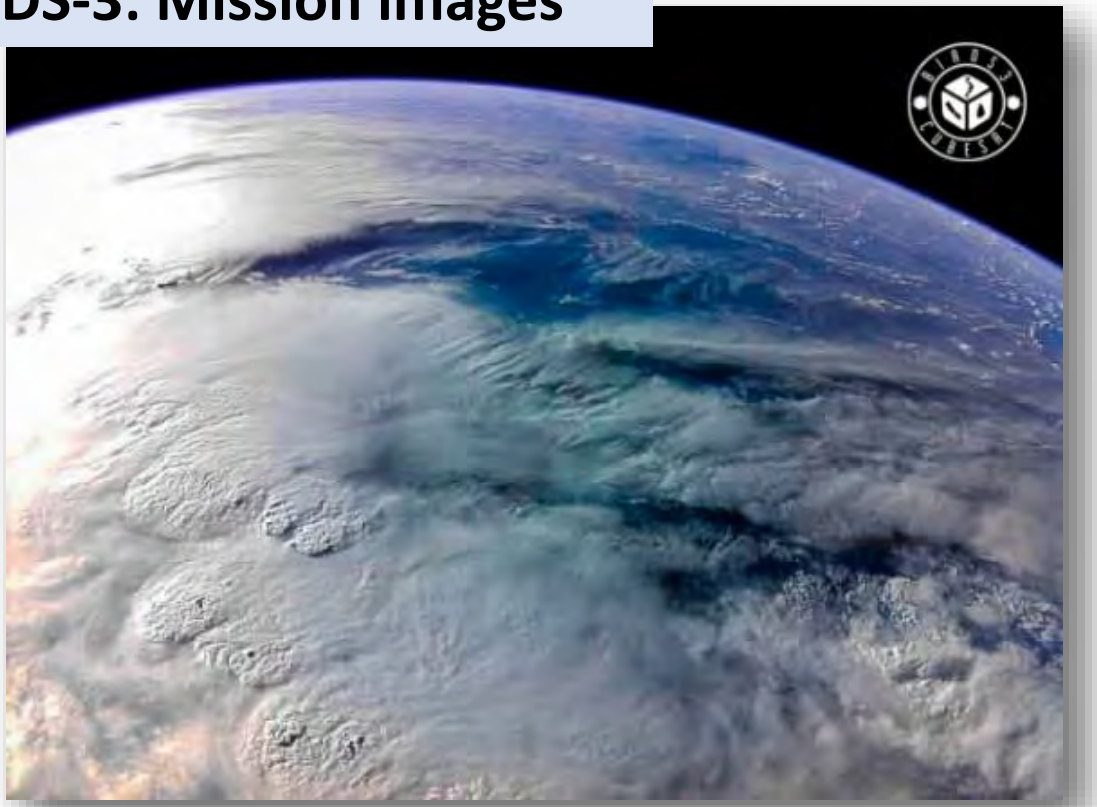
BIRDS-3 would like to announce winners of the Ground Station uplink competition which was held to encourage uplink success in BIRDS GS:

- **National University of Mongolia (NUM), Mongolia**
- **Arthur C. Clarke Institute of Modern Technology (ACCIMT), Sri Lanka**
- **King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand**

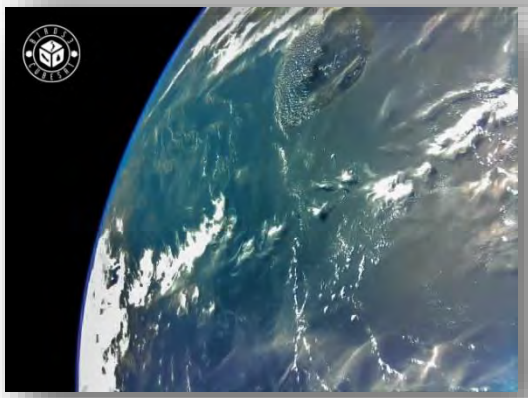


Uplink ACK received by NUM (Mongolian) GS

19. BIRDS-3: Mission images

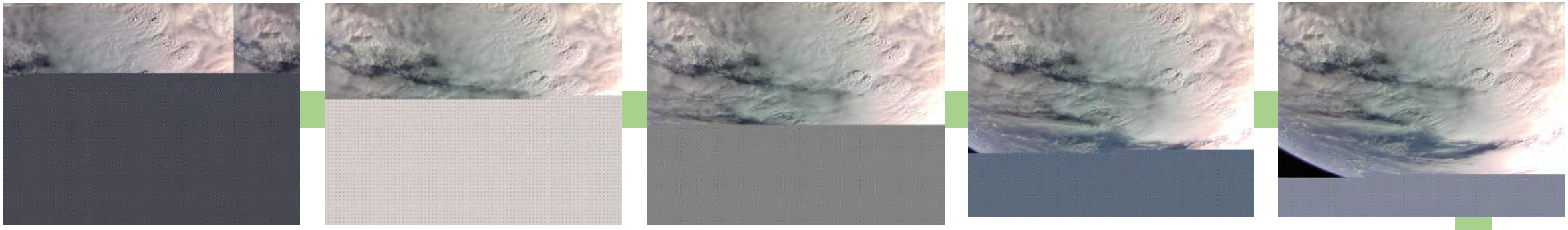


First image out from the BIRDS-3 project



BIRDS-3 Mission Images
(by Abhas)

BIRDS-3 Mission Images



BIRDS-3 satellite's camera has been taking photos given uplink command from Ground Stations from Thailand, Sri Lanka, Kyushu Institute of Technology (Japan) and Mongolia. The images take about 3-4 days to reconstruct for a 640x480 image with about 400-450 packets. All images are JPEG compressed on board.

Set of 50 packets of data is downlinked each time, verified and re-downlinked if the data is missing. The images are then recreated part by part.

JPEG headers begin with 0xFF 0xD8 and the footers end with 0xFF 0xD9. That is how the team understands that an image has been stored on BIRDS-3 Flash Memory

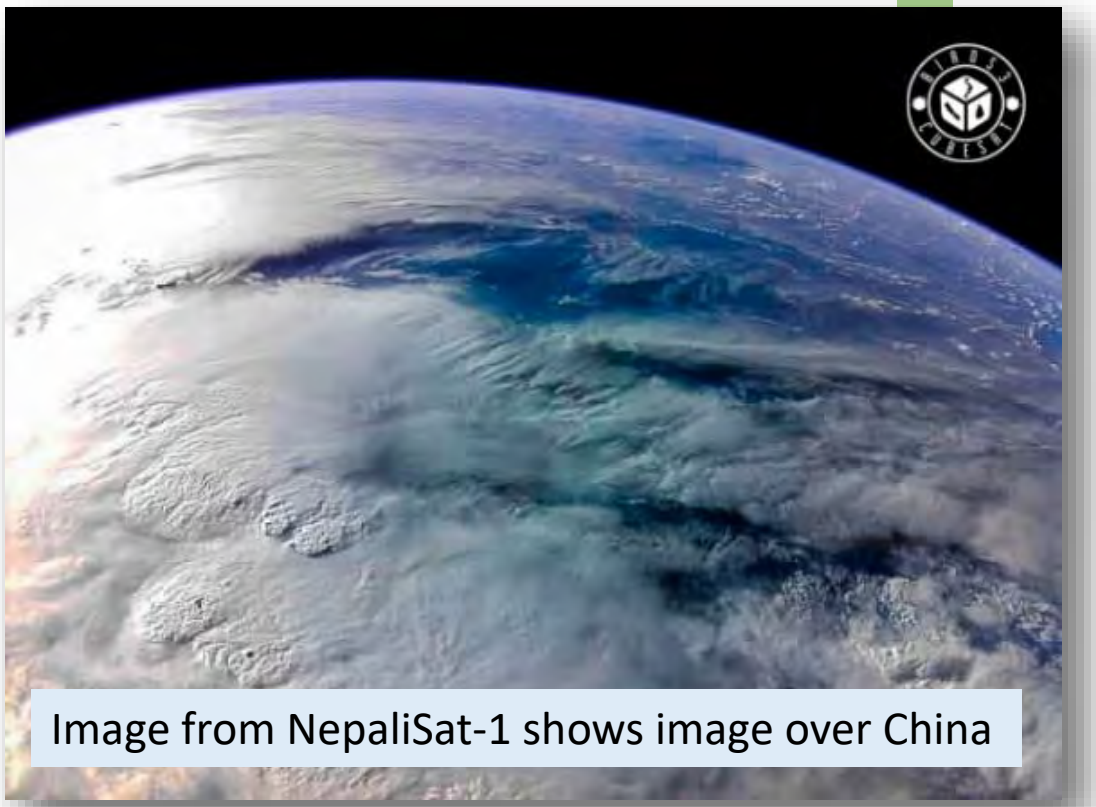
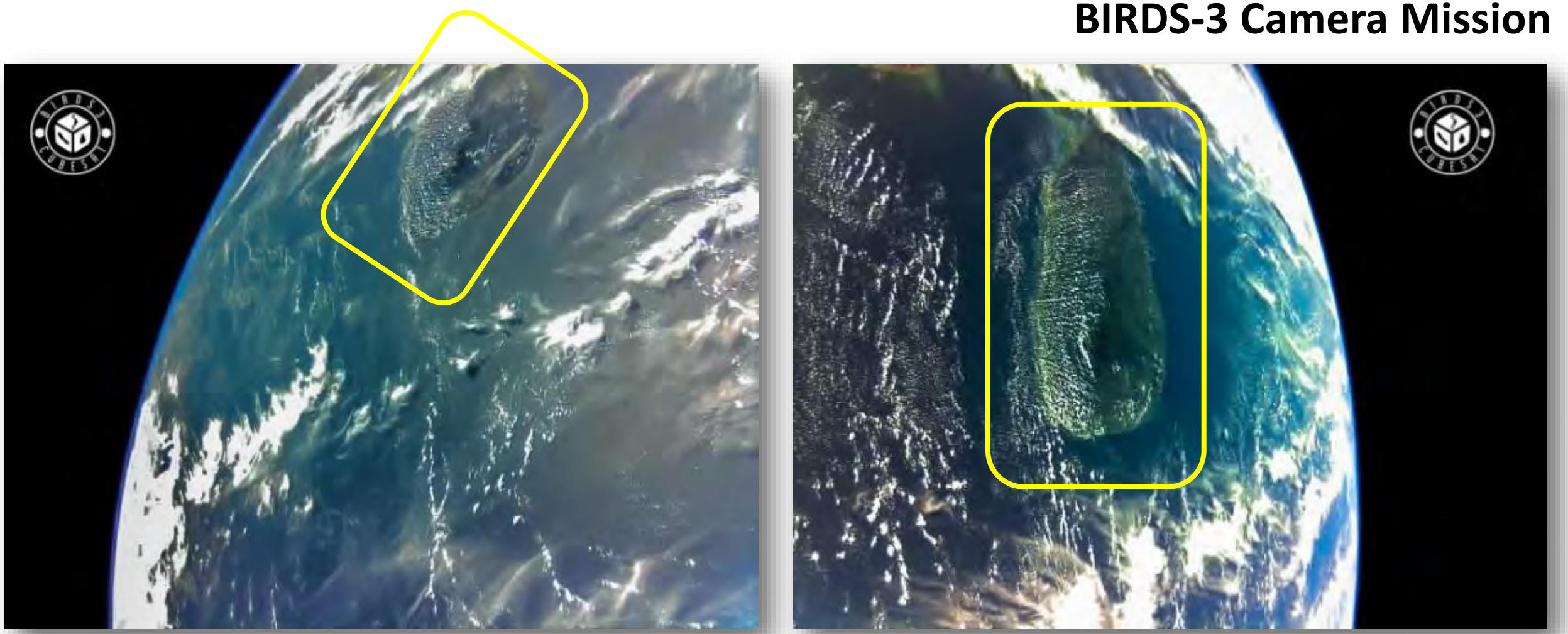


Image from NepaliSat-1 shows image over China

BIRDS-3 Camera Mission



Images of Sri Lanka taken by Raavana-1 (Sri Lankan) of BIRDS-3 Project.
Our primary mission is to take images of our home counties.

BIRDS-3 Camera Mission

"First Nepalese satellite took these photos"

BIRDS 3 Satellite Project
Published by Dulani Chamika
August 3 at 6:46 PM ·

We are pleased to release the pictures taken by BIRDS-3 satellites .

Please do acknowledge BIRDS-3 if you use these images.

BIRDS 3 Satellite Project, Yoshitaka Yanagida and 366 others

5 Comments 252 Shares

Home › Outreach

Photos taken by BIRDS-3 satellites

August 2, 2019 August 3, 2019 Outreach

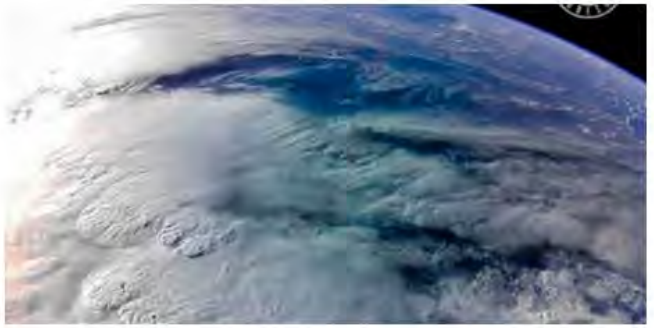
We are pleased to release the following photos that were taken by the BIRD-3 satellites

This is the first image taken by BIRDS-3 satellites.

It is an image of the sun

https://birds3.birds-project.com/2019/08/02/images/

पहिलो नेपाली भूउपग्रहले अन्तरिक्षबाट खिच्यो यस्ता तस्बिर



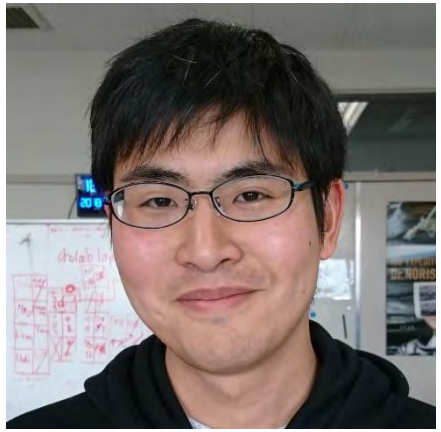
नेपाली स्याट वानले अन्तरिक्षबाट खिचेको तस्बिर। फोटोः बर्ईस परियोजना

मणि दाहाल
काठमाडौं, साउन १८

Images published in Nepalese local media

Mission statement of the Camera Mission was to use these images for outreach through social media

“CQ ham radio” magazine discusses BIRDS-3 and BIRDS-4



by Daisuke NAKAYAMA

August 10, 2019

CQ ham radio discusses BIRDS-3 and BIRDS-4

Written By: Daisuke Nakayama

CQ ham radio magazine, Aug 2019

BIRDS3 and BIRDS4 were introduced in this issue

CQ Ham radio is a magazine published by CQ publishing for amateur radio community in Japan. This magazine has over 70 years history. There is a serial page about satellite communication information written by JN1GKZ(Masahiro Arai) in this magazine and the BIRDS-3 satellite project was introduced at top of this page. The BIRDS-4 was introduced as the next BIRDS project.

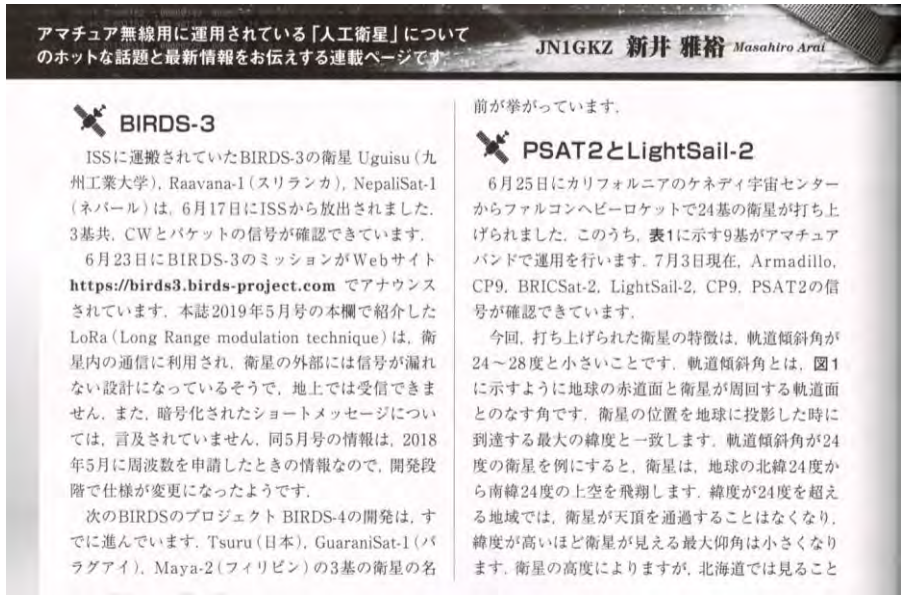
The contents are as follows

"The BIRDS-3 satellites Uguisu (Kyushu Institute of Technology), Ravana-1 (Sri Lanka), and NepalisSat-1 (Nepal) that were transported to the ISS were released from the ISS on June 17. All three satellites have confirmed CW and packet signals.

…

The next BIRDS project, BIRDS-4, is already under development. The names of three satellites, Trusu (Japan), GuaraniSat-1 (Paraguay), and Maya-2 (Philippines) have been raised."

I am very happy that Japanese amateur radio people are interested in the BIRDS project of Kyutech.



アマチュア無線用に運用されている「人工衛星」についてのホットな話題と最新情報をお伝えする連載ページです。

JN1GKZ 新井 雅裕 *Masahiro Arai*

BIRDS-3

ISSに運搬されていたBIRDS-3の衛星 Uguisu（九州工業大学），Raavana-1（スリランカ），NepaliSat-1（ネパール）は，6月17日にISSから放出されました．3基共，CWとパケットの信号が確認できています．

6月23日にBIRDS-3のミッションがWebサイト **https://birds3.birds-project.com** でアナウンスされています．本誌2019年5月号の本欄で紹介したLoRa（Long Range modulation technique）は，衛星内の通信に利用され，衛星の外部には信号が漏れない設計になっているそうで，地上では受信できません．また，暗号化されたショートメッセージについては，言及されていません．同5月号の情報は，2018年5月に周波数を申請したときの情報なので，開発段階で仕様が変更になったようです．

次のBIRDSのプロジェクト BIRDS-4の開発は，すでに進んでいます．Tsuru（日本），GuaraniSat-1（パラグアイ），Maya-2（フィリピン）の3基の衛星の名前が挙がっています．

PSAT2とLightSail-2

6月25日にカリフォルニアのケネディ宇宙センターからファルコンヘビーロケットで24基の衛星が打ち上げられました．このうち，表1に示す9基がアマチュアバンドで運用を行います．7月3日現在，Armadillo，CP9，BRICSat-2，LightSail-2，CP9，PSAT2の信号が確認できています．

今回，打ち上げられた衛星の特徴は，軌道傾斜角が24～28度と小さいことです．軌道傾斜角とは，図1に示すように地球の赤道面と衛星が周回する軌道面とのなす角です．衛星の位置を地球に投影した時に到達する最大の緯度と一致します．軌道傾斜角が24度の衛星を例にすると，衛星は，地球の北緯24度から南緯24度の上空を飛翔します．緯度が24度を超える地域では，衛星が天頂を通過することはなくなり，緯度が高いほど衛星が見える最大仰角は小さくなります．衛星の高度によりますが，北海道では見ること

"Satellite communication information"; CQ ham radio magazine, Aug 2019 pp.196

A Technical Meeting with JAXA

Tomoaki MURASE

August 11, 2019

BIRDS-4
JOINT GLOBAL MULTI-NATION BIRDS SATELLITE PROJECT

A Technical Meeting with JAXA

Written By: Tomoaki MURASE

We did a meeting with JAXA about safety review and master schedule of BIRDS-4 satellite on July 23. JAXA is the Japan Aerospace Exploration Agency that performs various activities related to aerospace as an organization, from basic research in the aerospace field to the development and utilization. Our satellites will be launched by JAXA. When we give our satellites to them, we should be met with certain safety standards. For example, when the satellites are launched by a rocket intense vibrations and strong shocks will occur. Before the satellites are released from the International Space Station(ISS), we need to make sure that the satellites are not harmful for he astronauts due to launch environment after-effects. JAXA representatives are providing us the necessary safety…documents. One of them is for the payload. It describes the deployment interface control and its necessary conditions for the satellite. Another is on-orbit safety requirements for the small satellite to be deployed from ISS.

According to their information, we must prove that the satellite can withstand those vibrations and shocks. We were getting the crucial information like that at this meeting.

At first, we discussed master schedule when we will give our satellites to JAXA and when satellites will be launched. Then we introduced our satellite and missions. Perovskite Solar Cell(PSC) mission is especially important for safety review team because it is first time to be utilized on a satellite and JAXA wanted us to prove it's safe enough. We explained how the mission is and results of experiment were. New –rail-deployment switch, antenna deployment model, battery were also introduced. I think they learned about our satellite. Moreover, in order to meet their requirements, we must conduct various space environmental tests.

When we were talking about the satellite structure

Thermal Tests on BIRDS-4 Satellites

Anibal MENDOZA

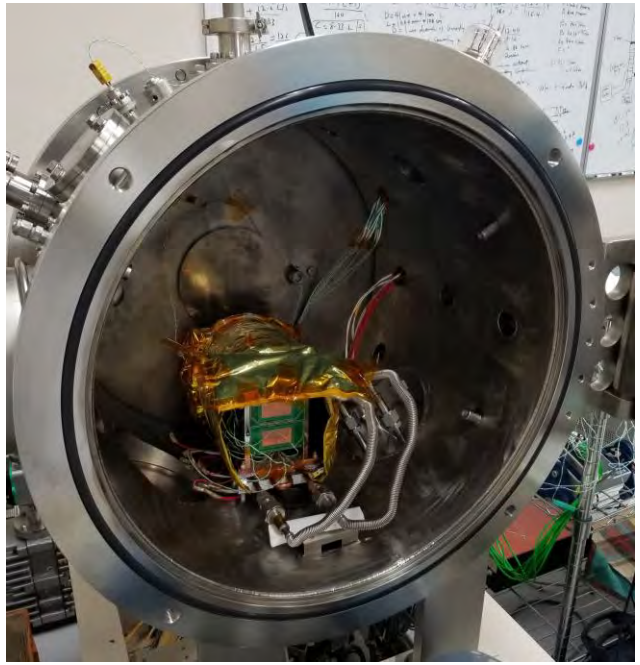
August 11, 2019

BIRDS-4
JOINT GLOBAL MULTI-NATION BIRDS SATELLITE PROJECT

Thermal Tests on BIRDS-4 Satellites

Written By: Anibal MENDOZA

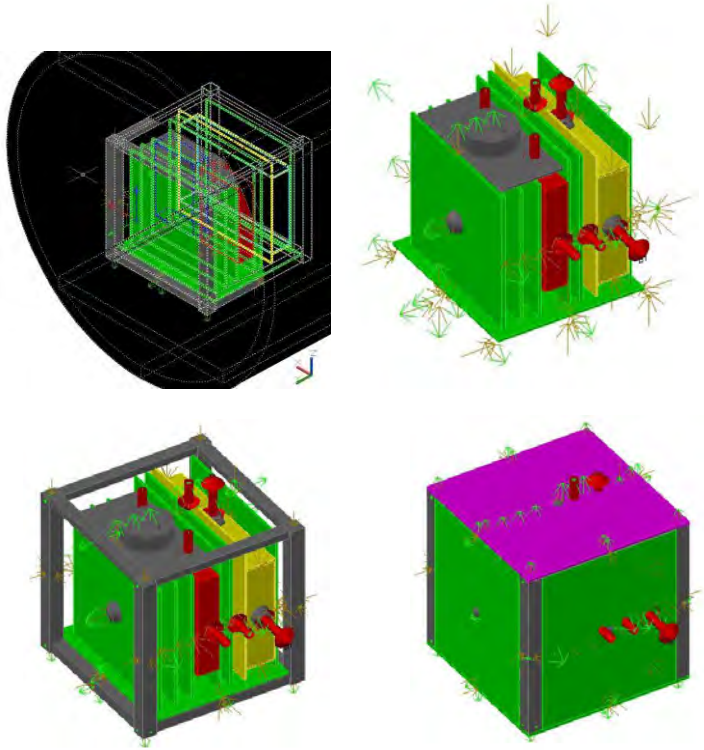
Thermal Balance and Thermal Vacuum tests that are performed on BIRDS satellites to make sure that the satellite was manufactured properly and, can survive and operate properly in the space environment.



Test article inside the vacuum chamber

Thermal Balance Test (TBT): Before the satellite is launched, to measure the temperature of the components in the harsh environment of space a "thermal model" of the satellite is needed. The thermal model is a mathematical simulation which contains information about the materials and optical properties of the satellite components.

The result of computer simulations with this thermal model (with the vacuum chamber environment applied to the model) must be as similar as possible to the results of actual Thermal Balance Test, which is performed in the mentioned vacuum chamber.



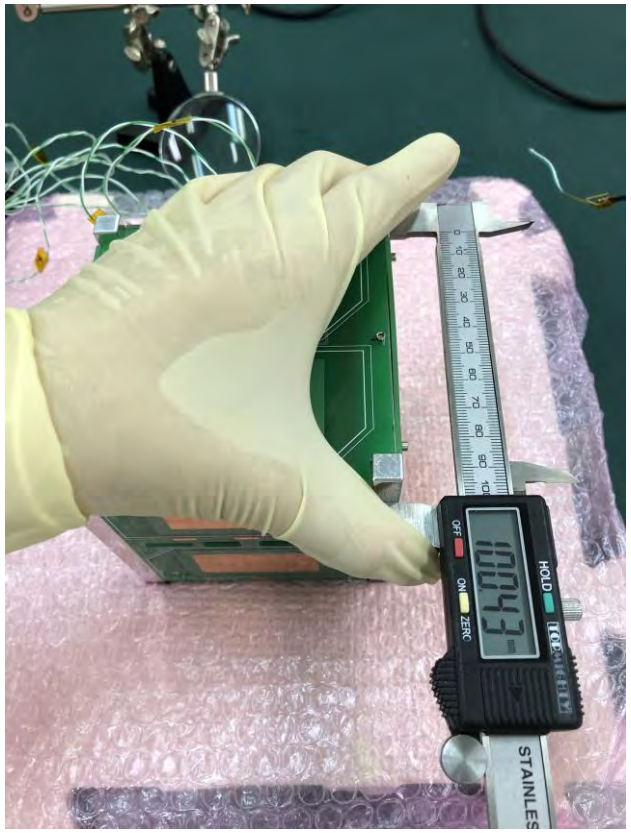
Thermal model

Thermal Tests on BIRDS-4 Satellites

Written By: Anibal MENDOZA

Thermal Vacuum Test (TVT): Similarly to TBT, in Thermal Vacuum Tests, the satellite is subjected to thermal cycles, but this test is more subjected to the demonstration of the functionality of the satellite more than measurement of the variation of temperature of its components. Only one thermal cycle is sufficient for TBT while in TVT, many cycles should be performed to ensure the satellite's normal operation in extreme hot and cold conditions.

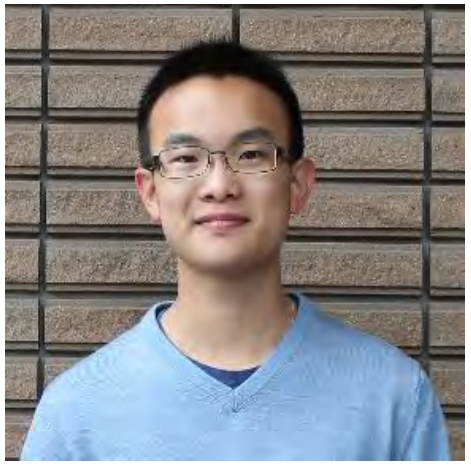
In short, the satellite shall pass qualification requirements under vacuum conditions and temperature extremes which simulate predicted space environment. These temperature ranges are defined according to the satellite flight data or the historical test range from a similar satellite.



It's important to measure the structure before and after the thermal tests for us as we use PEEK and Aluminum frames together.

Thermocouples attached to the test article

Visiting a Japanese Elementary School



Timothy Ivan LEONG

August 8, 2019

BIRDS-4
JOINT GLOBAL MULTI-NATION BIRDS SATELLITE PROJECT

Visiting a Japanese Elementary School

Written By: Timothy Ivan LEONG

On the afternoon of July, 11th, some members of BIRDS had the opportunity to visit the nearby Ayamegaoka primary school.

We were invited to this school to help 6th grade-schooler (around 11-12 years old) practice their English with some foreigners.

When we arrived we quickly presented ourselves, what we did in KyuTech and our roles in the BIRDS project. We did our presentation in English and then asked the students what they understood from what we said; the one that understood the most then summarized in Japanese what we said for the other students.

After our little presentation, we were separated and then sent to a different group of students so that they could show us typical Japanese games and pastimes.

For example, they showed us how to make some origami, the Daruma Otoshi game, the Kendama, the Beigoma (Japanese Spinning Tops), etc…

They even showed me some of the Japanese school manuals they were studying. I was surprised by how much images they had inside. In my home country, our textbook has very few images.

The small frog origami I made.
It can actually jump!

Location of the school compared to KyuTech

Visiting a Japanese Elementary School

Written By: Timothy Ivan LEONG

After showing us these different activities, we had a final question and answers with the students where they asked about our home country and ourselves in English.

I was impressed by how good some of the students were able to speak English despite their young age. Also, I think they are very lucky to be able to meet with foreign people to be able to practice their English at their school.

Overall, we spent a really fun and interesting afternoon with the children. I tried to practice my Japanese a little to ease them as they were a lot of children who were still uncomfortable with speaking English. But even with the language barrier, it was great to still be able to communicate through the games we played with them.

In front of the school, from left to right:
Hari Shrestha (BIRDS-4), Dulani Chamika (BIRDS-3), Nakano Tae (our liaison with the school), Timothy Leong (BIRDS-4) and Izrael BAUTISTA (BIRDS-4)

Presenting BIRDS project to the students. Unfortunately, we weren't allowed to take photos of the students.

EPS Block Diagram Update

Hari Ram SHRESTHA

August 8, 2019

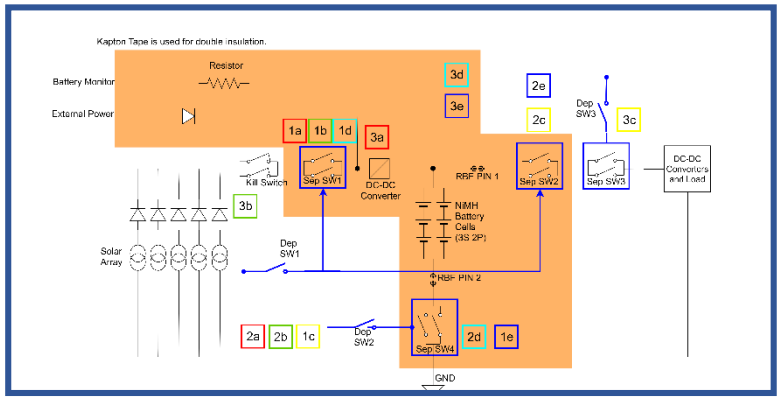
Overview: Updated EPS Block Diagram

Written By: Hari Ram SHRESTHA

The Electrical Power System (EPS) block diagram is a diagram of an Electrical Power System for CubeSat which the principal parts or functions are represented by blocks connected by the lines that show the relationship of the blocks.

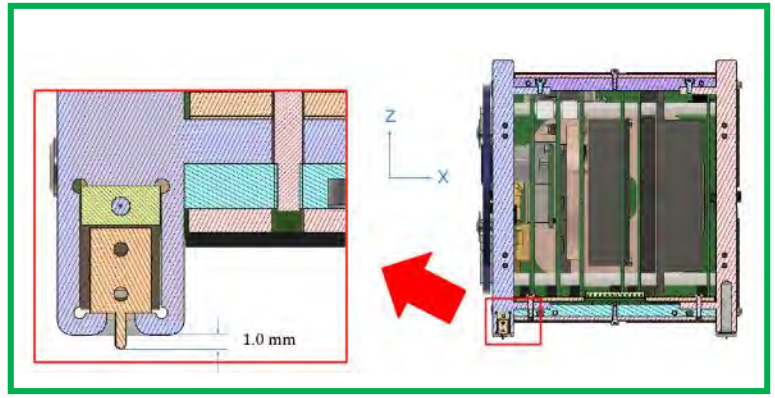
From BIRDS-4 EPS block diagram, the overall concept of how the responsibility of stable power generation for the CubeSat missions and subsystems is described.

The CubeSat block diagram has mainly three parts: energy generated part is a solar PV, the energy storage device is rechargeable battery and the power management system are voltage regulation, the modules protection, and the energy distribution.



The block diagram of BIRDS-4 CubeSat project after the technical meeting with JAXA about BIRDS-4

The BIRDS-4 technical meeting with JAXA safety team representatives in 23 July in LaSEINE. We confirmed the BIRDS-4 block diagram after the meeting; therefore, I updated the controlling mechanism of electrical and mechanical switches, removed the RBF pin from inhibits, and mentioned the overcharge, over-discharge and external short…inhibits with their condition following the JAXA's recommendations. As a beginning to we follow the JEM Payload Accommodation Handbook which book gives the technical idea to make design the system with safely. The safety is one of the important issues because the CubeSats shall deploy from "Kibo" module of the ISS. JAXA developed the unique system JEM small Satellite Deployer "J-SSOD" to deploy the satellite and inject the orbit from "Kibo".



Deployment switch positioned at –Z direction Source: Structure Subsystem Report by Yigit Cay, BIRDS-4

Technical Discussion on EPS

Written By: Hari Ram SHRESTHA

ABOVE: JAXA team members explained the safety review assessment

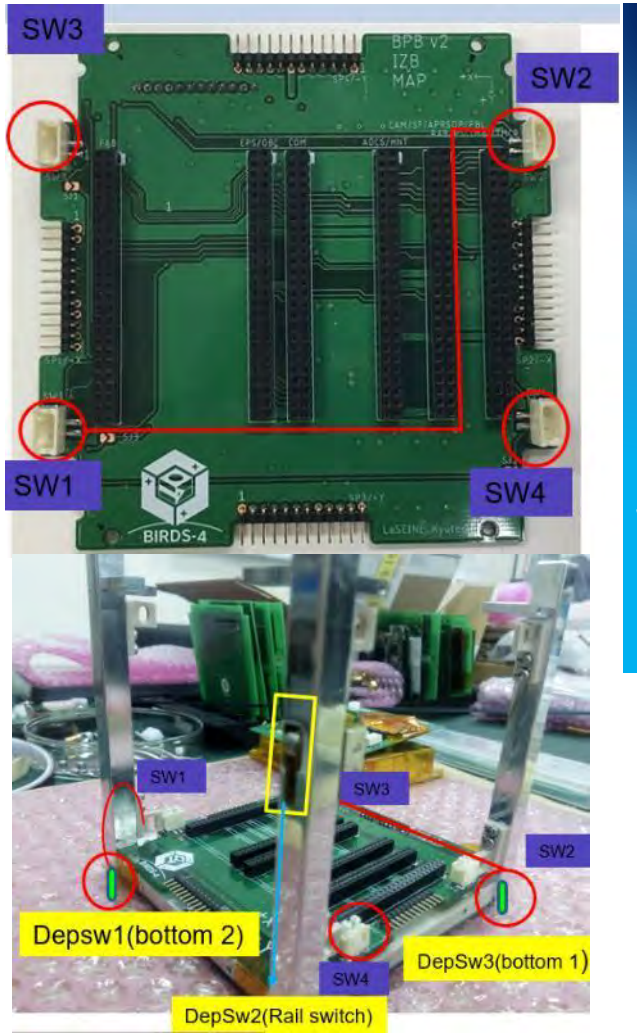
Component	Deployment Switch 1	Deployment Switch 2
Manufacturer	C&K COMPONENTS	OMRON Corporation Electronic
Part Number	SDS001	J-7-V22
Rated Current	100 mA(DC)	7 A
Rated Voltage	12 V(DC)	125-250 V(AC)
Actuating Force	0.74 N	0.54 N
Over travel	2 mm	1.6 mm
Life Cycle (electrical)	50,000 cycles	50,000 cycles
Operating Temperature	-40° C ~ +85 °C	-10° C ~ +80 °C

Using Deployment switch type 1 is a push bottom switch (mechanical) and deployment switch type 2(electrical) for CubeSat for Inhibits

Meeting time: JAXA team member with Dr. Masui, Dr. Kim, Dr. Yamauchi with BIRDS-4 team members

	sign	Condition: source	Sign	Condition: Load
Overcharge	1a	Sep Sw1		
	3a	DC/DC converter		
	2a	Sep Sw4		
Over discharge	1b	Sep Sw1	1c	Sep sw4
	2b	Sep Sw4	2c	Sep Sw2
	3b	Diodes	3c	Sep Sw3
External short	1d	Sep Sw1	1e	Sep Sw4
	2d	Sep Sw4	2e	Sep sw2
	3d	Double Insulator	3e	Double Insulator

BIRDS-4 inhibits with their conditions



Switch connection mechanism with BPB and the rail

SW1 and SW2 are connected in parallel.

Birthdays of Izrael, Hoda and Adolfo

Yuma NOZAKI

August 10, 2019

BIRDS-4

JOINT GLOBAL MULTI-NATION BIRDS SATELLITE PROJECT

The Birthdays of BIRDS-4 members in July

Written By: Yuma NOZAKI

In July, there were birthdays for three of BIRDS-4 members. We celebrated the birthdays of Izrael, Hoda and Adolfo. We were giving their birthday surprise and having a party. Each time, we were planning how we surprise them and keep secret before a party.

Celebrating Izrael's birthday

The birthday cake for Izrael

The birthday cake for Hoda

The Birthdays of BIRDS-4 members in July

Written By: Yuma NOZAKI

The group photo for Adolfo's birthday

Anechoic Chamber Activities in July

Hoda EL-MEGHARBEL

August 8, 2019

BIRDS-4
JOINT GLOBAL MULTI-NATION BIRDS SATELLITE PROJECT

Testing EM in Anechoic Chamber

Written By: Hoda Awny EL-MEGHARBEL

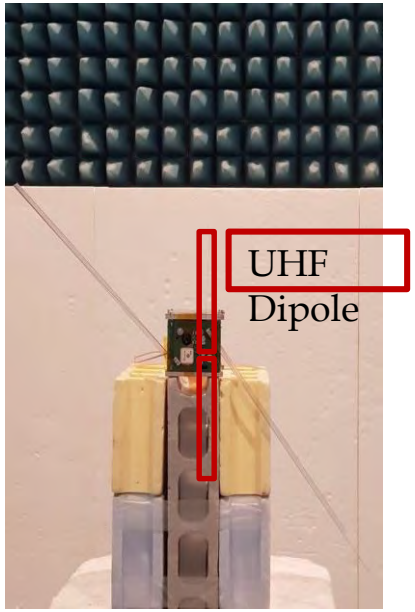
During the period between July 13 and July 28 BIRDS-4 team reserved the anechoic chamber in KyuTech testing facility to conduct some testing for the Engineering Model of the Satellite.

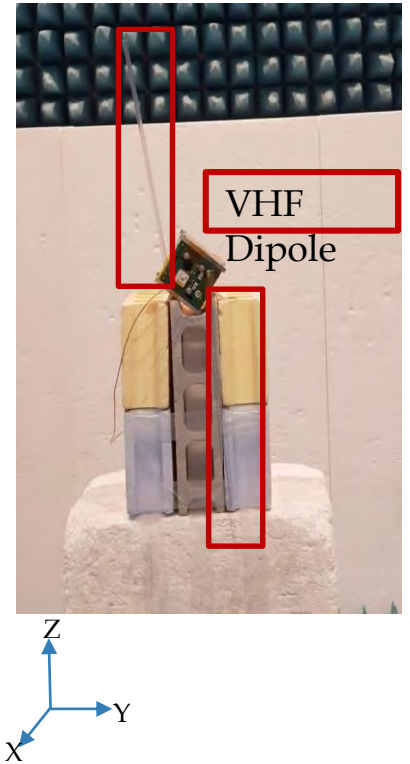
These tests include:

Antenna Tuning in which the Antenna board is placed inside the anechoic chamber while Vector Network Analyzer (VNA) was in the other room.

Antenna board inside the anechoic chamber

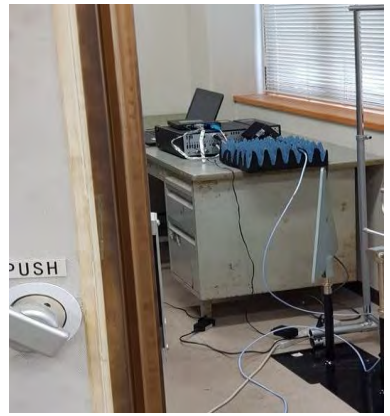
Radiation Pattern where TX - Antenna under test (AUT) is connected to Signal Generator (SG) and RX – Reference dipole is connected to Spectrum Analyzer (SA)





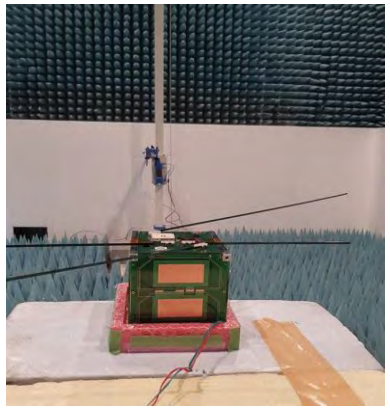
Radiation Pattern setup

Uplink Communication Sensitivity Test in which Ground station (GS) PC sends uplink command and monitor if the satellite responds. Test succeed if GS PC receives data from satellite.



Ground Station Room

Satellite inside Anechoic Chamber



Test Setup

27. Report from UiTM (Malaysia)

I. UiTM Visit to
   UPHSD, DOST-ASTI, & UPD
I. ICONSPACE 2019 Conference
II. National Science Week 2019, Malaysia

Report prepared by:

Muhammad Hasif Bin Azami (UiTM)

18th August 2019

UiTM Visit to UPHSD, DOST-ASTI, & UPD

Objective: Discussion on joint nanosatellite project between UiTM-UPHSD with UPD and DOST-ASTI

Date : June 18th, 2019

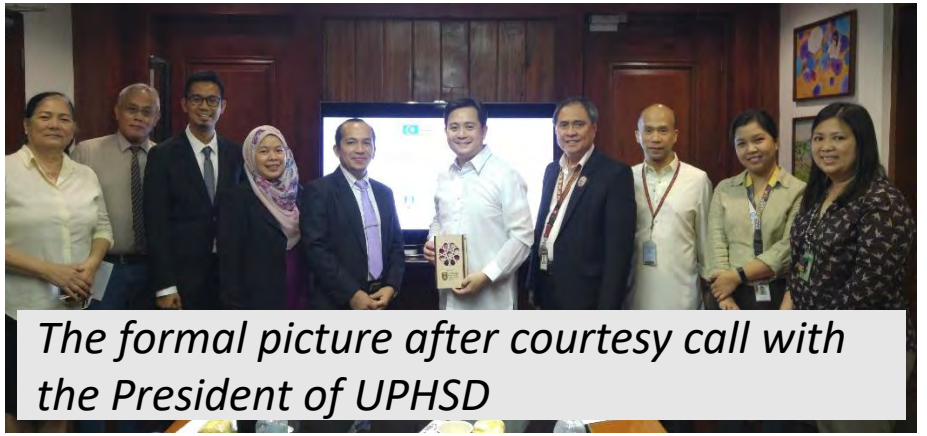
Location : University of Perpetual Help System Dalta and University of the Philippines Diliman, Philippines

People : Dr. Huzaimy & UiTM team, Dean Ilagan & UPHSD team, Dr. Joel Marciano & the team

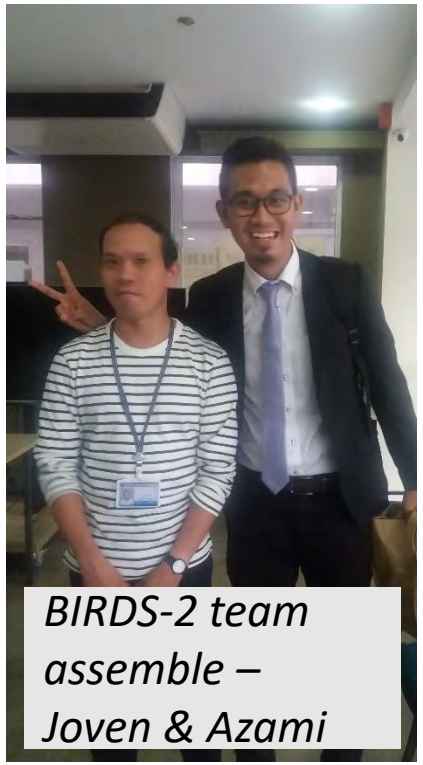
***Credit the pictures to Ms. Ericka Picar (UPD)*

UiTM Visit to UPHSD, DOST-ASTI, & UPD

Courtesy call with the Assist. Vice President for Academic Affairs of UPD



The formal picture after courtesy call with the President of UPHSD



BIRDS-2 team assemble – Joven & Azami

Final picture of the visit with the UPD and UiTM team

Technical meeting with the UPD satellite team at the EEEI operation room

2019 6th International Conference on Space Science and Communication

28 - 30 JULY 2019 | PULAI SPRINGS RESORT, JOHOR BAHRU, JOHOR, MALAYSIA

Organised by Supported by

ANGKASA
PUSAT SAINS ANGKASA
SPACE SCIENCE CENTRE

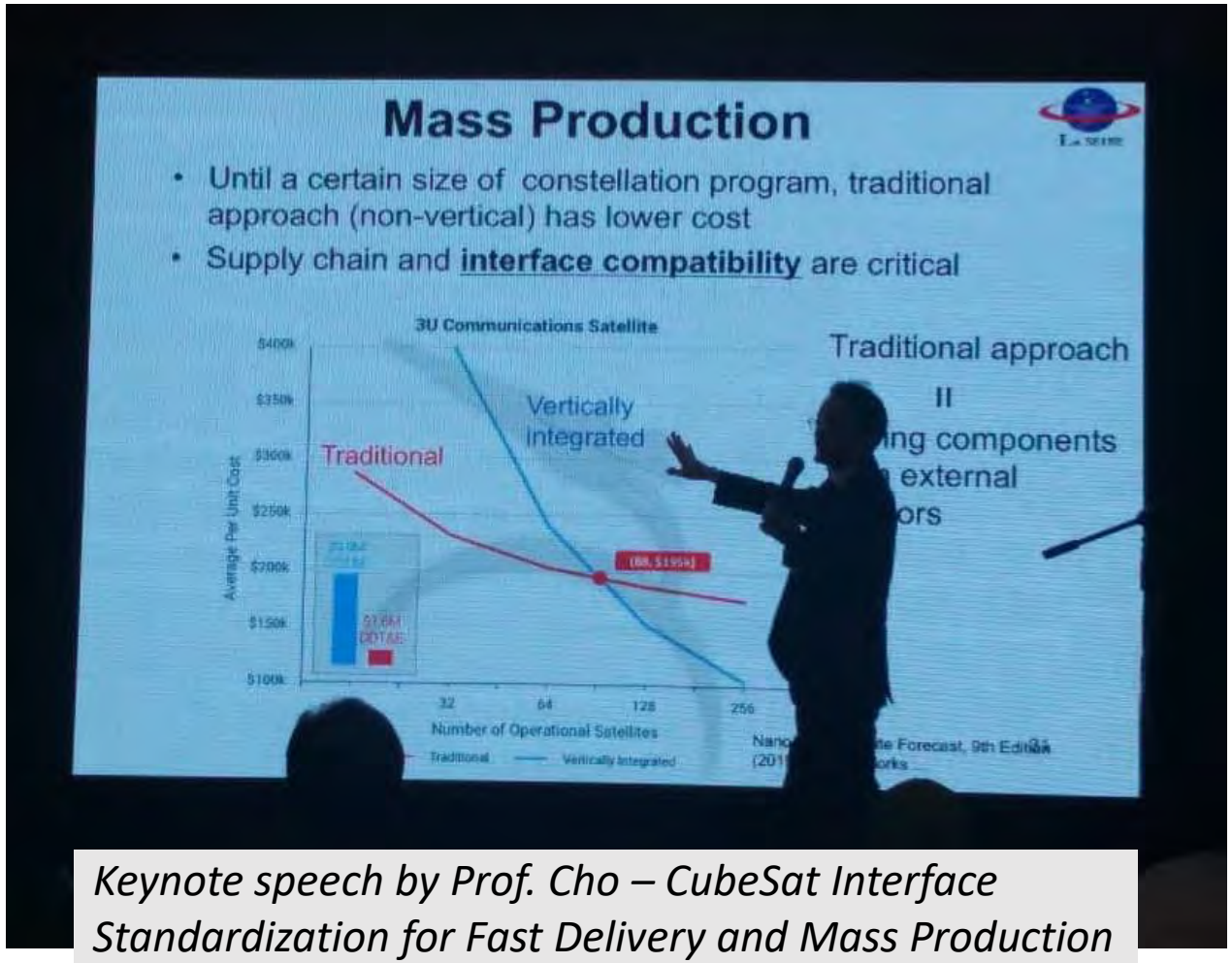
ANGKASA
MALAYSIA

CENTRE OF ADVANCED ELECTRONIC
AND COMMUNICATION ENGINEERING
Pusat Kejuruteraan Elektronik dan Komunikasi Terkehadapan (PAKET)
Faculty of Engineering and Built Environment
Universiti Kebangsaan Malaysia

essa
Persatuan Siswazah
SAINS BUMI
& ANGKASA
Rekayasa Sejagatraya

From left: Prof. Cho (Kyutech), Prof. Tariqul (UKM), Prof. Shabiul (MMU), Dr. Huzaimy (UiTM)

Prof. Cho and Dr. Huzaimy had a discussion after breakfast



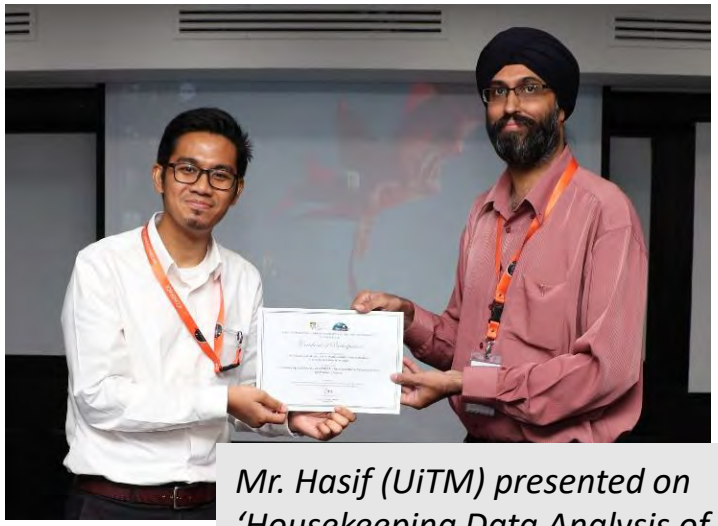
Keynote speech by Prof. Cho – CubeSat Interface Standardization for Fast Delivery and Mass Production

2019 6th International Conference on Space Science and Communication

28 - 30 JULY 2019 | PULAI SPRINGS RESORT, JOHOR BAHRU, JOHOR, MALAYSIA

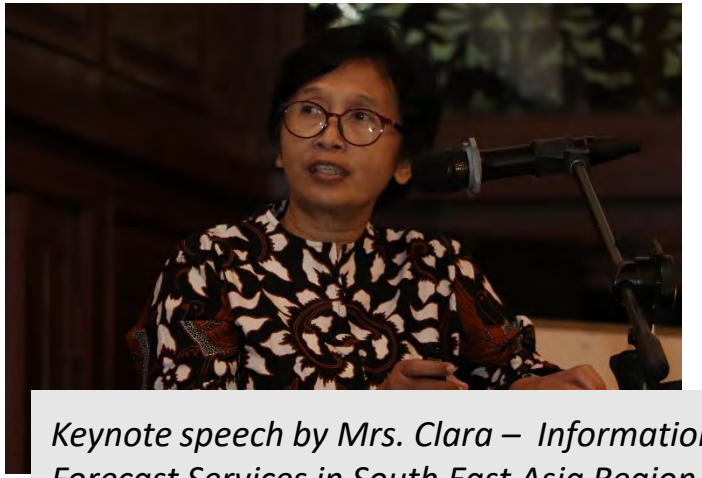
Dr. Amalina (UiTM) presented on 'Evaluation of Ground Station Terminal (GST) Transceiver System for UiTMSAT-1 Store & Forward Mission'

Official group photo after the keynote speeches



Mr. Hasif (UiTM) presented on 'Housekeeping Data Analysis of UiTMSAT-1 Nano-satellite by Observation from UiTM GS'

Dinner with Mrs. Clara (LAPAN)



Keynote speech by Mrs. Clara – Information and Forecast Services in South East Asia Region

MINGGU SAINS NEGARA

"SAINS UNTUK KESEJAHTERAAN"

OGOS 2019 | SELANGOR • NEGERI SEMBILAN • MELAKA • JOHOR • PAHANG KELANTAN • PERAK • KEDAH • PULAU PINANG • PERLIS | #MinggusainsNegara #SainsUntukKesejahteraan #MESTECC

Hindari Plastik Sekali Guna

National Science Week 2019

Objective: Raising public awareness of the importance of science, technology and innovation (STI) in everyday life in Malaysia

Time : August 15-17th, 2019

Location : Melaka International Trade Centre (MITC), Malacca, Malaysia

Organizer: Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) - Malaysia Space Agency (ANGKASA), and Malaysia Agency Remote Sensing (ARSM)

MINGGU SAINS NEGARA

"SAINS UNTUK KESEJAHTERAAN"

OGOS 2019 | SELANGOR • NEGERI SEMBILAN • MELAKA • JOHOR • PAHANG KELANTAN • PERAK • KEDAH • PULAU PINANG • PERLIS |

#MinggusainsNegara
#SainsUntukKesejahteraan
#MESTECC

Hindari Plastik Sekali Guna

1 10:00 pagi - 5:00 petang

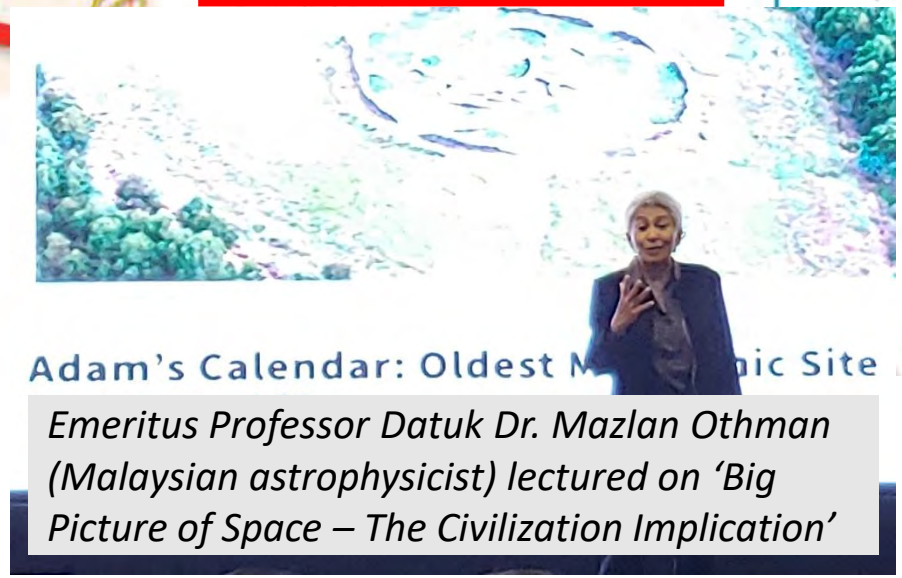
- **Majlis Perasmian MSN 2019 Peringkat Negeri Melaka**
- *Science Talk: 3D Hand Demo* oleh En. Sujana Rejab
- *Robotic Training*
- *Public Talk: Big Picture of Space - The Civilizational Implication* oleh Prof. Emeritus Datuk Dr. Mazlan Othman (Pakar Astro Fizik Wanita Pertama)

2 10:00 pagi - 5:00 petang

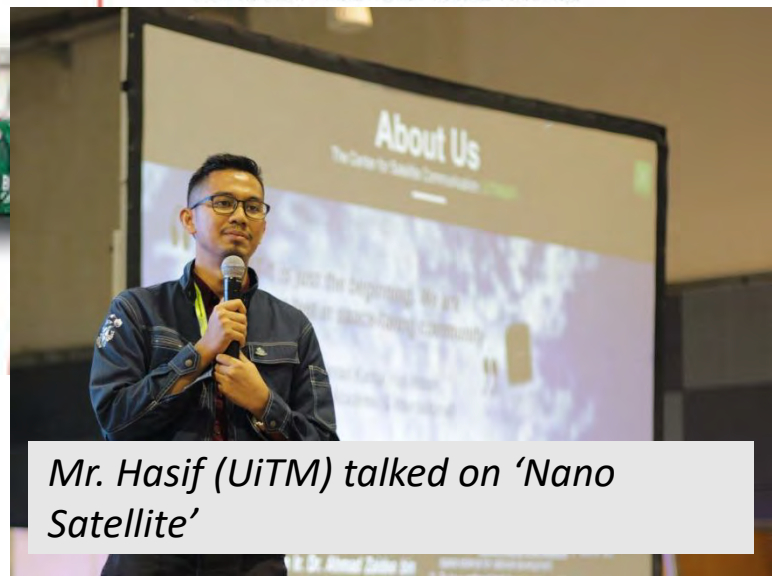
- *Solar Boat/Car Championship*
- *1st Malaysia Youth Chem E-Car Pre-Final*
- *Science Talk: Nano Satellite oleh Prof. Madya Ir. Ts. Dr. Mohamad Huzaimy Jusoh & En. Muhammad Hasif Azami*
- Kem Astronomi
- *Science Talk: Engineering Your Future (Heriot Watt University)*

3 8:00 pagi - 5:00 petang

- *Geocaching Treasure Hunt*
- *Science Talk: Pengalaman Penyelidikan Angkasa bersama NASA oleh Dr. Wan Wardatul Amani*
- Demonstrasi *UAV*
- Pertandingan Gasing Moden
- *1st Malaysia Youth Chem E-Car Final*
- *Science Talk: Drug Mythbusters oleh Dr. Mohd Hazreen Abdul Rashid*



Emeritus Professor Datuk Dr. Mazlan Othman (Malaysian astrophysicist) lectured on 'Big Picture of Space – The Civilization Implication'



Mr. Hasif (UiTM) talked on 'Nano Satellite'

MINGGU SAINS NEGARA

"SAINS UNTUK KESEJAHTERAAN"

OGOS 2019 | SELANGOR • NEGERI SEMBILAN • MELAKA • JOHOR • PAHANG KELANTAN • PERAK • KEDAH • PULAU PINANG • PERLIS | #MinggusainsNegara #SainsUntukKesejahteraan #MESTECC

Hindari Plastik Sekali Guna

UNISAT-Jr team (UiTM) for outreach program

Mr. Ariff explained how satellite works to the visitor

Mr. Norhaniff and Mr. Amir showed the video montage of UiTMSAT-1 to the visitors

They won the IoT idea contest!

The Malaysia Agency Remote Sensing visited UiTM booth

Mr. Fauzan assisted the kids how to spell their name in Morse Code

UiTM team with the Malaysian Amateur Radio Transmitters Society (MARTS) – we had a wonderful discussion for the future satellite project involving the ham radio operators

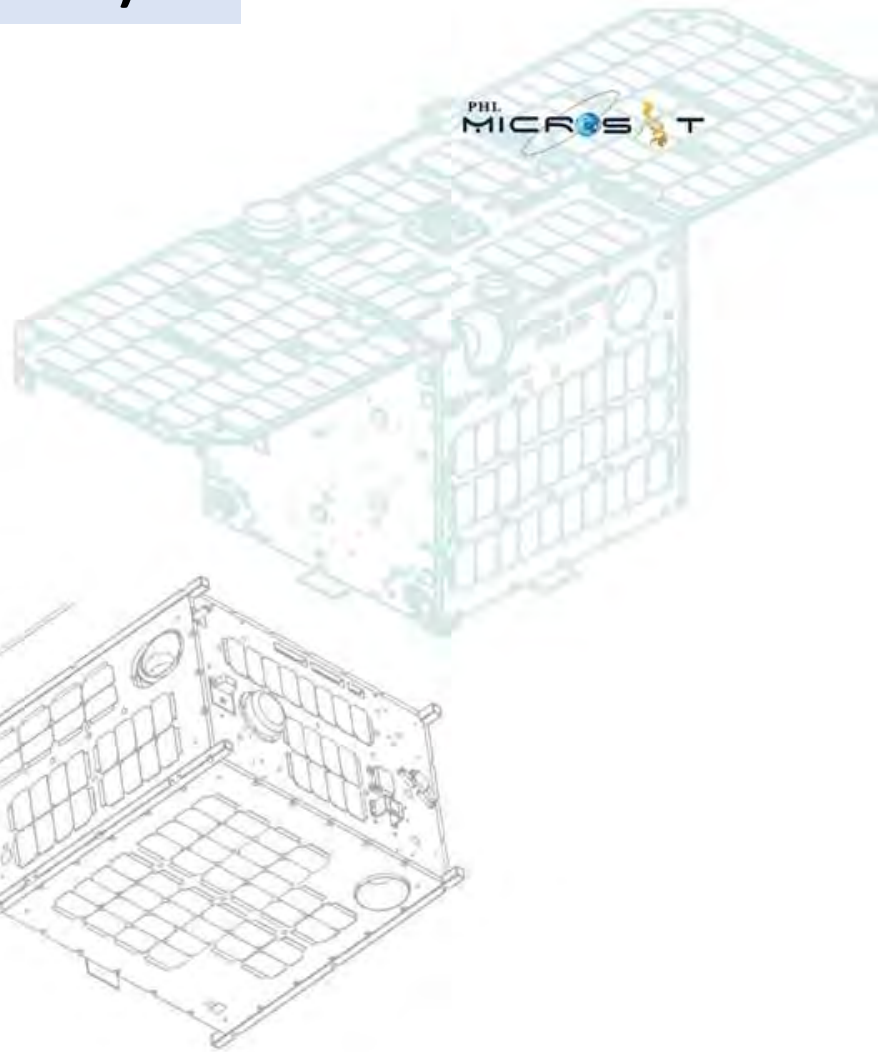
Reunion with the ANGKASA team, who had trained in Kyutech before – (they showed the 'BIRDS' hand gesture)

END OF THE REPORT FROM MALAYSIA

28. Report from UPD (Philippines)

STAMINA4SPACE

UPDATES FROM THE PHILIPPINES



August 15, 2019
University of the Philippines-Diliman
Quezon City, Philippines

PREPARED BY:

Mae Ericka Jean C. Picar
STAMINA4Space Communications Officer, STeP-UP Project
Graphic Artist and Contributing Writer

Nicole V. Ignacio
STAMINA4Space Communications Officer, PHL-50 Project
Contributing Writer and Editor

F. Mara M. Mendoza
STAMINA4Space Project Manager, STeP-UP Project
Contributing Writer and Editor

IN THE NEWS: The Philippine Space Act

The Republic Act (RA) 11363 or The Philippine Space Act has been officially signed into law by Philippine President Rodrigo Duterte on August 8, 2019.

The RA 11363 establishes both the Philippine Space Agency (PhilSA) and the Philippine Space Development and Utilization Policy (PSDUP).

Philippine Space Act

In photos (R-L) : Engr. Paul Jason Co (Project Leader,STeP-UP Project), Marx Tupas (UP Professor), Dr. Joel Marciano, Jr. (DOST-ASTI Acting Director, STAMINA4Space Program Leader), Sec. Fortunato de la Peña (Secretary, Department of Science and Technology), Dr. Enrico Paringit (Director , DOST-Philippine Council for Industry, Energy and Emerging Technology Research and Development), Dr. Atchong Hilario (Chief Science Research Specialist, OPTIKAL Project)

August 8, 2019

- Philippine President Rodrigo Duterte signs into law the bill pushing for the creation a **Philippine Space Agency (PhilSA).** A copy was released to the public on August 13, 2019.
- With the establishment of the Philippine Space Agency under RA 11363, all space science and technology applications in the country will be centralized into a single agency.

August 14, 2019

- DOST-Philippines held a press conference on the signing into law of the Philippine Space Act
- DOST Secretary Fortunato Dela Peña talked about the existing STA applications under DOST and the agency's investment in space R&D (a total of P7.48 billion).

Read more from DOST-ASTI's coverage

Philippine Space Act

Some of the STAMINA4Space Team members joining the photo-op session

DOST Secretary Fortunato de la Peña answering one of the media's questions regarding the establishment of the Philippine Space Agency

Dr. Marciano, Jr. explains the value of satellite data such as in how Japan's Himawari-8 website and app provides weather forecasting agencies with real-time satellite imagery.

(https://play.google.com/store/apps/details?id=org.amaterass.a.himawari&hl=en)

Maya-1 ISS Release Anniversary

August 10, 2019

On this day a year ago:

The three cube satellites (CubeSats) UiTMSAT-1 (Malaysia)🇲🇾, BHUTAN-1 (Bhutan) 🇧🇹, and Maya-1 (Philippines)🇵🇭 were released into orbit from the International Space Station. These small satellite platforms built under the the 2nd Joint Global Multi-Nation Birds Satellite Project (BIRDS-2 for short) are now being used as educational platforms for technology demonstration, with learnings that can be used for building bigger satellites, or more educational modules of this kind.

IconSpace 2019 Best Paper Award

2019 6th INTERNATIONAL CONFERENCE ON SPACE SCIENCE AND COMMUNICATION
(ICONSPACE2019)

Certificate of Award

This is to certify that paper entitled
Development of Software Defined Radio – based Satellite Telemetry and Telecommand System in Virtual Instrumentation Environment
(Calvin Artemies G. Hilario, Mar Francis D. De Guzman, Alvin E. Retamar, and Joel Joseph S. Marciano, Jr.)

has been awarded
Best Paper Award

for category
Track : Geoscience and Remote Sensing & Satellite and Communication Technology (GRS & SCT)

in the
2019 6th International Conference on Space Science & Communication (IconSpace2019)
on 28 – 30 July 2019 at Pulai Springs Resort, Johor Bahru, Johor, Malaysia.

Prof. Ir. Dr. Mardina Abdullah
General Chair

In photo : Certificate of Award

Visit the website for more details:
http://www.ukm.my/iconspace/

IconSpace 2019 Best Paper Award

28-30 July 2019
Pulai Springs Resort, Johor Bahru, Johor, Malaysia

DOST-ASTI team mebers Calvin Artemies G. Hilario (Senior Science Research Specialist), Mar Francis D. De Guzman (Science Research Specialist II), Alvin E. Retamar (Chief Science Research Specialist), and Dr. Joel Joseph S. Marciano, Jr. (Acting Director) were recognized for their winning paper titled "**Development of Software-Defined Radio-based Telemetry and Telecommand System in Virtual Instrumentation Environment**" under the category "Geoscience and Remote Sensing & Satellite and Communication Technology (GRS & SCT)"

TThe 2019 6th International Conference on Space Science and Communication (IconSpace2019) was organized with the theme "Advancing Space Science for Societal Sustainability" o provide a platform for researchers, scientists and industrially relevant to explore, co-operate, promote, motivate the participants in space science to achieve societal sustainability goals.

Regional Science and Technology Week: Siquijor

RSTW- Siquijor

August 15-17, 2019

Capital Square, Siquijor,

The small satellite replicas go to Siquijor! Together with DOST-ASTI, representatives of STAMINA4Space joined the celebration and shared their knowledge with the Philippines Region VII.

The exhibits were clustered into eight (8) categories, namely, Food Security Energy and Environment; Aging Society, Health and Medical Care; Science and Technology Human Resource Development; Equity and Growth in the Countryside; Biodiversity and Sustainable Biological Resources; Cities, History and Cultural Heritage; Resilience and Innovation; and International Linkages.

For more details: http://www.nstw.dost.gov.ph/

Updates from BIRDS-2S

"The fourth step..."

August 15, 2019
University of the Philippines- Diliman
Quezon City, Philippines

Prepared by STeP-UP scholars

Renzo S. Wee | Christy A. Raterta
Layout Designer

Derick B. Canceran
Contributing Writer

Judiel L. Reyes
Contributing Writer

Bryan R. Custodio
Project Manager
Contributing Writer

Gladys A. Bajaro
Contributing Writer

Marielle M. Gregorio
Contributing Writer

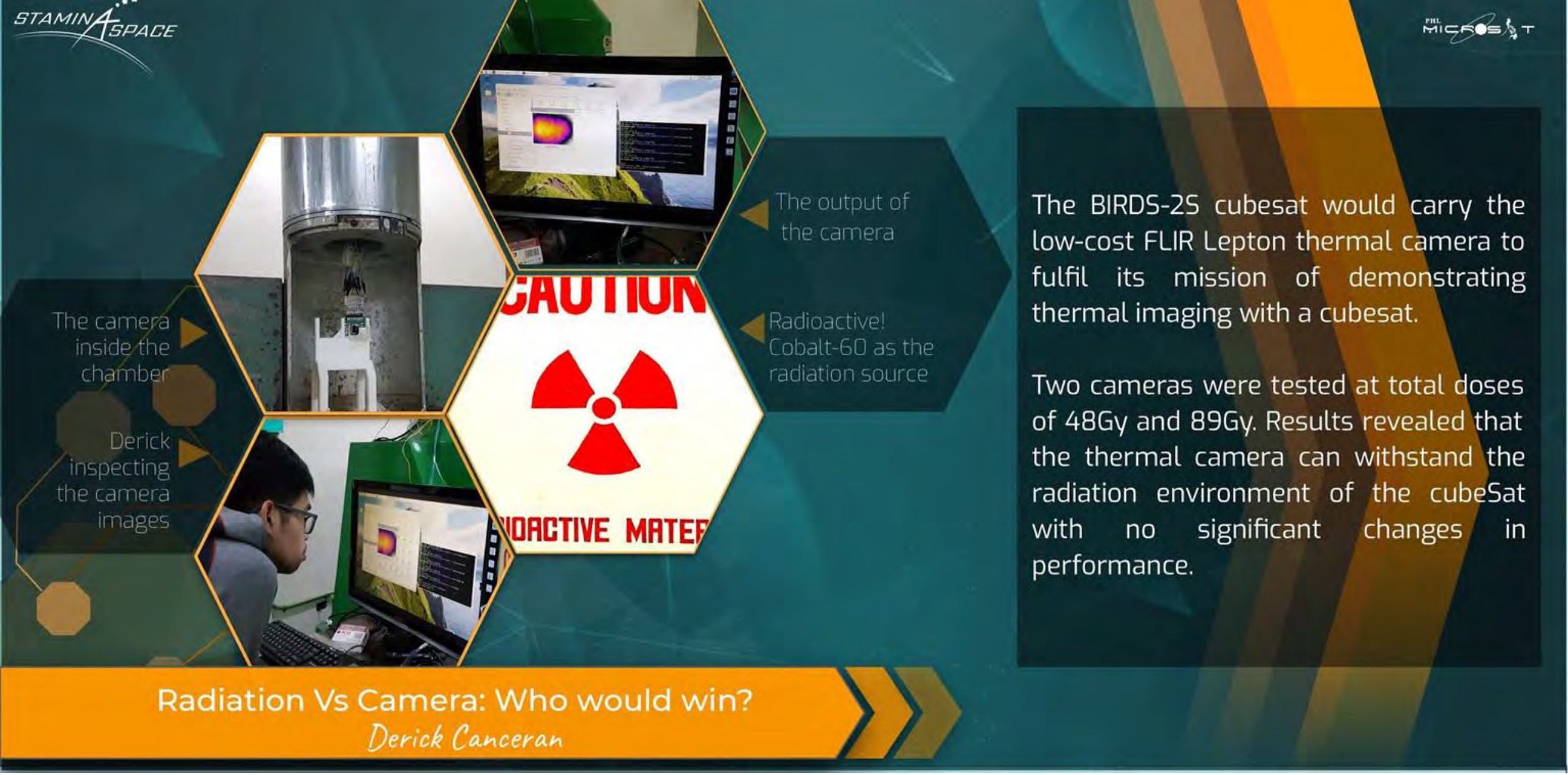
Radiation Vs Camera: Who would win?

Derick Canceran

Space is a harsh environment. Radiation is one of the hazards faced by spacecraft. With the gaining popularity of lean satellite design, commercial-off-the-shelf (COTS) components are integrated to these satellites. These components are not designed to be used in space and testing must be done to ensure their reliability.

The BIRDS-2S radiation testing team with STeP-UP members.

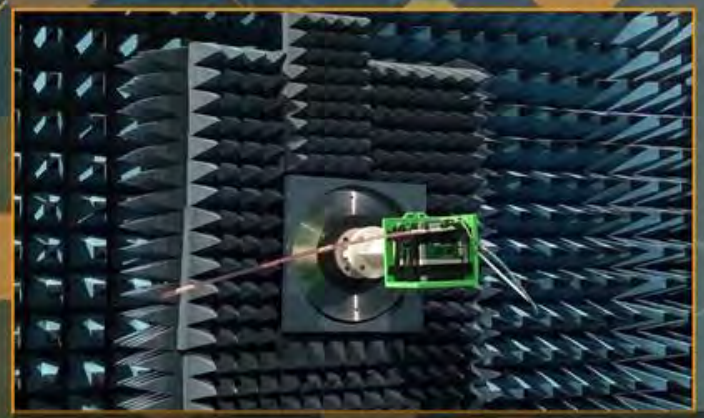
The UP EEEI building (right) as seen by the FLIR Lepton thermal camera (left).


STAMINA SPACE
PHL MICROSAT
The output of the camera
Radioactive! Cobalt-60 as the radiation source
The camera inside the chamber
Derick inspecting the camera images
CAUTION
IOACTIVE MATE
The BIRDS-2S cubesat would carry the low-cost FLIR Lepton thermal camera to fulfil its mission of demonstrating thermal imaging with a cubesat.
Two cameras were tested at total doses of 48Gy and 89Gy. Results revealed that the thermal camera can withstand the radiation environment of the cubeSat with no significant changes in performance.
Radiation Vs Camera: Who would win?
Derick Canceran

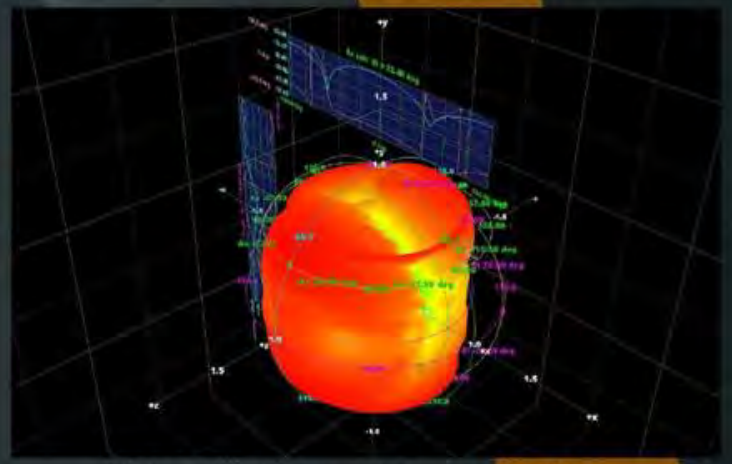
Antenna Radiation Pattern and Gain Measurement

-Bryan Custodio

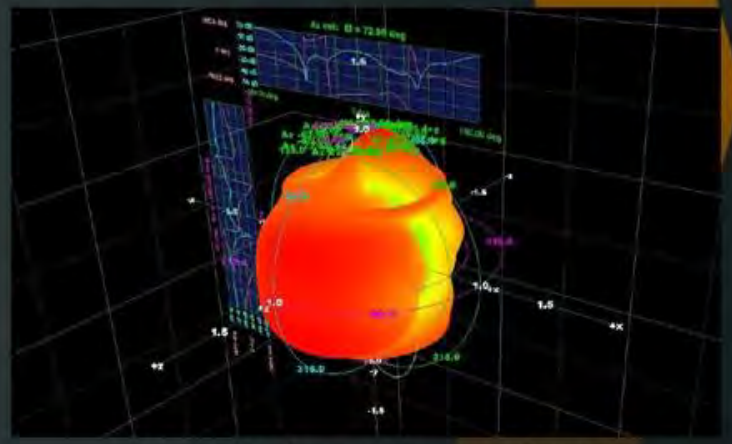
To determine the radiation characteristics of the UHf and VHF antenna system of the BIRDS-2S CubeSat, the team performed the antenna measurements at the Full anechoic chamber (FAC) at UP Diliman EEEI. The radiation characteristics such as the radiation pattern and the gain, are some of the parameters that defines the performance of an antenna in a wireless communication system.



Test Setup inside Full Anechoic Chamber (FAC)



3D radiation pattern of UHF antenna



3D radiation pattern of VHF antenna

A Roundtable Discussion...

Judiel Reyes/Gladys Bajaro

Last July, Round Table discussion was concluded between DOST-ASTI and DA-BFAR at Quezon City. The discussion aimed to have an Institutional collaboration on Fisheries Management and Geospatial Technology.
The event was organized by USAID and BFAR, and attended by representatives from STAMINA4SPACE program, UP, and DOST-ASTI.

The DA-BFAR and DOST-ASTI presented their current projects and plans for their respective departments, during the presentations they have their conducted discussions on which part and how the two departments can collaborate.

Let it go!

-Marielle Gregorio

Another bonding moment of the STeP-UP scholars was ice skating. The group enjoyed skating despite the cold ice floor. Bloopers! Stumbled and fell while learning the balancing in sliding. One thing we've learned in this activity was that, "You will never know how to do things if you will never have the courage to try it! And then you'll realize it was worth the try!"

THE END OF THIS REPORT FROM UPD

End of this **BIRDS Project Newsletter**

(ISSN 2433-8818)

Issue Number Forty-Three

This newsletter is archived at the BIRDS Project website:
http://birds1.birds-project.com/newsletter.html

When a new issue is entered in to the archive, an email message is sent out over a mailing list maintained by the Editor (G. Maeda, Kyutech). If you wish to be on this mailing list, or know persons who might be interested in getting notification of issue releases, please let me know.

This newsletter is issued once per month. The main purpose of it is to keep BIRDS stakeholders (the owners of the satellites) informed of project developments.