



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.*

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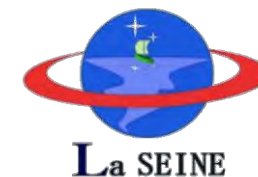
BIRDS Project Newsletter

Issue No. 42
(31 July 2019)

Edited by:

G. Maeda

Laboratory of Spacecraft Environment
Interaction Engineering (LaSEINE),
Kyushu Institute of Technology (Kyutech)
Kitakyushu, Japan



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. Prof. Mengu Cho wins the prestigious Frank J. Malina Astronautics Medal for 2019
2. The Logistics of the International Space Station -- this is a video worth watching
3. Dr Taiwo Tejumola (BIRDS-1 Project Manager) was invited to serve as a competition judge
4. Olayinka's World – Column #12
5. Space: The next trillion dollar industry
6. G. Maeda visited Mauritius to deliver presentation & to discuss avenues of collaboration
7. Congratulations to Dr. Pauline Faure: The Lockheed Endowed Professorship 2019 award
8. Some members of BIRDS-3/4 visited local elementary school for outreach
9. BIRDS-4 member is interviewed by AeroTime News
10. Kyutech has two African students under JICA's ABE Initiative
11. A good video on JICA, TICAD 7, and ABE
12. BIRDS-4: Lessons learned from first assembly
13. BIRDS-4: Timeline update for the BIRDS-4 project
14. BIRDS-4: Communication subsystem and related missions
15. BIRDS-4: Experiencing the ground station operations of BIRDS-3
16. BIRDS-4: Battery screening and matching procedure
17. BIRDS-4: Philippines' National Day celebration

Continued on the next page

From Sudan

The Guest Box



Explanation on the next page.

Table of Sections [continued]

18. BIRDS-3: Public viewing of deployment at Nepal side
19. Prof. Dianne DeTurrís of Cal Poly is teaching “Rocket Propulsion” for SEIC this summer
20. MIT Media Lab team teaches a summer mini-course
21. Update from Sri Lanka: Public viewing of RAAVANA-1 deployment, and GS status
22. Updates from the Philippines
23. BIRDS-1: The report about the deorbiting of BIRDS-1 satellites
24. BIRDS-3: On orbit status report
25. BIRDS-3: Nepal-Japan dialogue series IV – an outreach event
26. NanoRack releases LEO commercialization study

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.**

Explanation of the Guest Box photo of the previous page

Here you see the formal National Traditional cloth in Sudan, we wear them in most of the social events.

This image was taken in Kitakyushu, Japan, during **The Eid (Ramadan Month feast)**.

The National Costume for men is the wide white dress with the turban. It is optimum for the hot dry weather of Sudan. We call it *Jallabiyya*.

For Ladies, they wear what is called *Toub*, which is a long, big one-piece of cloth wrapped around the body in a very amazing way. Usually it is colorful in social events and white for official events.

**Happy Eid day to all of you!
May all your moments be blessed!**

-- Yasir ABBAS, BIRDS-4 Member

01. Prof. Mengu Cho wins the prestigious Frank J. Malina Astronautics Medal for 2019

FRANK J. MALINA ASTRONAUTICS MEDAL



Frank Joseph Malina (October 2, 1912 – November 9, 1981) was an American aeronautical engineer and painter, especially known for becoming both a pioneer in the art world and the realm of scientific engineering. Frank J. Malina also was an active volunteer of the International Astronautical Federation. He was a long serving SEOC member and SEOC Chair.

Since 1986, the Frank J. Malina Astronautics Medal is presented annually to an educator who has demonstrated excellence in taking the fullest advantage of the resources available to them to promote the study of astronautics and related space sciences. Any IAF member organisations in good standing may nominate candidates for the Frank J. Malina Astronautics Medal. Only one nomination per organisation will be accepted

each year. Every year during the IAF Spring Meetings in Paris, the IAF Malina Medal Subcommittee reviews the nominations and select the recipient.

The committee receives many high quality applications each year. Acknowledging that a lot of effort goes into the preparation of these nominations, the nomination will stay current for a period of 3 years from submission. Nominees have the opportunity to

2019 Call for Nominations – CLOSED

2019 RECIPIENT
Prof. Mengu Cho

Announced in June of 2019

Recipients

Frank J. Malina Astronautics Medal recipients include:

- 2018 **David B. Spencer** (USA)
- 2017 **Lynn Cominsky** (USA)
- 2016 **Bénédicte Escudier** (France)
- 2015 **Boris Pschenichner** (Russia)
- 2014 **Bryan Debates** (USA)
- 2013 **John M. Logsdon** (USA)
- 2012 **Amelia Ercoli-Finzi** (Italy)
- 2011 **Yves Gourinat** (France)
- 2010 **Jean-Marie Wersinger** (USA)
- 2009 **Barbara Morgan** (USA)
- 2008 **Anne Brumfitt** (Australia)
- 2007 **Peter M. Bainum** (USA)

This IAF medal is “presented annually to an educator who has demonstrated excellence in taking the fullest advantage of the resources available to them to promote the study of astronautics and related space sciences.”

See this in its entirety: <http://www.iafastro.org/activities/honours-awards/frank-j-malina-astronautics-medal/>

What is the IAF?



**INTERNATIONAL
ASTRONAUTICAL
FEDERATION**

Connecting @ll Space People

THE INTERNATIONAL ASTRONAUTICAL FEDERATION

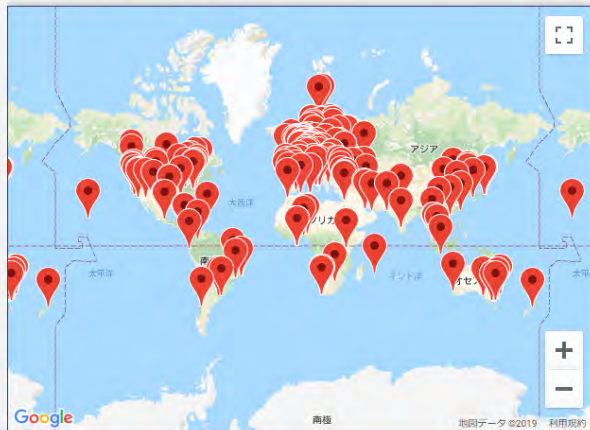
*“A space-faring world
cooperating for the
benefit of humanity”*

Founded in 1951, the International Astronautical Federation is the world’s leading space advocacy body with 366 members in 68 countries, including all leading space agencies, companies, research institutions, universities, societies, associations, institutes and museums worldwide.

Following its motto “Connecting @ll Space People” and its theme “A space-faring world cooperating for the benefit of humanity”, the Federation advances knowledge about space, supporting the development and application of space assets by promoting global cooperation.

As organizer of the annual International Astronautical Congress (IAC) – world’s premier global space event – and other thematic events, the IAF actively encourages the development of astronautics for peaceful purposes and supports the dissemination of scientific and technical information related to space.

IAF MEMBERS



For the rest of the above see: <http://www.iafastro.org/about/>

See the list of all current members: <http://www.iafastro.org/membership/#>

The 12 Japanese members of the IAF



IHI



NEC



MITSUBISHI
ELECTRIC



JRS

Japanese Rocket Society



Kyutech
Kyushu Institute of Technology



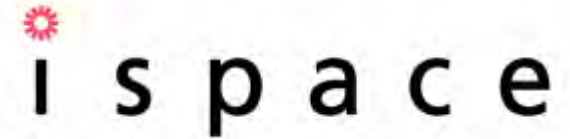
MITSUBISHI
HEAVY INDUSTRIES



JAXA



NICT
National Institute of
Information and
Communications
Technology



ispace



Infostellar



Japan Society for
Aeronautical and Space
Sciences



Japan Manned Space Systems Corporation
JAMSS



INTERNATIONAL
ASTRONAUTICAL
FEDERATION

Connecting @ll Space People

FOLLOW US:



BECOME A MEMBER

[Guide to IAF Membership](#)
[Membership Application](#)

MY IAF:

Sign in

Search...

Prof. Mengu Cho received the B.S. and M.S. degrees from the University of Tokyo, in 1985 and 1987, respectively, and the Ph.D. degree from the Department of Aeronautics/Astronautics, Massachusetts Institute of Technology, in 1992. After working at Kobe University from 1992 to 1995 and at International Space University from 1995 to 1996, he joined Kyushu Institute of Technology (Kyutech), Kitakyushu, Japan in 1996. Since 2004, He has been a Professor and the Director of the Laboratory of Spacecraft Environment Interaction Engineering (LaSEINE) of Kyutech. Currently, he is the head of Department of Space Systems Engineering. His research interests include spacecraft environmental interaction, particularly spacecraft charging and nano-satellite reliability.

[continued on the next page]

[Home](#) > Article

WINNER OF THE 2019 FRANK J. MALINA ASTRONAUTICS MEDAL



PROF. MENGU CHO

From this website: <http://www.iafastro.org/winner-of-the-2019-frank-j-malina-astronautics-medal/>

continued from the previous page...

He is the author or co-author of more than 160 papers in peer reviewed journals. He served as the project lead of three ISO standard, including the nanosatellite testing standard ISO-19683. He supervised 10 university satellite projects, among which 8 projects, 16 satellites, were already in orbit as of June 1 2019. He received Space Development and Utilization Award from Japanese government twice. The satellite project, BIRDS-I, he supervised received 2017 GEDC Airbus Diversity Award in recognition of demonstrating a fine example of bringing diversity to engineering education.

The Award will be presented at the Closing Ceremony of the 70th IAC in Washington D.C., United States on Friday, 25 October 2019.



02. The Logistics of the International Space Station -- this is a video worth watching



The cost of delivery to the ISS (very costly)



Failure rate of deliveries



Above: Dinner time



Right: Movie night

View the 12-min. video here: <https://www.youtube.com/watch?v=EkRRo5DN9II>

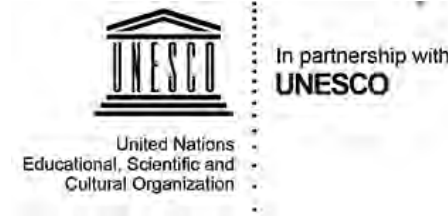
03. Dr Taiwo Tejumola (BIRDS-1 Project Manager) was invited to serve as a competition judge



TEJUMOLA Taiwo from Airbus Group Leadership University.

July 1 at 5:42 PM -- Blagnac, France

“As the 2017 Airbus Careers diversity award winner, it was a great pleasure to be back as one of the four Members of Jury for the finals of **2019 Airbus Fly Your Ideas** competition. No doubt, Airbus is the global leader in the promotion of innovative Aerospace ideas. Congrats to all the Finalists! “



For more info on this competition see: <https://www.airbus-fyi.com/>



OLAYINKA'S WORLD

COLUMN NO 12

04. Olayinka's World – Column #12

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)



IAU PRESIDENT'S VISIT TO NIGERIA

On Friday, May 24, 2019, the IAU president, Ewine van Dishoeck came on a working visit to the West African Regional Office of Astronomy for Development (WA-ROAD). She was hosted at the National Space Research & Development Agency, Obasanjo Space Centre, Abuja, Nigeria.

Her first engagement was a closed-door session with the management of the National Space Research & Development Agency and WA-ROAD. Astronomers Without Borders Nigeria organized a Space Science & Astronomy quiz for about 200 high school students, who were anticipating the chance to see the IAU president. After the meeting, she made a presentation that denoted, 'We are all world citizens under the same beautiful sky,' to a hall full of high school students, who eagerly anticipated the opportunity to listen to her. She had a barrage of questions from the students afterwards, and she gracefully answered every single question presented to her. After the question & answer session, she presented prizes to the top 10 students in the quiz competition.

The IAU president proceeded to the National Space Museum, where she was taken on a tour of the facility by the National Coordinator of AWBNigeria, Mrs. Olayinka Fagbemirot, and she inspected the WA-ROAD and AWBNigeria offices.



The IAU President with some AWB Members

IAU President presenting gift to the overall best student in the Quiz



The IAU President on a guided tour of the National Space Museum

A cross section of participants at the event



05. Space: The next trillion dollar industry



Space: The Next Trillion Dollar Industry

I can highly recommend this video about the future of the global space industry. It is under 30 minutes.

This video is here: <https://www.youtube.com/watch?v=hiRBQxHrxNw>

06. G. Maeda visited Mauritius to deliver presentation and to discuss avenues of collaboration

MRC = Mauritius Research Council



Above: GM takes questions

Left: Video recorded for live broadcast via Facebook.



Right:

GM chats with Dr Vickram.



See our Research & Innovation Grant Schemes:

- i. Collaborative Research and Innovation Grant Scheme
- ii. Intellectual Property Promotion Scheme
- iii. Social Innovation Research Grant Scheme
- iv. National SME Incubator Scheme
- v. Proof of Concept Scheme
- vi. Pole of Innovation Grant Scheme
- vii. Research and Innovation Bridges

Details are available on: <http://www.mrc.org.mu>

Mauritius Research Council
 6th Floor, Ebene Heights, 34, Cybercity, Ebene
 Tel: (230) 465 1235 Fax: (230) 463 1219
 E-mail: grs@imtae.mu Website: www.mrc.org.mu

MRC MAURITIUS RESEARCH COUNCIL

HALF-DAY SEMINAR

New Space vs. Old Space

DRAFT PROGRAMME

Venue: *Mauritius Research Council
 6th Floor, Ebene Heights,
 34, Cybercity, Ebene*

Date: *Friday, 21 June 2019*

Time: *10:30 hrs*

This was the program for my talk at MRC on 21 June 2019 at their main office in Ebene.

This was printed up and distributed. Many outsiders were invited.

CONTINUED ON THE NEXT PAGE

New Space vs. Old Space

Abstract

GM wrote this abstract

The peak of Old Space occurred in 1969 when the United States of America put a man on the surface of the Moon and return him safely to Earth. This year, 2019, is the 50th anniversary of that event. But what happened after the success of NASA's Apollo program? As many of you know, the public lost interest in space, and humanity's activities in space went into deep freeze for a long time. I am profoundly aware of that space "ice age" because I lived through it; I was born in 1959. However, a robust recovery is finally underway, since about 2005. This recovery is called by many as New Space. And it is very different from Old Space. I will discuss this revolutionary paradigm shift. And this shift is important to all of humanity. Because of New Space, all countries, including the country of Mauritius, can participate in space. In a nutshell, New Space has vastly lowered the barriers to getting involved in space. Therefore, I hope your country will passionately embrace this golden opportunity to explore and to exploit outer space for your own national needs.

PROGRAMME

10:00 – 10:30	Registration of Participants
10:30 – 10:35	Welcome Address <i>Dr N Gopaul, Officer in Charge Mauritius Research Council</i>
10:35 - 10:40	Address <i>Dr M Atchia, Chairman Mauritius Research Council</i>
10.40- 10.45	The First Mauritian Satellite <i>Dr V Bissonauth, Research Coordinator Mauritius Research Council</i>

New Space vs. Old Space

10:45 – 11:45	Presentation <i>Prof Georges Maeda Assistant Professor- Kyushu Institute of Technology</i>
11:45 – 11:55	Questions and Answers
11:55 – 12:00	Vote of Thanks <i>Dr V Bissonauth, Research Coordinator Mauritius Research Council</i>
12:00	Refreshments

One hour



This is Mauritius' first satellite – it won a free launch from JAXA under KiboCube.



Dr Atchia, chairman of MRC



facebook mauritius research council - mrc

All Posts People Photos Videos Pages

Your Groups and Pages
Public
Choose a Source...

POST TYPE
All Posts
Posts You've Seen

POSTED IN GROUP
Any group
Your Groups
Choose a Group...

TAGGED LOCATION
Anywhere
Fukuoka

Detailed guidelines are available from the website. 3:04

Seaweed Farming in Mauritius
Mauritius Research Council - MRC
September 23, 2016 - 44 Views

New Space v/s Old Space
Seminar: New Space v/s Old Space by Prof. Georges Maeda, Associa...
Mauritius Research Council - MR...
June 21 - 210 Views

The 18 satellites that we have launched so far

1:07:09



MRC FB: https://www.facebook.com/search/top/?q=mauritius%20research%20council%20-%20mrc&epa=SEARCH_BOX



One-hour video by MRC including the presentation by GM followed by Q&A:
<https://spacemauritius.com/2019/07/01/webinar-old-space-vs-new-space/>

07. Congratulations to Dr. Pauline Faure: The Lockheed Endowed Professorship 2019 award



Congratulations Pauline from all your friends at Kyutech Japan!



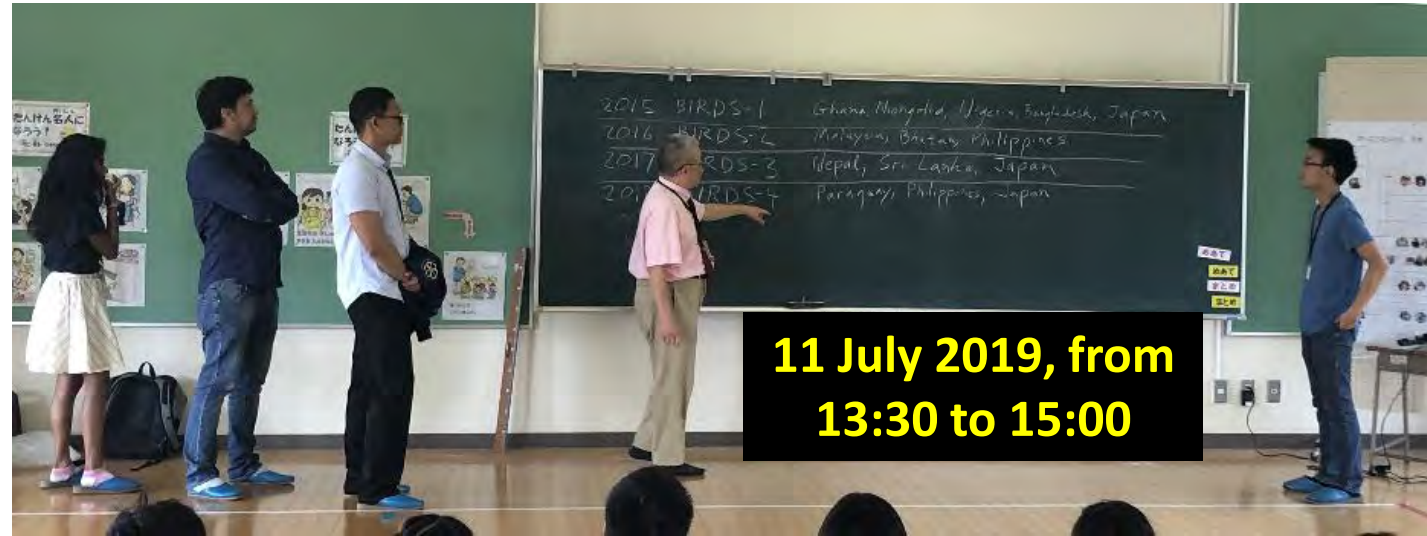
Dr. Faure receives the award at Cal Poly

08. Some members of BIRDS-3/4 visited local elementary school for outreach

At the request of this elementary school next door to Kyutech, we interacted with the young students. The school does not allow me to show photos of the students, unfortunately.



Hari, Dulani, 中野さん、Timothy, Izzie



11 July 2019, from 13:30 to 15:00

GM explains the background of the **BIRDS Project** to the students.

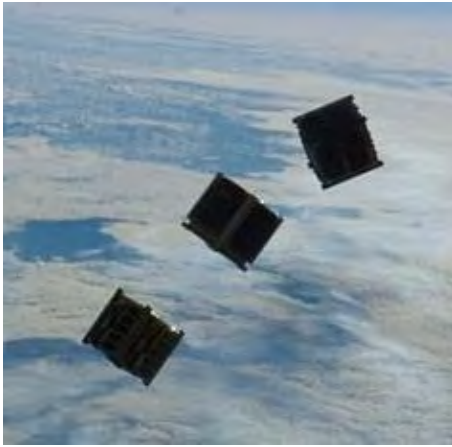


Website of this school: <http://www.kita9.ed.jp/ayamegaoka-e/>



BIRDS-4 Project Manager Izzie shows a photo of the 1U satellite.

09. BIRDS-4 member is interviewed by AeroTime News



How CubeSats revolutionize scientific space research?

[Interview]

The era of CubeSats is definitely in full swing. CubeSats – tiny, versatile spacecraft – are small satellites commonly used in low Earth orbit (LEO) for various applications, such as remote sensing and communications.

These miniature spacecraft are built to standard dimensions of the 10 cm cubic units with specified electrical power and mass capabilities. Currently, lighter, cheaper and less power-consuming than traditional satellites, CubeSats are mainly orbiting in low Earth orbit about 70 to 2,000 km (approximately 45 to 1,200 miles) above the Earth.

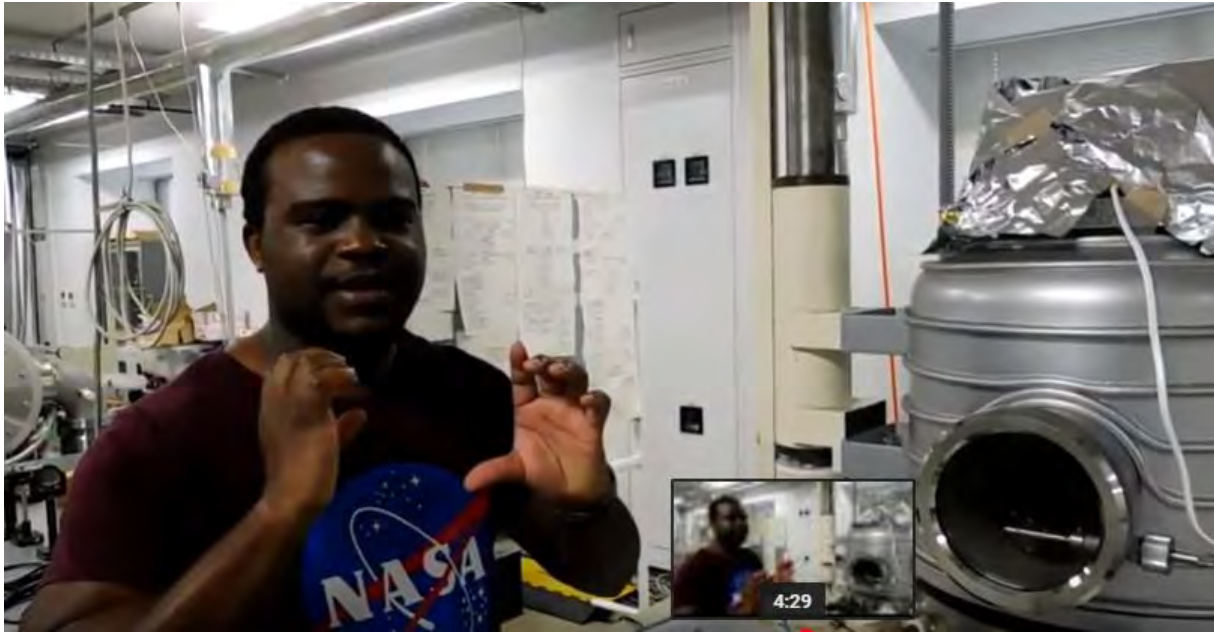
CubeSats are used for space education and scientific research. In the future, CubeSats, already being used in interplanetary missions, will go farther into space than any CubeSats have gone before.

Merve Kara from AeroTime has spoken with **Yigit Cay, an engineer and a Ph.D. student at Kyushu Institute of Technology (Japan), working on BIRDS-4 Satellite Project**, about how CubeSats are revolutionizing space exploration. **See the link below for the rest of this interview.**



See the full article: <https://www.aerotime.aero/merve.kara/22828-how-cubesats-revolutionize-scientific-space-research-interview>

10. Kyutech has two African students under JICA's ABE Initiative



Senior Shimhanda, Namibia



Hind Mahmoud Elhaj, Sudan

To promote ABE applications in Africa during the coming months, Senior and Hind have produced this short video to introduce Africans to the ABE Initiative and to space engineering at Kyutech.

View their 7-min video: <https://www.youtube.com/watch?v=IJ7H9icDeLo>

11. A good video on JICA, TICAD 7, and ABE



Kyutech will be participating in **TICAD 7 Yokohama** (28-30 Aug. 2019) – details in the next issue of the **BIRDS Project Newsletter**.

This event is important for us because we want to increase the number of BIRDS participants and the number of students from Africa.

If you want to learn more about Japan's support of Africa, about TICAD 7, and about the ABE Initiative, I highly recommend this 30-min. video from JICA:

<https://www.youtube.com/watch?v=IA2z-CbrfKs>

12. BIRDS-4: Lessons learned from first assembly



A Lesson-Learned from the First Assembly

Yiğit ay

BIRDS-4

July 7, 2019

About the Assembly Procedure

Written By: Yiğit Çay

In the article published in May, I'd written regarding our structural design in BIRDS-4. The new material, PEEK is introduced in this, the newest BIRDS satellite to match insulation requirement of Hentenna mission. Hentenna mission utilizes the 1U CubeSat body as an antenna to provide amateur radio communication in between the satellite and ground station. In order to realize this mission in structural design, we took a different step in BIRDS-4 compared to BIRDS-2 and 3 following BIRDS-1's structural design, and drastically changed into an Aluminum + PEEK hybrid structure.

We completed ordering every part necessary for the structure within May and on May 24, I assembled the Structural Testing Model (STM) mainframe for the...



*BIRDS-4 mainframe, after its first assembly
Adolfo and I were very happy and excited to see our structure
was finally assembled!*

...first time following BIRDS-3's assembly procedure for the frames. The assembly procedure for the satellites are crucial as the satellite's integrity is made sure through a good assembly reflecting the...

...design considerations such as defined screw type for specific holes, their necessary torque values... etc. Through a good assembly, one could avoid parts integrated into the system bump into and damage each other before the final product is ready.

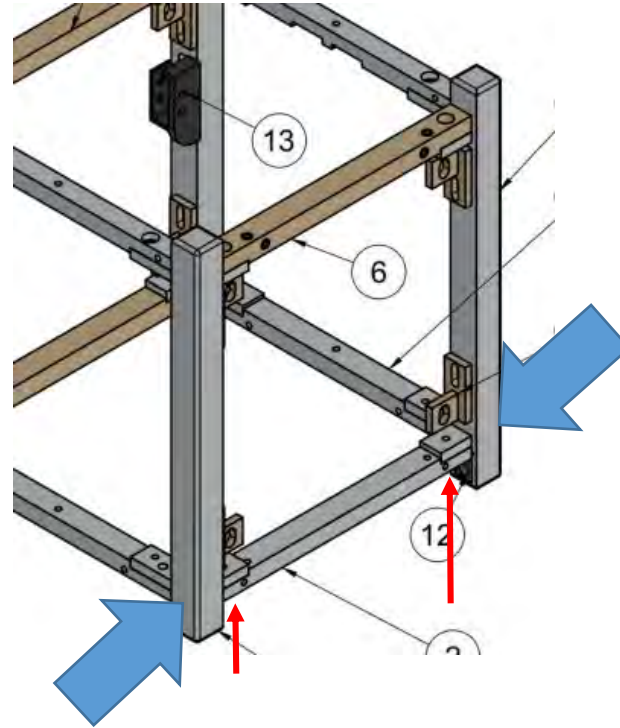
Sizes of a standard 1U (or one unit of) CubeSat's mainframes are defined as 100 x 100 x 113.5 mm in three axes. Hence, after the first assembly, I measured all axes' lengths using a Vernier caliper. I saw the lengths were slightly bigger than what we were expecting. Spacecraft are vehicles in the most severe environment: space. Therefore they have pretty strict conditions for the design in general. Our tolerance on each side of the mainframes was only 0.1 mm less than the actual length!

A Lesson-Learned from the First Assembly

Written By: Yiğit Çay

That means one side's the length can be any length between 99.9 mm to 100.0 mm. When we measure, two sides were 100.15 mm, making it impossible to enter the pod that will release the satellite into the space. I investigated the problem and realized two misses: I wasn't pressuring the corners enough during the assembly and university made frames were longer than the tolerance values.

After loosely tightening every screw in the mainframe, I needed to apply necessary torques on them one by one. Looking at the picture at the right side, for example, let's assume you want to tighten the screws to their holes with enough torque for that screw type (red arrows direction). In this case, a slight pressure from the two sides of the rails must be applied on the structure (blue arrows)...



Pressure points shown in blue before applying necessary torque to the screws roughly positioned at red arrow directions

... to assure the perfect integration. In my first assembly attempt, I didn't apply enough force and 0.01 mm level changes weren't applied to the structure to make the sizes more accurate. However, it...



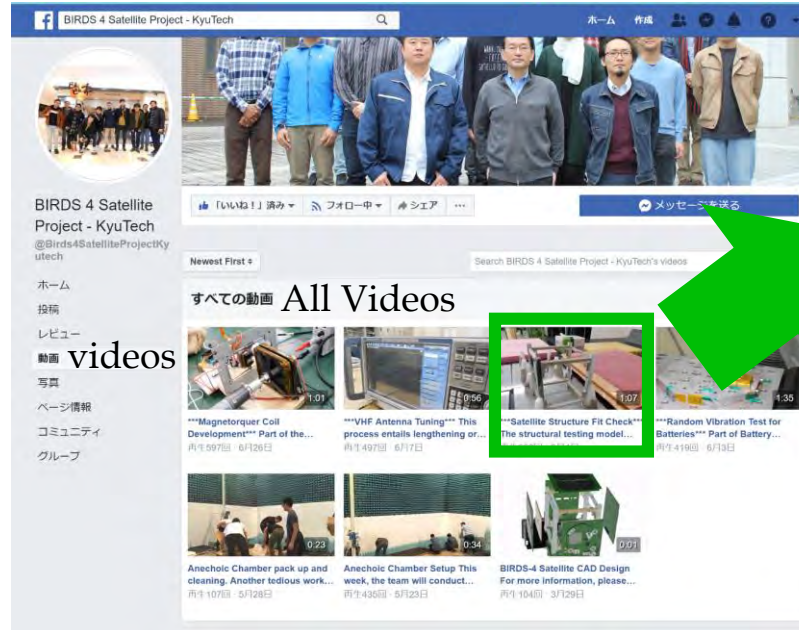
Required changes locations shown in red while the rough screw positions shown in green

...wouldn't be the only reason we had a longer structure. Thinking of the machining capabilities of different factories, I realized the frame (horizontal boom) connecting 2 rails (vertical booms) together were 0.1 mm longer than how it should be. As the manufacturing is complicated, we had ordered the rails from an outside company while we asked KyuTech's workshop working for the Mechanical Engineering faculty to produce the easily manufactured frame parts. Therefore, the assembly check...

A Lesson-Learned from the First Assembly

Written By: Yiğit Çay

...was performed by me for the first time. In the previous BIRDS projects, during the structural assembly, all structure was ordered to the same company by asking a prior assembly and tolerance check. After checking the sizes, the necessary machining was being applied to the parts. Hence, I had to perform sanding (removing material from its surface using a sanding block or orbital power tool) on the 2 frames causing the unacceptable tolerances. Fortunately, in the aircraft projects I'd participated in the past, I had enough experience in sanding and our workshop provided one spare for each frame they manufactured. I sanded the surfaces (shown as red lines in the photo of the previous page) and made double-check of the assembly immediately. After assembling and disassembling twice, the...



BIRDS-4's Facebook Page [\[link\]](#)

...measurement was 100 mm and screws of these frames (shown as green lines in the photo of the previous page) were still perfectly entering their holes as the distance change was divided into two at both sides. It was a stressful experience for me, but I believe we learned a lot...

BIRDS Project Newsletter – No. 42



Satellite Structure Fit Check
The structural testing model...
再生652回 · 6月4日

With our pod, in the clean room, we had checked once more after the modifications were done [\[watch the full video from here\]](#)

...from this. Now I'm extra careful about the pressure given at the sides and after discussing this issue with the team and professors, we decided to order following EM and FM structures from only one company by asking them to make a tolerance check. Few days after I complete writing this article, we're going to order our EM structure and I already asked the company to perform a tolerance check. We learned many other lessons from our first assembly, but this was the most important for us. I can't wait to experience more of the satellite assembly and learn!

Page 27 of 111

13. BIRDS-4: Timeline update for the BIRDS-4 project



Update on BIRDS-4 Project Timeline

Izrael Zenar Bautista
BIRDS-4
July 8, 2019

BIRDS-4 Updated Project Timeline

Written By: Izrael Zenar Bautista



Integrated mission and subsystem boards without battery box

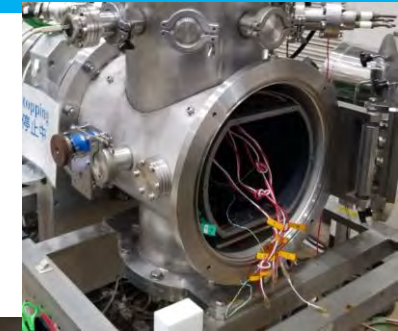


External view of BIRDS-4 Engineering model



(a)

BIRDS-4 EM inside (a) anechoic chamber (b) Thermal vacuum chamber and (c) Thermal chamber



(b)



(c)

Integration test finish (July 12)

- Since all mission boards and subsystem boards have arrived and were tested, they were integrated together and tested for functionality.



Chamber test

(July 13-28)

- Anechoic chamber – characterization for COMM and APRS-DP/S&F mission
- Thermal chamber – for Antenna deployment simulation under low temperature
- Thermal vacuum chamber – for thermal expansion of PEEK and thermal model

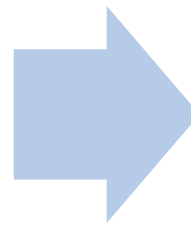
BIRDS-4 Project Timeline

Written By: Izrael Zenar Bautista



Thermal Vacuum test (Aug 3-9)

- Test the full functionality of the satellite under temperature and vacuum condition in space



Vibration test (Aug 13-16)

- Test the full functionality of the satellite after receiving vibration levels similar to what it will experience during launch

BIRDS-4 Project Timeline

CDR is on 5 Sept. 2019

Written By: Izrael Zenar Bautista



Critical Design Review

Buffer/Cont. of LDT (Aug 17-24)

- If unforeseen circumstances happen, this week would serve as back-up to do delayed tasks or tests.
- Continuation of long duration test if time permits



Documentation and Preparation (Aug 24-Sep 4)

- BIRDS-4 members will make a presentation on test results with Engineering model for the Critical Design Review



Critical Design Review (September 5)

- Stakeholders from participating countries and Professors will review the work done by BIRDS-4



Communication Subsystem and Related Missions

Marloun P. Sejera

BIRDS-4

July 7, 2019

Communication Subsystem and Related Missions

Written By: Marloun P. Sejera

Communication subsystem is responsible for relaying command, and mission data between the satellite and ground station, respectively. Without communication, information about the satellite's health and data about mission payload cannot be retrieved. So it is very important to make sure that the subsystem will in space.

BIRDS-4 shall use the same subsystem architecture of BIRDS-3. This has been proven working in space with the successful uplink and downlink communication of BIRDS-3 satellites (NepaliSat-1, Uguisu, and Ravaana-1) since its launch from ISS on June 17. The subsystem makes use of UHF transceiver board which operates at 437.375 MHz uplink, and 435.313 MHz downlink. Its...



ADD2705. UHF transceiver board that has a heritage from BIRDS-3

...rated transmit power is 800 mW, and uses Gaussian Minimum Shift Keying (GMSK) at 4800 bps baud. To cater Continuous Wave (CW) beacon, the board has second transmitter block...

... which uses On/Off Keying with a rated power of 200 mW.

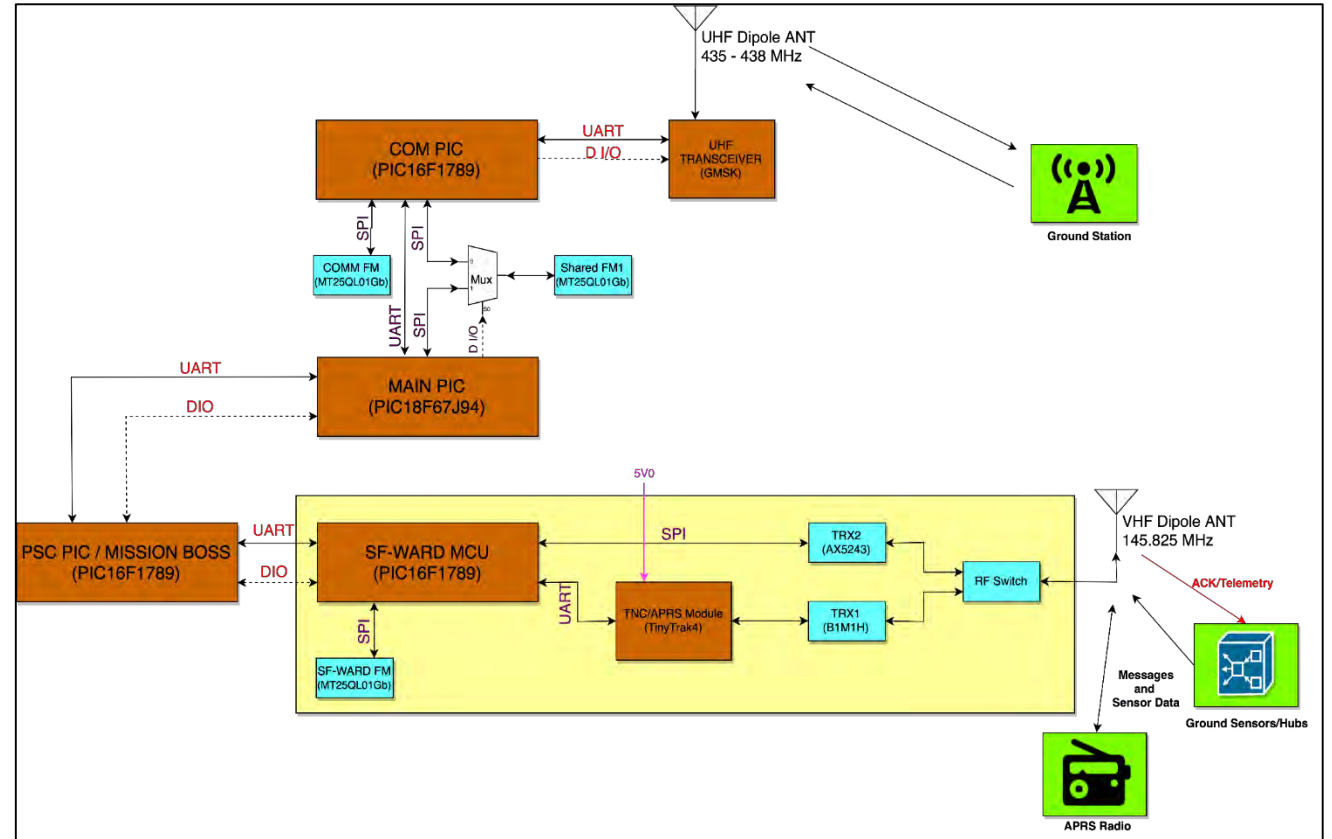
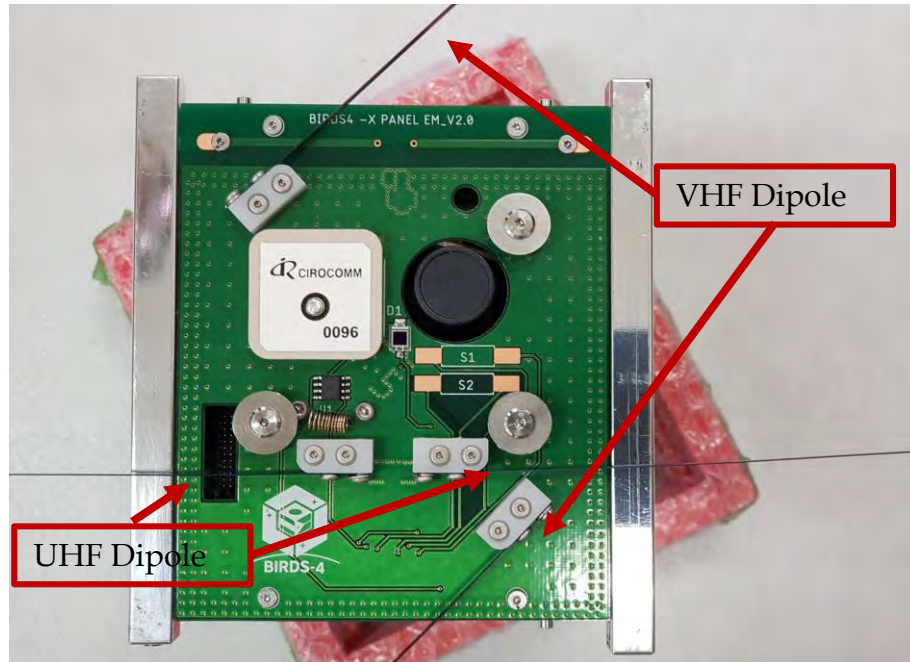
The transceiver board is then connected to a PIC microcontroller (COM PIC) via UART and DI/O. COM PIC process and execute the uplink command. It also performs data and housekeeping downlink. Finally, the UHF dipole antenna will be used for transmission and reception.

BIRDS-4 mission includes Store-and-Forward, and Automatic Packet Reporting System (APRS). It shall be operating at VHF, specifically 145.825 MHz. For these, commercial-of-the-shelf (COTS) transceiver shall be used as its primary transceiver. Its rated output power is 500 mW and receives sensitivity of -120 dBm (for 12 dB SINAD).

Communication Subsystem and Related Missions

Written By: Marloun P. Sejera

Secondary is a system-on-chip transceiver with a receive sensitivity of up to -138 dBm. It is also capable of doing Amplitude Shift Keying (ASK) and Frequency Shift Keying (FSK). Similar to UHF communication, both missions shall use a dipole antenna.



Top. Communication Block Diagram of BIRDS-4 satellites

Left. Antenna board where both UHF and VHF dipoles are placed

BIRDS-3 Ground Station Operation Experience



Hiroki Hisatsugu

BIRDS-4

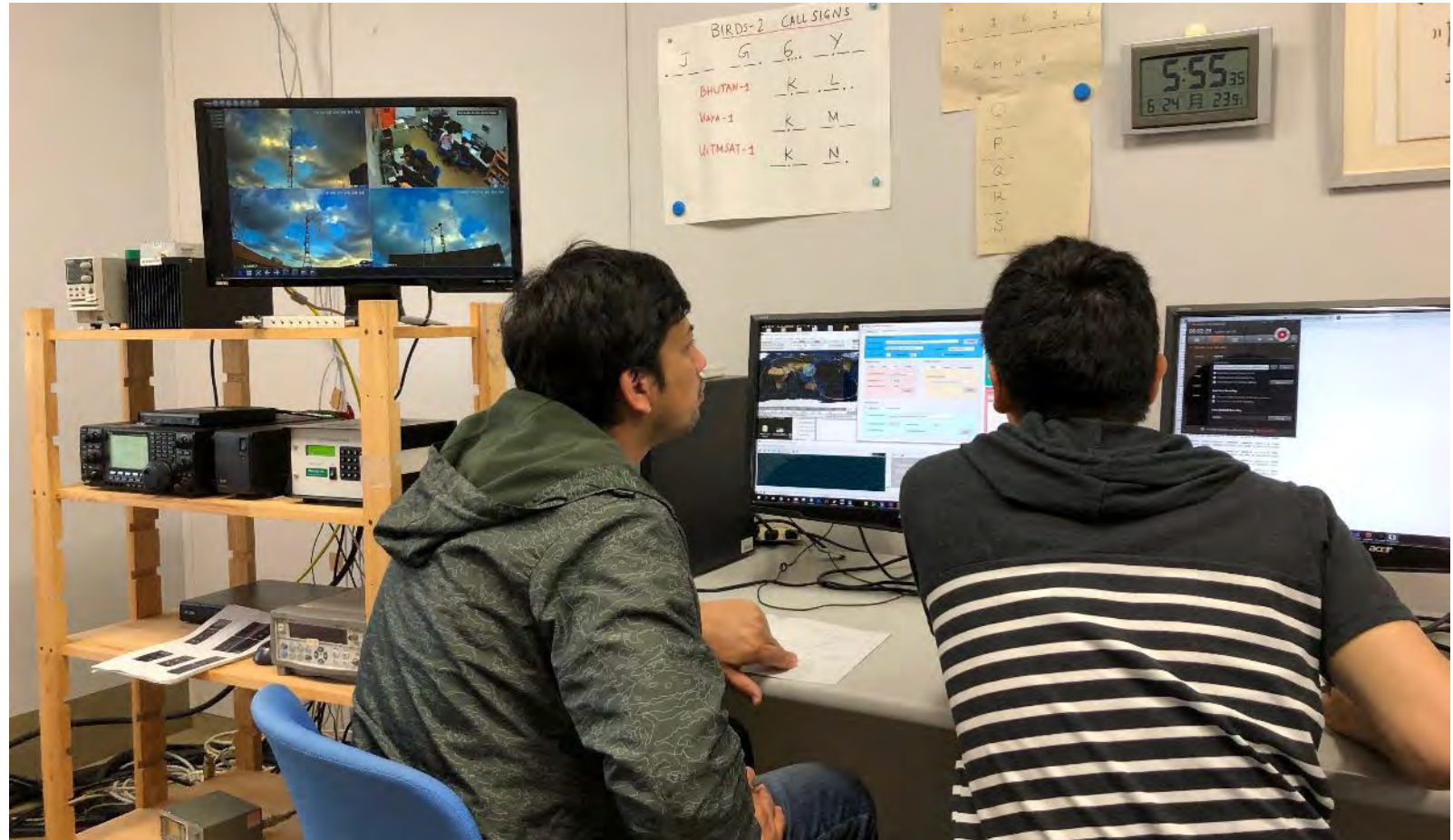
July 7, 2019

BIRDS-3 Ground Station Operation Experience

Written By: Hiroki Hisatsugu

As you all know, the BIRDS-3 satellite has succeeded in communication after being released from the ISS and is still operating normally. The operation is mainly conducted by the members of BIRDS-3, but from now on, we will also be in a supportive position. In the initial operations of this month, BIRDS-4 members joined as observers.

All satellites of BIRDS-3 is operating very well and there is worthwhile operation experience opportunity. Each time the housekeeping and mission data on the orbit come down, I was observing with great excitement.



FM command communication desk

BIRDS-3 Ground Station Operation Experience

Written By: Hiroki Hisatsugu

CW is visualized and displayed, and this screen is recorded so that the detailed contents can be confirmed later. The FM communication operation software had been produced by the BIRDS-3 team has an easy-to-understand user interface, and thanks to its proper functionalities, commands can be transmitted smoothly.

Satellites do not take our lives into consideration. There are many late-night and early-morning operations, and the operation members feel tired of this planning. As the BIRDS-3 satellites can be operated jointly in multiple countries through the BIRDS ground station network, it's hoped to attract the public attention for future cooperation between countries. It also has challenges such as data sharing from the operations via networks.



CW reception desk

Battery Screening and Matching Procedure



Hari Ram Shrestha

BIRDS-4

July 7, 2019

Battery Screening and Matching Procedure

Written by: Hari Ram Shrestha

CubeSat has solar cells to convert solar energy to electricity, that is then stored in rechargeable secondary batteries. For BIRDS-4 CubeSats, Ni-MH batteries shall be used to provide power during the eclipse as well as during peak load times.

To ensure that reliable batteries are selected for CubeSat, battery screening and matching are done. Battery screening has the following objectives: (1) To confirm that the batteries do not have an internal short circuit and do not rupture during launch period; (2) To confirm that the batteries experience a small change in physical characteristics after exposure to the launch environment. Battery matching is the selection of batteries with similar characteristics in terms of are dc resistance, open-circuit voltage (OCV),

capacity, and weight. The batteries that pass the criteria will then go to assembly.

Eighty (80) NiMH batteries were screened and matched. Thirty-six (36) batteries were then selected based on the matching criteria. A pack of six batteries will finally be assembled to be used in the satellite: two for Engineering Model (EM), three Flight Model (FM), and one for back-up).



BIRDS-4 shall use Panasonic Eneloop Ni-MH batteries.

Physical inspection and measurement

Each battery went to visual inspection and measurement before and after tests. This is to check whether there are significant changes in terms of physical appearance and/or measurement after the test. The battery's over current-voltage (OCV), weight and dimensions were measured.



A scale and a caliper are used to measure battery weight and dimensions, respectively.

Battery Screening and Matching Procedure

Written by: Hari Ram Shrestha

Battery Charge-Discharge Cycle Test

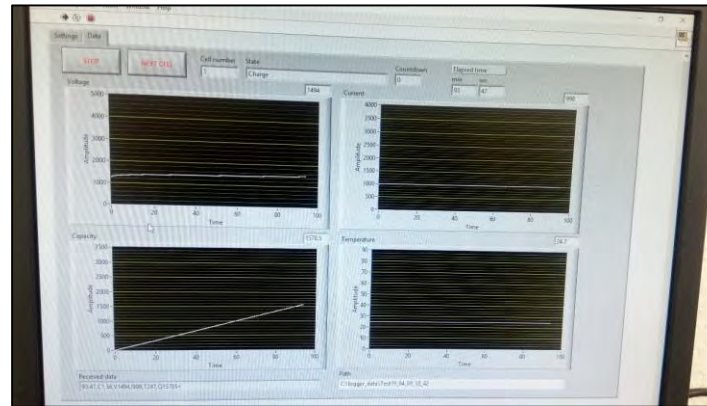
Four batteries were placed inside the charge-discharge hardware for cycle test. LabView was used to monitor and measure battery internal dc resistance, current and voltage at full charged and full discharged conditions. One cycle test took around 17 hours to finish. And each battery was subjected to three-cycle tests: before and after the vacuum test, and after the vibration test.

Vacuum Test

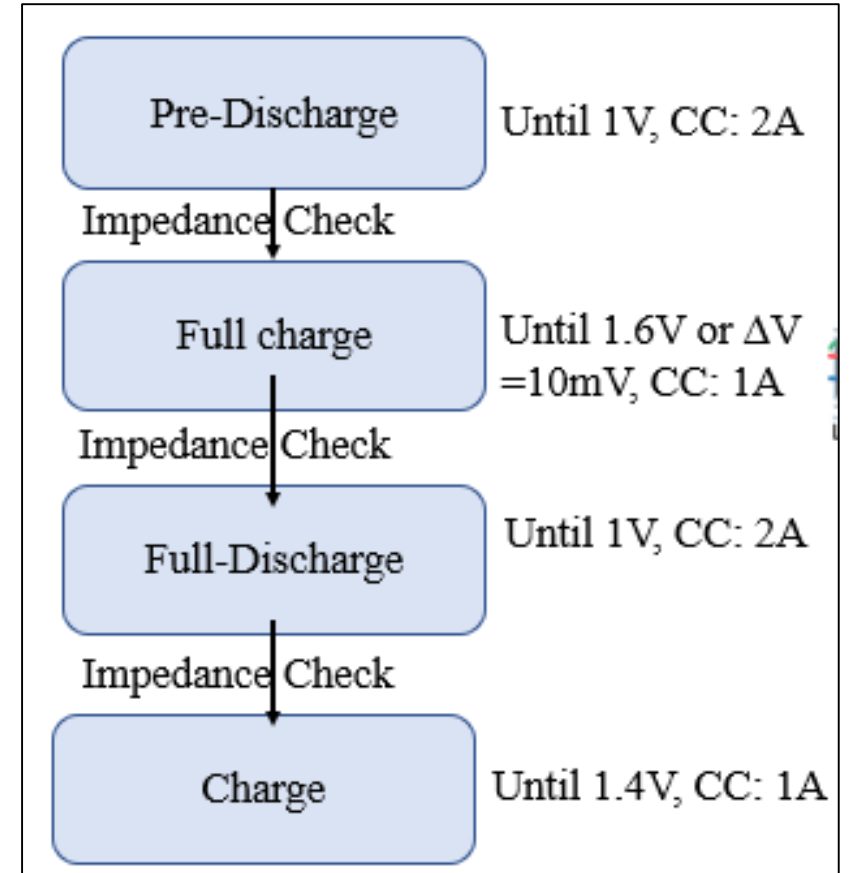
Vacuum test was performed to verify if any battery had leakage when subjected in vacuum condition. Batteries were placed inside an aluminum holder and inserted in the vacuum chamber for six hours.



Battery charge-discharge hardware



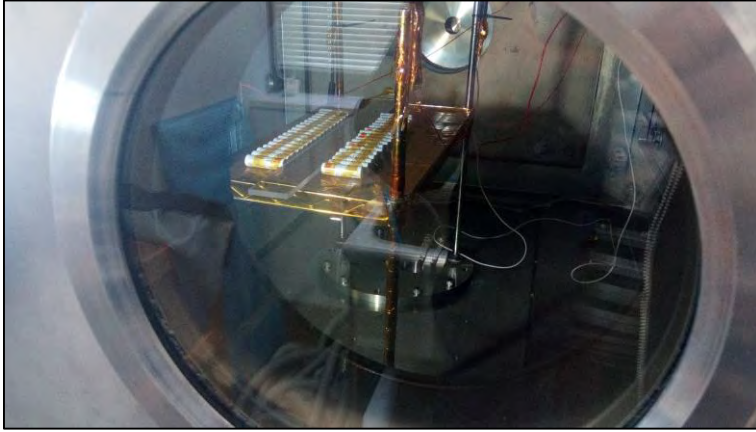
LabView to monitor battery current and voltage



Charge-discharge flow diagram

Battery Screening and Matching Procedure

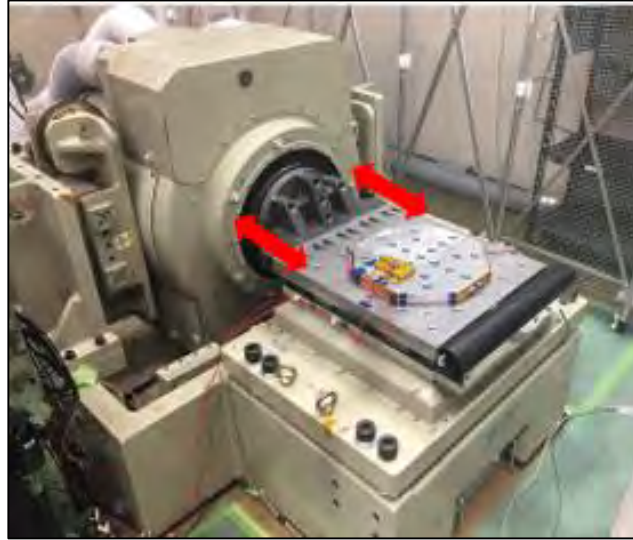
Written by: Hari Ram Shrestha



*Batteries were placed inside the vacuum chamber for battery leak test.
Setting: 1×10^{-3} Pa at 20 – 25 degree Celsius*

Vibration Test

Vibration test was performed to check if the batteries are tolerant of internal shorts.



Batteries in vibration test

Battery Matching

The final step was to analyze all the gathered data and match the batteries based on the following criteria:

1. The change of capacity before and after each environmental test should be less than 5%.
2. Dc resistance (Internal impedance) of the cells should be equal as much as possible
3. The change of mass and open-circuit voltage during before and after the environmental test should be less than 0.1%.
4. The change of mass and open-circuit voltage during before and after the environmental test should be less than 0.1%.



The Philippines' National Day Celebration



Mark Angelo C. Purio & Adolfo Jara

BIRDS-4

July 14, 2019

Philippines' National Day Celebration

Written By: Mark Angelo C. Purio

As part of the tradition of BIRDS to celebrate national days of its participating countries, June is the month to celebrate the Philippines' National day. Locally known as "Araw ng Kalayaan" or "Araw ng Kasarinlan", June 12 marks the commemoration of its independence from Spain.

In the Philippines, this day is a national holiday normally spent with family and friends where local governments in the Philippines prepare a program for this special event. Independence Day is a day when many people, including government officials, employees, and students, participate in nationwide parades. However, the main highlight is the police and military parade in Manila headed by the country's incumbent president, followed by a speech and

a 21-gun salute. Many Filipinos spend the day in parks and malls. Many Filipino communities in other countries also observe the nation's Independence Day celebrations. (timeanddate.com)

Photo Credit: Google Doodles Archive >>



Independence day celebration photos taken from Rappler.com



Philippines' National Day Celebration

Written By: Mark Angelo C. Purio

IN CELEBRATION OF PHILIPPINE INDEPENDENCE DAY

ORIGIN OF THE SYMBOLS OF OUR NATIONAL FLAG

WHITE TRIANGLE
Signifies the distinctive emblem of the famous Society of the "Katipunan" which by means of its blood compact inspired the masses to rise in revolution.

THREE STARS
Signifies the three principal islands of this Archipelago: Luzon, Mindanao, and Panay.

8 RAYS OF THE SUN
Signifies the eight provinces that revolted against the Spanish revolution: Manila, Cavite, Bulacan, Pampanga, Nueva Ecija, Bataan, Laguna, and Batangas.

BLUE RED AND WHITE
Commemorating the flag of the United States of North America, as a manifestation of our profound gratitude towards this Great Nation for its disinterested protection.

Source: malacanang.gov.ph/3845-origin-of-the-symbols-of-our-national-flag/

it's more fun in the PHILIPPINES

The Department of Tourism's "It's more fun in the Philippines" campaign has reached the attention of world travelers, as it promotes its great beaches. The Philippine flag campaign every year receives over a million responses and 2012, 2013 & 2014 seems it will have gotten better, proving that we are!

Want to know the reason why? We've gathered data and researched why it's become the number one destination for travelers from every corner of the globe. Here are the top 5 most popular "must-see" destinations in the Philippines.

7,107 islands in the Philippines
96M population

DID YOU KNOW?
* The Philippines stretches onto the area of 117,830 square miles, which makes it equal to the size of Italy.
* Philippines has the largest English-speaking population, second to the USA and the UK.
* Philippines has 1,200,000,000 people and 17,000 islands. It's a country that's big, with a lot to see and do.

LOCAL TRANSPORTATIONS
"Yes! Even the local transportations itself are tourist attractions."

JEEPNEY
Jeeps are the most popular mode of transportation in the Philippines. They are known for their modified bodies and hand-painted decorations, which have become a ubiquitous symbol of Philippine culture and art.

KALESA
A kalesa or kalesa is a horse-drawn carriage. The word also spelled kalesa, predates the Spanish colonial and derives ultimately from an Old Spanish kalesa, which means "wheeled".

TRICYCLE/PEDICAB
Pedicab is a three-wheeled, small-scale local means of transport. It can be manually used like a rickshaw, and can also be used using a motorcycle.

AVERAGE DAILY EXPENDITURES OF TOURISTS

120% FOOD & BEVERAGE	30% ACCOMMODATION	145% TRANSPORTATION
20% SHOPPING	93% ENTERTAINMENT	03% TOUR GUIDE
93% RECREATION		

"MABUHAY" is the tagalog word for "HAPPY"

BORACAY

BORAC
The word "Boracay" is said to have come from the local word borac, meaning cotton, clearly a reference to the sand's pristine white color and powder-like texture.

HIGHEST MOUNTAIN in the Philippines

2,954m MT. APO, 2,938m MT. DULANG DULANG, 2,922m MT. PULAG

ARIEL'S POINT
Eco-adventure destination for travelers who want to experience the natural splendor of the Philippines. Plenty of adventurous activities such as cliff diving, snorkeling, and paddling in an unspoiled setting with volcanic caves, mangrove forests, turquoise coves, and remote beaches.

"WORLD'S BEST ISLAND"
Europe's party central may be Ibiza, but Travel + Leisure magazine just voted Boracay as the "World's Best Island," beating Bali, Santorini, and the Islands of the Great Barrier Reef.

BULABOG BEACH
Known as the best kitesurf destination in Asia

Things to do in Boracay

There are hundreds of activities in Boracay, you can go kitesurfing, parasailing, ziplines, rent a speedboat, go under the water by helmet diving, or a non-backside side into the picnicking. Enjoy diverse experiences from sunrise till sundown.

- Zorb
- Motorbiking
- Helmet Diving
- Jetski
- Horseshoeing
- Henna Tattoo
- Skimboard
- Scuba diving
- Sail Boat
- Parasailing
- ATV Ride
- Night Life

PALAWAN

AMANPULO
The province of Palawan is a beautiful island, which is one of the most beautiful islands in the Philippines. It is a beautiful island with a beautiful coastline and a beautiful climate.

CALAUIT ISLAND
A beautiful island in Palawan, which is a beautiful island with a beautiful coastline and a beautiful climate.

EL NIDO
A beautiful island in Palawan, which is a beautiful island with a beautiful coastline and a beautiful climate.

BACUIT BAY
A beautiful island in Palawan, which is a beautiful island with a beautiful coastline and a beautiful climate.

8 SPECIES 5 (of birds in the world)

DID YOU KNOW?
Filipino inventor named Roberto de Sola-Sola invented the Karaoke. He first called his invention "Sing-along system" but Japanese popularized it & called the "KARAOKE" meaning to sing without accompaniment.

so long... Lolo!
Lolo is the longest crocodile in the world. It is a crocodile that is 11.7m long and 1.2m wide. It is a crocodile that is 11.7m long and 1.2m wide.

Puerto Princesa Subterranean River National Park

800 plant species

252 SPECIES OF BIRDS IN PALAWAN

165 RECORDED IN THE PARK

30 mammals species

19 reptiles species

8 bat species

NEWEST 7 WONDERS OF THE WORLD

LONGEST UNDERGROUND RIVER IN THE WORLD
The river is estimated to be more than 100 km and has a 224km x 4m underground section of the Cuyayan River.

Deeper areas of the river are almost impossible to explore due to the lack of oxygen.

MANILA

AROUND MANILA

INTRAMUROS, **COCONUT PALACE**, **LUNETA PARK**, **RESORTS WORLD MANILA**, **UNIVERSITY OF SANTO TOMAS**

PHIL. FLAG
The only symbol on earth that will be heavy if you're proud and light when it's heavy if you're not!

TARSIER
The tarsier is a small primate that is known for its large eyes. It is a small primate that is known for its large eyes.

MANILA'S TALLEST BUILDINGS

Manila City is one of the sixteen cities that make up Metro Manila. Right in the heart of bustling Manila, spread along the country's business center. Encompassing the Greenbelt and Greenbelt shopping malls, Manila has the highest concentration of the country's finest department stores, fashion boutiques, exclusive jewelry shops and antique stores, book stores, bookstores, and most other commercial establishments.

- 259M PNB COM 53 FLOORS
- 220M OF INTERA 41 FLOORS
- 207M OF INTERA 41 FLOORS
- 250M GRANDVIEW 53 FLOORS

246 MOVIE THEATRE
Philippines is the film capital in Asia

Infographic Sources: <https://www.pinterest.com/pin/304978206012082009/>,
<https://www.behance.net/gallery/11178413/Its-more-fun-in-the-Philippines-Infographics>

To aid in introducing the Philippines, the Filipino students collated some infographics from the Department of Tourism and CNN. Such information stirs interest among the participants of the event as well as they provide more insights on what the Philippines has to offer. In addition, the Philippine flag and its symbolism were also depicted.

Philippines' National Day Celebration

Written By: Mark Angelo C. Purio

Aside from information about the Philippines, one will know more about a place from the food it serves so we prepared a simple Filipino for lunch for everyone to enjoy. The following are the description of the food we prepared.

Lumpiang Shanghai

Lumpia or Lumpiang Shanghai is a Filipino spring roll. The basic filling is composed of ground pork along with minced onions, carrots, and seasonings such as salt and ground black pepper.

Pork Caldereta

Caldereta's name derives from the Spanish word "caldera" meaning cauldron. The dish is similar to meat stews from the Iberian peninsula and was brought to the Philippines by the Spanish during their 300-year occupation of the Philippines.

Pork Sinigang

Sinigang is a Filipino soup or stew characterized by its sour and savoury taste most often associated with tamarind. It is one of the more popular dish in Filipino cuisine.



WATCH THE VIDEO. CLICK THE LINK!!!

https://www.facebook.com/puryow/videos/vb.1268839407/10219167526320199/?type=2&theater¬if_t=video_processed¬if_id=1563044885862044



Maja Blanca

Maja Blanca is a Filipino dessert made from coconut milk, cornstarch, and sugar. Also known as coconut pudding, it is usually served during fiestas and holidays.



Chop Suey

Chop Suey is a stir-fried vegetable dish that is cooked with meat such as chicken. Quail eggs can also be added to the dish.



Chicken Adobo

Adobo is a popular Filipino dish and cooking process in Filipino cuisine that involves meat, seafood, or vegetables marinated in vinegar, soy sauce, garlic, and black peppercorns, which is browned in oil, and simmered in the marinade.

Philippines' National Day Celebration

Written By: Adolfo JARA

Philippines National's day is celebrated on June 12th to commemorate the independence of the Philippine Islands from the colonial rule of Spain, but we celebrated it at KyuTech on June 17th. Marloun SEJERA, Izrael BAUTISTA, and Mark PURIO organized the event where they explained the history of the country, its traditions, dances, clothes and typical foods.

Izrael prepared a detailed presentation where he explained each of the traditional dishes they cooked for that day.

It was nice to discover more about this country and its culture.



Photos taken at different times of the event

Philippines' National Day Celebration

Written By: Adolfo JARA

It was a really good experience. Marloun, Izrael, and Mark really showed off with the preparation of the event.

It is important to mention that the food they prepared was delicious and left us wanting to know more about the varied cuisine of the Philippines as well as its culture with heritage from Europe, America, and Asia.

Congratulations on preparing a successful Philippines national day at KyuTech!

On the right, there are several photos of the meals that we could enjoy during the event.



18. BIRDS-3: Public viewing of deployment at Nepal side



Public Viewing Program on deployment of NepaliSat-1@ NAST

Hari Ram Shrestha

BIRDS-3

July 15, 2019

Public viewing of deployment NepaliSat-1 @NAST

Written by: Hari Ram Shrestha

On 17th June 2019 NepaliSat-1 was deployed to the orbit from the ISS Japanese Kibo module. As this is a special day Nepal Academy of Science and Technology NAST organized a live telecast to the public audience about the deployment of the Nepalisat-1 along with Raavana-1 and Ugiusu (under the Birds-3 project). The title of the program was named as “Public Viewing Program on the deployment of NepaliSat-1”.

The deployment live telecast program was organized by the NASA and Japan Aerospace Exploration Agency (JAXA), Japan.

On the live telecast program day, two JAXA representatives came for this program. The live telecast was in the NAST auditorium hall.

Before the live telecast a technical presentation about the space utilization in KIBO was given by the Mr. Fumiaki TANIGAKI who was from the Technical expert of JAXA.



Technical presentation of the space utilization in Kibo by Mr. Fumiaki TANIGAKI, Technical Expert, JAXA

H.E Masamichi Saigo, Ambassador of Japanese Embassy in Nepal was a special guest for that program .



Remarks by H.E Mr. Masamichi Saigo, Ambassador, Japanese Embassy in Nepal

He wished and congratulated all the Nepalese People and Nepal for the first NepaliSat-1 which was deployed to the earth’s orbit successfully.

Interaction with JAXA's representative with Audiences

Written by: Hari Ram Shrestha



Mr. by Mr. Fumiaki TANIGAKI, Technical Expert, JAXA had answered participated peoples in this after telecast program.



Dr.Mulmi, NAST, has asking to some interesting questions about the ISS and Japanese KIBO.

The deployment was viewed by Hon'ble Mr. Giriraj Mani Pokharel, Minister of Education Science and Technology along with Dr.sunilbabu Shrestha, Vice Chancellor of NAST from JAXA, Japan.

video [Link\(1:45 min to 7:39 min\)](#)

Live From JAXA to NAST

Written by: Hari Ram Shrestha



Remarks by the Chief Guest, Mr. Krishna Raj B.C, Secretary, MOEST, Nepal Government at this program.



Japanese Delegates are in first row at live telecast from JAXA

After deployment : Group Photo



@ NAST: Watching the Live of deployment BIRDS-3 from ISS

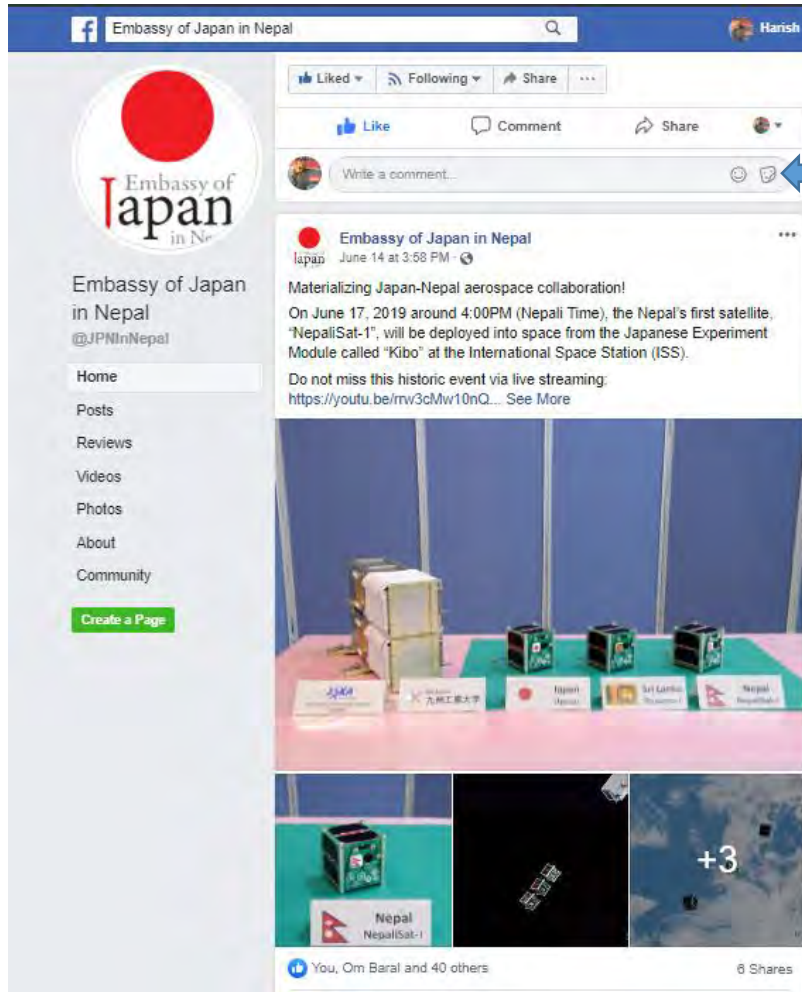


In photo: Mr. Masamichi Saigo, Ambassador of the Japanese embassy in Nepal, Ms. Yumiko Asakuma, Chief Representative for Nepal, JICA, Ms. Kaori SASAKI, Director, Space Education Center, JAXA, representative from ICIMOD, representatives from JAXA, Dr. Mahesh Kumar Adhikari, Secretary, NAST, Mr. Krishna Raj B.C., Secretary, Ministry of Education Science and Technology along with academicians/ associate academicians, NAST.

Photo credit: OM, Manchita, NAST

Wishes from Japan and U.S to Nepal

Written by: Hari Ram Shrestha



Wishes from Embassy of Japan in Nepal after the successfully deployment KIBO,ISS

Wishes from U.S Embassy Nepal after the successful rocket launch



19. Prof. Dianne DeTurrís of Cal Poly is teaching “Rocket Propulsion” for SEIC this summer

Introducing the lecturer for this course



Dr. Dianne DeTurrís
Aerospace Engineering Department
Cal Poly



DIANNE DETURRIS PROFESSOR

Dr. Dianne DeTurrís is an expert in hypersonic airbreathing propulsion, with degrees in Aerospace Engineering from Georgia Tech, Penn State, and Virginia Tech. She teaches propulsion courses for the Aerospace Engineering Department and does research in hybrid rockets and rocket based combined cycle technology. She is interested in broadening engineering education to include cultural competency and in increasing the participation and advancement of women in STEM.



Makino-san, Vincent (husband), Leo (son), Prof. DeTurrís, G.Maeda

Prof. DeTurrís and her family visits the Graduate School Office



**ROCKET
SCIENCE**



Routine lunches with staff



**Welcome lunch (11 June)
for Dr Dianne and Leo
when they arrived at
Kyutech**



**Celebrating
Umi No Hi
with SEIC
students on
15 July 2019
in her office
(dinner)**



Dr. Amelia Greig - Visiting Professor – Kyushu Institute of Technology

11 June 2017 – 11 September 2017

Over summer 2017, I spent 3 months at Kyushu Institute of Technology, teaching a graduate level course in 'Rocket Propulsion', and initiating joint research into environmental micro-sensors for micro-satellites.

The class was called 'Rocket Propulsion' and covered chemical propulsion, electric propulsion, nuclear propulsion, and advanced propellant-less propulsion concepts, as well as mission based selection and satellite integration.

Feedback received from the students was predominantly positive, most indicating that their knowledge of propulsion topics was expanded through the course. The only negative responses were in regards to the amount of homework given (which was a weekly problem set), due to other projects taking up all their time.



Four Japanese students in their final year of undergraduate studies joined me in working on developing a Langmuir Probe for CubeSats, to initiate joint Kyutech-Cal Poly research into environmental and scientific micro-sensors for micro-satellites.



Nakayama, Kakimoto, and Yasushima (missing Uemura)

The first step for the students was to become familiar with Langmuir probes in general, which was achieved using a larger LP in one of the chambers in the environmental lab. The students then designed a probe tip and voltage sweeping electronics board suitable for CubeSat applications. The final probe was not tested before I left due to delays with ordering parts. However, the students are continuing to work on the probe construction with discussions to occur through Skype. Testing of the probe in vacuum should be occurring soon.

Two years ago Dr Amelia Greig taught this course, **Rocket Propulsion**. This is her 1.5 page report on that experience.

An enjoyable part of the experience was the summer camp, where I presented to students about my home state of Tasmania (Australia), and learned about the interests of the other faculty. It was also nice to be able to talk with students in an informal setting, cooking eggs in the volcanic vents and enjoying a Japanese style BBQ.

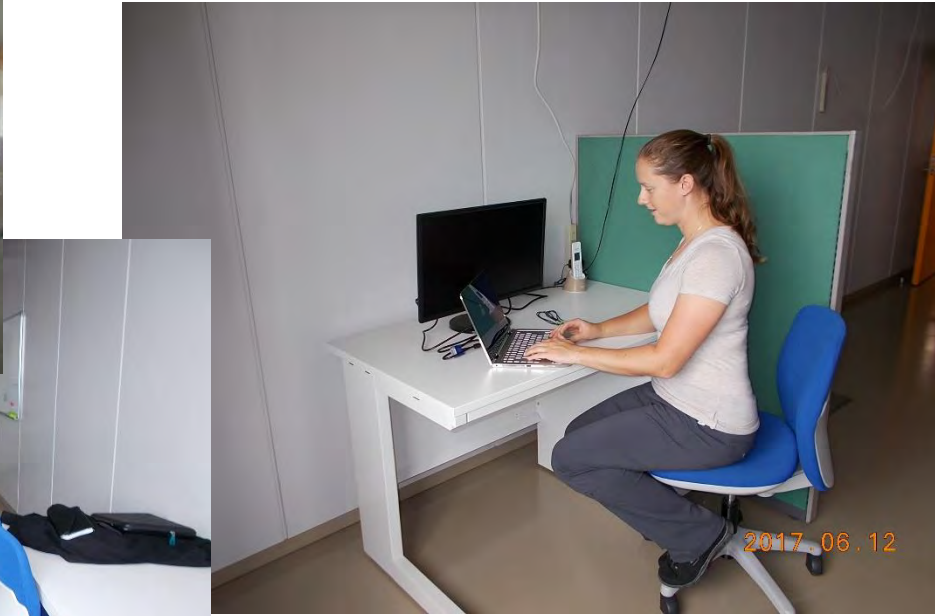
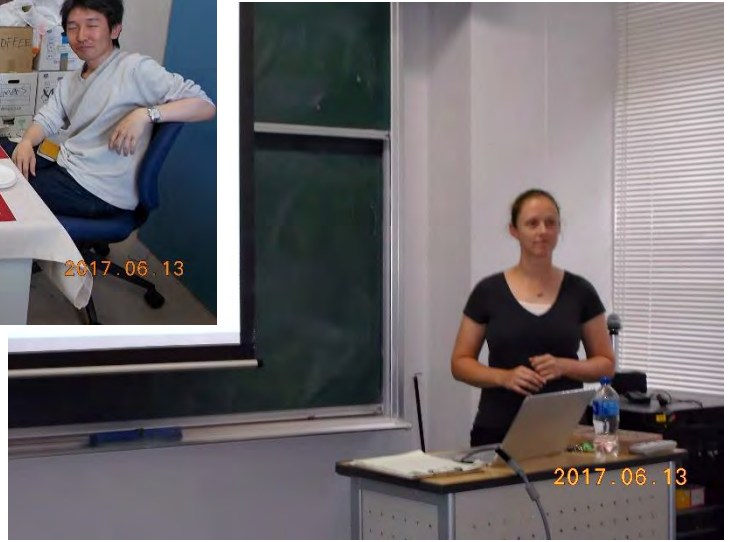
Outside of work, I managed to explore a large portion of Northern Kyushu including a number of volcanos and hot springs, and took advantage of some holiday days to climb Mt Fuji. Learning more about the Japanese culture through emersion was also good.

The support given to me through the staff of Kyutech was invaluable for my visit. They took care of all required paperwork, and made sure I had no problems at any time. Having accommodation organized in advance and located on campus was also a great benefit.

I thoroughly enjoyed my time at Kyutech and feel it was a beneficial experience for all involved. I look forward to continuing to work with the students and faculty in future collaborations.



The Summer of 2017



Prof. DeTurris also taught a special seminar entitled: “Engineering Mindsets Seminar” on 16 July 2019.

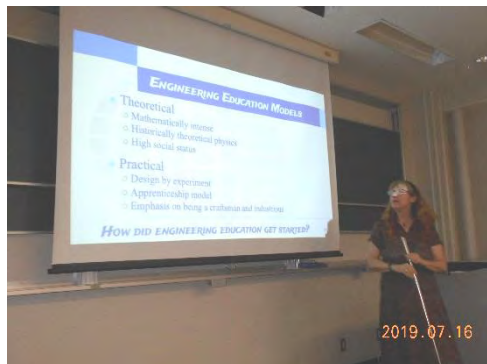


Seminar Abstract

Is engineering practiced the same everywhere in the world? The equations don't change, but the approach to problem solving is different depending on where the engineer is educated. Come hear how engineering education differs by country and how engineering culture might explain the “unexpected” design solution your co-worker just suggested. Understanding the engineering mindset helps make engineers more effective on teams with people of varied backgrounds. If you have ever found yourself perplexed by a teammate's unusual design solution, then this seminar is for you.

Date: Tuesday, July 16th, 2019,
4th period (14:40~16:10)

Place: S-2A @ General Research Building 1
総合研究1号棟 (Map, Building No. 15)



This mini-course was divided into two topics:

Hybrid Rocket Propulsion

and

Space Technology for the Sustainable Development Goals

**Taught by Dr Javier and
Prof Wood, respectively.**

**Both are with *MIT Media Lab* in
Boston, Massachusetts, USA.**



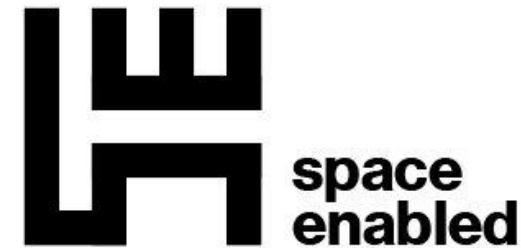
Prof. Danielle Wood, MIT Media Lab

Title: **Space Technology for the Sustainable Development Goals**,
taught by Prof. Danielle Wood, MIT

This course will introduce students to the intersections between space technology and sustainable development by examining technical, policy and social aspects of seven space technologies. The technologies we discuss include satellite earth observation; satellite communication; satellite positioning; human space flight and microgravity research; space technology transfer; fundamental scientific space research; and small satellites. The seminar will explore how these technologies can promote sustainable development via discussions, lectures, readings and projects. The seminar will also examine what upcoming trends in the space field are likely to impact the application of space for development. The course considers development from the perspective of leaders at several scales, including international development agencies, national governments, local community leaders and socially-motivated entrepreneurs.

Title: **Hybrid Rocket Propulsion**,
taught by Dr. Javier Stober, MIT

This course will introduce students to fundamentals of hybrid rocket propulsion for the purpose of familiarizing students with research, development, and testing activities in the area of hybrids. Traditional, as well as liquefying-fuel hybrids will be discussed with a focus on paraffin wax as a hybrid rocket fuel.





Dr. Javier Stober is a Research Engineer in the Space Enabled Research Group. In that role, he leads the development and operations of the satellite laboratory and fosters collaborations with partnering organizations. Javier earned Ph.D. and M.S. degrees in Aeronautics and Astronautics from Stanford University, researching novel propellants in the area of experimental hybrid rocket propulsion, as well as B.S. degrees in Mechanical and Aerospace Engineering from the University of Florida. He has worked at various organizations across the engineering landscape, public and private, small and large, foreign and domestic, including NASA, Honeywell Aerospace, Boeing, and Space Propulsion Group.



Professor Danielle Wood joined the Media Lab as assistant professor in the Program in Media Arts and Sciences as of January 2018. Within the Media Lab, Prof. Wood leads the Space Enabled Research Group which seeks to advance justice in earth's complex systems using designs enabled by space. Prof. Wood is a scholar of societal development with a background that includes satellite design, earth science applications, systems engineering, and technology policy for the US and emerging nations. In her research, Prof. Wood applies these skills to design innovative systems that harness space technology to address development challenges around the world. Prof. Wood's research also develops systems analysis tools to improve decision making during the design of complex systems. Most recently, Prof. Wood worked as the Applied Sciences Manager within the Earth Science Division of Goddard Space Flight Center. Previously, she served as Special Assistant and Advisor to the Deputy Administrator at NASA Headquarters in Washington, DC. Prior to working at NASA, Prof. Wood held positions at the Aerospace Corporation, Johns Hopkins University, and the United Nations Office of Outer Space Affairs. Prof. Wood studied at the Massachusetts Institute of Technology, where she earned a PhD in engineering systems, SM in aeronautics and astronautics, SM in technology policy, and SB in aerospace engineering.



Dr Stober holds up a chunk of paraffin during his lecture on 8 July 2019.



Dr Stober having lunch with members of his class on 8 July 2019.

Prof. Wood with her three groups



**Prof. Wood
conducted classes on
15 and 17 July 2019,
and was well
received by our SEIC
students.**



GS=ground station

Sri Lanka's first satellite RAAVANA-1 Deployment and Ground Station Status



Prepared By
R.A.D.Kaveendra Sampath
Electronics Engineer
Communication Division
ACCIMT

Arthur C Clarke Institute For Modern Technologies , Katubadda , Moratuwa , Sri Lanka.

Sri Lanka's first satellite RAAVANA-1 Deployment and Ground Station Status.



Director General
Eng. Sanath Panawennage was addressing the audience of RAAVANA-1 Deployment function on 17/06/2019 at ACCIMT Auditorium.



Deputy Director General
Eng. Kamani Ediriweera was addressing the audience of RAAVANA-1 Deployment function on 17/06/2019 at ACCIMT Auditorium.



Director Communication Div.
Eng. Kavindra Jayawardana Explaining about Cube satellites to the Media on 17/06/2019 at ACCIMT Auditorium.

Satellite deployment function was held at ACCIMT main auditorium at 3:30 PM in local time 17/06/2019.

For More Information: Please go through this link - <http://www.accimt.ac.lk/?p=4877>

Sri Lanka's first satellite RAAVANA-1 Deployment



All the guest were seated at the Main auditorium and TV channel crew was going to cover the function . . .

Video Screen carrier was parked at ACCIMT premises for public to watch the RAAVANA-1 deployment.



All are cheering after successful deployment.

Click [Here](#) to go for the Link

Sri Lanka's first satellite RAAVANA-1 Deployment



Celebration



ACCIMT Chief Staff



Audience



Video Screen carrier



Public visitors



ACCIMT Ground Station Status



Arthur C Clarke Institute For Modern Technologies , Katubadda , Moratuwa , Sri Lanka.

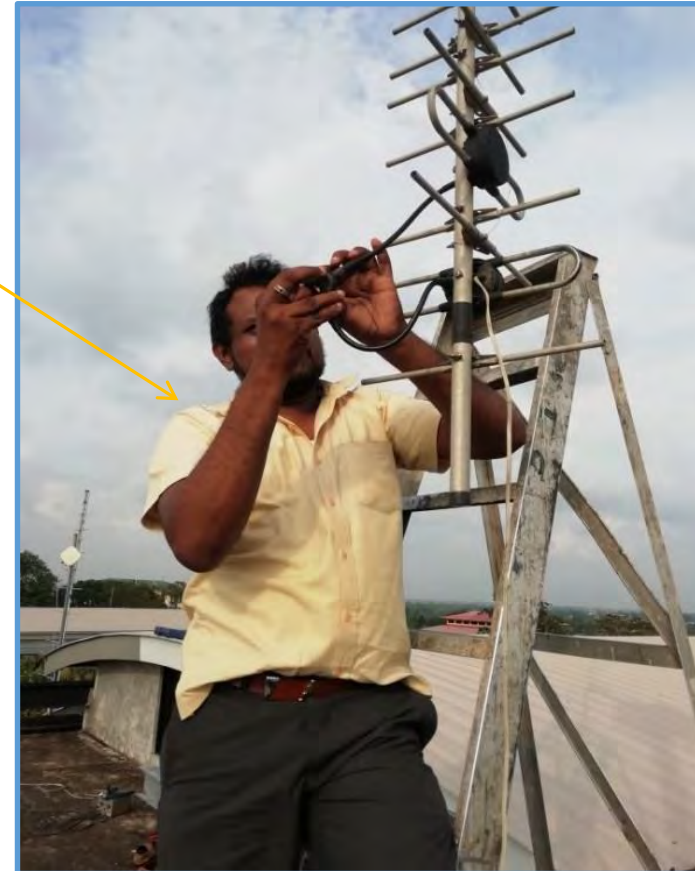
ACCIMT Ground Station Status



Kaveendra Sampath
(author of this report)

Chaminda Jayalath

Kaveesha Lakmal



UHF Antenna maintenance and Connector fixing

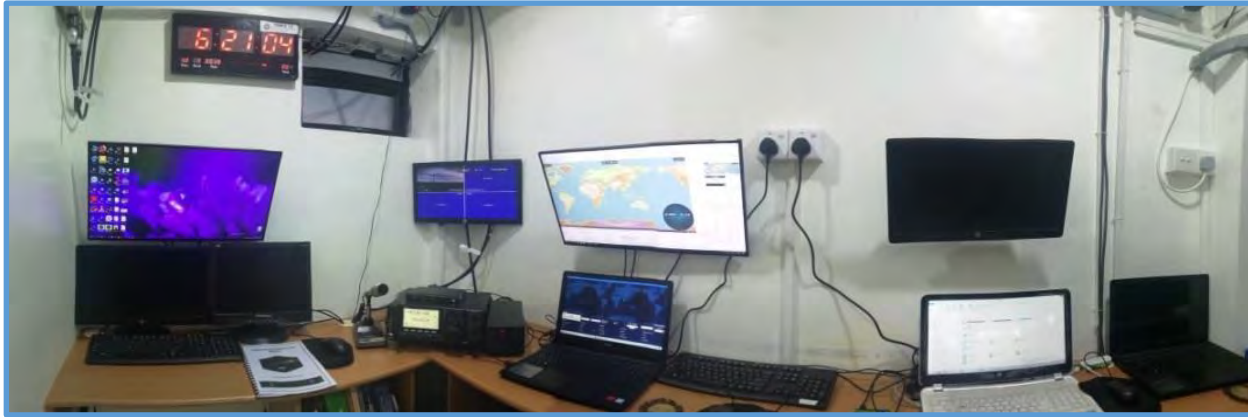
Test and Measurement at ACCIMT



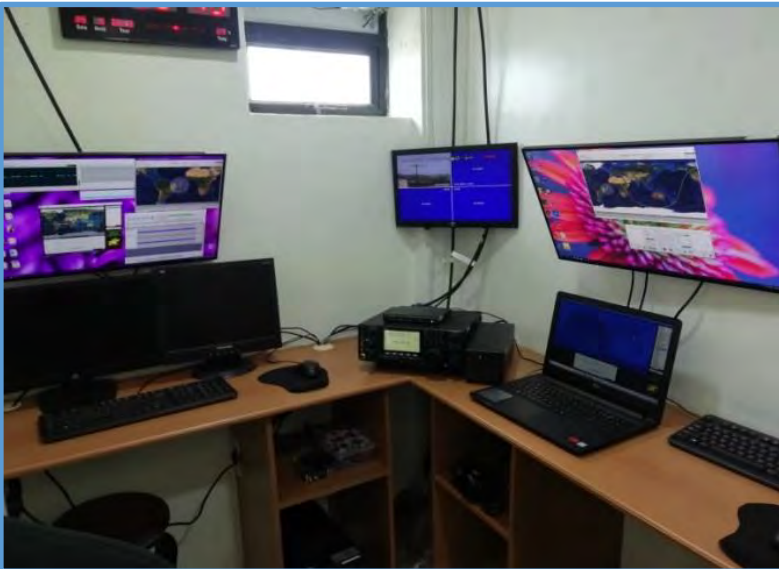
Lora module was tested in Communication lab

Antenna was tested using Field fox analyzer at ACCIMT GS

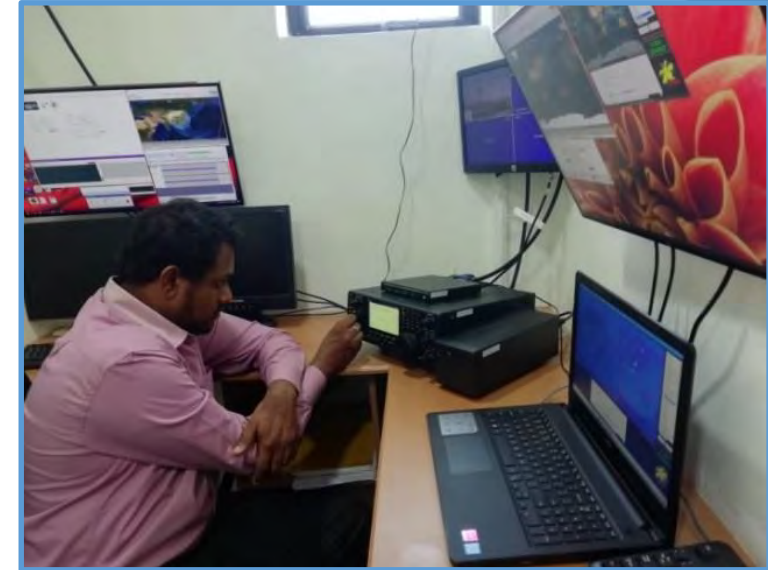
Inside Of The Ground Station



Panoramic view of ACCIMT GS inside.



ACCIMT GS setup



Setting up the ICOM9100 radio by Kaveendra Sampath at ACCIMT GS

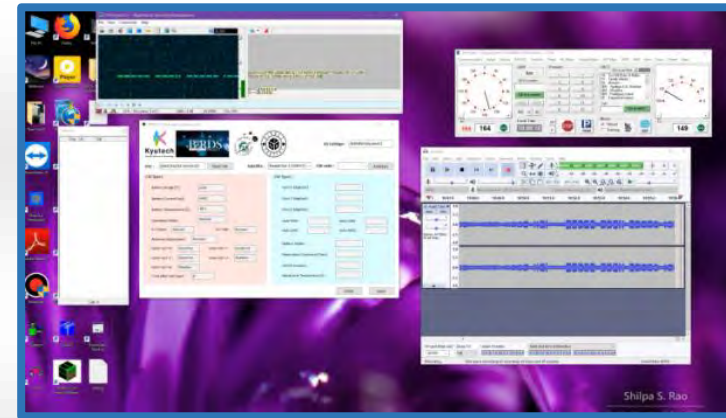
GS- Ground Station

For More Information.. Please click this link - <http://www.accimt.ac.lk/?p=4877>

ACCIMT Ground Station Achievement

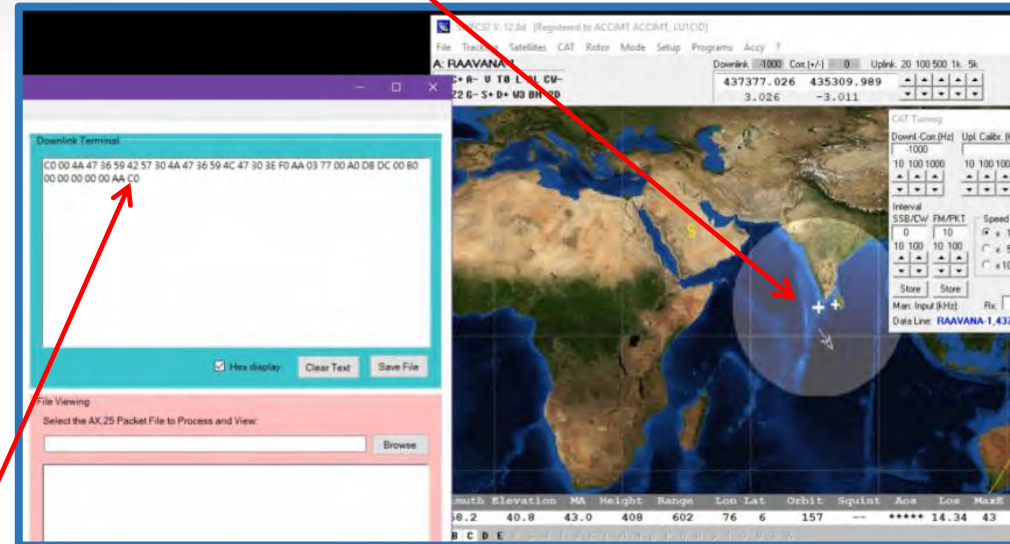
The Historical moment

The First Beacon Received from RAAVANA-1 and other two Satellites at 17.55 Sri Lanka time on 17th June 2019



The place of the Satellite when uplink was done.

Finally Japan Kyutech Ground Station and Sri Lanka ACCIMT Ground Station Deserved the recognition for achieved the successful Uplink and Down link for the BIRDS-3 Satellites.



Acknowledgement from RAAVANA-1 Satellite



UPDATES FROM THE PHILIPPINES

July 15, 2019

University of the Philippines-Diliman
Quezon City, Philippines

PREPARED BY:

Mae Ericka Jean C. Picar

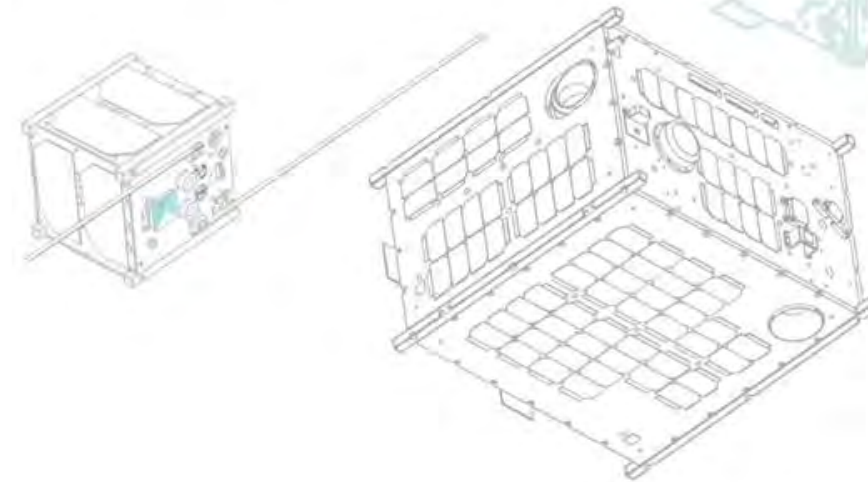
STAMINA4Space Communications Officer, STeP-UP Project
Graphic Artist and Contributing Writer

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



Universiti Teknologi MARA MALAYSIA



QUEZON CITY, PHILIPPINES - Faculty members from the Universiti Teknologi MARA (UiTM), Malaysia's largest university system, visited the Philippines and met with representatives from the Department of Science and Technology-Advanced Science and Technology Institute (DOST-ASTI), the University of the Philippines Diliman (UPD), University of Perpetual Help (UPH) and the Space Technology and Applications Mastery, Innovation and Advancement (STAMINA4Space) Program to explore possible collaborations on future nanosatellite missions on June 18, 2019.

Left photo (L-R): Engr. Bryan Paler (PEDRO), Prof. Lorena Ilagan (UPH), Dr. Joel Joseph Marciano, Jr. (DOST-ASTI, UP-EEEE, STAMINA4Space), Dr. Mohamad Huzaimy Jusoh (UiTM), Mr. Muhammad Hasif Bin Azami (UiTM), Dr. Siti Amalina Enche Ab Rahim (UiTM), Joven Javier (PEDRO, DOST-ASTI) and Engr. Gerwin Guba (DOST-ASTI)

Right photo: STeP-UP Scholars, DOST-ASTI, UPH, STAMINA4Space representatives at the University Laboratory for Small Satellite and Space Engineering Systems (ULyS³ES)





The UiTM visitors during the courtesy call with Dr. Carla Dimalanta (Assistant Vice President for Academic Affairs - Research, UP System)



Touring the visitors in the ULyS³ES Building

The STAMINA4Space (S4S) team presenting the Amateur Radio Unit (ARU) of Diwata-2

The Oblation, as seen in the photo, is an iconic symbol of the university.

Representatives of the STAMINA4Space Team showed the UiTM visitors around the University of the Philippines Diliman campus.



Davao Ground Receiving Station

Photos courtesy of DOST-ASTI

The Philippine's largest tracking antenna for earth observation (EO) satellites to date was soft-launched on June 30, 2019 at the Civil Aviation Authority Philippines (CAAP) Transmitter Facility in Davao City - three years after the first Ground Receiving Station (GRS) of the Philippine Earth Data Resource and Observation (PEDRO) Center was set up at the DOST-Advanced Science and Technology Institute (DOST-ASTI) office in Quezon City.

Now fully operational, the Davao GRS (D-GRS) provides additional support and acts as a back-up to the the PEDRO Center in Quezon City.

Read more here: <https://bit.ly/2XKdqXG>



STAMINA SPACE



Holy Angel University at ULyS³ES

DOST Balik Scientist Engr. Leo Almazan and students from Holy Angel University - one of the initial members of the university consortium - visited UPD to know more about the facilities housed in ULyS³ES.



STAMINA SPACE
PHIL MICROSAT

“Philippines’ Road to Space and Beyond”

June 22, 2019 (Day 1)

1:40 -2:00 PM



Ariston Gonzalez

Research Engineer

STAMINA4Space Program



Delburg Mitchao

Research Engineer

STAMINA4Space Program



**JUNE 22-23, 2019
THE MIND MUSEUM**



Manila Mini Maker Faire

Ariston Gonzalez and Delburg Mitchao, both research engineers from the STAMINA4Space Program, conducted a talk on the “Philippines’ Road to Space and Beyond” where they shared their experience in working under the PHL-Microsat/STAMINA4Space Program. They also shared information about the Philippine small satellites Diwata-1, Diwata-2, and Maya-1.

The STAMINA4Space Program was also invited to be an exhibitor during the event where they showcased a replica of Diwata-2.



PJWWRAT-mini

The Philippines-Japan Workshop on Wireless, Radio and Antennas and Technologies (PJWWRATT) is the first workshop on Antenna, Propagation and Wireless Technologies between the Philippines and Japan. A mini workshop session was conducted on July 4, 2019 at the DOST-ASTI Training Room. The main workshop will be held on December 2019.



Workshop on Wireless Radio and Antenna Technologies (PJWWRAT-mini)

Department of Science and Technology-
Advanced Science and Technology Institute
(DOST-ASTI) Training Room

04.07.2019

STAMINA SPACE

PHIL MICROS T

The Presenters during the PJWWRAT-mini



Prof. Jiro Hirokawa
Tokyo Institute of
Technology



Prof. Hiroyuki Arai
Yokohama National
University



Dr. Satoru Kurokawa
National Institute of Advanced
Industrial Science and
Technology



**Prof. Kunio
Sakakibara**
Nagoya Institute of
Technology



**Prof. Yuichi
Kimura**
Saitama University



Dr. Michitaka Ameya
National Institute of
Advanced Industrial
Science and Technology



**Dr. Lawrence
Materum**
De La Salle University



Antipas Teologo
De La Salle University



Mar Francis De Guzman
DOST-Advanced Science and
Technology Institute



Adrienne Rivas
University of the
Philippines Diliman



Gemelyn Barrogo
University of the
Philippines Diliman



Gems Mendoza
DOST-Advanced Science and
Technology Institute



Bernalyn Decena
University of the
Philippines Diliman

Philippine - Japan
Workshop on Wireless Radio and
Antenna Technologies
(PJ-WWRAT MINI)

STAMINA SPACE
PHIL MICROSAT

Updates from BIRDS-2S

"The third step..."

July 15, 2019

University of the Philippines- Diliman
Quezon City, Philippines

Prepared by STeP-UP scholars

Derick B. Canceran
Contributing Writer

Bryan R. Custodio
Project Manager
Contributing Writer

Marielle M. Gregorio
Contributing Writer



BIRDS-2S goes to NSB Engineering

-Derick Canceran



The BIRDS-2S team and STeP-UP members with NSB Engineering personnel.

Last June, the BIRDS-2S team had a chance to visit the facilities of NSB Engineering Design and Fabrication. NSB Engineering is a local metalworks company that fabricates various products, from sheet metal bingo machine cases to precision airplane parts.

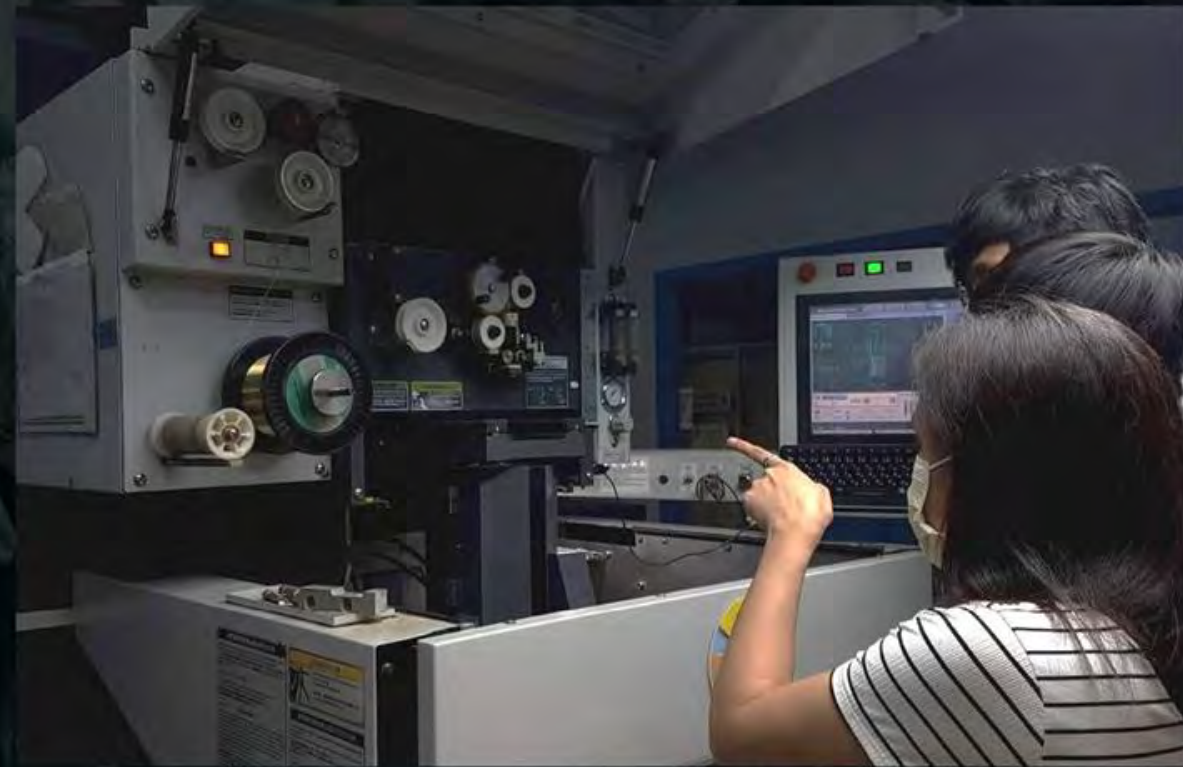
The visit was organized by STeP-UP to gauge the capacity of the company to fabricate materials for ground station operations. Engaging the local Philippine industry in these kinds of activities is in line with the goal of the STAMINA4Space program, which is to build an industrial base for activities and innovations in aerospace technology.

BIRDS-2S goes to NSB Engineering

-Derick Canceran



BIRDS-2S members watching the operation of a manual milling machine.



Shaping metals using a fine, charged copper thread.

BIRDS-2S goes to NSB Engineering

-Derick Canceran



CNC milling machine accessories and sample products.



CNC milling machine in action.

Tuning of BIRDS 2S CubeSat Antenna

-Bryan Custodio



BIRDS 2S member Bryan Custodio tuning the antenna using VNA

Antenna Tuning entails lengthening or shortening the radiative elements of the Antenna, so that structure resonates at the frequency of operation.

To tune an antenna, it must be connected to a vector network analyzer (VNA) using coaxial cables. The antenna is tuned when the Return Loss, as seen at the VNA, is at a minimum at the operating frequency.

Tuning of BIRDS 2S CubeSat Antenna

-Bryan Custodio



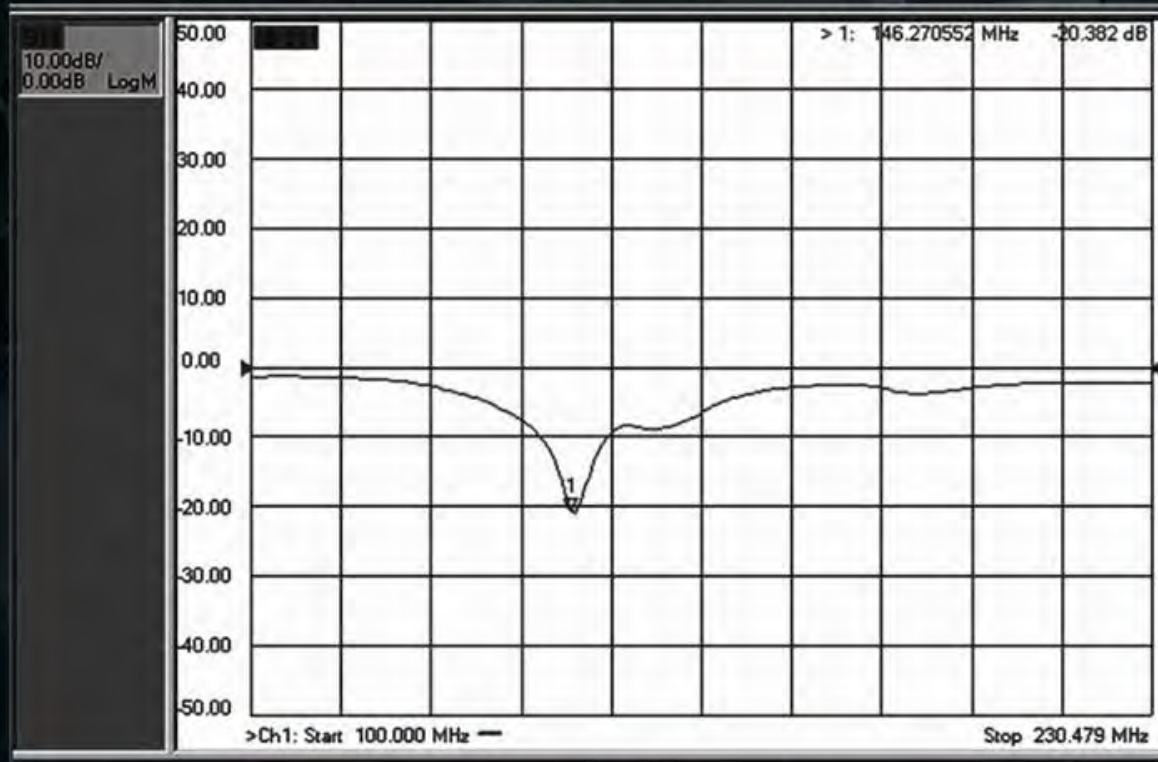
BIRDS 2S member Bryan Custodio cutting the antenna length



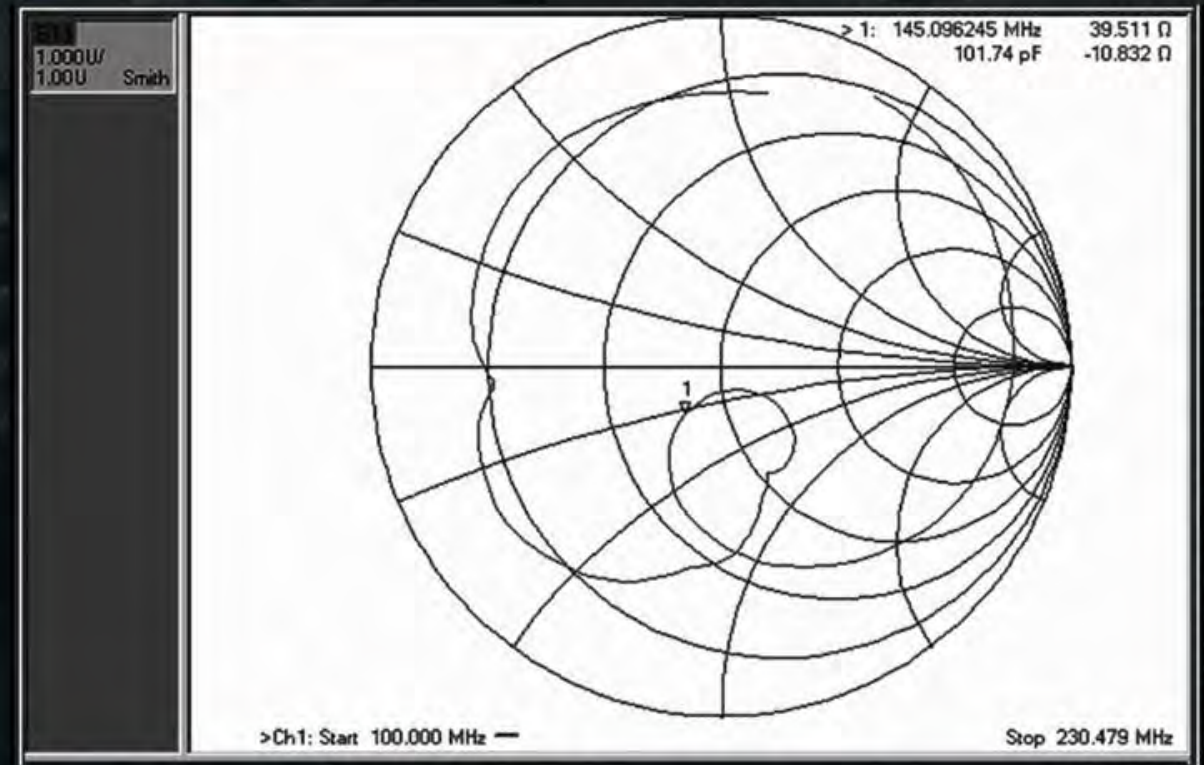
BIRDS 2S members checking the return loss plot of the VNA

Tuning of BIRDS 2S CubeSat Antenna

-Bryan Custodio



Return Loss (S11) Plot for the VHF Antenna



Impedance plot of the VHF Antenna

Happy

Inday Christy a.k.a.
Ada - Leslie



-Marielle Magbanua-Gregorio

Ms. Christy Andam Raterta is one of the STeP-UP scholars assigned for the Communications Subsystem of the BIRDS-2S cubesatellites. She is a graduate of Bachelor Science in Computer Science at Iligan Medical Center College, Iligan City, Lanao del Norte. She has been an instructor in St. Peter's College and STI College in Iligan City. Currently, while she is taking up the Master of Science in Electrical Engineering specialized on Nanosatellite Development, she is serving the country as a Naval Officer.





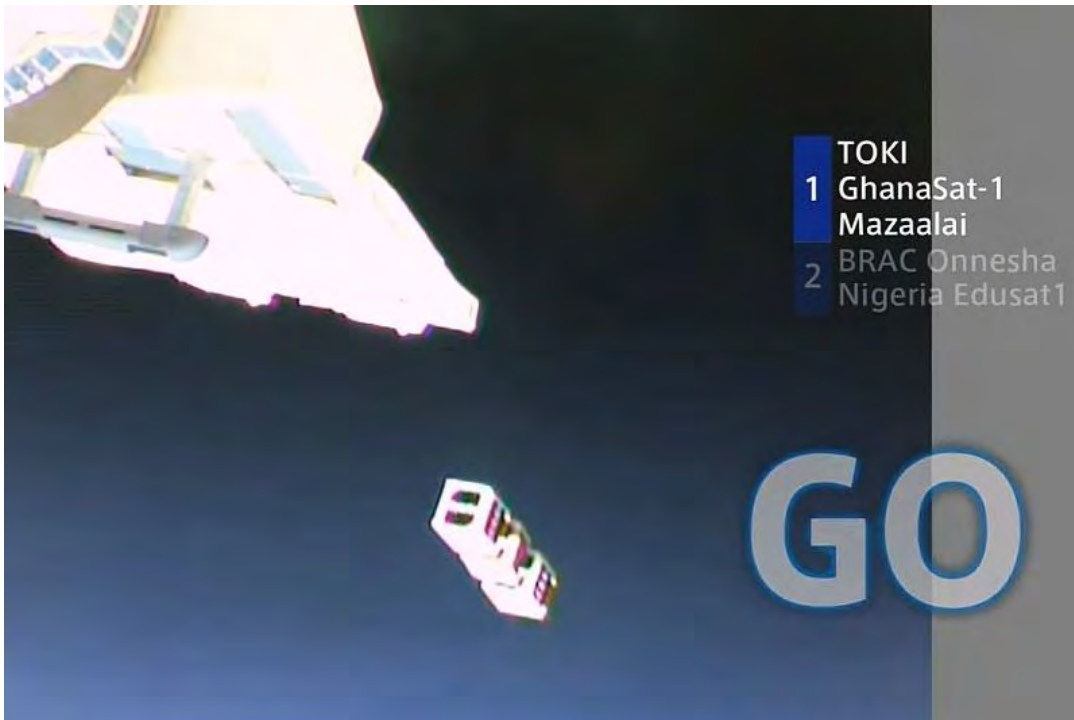
ANOTHER YEAR TO CELEBRATE NEW MILESTONES, MEET NEW FRIENDS, CREATE NEW MEMORIES.. JUST SO, TODAY, WE ARE GLAD YOU CELEBRATE THIS GRAND MILESTONE OF YOUR LIFE WITH US.. HAPPY BIRTHDAY CHRISTY!



Christy's Treat @ Vikings, SM Megamall, Metro Manila



Report on BIRDS-1 Deorbiting



BIRDS-1 deployment from International Space Station
On July 7, 2017 (Photo: JAXA Live streaming)

BIRD-B (BRAC Onnesha)	JG6YJS
BIRD-G (GhanaSat-1, ANUSAT-1)	JG6YJP
BIRD-J (Toki)	JG6YJO
BIRD-M (Mazaalai, NUMSAT-1)	JG6YJQ
BIRD-N (NigeriaEduSat-1)	JG6YJR

Report by:
Apiwat and Maisun
Members of BIRDS-1

Background

Joint Global Multi National BIRDS [JGMNB] project started in Oct. 2015 with 7 countries. The project soon became commonly known as the BIRDS Project. Fast forward to present time, the fourth generation of BIRDS satellites are under construction. The 3rd generation is already in space and 1st generation satellite have already deorbited. This article is dedicated to the *End of Life of BIRDS-1 satellites*.

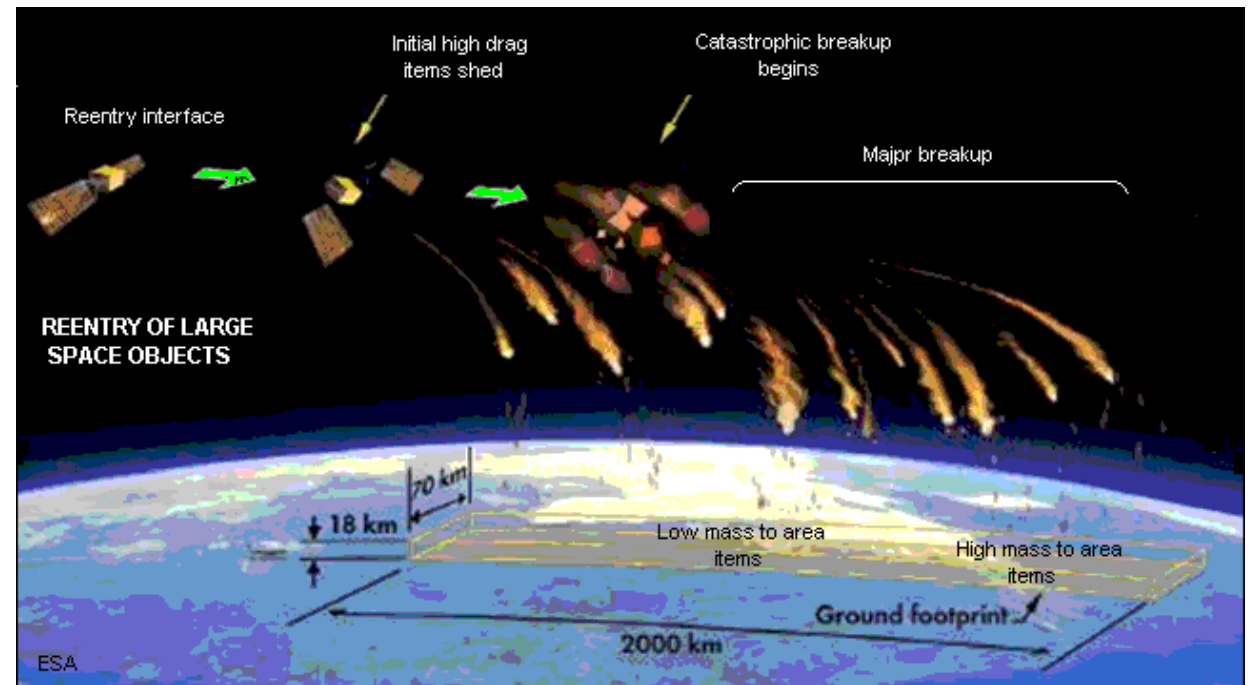
BIRDS-1 had 6 missions. Its main mission was to capture images of Japan, Ghana, Mongolia, Nigeria and Bangladesh. Other missions were: Digi-singer, Atmospheric drag measurement, Precise satellite tracking, Single Event Latch-up measurement & Ground Station Network demonstration. You can read more about the beginning of BIRDS-1 project in the **BIRDS Project Newsletter** [ISSN: 2433-8818] issues No. 1 through 5:

<https://birds1.birds-project.com/newsletter.html>

De-orbit mechanism:

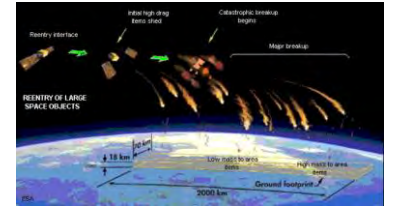
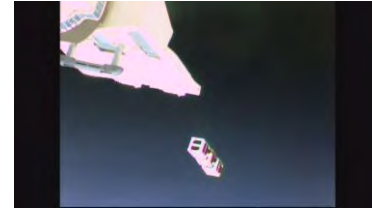
Due to gravitational pull of the earth, artificial satellites re-enter earth's atmosphere after a certain time. For Low Earth Orbit, this time is shorter. Therefore, CubeSats operating in Low Earth Orbit are generally designed for 6 months. This is same for BIRDS-1 satellites.

Any satellite orbiting under 200 km altitude experiences increased drag due to earth's atmosphere. As the altitude decreases, the satellite disintegrates and burns up in the atmosphere before returning to the Earth's surface.



<https://www.spaceacademy.net.au/watch/debris/reentry2.gif>

BIRDS-1 at a Glance



Kickoff Meeting

Satellite Delivery

Satellite Launch

**Satellite
Deployment**

First Beacon

Deorbit

1st October

9th February

3rd June

7th July.

11th July

May

BIRDS-1 Team Members
officially gather to
discuss on the project.

BIRDS team hand
delivered 5 satellites to
JAXA.

All 5 BIRDS satellites
went to space as
scientific payload on
board CRS-11 mission .

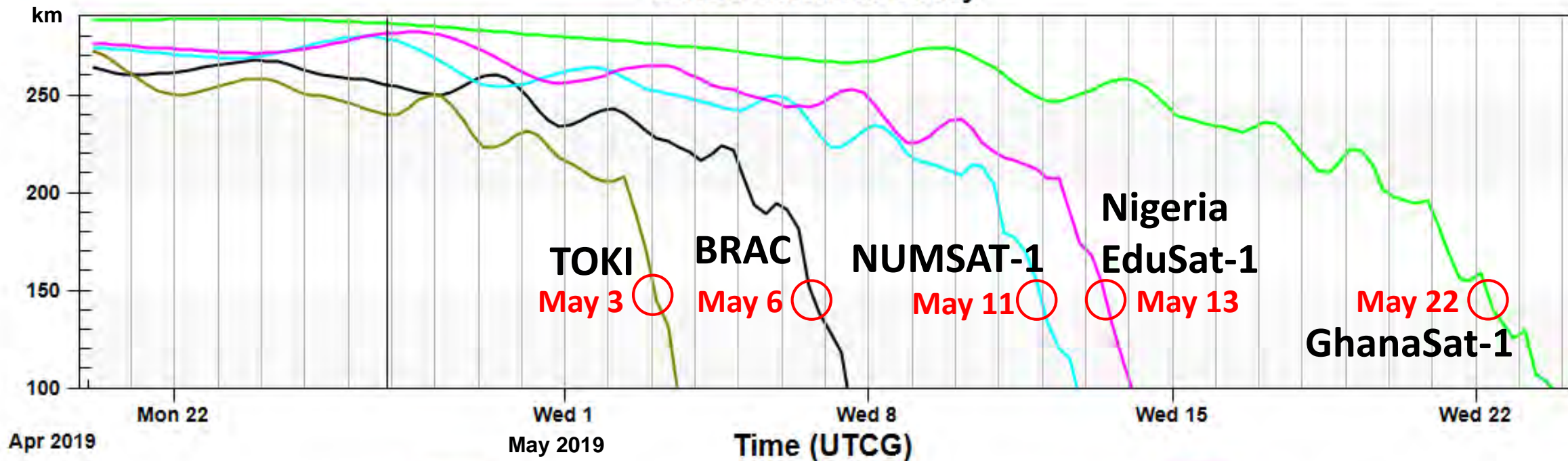
17:50 JST: Japan, Ghana
& Mongolian satellites
deployed

18:10 JST: Bangladesh &
Nigerian satellites
deployed

Beacons from BIRDS-1
Satellites received.

All BIRDS-1 satellites re-
enter atmosphere.

BIRDS Satellites Decay



BRAC_ONNESHA_42823 - Apogee Altitude (km)

MAZAALAI_NUMSAT-1_42822 - Apogee Altitude (km)

TOKI_42820 - Apogee Altitude (km)

GHANASAT-1_42821 - Apogee Altitude (km)

NIGERIAEDUSAT-1_42824 - Apogee Altitude (km)

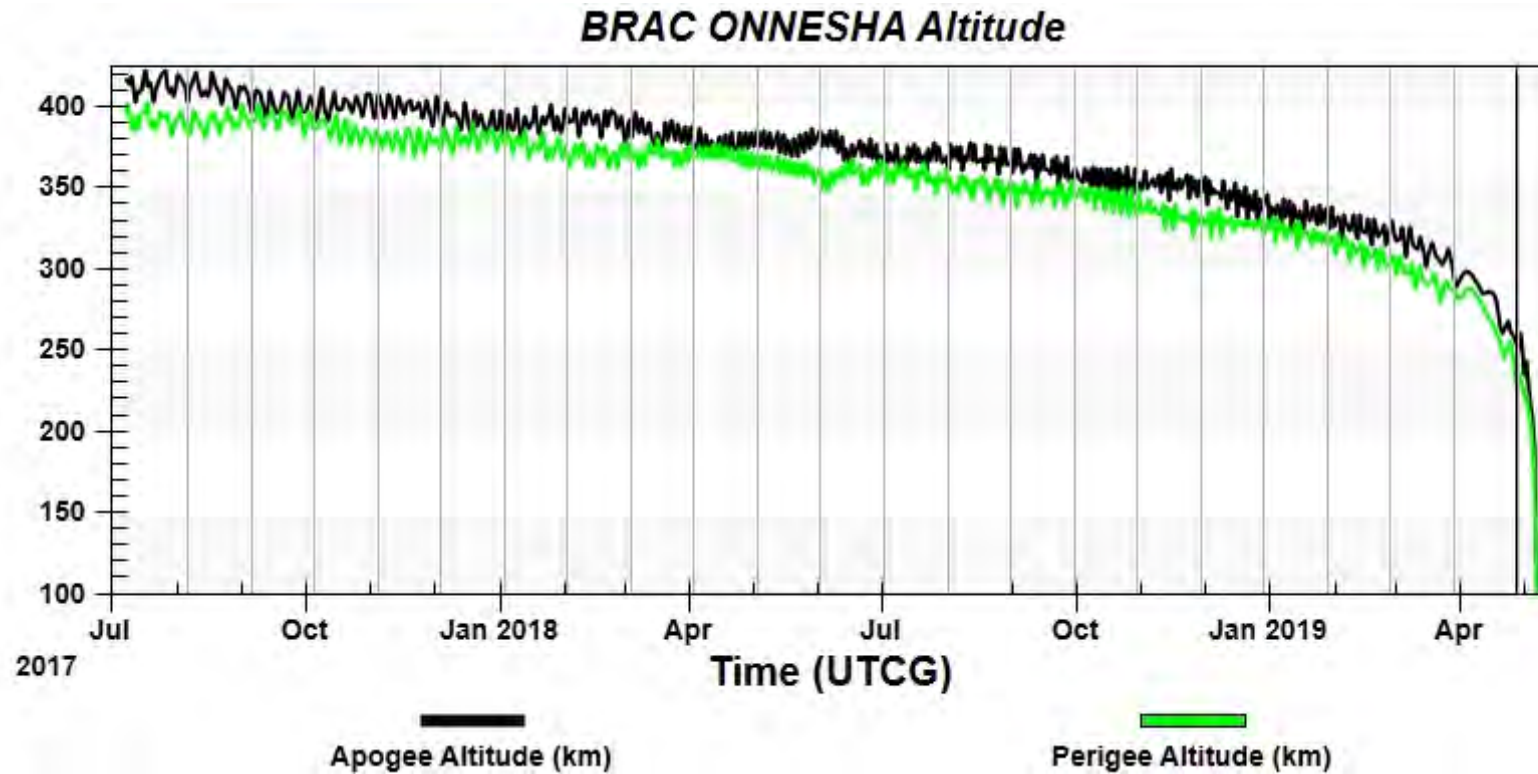
Based on calculation using TLE given by AGI's database.
BIRDS-1 satellites reentry into the Earth on May 2019.

Satellite	Date of Re-entry
<i>TOKI</i>	<i>3 May 2019</i>
<i>BRAC Onnesha</i>	<i>6 May 2019</i>
<i>NUMSAT-1</i>	<i>11 May 2019</i>
<i>NigeriaEduSat-1</i>	<i>13 May 2019</i>
<i>GhanaSat-1</i>	<i>22 May 2019</i>

*Due to atmospheric drag, the lowest altitude above the Earth at which an object in a circular orbit can complete at least one full revolution without propulsion is approximately 150 km.



BIRDS-1 Altitude: Case BIRDS-BB (Bangladesh)



BIRDS-1 satellites were deployed at 420 km above the Earth and because of atmospheric drag the satellites came down gradually, as shown above. By our initial orbit simulations, BIRDS-1 satellites were to stay in orbit for **1.1 years**. In reality, orbit lifetime of BIRDS-1 have exceeded our expectations by staying in orbit for **22 months -- almost 2 years**.

End of report

BIRDS-3 On orbit status

-- Report by Pooja Lepcha (Bhutan)

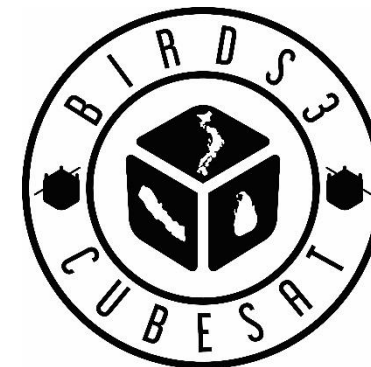
The names of the satellites are as follows:

Nepal:	NepaliSat-1
Sri Lanka:	Raavana-1
Japan:	Uguisu

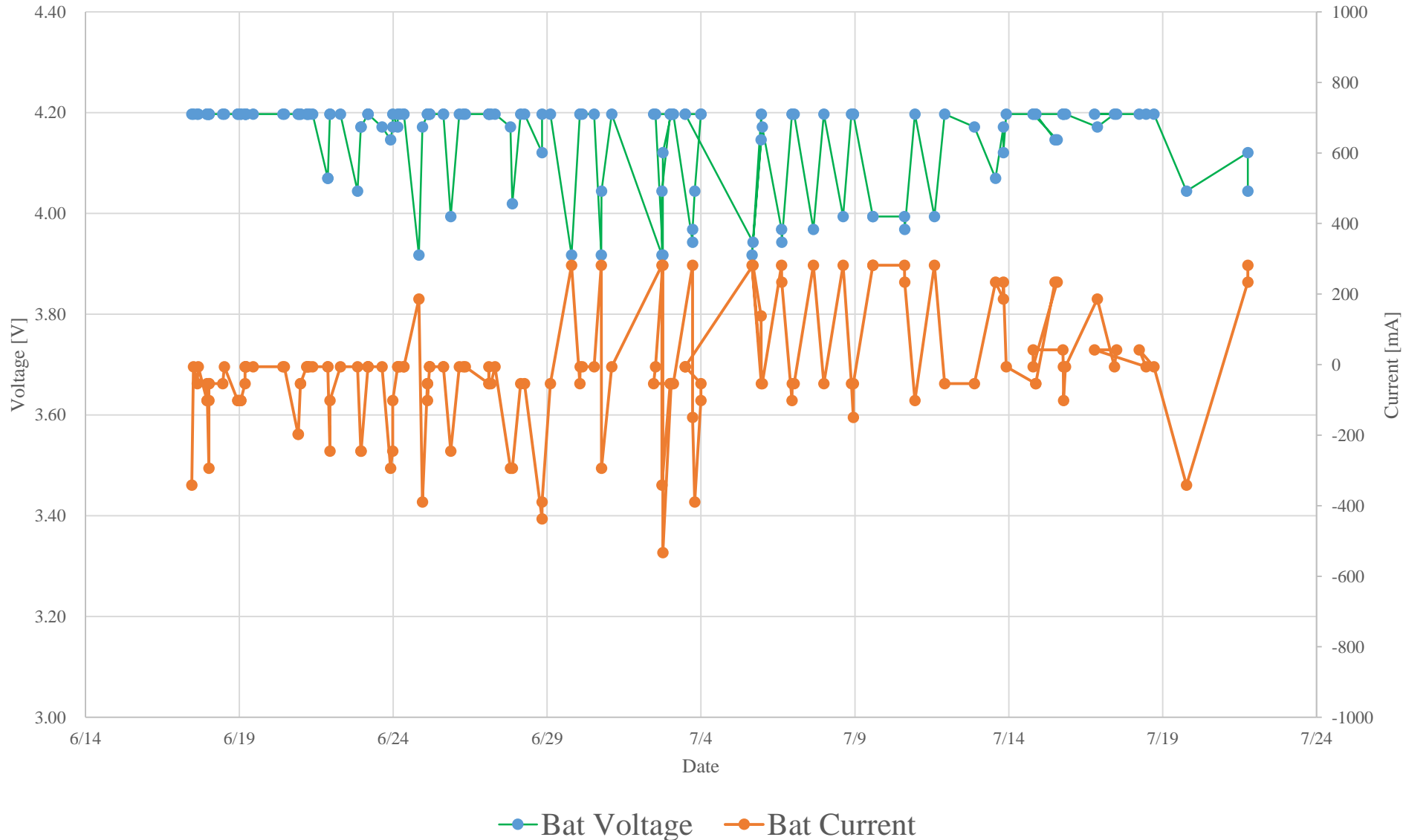
The three BIRDS-3 satellites were successfully deployed on 17th June 2019 by the ISS. Since then, operators from all the BIRDS Ground station (GS) network and amateur radio community have been tracking the satellites. All the operators have been providing invaluable data via CW (continuous wave, Morse Code).

Though a pass over a certain area is just about 10 minutes, having an extended GS network (of the BIRDS community) has enabled more aggregate access time with the BIRDS-3 satellites.

This article will show the health status of all the satellites by analysing the CW beacon data obtained from GS network and the amateur community.



NepaliSat-1 On orbit status



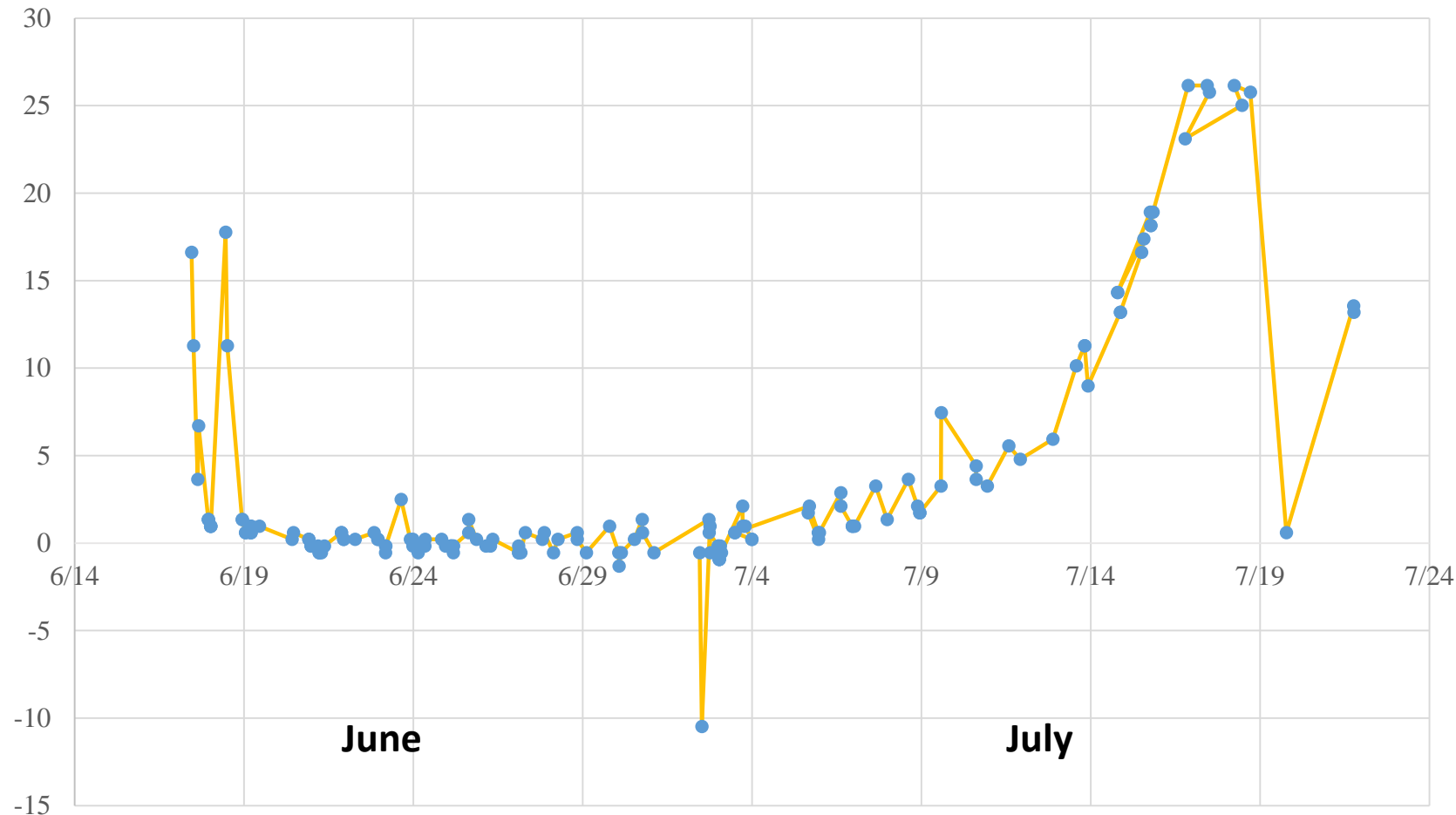
The battery voltage and current profile is as shown in the graph on the right.

The battery is in good state with maximum voltage at 4.2 V during the sunlight period, and 3.9V during the eclipse.

The battery current is negative when it is getting charged from solar panels and is positive when it is discharging

NepaliSat-1 On orbit status

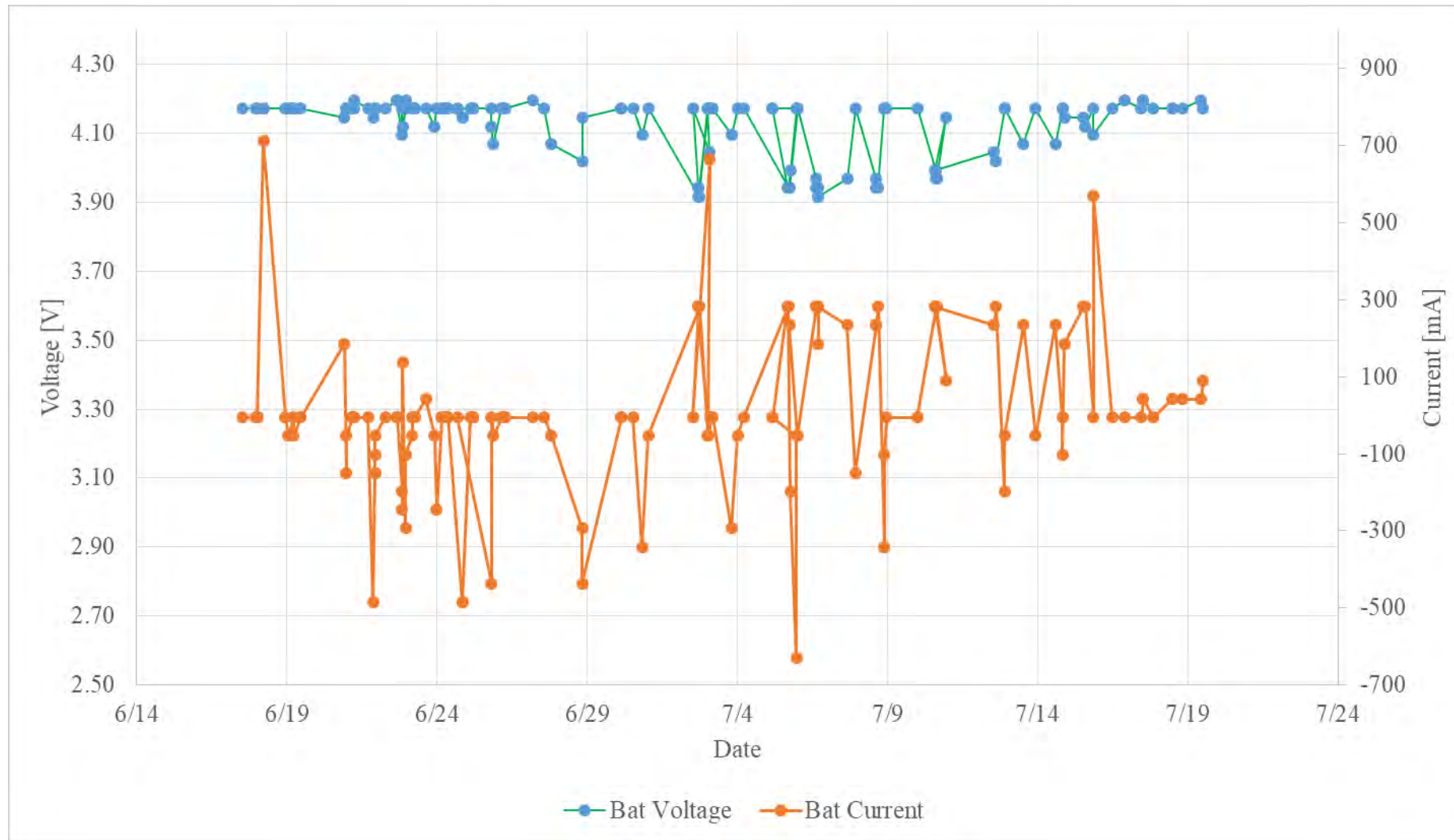
Batt Temp, deg. C



The battery temperature profile is as shown in the graph on the right as a function of time. The year is 2019.

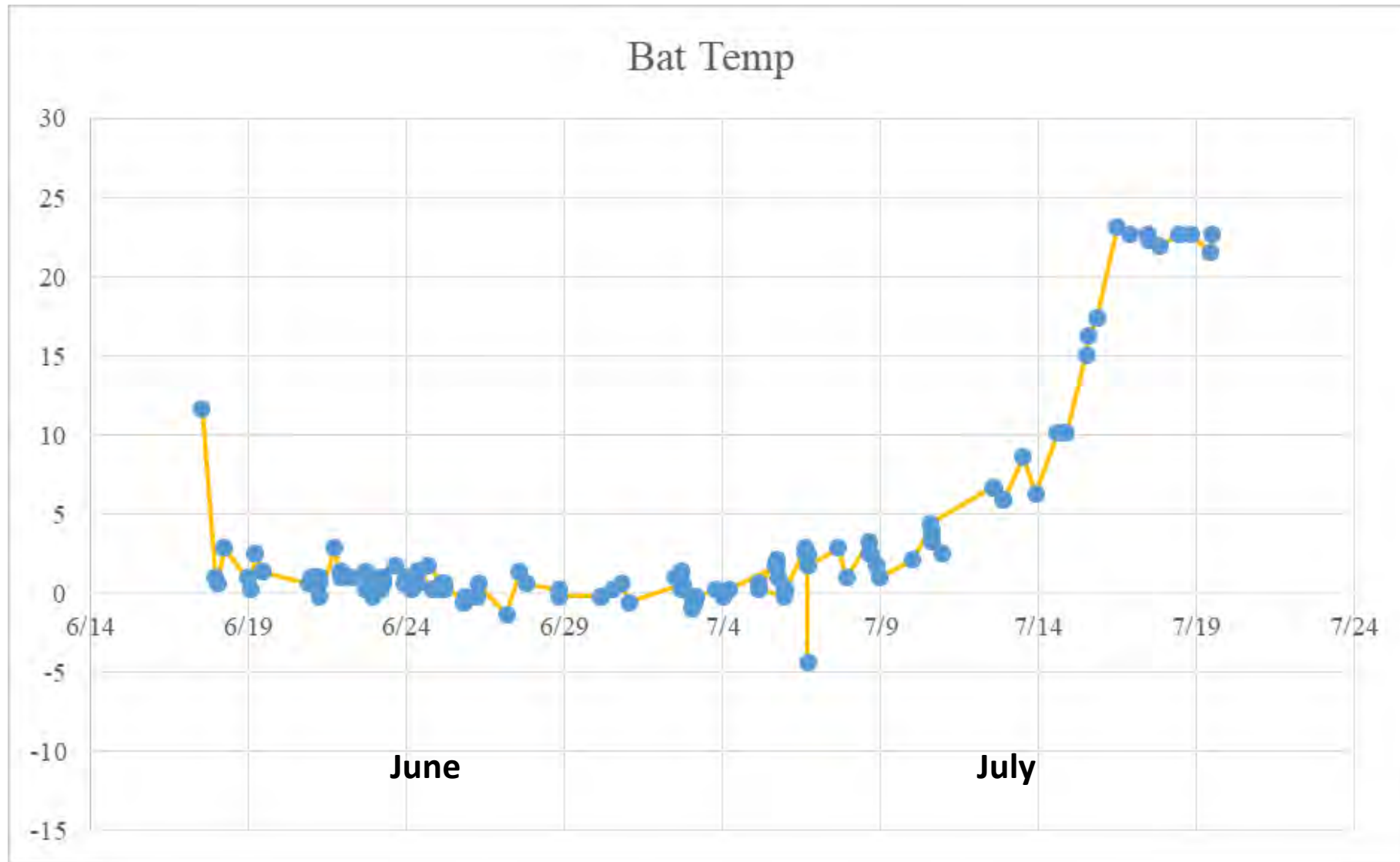
The battery has no active thermal control, therefore the temperature variation is due to the change in the beta angle.

Raavana-1 on orbit status

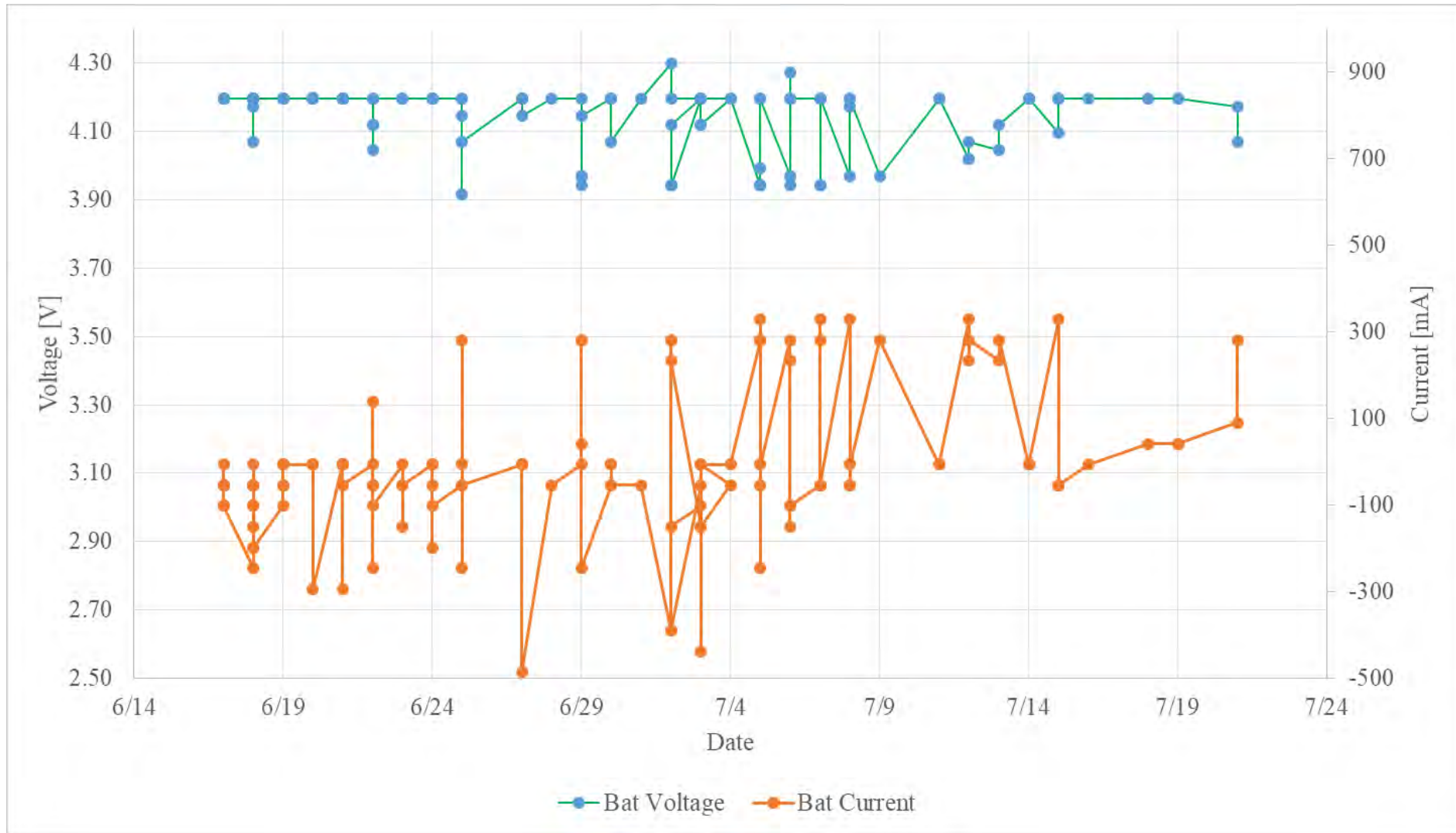


The battery voltage and current profile is as shown in the graph on the left. The profile is similar to that of other two satellites

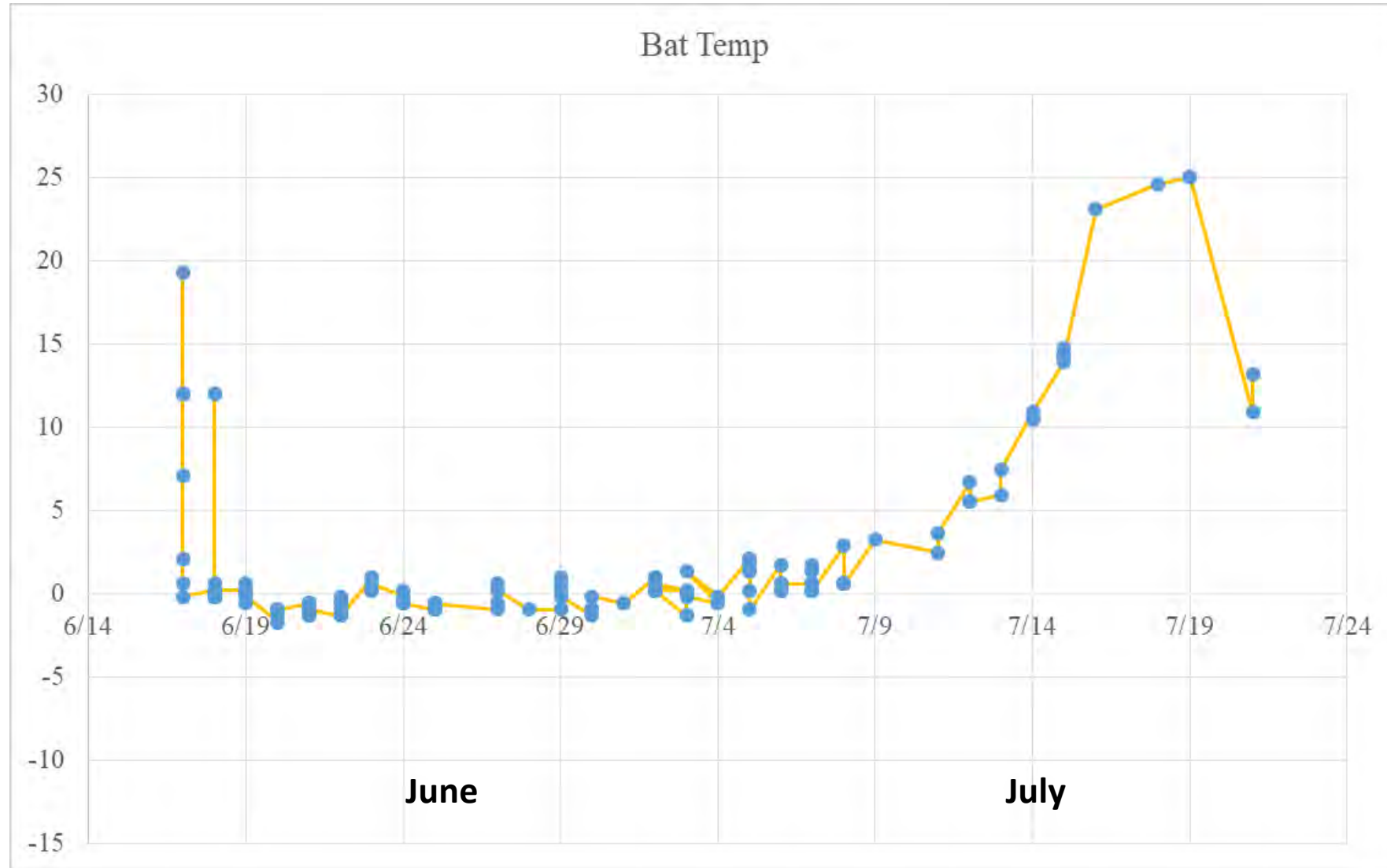
Raavana-1 on orbit status



Uguisu on orbit status



Uguisu on orbit status



Summary: BIRDS-3 on orbit mission status

BIRDS-3 satellites have 3 missions common to all satellites -- but the software-defined backplane board mission is only carried by the Uguisu satellite. The mission status (as of 22 July 2019) on orbit is as follows:

Mission→ Satellite	Camera Mission	Lora Demonstration Mission	ADCS Mission	Software Defined Backplane Mission
NepaliSat-1	Success, 7 images taken	Success	Not performed	Not applicable
Raavana-1	Success, 4 images taken	Success	Not performed	Not applicable
Uguisu	Success, 1 image taken	Success	Success	Success

End of report by Pooja of Bhutan

25. BIRDS-3: Nepal-Japan dialogue series IV – an outreach event



BIRDS-3 Outreach
8 June 2019
JICA Hall (Tokyo)

-- Report by Abhas
(Nepal)

Nepal-Japan Dialogue Series IV

NEPAL-JAPAN DIALOGUE SERIES IV

Supported by : The Embassy of Nepal, Tokyo
Co-supporters : UNIDO, JETRO

08. June. 2019 14:00-17:00

ENHANCING ICT INTEGRATION IN NEPAL

After Nepal's transition to federalism a unique opportunity is presented to change Nepal's current Information, Communication and Technology (ICT) system to one more oriented with the SDG goals and with a quality ICT system in mind. Since Japan is a prominent leader in the ICT arena, the series will discuss transferable components of the Japanese ICT system.

CHIEF GUEST
H.E. Ms. Prativa Rana,
Ambassador of Nepal to Japan

SPEAKERS
Mr. Abhas Maskey,
Project Manager, BIRDS 3 Project

Mr. Gokarna M. Duwadee,
Director General, DoLMA, Govt. of Nepal

Dr. Jay Rajasekera,
Vice-President,
Tokyo International University

Mr. Koji Kinouchi,
Manager, Weathernews Inc.

Dr. Yasunori Owada,
Senior Researcher, NICT

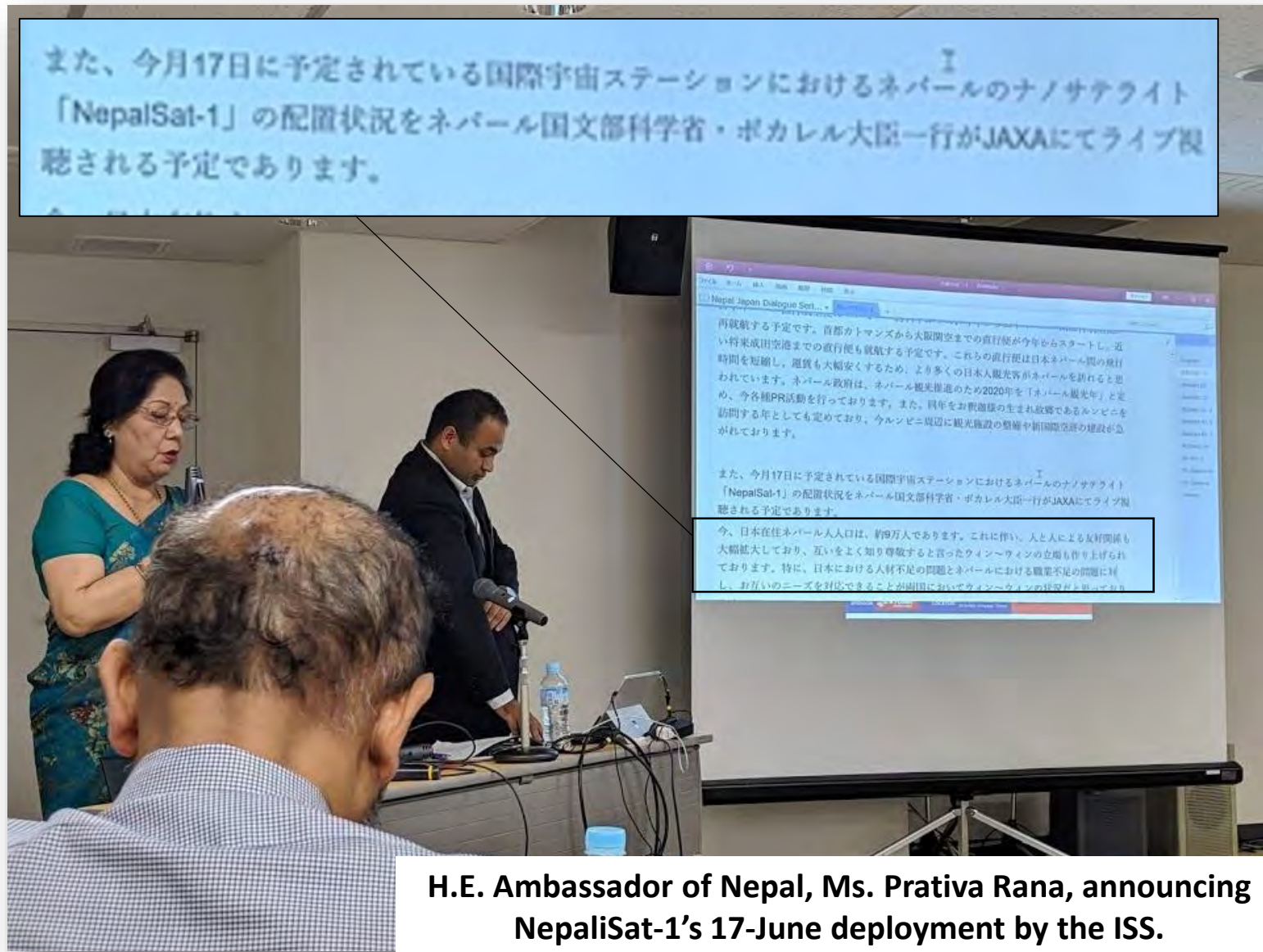
Mr. Taisuke Fukuno,
Chairman, jig.jp corporation

Dr. Ved Kafle,
Research Manager, NICT

MODERATOR
Dr. Kumar Basnet
Specialist, Toshiba Memory Corporation
basnet31@gmail.com

SPONSOR

LOCATION Seminar Room 600
JICA Hall, Ichigaya, Tokyo



また、今月17日に予定されている国際宇宙ステーションにおけるネパールのナノサテライト「NepalSat-1」の配置状況をネパール国文部科学省・ポカレル大臣一行がJAXAにてライブ視聴される予定です。

再就航の予定です。首都カトマンズから大阪関西までの直行便が今年からスタートし、近い将来成田空港までの直行便も就航する予定です。これらの直行便は日本ネパール間の飛行時間を短縮し、運賃も大幅安くするため、より多くの日本人観光客がネパールを訪れると思われています。ネパール政府は、ネパール観光推進のための2020年を「ネパール観光年」と定め、今各種PR活動を行っております。また、同年をお祝いの生誕地であるルンビニを訪問する年としても定めており、今ルンビニ周辺に観光施設の整備や新国際空港の建設が進められています。

また、今月17日に予定されている国際宇宙ステーションにおけるネパールのナノサテライト「NepalSat-1」の配置状況をネパール国文部科学省・ポカレル大臣一行がJAXAにてライブ視聴される予定です。

今、日本在住ネパール人人口は、約9万人であります。これに伴い、人々による友好関係も大幅拡大しており、互いをよく知り尊敬すると言ったウィン-ウィンの立場も作り上げられています。特に、日本における人材不足の問題とネパールにおける職歴不足の問題に、お互いのニーズを対応できることが両国においてウィン-ウィンの状態が実現されており

H.E. Ambassador of Nepal, Ms. Prativa Rana, announcing NepaliSat-1's 17-June deployment by the ISS.



Nepal-Japan Dialogue Series IV

Nepal-Japan Dialogue series is an ongoing exchange seminar between Japan and Nepal that is organized by the Embassy of Nepal and few expat Nepalese to discuss how the two countries are collaborating in Science and Technology and discuss on possible mutual development in the field in the days to come.

Media Coverages:
Republica (Nepal)

<https://myrepublica.nagariknetwork.com/news/68008/?fbclid=IwAR0CRjJ1xhNlzzMj06Ak-urZs-TCfiSJyuR3B3-TRU29s58pVBXBhMBrp8c>

Dialogue Series Full Video by
DC Nepal (Japan)

<https://www.facebook.com/dc.nepal/videos/395678461041530/>



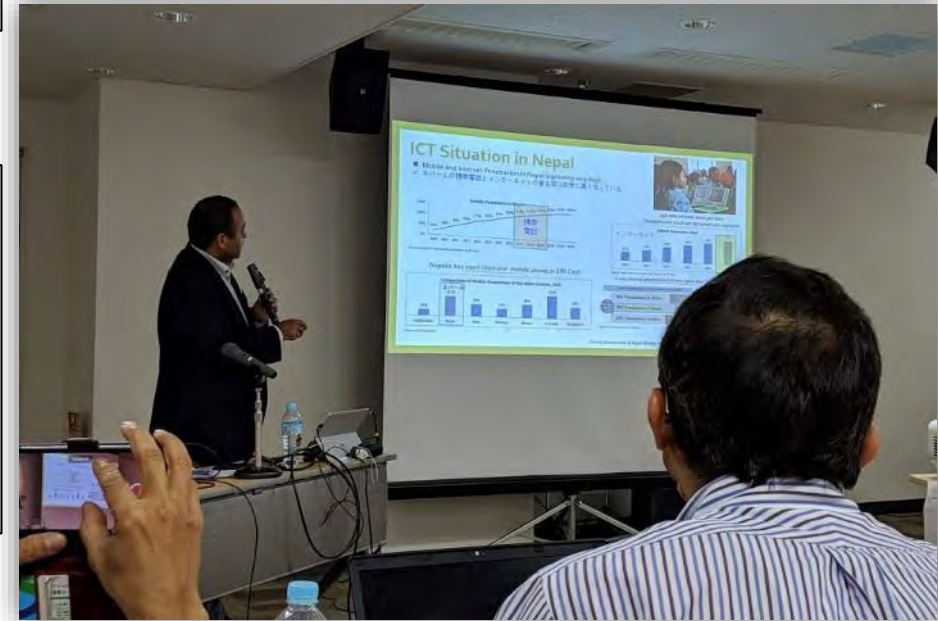
Participants, speakers and guests listen to presentations

Nepal-Japan Dialogue Series IV

Participants in the dialogue series were Nepalese and Japanese working in different industries in Japan/Nepal, Educators living and working in Japan who have had projects in Nepal and representatives from the Embassy of Nepal.



This time, the topic of discussion was on ICT development in Nepal and how Japan can play an important role in it's future development in the country.

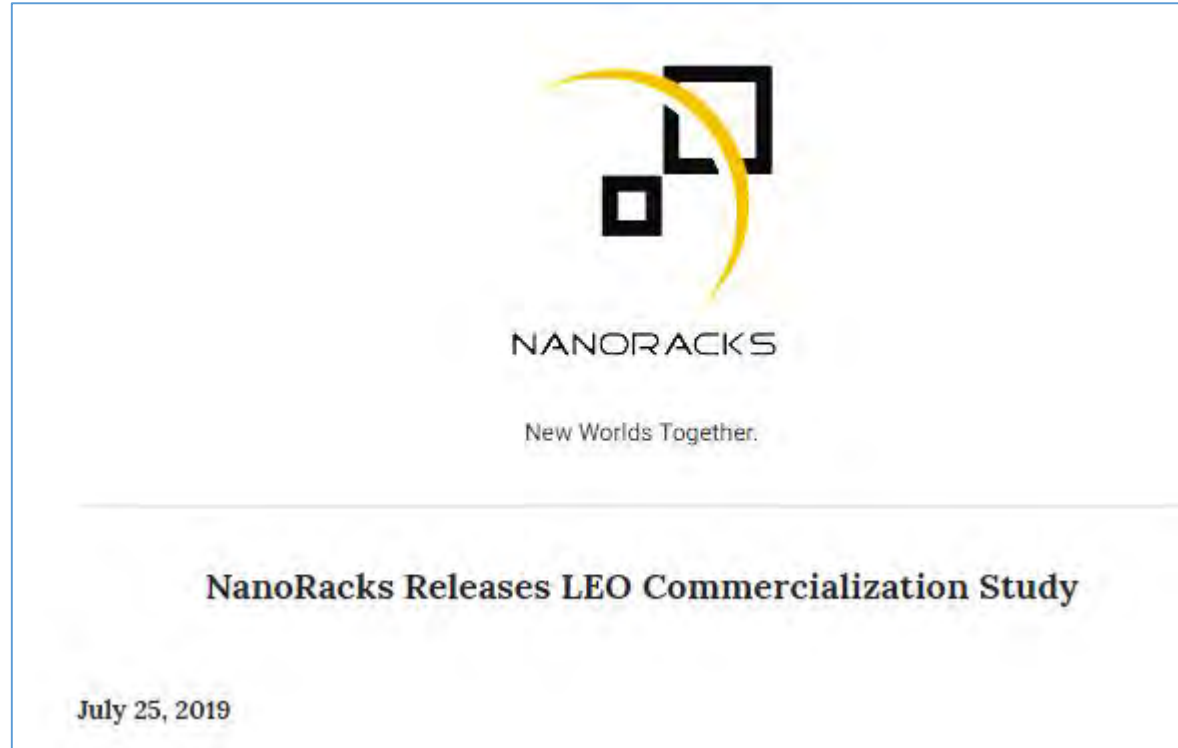




Abhas delivers his presentation on 8 June 2019

My presentation was on the topic of how Nepal and Japan ended up collaborating together for BIRDS-3 Project's NepaliSat-1, what challenges we had to face and how this collaboration can continue in the future. The audience asked specific questions on timeline, Ground Station (GS) development in Nepal and government's involvement in the project. The exchange was very positive.

26. NanoRack releases LEO commercialization study



SEE: <https://mailchi.mp/nanoracks/nanoracks-releases-leo-commercialization-study-2591407?e=b60ad576fb>

You can view the study by going to the link above.

End of this **BIRDS Project Newsletter**

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<http://birds1.birds-project.com/newsletter.html>

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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.