



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, -4 and -5, on 30-Oct-2020 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.*

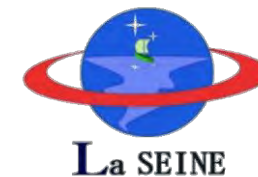
ISSN 2433-8818

# BIRDS Project Newsletter

**Issue No. 61**  
(24 Feb. 2021)

*Edited by:*  
G. Maeda

**革新的宇宙利用実証ラボラトリー**  
*Laboratory of **Lean Satellite Enterprises***  
*and **In-Orbit Experiments (La SEINE)***  
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.

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*From El Salvador*

**The Guest Box**



**Pupusas** are prepared using corn or rice dough and they are stuffed with one or different fillings such as cheese, cheese & fried bean paste, ground pork, or all of them at once better known as 'revueltas'. They are usually served alongside a traditional tomato sauce and a salad called 'curtido'. You can eat them for breakfast or dinner. They are the best to-go food in El Salvador! You can find them all around the country at a very cheap price! In the picture, cheese pupusas + salsa + curtido was made by me!

- Fatima Duran, new SEIC/PNST student; El Salvador

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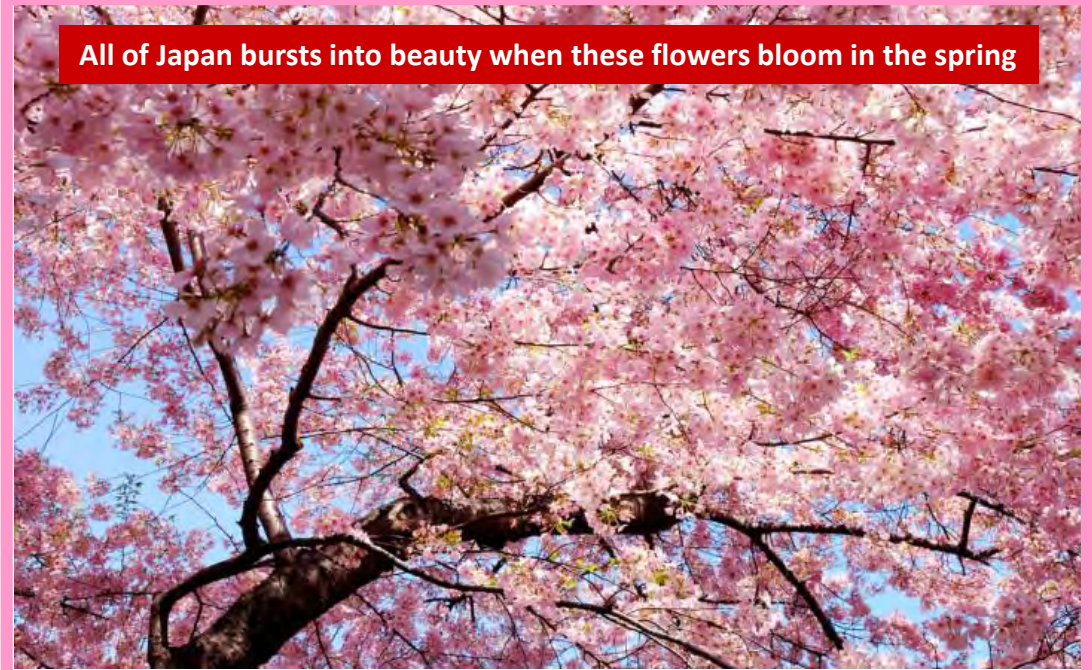
**End of Table of Sections**



**BIRDS-4 successfully launched from *Wallops Island* in Virginia, USA – see *Section 3* of this newsletter issue.**

**NEXT: Deployment of BIRDS-4 CubeSats from the ISS**

All of Japan bursts into beauty when these flowers bloom in the spring



**See the *Sakura* (cherry blossom) forecasts in *Section 9* of this newsletter issue.**



**JSPS provides the airfare funds of BIRDS Int'l Workshops and for Ground Station Workshops.**

## ***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.**

## 01. BIRDS-4: Paraguay did a press conference about their first satellite



AEP, the space agency of Paraguay, conducted a press conference on 16 Feb 2021. Prof Cho, the PI of the BIRDS Program, was one of the invited speakers of this event. The nationally televised event was about one hour in length.



In this press conference, AEP explained the nation's first satellite in broad terms, and also announced the launch date (the weekend of 20 Feb. 2021).



Prof Cho's interview was about 12 minutes, including the time needed for translation into Spanish.

← **Video by Facebook (the interview of Prof Cho)**

<https://fb.watch/3JV-ypqVzg/>

Note: You need to enable the audio at the bottom right of the frame of this web because the default is "audio off".



## There were several speakers at this event

### *Speakers representing AEP:*

- Liduvino Vielman - AEP president
- Hebe Romero – AEP Director
- Jorge Kurita – AEP Director
- Alejandro Roman – AEP Director
- Adolfo Jara – BIRDS-4 member, student at Kyutech
- Anibal Mendoza – BIRDS-4 member, student at Kyutech
- Javier Ferrer – AEP Ground Station operator

### *Guest speakers of this event:*

- Prof. Mengu Cho – PI of the Kyutech BIRDS Program
- Dr. Zully Vera – President, National University of Asuncion
- Dr. Antonieta Rojas de Arias – President, Scientific Society of Paraguay President

- **Ms. Yoshie Nakatani – Japan’s ambassador to Paraguay**



Read article (日本語 and English) about Ambassador Nakatani in the *BIRDS Project Newsletter*; page 11 of Issue No. 58.

# Paraguay's 1st satellite said to herald new era of development

Online News Editor • February 16, 2021

2 minutes read



Asuncion, Feb 16 (efe-epa).- The impending launch of Paraguay's first satellite promises to be the start of a new phase of technological progress in the South American nation, officials said here Tuesday. Participation in the Guaranisat-1 project has already had a "domino effect," the head of planning for the Paraguay Space Agency (AEP), Jorge Kurita, said during a press conference in Asuncion, pointing to "the creation of research teams and groups in the space sector, applied to solving terrestrial problems."

Far from only being a matter of national pride, Guaranisat-1 will be a valuable tool for Paraguayan policy-makers, AEP director of aerospace development Alejandro Roman said.

Observations of the Earth from orbit can be useful for authorities in dealing with natural disasters such as floods and wildfires, he said. "They are examples of how space science and technology can improve the management of a country and a government," Roman said. "The AEP is not only engaged in the launch of a satellite, it is a means to be able to advance in technological development."

To put its own satellite into space, Paraguay joined the **BIRDS-4 initiative**, organized by Japan's Kyushu Institute of Technology (Kyutech) with the Japanese and Philippine governments.

The Guaranisat-1 is based on the CubeSat, a miniaturized satellite for space research that is made up of multiple cubic modules of 10cm × 10cm × 10cm.

Two Paraguayan engineers who traveled to Japan for the project, Adolfo Jara and Anibal Mendoza, took part in Tuesday's media event by video-link.

Jara said that Guaranisat-1 is set to complete nine distinct data-collection tasks during its useful life, expected to be a minimum of 18 months. "With those data, we will say that our satellite has completed its mission," he said. After the launch, the AEP's Roman said, Guaranisat-1 will dock at the International Space Station, where it is to remain until it is "placed in orbit using a robotic arm in March or April and begins the test period." Paraguay has built two ground stations to receive data from Guaranisat-1: one in the Asuncion suburb of San Lorenzo, the other in the far-western Chaco region.

The AEP chief, retired Col. Liduvino Vielman, called the creation of Guaranisat-1 a "bet on innovation" that addresses Paraguay's deficit in "research and development."

<https://www.laprensalatina.com/paraguays-1st-satellite-said-to-herald-new-era-of-development/>



**The following pages contain news media reports about BIRDS-4 during the past 12 months. These reports were collected by the Philippine and Paraguay students of BIRDS-4 (viz., Adolfo, Anibal, Izrael, Mark, and Marloun).**



*“[This contributes to] developing our human resources by increasing the number of Filipino engineers and scientists that are trained and knowledgeable in small satellite development and operations”*

*- DOST Secretary Fortunato dela Peña said in his video message during the event.*

**STAMINA4Space,  
October 19, 2020**

## Maya-2 Flight Model completed, turned over to JAXA

Written by: STAMINA4Space

October 19, 2020



Maya-1 will soon have a companion in space.

Maya-2, the Philippines' second cube satellite (CubeSat), has been turned over to the Japan Aerospace Exploration Agency (JAXA) together with GuaraniSat-1 (Paraguay)

*“BIRDS-4 deploys during the JEM Small Satellite Orbital Deployer-16 (J-SSOD-16) micro-satellite deployment mission, is handled by the Japanese Experiment Module Remote Manipulator System (JEMRMS), and launches to the International Space Station aboard the NG-15 Cygnus Cargo Vehicle,” NASA added*

UNTV,

December 14, 2020



## NASA introduces PH satellite Maya-2; to launch in 2021

Marje Pelayo · December 14, 2020 · 745



MANILA, Philippines — The Department of Science and Technology’s (DOST) STAMINA4Space Program announced on Monday (December 14) that the 4th Joint Global Multi-Nation Birds Satellite or BIRDS-4 project is now on the website of the National Aeronautics and Space Administration (NASA).



*“Officially published in NASA website. Konting push na lang guys, launching na!!! [Just a little more and it will be launching] #ParaSaBayan,” the youthful electronics engineer-educator wrote.*

**Adamson University, January 18, 2021**

## Purio of Engg, BIRDS-4 project get study published by NASA

Date Posted: January 18, 2021 at 02:27 PM

Engr. Mark Angelo Purio continues to make strides as a member of the BIRDS-4 project after the space engineering program had its research manuscript published by the National Aeronautics and Space Administration (NASA) website.

Engr. Purio acknowledged the feat in a Facebook post last January 6, announcing the said publication.

*“Officially published in NASA website. Konting push na lang guys, launching na!!! #ParaSaBayan,”* the youthful electronics engineer-educator wrote.

Engr. Purio is responsible for the Camera Mission of the CubeSat project, putting camera payloads in the three BIRDS 4 CubeSat for its mission to capture [satellite] images of the member countries and be able to transmit it for further processing.

BIRDS is a cross-border interdisciplinary CubeSat project hosted by Kyushu Institute of Technology (KyuTech) in Japan, in partnership with three nations whose representatives are to develop their own satellites -- the Maya-2 CubeSat (Philippines), GuaraniSat-1 CubeSat (Paraguay), and Tsuru CubeSat (Japan). The Joint Global Multi-nation project is currently on its fourth leg (BIRDS 4).

Engr. Purio is one of three Filipinos who are granted scholarship by the Department of Science and Technology (DOST) and are sent to KyuTech to pursue a PhD in Space Engineering and be part of the satellite project.



# Soaring with BIRDS to space

Date Posted: October 20, 2020 at 01:18 PM

Engr. Mark Angelo Purio was in the Dean’s Office of the College of Engineering when Dean Evelyn Raguidin received a call inviting a faculty member for a Space Engineering program in Japan – BIRDS. The Engineering Dean quickly asked Engr. Purio, who had finished Master’s degrees in Electronics Engineering and Education, if he was willing to apply for the said project.

“Since I was looking for a PhD stint, I willingly agreed and went through the screening and selection process... I accomplished several documentary requirements and underwent a series of Panel Interviews,” Engr. Purio explained his response, and everything is history.

*“I am excited to see more students being trained, supported and funded in these kinds of careers and projects. I also believe this is when Adamson University will begin to see this discipline as an important field,” he said.*

Adamson University, October 20, 2020

**Joint Global Multi-Nation Birds (BIRDS-4 Satellite Project)**  
Kyushu Institute of Technology

**Project Outline**

- 2.4 Units of 1U CubeSats (3 kg, 10 cm<sup>3</sup>)
- 2.4 Satellite Project for developing nations
- 2.4 Project already started and underway at Kyushu of Participating Countries: Japan, Paraguay and Philippines
- 2.4 Bus systems adopted from spaceproven BIRDS-1, 2, and 3 project satellites
- 2.4 Satellites to be operated from 13 unconnected ground stations across the world!

**Physical Features & Specifications**

Size (mm) (x, y, z)	100x100x113
Mass (g)	~3200
Orbit	Altitude: ~600 km Orbit Inclination: 53.4°
Communication	UPL & Mission: Downlink: 437.375 MHz, 0000bps (24FSK) Mission Code (Mission): 437.375 MHz, Command Uplink: 1.300 band
Integrated Bus System	COTS Components BIRDS-1, BIRDS-2, BIRDS-3 Heritage

**BIRDS-4 CubeSats & Ground Stations Network**

**BIRDS-4 Missions & Onboard Payloads**

- Attitude Determination & Control System (ADCS)
- COTS GPS
- Earth Imaging (OCAM) & Image Classification (OCU)
- Total Ionizing Dose Measurement of COTS & Unbuffered Rad-Hard Components (TIDCR)
- Automatic Packet Repeating System (APRS)





*“Amb. Laurel also acknowledged the participation of the Filipino members of the team through the support of the Department of Science and Technology (DOST). The Philippines will strive to continue its support to international cooperation on space programs, and look forward to further cooperation with Japan and Paraguay, as well as future activities under the BIRDS Project.”*

**Philippine Embassy, September 29,  
2020**

## PH EMBASSY IN TOKYO PARTICIPATES IN THE HANDOVER CEREMONY OF BIRDS-4 CUBE SATELLITES

PH Embassy in Tokyo Participates in the Handover Ceremony of BIRDS-4 Cube Satellites



*Philippine Ambassador to Japan Jose C. Laurel V delivers his remarks on the occasion of the BIRDS-4 Cube Satellite Handover Ceremony on 24 September 2020. (Tokyo PE photo)*

TOKYO 30 September 2020 — Philippine Ambassador to Japan Jose C. Laurel V participated and delivered his remarks during the BIRDS-4 Cube Satell Handover Ceremony which was held on 24 September 2020.



COLLEGE OF  
ENGINEERING

*“The Maya-2 CubeSat, developed by Filipino students coming from different Philippine universities, will follow the earlier satellites Diwata-1 and Maya-1 launched in 2016 and 2018, respectively. Maya-2 is one of the Satellite Projects under the Stamina4Space Program by the Department of Science and Technology (DOST) and University of the Philippines Diliman.”*

**University of the Philippines – College of Engineering, September 24, 2020**



The BIRDS-4 Handover Ceremony and Press Conference was held via online livestream on September 24, 2020. The Joint Global Multi-nation “BIRDS-4 Satellite Project” is a cross-border interdisciplinary CubeSat (cube satellite) project hosted at Kyushu Institute of Technology in Japan, in collaboration with the development of satellites of three (3) nations: the Maya-2 CubeSat of the Philippines, the GuaraniSat-1 CubeSat of Paraguay, and the Tsuru CubeSat of Japan.



#### Recent Posts

- Online Processing of Documents - Office of the College Secretary
- Appeal for Readmission for 2nd Semester, AY 2020-2021
- UP College of Engineering Statement on the Abrogation of the 1989 UP-DND Accord\*
- Applications for Shiftcees and Transferees for 2nd Sem AY 2020-2021
- Birthday Greetings to the UP CoE College Secretary!

#### Archives

- February 2021
- January 2021
- December 2020
- November 2020
- October 2020
- September 2020



*“It is a huge leap towards the technological modernization of the country. In that sense, I am very happy that we did it with Japan, since it is a friendly country that has an honest interest to countries like ours, achieving the technological progress.”* Amb. Florentin said

**El Independiente (The Independent),  
October 8, 2020**

Actualidad

## GuaraniSat-1, un paso más hacia la conquista del Espacio

Por **Equipo Periodístico** - 8 octubre, 2020

446

Like 25



*“The benefits of this project are as wide as varied, being the main benefit, the learning obtained with this whole process, since Paraguayan engineers have had the opportunity to develop space-grade technology and the fact that it has been accepted to be launched indicates that it meets the requirements and the necessary standards” Prof. Roman said.*

**La Nacion (The Nation), September 24, 2020**

## GuaraniSat-1: a fin de año lanzarán el primer satélite paraguayo

Compartir en redes



El primer satélite del Paraguay, denominado GuaraniSat-1, estaría siendo lanzado hacia la Estación Espacial Internacional (EEI) a finales del presente año y posteriormente colocado en órbita en los primeros meses del 2021. Esto fue lo que explicaron el Prof. Mg. Alejandro Román y Enrique Niels Martínez, de la Agencia Espacial Paraguaya (AEP), durante un contacto con el canal C9N.

El aparato será presentado hoy en Japón (a las 22:00, horas de Paraguay) y luego será entregado a la Agencia Espacial Japonesa (JAXA), quien será la encargada de realizar el lanzamiento a la EEI. El satélite ha sido construido en su totalidad por mano de obra paraguaya, desde el diseño, pasando por las todas las etapas intermedias hasta lograr el modelo de vuelo, que es el que finalmente irá a orbitar el planeta. Todo este proceso ha sido parte de un proyecto académico cuyo resultado final se está entregando el día de hoy en Japón.

[Lea también: Lanzan satélite para estudiar el clima](#)





*“The satellite has been delivered to JAXA (Japan Aerospace Exploration Agency) and its launch to the International Space Station (ISS) will take place in the coming months. In one more example of an alliance with Japan, it will be put into orbit from the Japanese KIBO Module, of the ISS, by the hand of an astronaut from that country.”*

**La Nacion (The Nation), January 7,  
2021**

## Paraguay está adquiriendo capacidad para construir nuevos satélites

Compartir en redes



La Agencia Espacial del Paraguay (AEP) es un organismo especializado, civil y dependiente del Gobierno, que apuesta fuertemente a la cooperación internacional.

El satélite GuaraniSat-1 fue diseñado, desarrollado, probado e integrado por profesionales paraguayos de la AEP, en el marco de la cuarta edición del proyecto BIRDS, que consiste en una serie de proyectos satelitales que se inician en octubre de cada año en el Instituto Tecnológico de Kyushu (Kyutech), Japón.

[Lea también: En marcha la primera misión satelital del Paraguay](#)

### Formación de capacidades

El proyecto forma parte de las iniciativas del plan Paraguay al Espacio, que tiene como objetivo principal la inclusión del país en un programa internacional de formación de capacidades, llevado adelante por el Instituto Tecnológico de Kyushu (Kyutech), una universidad japonesa que en el 2020 fue posicionada como número uno en el mundo por tercer año consecutivo entre operadores de satélites de universidades e instituciones académicas.

Nuestro país no contaba con ninguna experiencia en el desarrollo de tecnología espacial y ahora no solo cuenta con su primer satélite “construido con mano de obra auténticamente paraguaya”, sino ha adquirido la capacidad de construir nuevos satélites y formar parte de una red internacional de investigación.

### Próxima puesta en órbita



TETĀNGUÉRA NDIVE  
JOKUPYTYRĀ  
Motenondecha

Ministerio de  
RELACIONES  
EXTERIORES

*“Until recently, Paraguay had no experience in the development of space technology. Currently, our country not only has its first satellite, built with Paraguayan labor, but it has also acquired the ability to build new satellites and be part of an international research network”*

**Ministry of Foreign Affairs, January 7,  
2021**

El GUARANISAT-1, primer satélite paraguayo, consolida el proyecto “Paraguay al Espacio”

Inicio / Pagina actual

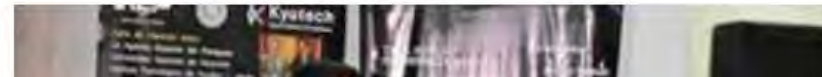
Publicado: 01/07/21 06:00 p. m.



Paraguay apuesta por la innovación y a través de la Agencia Espacial del Paraguay (AEP) desarrolla sus capacidades en el campo de la tecnología espacial.

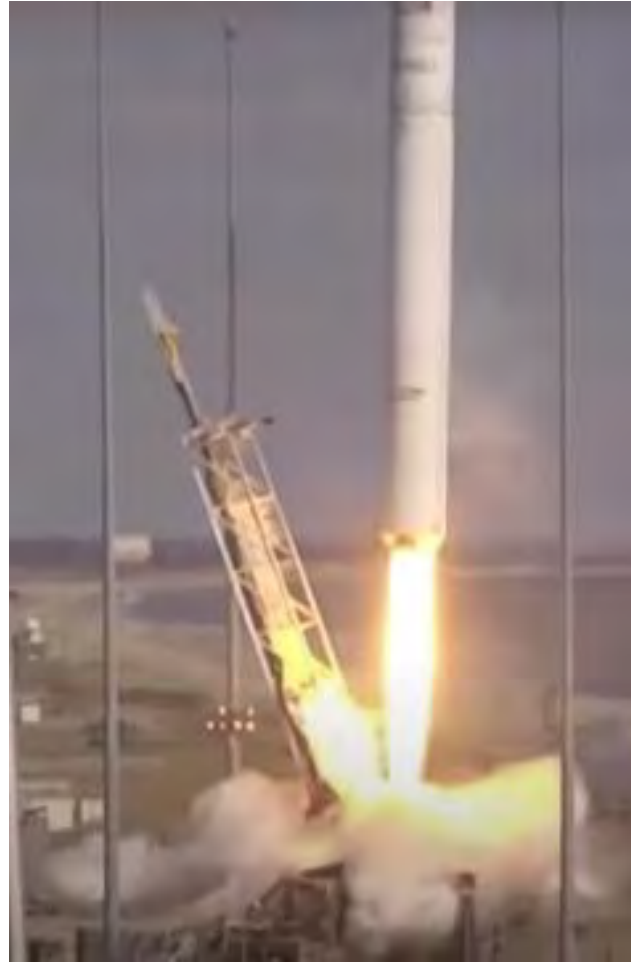
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El proyecto forma parte de las iniciativas del plan “Paraguay al Espacio”, que tiene como objetivo principal la inclusión del país en un programa internacional de formación de capacidades, llevado adelante por el Instituto Tecnológico de Kyushu (Kyutech), una universidad japonesa que en el 2020 fue posicionada como número uno en el mundo por tercer año consecutivo entre operadores de satélites de universidades e instituciones académicas.



**End of  
this  
Section**

### 03. BIRDS-4: Satellites were successfully launched by NASA on 20 Feb 2021 (local time)



**Launched were:**  
Tsuru (Japan), Maya-2  
(Philippines), and  
GuaraniSat-1 (Paraguay)



**Read the details on the next page.**

**VIEW THE LAUNCH:**

<https://www.youtube.com/watch?v=0wztEa0EhW0>

[ Only 4 minutes in length]

# Northrop Grumman Antares rocket launches Cygnus cargo ship to space station for NASA

By Amy Thompson, 20 Feb. 2021

*It's headed to the International Space Station.*

WALLOPS ISLAND, Virginia, USA — A Northrop Grumman-built Cygnus cargo ship lifted off from Virginia on Saturday (20 Feb. 2021), carrying vital supplies for astronauts on the International Space Station.

Perched atop a two-stage Antares rocket, the uncrewed Cygnus NG-15 spacecraft blasted off from Pad 0A at the Mid-Atlantic Regional Spaceport at NASA's Wallops Flight Facility here at 12:36 p.m. EDT (1736 GMT).

The craft is hauling more than 8,200 lbs. (3,719 kilograms) of cargo that include scientific equipment, fresh food and supplies for the seven astronauts on board the space station. It's also packed with new hardware and spacewalk equipment.

SPACE.com



News

Tech

Spaceflight

Science & Astronomy

The 139-foot-tall (42.5-meter) Antares rocket lifted off right on time, at the beginning of a planned 5-minute window. It's Cygnus NG-15 cargo ship is named after **Katherine Johnson**, the trailblazing NASA mathematician who helped make John Glenn's historic orbital flight — the first by an American astronaut — possible. Now, 59 years later, the S.S. Katherine Johnson embarks on her own flight to space on the 59th anniversary of Glenn's Friendship 7 Mercury flight.

Including the  
**BIRDS-4 CubeSats of:  
Japan, Paraguay, and the  
Philippines**



<https://www.space.com/northrop-grumman-launches-cygnus-ng15-cargo-ship>





You can find the latest info at the BIRDS-4 *FaceBook*

<https://www.facebook.com/Birds4SatelliteProjectKyutech/>

## Email of 22 Feb 2021

Dear Maeda Sensei,

I'd like to share with you NASA's tweet in Spanish regarding yesterday's launch. The translation to the English is:

*"We have lift-off! The SS Katherine Johnson Spacecraft of @NorthropGrumman is already on its way to the @space\_station with the Paraguayan CubeSat GuaraniSat-1 on board"*

Source: [https://twitter.com/NASA\\_es/status/1363186056166834177?s=04&fbclid=IwAR35i9ilg24ZHQ7n-G9HHB\\_E-cxHCyP6MEilfkaleWlWaWaFI\\_9te2Nu7sM](https://twitter.com/NASA_es/status/1363186056166834177?s=04&fbclid=IwAR35i9ilg24ZHQ7n-G9HHB_E-cxHCyP6MEilfkaleWlWaWaFI_9te2Nu7sM)

Best regards

Adolfo JARA, Ph.D. student

Kyushu Institute of Technology

Department of Applied Science for Integrated System Engineering

Laboratory of Lean Satellite Enterprises and In-Orbit Experiments

1-1 Sensui-cho, Tobata-ku, Kitakyushu-shi, Fukuoka 804-8550, Japan



## 04. You are invited to enter the MIC7 – Mission Idea Contest No. 7



**The 7th  
Mission Idea Contest**  
For Deep Space Science and Exploration

### Introduction to the Mission Idea Contest

The Mission Idea Contest (MIC) was established in 2010 to provide aerospace engineers, college students, consultants, and anybody interested in space with opportunities to present their creative ideas and gain attention internationally. The primary goal of MICs is to open a door to a new facet of space exploration and exploitation.

Development of micro/nano-satellites started as an educational and research program primarily at university laboratories. As the micro/nano-satellite technology matures, it has spread rapidly across the academics and industry for practical application.

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The 7th Mission Idea Contest for Deep Space Science and Exploration with Nano/Micro Satellite will be held as follows:

### Schedule

Oct 23, 2020	Restart announcement (Virtual seminars are to be provided)
July 2021	Deadline of Abstract submission
August 2021	Notification of Finalists
September 2021	Deadline of Final Paper submission
November 2021	Final presentation (the location and date are to be determined.)

**GO TO HERE:** <http://www.spacemic.net/>

Subject: [UNISEC2020] 超小型衛星深宇宙探査 レクチャーのお知らせ (2月15, 18, 25日, 3月1, 4日)  
From: Rei Kawashima  
Date: 2021/02/03  
To: Entire universe

UNISEC の皆様 (**English on the next page**)

第7回超小型衛星ミッションアイデアコンテストのアブストを現在募集しております。(締め切りは7月です) <http://www.spacemic.net/>

今回は、深宇宙探査を対象としており、低軌道ミッションとは違う知識が必要となりますので、レクチャーを開催することになりました。コンテストに参加しない方でも、深宇宙探査に興味のある方は、お気軽にご参加ください。一回だけの参加も可能です。

日程: 2月15, 18, 25日, 3月1, 4日 (夜9時から10時半まで)

費用: 無料

言語: 英語

プログラム: 添付のチラシ、あるいは <http://www.spacemic.net/lecture.html> でご確認ください。

参加形式: ZOOMによるオンライン講座(講師への質問も可能です)

申込: <<https://forms.gle/jtiRtJB8ougK85ux7>> からお申込みください。

Googleフォームが使えない方は、[info@spacemic.net](mailto:info@spacemic.net) までメールを送ってください。現在、45名のお申込みがありますが、日本からの申し込みは少ないので、ぜひご参加ください。川島



# The 7th Mission Idea Contest Lecture Series

## For Deep Space Science and Exploration

With Nano/Micro Satellites



The University of Tokyo,  
Institute for Open Innovation



<p><b>1</b> Mon 02/15/21 – New challenges for Deep Space Exploration with Micro/nano Satellites</p>  <p><b>Prof. Ryu Funase</b> -Professor, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency -Associate Professor, Department of Aeronautics and Astronautics in School of Engineering, The University of Tokyo</p>	<p><b>2</b> Thurs 02/18/21 - Science operations of Space missions</p>  <p><b>Prof. Munetaka Ueno</b> -Research Director, Space Exploration Innovation Hub Center (Technology Advancing Node for SpAce eXploration , TansaX), Japan Aerospace Exploration Agency (JAXA). -Professor, Graduate School of Science, Kobe University.</p>	<p><b>3</b> Thurs 02/25/21 – Deep space exploration and micropropulsion</p>  <p><b>Prof. Hiroyuki Koizumi</b> - Associate Professor, Department of Advanced Energy in Graduate School of Frontier Sciences &amp; Department of Aeronautics and Astronautics in School of Engineering, The University of Tokyo</p>
<p><b>4</b> Mon 03/01/21 – Trajectory Design for Deep Space Exploration Missions</p>  <p><b>Prof. Naoya OZAKI</b> - Assistant Professor, Department of Spacecraft Engineering, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency</p>	<p><b>5</b> Thurs 03/04/21 – MIC7 General session, Lecture summary, and Q&amp;A with experts.</p>  <p><b>Prof. Atsushi TOMIKI</b> -Associate Professor, Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency</p>	<p style="text-align: center; font-size: 1.2em;"><a href="http://www.spacemic.net">http://www.spacemic.net</a></p> <p style="text-align: center;">  @missionideacontest             info@spacemic.info)       </p>

Please join the MIC-7 Lecture series. (No obligation to enter the contest. Lectures are free of charge.) We have 45 registrants so far and would like to have more attendees. If you are not familiar with deep space science and exploration, you are most welcome to join.

Please register at: <https://forms.gle/jtiRtJB8ougK85ux7>

The program can be found at: <http://www.spacemic.net/lecture.html>

MIC Office; info@spacemic.net



## 05. Monthly highlights of Japan from the Government of Japan



PUBLIC RELATIONS OFFICE  
GOVERNMENT OF JAPAN



### February 2021 ACTIVE SENIORS: THE POTENTIAL OF A “SUPER-AGED” SOCIETY



– THEME FOR February

#### ACTIVE SENIORS: THE POTENTIAL OF A “SUPER-AGED” SOCIETY

As Japan is rapidly aging, a growing proportion of “older people” are remaining active in the workforce and other sectors of society. Through interviews with such active seniors, we look at the possibilities for the new age of longevity in which people can expect to work and play long into their healthy lives.

**PDF(288KB)**

← To download this pdf, use the link below

**GO HERE FOR ACCESS:**

<https://www.gov-online.go.jp/eng/publicity/book/hlj/20210201.html>

**See also statistics from Wikipedia:**

[https://en.wikipedia.org/wiki/Aging\\_of\\_Japan#:~:text=According%20to%202014%20estimates,%2033.0%%20of%20the%20Japanese,a%20post-war%20baby%20boom%20between%201947%20and%201949.](https://en.wikipedia.org/wiki/Aging_of_Japan#:~:text=According%20to%202014%20estimates,%2033.0%%20of%20the%20Japanese,a%20post-war%20baby%20boom%20between%201947%20and%201949.)

# UPDATES FROM THE PHILIPPINES



**February 15, 2020**

University of the Philippines Diliman  
Quezon City, Philippines

**PREPARED BY:**

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# 2nd Integrated STEM Leadership Summit in Asia

January 21-22, 2020

STAMINA4Space Project Leaders Dr. Maricor Soriano (Project 1: OPTIKAL), Dr. Marc Caesar Talampas (Project 2: PHL-50), and Engr. Paul Jason Co (Project 3: STeP-UP) joined the 2nd Integrated STEM Leadership Summit in Asia\*. This year's theme was "Reimagining Integrated STEM Education: Amplifying Agility and Transformational Collaboration for a Post-Pandemic Asia".

\*The summit aims to: (1) create a community of STEM champions, brand ambassadors, key influencers, and opinion leaders in Asia to bridge the gap between education and industry in nurturing the STEM ecosystem; (2) foster integrated STEM education to prepare learners to compete in a changing global economy; and (3) support the aspirations of learners for the future of work and a better quality of life.

### Hardware Verification Phase: Hardware-in-the-Loop Mode

The diagram illustrates the hardware verification process. It features three main components:
 

- MATA VISUALIZATION**: A software interface showing a 3D model of a satellite in orbit.
- MATA - HARDWARE INTERFACE**: A control panel with various status indicators and data fields.
- S4: SMALL-SATELLITE SIMULATION SYSTEM**: A central hub connecting to physical hardware including an *Air bearing platform*, *Multispectral Camera*, and *Hardware Chip*.

 Arrows indicate the flow of data and control between these systems.

### MULTISPECTRAL CAMERA

The diagram explains the operating principle of an RGB camera. Light from a **field** (represented by a landscape image) passes through a **lens** and **RGB Filters or Splitter** to reach a **sensor**. A **far object** is also shown being imaged. The resulting data is processed into a **sensor** output, which is visualized as a grid of colored pixels (red, green, blue).

### Philippine CubeSats: From Firsts to Sustainability

Maya-1 First PH CubeSat	Maya-2 First PH Inter-University Satellite Project	Maya-3 and Maya-4 First PH University-Built CubeSat	Maya-5 and Maya-6 First Generation-CubeSat Platform
Launched 2018 Deorbited 2020	Target Launch 2021	Target Launch 2021	Target Launch 2022
Built by Filipino Engineers in Japan in partnership with Bhutan, Malaysia, and Japan	Built by Engineers and Faculty members from UPD, Ateneo, and Mapua University in Japan in partnership with Pangloss and Japan	Built by eight MS-IMEE students under UPD EEE's Nanosatellite Engineering Track based on Maya-1 bus. This marks the first PH university-based satellite development.	Ongoing development by eight MS-IMEE students at UPD EEE. The CubeSats are based on the most advanced Maya-2, and will incorporate locally fabricated parts.

# Filipino Aerospace Expo 2021

January 30, 2020

Researchers from the STAMINA4Space: Project 5 - Advanced Satellite Development and Know-How Transfer for the Philippines (ASP) Ms. Jamaica Pangasinan, Engr. Edgar Paolo Violan, and Dr. Adrian Salces were invited by the University of Makati STEM Society to be three of the guest speakers for their Filipino Aerospace Exposition 2021.

Following the the theme of "Science for the People: The Crusade in Filipino Space Frontier", they presented updates about Philippine space technology, satellites applications, and insights from their experiences while working in the field. They hope to inspire more young people to consider STEM careers.



“  
"If you love the environment, you can be involved in this field and as a woman, I would like to inspire you, women, out there. [...] Even though you're married [or] if you're already having kids. If you're in that stage, you can still pursue this."  
Ms. Jamaica N. Pangasinan  
STAMINA4SPACE  
FILIPINO AEROSPACE EXPO 2021



“  
"We are building from the ground up, but not from scratch."  
Engr. Edgar Paolo Violan  
Philippine Space Agency  
FILIPINO AEROSPACE EXPO 2021



“  
"It's really challenging but this is worth it. [...] Not just for us, individuals, but also for the country."  
Dr. Adrian C. Salces  
Philippine Space Agency  
FILIPINO AEROSPACE EXPO 2021

Photos courtesy of STEM Society-Higher School ng UMak

Editor's note: Adrian was a member of BIRDS-2

# Filipino Aerospace Expo 2021

January 30, 2020

The event was open to the public and was attended by mostly STEM students.

**Satellite Downstream Applications: Looking at the Philippine Environment from Space**

Jamaica Pangasinan STAMINA4Space  
Filipino Aerospace Expo  
January 30, 2021

Coastal Erosion, Sedimentation, Benthic Habitat Mapping, Aquaculture Monitoring, Fish Productivity Monitoring.

**FILIPINO AEROSPACE EXPO 2021**

STEM SOCIETY of the Higher Learning (DMA), University of Malaya (UM)

**HANDS-ON EXPERIENCES IN DEVELOPING MADA-1 CUBESAT IN THE BIRDS-2 PROJECT**

Adrian C. Salvas, 工学博士  
STAMINA4Space Program  
Project 0: Advanced Space Development and Knowledge Transfer for the Philippines (ASDP-KAT)

**The Filipino's Journey to Space**

The Philippine Space Agency & The Diva-1 Microsatellites

Edgar Ferris B. Veloso  
Office of the Director General  
spas@psa.gov.ph

**Build, Build, Build in Space (B3iS)**

Current Capabilities:

- Optical Imaging
- Radar Imaging
- Ship Tracking
- Heat Flux
- Communication
- Data Store & Forward

Future Plans:

- Telecommunications
- Intelligence & Reconnaissance
- Advancement in Optical, Thermal, and Radar Imaging

# S4S joins the KiboCUBE Academy

January 14, 21, 28, and February 4, 2020

Members of the STAMINA4Space Program participated in the KiboCUBE Academy\*: a series of technical webinars hosted by the United Nations Office for Outer Space Affairs (UNOOSA) and Japan Aerospace Exploration Agency (JAXA). The speakers included experts from JAXA and collaborating Japanese Universities.

\*The KiboCUBE Academy aims to help applicants for the KiboCUBE programme gain technical knowledge about how to actually design, develop, and test their CubeSats; how to operate it once it is in space; and how to utilize the data that they acquire from their CubeSats to develop useful applications on Earth.

Read more here:

[https://www.unoosa.org/documents/pdf/psa/hsti/KiboCUBE/KiboCUBEAcademy2021/KiboCUBE\\_Academy\\_Agenda\\_and\\_Speaker\\_Bio\\_FINAL.pdf](https://www.unoosa.org/documents/pdf/psa/hsti/KiboCUBE/KiboCUBEAcademy2021/KiboCUBE_Academy_Agenda_and_Speaker_Bio_FINAL.pdf)

Day #4 02.04 21:00-23:00 (JST)  
**KiboCUBE Academy**  
Lecture 4-1  
Satellite Operation and Related Regulations  
Tohoku University  
Department of Aerospace Engineering  
Associate Professor Dr.-Ing. Toshinori Kuwahara

This lecture is NOT specifically about KiboCUBE and covers GENERAL engineering topics of space development and utilization for CubeSats.  
The specific information and requirements for applying to KiboCUBE can be found at:  
<https://www.unoosa.org/oosa/en/ourwork/psa/hsti/kibocube.html>



### 6. Operational Phase

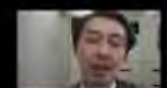
#### Early Operation Phase

- After the deployment from the ISS, a CubeSat automatically starts functioning in space.
- The most exciting moment is the first communication contact between the satellite and the ground station.
- Health status of the satellite is checked, such as power generation, battery state-of-charge, temperature, signal strength, etc.



First ground contact with deployed CubeSat

February 4, 2021 KiboCUBE Academy 37



The STAMINA4Space Program  
welcomes its new Program Leader

## Dr. Maricor N. Soriano



Dr. Soriano is a Professor of Physics at the University of the Philippines Diliman who specializes in developing hardware and software tools for video and image processing.

Her work spans multidisciplinary domains such as:

- Coral reef imaging (for which she won the PCIEERD R&D prize in 2018)
- Cultural heritage conservation
- Video analysis of sports
- Medical imaging

Awards and Recognition

- NRCP Outstanding Young Scientist (2006)
- Third World Academy of Science Physics Prize recipient (2009)
- Outstanding Women in the Nation's Service (TOWNS) awardee in Applied Physics (2013)



# STAMINA4Space New Program Leader!

February 1, 2020

We would like to introduce our new Program Leader, Dr. Maricor N. Soriano!

She will be taking over the STAMINA4Space Program leadership as Dr. Gay Jane Perez takes on the role of Deputy Director General at the Philippine Space Agency (PhilSA), under the leadership of PhilSA Director General Dr. Joel Marciano, Jr.

Dr. Soriano also continues to serve as the Project Leader of our Optical Payload Technology, In-depth Knowledge Acquisition, and Localization (OPTIKAL) Project, and Dr. Perez concurrently continues as Project Leader of our Advanced Satellite Development and Know-How Transfer for the Philippines (ASP) Project.

We wish Dr. Soriano and Dr. Perez all the best in their new endeavors! They have our full support.

# Updates from STEP-UP

scholars

*"The 16<sup>th</sup> step..."*

February 2021

University of the Philippines- Diliman  
Quezon City, Philippines

*Prepared by STeP-UP scholars*

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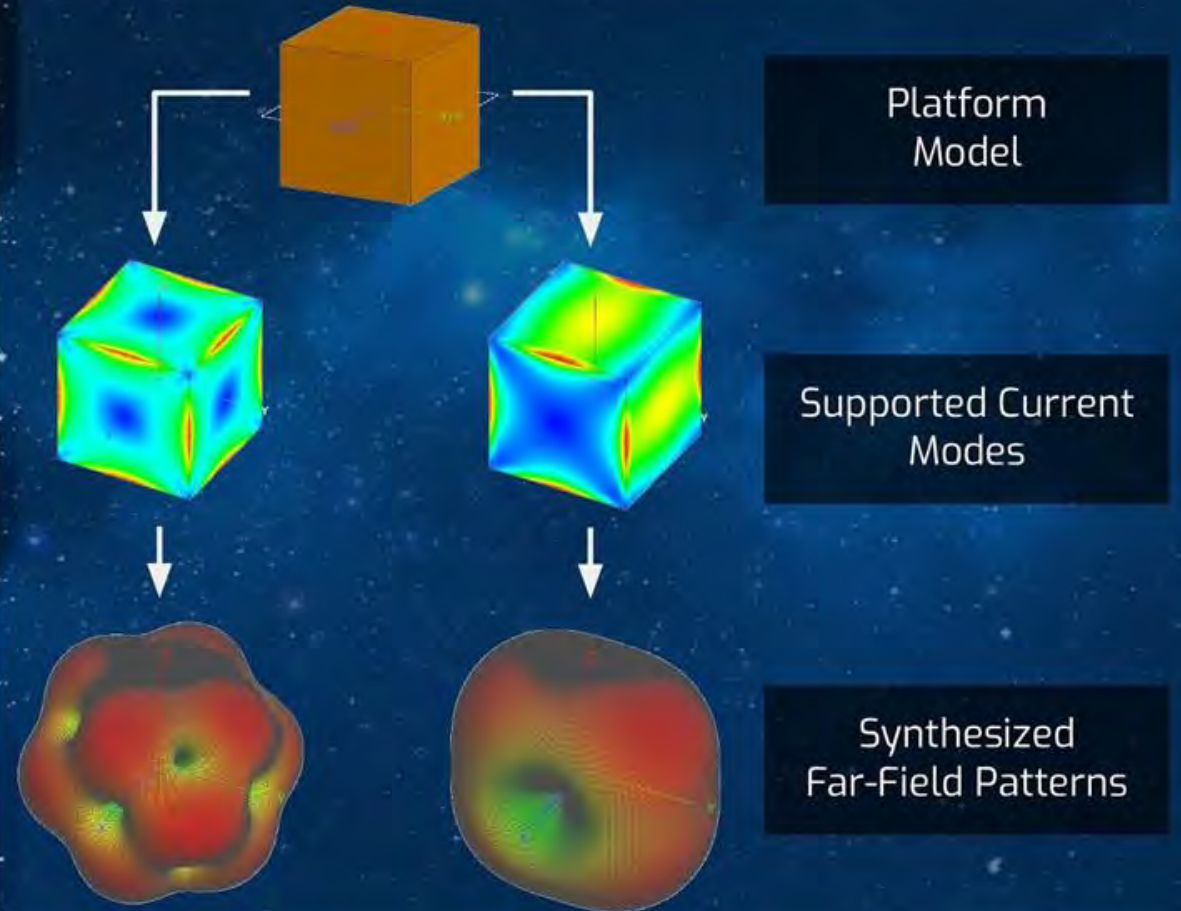
# Featuring a STeP-UP Scholars' Research work: Characteristic Mode Theory (CMT)

Bryan Custodio



It has been a month since the Batch 1 of the STeP-UP Scholars returned from Kyushu Institute of Technology for the Acceptance test of the Maya-3 & 4 Flight Models. With Maya-3 & 4 waiting for its launch in space, the STeP-UP Scholars will focus on their research work which is another major requirement of the Graduate program. For this issue, we present a snippet of the tools that I will utilize for my graduate research.

Being assigned to the antenna system of Maya-3 & 4, I decided to pursue a research on the design of antennas for Cube Satellites. Using the characteristic mode theory (CMT), a more compact antenna design for CubeSats will be developed. Essentially, the central idea of the application of the CMT is to make a hosting platform (in this case, the Cubesat), the main radiator. According to Harrington and Mautz, characteristic modes provide a set of orthogonal current mode distribution that can be excited over the surface of a conducting body. CMT has been used in antenna design problems for mobile handsets and certain platforms such as aircrafts, UAVs, and ships. It has also been used for radiation pattern synthesis and decomposition. In this research, the feasibility of using the CubeSat chassis as the main antenna, will be investigated.



Characteristic modes supported by a 10 cm x 10 cm x 10cm Cube (Standard 1U Cube Satellite dimension)



# BIRDS' EYE

UPDATES FROM STEP-UP BATCH 2

February 15, 2021

University of the Philippines, Diliman  
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JJ (left) assisting during the Comms team's Anechoic Chamber tutorial



Timm helping JJ in programming the MCU for the SFWARD mission



Val cutting the antenna material



Gio (left) soldering components on the -Y panel for testing, Ronald (right) preparing the BPB for testing



Anna exploring the ground station radio and software



Jim attempting to drill mount holes onto antenna material



The scholars are currently on the assembly and functionality testing stage for the parts that arrived from Japan last month. This is in preparation for their Preliminary Design Review (PDR), which will be happening in a few weeks' time. Since they have been allowed to enter the UP-EEEI building following safety protocols, they have been working in the laboratory and also attending various training sessions to help them with their missions and subsystems.

# MAYA-5 AND MAYA-6 DEVELOPMENT

# HAPPY BIRTHDAY GIO ASHER!

We would like to wish our Project Manager a happy, happy birthday! Gio, whose birthday falls on the 8th of February, celebrated his 25th birthday last February 2 with a lunch out at the classic Rodic's Diner with teammates. Cheers!





# GREEN THUMB

The scholars all moved out of their hometowns and into busy Metro Manila for the development of Maya-5 and Maya-6. Anna, our resident *plantita* (“plant aunt”), shares her tips on keeping your plant babies healthy even in indoor settings like her Quezon City apartment.

**1. Remember NPK! (Nitrogen, Phosphorus, Potassium)**

These are the important nutrients needed for your plants to thrive. If you keep fishes for pets, you can use fish tank water to water your plants for a boost of Nitrogen.

**2. Fertilizers are all around us**

Anna fertilizes her plants with organic materials such as eggshells, banana peels, coffee grounds and rice water— which we would all just normally throw out!

**3. Know your plants**

Just like people, plants have their own personalities and needs in order to grow. Do research for their specific requirements such as amount of light, water, and soil mix.

**4. Show some TLC!**

Give your plants some attention. Observing them will let you know if they are receiving enough light, when to water, and what their growing patterns are. Root for your plants and they will root for you! ❤️



## Note about how the satellites of the Philippines are named:

MAYA-1

BIRDS-2

MAYA-2

BIRDS-4

MAYA-3

Also known as “BIRDS-2S” by Kyutech students

MAYA-4

Also known as “BIRDS-2S” by Kyutech students

MAYA-5

Also known as “BIRDS-4S” by Kyutech students

MAYA-6

Also known as “BIRDS-4S” by Kyutech students

- The editor



# UiTMSAT COLUMN

Column No. 14

## 07. Column #14 from Malaysia

Editor: FATIMAH ZAHARAH BINTI ALI ([ali.fatimahzaharah@gmail.com](mailto:ali.fatimahzaharah@gmail.com))  
PhD CANDIDATE, LABORATORY OF SPACE WEATHER AND SATELLITE SYSTEM  
COLLEGE OF ENGINEERING  
UNIVERSITI TEKNOLOGI MARA (UiTM), SELANGOR, MALAYSIA



UNIVERSITI  
TEKNOLOGI  
MARA

*UiTM Sentiasa Di Hatiku*  
"UiTM Always in My Heart"

## Rendering the Apprehension on Space Weather

Faculty of Electrical Engineering, Universiti Teknologi MARA (UiTM), Campus of Pasir Gudang in Johor, Malaysia has undertaken an initiative in spreading the understanding of space weather and its scrutiny to academia and researches through an interdisciplinary research colloquium. This virtual interdisciplinary research colloquium is organized by the Space Science and Engineering Research Group in UiTM Pasir Gudang, incorporated with IEEE Young Professionals Malaysia.

Divided into two (2) separated sessions, the interdisciplinary research colloquium presented six (6) experienced speakers that provides imperative information and knowledge on the geomagnetic phenomenon. The topics of the talks are arranged sequentially in ensuring the grasp of the participants especially the beginners on the space physics events.

## THE IMPORTANCE OF UNDERSTANDING SPACE WEATHER

The Interdisciplinary Research Colloquium

### SESSION 1: 10 FEB 2021

- 9:00 am** Empirical Analysis on Geomagnetic Disturbance  
by Puan Nornabilah Mohd Anuar, FKE UiTM Pasir Gudang
- 10:30 am** Geomagnetic Induced Current (GIC) in Equatorial Region  
by Puan Zatul Iffah Abd Latiff, FKE UiTM Pasir Gudang
- 2:00 pm** Economic Impact on Geomagnetic Disturbance due to Space Weather  
by Puan Suhana Mohamed, FPDP UiTM Pasir Gudang

### SESSION 2: 17 FEB 2021

- 9:00 am** Coronal Mass Ejection (CME) and Solar Flare Eruption & Its Implication to The Power Grid by Assoc. Prof. Ts. Dr. Zety Sharizat Hamidi,  
Coordinator Physics and Industrial Physics, FSG UiTM Shah Alam
- 10:30 am** Geomagnetic Induced Current (GIC) in Arctic & Antarctic  
by Assoc. Prof. Ir. Dr. Mohamad Huzaimy Jusoh,  
Director of Center for Satellite Communication, FKE UiTM Shah Alam
- 2:00 pm** Recent Advancement in AI and Machine Learning Analysis Method  
by Dr. Muhammad Asraf Hairuddin, FKE UiTM Pasir Gudang

Meet <http://bit.ly/sserg01>

Feb 2021 | 9:00 am - 4:00 pm

Science and Engineering Research Group, FKE UiTM  
Malaysia

The first session has commenced on February 10<sup>th</sup>, 2021 with talks more on geomagnetic disturbance and its effect on nation and economic. The next session will be held on the next following week which is on February 17<sup>th</sup>, 2021, with another three (3) talks on implications of space weather events on power grid, its phenomenon in two (2) extreme poles, and analysis method using Artificial Intelligence (AI) technology.

The research colloquium is not only targeting the science and technology fields participants but also other participants from broad backgrounds. This is because the programme is an interdisciplinary academic talks that involved speakers not only from electrical engineering faculty but also from faculty of applied science and business management. As aforementioned, the talks also covered the effects of the solar events to the economic and electricity network systems or the power grid.



**THE IMPORTANCE OF UNDERSTANDING SPACE WEATHER**  
The Interdisciplinary Research Colloquium

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Meet <http://bit.ly/sserg01>  
10 & 17 Feb 2021 | 9:00 am - 4:00 pm  
Organized by Space Science and Engineering Research Group, FKE UiTM PG and IEEE Young Professionals Malaysia

@fkeuitmpg  
UiTM di hatiku

**THE IMPORTANCE OF UNDERSTANDING SPACE WEATHER**  
The Interdisciplinary Research Colloquium

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Organized by Space Science and Engineering Research Group, FKE UiTM PG and IEEE Young Professionals Malaysia

@fkeuitmpg  
UiTM di hatiku

The interdisciplinary concepts could create an opportunity especially to the researchers or space physics devotees to stimulate ideas for further advanced exploration and investigation on space weather. Indirectly, it will encourage future potential project on this solar events phenomenon.

The talks are conducted to provide understanding on solar activities and space weather, the effects of the phenomenon on power grid technology and its impact economically, and the application of machine learning in analyzing the data from the space weather systems. Anyone who would like to broaden knowledge on those

aforementioned topics can join the academic talks for free. The second session will be conducted on February 17<sup>th</sup>, 2021, at 9 am (Malaysia Time) through Google Meet platform at <http://bit.ly/sserg01>.

## ASEANSAT Project Commencement

On February 1<sup>st</sup>, 2021, marked a significant date where the multination project collaboration on Nanosatellite development, ASEANSAT Project, has kicked-off. The project that involves participation from UiTM, Malaysia, King Mongkut's University of Technology North Bangkok (KMUTNB), Thailand, and University of Perpetual Help System DALTA (UPHSD), Philippines, is the very first ASEAN collaboration project on Nanosatellite. As covered in previous issue of the *BIRDS Project Newsletter* (No. 60), UiTM has managed to secure a funding from Malaysian Ministry of Science, Technology and Innovation (MOSTI) for the development of Flight Model of 1U-sized Nanosatellite with improved ground resolution camera payload.

The project was kicked-off in line with the day where the funding agreement was officially signed. The initial step of the project will be the mission analysis where the mission and subsystems of the Nanosatellite will be delivered to technical team members for work breakdown assignment. The updates of the project will be covered in the next *BIRDS Project Newsletter*.

**End of Malaysia's Column**

## 08. KMUTNB is a member of the BIRDS Network

King Mongkut's University of Technology North Bangkok



International News

No. 92 July - December 2020

### Virtual KMUTNB-Kyutech Committee Meeting

Page 3

On 22<sup>nd</sup> December 2020, the 1<sup>st</sup> Liaison Committee Meeting between KMUTNB and Kyushu Institute of Technology, Japan, was held and it was co-presided by Ms. Sikan Kulchonchan, KMUTNB's Vice President for International Affairs, and Prof. Yasunori Mitani, Kyutech's Vice President for International Affairs. Furthermore,



Assoc. Prof. Dr. Udomkiat Nontakaew, Dean of Faculty of Engineering and his team joined the meeting. The representatives from both sides discussed and followed up the progress of their all projects in previous year, especially, the establishment of the KMUTNB-KYUTECH Collaboration Satellite Office at the Faculty of Engineering. Due to Covid-19's situation, each of activities should be reviewed and modified in next year. It will strengthen the academic partnership between KMUTNB and Kyutech.

← Issue No. 92 of this KMUTNB newsletter contains 8 pages.

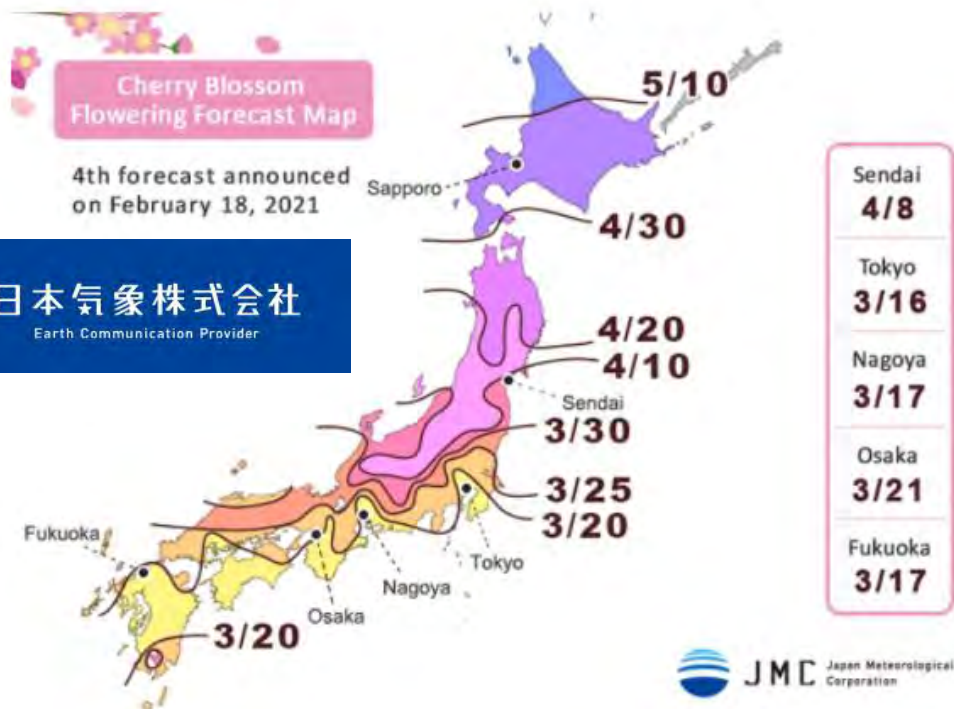
On page 3, a recent virtual meeting between KMUTNB and Kyutech is described.

**KMUTNB is a member of the BIRDS Network as it provides a ground station. It is an active participant of *BIRDS International Workshops*.**

# 09. Cherry blossom forecasts are out

Below is from :

<https://n-kishou.com/corp/news-contents/sakura/?lang=en>



On February 18, 2021, JMC released its 4th forecast of the dates when cherry blossoms will start to flower (kaika) and reach full bloom (mankai). JMC has estimated the flowering and full bloom dates for Somei Yoshino (Yoshino Cherry) trees in approximately 1,000 cherry blossom viewing locations in cities from Hokkaido to Kagoshima. JMC will provide timely updates.

(next update: 25 Feb 2021)



← From *Nikkei* newspaper of 17 Feb 2021.

It says Tokyo blossoms will start on 19 March.

## 10. New SEIC students settle down at Kyutech

Paraguay



My First  
month at  
Kyutech  
--- Settling  
DOWN

Submitted on 7th February 2021

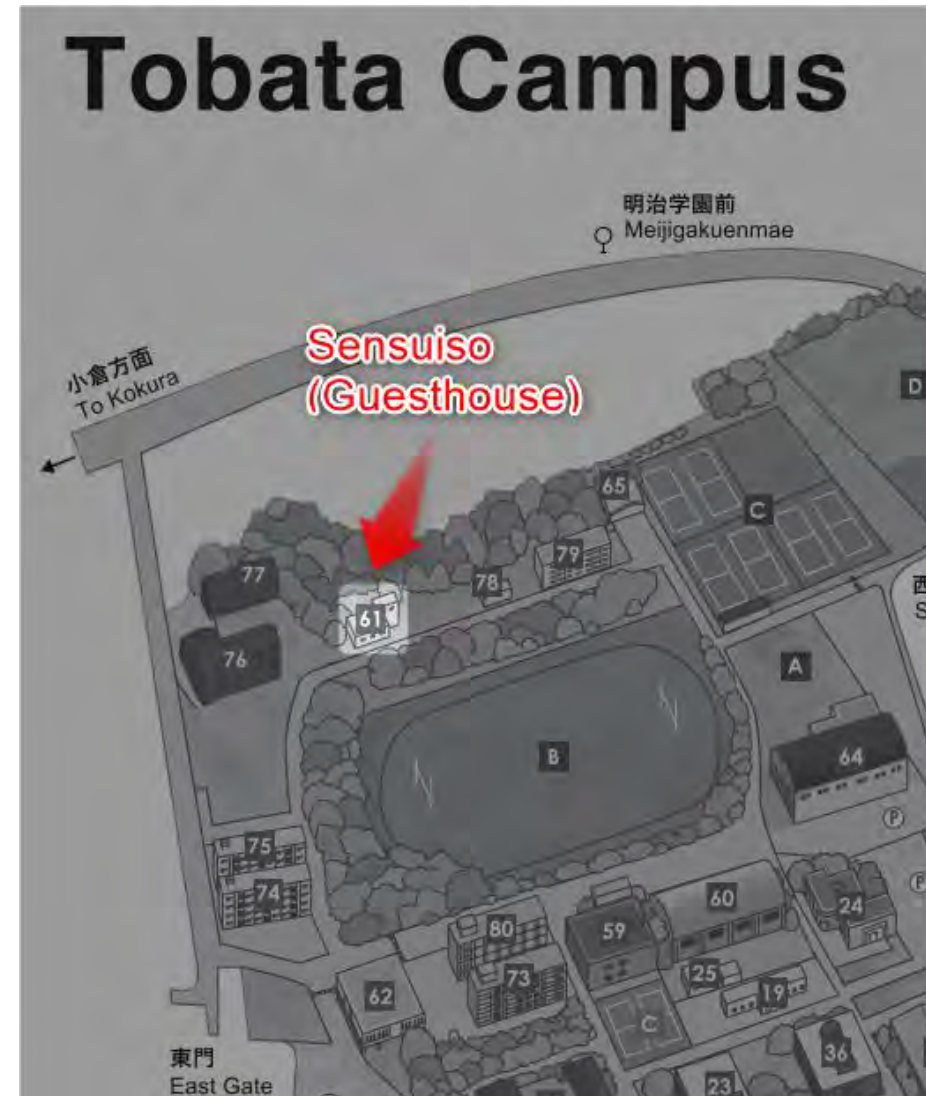
By Ariel Manabe, SEIC's Paraguayan SDG student who recently completed 2-weeks quarantine at Narita

In my first two days at Tobata I could stay at the Guest house in Kyutech. Meanwhile with the help of my tutor, I looked for an apartment where to live during my time at Kyutech.

When searching for a home, it is important to have money in cash. Particularly, the company with which I managed the rental does not work with a credit card.

At this point, I think it is necessary to mention the amount necessary to cover all the initial expenses, making quick calculations, you can easily spend approximately 130,000 Yens with all the initial requirements that make a rental and insurance payment.

This amount can go up, mainly depending on the type of apartment one chooses but, according to what has been discussed with other colleagues, it is a good average.



- After choosing a house, I started with the first purchases, a futon, a blanket, an internet modem. (the house already had an internet connection).
- At first, I did not have appliances such as a stove and a refrigerator. So, I bought obentos and food that would not spoil easily.
- It is important to know that there is a *Facebook* group of Kyutech's students where you can buy at lower prices appliances, furniture or just get them when someone is giving away. Just ask to a friend in order to enter in his group (Buy-Sell-Swap KyuTech Tobata)
- Another option that I found very convenient is creating an amazon account and use the Amazon gift card (you can get one from the combini store from 20000 Yen) as an alternative payment method.





The **first experience** with the snow! Amazing! On the other hand, in the room the floor was very cold with just the futon. So, it is a good idea to place some cardboard underneath the futon.

If it is not enough, you may try the “Hokkairo”; a kind of personal Heater. Just be careful and not place it directly over your skin to avoid burns







## Exploring Yomiya Park

From this first month there are a lot of details and stories for tell, but the most important thing is there were many enjoyed adventures with old and new friends.

*Let's go for more adventures!*

**End of this article**

## 11. MPCP of Thailand – a new satellite project; you can buy a slot on it



The following article describes a new project by INSTED and NB\_Space of *King Mongkut's University of Technology North Bangkok* (KMUTNB).

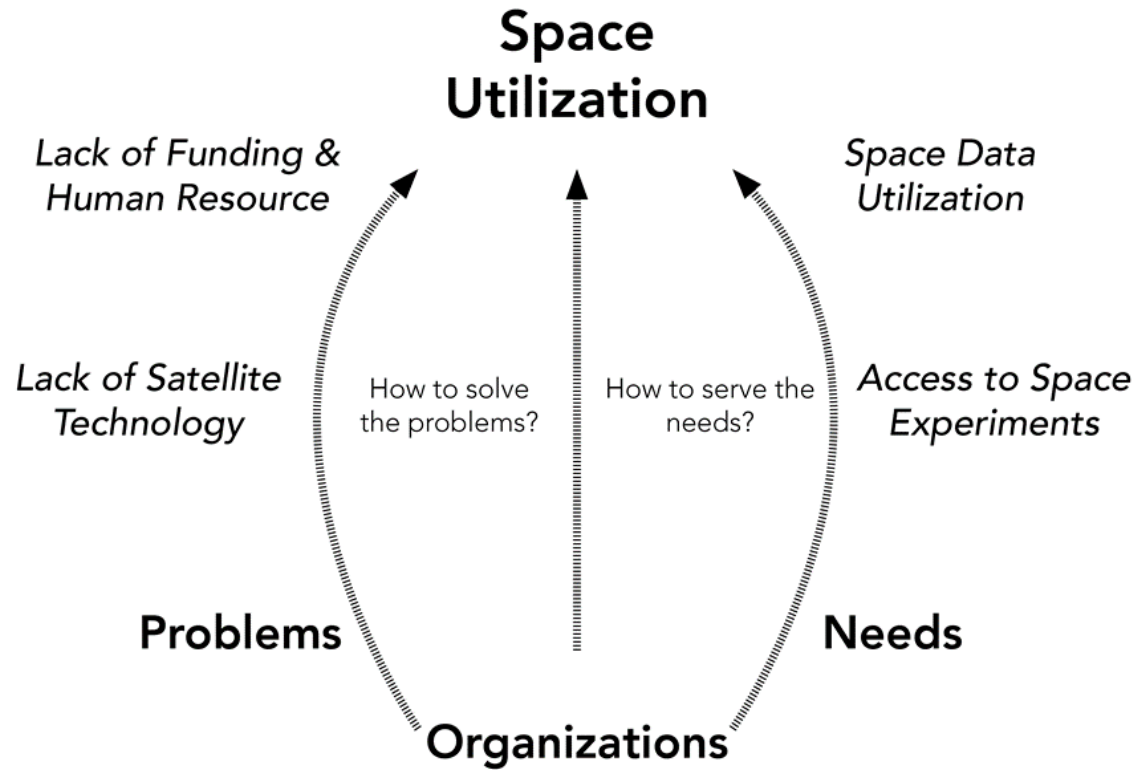
Please note *the second to the last page* of this article. **It points out that 3 payload slots are still available** – if you are interested in putting a payload in this satellite please contact G. Maeda (editor of this newsletter) or Dr. Phongsatorn “Pom” Saisutjarit (Acting Director of INSTED) for further details. There are ten slots in total for this satellite.



# Multi-Payload Cubesat Platform (MPCP)

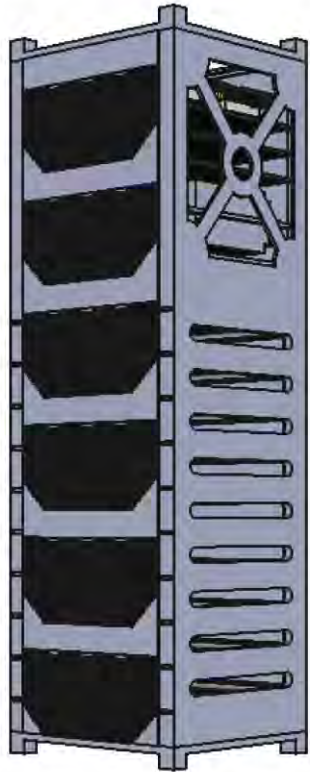
*Dr. Phongsatorn Saisutjarit*

Multi-Payload Cubesat Platform (MPCP) is a collaborative project among the International Institute of Space Technology for Economic Development (INSTED), King **Mongkut's** University of Technology North Bangkok (KMUTNB), NBSPACE (**KMUTNB's** spin-off space tech company), and Kyushu Institute of Technology (KYUTECH). This project is led by Dr. Phongsatorn Saisutjarit who is the acting director of INSTED.



INSTED

Many of the customers and partners of INSTED and NBSPACE need to access space experiments and data without long development time and high cost. However, their pain point is that they do not have satellite technology, funding, and human resources to meet their needs. Both INSTED and NBSPACE have listened to the voice of customers and would like to provide the right solution for them. Thus, the MPCP project is born.



## “One Satellite Multi-Payload”

### Bus System

- Communication
- OBC
- EPS
- Antenna

### Multi-Payload (10 Slots)

- Designed and developed by users

*To be launched  
in Q1 2022*

### Space-Proven Parts

3U Cubesat Multi-Payload Platform  
Designed and Developed by



### Ride-Sharing Concept

Shared Launch and Testing Fees  
Among Riders

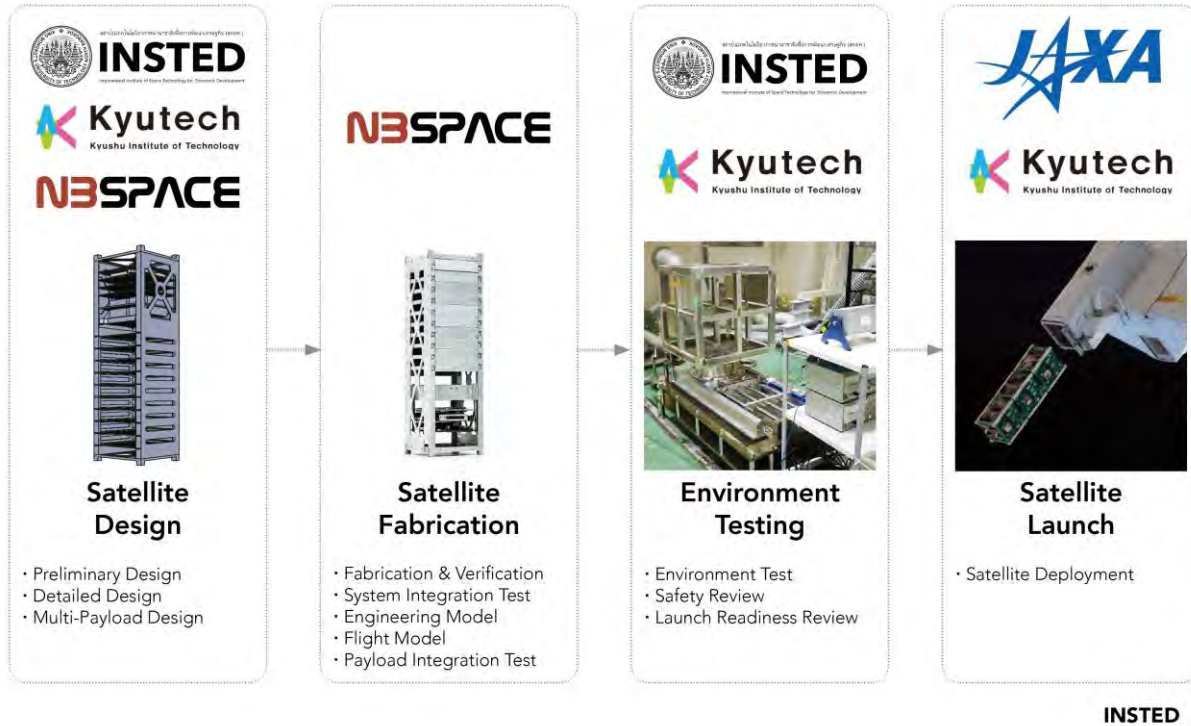
Fully Supports on  
License and Safety Review

Focused on Payload Development  
Not Satellite Development

INSTED

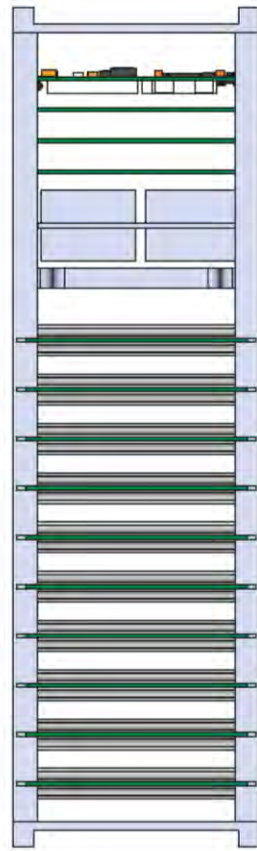
MPCP is a multi-payload satellite with the “Ride-Sharing” concept. The satellite can host up to 10 payloads that are designed and developed by the customers. The bus system is co-designed and developed by INSTED, NBSPACE, and KYUTECH. MPCP customers only need to embed their payloads in the satellite without worrying about the rest (satellite design, testing, licensing, and safety review). Also, the launch cost is shared among the riders. Thus, MPCP dramatically reduces the cost and development time, moving the customers quicker and cheaper to

## Collaborative Platform Development



The MPCP project is a collaborative effort among INSTED, KYUTECH, and NBSPACE. These organizations co-design the satellite to meet the customer requirements and space standards. NBSPACE fabricates the satellite and carries out the system integration test. The satellite is then performed under the space environment conditions at KYUTECH and co-evaluated by KYUTECH and INSTED personnel. After the safety and launch readiness reviews are examined, MPCP will be deployed by J-SSOD under the collaborative program between JAXA

# Space-Proven Components



## Bus System

- Communication
- OBC
- EPS
- Antenna

## KNACKSAT

The First Made-in-Thailand Satellite by KMUTNB



## 3U Platform

3U Cubesat Platform  
Co-Designed by  
INSTED and NBSPACE



## Birds Project

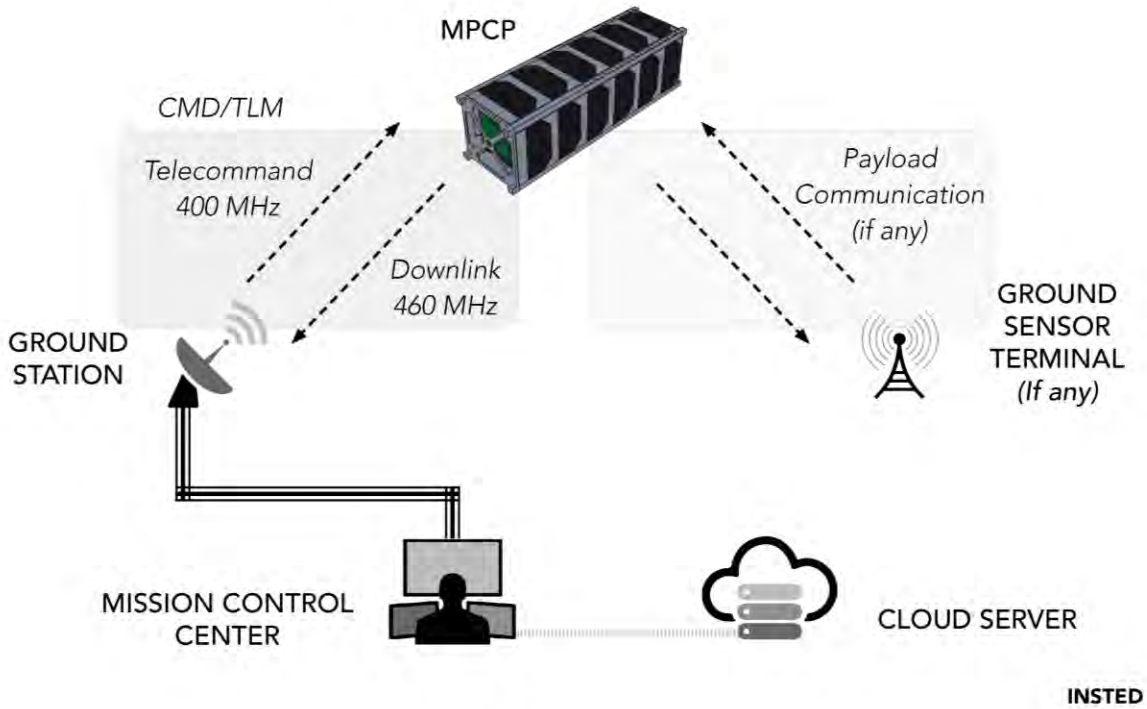
International Satellite Project by  
Kyutech



INSTED

MPCP is a 3U satellite and most of its main components are the heritage of the space-proven components from KMUTNB (KNACKSAT Project) and KYUTECH (Birds Project). As a result, MPCP is designed to ensure its reliability in space operation.

## MPCP Concept of Operation



The concept of MPCP's operation is quite simple. The mission control center at INSTED is linked to the ground station that communicates with MPCP using 400 MHz telecommand and 460 MHz downlink. The satellite payload will also communicate with the ground sensor terminal (if any). When MPCP flies over the ground station, it will transmit the payload data to the ground station, which is then transferred to the mission control center. Finally, the payload data is stored in the cloud server and all the customers are given the authorized access to their own payload data.



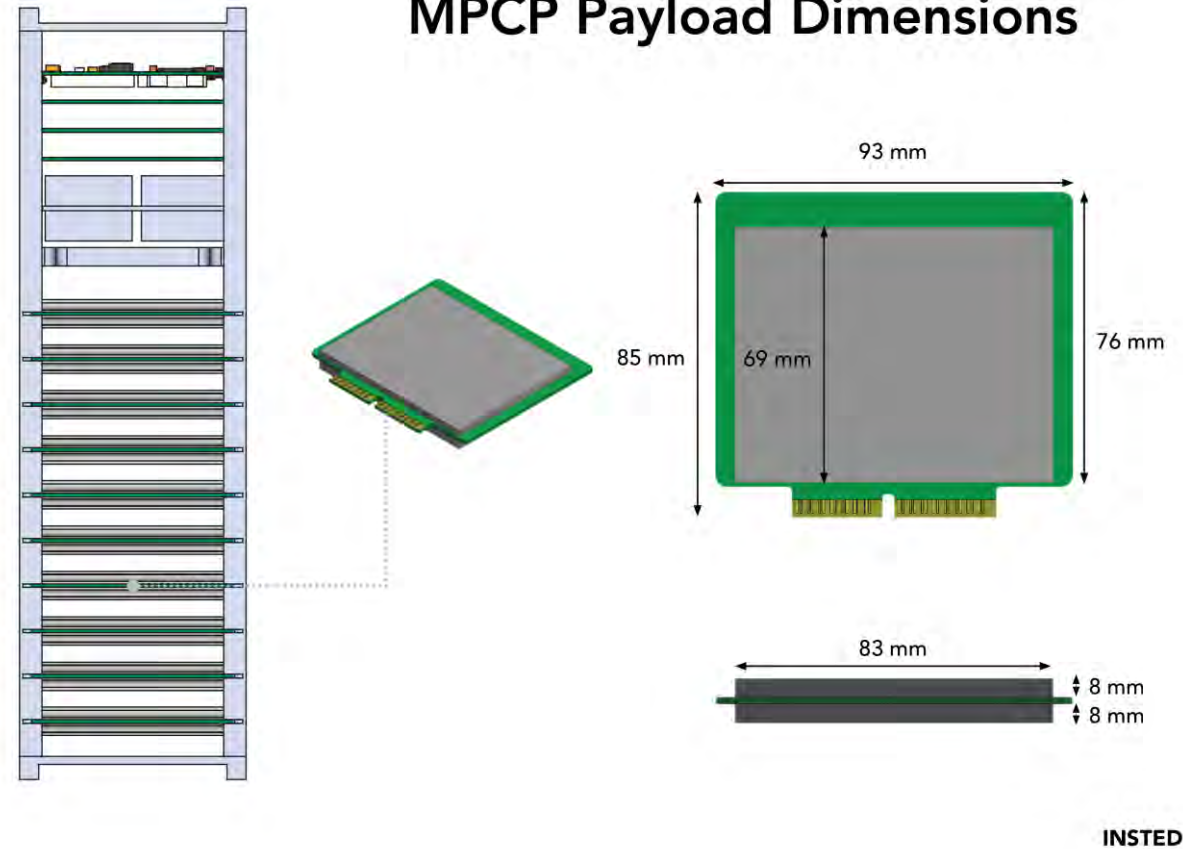
# MPCP Technical Information

<b>Orbital Altitude:</b>	400 km
<b>Inclination:</b>	ISS Orbit ( $\pm 51.6^\circ$ )
<b>Payload (P/L):</b>	<u>Multi-Payload</u>
<b>CMD/TLM Transmission Rate:</b>	9600 bps
<b>Data Downlink:</b>	500,000 Byte/Day (Maximum)
<b>Time Resolution:</b>	5 Pass/Day (6-8 Minute/Pass)
<b>Electrical Power:</b>	5V, 3.3V limited to 1A
<b>Battery:</b>	Limited to 7.4V
<b>Data Interface:</b>	I2C, CAN, UART, SPI
<b>Main Communication:</b>	Telecommand 400MHz, Downlink 460 MHz
<b>Lifetime:</b>	18 Months (ISS Orbit)

**INSTED**

The technical information of MPCP is given above. Note that the customers would design their payload missions and specifications based on the given information.

## MPCP Payload Dimensions



INSTED

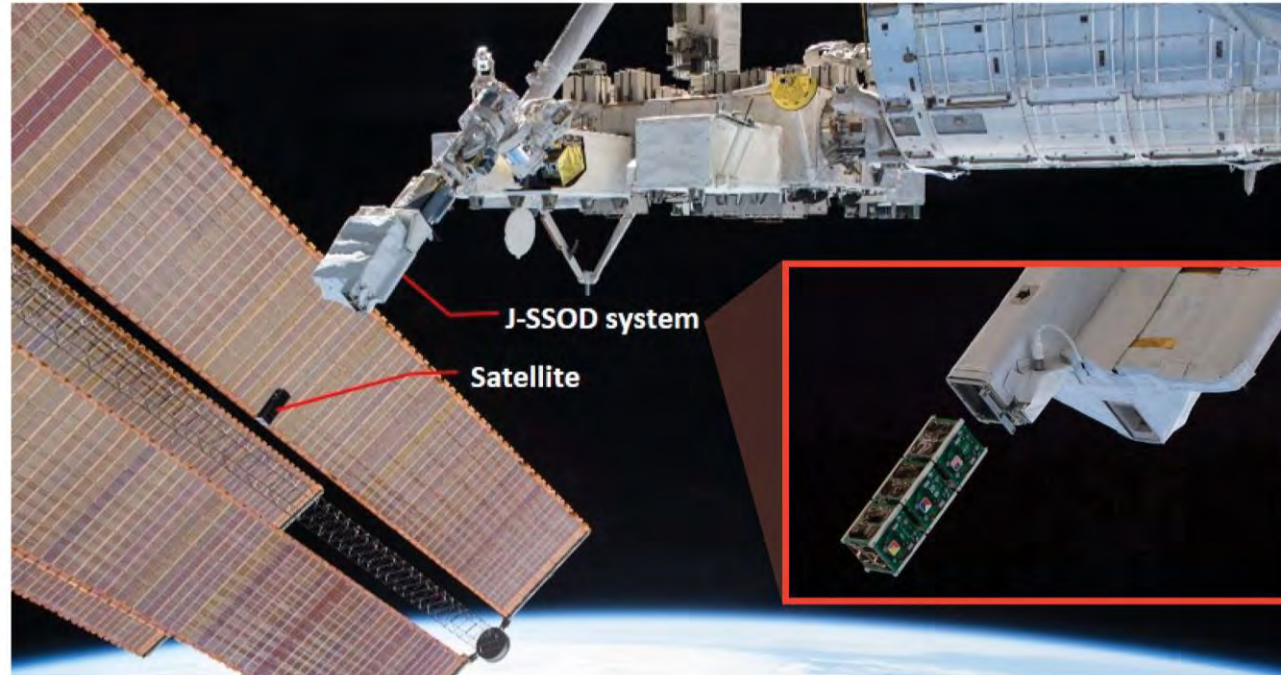
This figure shows the payload dimensions in one of the MPCP slots. Customers would need to design and develop their own payloads according to the given dimensions. Note that INSTED and NBSPACE also provide the payload development service to the customers.



# J-SSOD

JEM Small Satellite Orbital Deployer

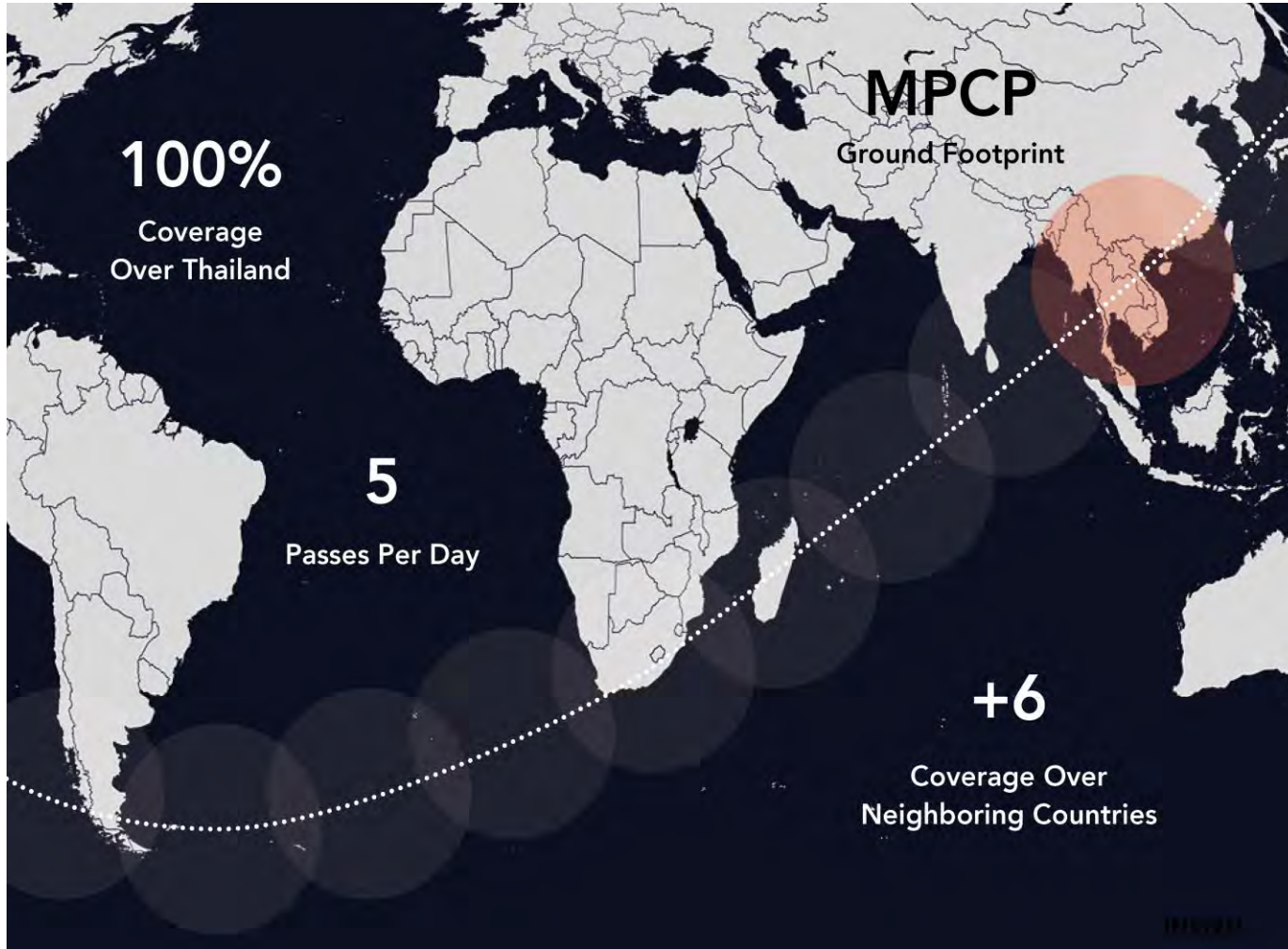
## On-Time Launch Schedule



Source: <https://iss.jaxa.jp/en/kiboexp/jssod>.

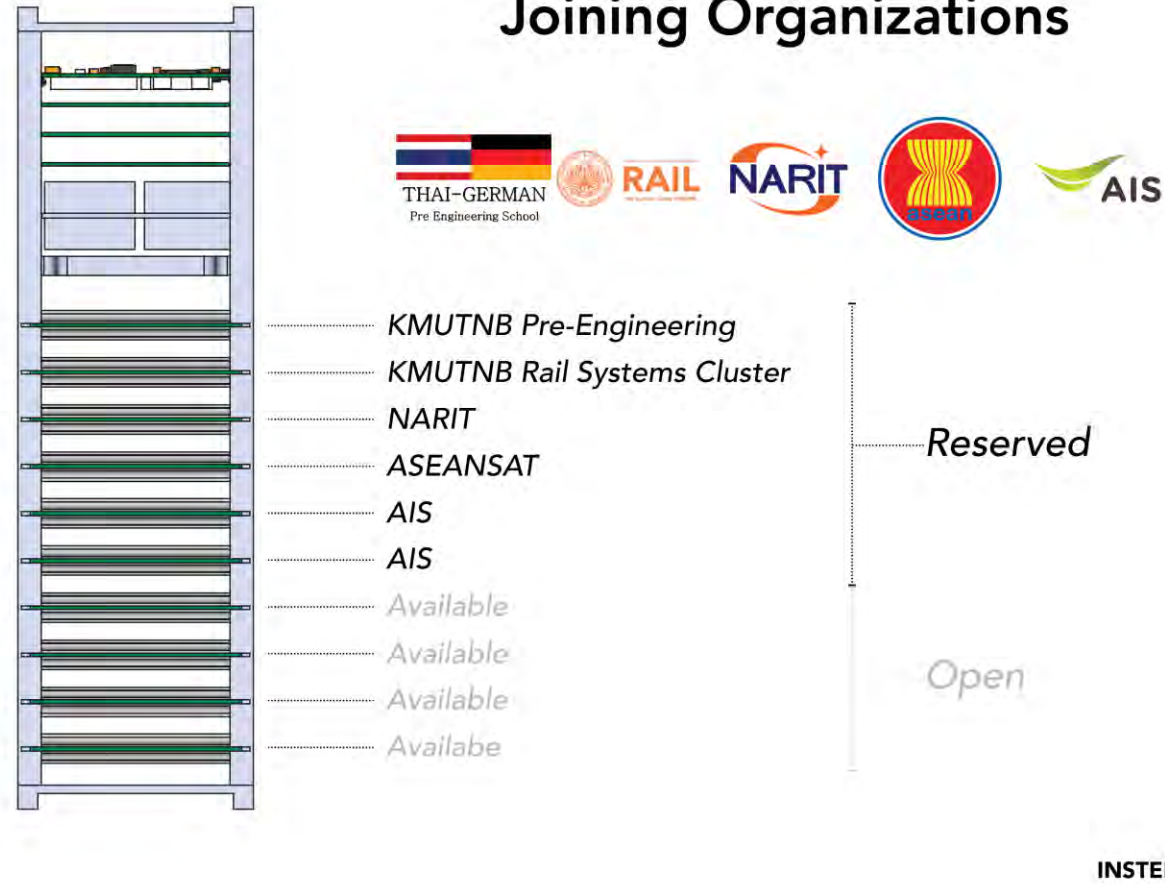
INSTED

To solve the customer's main concern about long delays in launch services, J-SSOD is selected for MPCP due to its on-time launch schedule. With the set launch date, the customers could plan their space utilization projects more effectively and timely.



After the deployment of MPCP, the satellite will orbit at about 400 km above the earth. Its ground footprint will cover Thailand and the neighboring countries at approximately 5 passes per day. Note that the lifetime of MPCP will be about 18 months after

# Joining Organizations



Currently, there have been 5 organizations reserving 6 payload slots of MPCP. These organizations are from both public and private sectors. **Note that there are still 3 slots available for domestic and international organizations.**



สถาบันเทคโนโลยีอวกาศนานาชาติเพื่อการพัฒนาเศรษฐกิจ (สทอศ.)

# INSTED

International Institute of Space Technology for Economic Development

**Dr. Phongsatorn Saisutjarit**  
Acting Director

King Mongkut's University of Technology North Bangkok  
1518 Pracharat 1 Rd., Wongsawang, Bangsue  
Bangkok 10800 THAILAND  
Tel. +66-2555-2000 Ext. 2077  
Fax. +66-2587-4350  
Email. phongsatorn.s@eng.kmutnb.ac.th

For more detailed information about the MPCP project, please contact:

Dr. Phongsatorn  
Saisutjarit  
Acting Director

International Institute of Space  
Technology for Economic  
Development (INSTED);

**END OF THIS ARTICLE**

**King Mongkut's University of**

Technology North Bangkok

# BIRDS web portal analytics

by

**Maisun of Bangladesh (former web portal manager for BIRDS)**

&

**Pooja of Bhutan (current web portal manager for BIRDS)**

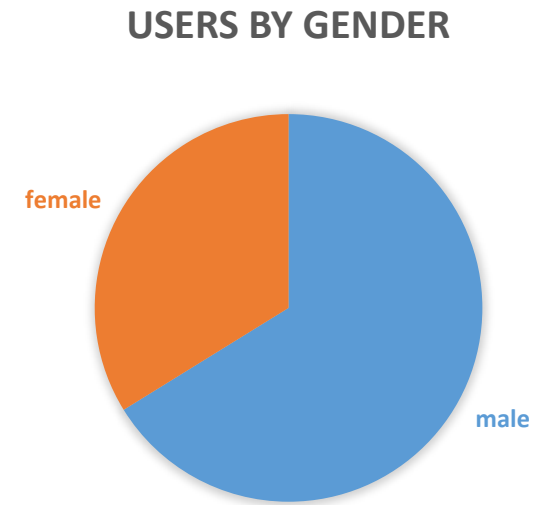
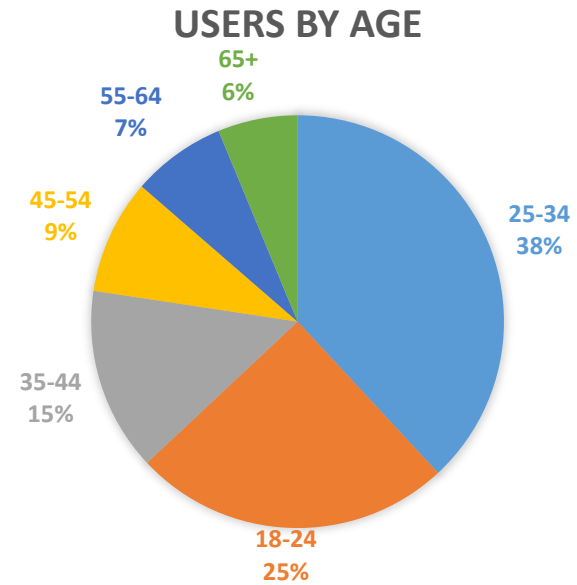
**11 Feb 2021**

# What are web analytics?

“Google Analytics” can provide generic behavior data for users of particular website. We started using “Google Analytics” service from June 2018.

BIRDS does not collect any personally identifiable data from its users.

Image on the right is the BIRDS-1 website visitor age and gender distribution.

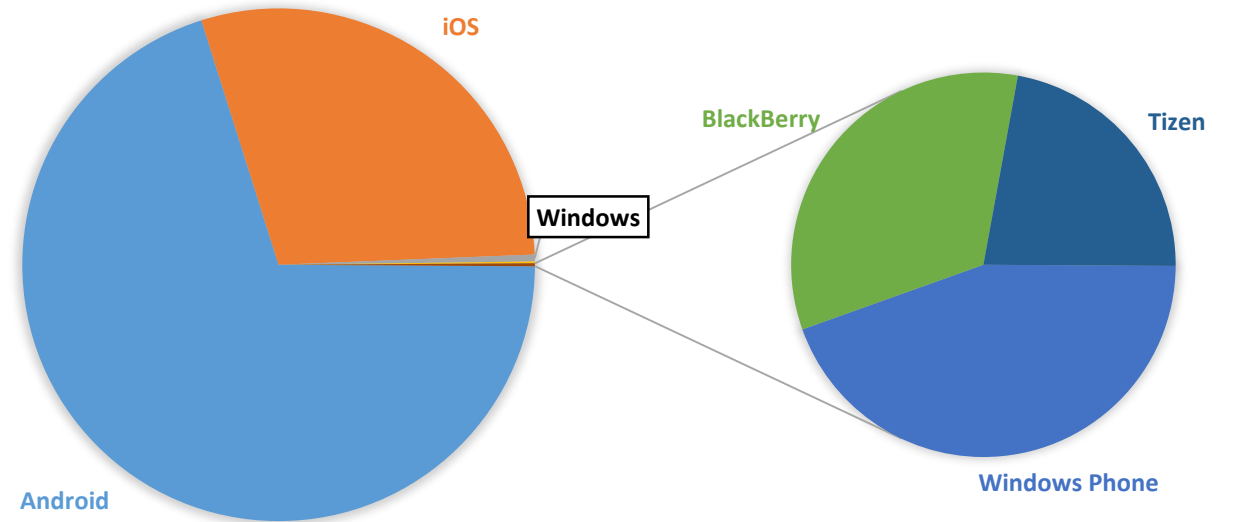




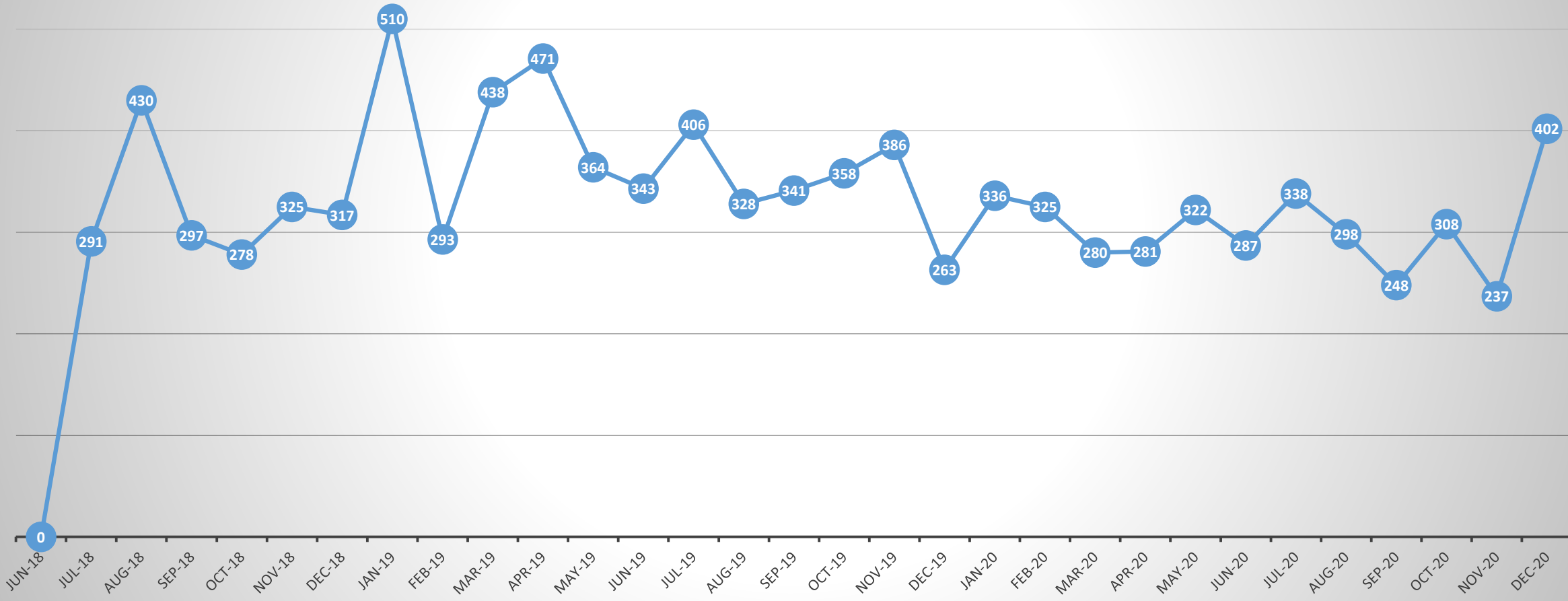
BIRDS-1 users usually visit from their handheld devices.

What is interesting: There are 2 users using Blackberries. And 2 users have Tizen devices (Smart watch?)

USERS BY DEVICE TYPE



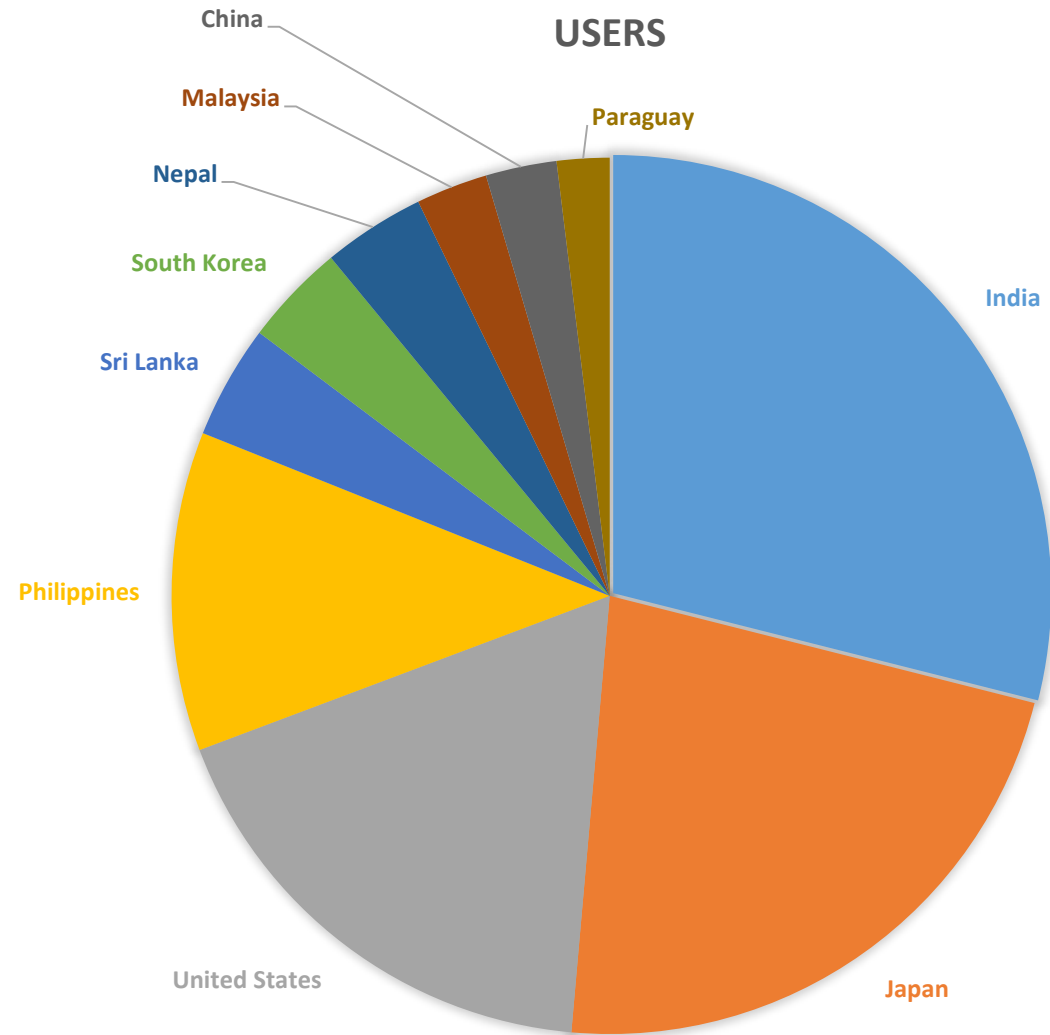
### Number of Newsletter readers



On average, we have 400 readers read our **BIRDS Project Newsletter** monthly.



India (29%) is the number 1 fan of the BIRDS-1 Project. India is followed by USA (18%) and Phillipines (12%).



**The End of this Article**

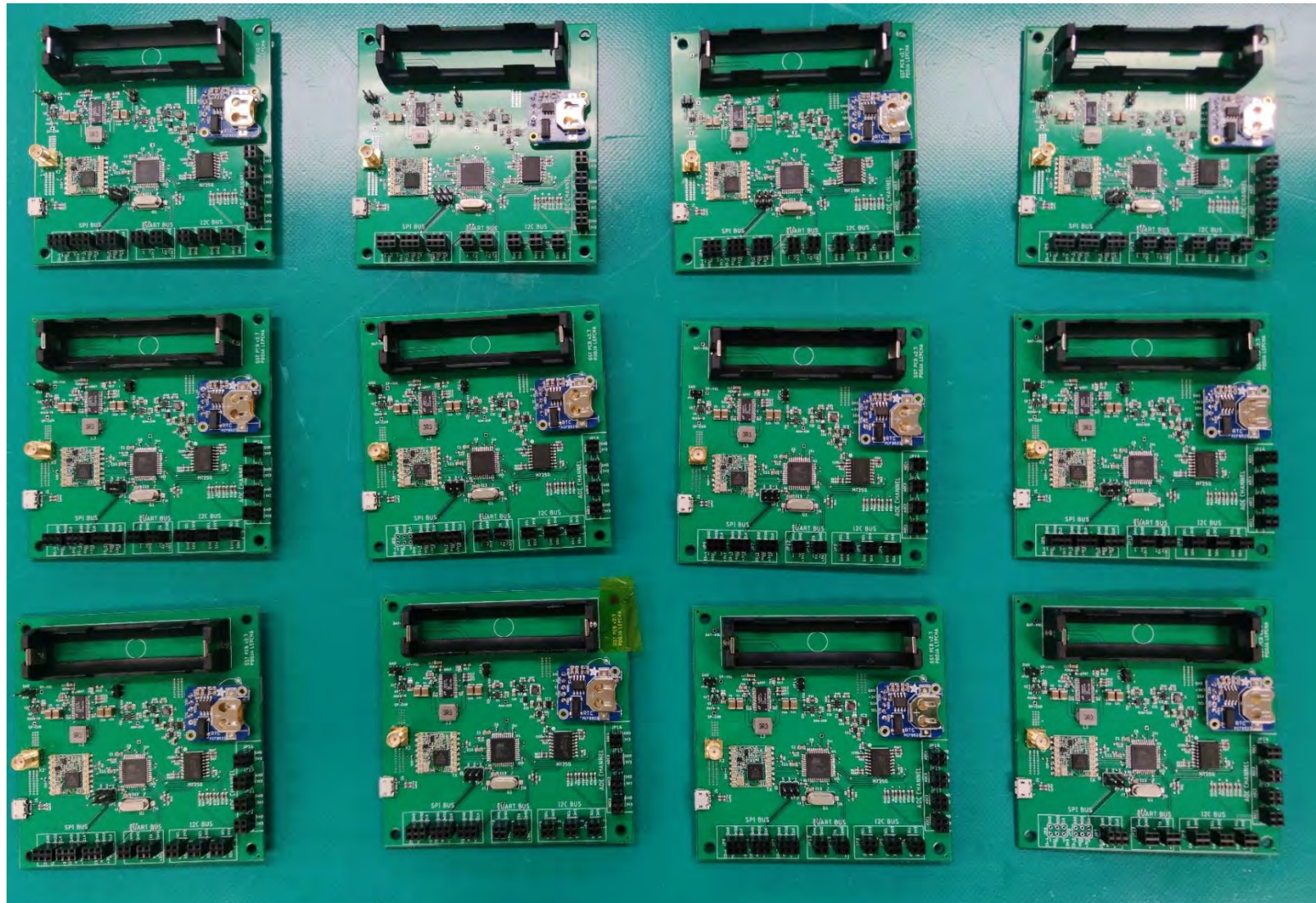


# GST Column

Fifth Issue (16 Feb 2021):  
Updates and Announcement

written each month by  
*Pooja Lepcha*, Bhutan

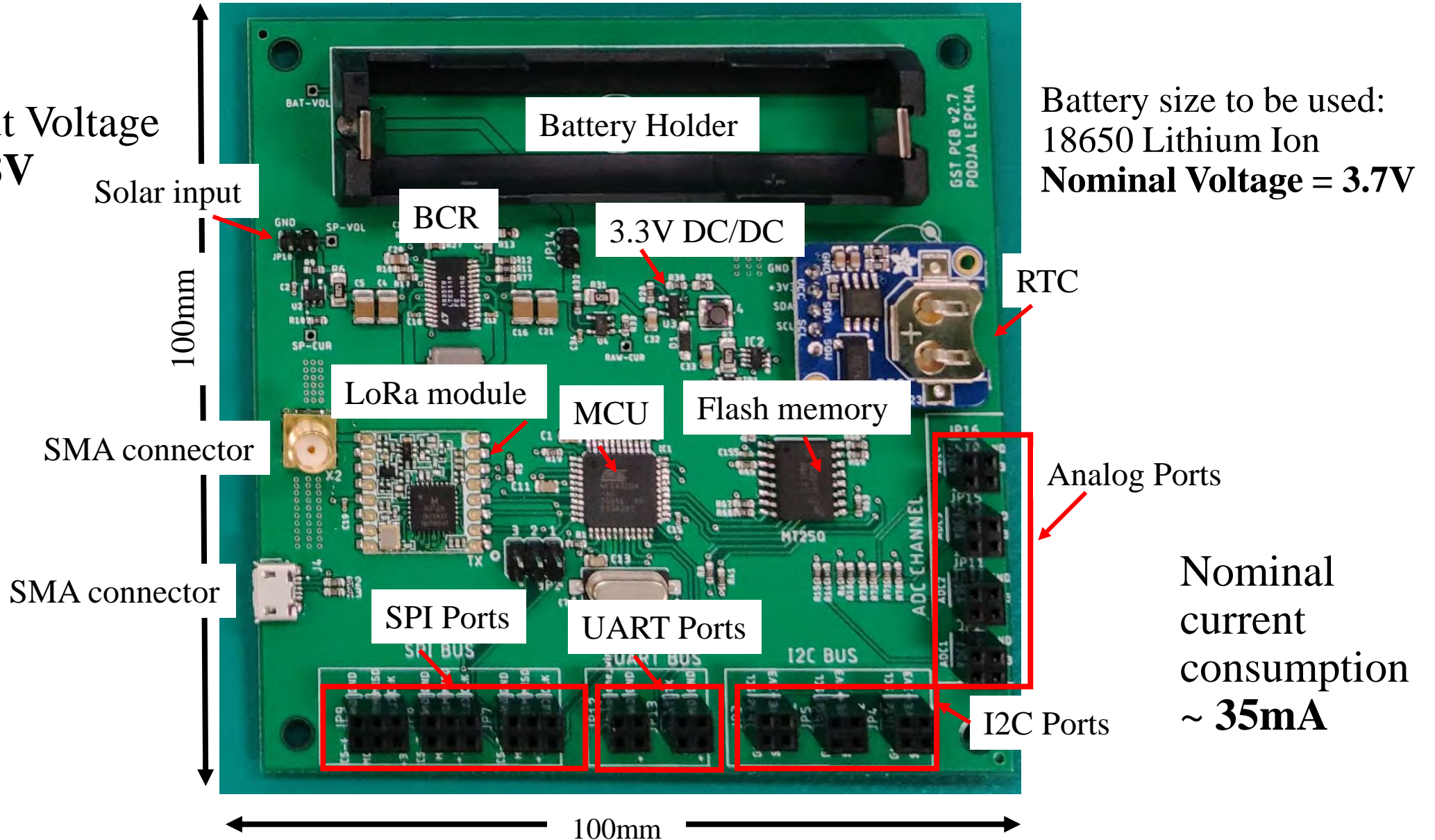
# Updates for GST Development at Kyutech:



- 12 sets of GST PCB were fabricated and components were soldered.
- Each one of this PCB will be distributed to BIRDS countries participating in the GST Network

# What makes the GST PCB?

Solar Input Voltage  
- **Up to 18V**





# GST Workshop (virtual) will be on

**4th March 2021**

**21:00 up til midnight  
(Japan Std Time)**

**See the agenda on the next page.**



# GST Workshop Agenda

Participants  
from **Bhutan**,  
**Uganda** and  
**Zimbabwe** will  
join as  
observers

	Time	Presenter	Name	Contents
<b>1</b>	21:00-21:05	Kyutech	Prof. Cho	Opening remarks
<b>2</b>	21:05 -21:30	Kyutech	Pooja	Update on GST and KITSUNE
<b>3</b>	21:30-21:37	Malaysia	Nik Amirul	Update on the GST development
<b>4</b>	21:37-21:44	Taiwan	Ke-Yen	Update on the GST development
<b>5</b>	21:44-21:51	Philippines	Jeric	Update on the GST development
<b>6</b>	21:21-21:58	Sri Lanka	Kavindra	Update on the GST development
<b>7</b>	21:58-22:28	Thailand	Apiwat	Update on Ground Station Software
<b>BREAK - 10 minutes</b>				
<b>8</b>	22:38-22:45	Nepal	Dibodh	Update on the GST development
<b>9</b>	22:45-22:52	Paraguay	Federico	Update on the GST development
<b>10</b>	22:52-22:59	Costa Rica	Juan Jose	Update on the GST development
<b>11</b>	22:59-23:06	Mongolia	Tuguldur	Update on the GST development
<b>12</b>	23:06-23:36	ALL	ALL	Discussions and Way Forward
<b>13</b>	23:36-23:51	Kyutech (BIRDS-4)	Izrael	Updates and Announcements from BIRDS-4



**If you wish to be part of the GST Workshop,  
please register here:**

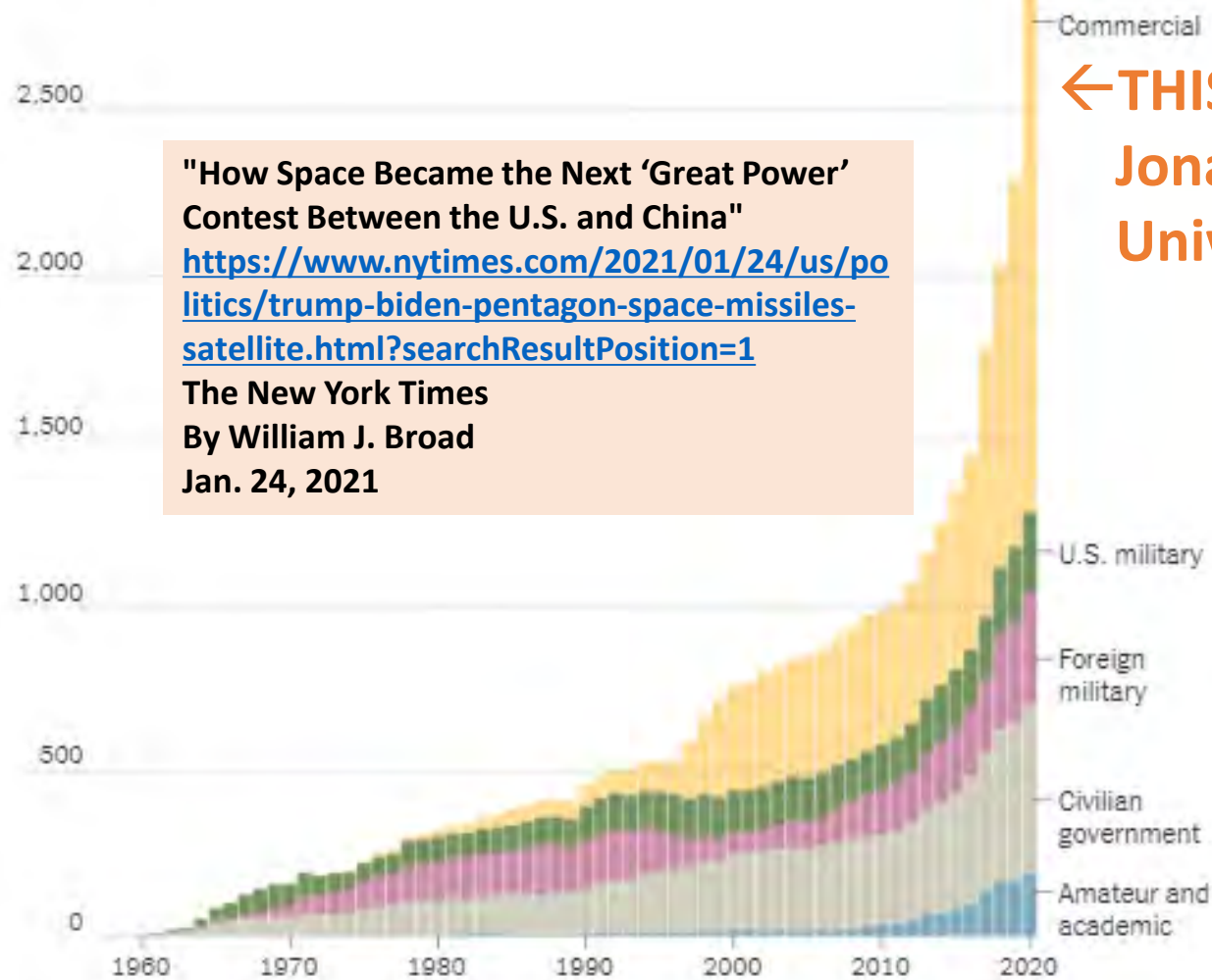
<https://forms.gle/QRtzGcHAMWaM1e6w8>

**ZOOM link will only be sent to registered participants**



**End of the FEB-2021 GST Column**

Estimated number of active satellites worldwide  
Since 1957, as of Dec 31 each year



"How Space Became the Next 'Great Power' Contest Between the U.S. and China"  
<https://www.nytimes.com/2021/01/24/us/politics/trump-biden-pentagon-space-missiles-satellite.html?searchResultPosition=1>  
The New York Times  
By William J. Broad  
Jan. 24, 2021

## 14. The growth of satellites in orbit since 1957

← THIS IS A FANTASTIC GRAPH CREATED BY Jonathan Christopher McDowell of Harvard University.

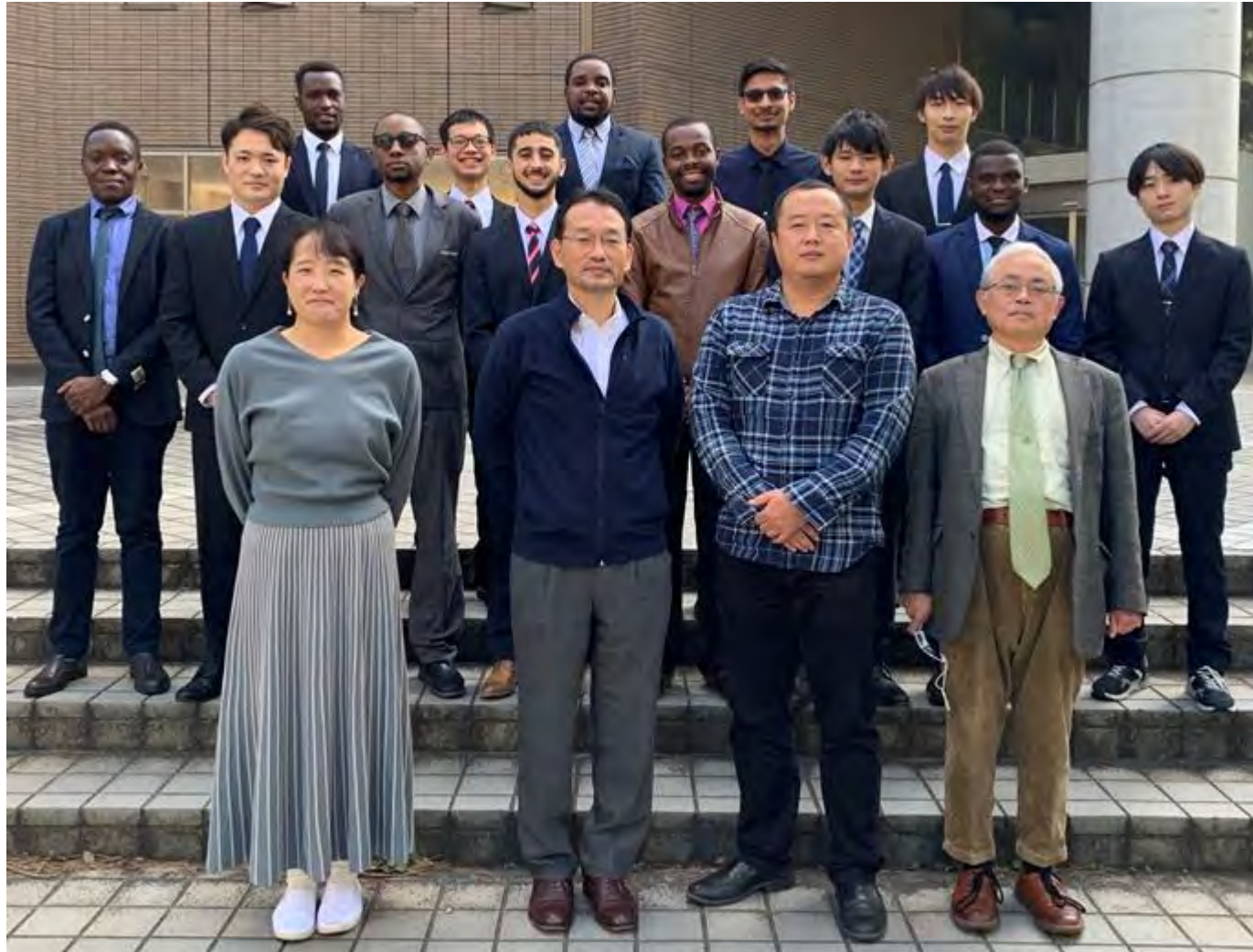
According to Wikipedia:

*He was born in 1960. He is an astrophysicist at the Harvard-Smithsonian Center for Astrophysics. He is a staff member at the Chandra X-ray Center. McDowell is the author and editor of Jonathan's Space Report, an e-mail-distributed newsletter documenting satellite launches.*

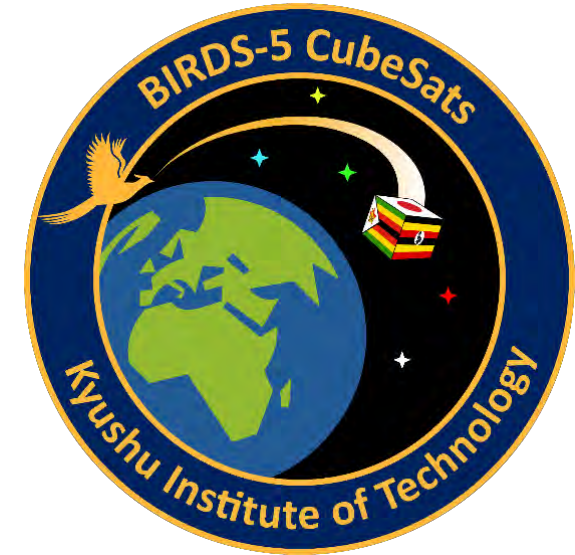
**Read more about McDowell:**

[https://en.wikipedia.org/wiki/Jonathan\\_McDowell](https://en.wikipedia.org/wiki/Jonathan_McDowell)

Source: Jonathan McDowell, Harvard University



**BIRDS-5 Team on 30-OCT-2020**  
(Dr. Masui and JAXA members are missing in this group photo)

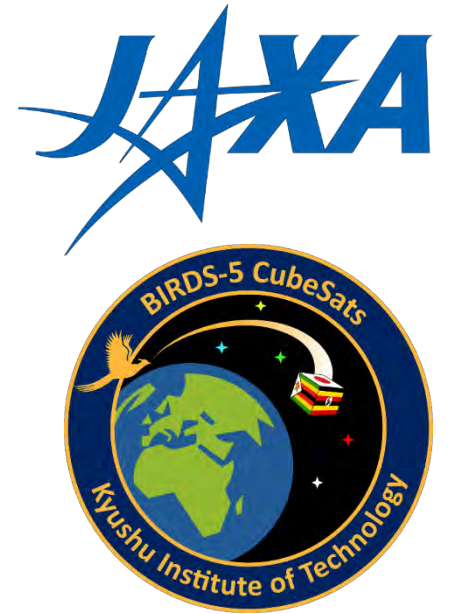


**BIRDS-5 reports  
of this month  
are on the  
following pages**

# How to measure the energy of high-energy electrons



Takefumi MITANI, and PINO team  
February 9, 2021



# Electron measurement by PINO

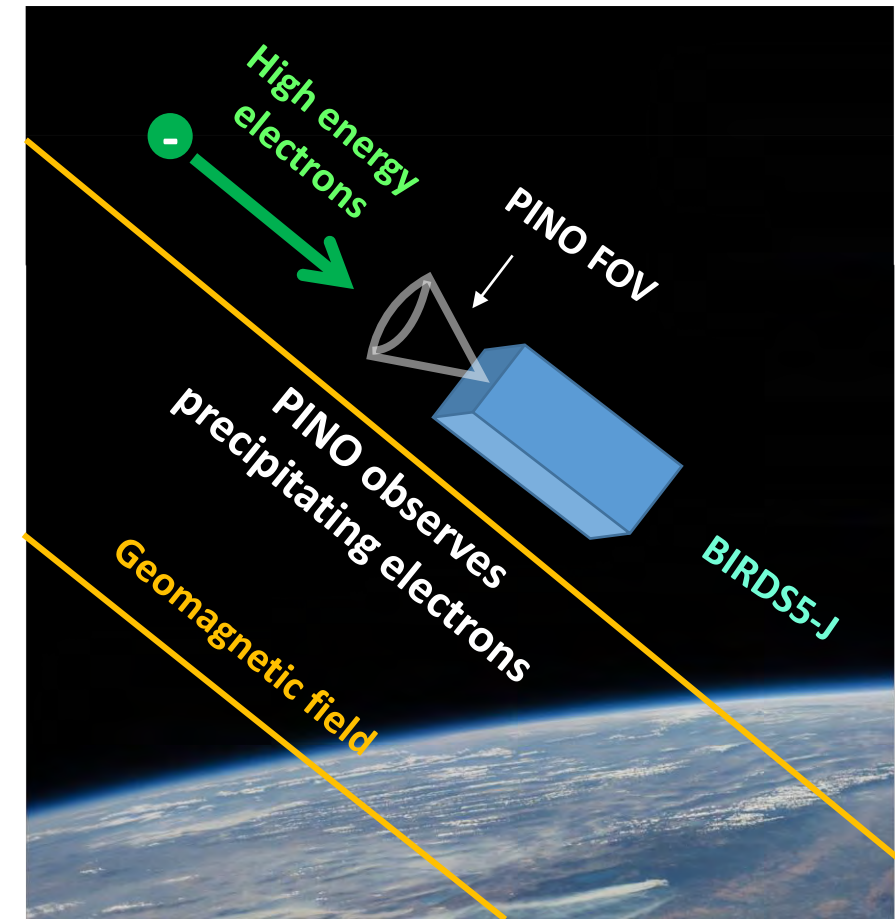
PINO (Particle Instrument for Nano-satellite) will measure high energy electrons precipitating into the upper atmosphere.

Features we would like to know about electrons are

- ✓ incident direction
- ✓ electron energy
- ✓ counting rate.

The direction of incident electrons is constrained by a mechanical collimator and the satellite attitude.

Therefore, the main functions of PINO detector part are measuring the energy of incoming electrons one by one and recording the counting rate for several energy ranges.



# Electron interaction with matter

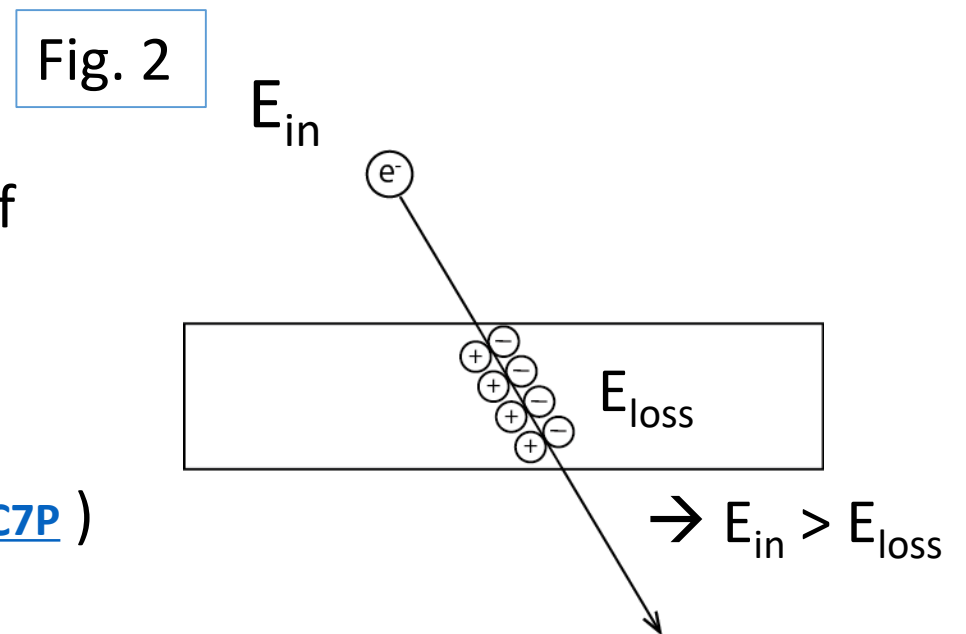
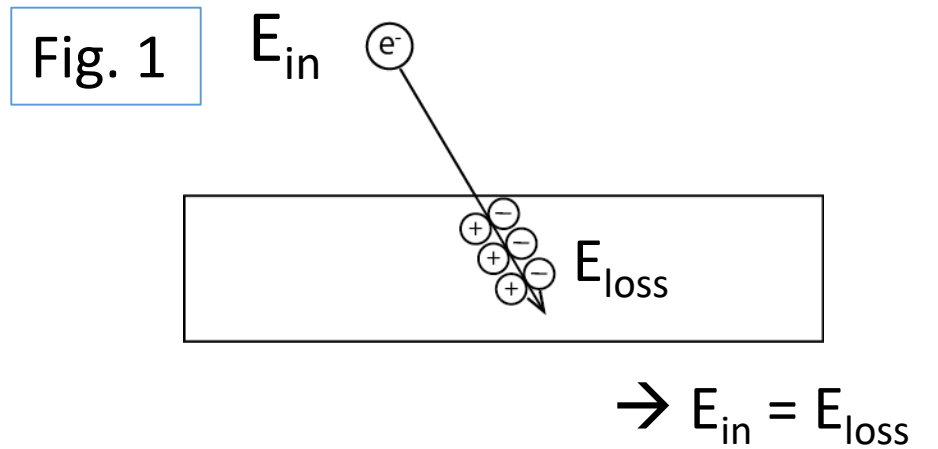
Electrons lose their energy while passing through a material. An electron loses its energy continuously in the material and stops when it loses all of its initial energy (Fig.1). If it reaches the boundary of the material without losing all of the energy, it escapes from the material (Fig. 2). Therefore, thicker materials are necessary to detect higher energy electrons.

The range (average path length traveled by an electron) of electrons in Silicon:

2.3 mm for 1 MeV electron

7.8 mm for 3 MeV electron

(based on NIST estar database <https://dx.doi.org/10.18434/T4NC7P> )



# Measuring energy loss by semiconductor detector

When an electron interacts with a semiconductor detector, electron-hole pairs are generated.

The number of electron-hole pairs ( $N$ ) depends on energy loss ( $E$ ) in the detector.

$$N = E / \varepsilon_i ,$$

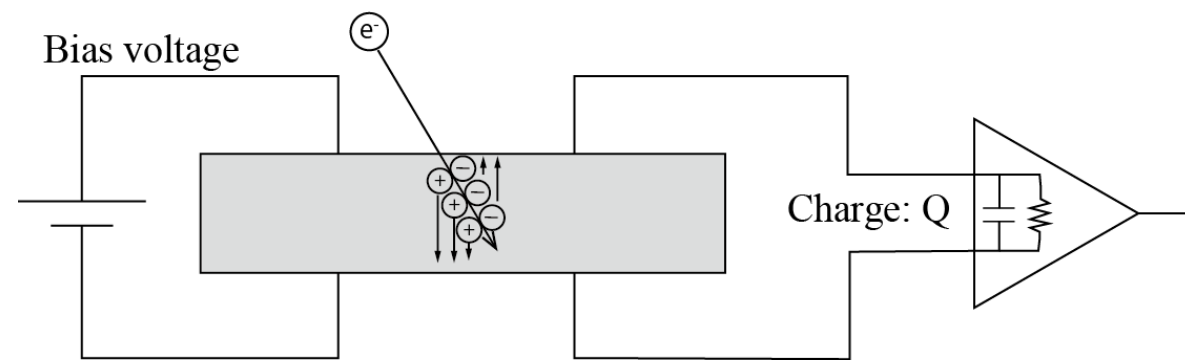
$\varepsilon_i$  is average energy to produce an electron/hole pair.  $\varepsilon_i = 3.6$  eV for Silicon.

For example, in the case that  $E = 100$  keV,  $2.8 \times 10^4$  pairs are generated in it. By applying bias voltage to the detector, the generated charges can be collected.

Here, the elementary charge ( $q_e$ , the electric charge carried by a single electron ) is  $1.6 \times 10^{-19}$  [C].

Then, the generated charge is  $Q = N \times q_e = E / \varepsilon_i \times q_e$ .

Thus, the charge signal is proportional to the energy loss in the detector. By measuring this charge signal, energy deposit in the detector can be determined. The charge is amplified by a charge sensitive preamplifier and a main amplifier. (For example,  $Q = 4.4$  [fC] for 100 keV. )

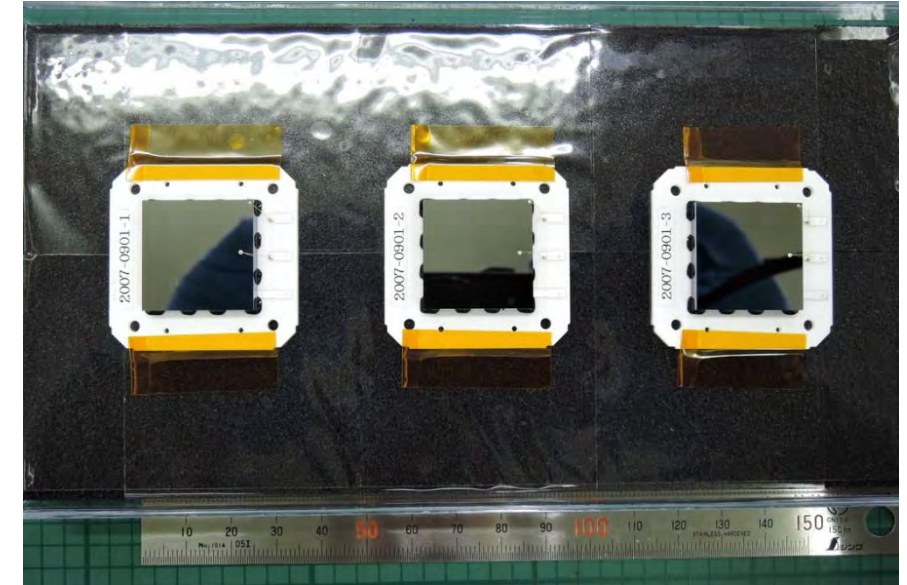
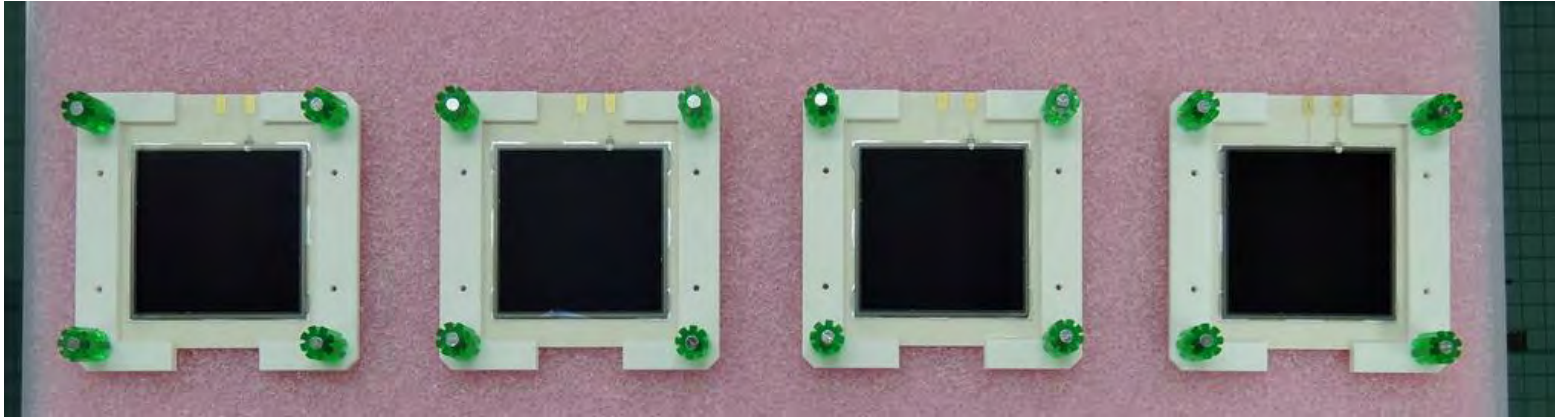


This small signal is the information we want to know.

# Semiconductor detectors for PINO

Silicon detectors ( 28mm × 28mm, 0.5mm thick )

CdTe detectors  
( 20mm × 20mm, 3mm thick )



Density =  $2.33 \text{ g/cm}^3$

Range in Silicon:

2.3 mm for 1 MeV electron

7.8 mm for 3 MeV electron

Density =  $5.8 \text{ g/cm}^3$

Range in CdTe:

1.1 mm for 1 MeV electron

3.7 mm for 3 MeV electron

**Both detectors are under evaluation.**



# BIRDS-5 Team Jackets



**By : Fukudome Shoma**  
**2021/FEB/04**



# About the BIRDS-5 Team Jacket

Each BIRDS project has always made its team jacket. BIRDS-5 team is working on its jacket design. We discussed and decided on the color of our jacket as being Navy Blue (circled in red at the right).

Also, we decided to put four images on the jacket:

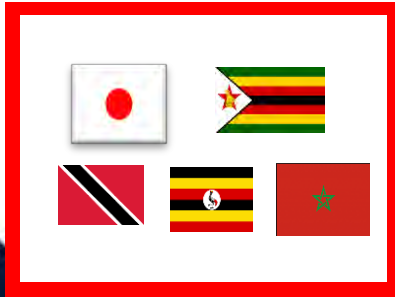
- National flag of our own countries
- “BIRDS-5”
- BIRDS-5 logo
- Kyutech × ISAS

ISAS stands for Institute of Space and Astronautical Science. They are the team from JAXA working on the PINO mission with us.



# BIRDS-5 TEAM JACKET DESIGN

front



back

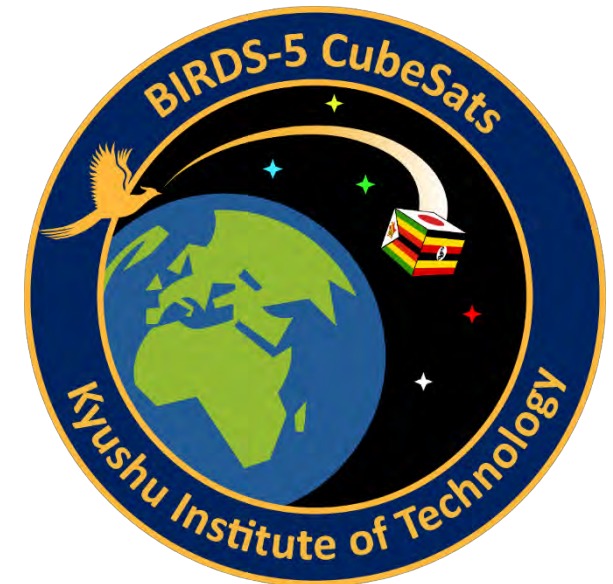


**The design is almost complete. We are so looking forward to starting to wear our team jacket !**

# Frequency Coordination



By: Yukihiisa Otani  
February 10, 2020



# Why do we need frequency coordination?

- In Japan, the frequency assignment is managed by MIC.
- Everybody can use the frequency, however MIC thinks that it should be fairly assigned, to those who want to use it, leading to the improvement of public welfare.
- Amateur radio is also defined to be used for non-monetary purpose but also for technology and as a hobby.

Note: MIC = Ministry of Internal Affairs and Communications

JARL  
(Japan Amateur Radio League)



IARU  
(International Amateur Radio Union)

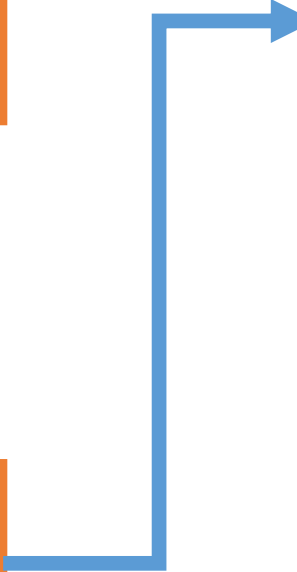
## Amateur Radio Frequency Coordination

ITU  
(International Telecommunication Union)

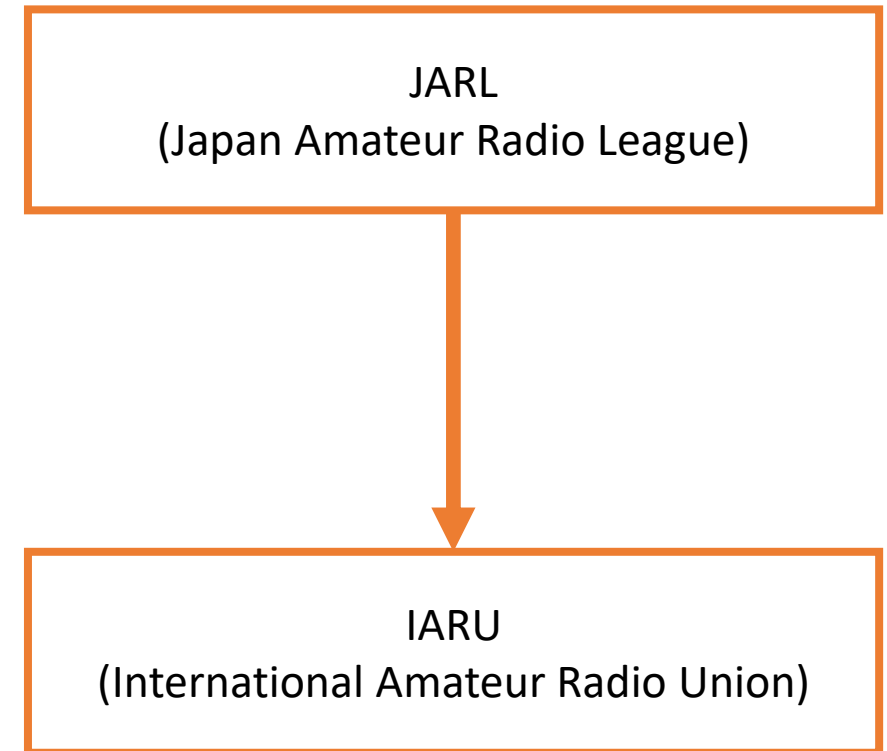


MIC  
(Ministry of Internal Affairs and  
Communications)

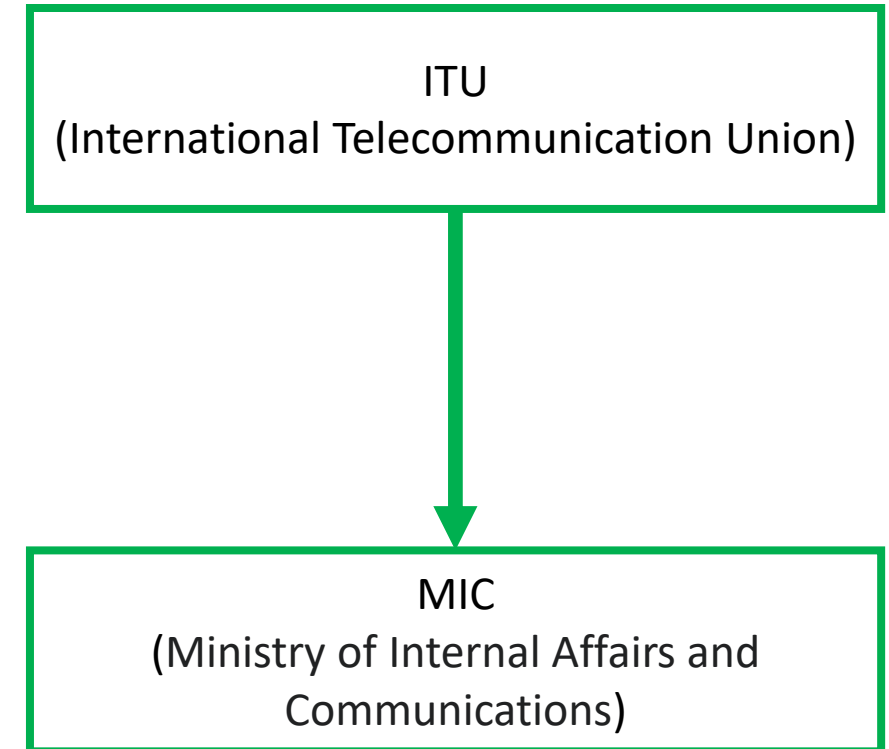
## Frequency Coordination



- JARL supports us to be registered by the IARU.
- We have to submit an application document to the IARU.
- We show the reason why we want to use the amateur radio frequency and the satellite system in the application sheet.
- For this application, we create not only one document but a set, containing information about the Link Budget, Antenna Pattern, Power Budget, Communication Diagram, and the Communication Plan.
- The panel meeting to assign the frequency in the IARU is held once per month.



- After getting permission, we need to submit an application to the ITU.
- We cannot contact the ITU directly unlike for the IARU.
- At first, we tell the MIC what we want to apply for, then we submit the satellite experiment information and the API documents.
- The workers of the MIC submit the API document to the ITU.
- After that, we apply to the MIC to use the frequency in Japan.



Note: API = Advance Publication Information



# Amateur Radio License

- The operator who communicates with the satellite using the amateur radio frequency needs a license to use the transmitter (to perform uplink).
- International students can also get it in Japan by passing the examination.
- Every year, BIRDS project members take the exam so that can be ground station operators.
- There are also chances to take the exam in 2021.



Japanese amateur radio license

# Antenna design and deployment



By :Tomoya Iwase  
Date: 9 December 2020



# Antenna mechanism

This is the antenna mechanism that will be used in BIRDS-5. Figure 1 shows the antenna folded and tied with a thread.

Figure 2 shows the deployed antenna. I decided to call this mechanism the “windmill-shaped” type since it looks like it. Deciding on this deployment method was based on the comparison between two prototypes.

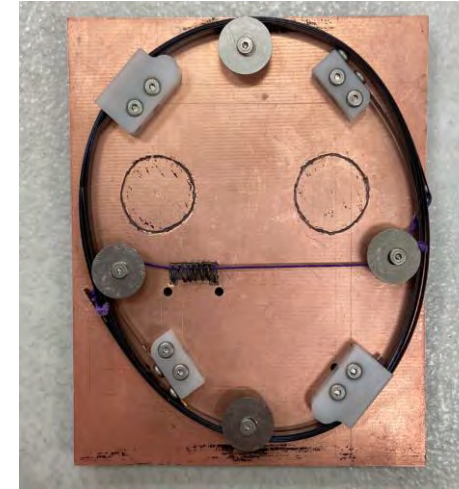


fig.1 Folded antenna

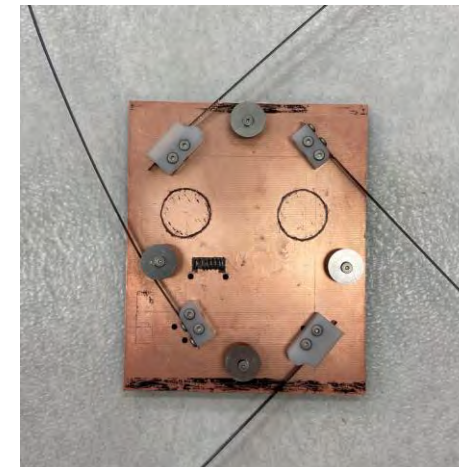


fig.2 Deployed antenna

# Comparison of two prototypes

I did the comparison of the deployment test between the mechanism used in BIRDS-4 (fig.3) and the new windmill-shaped mechanism (fig.4).

The main changes from BIRDS-4 are the position of the UHF antenna holders (the blue boxes), and the way the antenna is folded with the thread (indicated by the red lines).

The BIRDS-4 style showed that the parts were crowded near the nichrome wire, which is avoided with the windmill shape.

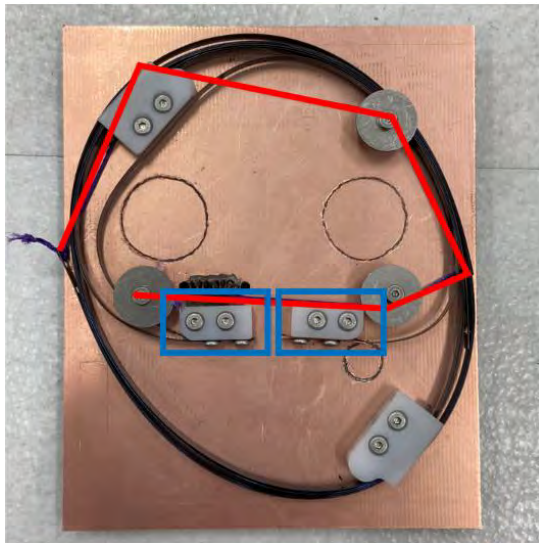


Fig.3 BIRDS-4 style

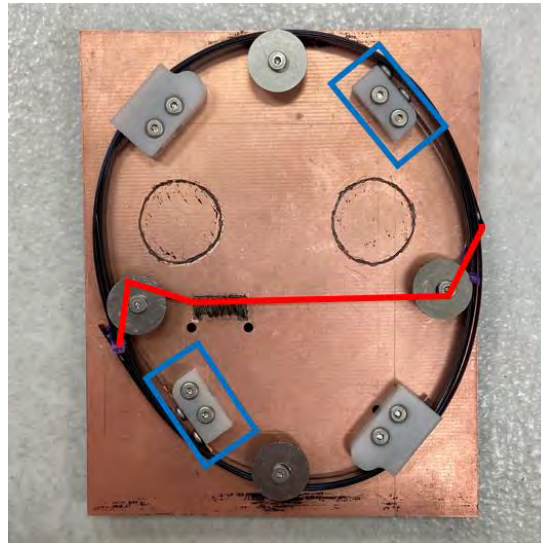


Fig.4 Windmill style

# Deployment test

The deployment test is performed by applying voltage to a nichrome wire to generate heat and cut the tied thread.

There are no problems encountered for the deployment of both of the prototypes, but we can see that the UHF antenna, on the right side, touched a holder in BIRDS-4 case (fig.6). It is better to avoid and prevent unnecessary contact like this.

I decided to use the windmill style mechanism for BIRDS-5, although it is better to have each UHF antenna close to each other, for a better impedance in the circuit. This requires to design the transmission line in a way that it can communicate without problems on the BBM (Bread Board Model).

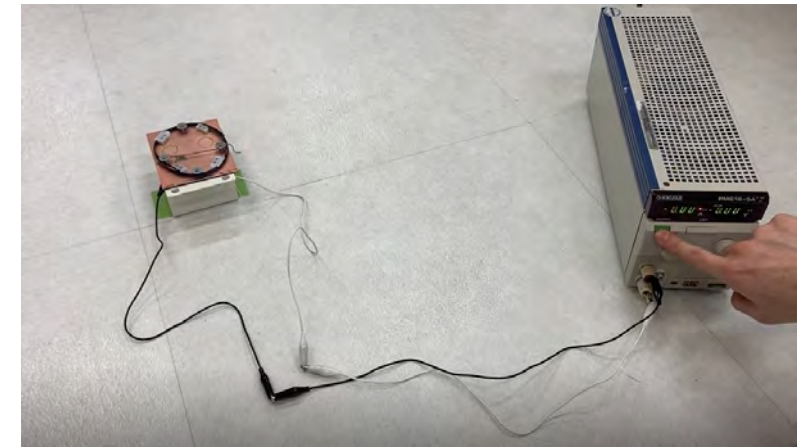


Fig.5 Deployment test

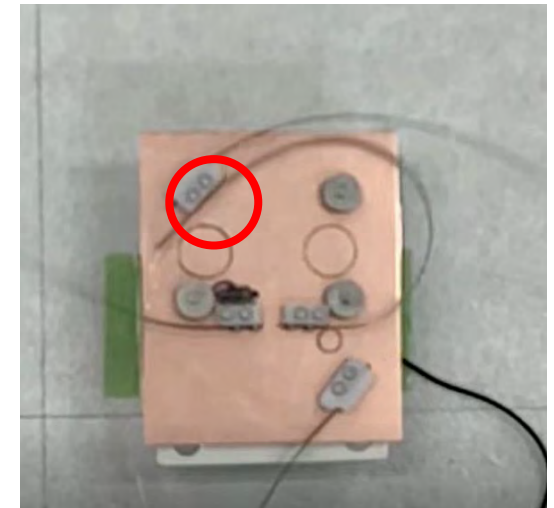


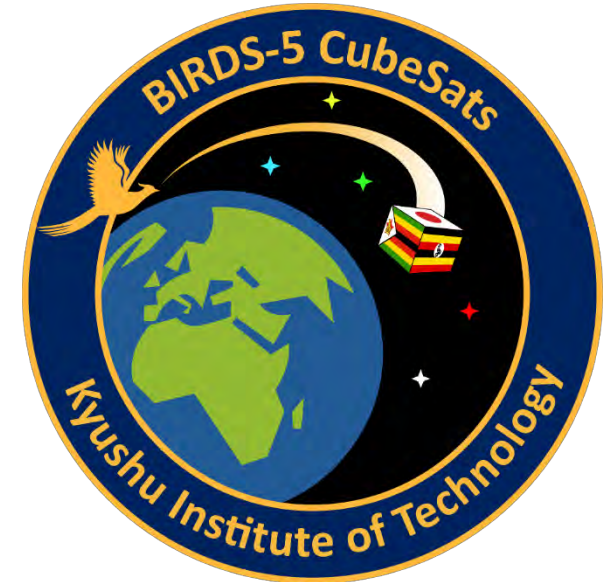
Fig.6 UHF antenna touching other parts

# Vibration Test on Ni-MH Batteries



By : Derrick TEBUSWEKE  
(Uganda)

Date: 19 February 2021



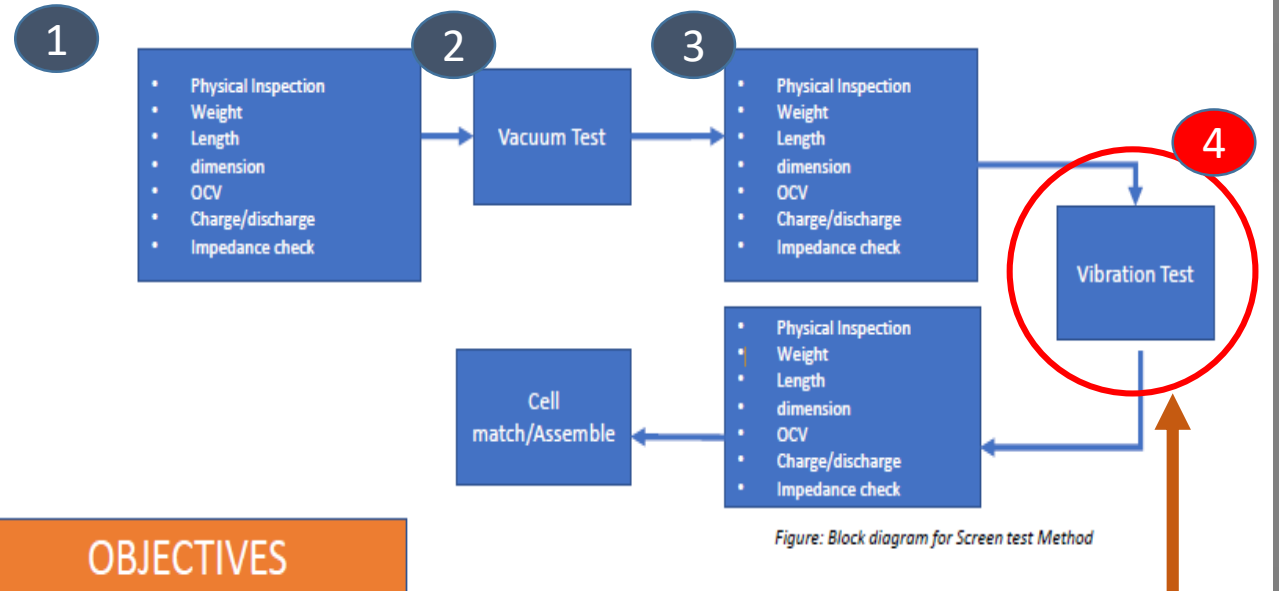
# Background!

BIRDS-5 CubeSats will use Panasonic *Eneloop* Ni-MH Batteries. This is because of their proven space heritage.

We have been conducting Screening and environmental tests on these battery cells for our Engineering Model CubeSats.

We are getting closer to selecting perfect cells with similar properties for manufacturing our battery.

## Cell screening process : charger /discharger system

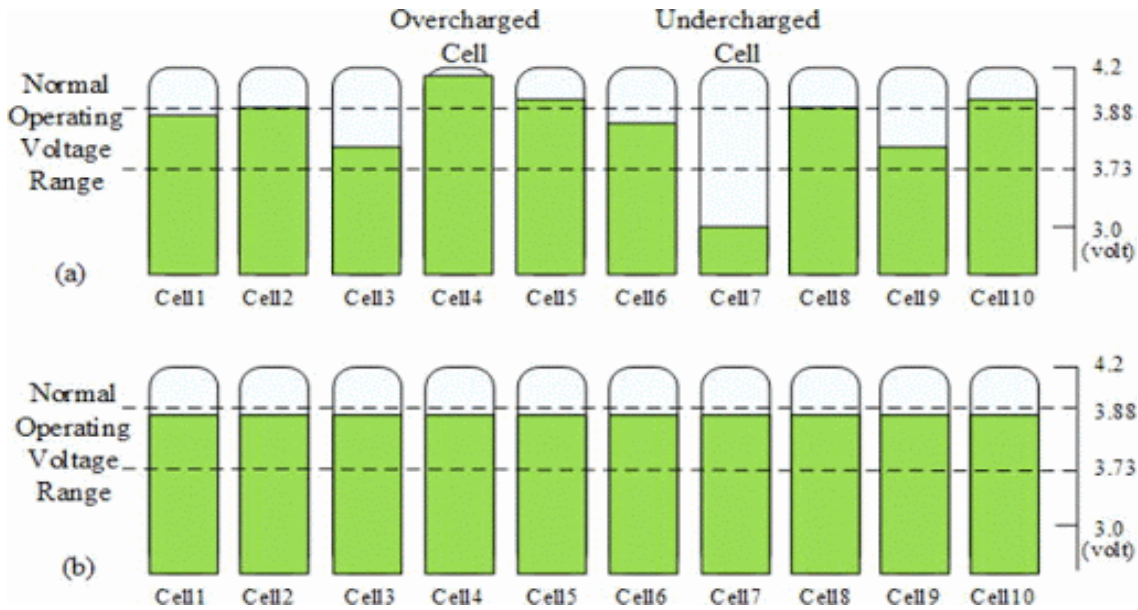


- Measure the Physical properties and electrochemical characteristics
- Find defects
- Assemble battery with the best

# Why cell matching is important

If imbalanced: some cells in the battery are overcharged.

⇒ Overcharge OR over-discharge ⇒ **FIRE EXPLOSION**



<https://doi.org/10.1063/1.4944961>



[https://en.m.wikipedia.org/wiki/Boeing\\_787\\_Dreamliner\\_battery\\_problems](https://en.m.wikipedia.org/wiki/Boeing_787_Dreamliner_battery_problems)

This is a hazard and can potentially destroy our satellites.



# Vibration Test at CeNT:

Test used to demonstrate the tolerance of satellite/components against vibration environment imposed during launch of a rocket.

For batteries; it exposes quality of workmanship and short-circuits in them.

Vibration amplitude is measured in G-force (Gravitational force)

A G-force is a measure of acceleration. Humans have 1G when standing still on earth.

SpaceX's Falcon 9 rocket can experience G-force of up to 6G.

At CeNT, we tested at 6.06G, hence mimicking launch environment.



[https://fortune.com/2020/06/01/spacex-photos-rocket-launch-iss-commercial-spaceflight/a mp/](https://fortune.com/2020/06/01/spacex-photos-rocket-launch-iss-commercial-spaceflight/)



\*CeNT: Center for Nanosatellite Testing, at Kyutech

# The Test Plan:

Random vibration test was carried out, Real world vibrations are usually of the random type.

First, you prepare the Electrodynamic Shaker's Jig, Accelerometer sensors, and PSD pattern ranges you want to test.

Then use the right torque range to fix the Jig onto the Shaker (90Nm), and then to fix the battery box onto the jig (1.5Nm) for M4 bolts.

Torque is critical in this test, as looseness of bolts might cause noise perturbations, and the results will be out of range.

The accelerometer sensor channels used were Ch2 and Ch3, set at 145 and 138 pC (m/s<sup>2</sup>) respectively.

1 Setting Torque range for Jig bolts.

2 Battery box containing batteries to be tested.

3 Setting the accelerometer sensor values.

4 Fixing two accelerometer sensor on opposite sides of jig

5 Final setup.

Battery Box

Electrodynamic Shaker

Jig

Accelerometers

# Test Procedure:

The entire system is a Closed feedback loop.

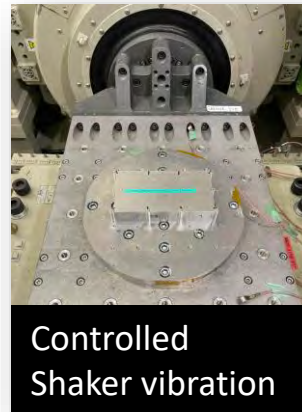
The Shaker generates random vibration waves, but it is controlled by the user through accelerometers that transfer generated frequencies to the control panel.

Accelerometer output is analog data, hence need for ADQ (Analog to Digital Converter).

Also accelerometer output is very small (pC), hence need for an amplifier.

Because the random frequencies generated have varying lengths, they are characterized by PSD for easier interpretation through FFT.

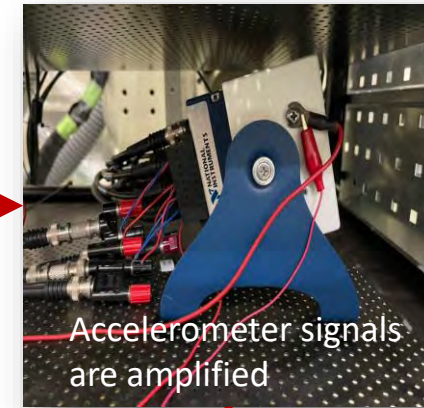
The test was carried out in X and Y axes only, following a preset PSD pattern.



Controlled Shaker vibration

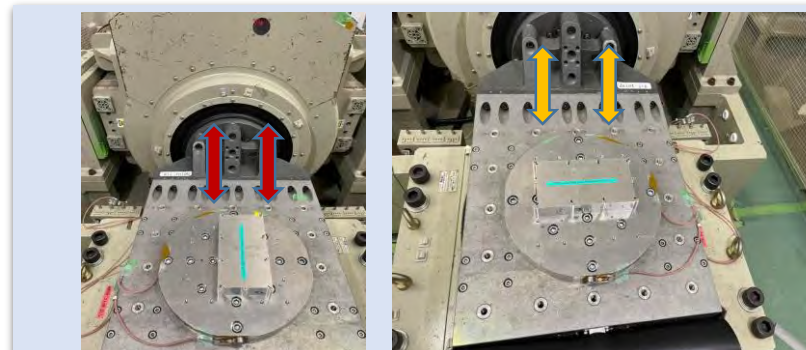


Accelerometer sensor channels

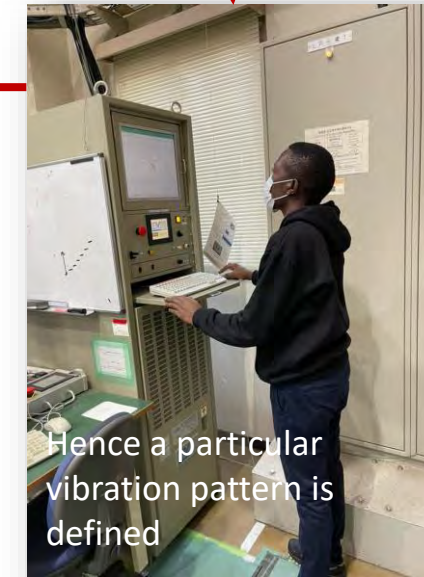


Accelerometer signals are amplified

Closed loop operation is achieved



Test Configuration in Y and X axes respectively



Hence a particular vibration pattern is defined

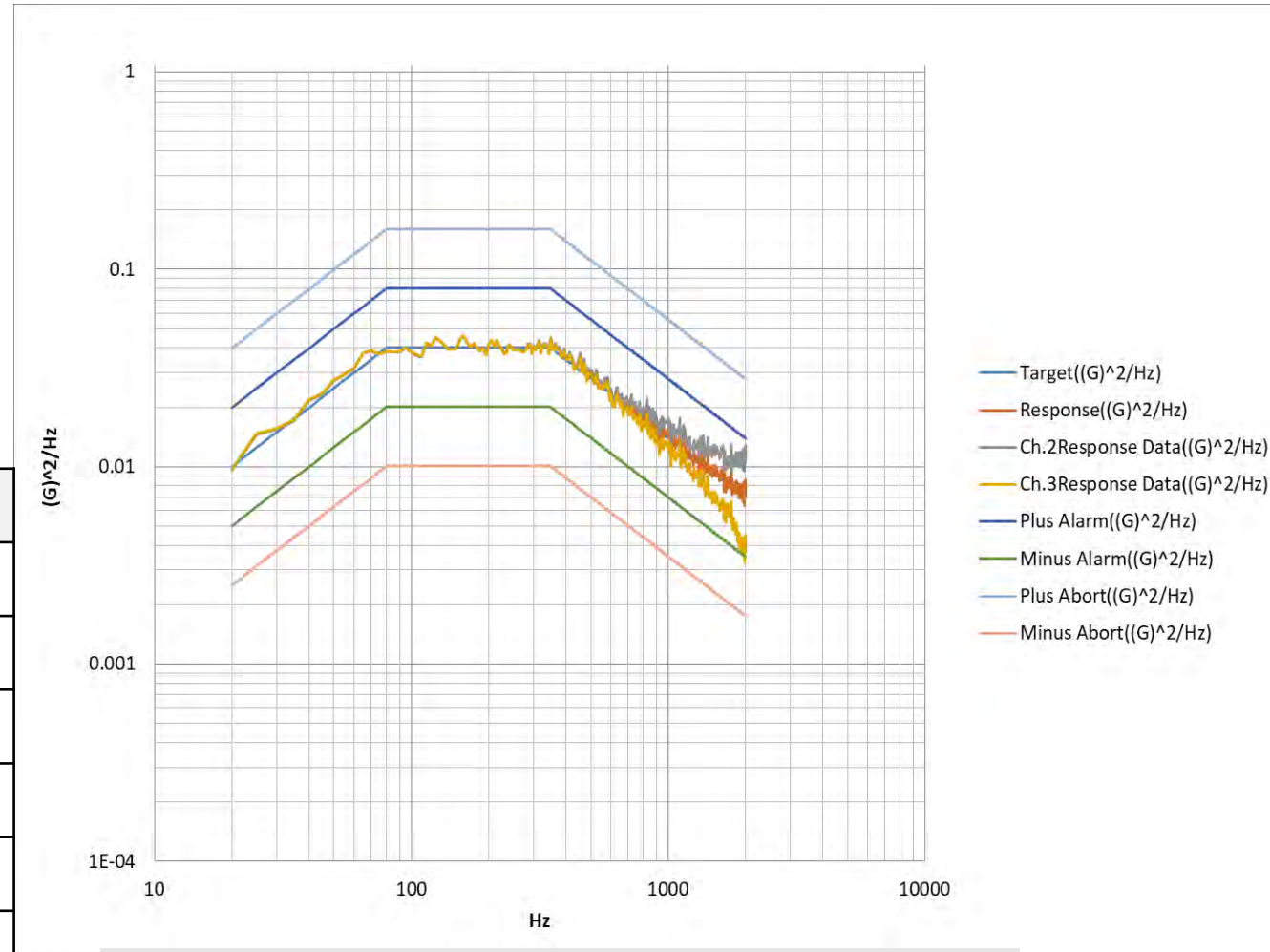
\*FFT is Fast Fourier Transform

\*PSD is Power Spectral Density ( $g^2/Hz$ )

# Evaluation of test results:

Random vibration test of battery cells utilizes the conditions shown by the table below. The vibration level covers Minimum Screening Level (MSL)

Frequency [Hz]	PSD [ $g^2/Hz$ ]
20	0.010
80	0.040
350	0.040
2000	0.007
<b>Overall [Grms]</b>	<b>6.1</b>
<b>Duration (sec)</b>	<b>60</b>



Results of the test showing our Response graph was within acceptable limits.



We tested the accelerometers at 2ms/Division and confirmed they were fine.



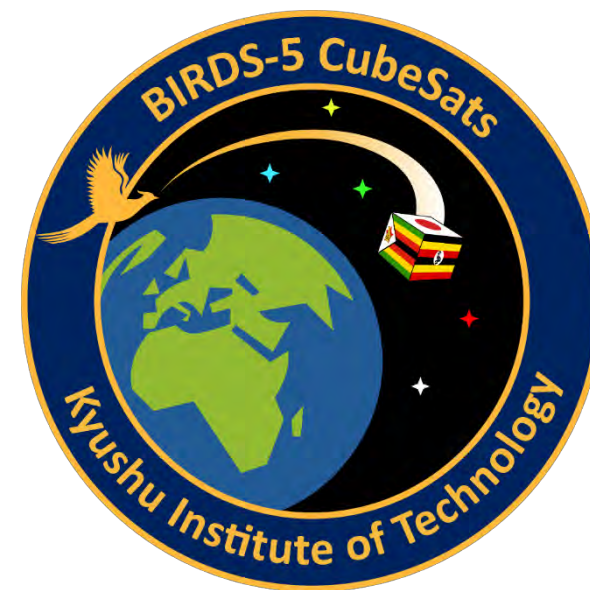
Test completed

**THE END**

# P-ban procurement

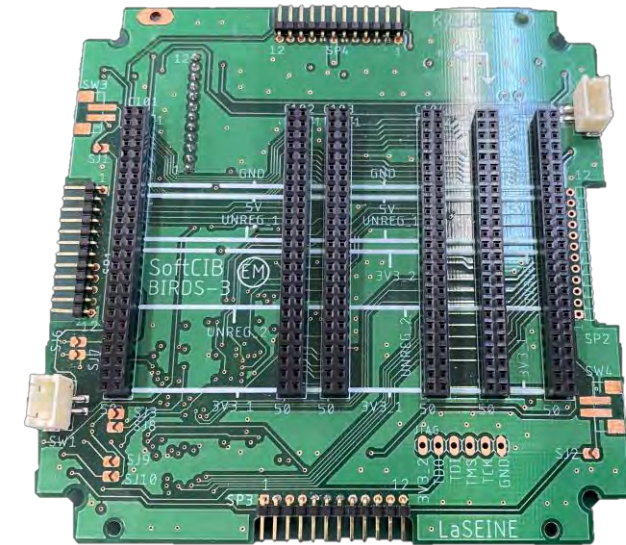


By : Takashi Oshiro  
2021/Feb/9



# What is P-ban.com company?

- P-ban.com is a Japanese company that designs boards, manufactures boards, mounts parts, procures parts, and processes harnesses and more. The boards used in our satellite project (BIRDS-5) are ordered from this company.
- It is not cheap to order from this company, however they provide technical support for our board manufacturing and for our mounting orders. This is very helpful in reducing board manufacturing mistakes.



BIRDS-3 BPB EM  
manufactured by P-ban

# PCB manufacturing services

- We can order any PCB that we design. Before starting to manufacture, we get three chances to re-check our circuit board.
- First, we can download the DRC (Design Rule Checker) file for EAGLE PCB design software from the P-ban.com webpage. Then we can check our circuit board on EAGLE by ourselves.

Noted: PCB = Printed Circuit Board

一般CADのガーバー出力方法一覧

Allegro  
Altium (Prote)  
CADLUS  
CADVANCE  
CircuitMaker 2000  
DK Magic  
EAGLE  
K2CAD  
OPUSER  
OrCAD  
PCAD 2002  
PCBE  
Quadcept

大会将書様

案件一覧はこちら

完了一覧はこちら

ログアウト>

ガーバーデータ出力方法「EAGLE (ver.5.10)」

P板.comでは、EAGLEより出力したガーバーデータで数々の製造実績がありますので、出力したガーバーデータで安心してご発注いただけます。

【参照】P板.com専用デザインルールファイル  
EAGLEを起動し、下記druプロセッサーリンクを右クリックで「対象をファイルに保存」を選択し、「C:\Program Files\EAGLE-5.10\dru」ダウンロードしてご利用ください。

2層板、パターン幅/間隔	0.127mm【標準】	pban_5mil-l2.dru
4層板、パターン幅/間隔	0.127mm【標準】	pban_5mil-l4.dru
2層板、パターン幅/間隔	0.1mm【特注】	pban_4mil-l2.dru
4層板、パターン幅/間隔	0.1mm【特注】	pban_4mil-l4.dru

} DRC files

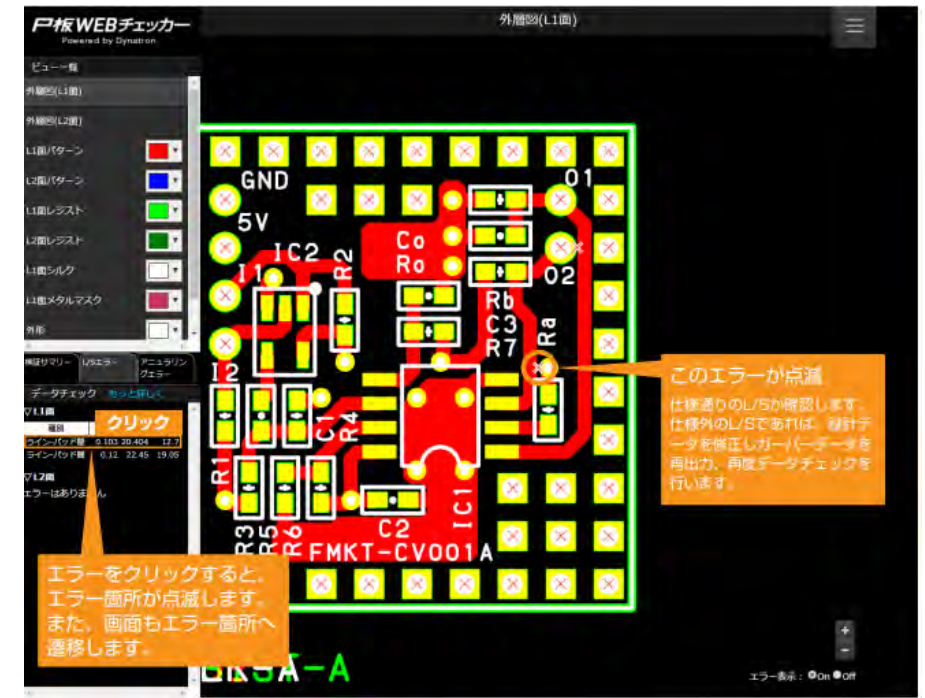
<https://www.p-ban.com/gerber/eagle.html>



DRC detects the clearance problem

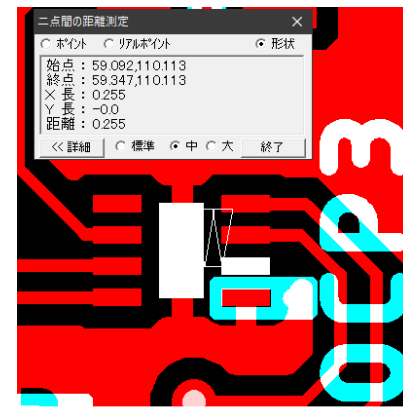
# PCB manufacturing services

- Second, we can use P-ban web checker on the internet. It can detect mistakes if you put your “Gerber” data.
- Third, after you send your design to P-ban, they check your PCB design. Then if something is problematic, they request you, through emails, to improve the design so that the PCB manufacture contains no mistakes. Sometimes, the consultation by emails takes time. But this process is very important for us to learn how to design PCBs.



P-ban web checker

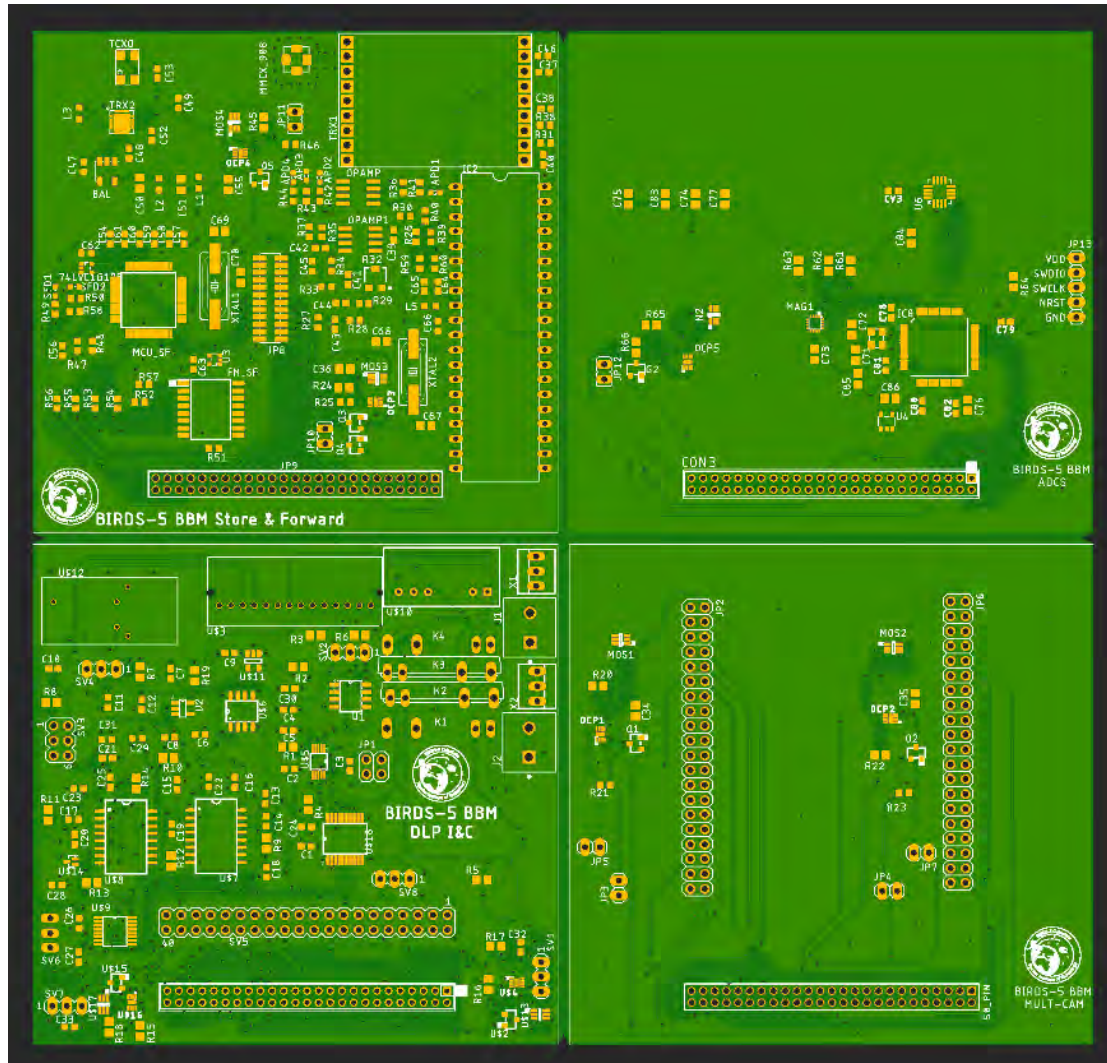
[https://www.p-ban.com/guide/pdf/pbanWebChecker\\_guide.pdf](https://www.p-ban.com/guide/pdf/pbanWebChecker_guide.pdf)



The distance between the pads is too close to print the pattern



# We ordered the BBM (Bread Board Model)



- This is the preview of what we ordered for our BBM in January. As you can see in this picture, the PCB is made of 4 small boards. After we receive our PCBs, we can cut it easily into 4 thanks to P-ban's V-cut service.
- If you order each board separately, they need to make metal masks for each board to solder the components. So combining boards like this time makes the cost lower.

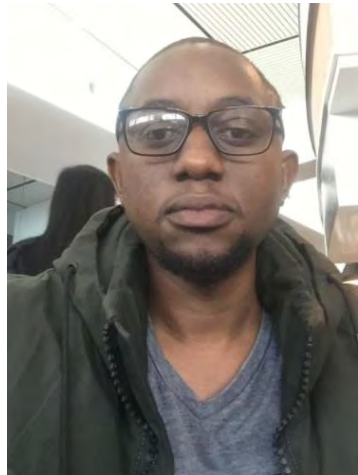
# The received BBM (breadboard models)



Upon reception, the BBMs could be separated by hand

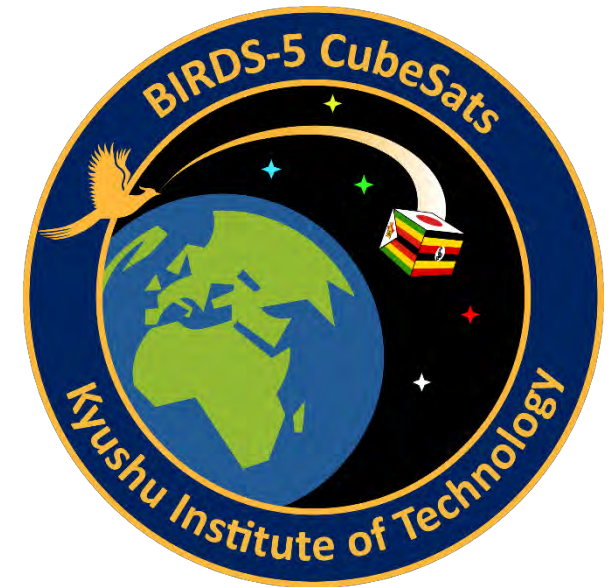
**THE END**

# Survey for Africa Space Development Model



By : Timothy Kudzanayi Kuhamba

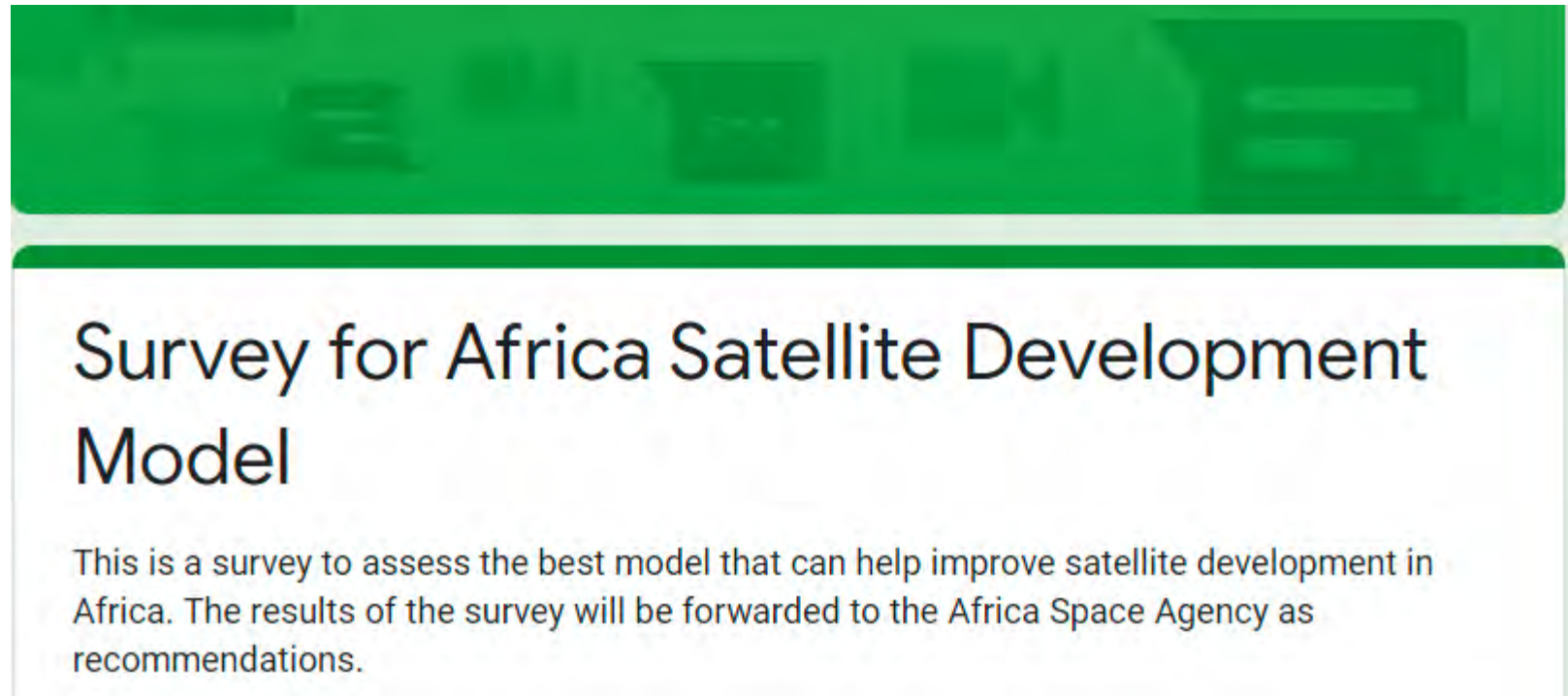
Date 22 February 2020



# Survey for Africa Space Development Model

- Improving Satellite Development Models in Africa begins with making recommendations to Africa Space policymakers.
- It is therefore of paramount importance to assess the needs of the people in the satellite development process and also what policymakers need to priorities to improve satellite development in Africa while also ensuring sustainability.
- You can help improve satellite development in Africa by completing the Survey for Africa Satellite Development Model

Please complete the link below

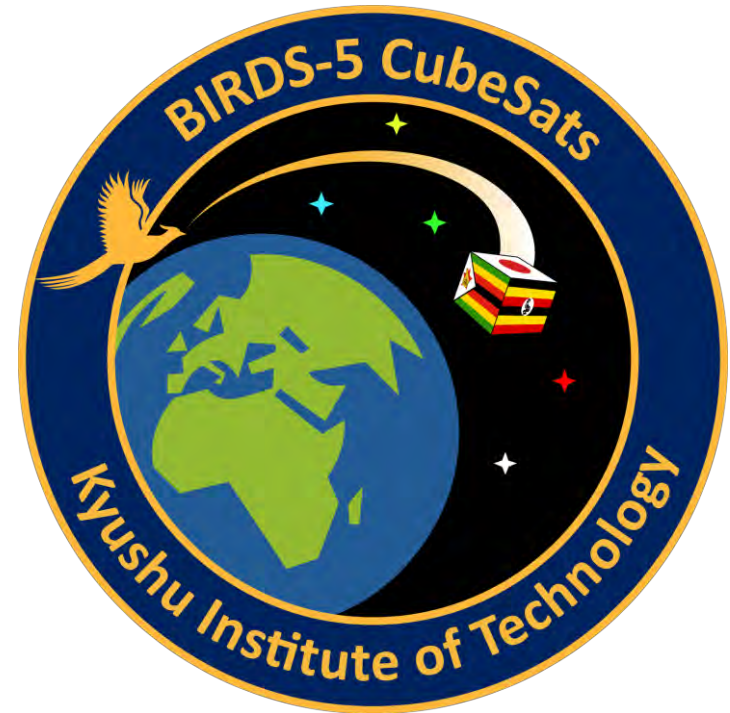


[https://docs.google.com/forms/d/e/1FAIpQLSfj9VGlicNkIK73BdPXu5DXvQJibjhGADnWB\\_1Wx1IDPYJkWA/viewform](https://docs.google.com/forms/d/e/1FAIpQLSfj9VGlicNkIK73BdPXu5DXvQJibjhGADnWB_1Wx1IDPYJkWA/viewform)

# End of BIRDS-5 reports for this month.

*Thanks to Fahd for the compilation work.*

*- Editor*



# IAC 2021 CALL FOR SESSION PROPOSALS AND ABSTRACTS



## CALL FOR ABSTRACTS

The Call for Abstracts is a precursor to a subsequent submission of a final paper, which may be presented at the 72nd IAC. Authors are invited to submit an abstract regarding an original, unpublished paper that has not been submitted in any other forum. Papers can be submitted for either formal oral presentation or interactive presentation.

All selected papers will be treated as equally important in the presentation sessions and Congress Proceedings, differing only in the format of the presentation sessions (in other words, Oral Presentation papers will NOT be considered more important than Interactive Presentation papers). Abstracts must be submitted online at <https://iafastro.directory/iac/account/login/> by **28 February 23:59 CET**.

# End of this **BIRDS Project Newsletter**

(ISSN 2433-8818)

## Issue Number Sixty-One

This newsletter is archived at the BIRDS Project website:

<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.