Members of BIRDS -1, -2, and -3 on 4 October 2017, at Tobata Campus

Project website:  http://birds.ele.kyutech.ac.jp/
All back issues are archived at this website.

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

BIRDS Project Newsletter

Issue No. 23
(25 December 2017)
FINAL ONE FOR 2017
All back issues of this newsletter can be easily downloaded. Go to here:  [http://birds.ele.kyutech.ac.jp/](http://birds.ele.kyutech.ac.jp/)

At the top, click on the tab called NEWSLETTER. You will get a menu for all back issues.

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The Guest Box

From Nepal (BIRDS-3)

Boudhanath Stupa (Or Boudha Stupa) is the largest stupa in Nepal and the holiest Tibetan Buddhist temple outside Tibet. The diameter is about 100m while standing 40m tall. It is the center of Tibetan culture in Kathmandu and rich in Buddhist symbolism, The stupa is located in the town of Boudha, on the eastern outskirts of Kathmandu. It is also one of the World Heritage Sites of Nepal.

--Suyog Bam, Grade X, Brihaspati School, Nepal
01. Post-graduate study on Nano-Satellite Technologies (PNST) has been renewed

If you are from a non-space-faring nation, you have a solid engineering background (bachelor’s degree), and you are under Age 35, you are eligible to receive this scholarship (for either PhD or masters degree).

Update 22 December 2017: The Application is now OPEN!!

Apply at the UNOOSA website shown above – its URL is as follows: http://www.unoosa.org/oosa/en/ourwork/psa/bsti/fellowships.html

Dead line for applications is 28 January of 2018 – 5:00 PM Japan Standard Time. A complete application package is due by this dead line. Shortlisted candidates will be interviewed via Skype.
The BIRDS Project is undertaken by LaSEINE, Laboratory of Spacecraft Environment Interaction Engineering.

This is a photo of the staff and students of the laboratory. It was taken on 29 Nov 2017 on the ground floor of our building on the Tobata Campus of Kyutech.
03. Winning design of “Lean Sat Logo Competition”

During the month of November 2017, an internal competition was held to come up with a logo for “Lean Satellite” concept. It will be used in various places (websites, flyers, posters, etc.).

Note: BIRDS is an example of a lean satellite.

The Lean Sat Logo Competition winning design is shown at the right; it was designed by Rahmi, a PNST Phd Fellow.

1st Prize: Rahmi (Indonesia)
2nd Prize: Turo (Mongolia)
3-5th Prizes:
  Joven (Philippines),
  Morii (Japan),
  Kiran (Bhutan)

First prize is high-quality tea →
The 15th Spacecraft Charging Technology Conference (SCTC2018) will take place from the 25th to the 29th of June 2018 at Integrated Research Center of Kobe University in Japan. The SCTC is an international series focusing on the science and technology of plasma and charged particle interactions with space systems. Initiated in 1977 it has become a goal to hold the conferences with a periodicity of 2 years, rotating between Europe, the USA, and Japan. The conference is now returning to Japan following the very successful meetings held at Noordwijk (The Netherlands) in 2016 and Pasadena (USA) in 2014.

Contributions are sought on a broad range of technology and science topics concerning the interaction of spacecraft with the charged particle environment and environmental impacts on spacecraft. The followings are the possible fields for the conference session.

- Country Overviews
- Standards
- On-Orbit Investigations & Nanosatellites
- Ground Testing
- Plasma Propulsion and Tethers
- Material Properties
- Charging and Arcing Mitigation
- Space Weather & Charging
- Theory, Modeling and Computer Simulations
- Internal Charging
- Charging of Dusts and Small Bodies in Space
- Solar Array Plasma Interactions

Organizers:
- Graduate School of System Informatics, Kobe University
- Japan Aerospace Exploration Agency (JAXA), Aerospace Research and Development Directorate

Sponsors:
- Education Center on Computational Science and Engineering, Kobe University
- Faculty of Engineering, Kobe University

All of the above from the conference website (see the poster at the left)
ISEF2 is a ministerial-level meeting to build support for global cooperation in space exploration. The Japanese government is hosting the ISEF2, to be held on March 3, 2018.

Cont’d next page

http://www.isef2-se.space/
The International Space Exploration Forum (ISEF) is a meeting for dialogue among ministers and other high-level government representatives targeted at promoting international collaboration in space exploration.

The inaugural meeting of ISEF took place in January, 2014 in Washington D.C., U.S.A. In March, 2018, the 2nd ISEF will be convened in Tokyo, Japan.

In conjunction with this international ministerial-level forum, side events will also be held geared for industry (general public may observe: registration required) and young professionals (participants will be solicited through an open application process) with the objective of advancing international space exploration.

The above from http://www.isef2.jp/

Yomiuri Newspaper of 13 December 2017
06. “Space Girls”, a book published in Japan

I discovered this book in the Central Library of Kyutech. It is written in Japanese, of course. It is interesting. A book review of it starts on the next page. - The Editor.
『宇宙就職案内』と『宇宙女子』

じつは2004年から2年間ほどJAXAの宇宙オープンラボ・アドバイザ委員を務めていたことがある。当時JAXAは「見上げる宇宙から使う宇宙へ」をスローガンに、宇宙オープンラボの民間利用を促進していたのだ。ホリエモンにはじて会ったのも、このアドバイザ会議の場だった。JAXAはアメリカではIT経営者たちは次々と宇宙ビジネスに旅立つのをみて、日本でも宇宙に興味をもつIT関係者はいないかと探していたらしい。ソニーコンピュータサイエンス研究所取締役所長の北野宏明氏のその1人だった。当時のJAXA理事長は元NTTドコモ社長の立川敬二氏で、彼を囲んで宇宙マーケティングの可能性などについて良く話し合っていた。間違いなく一部の人たちにとって、宇宙はビジネスの場としてまさに最先端の場所になっていたある。

『宇宙就職案内』はその身近になった宇宙関連の仕事についての現状報告だ。宇宙開発には「ピークを高く」「裾野を広く」という2つの方向性があるという。「ピークを高く」はより深部の宇宙へ、「裾野を広く」は開拓した宇宙を利用するという立場だ。本書の第1章ではまずそのピークを探る天文学者たちが登場する。日本で天文学を職業にしている人は700人ほどだという。そのうち250人ほどが国立天文台で勤務している。職場としてはごく小さく狭い門である。しかし、壮大な深宇宙を毎日覗き考えると、まさに浮世離れした職業とは羨ましい限りである。その天文学者たちは1日30時間制を使っているという。

すばる望遠鏡のあるハワイとの時差を考えると午前2時よりも26時のほうがミスコミュニケーションを減らすことができるからだ。もちろん天文学者たちはただただそこに望遠鏡を覗いているだけではない。宇宙望遠鏡や観測装置も自作する。人類が太陽系外の惑星を初めて直接撮影したのは、日本人研究者が開発した観測装置によってだった。その名も「HiCIAO」ハイチャオ！

第2章は宇宙飛行士とそのサポートチームについてだ。高い基礎能力、長く厳しい訓練、宇宙との往復で100回に1回発生する重大事故、宇宙では誰かが発注した実験のオペレーターという立場などを考えると、宇宙飛行士とはいまだ冒険者なのだと思う。ところで、その宇宙飛行士たちが行う実験のなかでもっとも期待されているものの1つに新薬開発がある。無重量のなかでは熱対流がないため、タンパク質の結晶をきれいに成長させることができる。つまりタンパク質の立体構造が決定できるのだ。立体構造が判ればそれにぴったりと嵌めあう新薬を創り出すことができるというわけだ。将来、宇宙飛行士たちが命がけで開発に協力した新薬が登場することであろう。

天文学者、宇宙飛行士につづく3番目の仕事はロケットや探査機、人工衛星の開発者だ。先日「H2A」21号機が発射され、韓国の多目的観測衛星「アリラン3号」の軌道投入が成功した。液体燃料のH2Aは非常に高価なロケットで商業的に大成功するとは思われないが、しかし2012年には固体燃料ロケットのイプシロンの打上げが予定されている。
ノートパソコン1台で点検・管制可能という低コストシステムだ。本書では現在運用されている日本の宇宙貨物船「こうのとり」、小惑星探査機「はやぶさ」、月周回衛星「かぐや」、GPS衛星「みちびき」、陸域観測技術衛星「だいるち」、温室効果ガス観測技術衛星「いぶき」、水域観測技術衛星「しずく」などが紹介されている。それぞれの役割や機能を知るとワクワクしてくる。

とはいえ本書を読むかぎり、宇宙関連の仕事は非常に専門的・技術的で普通の人では近寄りがたいという印象になってしまう。しかし、実際には多くの普通の女子が宇宙関連ビジネスですでに働いているのだ。『宇宙女子』はそのガイドブックだ。JAXAで宇宙ステーションとの通信スケジュールを決めているのは筑波技術短大卒の28歳の女子だ。ちなみに筑波技術短大は宇宙関連への就職実績が豊富だという。宇宙服を作るのは日本女子大学家政学部被服科卒業で現在ポンジョ教授の女子。大学時代にアルバイトで入った天文雑誌社でいつのまにか編集者になっていた女子。宇宙就活実行委員会を率いる現役女子大生。JAXAで日本の宇宙実験棟「きぼう」のプロモーターをしている女子は元ロンドン観光局公認ガイド。などなど24人の宇宙女子が登場する。

宇宙専門のフリーライターとして紹介されているのは林公代さん。よく見てみると『宇宙就職案内』の著者だった。彼女の経歴はつくば万博でアルバイト、フリーペーパーを制作する新聞社で営業職、「YAC(日本宇宙少年団)」で編集者を経てフリーライターになっている。結局、みんな好き者なのだ。好きこそものの上手なれ。何かに夢中になることができる才能こそが本物の才能。宇宙のような極端な仕事場にこそ、本物の才能を持った人たちが集まっているのかもしれない。

生協で注文可能

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United Nations/South Africa Symposium on Basic Space Technology

11 DECEMBER 2017 - 15 DECEMBER 2017

The objectives of this Symposium are to address the status of capacity-building in space technology development, in particular for small satellite activities, with a special focus on Africa; to consider opportunities for regional and international cooperation, as well as legal and regulatory issues of space technology development, including the long-term sustainability of outer space activities; and to discuss recent developments on basic space technology.

The presentation at the right was delivered during the symposium (described above) by Daniel Garcia Yarnoz of UNOOSA. His slides (the next three pages) are reprinted with his permission – which is acknowledged with gratitude.
The PNST Fellowship at Kyutech was explained during the presentation at the UN/South Africa Symposium in December of 2017.

Fellowship Programmes

- United Nations/Japan Long-term Fellowship Programme, hosted by the Kyushu Institute of Technology at its Center for Nanosatellite Testing
- Post-graduate study on Nano-Satellite Technologies (PNST)
- 3-year PhD and 2-years Masters programme, up to 6 students/year
- All cost (tuition, living cost, travel) covered
- 5 year PNST Symposium: 4-5 Dec 2017
  - YASE Panel and Session 7: Tejumola
SEIC course taught at Kyutech in early 2017 was also explained.

It was entitled "The International Dimension of Space Activities: Space Law and Policy for Engineers".

It was taught by Dr Werner Balogh (pictured below) for SEIC at Kyutech from 8 January 2017 to 9 March 2017. The course syllabus appears on the next page.
Dr Balogh’s course was very well received by Kyutech students. Many said it should be taught every year.

End of reprints of presentation by Daniel Garcia Yarnoz.

**Course Syllabus**

<table>
<thead>
<tr>
<th>#</th>
<th>Lecture Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction – why space engineers need to know about space law and policy.</td>
</tr>
<tr>
<td>2</td>
<td>History of space activities – how space activities evolved in the context of space law and policy.</td>
</tr>
<tr>
<td>3</td>
<td>Importance of space activities – why they are essential for humankind.</td>
</tr>
<tr>
<td>4</td>
<td>United Nations and space activities – the role of the United Nations and other international organizations.</td>
</tr>
<tr>
<td>5</td>
<td>Essentials of international space law, Part I – fundamentals of international law, outer space treaty.</td>
</tr>
<tr>
<td>6</td>
<td>Essentials of international space law, Part II – space objects, liability and registration, Moon treaty.</td>
</tr>
<tr>
<td>7</td>
<td>Long-term sustainability of outer space activities – space debris, frequency coordination, orbital positions.</td>
</tr>
<tr>
<td>8</td>
<td>Developing a national space policy and strategy for your country – team exercise.</td>
</tr>
<tr>
<td>9</td>
<td>National space law – importance of developing and implementing national space law.</td>
</tr>
<tr>
<td>10</td>
<td>International space cooperation – why and how to cooperate, space cooperation examples.</td>
</tr>
<tr>
<td>11</td>
<td>Developing national space law for your country – team exercise.</td>
</tr>
<tr>
<td>12</td>
<td>Space in support of sustainable development – how space activities contribute to Agenda 2030 implementation.</td>
</tr>
<tr>
<td>13</td>
<td>Future of space governance – UNISPACE conferences, UNISPACE+50 and Space 2030.</td>
</tr>
</tbody>
</table>
2017 PNST Symposium

Post-graduate study on Nano-Satellite Technologies

Day 1  4 December 2017
Day 2  5 December 2017

Venue: Tobata Campus, Kyutech, Kitakyushu City, Japan

A great many BIRDS students are on PNST scholarships.

THIS ARTICLE CONSISTS OF 13 PAGES.
The Program for Day 1
(4 Dec 2017)

Mr. Matsuo was replaced at the last minute by Mr. Shigeki Izumi, Office for Student Exchange, Higher Education Bureau, MEXT.
Key Note Speeches

[1] PNST summary, Prof. Mengu Cho (Kyutech, PNST program director)
    Mr. Luc St-Pierre, (Chief, Space Applications Section, Office for Outer Space Affairs,
    United Nations Office at Vienna)
    Mr. Yasuhiro Yukimatsu (Director, National Space Policy Secretariat, Cabinet Office)
    opportunity for Micro/Nano-satellite by using one and only function on Kibo/ISS”
    Dr. Koichi Wakata (ISS Program Manager / Astronaut, Human Space Technology Directorate, JAXA)
Dr Yahia (Egypt) makes student representative speech

Panel discussion led by Prof. Cho.

TOPIC: How do we apply the lessons of PNST for more and better space engineering capacity building in the future?

Many SEIC students attended

BIRDS engineers Ibukun (Nigeria) and Turo (Mongolia)

Dr Wakata and Jesus (Colombia)
Official Group Photo for Day 1

Ground floor of Nakamura Memorial Hall on the Tobata Campus of Kyutech
Prof Serikawa, Dean of the College of Engineering, gives the opening toast.

From left:
- Yeshey (Bhutan)
- Dr Wakata (JAXA)
- Pooja (Bhutan)
- Dulani (Sri Lanka)

THE RECEPTION (情報交換会)

Meeting old friends and making new ones.

Left:
Dr Wakata (JAXA) with Taiwo

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The Program for Day 2
(5 Dec 2017)

11:15-11:40 Ammarin Pinnreo (PhD) Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand Past and Future Cooperation between GISTDA and Kyutech

11:40-12:00 Lunch

13:00-15:00 Afternoon session (to be led by Mr. St-Pierre) Afternoon is devoted to exchanges between graduates and current students. Students may get a direct glimpse at the professional world and job market from these exchanges. Graduates may also be interested in hearing (seeing) the projects of current students. Hence the afternoon session is informal in style.

We used the AV Hall of the main library of Tobata Campus

Cont’d next column
Luc, UNOOSA

20-minute presentations

Sidi, Algeria

Yahia, Egypt
Mariela, Costa Rica

20-minute presentations

Erka, Mongolia

Ammarin, Thailand
After lunch, Luc organized a group discussion exercise. About six groups were formed. Shown here are two groups. Students were asked to outline a system of a constellation of satellites by considering issues such as→

- Maintenance
- Funding
- Governance
- Technology

Students delved into deep discussions!
Representatives of each group gave a presentation to summarize the group discussions.
Dima and Yahia are holding the symposium poster.
09. Prof Tariqul and Dr Huzaimy commence their 2017 4th quarter courses at SEIC

7th Dec. 2017; First Lecture “Satellite Communication” 4th Quarter of 2017; SEIC, Kyutech, Japan

Taught by Prof. Tariqul of UKM_Malaysia Visiting Professor, Kyutech.

A big plus of SEIC education is that world-class space engineering lecturers are invited to teach important subjects for the benefit of SEIC students -- many of them are BIRDS students.

12th Dec. 2017; First Lecture “Space Weather and Satellite System Interaction” 4th Quarter of 2017; SEIC, Kyutech, Japan

Taught by Dr. Huzaimy of UiTM_Malaysia Visiting Professor, Kyutech.
10. Work Breakdown and Product Breakdown session of BIRDS-3

Work breakdown and product breakdown presentation of BIRDS-3 was held on 11th of December 2017. Work breakdown of the overall project, product breakdown, functions and requirements of subsystems and missions were presented. We announced the role of each person in BIRDS3 in this session.
### Subsystems Responsibility

<table>
<thead>
<tr>
<th>Subsystem</th>
<th>Responsible person</th>
<th>Secondary person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structure</td>
<td>Sasaki</td>
<td>Kakimoto</td>
</tr>
<tr>
<td>OBC</td>
<td>Kakimoto</td>
<td>Dulani</td>
</tr>
<tr>
<td>Communication</td>
<td>Tharindu</td>
<td>Makiko</td>
</tr>
<tr>
<td>Antenna</td>
<td>Makiko</td>
<td>Tharindu</td>
</tr>
<tr>
<td>EPS</td>
<td>Pooja</td>
<td>Tharindu</td>
</tr>
</tbody>
</table>

### Mission Responsibility

<table>
<thead>
<tr>
<th>Mission</th>
<th>Responsible person</th>
<th>Secondary person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera</td>
<td>Abhas</td>
<td>Tharindu</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Tharindu</td>
<td>Abhas, Makiko, Pooja</td>
</tr>
<tr>
<td>Backplane</td>
<td>Abhas</td>
<td>Makiko</td>
</tr>
<tr>
<td>ADCS</td>
<td>Dulani</td>
<td>Kakimoto</td>
</tr>
<tr>
<td>Glue</td>
<td>Sasaki</td>
<td>Makiko</td>
</tr>
<tr>
<td>Magnetic field density measurement</td>
<td>Dulani</td>
<td>Kakimoto</td>
</tr>
</tbody>
</table>

*This 2-page article was created by Dulani Chamika (Sri Lanka, BIRDS-3)*
Profiles of BIRDS-3 Members

Relaxing during a weekend home party
Role in BIRDS-3: Appointed as the Project Manager for BIRDS-3 project, my main task is to keep the tight development time schedule while managing the team. As the Project Manager’s work has expanded to design and development from BIRDS-2, I am also taking care of the Imaging Payload. This was a natural step as my Master’s degree thesis was based on scratch camera design for Seoul National University’s QB50 SNUSAT-1/1b CubeSat Project.

Suffice to say, I am incredibly honored to be leading such a diverse team while building the first satellite for Nepal.

Email: maskey.abhas481@mail.kyutech.jp

Name: Abhas Maskey
Nationality: Nepalese
Major: BSc. in Mechanical (min.) and Aerospace (maj.) Engineering
MSc. in Aerospace Engineering, Seoul National University (both degrees)
Role in BIRDS-3: In Birds-3 project I’m working on Onboard Computer (OBC) system. OBC works as the brain of the satellite. OBC has to execute commands from ground station, collect and manage housekeeping data, and control subsystems such as antenna deployment and electrical power supply control, payloads etc.

In addition, I’m working on Attitude Determination and Control System (ADCS). Active attitude control is a mission in BIRDS-3 project.

Moreover I’m working on the mission “Magnetic field density measurement in the orbit”. The purpose of this mission is to collect the magnetic density data in the orbit and create a database.

In addition to these technical activities I coordinate the outreach activities of the BIRDS-3 project. This is my first ever satellite project and I’m so excited to be a part of BIRDS-3.

Email: withanage.dulani-chamika622@mail.kyutech.jp
Role in BIRDS-3: I have been assigned to communication subsystem of BIRDS-3 project. My role is to ensure every components related to communications functions as they are intended. Beside communication subsystem I am assigned as secondary person for antenna deployment system.

In addition I am the responsible person for Data Collection mission. Data Collection mission is one of main mission of BIRDS-3 project. I think, this mission is quite challenging since it involves many modifications and testing.

I feel fortunate to be able to take part in BIRDS-3 project. I hope my works and BIRDS-3 project will be very successful.

Email: malmadayalage.tharindu-lakmal346@mail.kyutech.jp
Name: Pooja Lepcha
Nationality: Bhutanese
Major: B.E in Electrical Engineering from College of Science and Technology, Royal University of Bhutan, Bhutan

Role in BIRDS-3: I am primarily responsible for Electrical Power System (EPS) in BIRDS 3. The main function of EPS is to provide uninterrupted power to on board electronics of the CubeSat both in sunlight and in eclipse.

I am also involved in the Ground station development in BIRDS 2; since my country is a participating country in BIRDS 2. BHUTAN-1 will be the first satellite of Bhutan and I feel privileged to be a part of it.

It is also a great opportunity for me to be part of BIRDS 3 team. I expect it to be intriguing and challenging, and I hope to take back home a lot of experiences, lessons and life long friendships.

Email: lepcha.pooja586@mail.kyutech.jp
Name: Kakimoto Yuta
Nationality: Japanese
Major: Systems Engineering, Kyushu Institute of Technology, Japan

Role in BIRDS-3: My role is mainly Attitude determination and control system (ADCS). I will try to develop active control by magnetic torquer, which is a different control method from BIRDS-1/2. In this method, considering how to design control algorithm will be the key factor to be succeed. Also, I will have some tasks in OBC, thermal design and some non-product works.

In this project, we can learn the whole process of building a system through designing, developing, testing and operating the satellite. This will be very valuable experience to work as an engineer in the future. I want to contribute greatly in this project while improving my skill.

Email: o111013y@mail.kyutech.jp
Name: Makiko Kishimoto  
Nationality: Japanese  
Major: Systems Engineering, Kyushu Institute of Technology, Japan

Role in BIRDS3: I am working on Antenna design and Antenna deployment system for BIRDS3 project. I think this system is a very important part in the satellite, so I want to do my best to be successful.

Then I also have my roles which are the secondary person of Communication system (COM) and some missions (Demonstration of software defined Backplane, Use of Glue which is available on the market and Magnetic field density measurement). In the non-product element, my roles are outreach, advertisement, data distribution, requirement management and inventory management. I think that these roles are also important for to proceed the project, so I want to support BIRDS3 members to make their works easier and to inform BIRDS3 project to the world.

During BIRDS3 project, I will gain more skills and experiences.

Email: p111016m@mail.kyutech.jp
Name: Kakimoto Yuta
Nationality: Japanese
Major: Systems Engineering, Kyushu Institute of Technology, Japan

Role in BIRDS-3: My role in the BIRD-3 Project is Structure Design. The structure must play the role of mechanical support for all subsystems. I will efficiently arrange all the equipment and missions to move within the limited space in 10 cm cubic. The basic design will take over the design of BIRDS-2 and will change the design to introduce new elements such as the new backplane and magnetic torquer. Therefore, I am playing an important part to make this project successful, so I will do my best to work hard and enjoy my job at the same time.

Projecting with a lot of foreign students will be a very valuable experience for me. I would like to use this opportunity to improve English and learn about foreign cultures at the same time.

I hope that this project will be successful.

Email: o111021y@mail.kyutech.jp
12. BIRDS-3 Activities during Nov-Dec, 2017 (1), by Abhas

Nov 14, 2017
Mission Mode Revision

Nov 20, 2017
Dr. Kim’s Session

Nov 22, 2017
Mission Functions Session

Nov 25, 2017
Potluck with BIRDS-1 (Taiwo, Maisun)

Nov 30, 2017
PIC Programming Hands-on Session
Tharindu (BIRDS-3)

Dec 02, 2017
BIRDS-3 Radio License Exam
13. BIRDS-3 Activities during Nov-Dec, 2017 (2), by Abhas

BIRDS-3 members are now preparing for the upcoming Mission Design Review (MDR) which marks a milestone in the satellite development process. The MDR is posed to be held at Kyutech on Dec 28, 2017. BIRDS-3 satellite is posed to have Data Collection and Imaging Missions as their main missions.

- Dec 4, 2017: BIRDS-3 Members attend PNST Symposium
- Dec 4, 2017: PNST Symposium with Astronaut Dr. Wakata
- Dec 5, 2017: PNST Symposium; DAY-2
- Dec 11, 2017: Work Breakdown Structure Presentations
- Dec 11, 2017: Work Breakdown Structure Discussions
14. Special photo report on UN/South Africa Symposium, by Senior of Namibia

The next nine pages were created by Senior Shimhanda, a student in Namibia. There is a chance he will come to Kyutech to enter SEIC, and perhaps join a future BIRDS Project. Kyutech is seeking ways for him to get over here for studies in space engineering.

United Nations/South Africa Symposium on Basic Space Technology
11 DECEMBER 2017 - 15 DECEMBER 2017

The flag of Namibia
Senior Shimhanda (Namibia), Joseph Quansah (ANUC, Ghana) & Barbara Ojur (University of Cape Town) building a 1U pico-satellite during the HEPTA Sat training.

The symposium venue (The Stellenbosch Institute for Advanced Study, South Africa) →
The benefits of becoming a spacefaring nation and potential satellite applications in Namibia

Senior Shinkans, Elng
Namibia University of Science and Technology

Introduction

This work was carried out in association with Namibia and includes the processes of setting up a spacefaring nation. Namibia has no active programs or a space-related program, but the national government has expressed interest in the region. The National Committee on Interagency, System, and Marine Technology (NCIST) has established a team to coordinate the establishment of space activities in Namibia. Currently, a few universities and training institutes are starting to offer courses in space technology and related fields. However, there is need for comprehensive training and the required facilities in Namibia. For this, the Namibian government must take appropriate actions, including the establishment of relevant institutions, to ensure the development of space activities in Namibia.

Space Engineering International Course

The Space Engineering International Course (SEEC) is a one-week course offered to the students of Namibia. SEEC aims to provide theoretical and practical training in space technology. The course covers fundamental concepts, space vehicles, orbit determination, satellite communications, remote sensing, and space exploration.

Space Activities in Namibia

The Space Engineering International Course (SEEC) is a one-week course offered to the students of Namibia. SEEC aims to provide theoretical and practical training in space technology. The course covers fundamental concepts, space vehicles, orbit determination, satellite communications, remote sensing, and space exploration.

Conclusion

In summary, the establishment of a spacefaring nation in Namibia requires comprehensive training and the development of space activities. The Namibian government must take appropriate actions to ensure the development of space activities in Namibia.

References

1. World Space Week, "Standing on the Shoulders of Giants: Celebrating 50 Years of Achievements in Space Science and Technology."
2. National Aeronautics and Space Administration (NASA), "Space Science and Engineering."

← Senior’s Poster [Note the BIRDS-1 team of Bangladesh; editor]
Group 2 members receiving their certificates for completing the HEPTA Sat Training.
From left Prof Yamazaki (Nihon University), Senior Shimhanda (Namibia), Barbara Ojur (UCT, South Africa) and Joseph Quansah (Ghana)
The objectives of the UN/South Africa Symposium are:

1. Review the status of capacity-building in basic space technology for small satellites including lessons learned from the past and ongoing development activities with a focus on regional and international collaboration opportunities, in particular for countries in Africa;

2. Examine issues relevant to the implementation of small satellite programmes, such as organizational capacity-building, development and testing infrastructure and launch opportunities;

3. Review state-of-the-art scientific applications of small satellite programmes and their associated supporting technological developments, in particular with focus on applications for agriculture, environment and city monitoring, and education to promote a sustainable growth, in line with the 2030 Agenda for Sustainable Development;

4. Elaborate on regulatory issues of space technology development programmes, such as frequency allocation and space debris mitigation measures for enhancing the long-term sustainability of outer space activities as well as import/export controls;

5. Elaborate on legal issues and responsibilities related to space technology development programmes, such as those that are raised from the relevant provisions in international space law;

6. Discuss the way forward for the Basic Space Technology Initiative (BSTI), and its capacity-building and international cooperation activities in preparation of UNISPACE+50.
Senior Shimhanda networking with Taiwo Tejumola (Kyutech) – Day 1
Luis Diego Solano (Costa Rica), Senior Shimhandha and Faraaz Shamutally (Mauritius) posing at the New Space Systems stand – Day 3
BSTI Participants having dinner at the Protea Hotel Marriot. Wonderful food!

A room with a view.
John (Nigeria), Duckie (SA), Tomas (Slovakia) and Senior (Namibia) in front of the Wallenberg Research Centre
End of Senior’s article on the UN symposium near Capetown, South Africa.

- Thank you, Senior!

The Editor
15. 27-year-old “Space World”, an icon of the Kitakyushu area, will close its gates this month

“Space World” is a space-themed amusement park not far from the Tobata Campus of Kyutech. It opened in 1990 near the peak of the “Bubble Economy of Japan”. It inspired many kids to consider a space-related career. It was easily visible during the train ride between Fukuoka City and Kitakyushu City. Sadly, expenses outpaced revenue, and so it will soon permanently close its gates.
16. A discussion on NanoRacks Cubesat Deployer, and JAXA’s deployer

All BIRDS satellites are deployed via JAXA’s J-SSOD. There is another deployment system in the ISS. Read all about both of them.

History

JEM Small Satellite Orbital Deployer
The Japanese Experiment Module Small Satellite Orbital Deployer (J-SSOD) is the first of its kind to deploy small satellites from the International Space Station. The facility provides a unique satellite install case to the Japanese Experiment Module (JEM) Remote Manipulator System (RMS) for deploying small, CubeSat, satellites from the ISS.\[3\] The J-SSOD holds up to 3 small one-unit (1U, 10 x 10 x 10 centimeters) small CubeSats per satellite install case, 6 in total, though other sizes up to 55 x 55 x 35 cm may also be used. Each pre-packed satellite install case is loaded by crewmembers onto the Multi-Purpose Experiment Platform (MPEP) within the JEM habitable volume.\[3\] The MPEP platform is then attached to the JEM Slide Table inside the JEM airlock for transfer to the JEMRMS and space environment. The JEMRMS grapples and maneuvers the MPEP and J-SSOD to a predefined deployment orientation and then jettisons the small CubeSat satellites.\[3\]

All of this is continued at:
With any BIRDS project, Kyutech receives students and puts them through tough training so that learn the entire CubeSat development process from A to Z.

However, it is also important to develop human resources back at home. Kyutech strongly encourages staff and students back at home to get involved in any aspect (big or small) of the satellite project.

A good example of staff involvement is Dr. Noraisyah of Malaysia. Read her story on this page and on the next page.

She has applied for the Hitachi Scholarship. If she receives this, she will be able to come to Kyutech for a few months next year.

Hi! I am Noraisyah, currently working as a lecturer in University of Malaya (UM) Malaysia. I completed my PhD dissertation in 2014 on satellite signal propagation, focusing on investigating diurnal variations in the received satellite beacon signal level during clear sky. We extracted satellite propagation data from several experiments, this include NASA’s ACTs, INTELSAT beacon experiment observed by Texas A&M University, INTELSAT 705 beacon experiment observed by Pontifical Catholic University of Rio de Janeiro and the Olympus satellite beacons observed by Virginia Tech.

From the investigation we concluded that a 24 hour diurnal variations seen is due to atmospheric effects, and not due to satellite payload or orbital instabilities. From our findings we recommend that the seasonal and diurnal variation of the mean clear-sky level is considered in determining link budget for low margin systems, and the sinusoidal nature of the variation augment the function of radiometers in evaluating the true rain fade level. Cont’d next page
Upon returning to Malaysia, I continued to teach Undergraduate and Masters Degree students in various courses pertaining to the field of Electrical and Telecommunications Engineering. I joined a few research groups that focused on satellite communication as well as radio astronomy.

Through Dr Huzaimy of Uitm Malaysia, I was introduced to the **BIRDS Project at Kyutech**. My work will be in assisting the development of a double Langmuir probe as payload to monitor the electrons in the ionosphere.

I hope to be able to continue my research in the new field of nanosatellite and assist team Malaysia in sending out our own nanosatellite!

I look forward to have the opportunity to join you in Kyutech.

With the radio astronomy research group from UM & UPSI at Uitm’s applied electromagnetic research lab. (L-R) Ms Ain Zakaria, Myself, Mr Danial, Dr Zamri and Mr Wan Zul.

Dr. Noraisyah: Thank you for this write-up. We hope you’ll get the Hitachi Scholarship.

- The Editor.
18. Yomiuri Newspaper interviews several members of BIRDS -1 -2 and -3 on 20 Dec 2017

The Yomiuri journalist asked, for example,

- **To Sri Lanka team:** the current status of their work.
- **To Bhutan team:** What the King of Bhutan asked when they had their Skype call with him a few months ago.
- **To Benjamin:** What happened when the President of Ghana visited ANUC to confer honors on the GhanaSat-1 team.
19. International Conference on Space Weather and Satellite Application

This international workshop is being organized by UiTM’s Centre for Satellite Communication [Director is Dr. Huzaimy].

UiTM is a member of the BIRDS-2 Project, along with Bhutan and the Philippines.

We hope all BIRDS member will consider attending this gathering in sunny Malaysia during 7-8 August of 2018. Please note the various deadlines listed in the red box at the right. The poster is from Dr. Huzaimy. All questions can be sent to him.

Dr. Mohamad Huzaimy Jusoh <huzaimy@salam.uitm.edu.my>
42-page Photo Report of “2nd BIRDS International Workshop”

20-24 November 2017; hosted by ANUC, Ghana. The BIRDS Project gratefully acknowledges the fantastic job performed by ANUC to make this workshop an outstanding success.

The *BIRDS Project* would also like to thank JAXA for its significant contributions to this workshop. We are grateful.
Members of BIRDS were lodged at Eastern Premier Hotel – about 20 minutes from the workshop venue by bus.

The dining room – each day started here.

Breakfast buffet started each day at 7 AM

- Baked beans
- Omlette
- Sausages
- White rice
- Fried rice
- Chicken
BREAKFAST OF DAY 1 (20 Nov 2017)

Prof. Tsolmon and Marco

Mr Ozawa, Dr Huzaimy, Dr Tsolmon, Dr Marciano

Professors Cho and Juang
TRANSFER FROM HOTEL TO VENUE ON DAY 1

**DEPARTURE**

**ARRIVAL**

Venue banner

Ghana Sat-1
THE VENUE

Reception Desk

Giant photos of Ernest, Benjamin, Joseph are on the stage screen

Apiwat, Ibukun, Adrian

Mr Kwizera and Prof. Akinyede
Welcome speech by the President of ANUC, Dr Samuel Donkor

A packed hall
30-minute keynote address by Prof. Jimmy Adegoke, interim executive director of WASCAL. I thought he made several good points.
JAXA PRESENTATION BY MESSRS. AKAGI AND OZAWA

Above: RBF pin and Ghana flag (returned from the ISS) are presented to ANUC
Above: RBF pin and Ghana flag (returned from the ISS) are presented to Dr. Carlene, vice president of ANUC, by Mr Akagi.

Coffee break – continued on the next page.
ANUC generously provided coffee, tea, and cakes, during breaks throughout the workshop.
LUNCH OF DAY 1 – continued on next page

Fried chicken is common in Ghana
Dr Huzaimy gives a thumbs up
After lunch: **BIRDS session of Day 1**

THE NEXT FEW PAGES

← Prof Cho makes a few key points
Airfare for BIRDS participants was provided by JSPS
Mr. Georges Kwizera (RURA, Rwanda) discusses nanosatellites and the ITU.

We learned about the international licensing aspects of the ITU.
Mr. Sithar Dorji of Satellite Working Group, Bhutan
Marco talks about TEC’s new space engineering lab – the first one in Central America.

Currently the only BIRDS partner from Latin America is TEC of Costa Rica.
GALA DINNER OF DAY 1 – continued on the next 3 pages
[photos by G. Maeda and Apiwat]
Dr Donkor addresses the participants
Lots of dancing – Ghana style
Many thanks to ANUC for this wonderful dinner

Lots of dancing – Ghana style
DAY 2
(in the morning)

Panel Discussion
Topic:
Fighting illegal mining (Galamsey) from space
LOCAL HIGH STUDENTS CHECK OUT THE JAXA EXHIBIT

Joseph (BIRDS-1 member) explains the ISS cubesat deployer J-SSOD in this outreach endeavor.
DAY 2
(in the afternoon)
Extensive discussions about GhanaSat-2

Dr Carlene closes THE 6TH SPACE SCIENCE AND SATELLITE TECHNOLOGY APPLICATIONS CONFERENCE
STORE AND FORWARD PRESENTATIONS OF DAY 3 (WEDNESDAY)
STORE AND FORWARD PANEL DISCUSSION

Moderated by Prof Cho

Morning of Day 3

Prof Cho
Japan

Joel
Phil.

Adrian
Phil.

Quentin
France

Huzaimy
Malaysia

Marco
Costa Rica
Tour of the ANUC ground station – rain was coming down violently during this tour.

Mr Benjamin Bonsu explains the system.
On Day 3
I had the pleasure of having lunch with Dr Delele (Ethiopia), on the left, and Dr Moutaman (Sudan).

This is in the campus cafeteria. Editor.

The Blue Nile starts in Ethiopia and flows into Sudan
COUNTRY PRESENTATIONS
The last formal item of the workshop: **Signing the Letter Of Intent (LOI)**

The LOI was first signed at the “1st BIRDS Int’l Workshop” (Kyutech, 2016). By signing, it indicates a willingness to join the “BIRDS Network.” New members were added with the Appendix shown at the right; it contains 7 new members.

Joining the LOI requires the approval of existing members of the LOI (a Kyutech rule). Prof. Mengu Cho confirmed this approval, and then signed the Appendix as the official witness.

**Appendix**

- **Nigeria**
  - Federal University of Technology, Akwat (FUTA), Nigeria
  - Prof. Aliyu Sule Oko

- **Sudan**
  - Institute of Space Research and Aeronautics (ISRA), Sudan
  - Dr. Motamman

- **Ethiopia**
  - Bahir Dar University (BDU), Ethiopia
  - Dr. Abeb Debele Worku

- **Costa Rica**
  - Tecnologico de Costa Rica (TEC), Costa Rica
  - Mr. Mano Comar Jenkins

- **Malaysia**
  - Universiti Teknologi MARA, Malaysia
  - Assoc. Prof. Dr. Mohd. Hussian Jusoh

- **Bhutan**
  - Satellite Working Group (SWG), Bhutan
  - Mr. Sither Tsej

- **Philippines**
  - Univ. of the Philippines at Diliman, Philippines
  - Prof. Joel Marciano

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WITNESS (see photo)
Group photo after the LOI signing ceremony
-- the “BIRDS Family” photo
Workshop
Excursion to
Manhyia Palace

Located in Kumasi, the capital of the Ashanti Kingdom and Ashanti Region.

Thursday (5am til 8pm)
23 November 2017
in two mini-vans provided by ANUC

Prof. Tsolmon (NUM, Mongolia) in a gift shop
Manhyia Palace. This is the principal façade, the Front; originally constructed and completed in 1925. It acquired its present appearance following a remodelling, in 1995.

-- Wikipedia
Grounds (above) and gift shop (below) of Manhyia Palace
Excursion lunch in the city of Kumasi

Fried noodles with beef

Some of the dishes were extremely spicy hot.

Pauline  Mr Dorji  Huzaimy  Georges
France    Bhutan    Malaysia    Rwanda
7:30 AM departure on 24 Nov 2017 from hotel to airport (one batch)
2017
2nd BIRDS International Workshop

A special lecture by a member of the BIRDS Network for the benefit of ANUC students

Title: CubeSats

Lecturer: Prof. Jyh-Ching Juang

With the:
Department of Electrical Engineering,
National Cheng Kung University
Tainan, Taiwan
国立成功大学、台湾

Date of lecture: Friday, 24 Nov. 2017
Location: Main campus of All Nations University
Special half-day lecture by Prof. Jyh-Ching Juang
Prof. Juang,
Thank you for this enlightening and enriching lecture.

- workshop organizers, 
ANUC and Kyutech
The next BIRDS workshop will be hosted by NUM in Mongolia

End of article about the Ghana workshop
End of this BIRDS Project Newsletter
– Issue Number Twenty-Three

This newsletter is archived at the BIRDS Project website:

Project website:  http://birds.ele.kyutech.ac.jp/

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

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