



Activity report

UNISEC-Mongolia

Contents

- UNISEC-Mongolia – Point of contacts and partners
- About UNISEC-Mongolia
- Organized activities
- Other activities
- Discussion

UNISEC-Mongolia – Local chapters

National University of Mongolia (NUM) –
Prof. R. Tsolmon and Ass.Prof. D. Erdenebaatar



Mongolian University of Science and Technology (MUST)
Prof. D. Erdenebat



Mongolian University of Life Science
(MULS) – Prof. M. Tuvshinbayar



Mongolian National Defense
University (MNDU)



**ҮНДЭСНИЙ БАТААН
ХАМГААЛАХЫН ИХ СУРГУУЛЬ**
MONGOLIAN NATIONAL DEFENCE UNIVERSITY



Laboratories for Space science and Remote Sensing



Nanosatellite Development Laboratory

The associations for Space science and engineering in Mongolia

These organizations manages some activities related to space science and engineering for the kids, students and amateurs since 2018.

- TV program
- Podcasts
- Space science museum
- Training courses

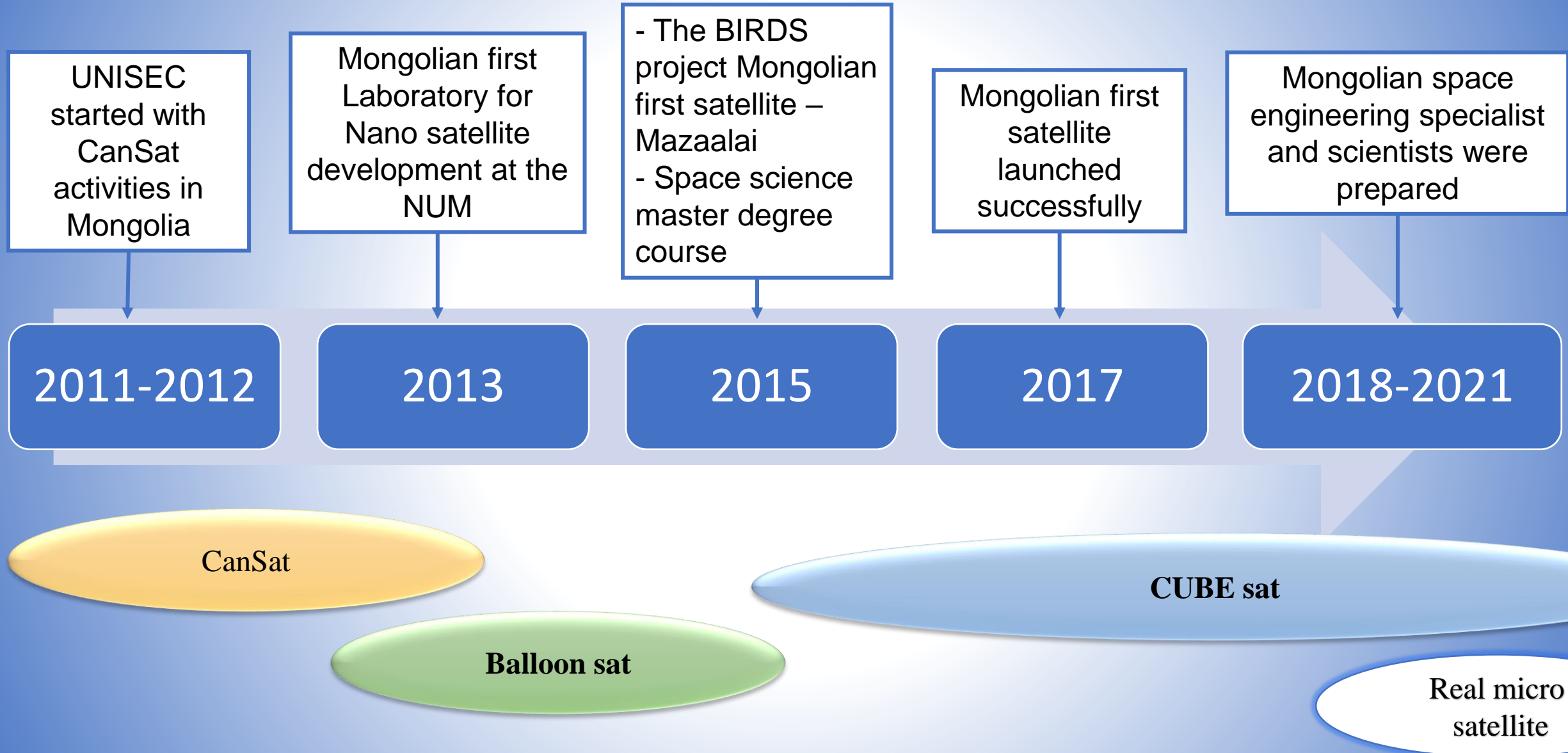


Mongolian Space
Technology Association



Mongolian Aerospace Research
and Science Association

UNISEC-Mongolia's timeline (highlight years)



2011-2012

2013

2015

2017

2018-2021

CLTP



Cansat Leader
Training Program

Graduates



Program



How to Apply

Contact

Links

CanSat – CLTP participants from Mongolia



Batmunkh

CLTP 2



Balt

CLTP 3



Begzsuren

CLTP 4



Margad-
Erdene

CLTP 5



Khash

CLTP 7



Baasandorj

CLTP 8



Jargalsaikhan

CLTP 9

- Participated CLTP2 since 2011 and 2012, 2013, 2014, 2016 and 2018

2011-2012

2013

2015

2017

2018-2021



*CanSat Leader Training
Program in Mongolia
since 2012
(every year)*



2011-2012

2013

2015

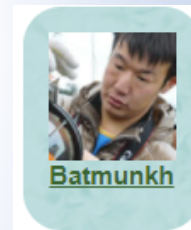
2017

2018-2021

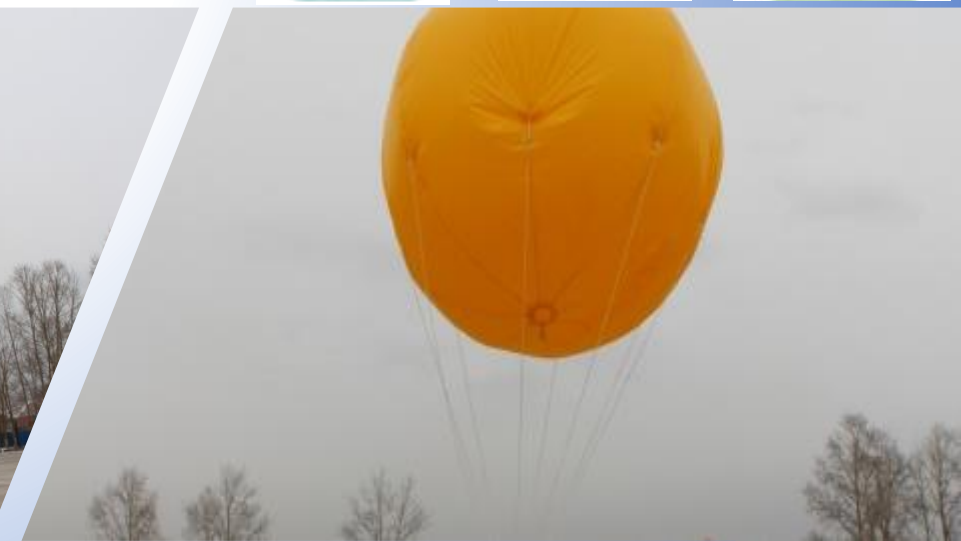


CANSAT LEADER TRAINING PROGRAM

CLTP 2,3,4 participants



TEAMS BALLOON TEST



2011-2012

2013

2015

2017

2018-2021



Mongolian Prime minister N. Altankhuyag

*Opening ceremony for
Nanosatellite
Development Laboratory
at the National University
of Mongolia
April 06, 2013*

First National CANSAT Competition since 2013 every year

<http://www.infomongolia.com/ct/ci/5830>

2011-2012

2013

2015

2017

2018-2021

Space science and engineering education



NUM-ITC-UNESCO for Space Science and Remote Sensing laboratory

Head of Laboratory: Prof. R. Tsolmon

- Established May 2003
- Graduate curriculums: Remote Sensing and Geographic Information system for master and PhD course (2005-2014)

Space Science master course (2015-now)

- Alumni numbers: 35 (2 PhD, 33 MSc)
- Current students: 30 (Doctorate 10, Master student 20)

Nanosatellite development laboratory

It was belonged from NUM-ITC-UNESCO Space Science and Remote sensing laboratory between 2013 to 2018.

From 2018, head of laboratory: Ass.prof. D. Erdenebaatar

- Established April 2013
- Research group working on Temuulel Cubesat satellite
- Space engineering bachelor and master course will be defined ...

2011-2012

2013

2015

2017

2018-2021

UNISEC-Mongolia's Challenge



To build capacity building for CubeSat and Microsatellite development

2011-2012

2013

2015

2017

2018-2021

Counterpart universities in Higher Engineering Education Development (M-JEED) Project (2015-2023)

Counterpart universities:



Space Systems
Engineering Course

Laboratories:

Laboratory of
Space Systems

Laboratory of Space
Utilization



Chiba University

Earth Science,
Graduate School of
Science

National Astronomical
Observatory of Japan
(NAOJ)



Space Engineering
International Course

Nanosatellite
Laboratories:



Project coordinator:

Prof. Dr. Tsolmon
Renchin
(2015-2018)

Ass.Prof.
Erdenebaatar
Dashdondog
(2018-2023)



2011-2012

2013

2015

2017

2018-2021

Capacity building in Space engineering under the MJEED project

- PhD – 2+3
- Master – 1
- Postdoc program – 7
- Visiting professors - 4



МОНГОЛЫН ИХ СУРГУУЛИУДЫН ХАМТАРСАН
АНХНЫ МИКРО ХИЙМЭЛ ДАГУУЛЫГ
ХӨӨРГӨХ АЖЛЫН ХҮРЭЭНД

LECTURE:
**Next-generation remote-sensing
with micro-satellite**

SPEAKER:
Prof. Yukihiro TAKAHASHI
(Department of Cosmo sciences, Hokkaido University)

Research areas:
Earth and Planetary Science
Professional Experience and Education

Director
Space Mission Center (SMC)
Creative Research Institution (CRIS)
Hokkaido University



Кюүшүгийн технологийн институт

- Проф Менгү Чо
- 8 сарын 30 – 9 сарын 5, 2015



Aug 31	Talk for Mongolian UNISEC University members Meeting with M-JEED project of NUM (Amarbayar san)
Sep 3	Meeting with NUM faculties and NUM staffs for MOU between NUM and Kyutech Meeting with NUM management Meeting with Mongolian students from Space related fields. Talk about Kyutech Space research and education Possible Interview for Mongolian students who interested to study in Japan for space engineering Visit NUM laboratories
Sep 4	Visit to MUST /in the morning/ meeting with MUST staff/ IIPTA Possible visit and meeting to space related government organizations



“Орчин үеийн сансар судлал”
сэдэвт лекц, семинар

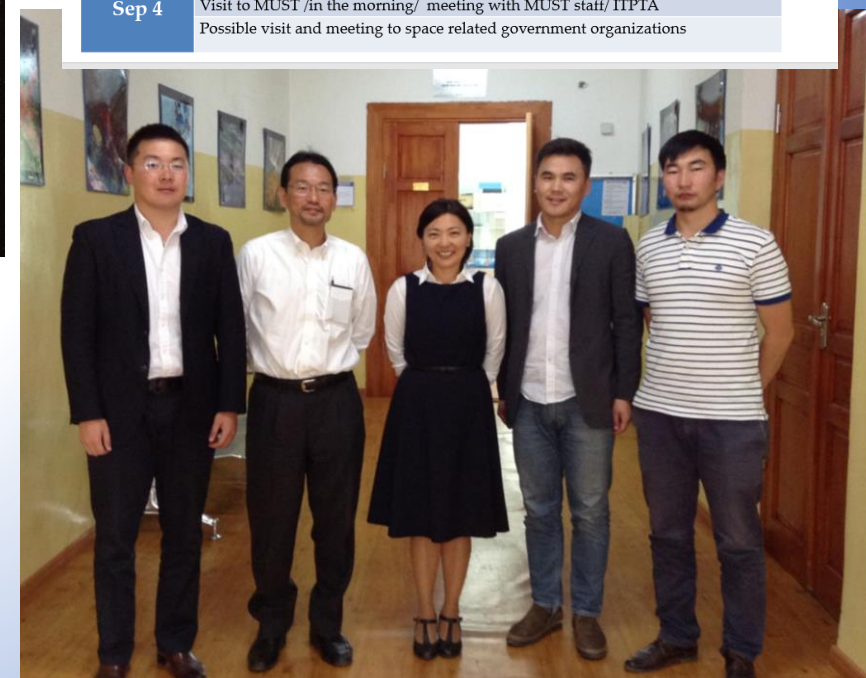
Prof. Hidehiko Agata
National Astronomical Observatory of Japan (NAOJ)

Prof. Kazuhiro Sekiguchi
National Astronomical Observatory of Japan (NAOJ)

Prof. Eiichiro Kokubo
National Astronomical Observatory of Japan (NAOJ)
Division of Theoretical Astronomy

Prof. Insung Yim
Korean Astronomy & Space science Institute (KASI)

Prof. Hong-Jin Yang
Korean Astronomy & Space science Institute (KASI)



2011-2012

2013

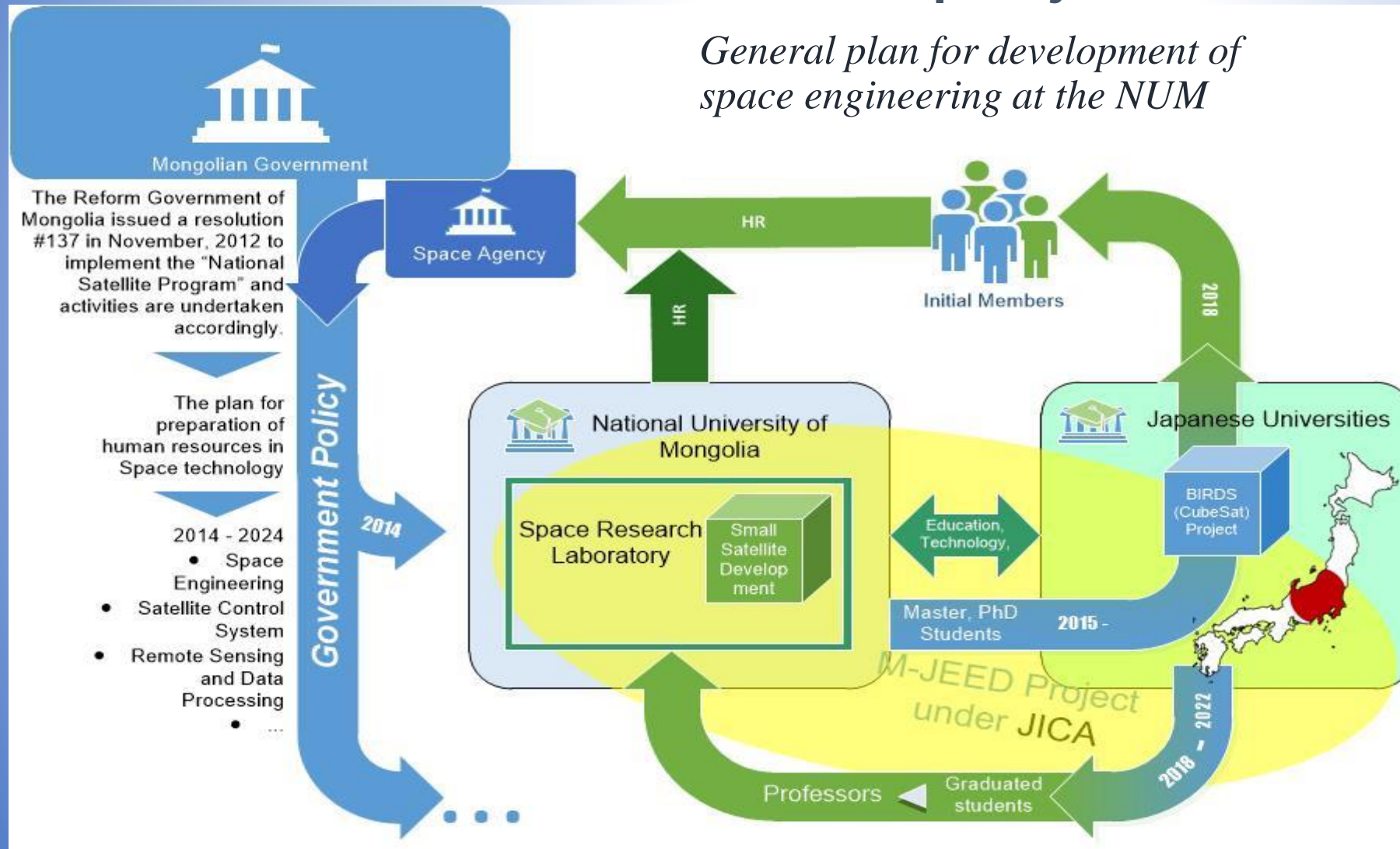
2015

2017

2018-2021

M-JEED & BIRDS projects

General plan for development of space engineering at the NUM



Prof. Dr. Tsolmon Renchin



Prof. Dr. Mengu Cho



At the National University of Mongolia

2011-2012

2013

2015

2017

2018-2021

The nations of the BIRDS-1 Project

Bangladesh



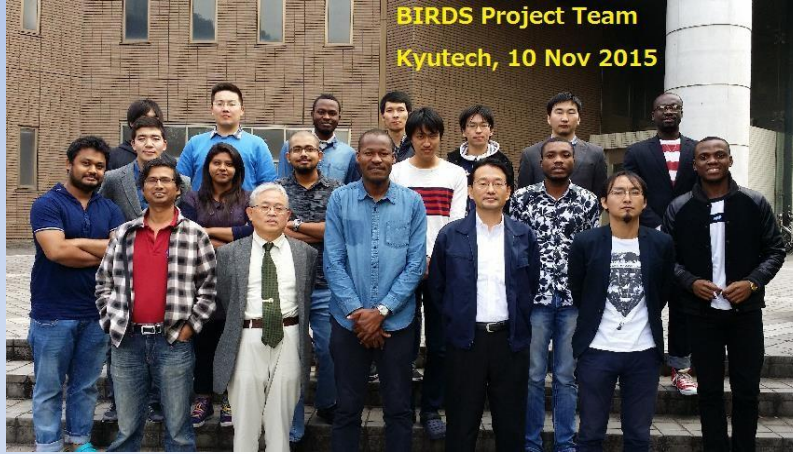
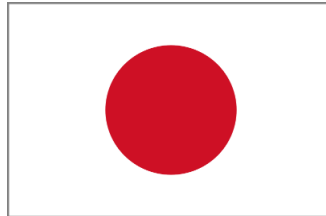
Nigeria



Mongolia



Ghana



Mongolian working group members
BIRDS-1 satellites were successfully launched
on launch site of Space-X11



During deployment in JAXA
July 7, 2017

2011-2012

2013

2015

2017

2018-2021



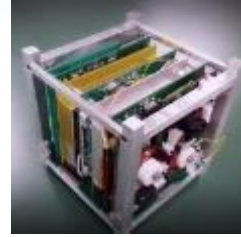
BIRDS-1 satellites timeline



2015.10

Start of
the project

PDR

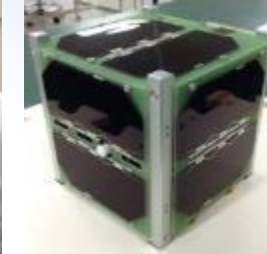


Engineering Model
development

EM



Flight Model Integration



FM



Deployment
from ISS

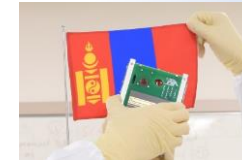
2017.07

2016.01
MDR

2016.06
CDR

2016.11

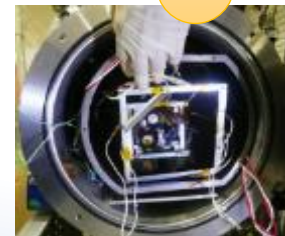
2017.02



Space environmental tests



BIRDS Workshop



Working with UNISEC-Global and the UN to implement *Space Engineering Capacity Building*



BIRDS-1

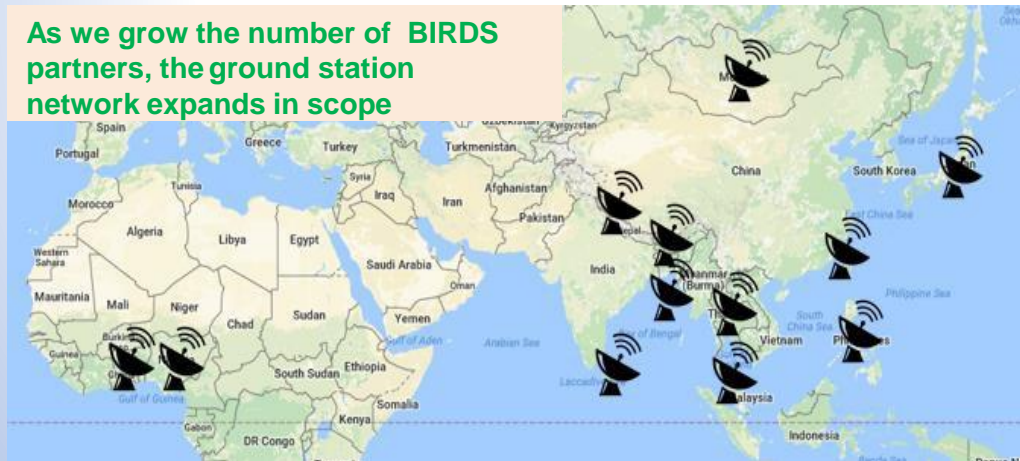
	Launch	Deployment	Participating countries
BIRDS-1 (5 sats)	summer of 2017 (3 June 2017)	summer of 2017 (7 July 2017)	Japan, Ghana, Mongolia, Nigeria, Bangladesh

BIRDS Mission Statement: Make the first step toward creating an indigenous space program by designing, building, testing, launching, and operating, the first satellite for participating nations.



Photo above: ISS deployment of BIRDS-1, CubeSats of Nigeria and Bangladesh, on 7 July 2017.

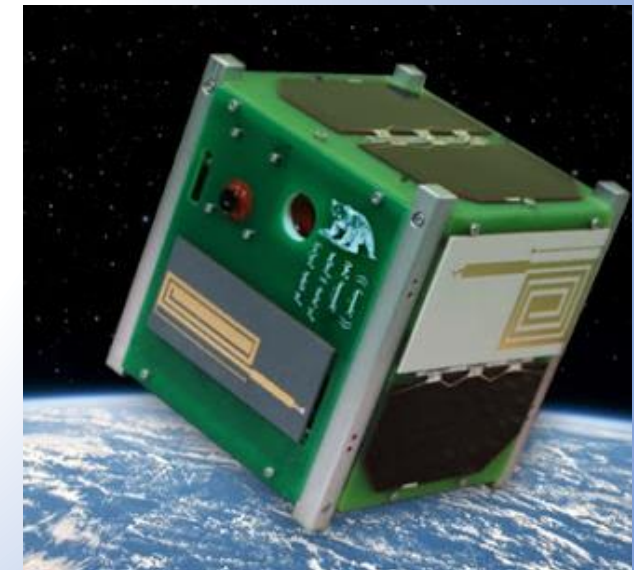
As we grow the number of BIRDS partners, the ground station network expands in scope



The BIRDS Ground Station Network

Archive of the "BIRDS Project Newsletter"

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



Mongolian CubeSat - Mazaalai

2011-2012

2013

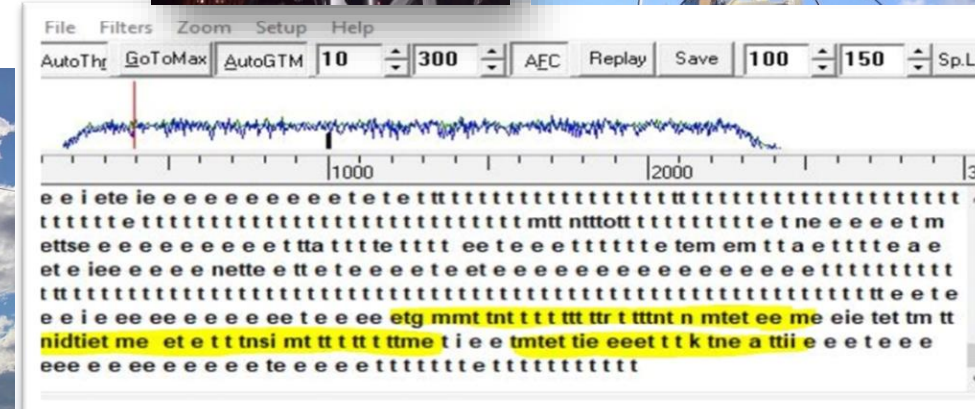
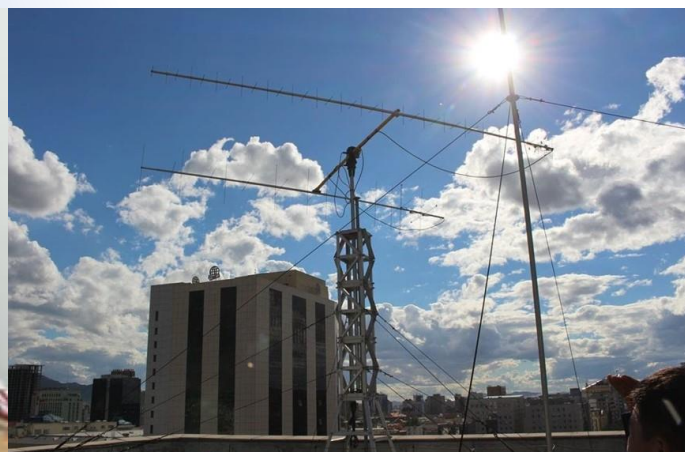
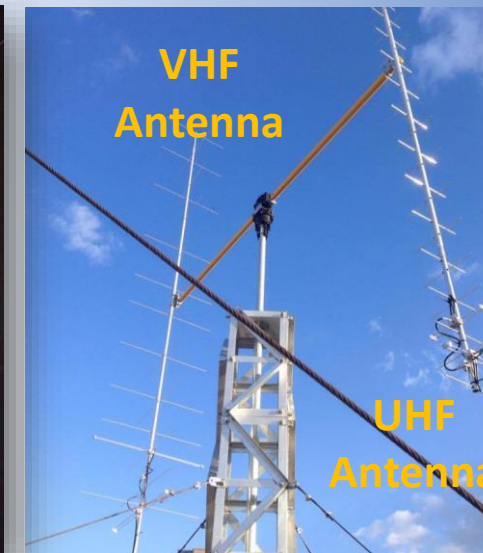
2015

2017

2018-2021



Ground Station Building



The first signal reception from AOBA-VELOX 3 satellite on 23rd of May 2017

2011-2012

2013

2015

2017

2018-2021

We organized the 3rd BIRDS International Workshop in Ulaanbaatar city 16-19 August, 2018



Participated countries:

Thailand	Japan
Ethiopia	Nigeria
Belgium	Ghana
Sri Lanka	Bangladesh
Costa Rica	Taiwan
Nepal	Malaysia
Bhutan	Philippine
Sudan	



2011-2012

2013

2015

2017

2018-2021



UNISEC-Mongolia meeting

2011-2012

2013

2015

2017

2018-2021

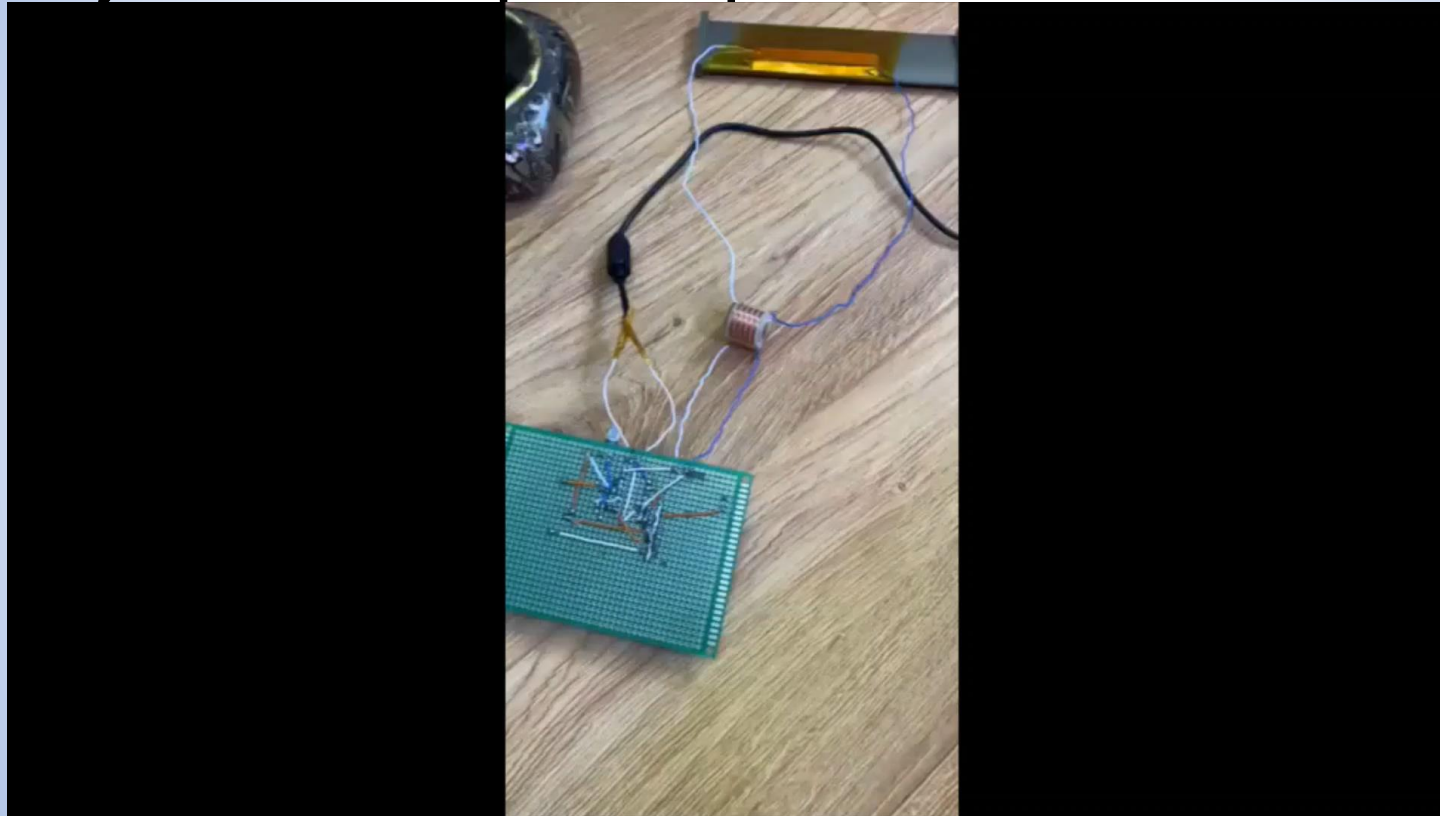
Smoke experiment on NACA 0015 airfoil

B. Baasandorj – CLTP9 participant



Mongolian
University of
Science and
Technology

Plasma actuator:



Plasma actuators are electrical devices that generate a wall bounded jet without the use of any moving parts. For aerodynamic applications they can be used as flow control devices to delay separation and augment lift on a wing. Since April 2021 they started activities on this field and could obtain plasma.

2011-2012

2013

2015

2017

2018-2021



The two master students participated the 1st Summer camp of the APSCO Student Small Satellite (SSS) project from the National University of Mongolia.



2011-2012

2013

2015

2017

2018-2021

"Women and Girls in Space Science"
Online lecture– 2021
On the event of International Women's Day

Presenters

R. Tsolmon
Professor, Space scientist,
National University of Mongolia

Ts. Sarantsetseg
Art of Living Mongolia
NGO, Doctor of medicine,
Amateur astronomer

B. Bayartungalag
PhD, Institute of Geography and Geo-ecology, Mongolian Academy of Science

N. Enkhjargal
PhD student, Ghent University, Belgium

A. Tsolmon
PhD student, Space science laboratory, National University of Mongolia

M. Zaya
PhD student, Chiba University, Japan

Topic

Blue dot (Earth)

About infinity

Giving the Mongolian name for the newly discovered star and planets

Earth's moon

Constellations

Space satellites

Date and time

March 5
20:10-21:00

MeetingID:
871 8715 0088
Passcode: 1008
<https://uws.zoom.us/j/87187150088?pwd=Z2x3S0xXaG8wUkZlTlZnREUlpQZz09>

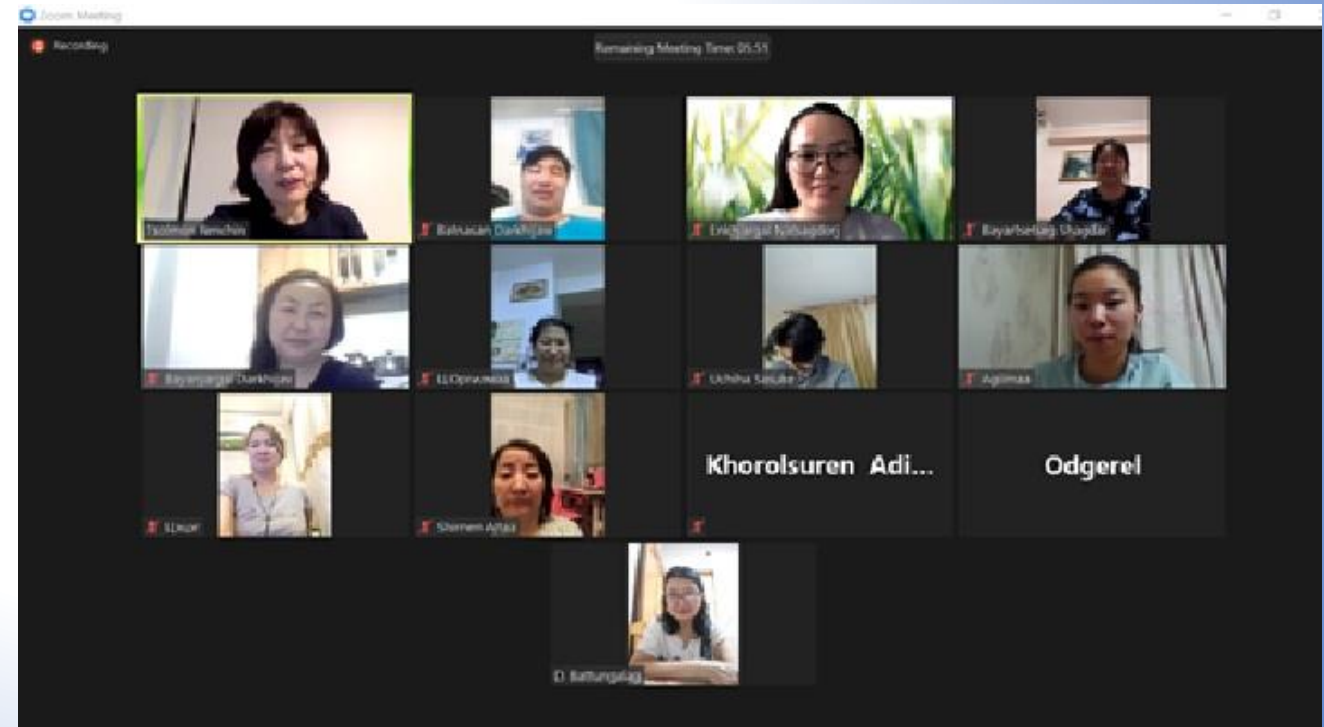
March 7
19:00 – 19:45

MeetingID:
761 6982 0836
Passcode: MfcQtw
<https://uws4web.zoom.us/j/76169820836?pwd=UDV3dnllFanhyOGp4TUlxcmR0ShBdz09>

March 8
14:00 – 14:45

MeetingID:
883 6709 4815
Passcode: w3MFN2
<https://uws4web.zoom.us/j/88367094815?pwd=OWp3SFZlN3RlTlZnREUlpQZz09>

Women in Space Science for the International Women's Day



2011-2012

2013

2015

2017

2018-2021

“Nanosatellite – New Possibility” business meeting



Prof. R. Tsolmon

Prof. D. Ulam-Orgikh



2019-06-04

The Mongolian team has announced the launch of its next satellite project, which named Temuulel, on the 2nd anniversary of the launch of the MAZAALAI satellite. Moreover, the results of the Mazaalai satellite project and further opportunities for satellite development, cooperation, and business proposals are also discussed on this meeting.

Logo of the “Temuulel”
project

Temuulel satellite
development team





Temuulel satellite project

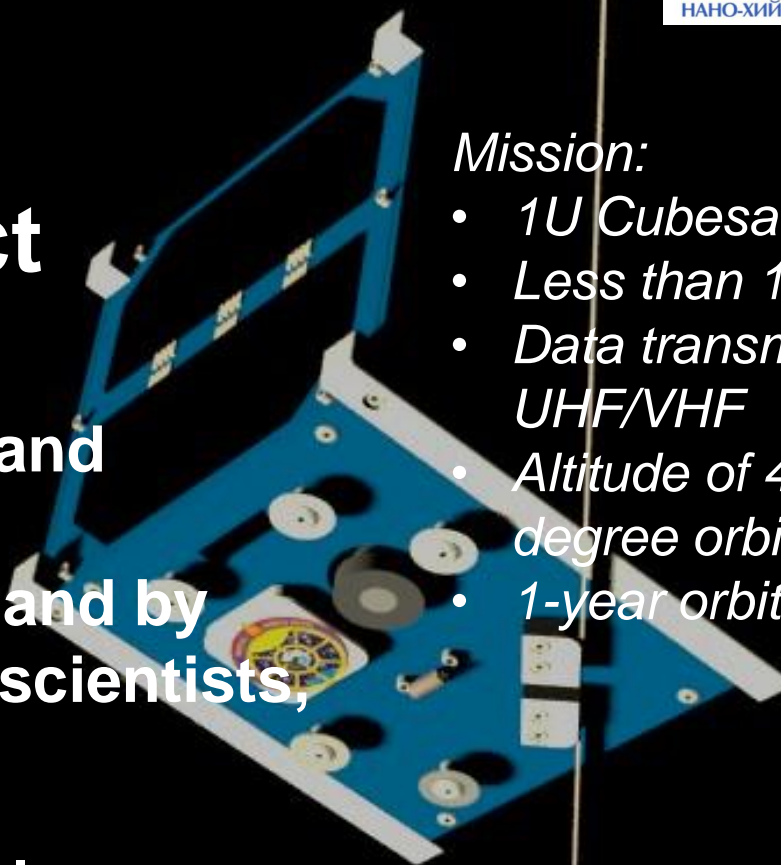
- A small satellite for scientific research and technology testing
- It will be the first satellite built in homeland by Mongolian engineers, researchers and scientists,

Development team

- Alumni from Kyushu institute of Technology
- Students who participated APSCOs SSS project summer school and short trainings

Mission:

- 1U Cubesat
- Less than 1.3 kg
- Data transmission with UHF/VHF
- Altitude of 400km and 51-degree orbital inclination
- 1-year orbital lifetime



2011-2012

2013

2015

2017

2018-2021



“CanSat” national competition

2020-01-15

An orientation training was organized for the 5th CANSAT national competition, which aims to provide space technology knowledge and education through a real project under the motto “Let's challenge ourselves”. In addition to 12 teams from 9 domestic universities, 15 teams from 3 amateur clubs are participating in the Fifth National Competition.



2011-2012

2013

2015

2017

2018-2021



“CanSat” orientation training



Participating universities and teams



MAKEUPACE

Mission №1



- ✓ КАНСАТ-ын даалгаврыг багууд өөрсдөө тодорхойлно.
- ✓ Цойлуураас салснаас хойш (агаарт байхдаа) даалгавар гүйцэтгэж эхэлнэ
- ✓ Эвдрэлгүй газардах ёстой
- ✓ 330мл лааз (115мм-ийн өндөртэй, 66 мм-ийн диаметртэй, 350gr)
- ✓ Шүхэр (70мм өндөртэй, 66мм-ийн диаметртэй цилиндр, 150gr.)

Traditional CanSat

Mission №2



- ✓ Өгөгдсөн цэгт хүний оролцоогүйгээр өөрөө явж очих ёстой
- ✓ Богино хугацаанд, хамгийн ойрхон очсон баг хамгийн өндөр оноо авна
- ✓ Цойлуураас салснаас хойш даалгавар гүйцэтгэж эхэлнэ. Газарт буусны дараа ч даалгавар эхэлж болно.
- ✓ Эвдрэлгүй газардах ёстой
- ✓ 230мм –ийн өндөртэй, 130 мм –ийн диаметртэй цилиндрт багтах хэмжээтэй. 1кг-аас хэтрэхгүй жинтэй

Rover

Final competition organized in the summer

Totally, 27 teams participated for the competition.



2011-2012

2013

2015

2017

2018-2021



CanSat orientation training

2020-01-24

E.Usukhbayar, a master's student at Beihang University in China, gave a training to the participants of the CanSat 2020 competition to guide them on the features, tasks, CanSat structure and his personal experience of the previous CanSat competitions .



2011-2012

2013

2015

2017

2018-2021

Other activities



MARS-V
#04
**MARS-V
PODCAST**

21th December 2020
From 20 PM

Шатарын
НАНДИН-ЭРДЭНЭ
MARS-V төслийн
гадаад харилцааны
багийн гишүүн

Ренчингийн
ЦОЛМОН
Доктор профессор, МУИС,
Физикийн тэнхим, Сансар
судлалын лаборатори

Гинжбаатарын
АМГАЛАНБАЯР
MARS-V төслийн
Гүйцэтгэх захирал

WWW.MARS-V.COM



MARS
ON
EARTH
INTERNATIONAL CONFERENCE

13 NOVEMBER
ULAANBAATAR, MONGOLIA

2011-2012

2013

2015

2017

2018-2021

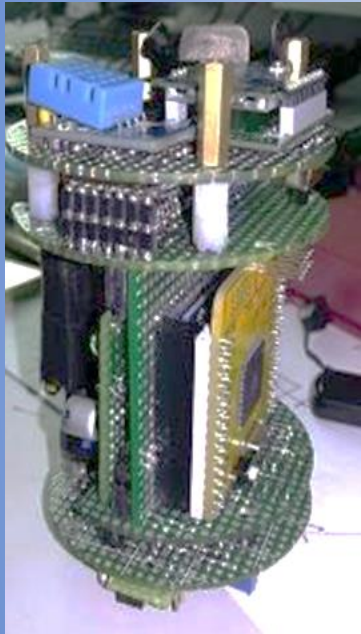
2021-03-22



Oyun-Erdene. L, PM of Mongolia, NSDL of NUM team to discuss Mongolian Space Science and Technology Development and further possibilities

Plan for Space engineering development in Mongolia

Cansat ➡ PhoneSat ➡ Cube Satellite ➡ Micro Satellite



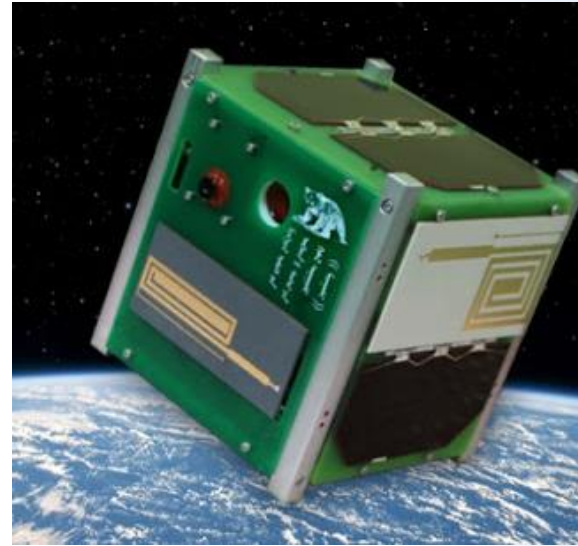
2013-2014

Undergraduate
students



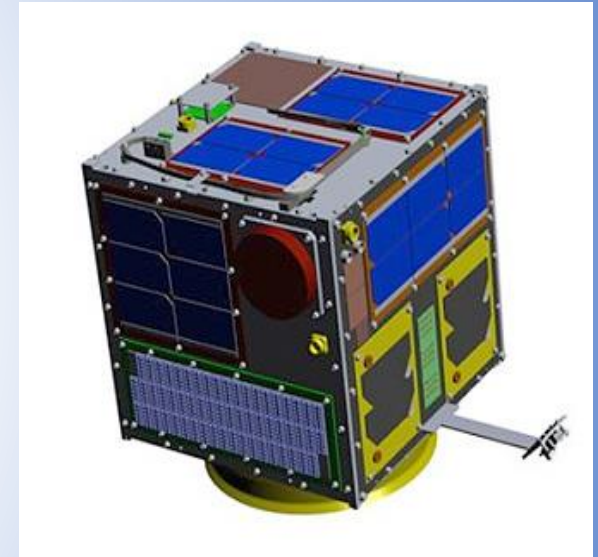
2014-2015

Graduate
students



2015-2021

Graduate students
& Researchers



2021-202x

Specialists &
Researchers

BENEFITS

The applications of Micro/Nano Satellites can be implemented to explore every possible regions for hidden natural resources.

- Capacity building development in Space technology
- Real-time monitoring and preventing system for natural disasters like steppe and forest fires, thunder storms, dust storms etc.
- Long term forecasting of regional climate, like dzud disaster, desertification, drought etc.
- Education and increase public awareness of space science
- Exploration of Resources and Agriculture Support

Discussion

- ❖ To build human resources on space engineering
 - ❖ short and long term training
 - ❖ degree program for space engineering for bachelor and master
- ❖ To enhance our tools and laboratories
- ❖ To build Cubesat / Nanosatellite technology in Mongolia
- ❖ To develop the National/ International programs on training, degree programs, competition, workshops, international symposium and cooperation so on.

Thank you so much for your attention!