



# Activity report

# UNISEC-Mongolia

B. Tamir; Prof.R.Tsolmon  
NUM-ITC-UNESCO Space Science and Remote  
sensing laboratory

# 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 БАТЛАН  
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

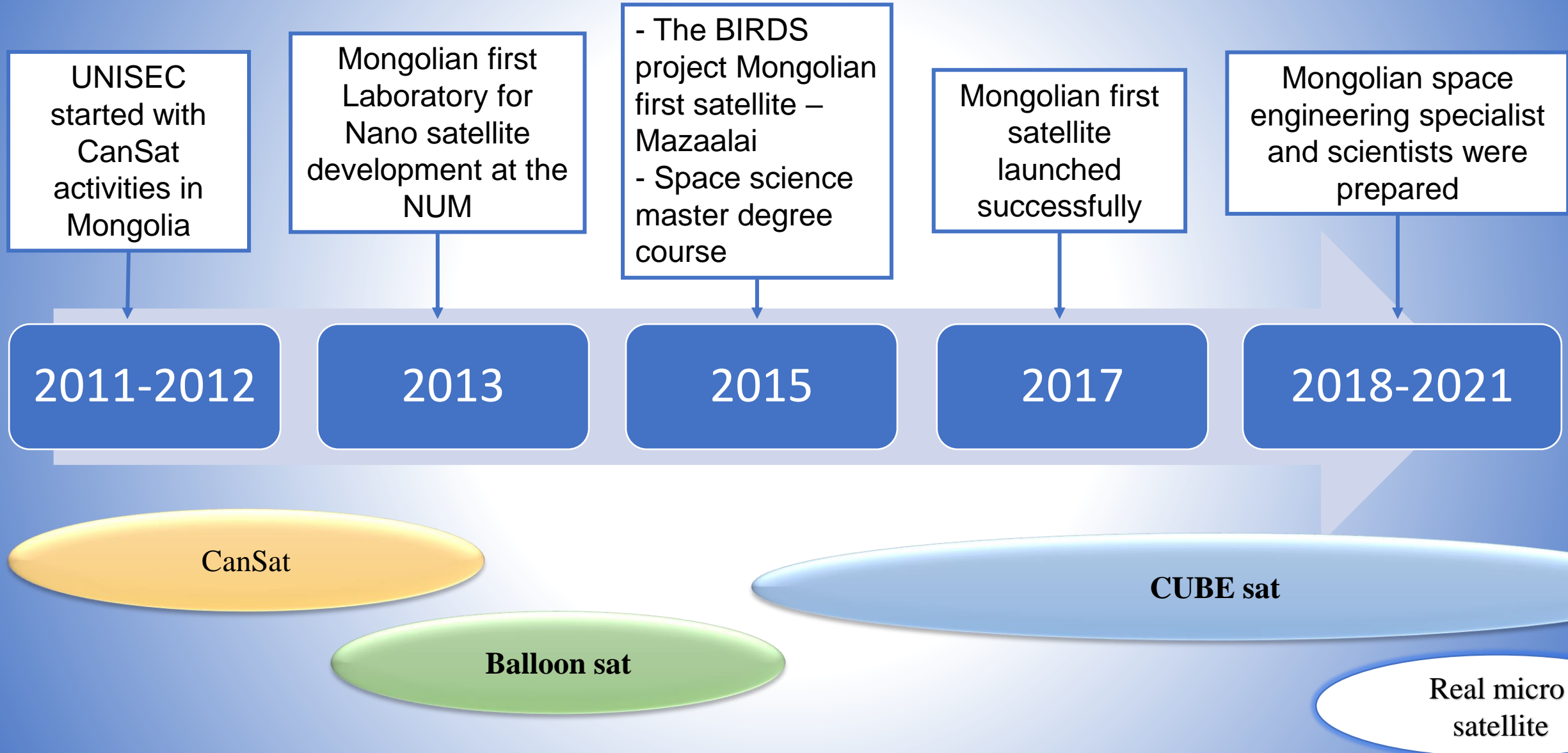
The logo for MOSTA (Mongolian Space Technology Association) features the word "MOSTA" in a bold, blue, sans-serif font. The letter "O" is replaced by a stylized white rocket or satellite component with a blue orbital path around it.

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



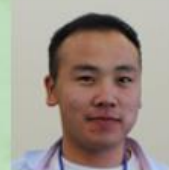
Begzsuren

CLTP 4



Margad-  
Erdene

CLTP 5



Khash

CLTP 7



Baasandorj

CLTP 9



Jargalsaikhan

- Participated CLTP2 since 2011 and 2012, 2013, 2014, 2016, 2018 and 2022

2011-2012

2013

2015

2017

2018-2021



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



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

2018-2023

# 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 CosmoSciences, 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

БОЛОВСРОЛ, СӨД, ШИНЖЛЭХ УХААН, СПОРТЫН ЯАМ  
"ИНЖЕНЕР ТЕХНОЛОГИЙН ДЭЭД БОЛОВСРОЛ" ТӨСӨЛ

M-JEED 100% ENGINEERS

JICA

МУИС, ШИНЖЛЭХ УХААНЫ СУРГУУЛЬ, "САНСРЫН ИНЖЕНЕРЧЛЭЛИЙН ПРОГРАМ ТҮҮНИЙ ХЭРЭГ, ТЭЭ ТӨСӨЛ"-ИЙН БАГ

国立天文台  
NAOJ  
National Astronomical Observatory of Japan

"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

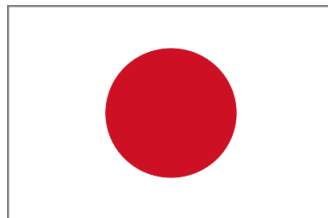
2018-2023

# 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

2018-2023



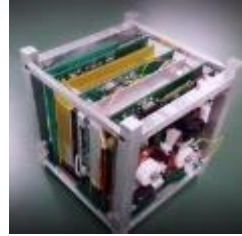
# BIRDS-1 satellites timeline



2015.10

Start of the project

PDR

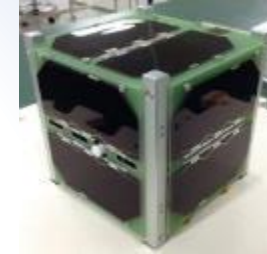


Engineering Model development

EM



Flight Model Integration



FM



Deployment from ISS

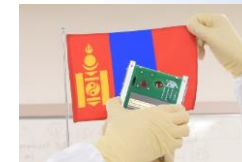
2017.07

2016.11

2017.02

2016.01  
MDR

2016.06  
CDR



Space environmental tests



BIRDS Workshop



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



**BIRDS-1**

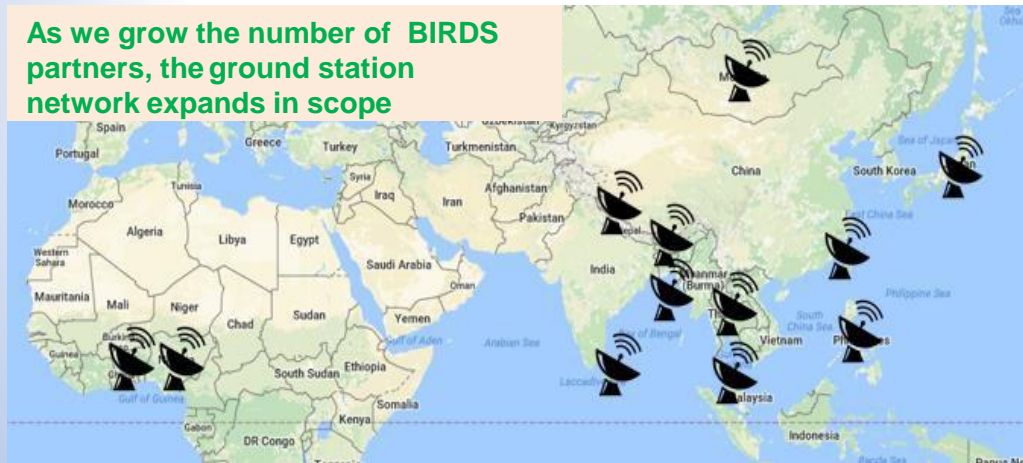
	Launch	Deployment	Participating countries
BIRDS-1 (5 sats)	summer of 2017 (3 June 2017)	summer of 2017 (7 July 2017)	Japan, Ghana, Mongolia, Nigeria, Bangladesh

**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.



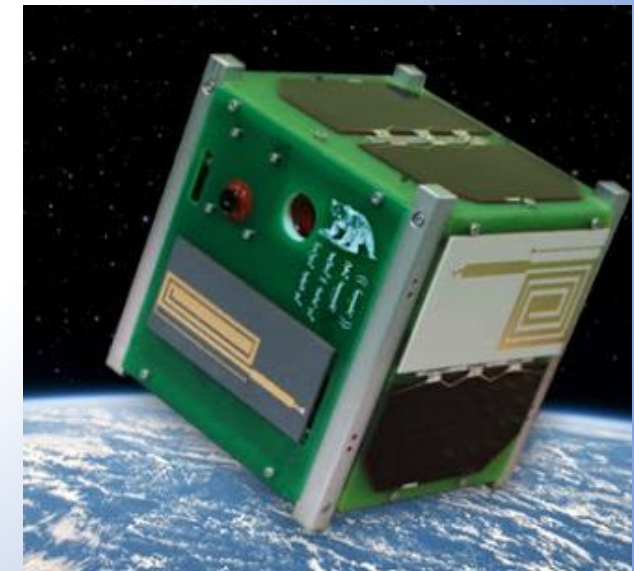
Photo above: ISS deployment of BIRDS-1, CubeSats of Nigeria and Bangladesh, on 7 July 2017.

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

2018-2023

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



**Participated countries:**

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



2011-2012

2013

2015

2017

2018-2023



# UNISEC-Mongolia meeting

2011-2012

2013

2015

2017

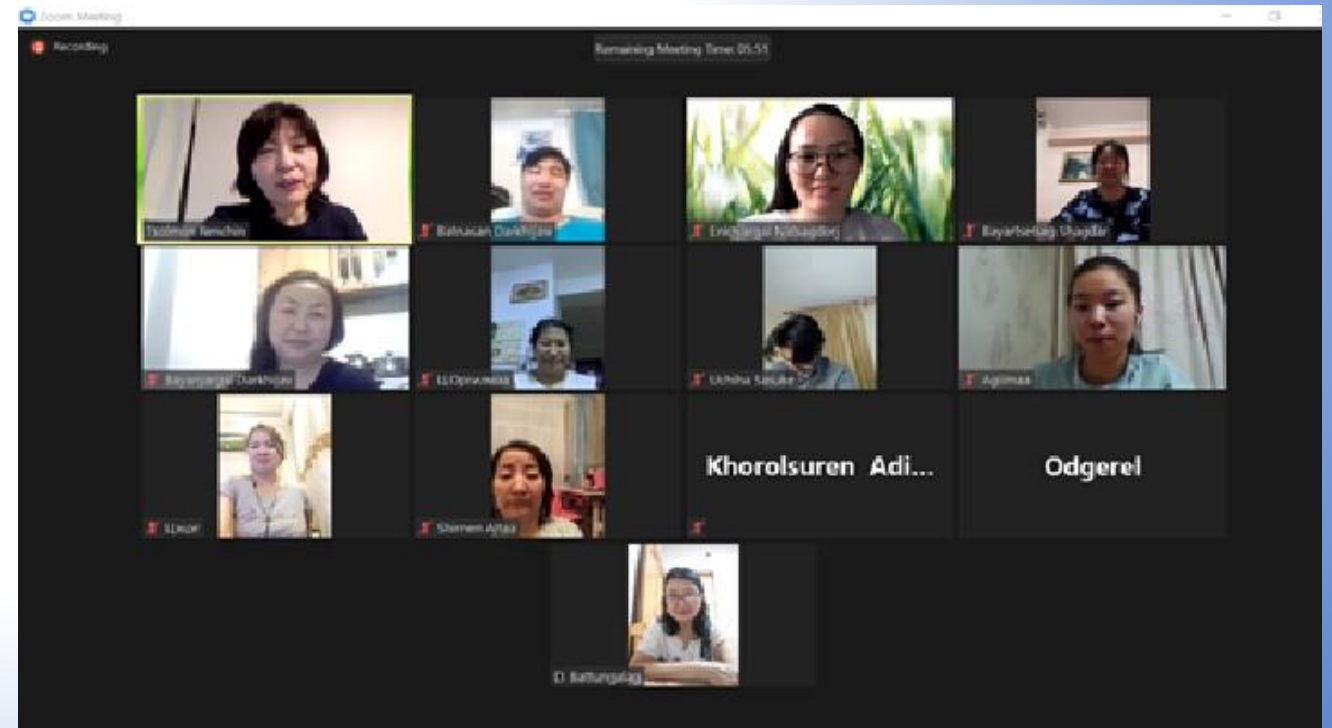
2018-2023

**“Women and Girls in Space Science”  
Online lecture– 2021**  
On the event of International Women’s Day



<u>Presenters</u>	<u>Topic</u>	<u>Date and time</u>
 <b>R. Tsolmon</b> Professor, Space scientist, National University of Mongolia	<b>Blue dot (Earth)</b>	March 5 20:10-21:00  MeetingID: 871 8715 0088 Passcode: 1008  <a href="https://uws.zoom.us/j/87187150088?pwd=Z2eXSOxXeG8wUkZlTlE1ZnREUlpQZz09">https://uws.zoom.us/j/87187150088?pwd=Z2eXSOxXeG8wUkZlTlE1ZnREUlpQZz09</a>
 <b>Ts. Sarantsetseg</b> Art of Living Mongolia NGO, Doctor of medicine, Amateur astronomer	<b>About infinity</b>	March 7 19:00 – 19:45  MeetingID: 761 6982 0836 Passcode: MfcQtw  <a href="https://uws4web.zoom.us/j/76169820836?pwd=UDV3dnlFanhvOEp4TUx0cmR0SihBdz09">https://uws4web.zoom.us/j/76169820836?pwd=UDV3dnlFanhvOEp4TUx0cmR0SihBdz09</a>
 <b>B. Bayartungalag</b> PhD, Institute of Geography and Geo-ecology, Mongolian Academy of Science	<b>Giving the Mongolian name for the newly discovered star and planets</b>	March 8 14:00 – 14:45  MeetingID: 883 6709 4815 Passcode: w3MFN2  <a href="https://uws4web.zoom.us/j/88367094815?pwd=OWp0SFZrN3RCUkE1ZnREUlpQZz09">https://uws4web.zoom.us/j/88367094815?pwd=OWp0SFZrN3RCUkE1ZnREUlpQZz09</a>
 <b>N. Enkhjargal</b> PhD student, Ghent University, Belgium	<b>Earth’s moon</b>	
 <b>A. Tsolmon</b> PhD student, Space science laboratory, National University of Mongolia	<b>Constellations</b>	
 <b>M. Zaya</b> PhD student, Chiba University, Japan	<b>Space satellites</b>	

# 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







## Temuulei satellite project

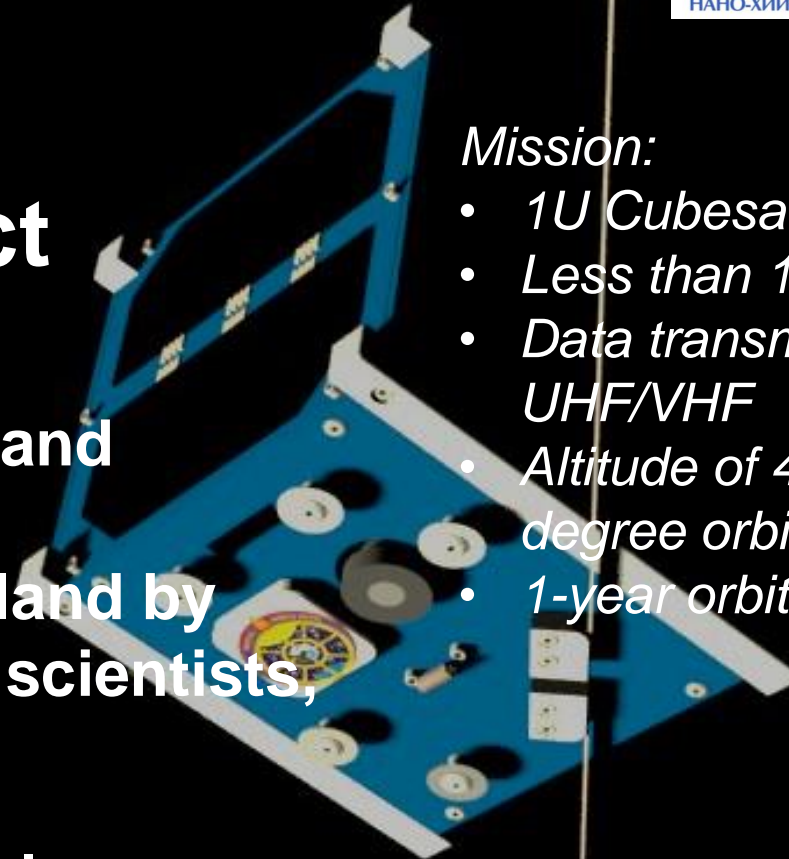
- A small satellite for scientific research and technology testing
- It will be the first satellite built in homeland by Mongolian engineers, researchers and scientists,

### 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

2018-2023



# “CanSat” orientation training



## 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, 350гр)
- ✓ Шүхэр (70мм өндөртэй, 66мм-ийн диаметртэй цилиндр, 150гр.)

## Traditional CanSat

## Mission №2



- ✓ Өгөгдсөн цэгт хүний оролцоогүйгээр өөрөө явж очиж 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.

## Participating universities and teams



# MAKEUPACE

2011-2012

2013

2015

2017

2018-2023



# 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

2018-2023

# 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

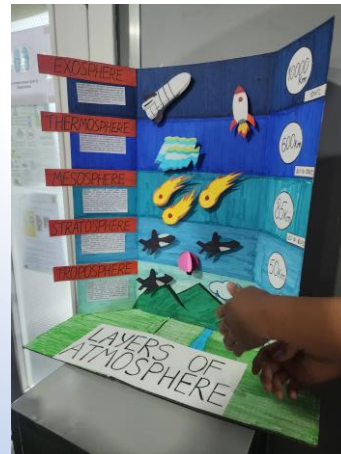
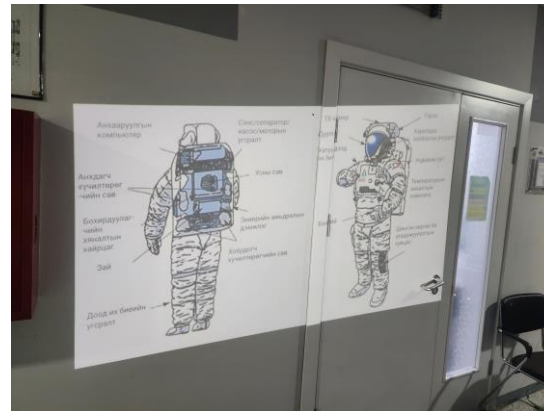
2015

2017

2018-2023

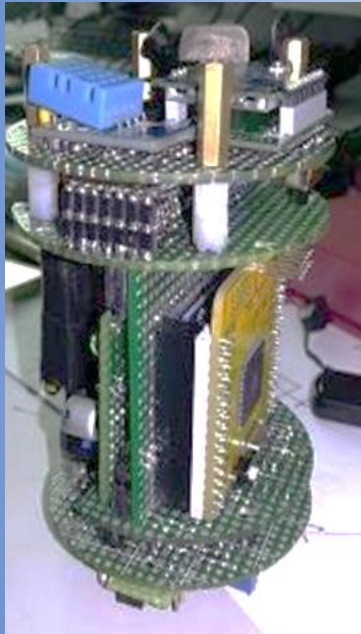
## Promotion of natural sciences and astronomy to the public

- The work was organized monthly among students and students.
- 50 to 80 students participated in each event.



# Plan for Space engineering development in Mongolia

Cansat → PhoneSat → Cube Satellite → Micro Satellite



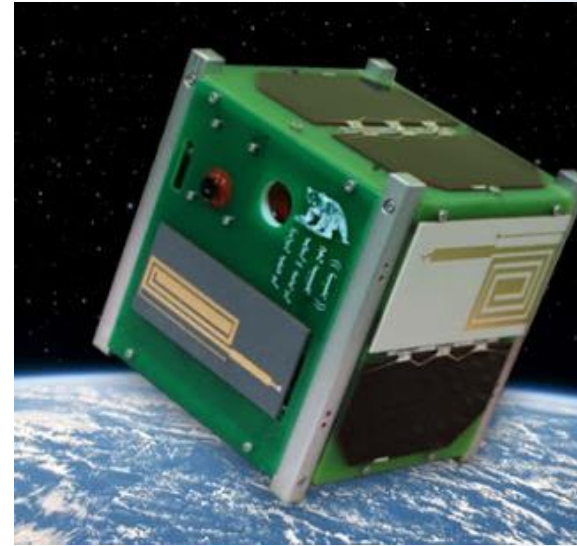
2013-2014

Undergraduate  
students



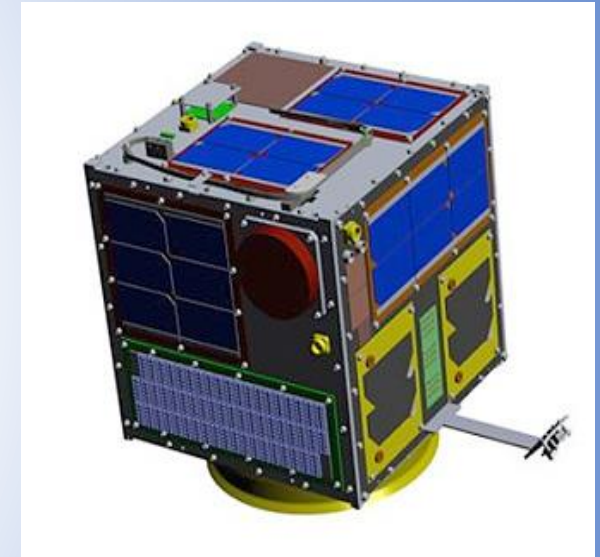
2014-2015

Graduate  
students



2015-2021

Graduate students  
& Researchers



2021-202x

Specialists &  
Researchers

2011-2012

2013

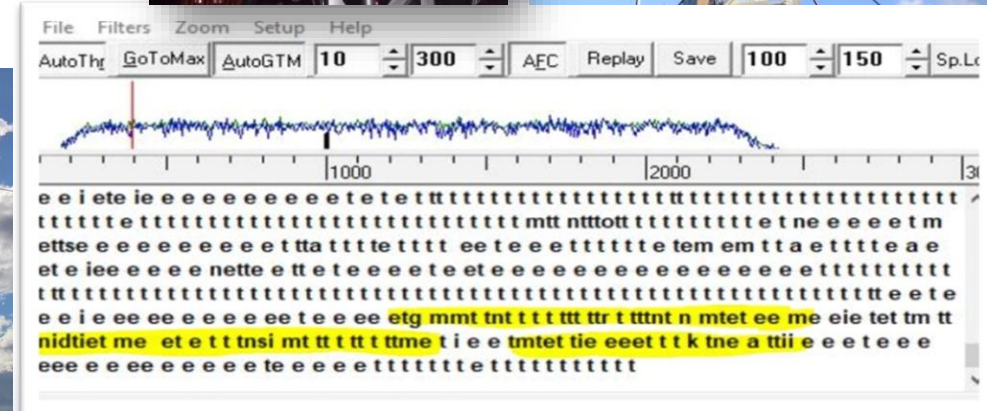
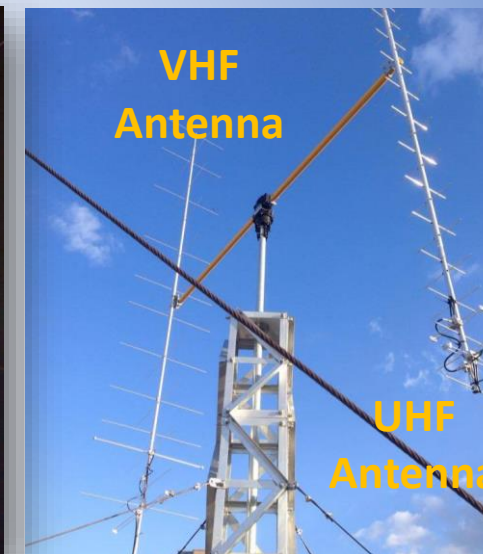
2015

2017

2018-2023



# Ground Station Building



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

2011-2012

2013

2015

2017

2018-2023

# The ongoing issue (winter 2024)

- the winter
- Temperature



- Snowstorm
- Currently not operational.



2011-2012

2013

2015

2017

2018-2023

# Status of other equipment

Other Devices are working normally



Thank you so much for your attention!