1st IAA NORTH EAST ASIA SYMPOSIUM ON SMALL SATELLITES

Final Program as active version

August 21 – 23, 2017
The Best Western Premier Tuushin Hotel
ULAANBAATAR, MONGOLIA

International Academy of Astronautics

Supported and hosted by

Mongolian Society of Photogrammetry and Remote Sensing (MSPRS)

MONMAP LLC
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Meirbek Moldabekov (Kazcosmos, Kazakhstan)
Zaire Rakisheva (Kaznu, Kazakhstan)
Yuei-An Liou (National Central Univ – Taiwan)
AGENDA

Sunday, August 20, 2017

16:00 – 19:00 Registration at 5th floor, Soyombo Hall, The Best Western Premier Tuushin Hotel

19:00 – 20:00 Ice Break

Monday, August 21, 2017

08:00 – 09:00 Registration at 5th floor, Soyombo Hall, The Best Western Premier Tuushin Hotel

09:00 – 09:30 Opening:
   Prof. G. Chuluunbaatar
   Minister of Education, Culture, Science and Sports (MECSS)

   Dr. R.Sandau
   Technical Director, Satellite and Space Applications of IAA

   Prof. D.Regdel
   President of Mongolian Academy of Science

09:30 – 10:30 Keynote Session

10:30 – 10:50 Tea Break

10:50 – 11:50 Keynote session
11:50 – 12:30 Opening the Exhibition

12:30 – 13:30 Lunch Break

13:30 – 15:00 Session 01: Worldwide Achievements
   Chair:
   Peter Martinez, UN COPUOS, South Africa

15:00 – 15:20 Tea Break

15:20 – 16:40 Panel 1: Benefits of small satellites
   Moderator: Rene Laufer, Baylor University, USA

16:40 – 17:40 Exhibition (Commercial presentations)
**Tuesday, August 22, 2017**

09:00 – 10:30 **Session 02: International Endeavours**  
*Chair:*  
Rene Laufer, Baylor University, USA

10:30 – 10:50 Tea Break

10:50 – 12:30 **Session 03: Mission of NEA**  
*Chair:*  
Igor V. Belokonov, Samara State Aerospace University, Russia

12:30 – 13:30 Lunch Break

13:30 – 15:00 **Session 04: Small Satellite Technology 1**  
*Chair:*  
Alex da Silva Curiel, SSTL, UK

15:00 – 15:20 Tea Break

15:20 – 16:40 **Session 05: Application Studies for the Region**  
*Chair:*  
Saandari Mijiddorj, MonMap, Mongolia

16:40 – 17:40 Poster Session and Exhibition (Commercial Presentation)

18:00 – 20:00 Exhibition cocktail

**Wednesday, August 23, 2017**

09:00 – 10:30 **Session 06: Small Satellite Technologies 2**  
*Chair:*  
Toshinori Kuwahara, Tohoku University, Japan

10:30 – 10:50 Tea Break

10:50 – 12:30 **Session 07: University Projects**  
*Chair:*  
Rei Kawashima, UNISEC-Global, Japan

12:30 – 13:30 Lunch Break

13:30 – 15:00 **Panel 2: Benefits of small satellites for the Region**  
Moderator: T Christian Heipke, ISPRS, Germany

Closing the Exhibition

15:00 – 15:20 Tea Break
15:20 – 16:40 Closing and approval of the conference declaration

*Honorary chairman:* D. Regdel, Mongolian Academy of Science

*Chairmen:* R. Sandau, IAA, France, M. Saandar, MSPRS, Mongolia

*General Rapporteur:* Rene Laufer, Baylor University, USA

16:40 – 17:40 Visit to the Soviet - Mongolian Joint Space Flight History Museum

18:00 – 21:00 Reception with Mongolian folklore and music at the Space History Museum

**Thursday, August 24, 2017**

10:00 – 12:00 Visit to the Student Satellite Laboratory, the National University of Mongolia

Sightseeing country side trip
Technical Program

Keynote Session: Monday, August 21, 2017, 9:30 – 10:30, 10:50 – 11:50

Rainer Sandau, IAA, France

The IAA at the forefront of small satellite activities

Rene Laufer, Baylor University, USA

Small Satellites – A Global Perspective

Peter Martinez, UN COPUOS, South Africa

Preserving the long-term sustainability of outer space activities

Christian Heipke, ISPRS, Germany

Satellite image processing – an overview with applications


Chair: Peter Martinez, UN COPUOS, South Africa

Small Satellites, Big Opportunities
Alex da Silva Curiel, Kasia Wisniewska, Vince Nsengumuremyi, Andrew Cawthorne, Prof. Guiglielmo Aglietti, Prof. Sir Martin Sweeting, SSTL, UK

IAA-NEA-0101

Coordinated operations of small satellites targeted to Earth Observation
Giovanni B. Palmerini, Scuola di Ingegneria Aerospaziale, Sapienza Universita di Roma, Italy

IAA-NEA-0102

The DLR Microsatellite Development Line
Winfried Halle, Rainer Sandau, Thomas Terzibaschian, Wolfgang Bärwald, Christian Schultz, Matthias Hetscher, German Aerospace Center – DLR, Germany

Analysis of mini-magnetospheric plasma propulsion for small earth observation satellite
Harijono Djojodihardjo, The Institute for the Advancement of Aerospace Science and Technology, Indonesia

IAA-NEA-0103

IAA-NEA-0104

Panel 1: Benefits of small satellites Monday, August 21, 2017, 15:20 – 16:40

Moderator: Rene Laufer, Baylor University, USA

Panelists:
Rainer Sandau, IAA, France,
Peter Martinez, UN COPUOS, South Africa
Christian Heipke, ISPRS, Germany
Rei Kawashima, UNISEC-Global, Japan
Alex da Silva Curiel, SSTL, UK
Session 02: International Endeavours  
Tuesday, August 22, 2017, 09:00 – 10:30

Chair: Rene Laufer, Baylor University, USA

The development of space policy in an emerging space nation - the South African experience  
Peter Martinez, UN COPUOS, South Africa  
IAA-NEA-0201

ISPRS - the International Society for Photogrammetry and Remote Sensing and its programme for 2016 - 2020  
Christian Heipke, Leibniz University, Hannover, Germany  
IAA-NEA-0202

Introduction to UNISEC-Global  
Rei Kawashima, UNISEC-Global, Japan  
IAA-NEA-0203

The importance of information interrelation  
Can Unlusoy, Erdene Namjilmaa, Navid Alaee, York University, Canada  
IAA-NEA-0204

Session 03: Mission of NEA  
Tuesday, August 22, 2017, 10:50 – 12:30

Chair: Igor V. Belokonov, Samara State University, Russia

Dimensional Stability Analysis of high performance compact satellite SpaceEye-X  
Eundeok Bae, Satreci, South Korea  
IAA-NEA-0301

Mongolian first satellite and possibility to develop space technology in Mongolia  
Erdenebaatar Dashdondog, Turtogtokh Tumenjargal, Amartuvshin Dagvasumberel, Ulam-Orgikh Duger, Suvdantsetseg Balt, Tsoilmon Renchin, Mengu Cho, National University of Mongolia, Mongolia  
IAA-NEA-0302

Design Policy of Micro Satellite (In case of On-demand Micro Satellite with X-band SAR)  
Kei-ichi Hirako, Seiko Shirasaka, Toshihiro Obata, Shin-ichi Nakasuka, Ken-ichi Anma, Shinobu Nakamura, Takeshi Tohara, Keio University of Japan, Japan  
IAA-NEA-0303

Small Remote Sensing Satellites based on HT-100 and HT-500 platforms in Russia  
M.F.Reshetnev, Information Satellite Systems Ltd, Russia  
IAA-NEA-0304
Session 04: Small Satellite Technology 1  Tuesday, August 22, 2017, 13:30 – 15:00

Chair: Alex da Silva Curiel, SSTL, UK

The BIROS satellite: New Technologies for improvement of small satellite performance
Matthias Hetscher, Winfried Halle, Ekkehard Lorenz, Axel Lauterbach, Christian Raschke and Wolfgang Bärwald, German Aerospace Center – DLR, Germany

Microsatellite bus system Technologies of Tohoku University
Toshinori Kuwahara, Yuji Sakamoto, Shinya Fujita, Yuji Sato, Ryo Taba, Hiroto Katagiri, Masafumi Endo, Kazuya Yoshida, Tohoku University of Japan, Japan

Development and research 3D-track gas detector for the analysis of space radiations in low orbits by means of nanosatellites
O.V. Phylonin, I.V. Belokonov, M.A. Petrov, K.S. Nasonov, Samara National Research University, Russia

Safety assessment and verification results for Micro and Nano Satellites with deployable mechanism
Yuji Sakamoto, Shinya Fujita, Toshinori Kuwahara, Kazuya Yoshida, Department of Aerospace Engineering, Tohoku University, Japan

Session 05: Application Studies for the Region. Tuesday, August 22, 2017, 15:20 – 16:40

Chair: Saandar Mijiddorj, MonMap LLC, Mongolia

Spectro-polarimetric BRDF measurement and optical model of green leaves with chlorophyll concentration
Begzsuren Tumendemberel, Yukihiro Takahashi, Tetsuro Ishida, Ade Purwanto, Junichi Kurihara, Hokkaido University, Japan

Application of multi-satellite data for crop growth status in Tuv province of Mongolia
Ts. Enkhzaya, D. Ichikawa, K. Wakamori, Mongolian University of Life Sciences, Mongolia

Agricultural crop growth monitoring and field management by using multi-satellite data
K. Wakamori, D. Ichikawa, Japan Manned Space Systems Corporation, Japan

Multi-satellite data processing for agriculture production and management in Mongolia
D. Ichikawa, K. Wakamori, Japan Manned Space Systems Corporation, Japan

National Land Cover and Change Detection of Mongolia based on MODIS/NDVI data
Elbegjargal Nasanbat, Khudulmur Sodov, Information and Research Institute of Meteorology, Hydrology and Environment of Mongolia, Mongolia
Applications of Satellite RS for Environmental Studies in Mongolia
D.Amarsaikhan, Mongolian Academy of Sciences (MAS), Mongolia

GNSS Geodesy Network for Geodynamics Research in Mongolia
Erdenezul Danzansan, Institute of Astronomy and Geophysics, MAS, Mongolia

Active faults around Ulaanbaatar city
Ulziibat M., Battogtokh D., Nyambayar Ts., Oyun-Erdene M., Baigalimaa G., Bayarsaikhan E., Baatarsuren G., Matthieu F and Smekalin O, Institute of Astronomy and Geophysics, MAS, Mongolia

The estimation lake area changes and their relations with socio-economic variables in Mongolia
Tsolmon Altanchimeg, Tsolmon Renchin, Chimgee Dari, Erdenechimeg Munkhbayar, National University of Mongolia, Mongolia

Long-term moisture analysis using satellite and in-situ data in Mongolia
Enkhjargal Natsagdorj, Tsolmon Renchin, Phillipe De Maeyer, Batchuluun Tseveen, National University of Mongolia, Mongolia

Crop monitoring and mapping with remote sensing technology
B. Batbileg, E.Erkhembayar, D.Tuvshinbayar, D.Byambasuren, Mongolian University of Life Sciences, Mongolia

Monitoring forest cover change of communities between 2000 and 2015 using forest index

GNSS observations applied to geophysical processes in North East Asia
Rui Fernandes, Machiel Bos, Mijiddorj Saandar, Maksim Tretyakov, SEGAL(UBI/IDL ), Portugal, Mongolia and Russia

Remote lithofacies mapping of the Shine Jinst area
Undariya Jalbaa and Sersmaa Gonchigdorj, The Mongolian University of Science and Technology, Mongolia
Session 06: Small Satellite Technologies 2  Wednesday, August 23, 2017, 09:00 – 10:30

Chair: Toshinori Kuwahara, Tohoku University of Japan, Japan

Magnetic-induction system launch of nanosatellites on a given orbit
Zafar Gimranov, Samara National Research University, Russia  IAA-NEA-0601

Next generation remote sensing and applications realized by micro-satellite and its international collaboration
Yukihiro Takahashi, Hokkaido University, Japan  IAA-NEA-0602

Creating the "Total package" through Spatial and Temporal Resolution of Satellite Imagery
Andrew Steele, Digital Globe Inc, USA  IAA-NEA-0603

Development of Student’s Pico-satellite based on PocketQube standard for Space Radiation Measurement
R. C. Prajapati, S. McAndrew, S. Paudel, J. Thapa, S. Shrestha, Orion Space, Nepal  IAA-NEA-0604

Session 07: University Projects  Wednesday, August 23, 2017, 10:50 – 12:30

Chair: Rei Kawashima, UNISEC-Global, Japan

The program of Samara University for developing scientific-educational nanosatellites
Igor Belokonov, Samara National Research University, Russia  IAA-NEA-0701

Student Small Satellite (SSS) project for Mongolian Space Education and Science Development
Suvdantsetseg. B and Batbayar. V, National University of Mongolia, Communication and Information Technology Authority of Mongolia, Mongolia  IAA-NEA-0702

Teaching GNSS technologies in a modern University
Ilya Kudryavtsev, Samara National Research University, Russia  IAA-NEA-0703

University Project
R. Tsolmon, National University of Mongolia, Mongolia  IAA-NEA-0704


Moderator: Christian Heipke, ISPRS, Germany

Closing and approval of the conference declaration  Wed, August 23, 2017, 15:20 – 16:40

Honorary chairman: D. Regdel, Mongolian Academy of Science

Chairmen: R. Sandau, IAA, France, M. Saandar, MSPRS, Mongolia

General Rapporteur: Rene Laufer, Baylor University, USA
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<td>Tsolmon Altanchimeg</td>
<td>IAA-NEA-0509P</td>
<td>Yuji Sakamoto</td>
<td>IAA-NEA-0402</td>
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<tr>
<td>Tsolmon Renchin</td>
<td>IAA-NEA-0704</td>
<td>Yuji Sato</td>
<td>IAA-NEA-0402</td>
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<td>Tsolmon Renchin</td>
<td>IAA-NEA-0512P</td>
<td>Yukihiro Takahashi</td>
<td>IAA-NEA-0602</td>
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<td>Tsolmon Renchin</td>
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<td>Yukihiro Takahashi</td>
<td>IAA-NEA-0501P</td>
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<td>Zafar Gimranov</td>
<td>IAA-NEA-0601</td>
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<tr>
<td>Tsolmon Renchin</td>
<td>IAA-NEA-0510P</td>
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Note: IAA-NEA-0000P

Session No
Presentation Slot, “P” indicates Poster Session
Symposium Venue

The symposium will take place in the Best Western Premier Tuushin Hotel (Soyombo Hall, 5th floor), Ulaanbaatar, Mongolia. [http://bestwesternmongolia.mn/](http://bestwesternmongolia.mn/)

More information: [www.monmap.mn/iaa-symposium](http://www.monmap.mn/iaa-symposium)

On-site Registration

The Registration Desk will be set up in the Soyombo Hall, 5th floor of the Best Western Premier Tuushin Hotel. It will be open:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>August 20, Sunday</td>
<td>16:00 – 19:00</td>
</tr>
<tr>
<td>August 21, Monday – August 23, Wednesday</td>
<td>08:00 – 18:00</td>
</tr>
</tbody>
</table>

The symposium registration fees for participants – 300 USD, for students – 50 USD and for exhibitors – 500 USD and its payment on-site by credit card or cash at the registration desk.

Name badges

Name badge must be worn at all times in order to be admitted to the sessions and social events. The following colors have been assigned:

- Participants: White
- Students: White
- Exhibitor: Blue

Language

The official language of the symposium is English

Offices

- The symposium office will be co-located with the registration desk in the Symposium room Soyombo Hall, 5th floor of the Best Western Premier Tuushin Hotel.

- Authors are requested to arrive at the symposium session room 10 minutes before the start of the session in order to meet the session chairperson for final preparations. Please bring your final paper and short biographies (Bio note).

Publication of Papers

The proceedings will be published after the symposium (including all submitted 8-page Final Papers).
**Lunch and Tea Breaks**

The registration fee of the participants, students and exhibitors covers the tea breaks and the lunch.

**Tours and Sightseeing**

Thursday, August 24, 2017

10:00 – 12:00 Tour to the Student Satellite Laboratory, the National University of Mongolia (NUM). Who interested for this tour please contact a representing person of the student satellite laboratory of NUM at the registration desk.

**Local sightseeing tours**

The local sightseeing tours will be organized by local travel agent after the symposium. Who are interested for the sightseeing tour please contact local travel agent at the registration desk.
The location map the 1st IAA North-East Asia Symposium venue, Ulaanbaatar, Mongolia
# The Program of 1st IAA North-East Asia Symposium on Small Satellites, Ulaanbaatar, Mongolia

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<tr>
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<tbody>
<tr>
<td>09:00 – 10:30 Papers</td>
<td>08:00 – 09:00 Registration 09:00 - 09:30 Opening Ceremony, Welcome and greetings 09:30 - 10:30 Keynote Session</td>
<td>Session 02 International endeavours</td>
<td>Session 06 Small Satellite Technologies 2</td>
</tr>
<tr>
<td>10:30 – 10:50 Tea Break</td>
<td>10:50 – 12:30 Papers</td>
<td>Session 03 Mission of NEA</td>
<td>Session 07 University Projects</td>
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<tr>
<td>10:50 – 12:30 Papers</td>
<td>Keynote Session Opening the Exhibition</td>
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<tr>
<td>13:30 – 15:00 Papers</td>
<td>Session 01 Worldwide Achievements</td>
<td>Session 04 Small Satellite Technology 1</td>
<td>Panel 2: Benefits of small satellites for the region Closing the Exhibition</td>
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<tr>
<td>15:00 – 15:20 Tea Break</td>
<td>15:20 – 16:40 Papers</td>
<td>Session 05 Application Studies for the Region</td>
<td>Closing and approval of the conference declaration</td>
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<tr>
<td>15:20 – 16:40 Papers</td>
<td>Panel 1: Benefits of small satellites</td>
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<tr>
<td>16:40 – 17:40 Exhibition and Poster</td>
<td>Exhibition (Commercial Presentation)</td>
<td>Poster Session and Exhibition (Commercial Presentation)</td>
<td>Visit to the Soviet - Mongolian Joint Space Flight History Museum</td>
</tr>
<tr>
<td><strong>SUNDAY, August 20, 2017</strong></td>
<td><strong>16:00 – 19:00 – Registration at 5th floor, Soyombo Hall, The Best Western Premier Tuushin Hotel</strong></td>
<td>No event</td>
<td>18:00 - 21:00 Reception with Mongolian folklore and music at the Space History Museum</td>
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<tr>
<td>19:00 – 20:00 – Ice Break</td>
<td>Exhibition cocktail</td>
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