United Nations / Austria / European Space Agency
Symposium on
Small Satellite Programmes for Sustainable Development

Programme
(as of September 3, 2009)

Austrian Academy of Sciences, Institute for Space Research
Schmiedlstraße 6, Graz, Austria

Hosted by the Austrian Federal Ministry for European and International Affairs,
Federal Ministry for Transport, Innovation and Technology,
State of Styria and City of Graz
and co-sponsored by the European Space Agency

8- 11 September 2009
Honorary Committee (in alphabetical order):

H. Böck  Federal Ministry for European and International Affairs, Austria
C. De Cooker  European Space Agency, France
K. Edlinger-Ploder  Member of the Government, State of Styria, Austria
S. Nagl  Mayor, City of Graz, Austria
M. Othman  Director, Office for Outer Space Affairs, United Nations
I. Schädler  Deputy Director General, Federal Ministry for Transport, Innovation and Technology, Austria
F. Voves  Governor, State of Styria, Austria
M. Wegscheider  Member of the Government, State of Styria, Austria

Programme Committee (in alphabetical order):

H. Böck  Federal Ministry for European and International Affairs, Austria (Chairman of the Programme Committee)
L. Canturk  Office for Outer Space Affairs, United Nations
S. Chernikov  Office for Outer Space Affairs, United Nations
J.M. Contant  IAA, France
A. Kleinsasser  Federal Ministry for Transport, Innovation and Technology, Austria
O. Koudelka  Joanneum Research and Graz University of Technology, Austria
P. Lala  Czech Space Office, Czech Republic
J. Ortner  EURISY, Austria
W. Riedler  Austrian Academy of Sciences, Austria
C. Reinprecht  Federal Ministry for European and International Affairs, Austria
R. Sandau  DLR, Germany
M-E. De Vel  European Space Agency, France

Local Organizing Committee (in alphabetical order):

A. Edler  Joanneum Research
A. Fuchs-Fehringer  Graz Tourism
G. Haubenhofer  City of Graz
O. Koudelka  Joanneum Research
W. Riedler  Austrian Academy of Sciences (Chairman)
A. Rupprecht  State of Styria
E. Zenz  Joanneum Research

Focal Point:
Office for Outer Space Affairs
United Nations Office at Vienna
P.O. Box 500, A-1400 Vienna, Austria
Sergei Chernikov
Phone: (+43) 01-26060-4948
Fax: (+43) 01-26060-7-4948
Email: Sergei.Chernikov@unoosa.org

Local Organizer:
JOANNEUM RESEARCH
Forschungsgesellschaft mbH
Otto Koudelka
Institute of Applied Systems Technology
Inffeldgasse 12, A-8010 Graz, Austria
Elke Zenz
Joanneum Research, Steyrgasse 17, A-8010 Graz
Phone: (+43) 0699 1876 1256
FAX: (+43) 0316 876 1404
Email: Elke.Zenz@joanneum.at
Tuesday, 8 September 2009

**Morning**

09:00 **Opening session**
*Master of Ceremony: Willibald Riedler, Austrian Academy of Sciences*

09:10 **Opening Ceremony**

Welcome / Opening Remarks
- Wolfgang Baumjohann, Austrian Academy of Sciences
- Harald Posch, Federal Ministry for Transport, Innovation and Technology
- Amnon Ginati, European Space Agency
- Peter Piffl-Percevic, City of Graz
- Helmut Böck, Federal Ministry for European and International Affairs
- Mazlan Othman, United Nations Office for Outer Space Affairs

10:00 **Keynote Addresses**
*Chairperson: Dr. Rainer Sandau, German Aero Space Center (DLR), Germany*

10:00 Using Small Satellites for Low Cost Space Education & Science Missions
Prof. Bob Twiggs, Space Science Center, Morehead State University, USA

10:30 ESA New Integrated Applications Programme Stimulating User Driven Small Satellites Missions
Prof. Amnon Ginati, Integrated Applications Programme, European Space Agency (ESA)

11:00 **Coffee/Tea Break**

11:00-12:30 **Press Conference** *(by invitation)*

11:30 **Objectives of the 2009 Symposium**
UNOOSA

12:00 **Lunch**

**Afternoon**

13:30 **Utility of small satellites for capacity building**
*Chairperson: Prof. Johannes Ortner, EURISY, Austria*
*Rapporteur: Mr. Ronnie Nader, Ecuadorian Civilian Space Agency (EXA), Ecuador*

13:30 Introductory Lecture: Small Satellites – A Driver for Capacity Building
Dr. Rainer Sandau, German Aero Space Center (DLR), Germany

13:50 SmallSats: Programmatic and Political Challenges – an Agency Point of View
Mr. Harald Posch, Head, Austrian Aeronautics and Space Agency, Austria

14:10 STAR Program – Cooperative Satellite Development Project in Asia-Pacific
Mr. Masanobu Tsuji, STAR Programme, JAXA, Japan

14:30 Potential Role of Small Satellite Technology for Enhancing the Implementation of Sustainable Development Programs in Amazonian Countries: Analysis of the Venezuelan and Regional Context
Ms. Romina Acevedo Galindo, Bolivarian Agency for Space Activities (ABAE), Venezuela
14:50 Super-Small Spacecrafts as Effective Means for Development of Advanced Space Technologies Mr. Alexey Romanov & Mr. Valery Vishnyakov, Russian Institute of Space Device Engineering, Russia
15:10 HUMSAT Project: A Picosatellite Constellation for humanitarian initiatives, climate monitoring and sustainable development Prof. Fernando Aguado-Agelet, University of Vigo, Spain
15:30 Coffee/Tea Break
16:00 ESA's Small Satellites Education Activities Mr. Piero Galoene, Education Office, European Space Agency (ESA)
16:20 The Micro-Satellite for Sustainable Development Program in the Aerospace Electronics Technology Center, National Institute of Aeronautics and Space (LAPAN) Mr. Robertus Triharjanto and Mr. Chusnul Tri Judianto, National Institute of Aeronautics and Space Indonesia (LAPAN), Indonesia
16:40 New Challenges and Opportunities for Africa: Home-made Small Satellite in Cameroon for Sustainable Development and Disaster Risk Management Mr. Shibkwu Jatong Frederick and Mr. Chia Tomukum Global Centre for Compliance, Hazards & Disaster Management, Cameroon
17:00 The Development Algorithm – How to Apply Space Technology for Large Scale Development in Africa Mr. Sias Mostert, Space Commercial Services Ltd., South Africa
17:20 Capabilities of Small Satellites of ISRO for Serving Remote Sensing Missions Mr. Dantu Venkaja Anantha Raghava Murthy, Small Satellite Projects, Indian Space Research Organization (ISRO), India
17:40 Satellite-Based Built-Up Area Monitoring for Efficient Earthquake Response: A Case Study of Grande-Terre Island, Guadeloupe Mr. Nikolay Khabarov, International Institute for Applied Systems Analysis (IIASA), Austria
18:10 Transfer to the hotel
19:00 Transfer from the hotel to the City of Graz
19:30 Reception by the Governor of the State of Styria in “Orangerie”

Wednesday, 9 September 2009

Morning
09:00 Establishing a small satellite programme: policy, planning and implementation Chairperson: Prof. Bob Twiggs, Space Science Center, Morehead State University, USA Rapporteur: Mr. Valery Vishnyakov, Russian Institute of Space Device Engineering, Russia
09:00 RazakSAT Project Mr. Ahmad Sabirin Arshad, Astronautic Technology (M) Sdn Bhd, Malaysia
09:20 SATEDU - University Didactic Satellite for Hands-on Training and Easy Access to Low Cost Small Satellite Missions Mr. Esau Vicente Vivas, Universidad Nacional Autónoma de México (UNAM), Mexico
09:40 The Role of Education in Small Satellite Programmes: A Nigerian Perspective Mr. Olaleye Salu, African Regional Center for Space Science and Technology Education, Nigeria
10:00 DMC - the Benefits to Developing Nations Mr. Simon J. Crouch, Surrey Satellite Technology Ltd, UK
10:20 Coffee/Tea Break
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:40</td>
<td>Linking Space Technology to National Policy Process</td>
<td>Mr. Byron Anangwe, Regional Centre for Mapping of Resources for Development, Kenya</td>
</tr>
<tr>
<td>11:00</td>
<td>Project HERMES: The first Internet-to-Orbit Automated Gateway</td>
<td>Mr. Ronnie Nader, Ecuadorian Civilian Space Agency (EXA), Ecuador</td>
</tr>
<tr>
<td>11:20</td>
<td>Turkish Satellite Technology Applications for Sustainable Development and Capacity Building</td>
<td>Ms. Burcu Dikmen, TUBITAK, Turkey</td>
</tr>
<tr>
<td>11:40</td>
<td>The Launch of the Brazilian INPE/UFSM’s Cubesat, the NANASATC-BR Space Weather Mission</td>
<td>Mr. Eduardo Escobar Burger, Federal University of Santa Maria/INPE, Brazil</td>
</tr>
<tr>
<td>12:00</td>
<td>The Need for an Integrated Small Satellite Space Programme: Perspective from the SumbandilaSat Missions Operations</td>
<td>Mr. Pieter Paul Adriaan Kotze, CSIR Satellite Applications Centre, South Africa</td>
</tr>
<tr>
<td>12:20</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

**Afternoon**

13:30 **Launch opportunities for small satellites and regulatory issues**
Chairperson: Mr. Piero Galoene, Education Office, European Space Agency (ESA)
Rapporteur: Mr. Masanobu Tsuji, STAR Programme, JAXA, Japan

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:30</td>
<td>ITU Radio Regulations Related to N-GSO Small Satellites</td>
<td>Mr. Attila Matas, International Telecommunication Union (ITU)</td>
</tr>
<tr>
<td>13:50</td>
<td>Launch opportunities for small satellites with SpaceX</td>
<td>Mr. Aaron Dinardi, Space Exploration Technologies (SpaceX), USA</td>
</tr>
<tr>
<td>14:10</td>
<td>Netherlands Antilles Satellite Orbit Development</td>
<td>Mr. Leonardo D. Ladeira, Bureau of Telecommunication and Post, Netherlands Antilles</td>
</tr>
<tr>
<td>14:30</td>
<td>Dnepr Cluster Launches: Large-scale Opportunities for Small Satellites</td>
<td>Mr. Alexander Serkin, Kosmotras, Russia</td>
</tr>
<tr>
<td>14:50</td>
<td>Coffee/Tea Break</td>
<td></td>
</tr>
<tr>
<td>15:15</td>
<td>Technical visit to ground station and satellite test facilities</td>
<td></td>
</tr>
<tr>
<td>17:00</td>
<td>Transfer to the City of Graz</td>
<td></td>
</tr>
<tr>
<td>17:30</td>
<td>Guided tour through the City</td>
<td></td>
</tr>
<tr>
<td>19:00</td>
<td>Reception by the Mayor of Graz</td>
<td></td>
</tr>
</tbody>
</table>

**Thursday, 10 September 2009**

**Morning**

09:00 **Mission Design/Hands on Activity (Facilitated by Experts)**
Presentations and Instructions supplemented by demonstration of related software tools (simulations) or by practical exercises

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00</td>
<td>Spacecraft Design Consideration as Compared to Terrestrial Devices: Satellite Orbits, Space Environment, Power Systems and Communications Design</td>
<td>Prof. Bob Twiggs, Space Science Center, Morehead State University, USA</td>
</tr>
<tr>
<td>10:00</td>
<td>Attitude Control</td>
<td>Mr. Norhizam Hamzah, Astronautic Technology (M) Sdn Bhd, Malaysia</td>
</tr>
<tr>
<td>11:00</td>
<td>Coffee/Tea Break</td>
<td></td>
</tr>
</tbody>
</table>
11:30 Communication Design:
- onboard command&telemetry links;
- onboard real-time high-speed downlinks for scientific and remote sensing data;
- intersatellite data links in constellations;
- receiving ground terminals.

Prof. Otto Koudelka, Joanneum Research, Austria & Dr. Valery Vishnyakov, Russian Institute of Space Device Engineering, Russia

12:30 Lunch

Afternoon
13:30 Mission Design/Hands on Activity (Facilitated by Experts) cont.
13:30 Demonstration of Satellite Took Kit (STK) Mr. Jürgen Kallup, Tukom, Germany
15:00 Coffee/Tea Break
15:30 Demonstration of Hermes System / Operator Training Mr. Ronnie Nader, Ecuadorian Civilian Space Agency, Ecuador
17:30 Transfer to the City of Graz
18:00 Dinner at “Landhauskeller” in the City

Friday, 11 September 2009

Morning
9:00 Mission Design/Hands on Activity (Facilitated by Experts) cont.
Working groups to develop project plans with assistance of available experts

12:00 Lunch

Afternoon
13:30 Wrap Up Session
Chairperson: Prof. Otto Koudelka, Joanneum Research, Austria
13:30 Putting knowledge to work - presentation by participants on concept of a national small satellite programme Followed by discussion: All participants
15:00 Coffee/Tea Break

15:30 Closing Ceremony
Master of Ceremony: Willibald Riedler, Austrian Academy of Sciences
Distribution of Certificates and Closing Remarks
○ Willibald Riedler, Austrian Academy of Sciences
○ United Nations Office for Outer Space Affairs

16.30 Transfer to the Hotel and end of Symposium
<table>
<thead>
<tr>
<th>#</th>
<th>Title</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-Remote Sensing activities in Bangladesh</td>
<td>Mohd. Golam RAHMAN, Bangladesh Space Research and Remote Sensing Organization (SPARRSO), Bangladesh</td>
</tr>
<tr>
<td></td>
<td>2-Suitability of multi-mission satellite in Bangladesh</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Technology &amp; Applications of remote sensing satellite and strategy towards the development of national remote sensing satellites for Pakistan</td>
<td>Faisal Yousuf KHAN, Satellite Research &amp; Development Center, Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), Pakistan</td>
</tr>
<tr>
<td>3</td>
<td>The ICT Sector survey in Burkina Faso</td>
<td>Lamoussa OUALBELOGO, Ministry of Post and ICT, Burkina Faso</td>
</tr>
<tr>
<td>4</td>
<td>Research about the rapid data fusion of Beijing-1 microsatellite images</td>
<td>Xiaorong XUE, Beijing University of Technology, China</td>
</tr>
<tr>
<td>5</td>
<td>The use of GIS and remote sensing technologies in variety of applications for sustainable management of Mekong River Basin</td>
<td>Suthy HENG, Cambodia National Mekong Committee (CNMC), Cambodia</td>
</tr>
<tr>
<td>6</td>
<td>Monitoring atmospheric chemical compositions and land surface and vegetation changes from satellites: A way forward for scientific advancement in Africa</td>
<td>Leonard Kofi AMEKUDZI, University of Science and Technology (KNUST), Kumasi, Ghana</td>
</tr>
<tr>
<td>7</td>
<td>Application of Satellite estimates over Uganda</td>
<td>Ms. Jamiat NANTEZA, Makerere University, Uganda</td>
</tr>
<tr>
<td>8</td>
<td>Capacity Building in Remote Sensing and GIS in Sudan</td>
<td>Prof. Mohammed Galal Mohammed AHMRD, Director General, National Center for Research, Khartoum, Sudan</td>
</tr>
</tbody>
</table>