

**United Nations / Austria / European Space Agency  
Symposium on  
Space Applications for Sustainable Development to Support  
the Plan of Implementation of  
the World Summit on Sustainable Development**

**SPACE TOOLS AND SOLUTIONS FOR  
MONITORING THE ATMOSPHERE IN SUPPORT  
OF SUSTAINABLE DEVELOPMENT**

**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**

**11 - 14 September 2007**

### **Honorary Committee (in alphabetical order):**

H. Böck	Head of the Department for International Organizations Federal Ministry for European and International Affairs, Austria
S. Camacho	Former Director, Office for Outer Space Affairs, United Nations
K. Edlinger-Ploder	Member of the Government, State of Styria, Austria
S. Nagl	Mayor, City of Graz, Austria
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

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W. Balogh	Office for Outer Space Affairs, United Nations
H. Böck	Federal Ministry for European and International Affairs (Chairman of the Programme Committee)
G. Bracht	Chairman, United Nations Committee on the Peaceful Uses of Outer Space
L. Canturk	Office for Outer Space Affairs, United Nations
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J. Higgins	National Aeronautics and Space Administration, United States of America
G. Juen	Federal Ministry for European and International Affairs
A. Kleinsasser	Federal Ministry for Transport, Innovation and Technology, Austria
O. Koudelka	Joanneum Research and Graz University of Technology, Austria
P. Martinez	South African National Working Group on Space Science and Technology
V. Moutarlier	GMES Bureau, European Commission
J. Ortner	EURISY, France
W. Riedler	Austrian Academy of Sciences, Austria
N. Shah	Pakistan Space and Upper Atmosphere Research Commission (SUPARCO)
L.L. Tieszen	US Geological Survey (USGS), United States of America

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A. Jud	Joanneum Research
G. Haubenhofner	City of Graz
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W. Riedler	Austrian Academy of Sciences (Chairman)
A. Rupprecht	State of Styria

#### Focal Point:

Werner Balogh  
Programme Officer  
Committee Services and Research Section  
Office for Outer Space Affairs  
United Nations Office at Vienna  
P.O. Box 500, A-1400 Vienna, Austria  
Phone: (+43) 01-26060-4952  
Fax: (+43) 01-26060-7-4952  
Email: werner.balogh@unvienna.org

#### Local Organizer:

JOANNEUM RESEARCH  
Forschungsgesellschaft mbH  
Otto Koudelka  
Institute of Applied Systems Technology  
Inffeldgasse 12, A-8010 Graz, Austria  
  
Birgit Reisenberger  
Joanneum Research, Steyrergasse 17, A-8010 Graz  
Phone: (+43) 0699 1876 1256  
FAX: (+43) 0316 876 1404  
Email: birgit.reisenberger@joanneum.at

## Tuesday, 11 September 2007

*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*
- *Helmut Böck, Federal Ministry for European and International Affairs*
- *Ulrike Rohrmeister (Ms.), Federal Ministry for Transport, Innovation and Technology*
- *Siegfried Nagl, City of Graz*
- *Hans Haubold, United Nations Office for Outer Space Affairs*

**10:00**

### **Keynote Addresses**

*Chairperson: Helmut Böck, Federal Ministry for European and International Affairs*

*Rapporteur: Levent Canturk, United Nations Office for Outer Space Affairs*

10:05

Tomorrow's Climate - Today's Challenge for Sustainable Development

*Lučka K. Kajfež-Bogataj (Ms.), IPCC*

10:35

Socio-economic Benefit Assessment of Global Earth Observations

*Michael Obersteiner, International Institute for Applied Systems Analysis*

11:05

*Coffee/Tea Break*

**11:00-**

**Press Conference**

*(by invitation)*

**12:30**

**11:30**

### **Objectives of the 2007 Symposium and Review of the 2006 Symposium**

*Chairperson: Johannes Ortner, EURISY*

*Rapporteur: Levent Canturk, United Nations Office for Outer Space Affairs*

11:35

Objectives of the 2007 Symposium

*Helmut Böck, Federal Ministry for European and International Affairs*  
*Werner Balogh, United Nations Office for Outer Space Affairs*

12:00

Review of the 2006 Symposium

*Thi Kim Oanh Nguyen (Ms), Asian Institute of Technology, Thailand*  
*Lawrence Friedl, NASA, United States*

12:25

*Lunch*

Afternoon

<b>14:00</b>	<b><u>Overview of Earth Observations, Satellite Applications, and Atmospheric Monitoring</u></b> <i>Chairperson: Johannes Ortner, EURISY</i> <i>Rapporteur: Levent Canturk, United Nations Office for Outer Space Affairs</i>	
14:05	Overview of Satellite Capabilities and Remote Sensing for Monitoring the Atmosphere and Review Uses in Air Quality and Other Applications	<i>Sundar Christopher, University of Alabama in Huntsville, United States</i> <i>Jill Engel-Cox (Ms.), Battelle Memorial Institute, United States</i>
<b>15:00</b>	<b><u>Global and Regional Initiatives</u></b> <i>Chairperson: Ulrike Rohrmeister (Ms.), Federal Ministry for Transport, Innovation and Technology</i> <i>Rapporteur: Virginia Fernandez Ramos (Ms.), National Environmental Agency, Uruguay</i>	
15:05	Activities within the WMO Space Programme	<i>Jerome Lafeuille, WMO</i>
15:30	<i>Coffee/Tea Break</i>	
15:50	Recent Progress with GMES and GMES Atmosphere Service	<i>Robert Lawson, European Environment Agency and GMES Bureau, European Commission</i>
16:15	Presentations by participants (10 min, except otherwise noted):	
	Indian Space Programme and its Contributions to Atmosphere and Climate Change Surveillance for Sustainable Development (20 min)	<i>Cheljuri B.S.Dutt, Indian Space Research Organisation (ISRO), ISRO Geosphere Biosphere Programme</i>
	Space Tools and Solutions for Monitoring the Atmosphere in Support of Sustainable Development	<i>Munaf Ali, General Organization of Remote Sensing (GORS), Syria</i>
	Ministry of Planning and Development Cooperation	<i>Ashwinie Boedhoe-Hemai (Ms.), Ministry of Planning and Development Cooperation, Suriname</i>
	The Gambia Environment Information Management System in Support to Sustainable Development	<i>Ebrima L. Ceesay, National Environmental Agency, The Gambia</i>
	Space Tools and Applications in the Context of National Spatial Data Infrastructure in Nepal	<i>Raja Ram Chhatkuli, Department of Survey National Geographic Information Infrastructure Programme (NGIIP), Nepal</i>
	Small Satellite Technologies for Atmospheric Monitoring	<i>Juan A. Fernandez-Saldivar, Mexico, presently at the Surrey Space Centre, University of Surrey, UK</i>
	Monitoring the Atmosphere Using Meteorological Satellites in Support of Sustainable Development for Africa	<i>Joan Kabaselleh (Ms.), IGAD Climate Prediction and Application Centre, Kenya</i>
18:00	<i>Transfer</i>	
19:30	<i>Reception by the Governor of the State of Styria</i>	<i>Weißer Saal</i>

## Wednesday, 12 September 2007

### *Morning*

<b>09:00</b>	<b><u>Space Tools for Atmosphere Monitoring</u></b> <i>Chairperson: Otto Koudelka, Joanneum Research, Austria</i> <i>Rapporteur: José Santos, Facultad de Ingenieria Maritima, Ecuador</i>	
09:05	EUMETCast/GEONETCast	<i>Vincent Gabaglio, EUMETSAT</i>
09:30	CEOS Virtual Constellations: Atmospheric Composition	<i>Lawrence Friedl, NASA, United States</i>
09:55	Space Tools for Atmosphere Monitoring: GMES PROMOTE	<i>Thilo Erbertseder, GMES PROMOTE, DLR</i>
10:20	<i>Coffee/Tea Break</i>	
10:40	African Monitoring of the Environment for Sustainable Development (AMESD)	<i>Vincent Gabaglio, EUMETSAT</i>
11:05	Ground Monitoring Using Satellite Communications	<i>Otto Koudelka, Joanneum Research, Austria</i>
11:30	Presentations by participants (10 min each):	
	The Philippine National Meteorological and Hydrological Service (NMHS): Its Products and Services for Sustainable Development	<i>Carina Lao (Ms.), Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), The Philippines</i>
	Space Tools and Solution for Monitoring the Atmosphere in Sustainable Development	<i>Nacima Rachedi (Ms.), Algerian Space Agency, Algeria</i>
	The Recent Activities of Atmospheric Chemistry Remote Sensing in NSMC/CMA	<i>Peng Zhang, China Meteorological Administration (CMA), China</i>
12:00	<i>Lunch</i>	<i>Dedicated tables will be set aside at lunch time for participants to discuss specific issues with speakers: Table 1: EUMETCast/GEONETCast Table 2: Aerosol Remote Sensing</i>

Afternoon

<b>13:30</b>	<b><u>Air Quality – Ozone and Particulate Matter</u></b> <i>Chairperson: Lawrence Friedl, NASA, United States</i> <i>Rapporteur: Amin Shaban, Lebanese National Council for Scientific Research, Lebanon</i>	
13:35	Who's Air Do We Breath? Addressing Air Pollution Issues on Regional and Continental Scales Presentation on global particulate matter air pollution and quality, cross-border transport, and regional/local air quality impacts	<i>Sundar Christopher, University of Alabama in Huntsville, United States</i>
14:00	Variability of Aerosol Index, Ultra-violet Radiation and Ozone from Satellite Observations over Nigeria and their Potential Uses	<i>Z. Debo Adeyewa, Federal University of Technology, Nigeria</i>
14:25	Satellite & Ground-based Aerosol Monitoring in Pakistan	<i>Badar Ghauri, SUPARCO, Pakistan</i>
14:50	<i>Coffee/Tea Break</i>	
15:10	Satellite Data and Air Quality Forecasting	<i>Jill Engel-Cox (Ms.), Battelle Memorial Institute, United States</i>
15:35	Satellite Air Quality Remote Sensing in South Africa	<i>Theo Fischer, Environmental Science Associate - Satellite Application Centre - Satellite Air Quality Remote Sensing Consortium, South Africa</i>
16:00	Urban Air Quality Monitoring in the Philippines	<i>Genevieve Rose Lorenzo (Ms.), Manila Observatory, The Philippines</i>
16:25	Presentations by participants (10 min each):	
	Researches of Atmospheric Air Quality in Uzbekistan	<i>Lyudmila Shardakova (Ms.), Research Hydrometeorological Institute (NIGMI) of Uzhydromet, Uzbekistan</i>
	Using the Software of Environmental Manual and GIS for Green House Gas Emission and Environmental Pollution Abatement	<i>Minh Y. Tran (Ms.), Space Technology Institute , Vietnamese Academy for Sciences and Technology, Vietnam</i>
	Urban Climate Analysis on the Land Use and Land Cover Change (LULC) in Bandung-Indonesia with Remote Sensing and GIS	<i>Laras Tursilowati (Ms.), Center for Atmospheric Sciences and Climate Application, LAPAN, Indonesia</i>
	Remote Sensing in Uganda	<i>Vensar Baryomu, Department of Meteorology, Uganda</i>
17:00	<i>Transfer</i>	
17:30	<i>Visit of the assembly hall of the Styrian Government "Landhaus" and the Armoury "Landeszeughaus" (15<sup>th</sup> century)</i>	
19:00	<i>Reception by the Mayor of Graz</i>	<i>City Hall, Old Town Graz</i>

## Thursday, 13 September 2007

*Morning*

**09:00**

### **Climate Change and Weather**

*Chairperson: Michael Obersteiner, International Institute for Applied Systems Analysis*

*Rapporteur: Theodore Michael Marguerite, National Meteorological Service, Seychelles*

09:05

Remote Sensing and Monitoring the Land Surface for Sustainable Development: Desertification, Carbon Sequestration, and Sustainable Interventions

*Larry L. Tieszen and G. Gray Tappan, USGS, United States*

09:30

Climate Change Monitoring and Atmospheric Change Analysis by Occultation

*Andrea Steiner (Ms.), University of Graz, Austria*

09:55

EMMA/METEOALARM/BRAHMATWINN – A Warning and Risk Management System

*Michael Staudinger, Central Institute for Meteorology and Geodynamics, Austria*

10:20

United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)

*Werner Balogh, United Nations Office for Outer Space Affairs*

10:40

*Coffee/Tea Break*

11:00

Presentations by participants (10 min each):

The Meteorological Natural Disasters Warning System of Thailand

*Somchai Baimoung, Thai Meteorological Department, Thailand*

Application of Satellite Imageries for Monitoring Atmospheric Events and Sustainable Development in Bangladesh

*Surajit Kumar Saha, Bangladesh Meteorological Department, Bangladesh*

Atmosphere Monitoring of the Marsh Zones in Iraq to Support the Sustainable Development

*Abdulkareem A. A. Mohammed, Ministry of Science & Technology, Iraq*

Satellite Remote Sensing for Coastal Engineering

*Iskander Tlili, Ministry of Equipment, Habitat and Territory, Tunisia*

12:00

*Lunch*

*Dedicated tables will be set aside at lunch time for participants to discuss specific issues with speakers:  
Table: Center for Earth Resources Observation and Science (EROS) and access to Landsat data*

*Afternoon*

- 13:30**     **Interactive Training on Satellite Tools and Applications for Air Quality**  
*Trainers: Sundar Christopher, Jill Engel-Cox (Ms.), Pawan Gupta, Representatives of the GEO User Interface Committee*
- 13:35     The training session features scenarios, data assessment and image analysis techniques and use of relevant online resources to convey the benefits and challenges of using space-based tools in assessing actual atmospheric events (e.g., a major wildfire, large dust storm, regional air pollution event). Trainers will guide and instruct the teams throughout this interactive training.
- Case Study 1: Northern India, Nepal, and Bangladesh
  - Case Study 2: North-eastern Egypt, Israel, and western Jordan
  - Case Study 3: South-eastern United States
  - Case Study 4: Greece
- 15:10     *Coffee/Tea Break*
- 15:30     Resume Training
- 16:40     Discussion *All participants*  
Participants discuss the training activities, their approaches, and the benefits and challenges to accessing data and using space-based tools
- 17:30     *Transfer*
- 18:00     *Reception at the Brewery Puntigam*

## **Friday, 14 September 2007**

*Morning*

- 9:00**     **Follow-Up Activities and Working Group Meetings**  
*Chairperson: Jill Engel-Cox (Ms.), Battelle Memorial Institute, United States*  
*Rapporteur: Laras Tursilowati (Ms.), National Institute of Aeronautics and Space (LAPAN), Indonesia*
- 09:05     United Nations-affiliated Regional Centres for Space Science and Technology Education (Brazil/Mexico, India, Morocco, Nigeria, Education Curricula) *Adelia Aquino (Ms.), United Nations Office for Outer Space Affairs*
- 09:30     Proposed Week-long Air Quality Training *Thi Kim Oanh Nguyen (Ms), Asian Institute of Technology, Thailand*  
*Presentation and discussion of a possible training curriculum for a training course on large-scale monitoring of air pollution using satellites.* *Lawrence Friedl, GEO User Interface Committee, United States*

09:55	Preparation of Working Group Splinter Meetings	<i>All participants</i>
	- Working Group 1: Training and Capacity Building <i>Chairperson: Jill Engel-Cox (Ms.), Battelle Memorial Institute, United States</i>	
	- Working Group 2: Availability and Use of Data & Tools for Atmosphere Monitoring <i>Chairperson: Sundar Christopher, University of Alabama in Huntsville, United States</i>	
10:15	<i>Coffee/Tea Break</i>	
10:35	Working Group Splinter Meetings	<i>All participants</i>
12:00	<i>Lunch</i>	
12:00-13:30	Informal consultations of the Working Group Chairpersons and Rapporteurs over lunch break to finalise the Working Group presentations, including Working Group conclusions and recommendations	<i>Working Group Chairpersons/Rapporteurs and interested participants</i>
<i>Afternoon</i>		
<b>13:30</b>	<b><u>Conclusions and Recommendations of the Symposium</u></b> <i>Chairperson: Hans Haubold, United Nations Office for Outer Space Affairs</i>	
13:35	Working Group presentations	<i>Working Group Spokespersons</i>
	Followed by Discussion:	<i>All participants</i>
	- Approval of Symposium conclusions and recommendations	
	- Feedback to Symposium organizers	
15:00	<i>Coffee/Tea Break</i>	
<b>15:20</b>	<b><u>Closing Ceremony</u></b> <i>Master of Ceremony: Willibald Riedler, Austrian Academy of Sciences</i>	
	Distribution of Certificates and Closing Remarks	<ul style="list-style-type: none"> <li>○ <i>Willibald Riedler, Austrian Academy of Sciences</i></li> <li>○ <i>Hans Haubold, United Nations Office for Outer Space Affairs</i></li> </ul>
16.30	<i>Transfer to the Hotel and end of Symposium</i>	