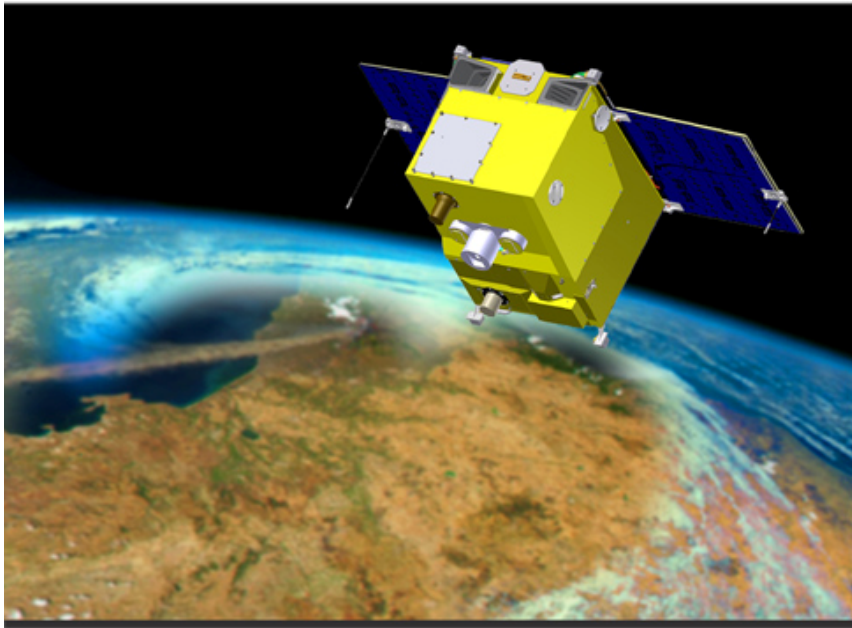


8th IAA SYMPOSIUM

ON SMALL SATELLITES

FOR EARTH OBSERVATION

Final Program



Composition picture: DLR

April 4 – 8, 2011

BBAW,
Gendarmenmarkt

BERLIN, GERMANY



*International
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LOCAL ARRANGEMENTS

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Co-ordinator, c/o DLR, Berlin

Henriette Urban/Dietmar Hennig,

Symposium Organizer CMT ConTour GmbH

Message of Greeting

from the Governing Mayor of Berlin, Klaus Wowereit, for the
8th Symposium on Small Satellites for Earth Observation of the
International Academy of Astronautics (IAA)
in Berlin, April 4 – 8, 2011



Klaus Wowereit

It is a great pleasure for Berlin to be able to welcome for the eighth time the participants in the international IAA Symposium on Small Satellites for Earth Observation.

I would like to extend my greetings to all those who have come to Berlin, a city which is proud of its scientific potential. My special thanks go to the International Academy of Astronautics (IAA) for choosing Berlin as the conference location again in 2011.

Berlin is continuing a long tradition in the field of aeronautics and space flight, the results of which are visible in the industry as well as in institutions of higher education and research institutions.

DLR and its site in Berlin-Adlershof, in cooperation with a large number of partners, have contributed to the growing acceptance - nationally and internationally - of small satellites. Berlin is now benefiting from the development of new small satellites in Berlin-Adlershof, the site of Europe's most modern Technology Park

The participation of a high number of experienced scientists, successful engineers, and promising students coming from about 25 countries not only reflects this growing interest in small satellites, but also expresses high regard for Berlin as an internationally recognized conference location.

In addition to your main tasks of exchanging scientific results, technical solutions, and programmatic visions, I hope you will find the time to discover Berlin as a metropolis of culture, history, architecture, and museums.

I wish all of you a successful symposium with new and interesting contacts, fruitful discussions, and a very pleasant stay here in Berlin.

A handwritten signature in black ink, which appears to read 'Klaus Wowereit'.

ACKNOWLEDGEMENT

We wish to thank the following for their contribution to the success of this conference
(in alphabetical order):



AGENDA

8th IAA Symposium on Small Satellites for Earth Observation

Sunday, April 3, 2011

16:00-20:00 Registration, BBAW¹

19:00-20:00 Get-Together

Monday, April 4, 2011

08:00-09:00 Registration, BBAW

09:00-09:15 **Welcome:**

J.-M. Contant,
Secretary General IAA

09:15-09:40 **Keynote Address1:**
IAA contribution to sustainable
development program
J.-M. Contant, IAA

09:40-10:05 **Keynote Address2:**
30 years of modern small satellites
Sir Martin Sweeting, SSTL, UK

10:05-10:40 BREAK, PRESS CONFERENCE

10:40-12:20 **Session 01:**
PROGRAMMATICS
Chair: J.-M. Contant, IAA
Rapporteur: H.-P. Röser,
Univ. of Stuttgart,
Germany

12:20-13:30 LUNCH

13:30-15:00 **Session 02:**
**HYPERSPECTRAL & SAR
MISSIONS**
Chair: S. Neeck, NASA/HQ, USA
Rapporteur: M. D'Errico, Univ. of
Naples, Italy

15:00-15:20 BREAK

15:20-16:40 **Session 03:**
NEW MISSIONS I
Chair: L. Maresi, ESA/ESTEC
Rapporteur: L. Paxton,
JHU/APL, USA

16:40-17:40 **Panel Discussion:**
Small Satellites as building blocks
for new applications and emerging
space nations
Chair: H. Stoewer, SAC,
Germany

Tuesday, April 5, 2011

09:00-10:30 **Session 04:**
CONSTELLATIONS
Chair: M. D'Errico, Univ. of
Naples, Italy
Rapporteur: S. Lysyy,
MSSRI, Russia

10:30-10:50 BREAK

10:50-12:10 **Session 05:**
SPECIAL ASPECTS I
Chair: P. Patterson, USU/SDL
USA
Rapporteur: C. Underwood,
Surrey Space Centre
University of Surrey
UK

12:10-13:30 LUNCH

13:30-15:00 **Session 06: (Special)**
STUDENT CONFERENCE
Chair: L. Paxton,
JHU/APL, USA
Rapporteur: H. Jahn, DLR,
Germany

15:00-15:20 BREAK

15:20-16:40 **Session 07:**
INSTRUMENTS
Chair: C. Underwood,
Surrey Space Centre
University of Surrey
UK
Rapporteur: R. Laufer,
Baylor Univ. Waco
USA

16:40-17:40 **POSTER SESSION I**

¹ Berlin-Brandenburgische Akademie der Wissenschaften

AGENDA (cont'd)

Wednesday, April 6, 2011

- 09:00-10:30 **Session 08:**
NEW LAND & MARITIME MISSIONS
Chair: S. Mostert, SCS, South Africa
Rapporteur: K. Mellab, ESA/ ESTEC
- 10:30-10:50 BREAK
- 10:50-12:10 **Session 09:**
SUBSYSTEMS
Chair: K. Brieß, TU Berlin, Germany
Rapporteur: J. Torley, Univ. of Colorado, USA
- 12:10-13:30 LUNCH
- 13:30-15:00 **Session 10:**
BUS SYSTEMS
Chair: S. Nakasuka, Univ. of Tokyo, Japan
Rapporteur: K. Brieß, TU Berlin, Germany
- 15:00-15:20 BREAK
- 15:20-16:40 **Session 11:**
SPECIAL ASPECTS II
Chair: J. Torley, Univ. of Tokyo, Japan
Rapporteur: M. Angulo, INTA, Spain
- 16:40-17:40 **POSTER SESSION II**

Thursday, April 7, 2011

- 09:00-10:30 **Session 12:**
STAR SENSORS & WHEELS
Chair: T. Terzibaschian, DLR, Germany
Rapporteur: M. Ovchinnikov, KIAM, Russia
- 10:30-10:50 BREAK

- 10:50-12:10 **Session 13:**
ATTITUDE CONTROL SYSTEMS
Chair: M. Ovchinnikov, KIAM, Russia
Rapporteur: H. Kayal, Univ. of Würzburg, Germany
- 12:10-13:30 LUNCH
- 13:30-15:20 **Session 14:**
NEW MISSIONS II
Chair: R. Laufer, Baylor Univ., Waco, USA
Rapporteur: T. Balint, NASA/HQ, USA
- 15:20-15:40 BREAK
- 15:40-16:40 **Session 15:**
RESULTS & LESSONS LEARNED
Chair: M. Angulo, INTA, Spain
Rapporteur: Ph. Davies, SSTL, UK
- 16:40-17:40 **Symposium Summary:**
Chair: R. Sandau, IAA, Germany
Chief Rapporteur : E. Gill, TU Delft, The Netherlands
- AWARDS**

Friday, April 8, 2011

- 09:00-12:00 **Visit to:**
- WISTA, Science and Technology Center**
Berlin-Adlershof
- or to:
- GFZ, Geo Research Center Potsdam**
Potsdam

TECHNICAL PROGRAM

Session 1: Programmatics

Monday, April 4, 2011, 10:40 - 12:20

Chair: J.-M. Contant, IAA

Rapporteur: H.-P. Röser, University of Stuttgart, Germany

NASA Earth Science and Small Satellites Neeck, S. P., Volz, S. M., NASA Headquarters, USA	IAA-B8-0101
Prospects of Next-Generation Earth Observation Missions te Hennepe, F., Tobehn, C., Penné, B., Ziegler, B., Sun, W., OHB-System AG, Germany	IAA-B8-0102
The second generation NanoSat-2 programme at INTA Angulo, M., Seoane, L., Gimeno, A., Prieto, M., Rodriguez, O., Esteban, S., INTA, Spain	IAA-B8-0103
From Education to Practical Use of Nano-satellites - Japanese University Challenge towards Low Cost Space Utilization - Nakasuka, S., University of Tokyo, Japan	IAA-B8-0104

Session 2: Hyperspectral & SAR Missions ***Monday, April 4, 2011, 13:30 - 15:00***

Chair: S. Neeck, NASA/HQ, USA

Rapporteur: M. D'Errico, Univ. of Naples, Italy

Status of the Advanced German Hyperspectral Imaging Satellite (EnMAP) Stuffer, T., Kayser Threde GmbH, Germany	IAA-B8-0201
The PROBA-V Mission Mellab, K., Galano, D., Santandrea, S., Teston, F., ESA/ESTEC, The Netherlands	IAA-B8-0202
An Affordable Small Satellite SAR Mission Whittaker, P., SSTL, UK; Cohen, M., Hall, D., Astrium Ltd. UK; Gomes, L., SSTL, UK	IAA-B8-0203
Switched CW SAR – A Novel and Low Cost SAR Solution for Microsatellites Ahmed, N., Underwood, C. I., Surrey Space Centre, UK	IAA-B8-0204

Session 3: New Missions I

Monday, April 4, 2011, 15:20 - 16:40

Chair: L. Maresi, ESA/ESTEC

Rapporteur: L. Paxton, JHU/APL, USA

New Small Satellites Join the International Earth Observing Constellation (A-Train) Kelly, A. C., Case, W. F., NASA/GSFC, USA	IAA-B8-0301
Earth Observation Low-Sized Satellite “Soyuz-Sat-O” for Multifunctional Space System Menshikov, V., Pushkarskiy, S., Lysyy, S., Ivanov, N., Blinov, V., Abalihin, O., Vasiliev, N., Dubovitskaya, N., Khrunichev Space Center, Russia	IAA-B8-0302
Present and Future Picosatellite Missions at TU Berlin Briess, K., Baumann, F., Trowitzsch, S., TU Berlin, Germany	IAA-B8-0303
Autonomous Assembly of a Reconfigurable Space Telescope (AAReST) for Astronomy and Earth Observation Underwood, C. I., Surrey Space Centre, UK; Pellegrino, S., CalTech, USA	IAA-B8-0304

Panel Discussion:

Small Satellites as building blocks for new applications and emerging space nations

Monday, April 4, 2011, 16:40 - 17:40

Chair: Heinz Stoewer, SAC, Germany

Panelists:

Tomukum Chia, Pan Africa Institute for Development, Buea, Cameroon
Shinichi Nakasuka, University of Tokyo, Japan
Sias Mostert, SCS, South Africa
Sir Martin Sweeting, SSTL, UK
Steve Neeck, NASA/HQ, USA

Session 4: Constellations

Tuesday, April 5, 2011, 09:00 - 10:30

Chair: M. D'Errico, Univ. of Naples, Italy

Rapporteur: S. Lysyy, MSSRI, Russia

- The DMC-3 1m Small Satellite Constellation** IAA-B8-0401
Cawthorne, A., Carter, P., Sills, L., da Silva Curiel, A., SSTL, UK
- Research on mini-satellite formation applied to Earthquake forecast** IAA-B8-0402
Sun, J., SAST, China; Wang, X., CAST, China
- Precision Formation Control for Inner-Formation Gravity Field Measurement Application** IAA-B8-0403
Wang, Z., Zhang, Y., Tsinghua University Beijing, China
- The QB50 Project** IAA-B8-0404
Reinhard, R., Muylaert, J., Asma, C. O., VKI, Belgium

Session 5: Special Aspects I

Tuesday, April 5, 2011, 10:50 - 12:10

Chair: P. Patterson, USU/SDL, USA

Rapporteur: C. Underwood, SSC, Univ. Surrey, UK

- Meeting the Future Launch Demand for Earth Observation Missions** IAA-B8-0501
Freeborn, P., Viertel, Y., Zorina, A., EUROCKOT, Germany
- Legal and regulatory context for small satellites** IAA-B8-0502
Smith, L. J., Leuphana University Lüneburg, Germany
- Single-Input Control in Formation of Small Satellites Aligned with Geomagnetic Field Induction Vector** IAA-B8-1302
Ovchinnikov, M. Yu., Zaramenskikh, I. E.; Trofimov, S. P., KIAM/RAS, Russia
- A Passive De-orbiting Strategy for High Altitude CubeSat Missions through a Deployable Reflective Balloon** IAA-B8-0504
Lücking, C. M., Colombo, C., McInnes, C. R., University of Strathclyde, UK

Session 6: (Special) Student Conference

Tuesday, April 5, 2011, 13:30 - 15:00

Chair: L. Paxton, JHU/APL, USA

Rapporteur: H. Jahn, DLR, Germany

- ITASAT-1: Brazilian university microsatellite for payload test** IAA-B8-0601
Shibuya, L. H., Saotome, O., ITA, Brazil; Timm, C., TUB, Germany; Fernandes, D., ITA, Brazil;
Yamaguti, W., INPE, Brazil

FoX – A German-Brazilian Formation Flying Mission Timm, C., Pacholke, F., Shibuya, L. H., Weise, J., Kornemann, G., TUB, Germany	IAA-B8-0602
Orbit Optimization for a Small Satellite Constellation for Observation at mid Latitudes Karatas, Y., Ince, F., TAFA, Turkey	IAA-B8-0603
Attitude control system of micro satellite RISING-2 Fukuda, K., Nakano, T., Sakamoto, Y., Kuwahara, T., Yoshida, K., Tohoku University, Japan; Takahashi, Y., Hokkaido University, Japan	IAA-B8-0604
Fault Tolerant Architecture on On-Board Computer for ITASAT University Satellite Vinci, E., Passaro, P. C. A. P., Saotome, O., ITA, Brazil	IAA-B8-0605
The MURB Deorbitation System for Small Satellites and Rocket Upper Stages Urbanowicz, M., Warsaw University of Technology, Poland	IAA-B8-0606

Session 7: Instruments

Tuesday, April 5, 2011, 15:20 - 16:40

Chair: C. Underwood, SSC, Univ. Surrey, UK

Rapporteur: R. Laufer, Baylor Univ. Waco, USA

Remote Sensing using GPS signals – The SGR-RESI instrument Unwin, M., de Vos Van Steenwijk, R., Da Silva Curiel, A., Cutter, M., SSTL, UK; Gommenginger, C., National Oceanographic Centre, UK; Mitchell, C., University of Bath, UK; Gao, S., Surrey Space Centre, UK	IAA-B8-0701
Development of the accelerometer sensor heads for the GOCE satellite: Assessment of the critical items and qualification Bodovillé, G., Lebat, V., ONERA, France	IAA-B8-0702
Instruments ELMAVAN and REPIN for the RESONANCE Mission Hruska, F., Kolmasova, I., Chum, J., Santolik, O., Truhlik, V., ASCR, Czech Republic; Verigin, M. I., RAS, Russia	IAA-B8-0703
Compact Hyperspectral Imager Breadboard Moreau, V., AMOS, Belgium ; Grabarnik, S., Maresi, L., ESA/ESTEC ; Delalieux, S., de Vos, L., Delauré, B., De Clercq, C., AMOS, Belgium; Dierckx, W., Knaeps, E., Michiels, B., VITO, Belgium	IAA-B8-0704

Poster Session I

Tuesday, April 5, 2011, 16:40 - 17:40

EIAST's UAE Space Programme Al Marri, S., EIAST, Dubai, UAE	IAA-B8-0305P
Small satellite constellations in multi-sunsynchronous orbits for the observation of tropical regions Ortore, E., Olivieri, C., Bunkheila, F., Percacciolo, S., Sapienza University of Rome, Italy	IAA-B8-0306P
Application of Microsatellites for Monitoring Natural Disaster Results in Siberia and for Educational Purposes Galochkin, S., Yakovlev, A., Valov, M., JSC "ISS", Russia; Okhotkin, K., Kartsan, I., Shangina, E., SibSAU, Russia	IAA-B8-0307P
The UNESCO International Satellite for Science Education and Basic Sciences (UNESCOsat) Fortov, V. E., Commission of the Russian Federation for UNESCO, Russia; Khamzaev, A. D., Russian Committee for UNESCO IBSP, Russia; Ordjonikidze, G. E., Commission of the Russian Federation for UNESCO, Russia	IAA-B8-0308P
Verification challenges on the RSI payload development Weng, S.-W., Lian, Y.-Y., NSPO, Taiwan, China	IAA-B8-0309P

Poster Session 1 (cont.)

- Taiwan Experimental Microsatellite Project - CKUTEX** IAA-B8-0310P
Juang, J.-C., Tsai, Y.-F., Tsai, C.-T., Jenq, S.-T., National Cheng Kung University, Taiwan, China; Tsai, J.-R., Pan, H.-P., NSPO, Taiwan, China
- Outline and Progress of ASNARO (Advanced Satellite with New System Architecture for Observation) Satellite System** IAA-B8-0311P
Ogawa, T., Kobayashi, Y., NEC Corporation, Japan; Mihara, S., Ijichi, K., USEF, Japan; Hamada, H., NEDO, Japan
- Fine scale radar altimetry constellation for future oceanography using a generic small satellite platform** IAA-B8-0312P
Strauß, S., te Hennepe, F., OHB-System AG, Germany
- Operational Service for global Greenhouse Gas Observation – CarbonSat Constellation** IAA-B8-0313P
Ernst, R., Tobehn, C., Shahsavari, A., Sun, W., OHB-System AG, Germany; Bovensmann, H., Buchwitz, M., Burrows, J.-P., Notholt, J., IUP Bremen, Germany
- MRES: A Medium Resolution Mapping Satellite System for the Republic of Kazakhstan** IAA-B8-0314P
Murzakulov, G. T., Ten, V., Nurguzhin, M. R., Murushkin, S. A., Albazarov, B., KGS, Kazakhstan; Taylor, M., Praine, I., da Silva Curiel, A., SSTL, UK; Carrin, G., Laffaye, G., Pages, C., Astrium, France
- BST Training Program - A new paradigm for successful technology transfer** IAA-B8-0315P
Buhl, M., Danziger, B., Segert, T., Berlin Space Technologies GmbH, Germany
- Design and development of the Earth and astronomical observation technology demonstration satellite “TSUBAME”** IAA-B8-0316P
Ishizaka, K., Matunaga, S., Tokyo Institute of Technology, Japan; The TSUBAME development team
- A Series of 50kg-Class Micro-Satellites for Advanced Science Missions** IAA-B8-0317P
Kazuya Yoshida, Yuji Sakamoto, and Toshinori Kuwahara, Tohoku University, Japan
- First satellite of Small Demonstration Satellite Program of JAXA** IAA-B8-0318P
Hirako, K., Nakamura, Y., Kawara, H., Kawashima, K., Yamamoto, K., JAXA, Japan
- Automated Remote Ground Station For Austrian Lightning Nanosatellite (LiNSAT)** IAA-B8-0509P
Jaffer, G., Koudelka, O., Graz University of Technology, Austria
- Optimized separation system for small satellites missions** IAA-B8-0510P
Corbelli, A., Bruzzi, D., ALMASpace S.r.l., Italy; Tortora, P., University of Bologna, Italy
- Satellite autonomous orbit determination using synthetic aperture radar** IAA-B8-0511P
Zhang, Y., Li, X., Geng, Y., Harbin Institute of Technology, P. R. China
- Micro-PrioraNet, creation of a global ground network service for small spacecraft** IAA-B8-0512P
Hyvönen, P., Krynitz; M., SSC, Sweden
- Operation Concept of the Precise Autonomous Orbit Keeping Experiment on the PRISMA Mission** IAA-B8-0513P
De Florio, S., University of Glasgow, UK; D’Amico, S., DLR, Germany; Radice, G., University of Glasgow, UK
- Synchronization Strategy and Overlap Ratio of Beam Footprint for Formation flying InSAR Satellite** IAA-B8-0516P
Zhang, J., Lan, S., Zhang, Z., Sun, Z., Harbin Institute of Technology, P. R. China
- Numerically efficient Time-Optimal Spacecraft Reorientation** IAA-B8-0518P
Romano, M., Boyarko, G., Yakimenko, O., Naval Postgraduate School, CA, USA

Poster Session 1 (cont.)

- Design and Ground Testing of Compact and Versatile Hyperspectral sensor HSC** IAA-B8-0705P
Aoyanagi, Y., Ueyama, Y., Satori, S., Hokkaido Institute of Technology, Japan;
Totani, T., Hokkaido University, Japan; Nakamura, A., AIDMA Inc., Japan;
Takeyama, N., Genesis Inc., Japan
- CIMBOL: uncooled infrared imager for space applications** IAA-B8-0707P
Beaumel, M., Guinde, G., Colmon, A., EADS Sodern, France
- Compact Spatial Heterodyne Fourier Transform Spectrometer for an Atmospheric CO₂ Monitoring Micro-Satellite Constellation** IAA-B8-0708P
Ikpayia, I., Underwood, C., Surrey Space Centre, UK
- Earth Observation R&D payloads on board INTA μ SAT-1** IAA-B8-0709P
Angulo, M., Seoane, L., INTA, Spain; Prieto, M., SRG-UAH, Spain; Esteban, S., UCM, Spain;
Cornara, S., DEIMOS-SPACE, Spain

Session 8: New Land & Maritime Missions

Wednesday, April 6, 2011, 09:00 - 10:30

Chair: S. Mostert, SCS, South Africa

Rapporteur: K. Mellab, ESA/ESTEC

- Preliminary Concept of Shinshu University Microsatellite for Forest Monitoring** IAA-B8-0801
Okamoto, K., Masuda, H., Kamemura, M., Wakayama, Y., Nakajima, A.,
Shinshu University, Japan
- Boosting Small Satellite Missions for Earth Observation at Regional Level: Main Drivers and Experiences** IAA-B8-0802
Corbera, J., Villafranca, A.G., PCOT, Spain; Luri, X., Universitat de Barcelona, Spain;
Canalias, E., Universitat de Girona, Spain; Delgado, A., CTAE, Spain
- Preliminary Assessment of an Integrated AIS/Imaging Spaceborne System for Maritime Surveillance** IAA-B8-0803
D'Errico, M., Graziano, M. D., Razzano, E., Seconda Università di Napoli, Italy
- SMRS: A Small Satellite Mission dedicated to Maritime Security** IAA-B8-0804
te Hennepe, F., OHB-System AG, Germany; Strauch, K., Marliani, F., ESA Noordwijk,
The Netherlands; Tobehn, C., Evans, L., OHB-System AG, Germany;
Eriksen, T., FFI, Norway; Storesund, F., Kongsberg Seatex, Norway; Ruy, G., Ries, P.,
LuxSpace Sarl, Luxembourg; Föckersperger, S., Kayser-Threde GmbH, Germany

Session 9: Subsystems

Wednesday, April 6, 2011, 10:50 - 12:10

Chair: K. Brieß, TU Berlin, Germany

Rapporteur: J. Torley, Univ. of Colorado, USA

- SEPTA[®]41 EV – A Solar Array Drive Assembly for Small Satellites** IAA-B8-0901
Rabin, J, Wiesmann, E., RUAG Space AG, Switzerland
- Adaptive Computers in Space – In-flight HW-reconfigurable processors using high density FPGAs** IAA-B8-0902
Michalik, H., Fichna, T., Fiethe, B., Bubenhagen, F., Michel, H., IDA TU Braunschweig,
Germany; Osterloh, B., DSI Informationstechnik GmbH, Germany
- Hardware Design of the Telecommand Receiver for the Small Satellite Flying Laptop** IAA-B8-0903
Beyermann, U., Röser, H.-P., Spetzler, M., Baumgärtner, J., IRS, Univ. of Stuttgart, Germany

RIT- μ X - A New Advanced Miniaturized Ion Thruster System for Small Satellites IAA-B8-0904
Leiter, H., Ellerbrock, H., Astrium GmbH Space Transportation, Germany;
Feili, D., Lotz, B., University of Gießen, Germany

Session 10: Bus Systems

Wednesday, April 6, 2011, 13:30 - 15:00

Chair: S. Nakasuka, Univ. of Tokyo, Japan

Rapporteur: K. Brieff, TU Berlin, Germany

The TET Satellite Bus – A high reliability bus for LEO missions IAA-B8-1001
Roemer, S., Eckert, S., Astro- und Feinwerktechnik Adlershof GmbH, Germany

Constellation of Distributed NanoSats for Real Time Earth Observation IAA-B8-1002
Andrews, J., Andrews Space, Inc., USA

Answering New Needs with Existing Solutions IAA-B8-1003
de Groot, Z., Sills, L., Hawkins, O., Gomes, L., Surrey Satellite Technology Ltd., UK

JAXA SDS-4 Spacecraft System Design and Test Results IAA-B8-1004
Ohtani, T., Nakamura, Y., Takahashi, Y., Inoue, K., Hirako, K., JAXA, Japan

Session 11: Special Aspects II

Wednesday, April 6, 2011, 15:20 - 16:40

Chair: J. Torley, Univ. of Colorado, USA

Rapporteur: M. Angulo, INTA, Spain

Software Component Model and its Monitoring Tool IAA-B8-1101
Dannemann, F., DLR-RY, Germany; Montenegro, S., University of Würzburg, Germany

An open-source system simulation framework for small-satellite development based on OpenSimKit, QEMU and System C IAA-B8-1102
Zienke, C., Fritz, M., IRS, Univ. of Stuttgart, Germany; Kossev, I., Brandt, A., Eickhoff, J., Privat, Germany; Röser, H.-P., IRS, Univ. of Stuttgart, Germany

Design and development of a GNSS spaceborne receiver for Earth Observation satellites orbit determination IAA-B8-1103
Avanzi, A., Tortora, P., University of Bologna, Italy

Ship Detection Service IAA-B8-1104
Schwarz, E., Maass, H., Lehner, S., Bruschi, S., DLR, Germany

Poster Session II

Wednesday, April 6, 2011, 16:40 - 17:40

Small Satellite Solar Generator Development. An Example of International Fair Cooperation IAA-B8-0905P
Ferrando, E., Grassi, M., Romani, R., Zanella, P., SELEX Galileo, Italy;
Lee, H., Satrec Initiative, Korea; Al Marri, S., EIAST, Dubai, UAE

A novel on-board computer and IP design based on FPGA IAA-B8-0906P
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Robust sliding mode control for attitude control of small satellite	IAA-B8-1311P
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A Low-Cost Modular Attitude Control System Applied to Small Satellites – Preliminary Concepts IAA-B8-1314P

Granziera Jr, F., National Institute for Space Research, Brazil;
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BIRD 9 years microsatellite mission – the experience of passive thermal control in space IAA-B8-1503P

Lura, F., Biering, B., Lötze, H. G., DLR, Germany; Studemund, H., Astro- und Feinwerktechnik Adlershof GmbH, Germany; Baturkin, V., National Technical University of Ukraine, Kyiv, Ukraine

Session 12: Star Sensors & Wheels

Thursday, April 7, 2011, 09:00 - 10:30

Chair: T. Terzibaschian, DLR, Germany

Rapporteur: M. Ovchinnikov, KIAM, Russia

STELLA - A New Small Star Tracker for Pico and Nano Satellites IAA-B8-1201

Balagurin, O., Wojtkowiak, H., Kayal, H., University of Würzburg, Germany

Software Reuse of the BIRD ACS for the TET Satellite Bus IAA-B8-1306

Maibaum, O., Terzibaschian, T., DLR, Germany; Raschke, C., Astro- und Feinwerktechnik Adlershof GmbH, Germany; Gerndt, A., DLR, Germany

Current development of the Facet Nano star tracker IAA-B8-1203

Ho, A., van Breukelen, E., Rotteveel, J.; ISIS, The Netherlands

RW 90, a smart reaction wheel – Progress from BIRD to TET-1 IAA-B8-1204

Stoltz, S., Raschke, C., Courtois, K., Astro- und Feinwerktechnik Adlershof GmbH, Germany

Session 13: Attitude Control Systems

Thursday, April 7, 2011, 10:50 - 12:10

Chair: M. Ovchinnikov, KIAM, Russia

Rapporteur: H. Kayal, Univ. of Würzburg, Germany

The PACE Nanosatellite Platform for Attitude Control Experiments IAA-B8-1301

Artur Scholz, A., Miao, J. J., Juang, J.-C., National Cheng Kung University, Taiwan, China

Magnetic attitude control of small satellites: A Survey of applications and a domestic example IAA-B8-1312

Sofyalı, A., Aslan, A.R., Istanbul Technical University, Turkey

An Attitude Determination System Implementation to Low Orbit Small Satellite with Fault-Tolerant Techniques IAA-B8-1303

Duarte, R. O., Torres, F. E., Gomes, T. H., Universidade Federal de Minas Gerais, Brazil; Martins-Filho, L. S., Universidade Federal do ABC, Brazil; Kuga, H. K., Instituto Nacional de Pesquisas Espaciais, Brazil

Low Cost Space Experimental Attitude Determination Systems (SEADS) For InnoSAT IAA-B8-1304

Said, M.A.M., Universiti Sains, Malaysia; Djojodihardjo, H., Universiti Putra, Malaysia; Fadly, M., Keui, A.A.M.P., Jamil, I., Sidek, O., Universiti Sains, Malaysia

Session 14: New Missions II

Thursday, April 7, 2011, 13:30 - 15:20

Chair: R. Laufer, Baylor Univ. Waco, USA

Rapporteur: T. Balint, NASA/HQ, USA

The Nemo Bus: Nanosatellite for Earth Monitoring and Observation IAA-B8-1401

Pranajaya, F. M., Zee, R. E., University of Toronto, Canada

Constellation and Spacecraft Design for GNSS Radio Occultation Mission with Selective Resolution for Severe Weather Forecasting	IAA-B8-1402
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MeTERS: a fresh look at meteors from orbit	IAA-B8-1403
Brosch, N., TAU; Oberst, J., Flohrer, J., Carsenty, U., DLR; Vaubaillon, J., IMCEE; Pariante, M., Spacecialist; and the MeTERS team ²	
Mission and System of the Earth Observation Microsatellite RISING-2	IAA-B8-1404
Kuwahara, T., Sakamoto, Y., Yoshida, K., Tohoku University, Japan; Takahashi, Y., Fukuhara, T., Kurihara, J., Hokkaido University, Japan	
PEEP-HOLE : a constellation of small Earth Observation satellites aiming at new applications and customers	IAA-B8-0405
Hernandez, D., Devil-Hop, France; Pavlin, O., ISAE ; Speaker : Escudier, B., ISAE, France	

Session 15: Results & Lessons Learned Thursday, April 7, 2011, 15:40 - 16:40

Chair: M. Angulo, INTA, Spain

Rapporteur: P. Davies, SSTL, UK

First on-orbit results from NigeriaSat-2	IAA-B8-1502
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Challenges and Lessons Learned in Manufacturing the first Stellite Structure	IAA-B8-1505
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2 years of operating the RapidEye Constellation – an evolving mission concept and lessons learned	IAA-B8-1504
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Symposium Summary

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Chair: R. Sandau, IAA, Germany

Chief Rapporteur: E. Gill, TU Delft, The Netherlands

AWARDS

Best Paper Presentation Award

Best Poster Presentation Award

STUDENT PRIZE PAPER COMPETITION

Final see Session 06 (Special)

The awards for the winners of the Student Prize Paper Competition will be presented during the IAA Dinner, Tuesday, April 5, 2011, 19:00 at Regent Hotel Berlin

A Special Thanks to the Students Paper Evaluation Committee:

Leon Alkalai, NASA/JPL, USA

Klaus Brieß, TU Berlin, Germany

Jaime Esper, NASA/GSFC, USA

Sias Mostert, Space Commercial Services, Stellenbosch, South Africa

Shinichi Nakasuka, University of Tokyo, Japan

Michael Ovchinnikov, Keldysh Institute of Applied Mathematics, Russia

Rainer Sandau, IAA, Germany

K. Thyagarajan, ISRO, India

James Torley, University of Colorado at Colorado Springs, USA

Craig Underwood, SSC, University of Surrey, UK

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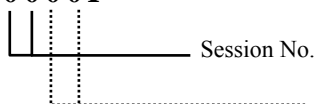
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Pushkarskiy, S.	IAA-B8-0302
Rabin, J.	IAA-B8-0901
Radice, G.	IAA-B8-0513P
Raschke, C.	IAA-B8-1204
Raschke, C.	IAA-B8-1309P
Raschke, C.,	IAA-B8-1306
Razzano, E.	IAA-B8-0803
Reinhard, R.	IAA-B8-0404

<u>Name</u>	<u>Paper/Poster Reference*</u>
Ries, P.	IAA-B8-0804
Rodriguez, O.	IAA-B8-0103
Roemer, S.	IAA-B8-1001
Romani, R.	IAA-B8-0905P
Romano, M.	IAA-B8-0518P
Röser, H.-P.	IAA-B8-0903
Röser, H.-P.	IAA-B8-1102
Röser, H.-P.	IAA-B8-1310P
Röser; H.-P.	IAA-B8-0913P
Rotteveel, J.	IAA-B8-1203
Ruy, G.	IAA-B8-0804
Said, M.A.M.	IAA-B8-1304
Said, M.A.M.	IAA-B8-1305P
Sakamoto, Y.	IAA-B8-0317P
Sakamoto, Y.	IAA-B8-0604
Sakamoto, Y.	IAA-B8-1404
Santandrea, S.	IAA-B8-0202
Santolik, O.	IAA-B8-0703
Saotome, O.	IAA-B8-0601
Saotome, O.	IAA-B8-0605
Satori, S.	IAA-B8-0705P
Schwarz, E.	IAA-B8-1104
Segert, T.	IAA-B8-0315P
Seoane, L.	IAA-B8-0103
Seoane, L.	IAA-B8-0709P
Shahsavar, A.	IAA-B8-0313P
Shahsavar, A.	IAA-B8-1006P
Shangina, E.	IAA-B8-0307P
Shibuya, L. H.	IAA-B8-0601
Shibuya, L. H.	IAA-B8-0602
Sidek, O.	IAA-B8-1304
Sidek, O.	IAA-B8-1305P
Sills, L.	IAA-B8-0401
Sills, L.	IAA-B8-1003
Smith, L. J.	IAA-B8-0502
Sofyali, A.	IAA-B8-1312
Spetzler, M.	IAA-B8-0903
Sprowitz, T.	IAA-B8-1005P
Steinmetz, F.	IAA-B8-0913P
Stoll, E.	IAA-B8-1504
Stoltz, S.	IAA-B8-1204
Storesund, F.	IAA-B8-0804
Strauch, K.	IAA-B8-0804
Strauß, S.	IAA-B8-0312P
Strauß, S.	IAA-B8-1006P
Studemund, H.	IAA-B8-1503P
Stuffer, T.	IAA-B8-0201
Sun, J.	IAA-B8-0402
Sun, W.	IAA-B8-0102
Sun, W.	IAA-B8-0313P
Sun, Z.	IAA-B8-0516P
Sun, Z.	IAA-B8-1308P
Sweeting, M. N.	IAA-B8-0917P
Takahashi, Y.	IAA-B8-0604
Takahashi, Y.	IAA-B8-1004
Takahashi, Y.	IAA-B8-1404
Takeyama, N.	IAA-B8-0705P
Tambini, A.	IAA-B8-0912P

<u>Name</u>	<u>Paper/Poster Reference*</u>
Taylor, M.	IAA-B8-0314P
te Hennepe, F.	IAA-B8-0102
te Hennepe, F.	IAA-B8-0312P
te Hennepe, F.	IAA-B8-0804
Ten, V.	IAA-B8-0314P
Terzibaschian, T.	IAA-B8-1306
Teston, F.	IAA-B8-0202
Timm, C.	IAA-B8-0601
Timm, C.	IAA-B8-0602
Tobehn, C.	IAA-B8-0102
Tobehn, C.	IAA-B8-0313P
Tobehn, C.	IAA-B8-0804
Tobehn, C.	IAA-B8-1006P
Torres, F. E.	IAA-B8-1303
Tortora, P.	IAA-B8-0510P
Tortora, P.	IAA-B8-0909P
Tortora, P.	IAA-B8-0912P
Tortora, P.	IAA-B8-1103
Tosin, M. C.	IAA-B8-1314P
Totani, T.	IAA-B8-0705P
Trofimov, S. P.	IAA-B8-1302
Trowitzsch, S.	IAA-B8-0303
Truhlik, V.	IAA-B8-0703
Tsai, C.-T.	IAA-B8-0310P
Tsai, J.-R.	IAA-B8-0310P
Tsai, Y.-F.	IAA-B8-0310P
Tsai, Y.-F.	IAA-B8-1402
Ueyama, Y.	IAA-B8-0705P
Ulivieri, C.	IAA-B8-0306P
Umit, M. E.	IAA-B8-0916P
Underwood, C. I.	IAA-B8-0708P
Underwood, C. I.	IAA-B8-0204
Underwood, C. I.	IAA-B8-0304
Unwin, M.	IAA-B8-0701
Urbanowicz, M.	IAA-B8-0606
Valov, M.	IAA-B8-0307P
van Breukelen, E.	IAA-B8-1203
Vasiliev, N.	IAA-B8-0302
Vaubailon, J.	IAA-B8-1403
Verigin, M. I.	IAA-B8-0703

<u>Name</u>	<u>Paper/Poster Reference*</u>
Viertel, Y.	IAA-B8-0501
Villafranca, A. G.	IAA-B8-0802
Vinci, E.	IAA-B8-0605
Volz, S. M.	IAA-B8-0101
Wakayama, Y.	IAA-B8-0801
Wang, X.	IAA-B8-0402
Wang, Z.	IAA-B8-0403
Weise, J.	IAA-B8-0602
Weng, S.-W.	IAA-B8-0309P
Whittaker, P.	IAA-B8-0203
Wieser, M.	IAA-B8-1006P
Wiesmann, E.	IAA-B8-0901
Williams, A.	IAA-B8-0911P
Winter, S.	IAA-B8-1310P
Wojtkowiak, H.	IAA-B8-1201
Xu, G.	IAA-B8-0907P
Yagci, H. B.	IAA-B8-0914P
Yakimenko, O.	IAA-B8-0518P
Yakovlev, A.	IAA-B8-0307P
Yamaguti, W.	IAA-B8-0601
Yamamoto, K.	IAA-B8-0318P
Ye, D.	IAA-B8-1308P
Yoshida, K.	IAA-B8-0317P
Yoshida, K.	IAA-B8-0604
Yoshida, K.	IAA-B8-1404
Yu, W.	IAA-B8-0906P
Zanella, P.	IAA-B8-0905P
Zaramenskikh, I. E.	IAA-B8-1302
Zee, R. E.	IAA-B8-1401
Zeile, O.	IAA-B8-1310P
Zhang, F.	IAA-B8-1311P
Zhang, J.	IAA-B8-0516P
Zhang, X.	IAA-B8-0906P
Zhang, Y.	IAA-B8-0403
Zhang, Y.	IAA-B8-0511P
Zhang, Z.	IAA-B8-0516P
Ziegler, B.	IAA-B8-0102
Ziemke, C.	IAA-B8-1102
Zorina, A.	IAA-B8-0501

*** I A A - B 8 - 0 0 0 0 P**



Sequential numbering, P indicating interactive presentation during Poster Session

Symposium Venue

The symposium will take place in the Berlin-Brandenburgische Akademie der Wissenschaften (BBAW), Jägerstraße 22/23, 10117 Berlin (mail address), **entrance from Markgrafenstraße 38 (Gendarmenmarkt)**.

Underground station: Stadtmitte (U2, U6).

More information: www.bbaw.de

On-site Registration

The Registration Desk will be set up in the symposium room foyer of the BBAW.

It will be open:

April 3, Sunday 16:00-20:00

April 4, Monday – April 7, Thursday 08:00-19:00

Name Badges

Name badges must be worn at all times in order to be admitted to the sessions and the social events.

The following colors have been assigned:

Participants	White
Students	White
Press	Yellow
Accompanying persons	Blue
Organization	Green

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 foyer of the BBAW
Phone +49 (0)30 20370422 Fax +49 (0)30 20370423
- Chairpersons' and Rapporteurs' meeting room: room 1,
Meeting of Session Chairpersons and Rapporteurs at 08:30 each day for introduction to their duties and latest changes.
- Authors are requested to arrive at the session room 10 minutes before the start of the session in order to meet the session chairperson for final preparations. Please bring your short biographies.

Publication of Papers

A proceedings CD-ROM will be dispatched after the symposium (including all submitted 8-page Final Papers).

Messages

A message center will be located in the registration area at the BBAW. There will be an internet terminal available for you to access your web-based e-mail accounts.

The lecture room will be equipped with wireless internet access (hot spot).

Lunch, Coffee Breaks

The registration fee of the participants covers the coffee breaks and the lunch buffet. Accompanying persons who want to take part in the lunch buffet may purchase a voucher at the registration desk (€ 15.00/day).

Social Events

Date/Time	Event	Venue
April 3, Sunday 19:00 – 21:00	Get-Together (included in the registration fee)	Berlin-Brandenburgische Akademie der Wissenschaften (BBAW) www.bbaw.de
April 4, Monday 19:00 – 23:00 (meeting point BBAW)	Reception (included in the registration fee)	Palais am Festungsgraben (Am Festungsgraben 1, 10117 Berlin) www.palais-am-festungsgraben.de
April 5, Tuesday 19:00 – 23:00 (meeting point BBAW)	IAA-Dinner € 90/person	The Regent Hotel Berlin Charlottenstr. 49, 10117 Berlin www.regenthotels.com/berlin
April 6, Wednesday 20:00 – 22:00	Concert: Berliner Philharmoniker Sir Simon Rattle	Berliner Philharmonie Herbert-von-Karajan-Str. 1 10785 Berlin www.berliner-philharmoniker.de
April 7, Thursday	Film presentation (included in the registration fee)	CineStar Imax 3D im Sony Center Potsdamer Str. 4, 10785 Berlin www.cinestar-imax.de

Excursion on Friday, April 8 (included in the registration fee)

09:00-12:00 Visit to

The WISTA-Management GmbH

WISTA Berlin Adlershof. is Germany's most successful science and technology park: Modern technology and entrepreneurial centers; eleven non-university research institutions; the natural sciences campus of the Humboldt University and Berlin's largest media location create a unique cluster of innovation.

WISTA promotes the networking between science and finance, as well as national and international cooperation, manage public relations for the entire development district.

www.adlershof.de

Departure: 9:00 - Boarding the bus in front of BBAW

09:00-12:00 Visit to

GFZ German Research Centre for Geosciences

The GFZ is the national research centre for Earth Sciences in Germany. We investigate “System Earth“ at locations all over the world with all the geological, physical, chemical and biological processes which occur at its surface and in its interior.

www.gfz-potsdam.de

Departure: 9:00 - Boarding the bus in front of BBAW

Sightseeing and Tours

During the symposium local sightseeing tours and tours to Potsdam with an English-speaking guide will be arranged on demand by CMT ConTour GmbH for accompanying persons. If you wish to order tickets for other events, concerts or theatres, please contact the concierge of the Hilton Hotel.

Sightseeing Tour in Berlin (by bus) - daily

Duration: 3 hours, German- and English-speaking guided

A sightseeing trip through the most famous historical parts of Berlin as well as the new sites of the growing German capital, including "Potsdamer Platz" and "Deutscher Bundestag".

Meeting place: Main Entrance of Hilton Hotel (Gendarmenmarkt)
Departure: 9:20 (and 13:20 only on Fri, Sat, Sun)
Fee: € 19.00 / person

City Circle Tour (by bus) – daily

Every 15 minutes - starting from 10:45 up to 15:45 - a sightseeing tour bus will pick you up at Gendarmenmarkt close to the Berlin Brandenburgische Akademie der Wissenschaften. There are 16 bus stops at the most beautiful places in the town, where you can leave the bus and discover the town by your own as long as you want. The next bus will take you off and bring you to the next stop and at last home. Informations in many languages are available at the sightseeing busses by headsets.

Meeting place: station Gendarmenmarkt (for the clearly defined place please ask the hostesses at the Symposium counter or the Concierge in the Hilton Hotel)
Departure: 10:45 – 15:45
Fee: € 20.00 / person

River Cruise on Spree river

Duration: 1 hour, German- and English-speaking guided (on demand)

The ride gives a short impression about the historic centre of the city and the area of the Parliament's buildings, examples of new architecture of Berlin.

Departure: station Nikolaiviertel
between 11:00 and 14:00 every 30 minutes
Fee: € 9.50 / person

Tour to Potsdam (by bus) – daily except Monday

Duration: approx. 4 hours, German- and English-speaking guided

The rococo Palace of Sanssouci became the favourite refuge of Prussia's greatest King, Friedrich II. Here, the Philosopher of Sanssouci entertained some of the most educated men of his time, among them the French poet Voltaire who was a frequent guest over many years. Our excursion takes you on an tour of the famous Sanssouci Palaces and the magnificent gardens.

Meeting place: Berlin Hilton
Departure: 9:20 and 13:20 (last departure only Saturday and Sunday)
Fee: € 39.00 / person

8th IAA Symposium on Small Satellites for Earth Observation	MONDAY April 4, 2011	TUESDAY April 5, 2011	WEDNESDAY April 6, 2011	THURSDAY April 7, 2011	FRIDAY April 8, 2011
09.00 - 10.30 <i>Papers</i>	09.00 - 09.15 Welcome	Session 04	Session 08	Session 12	Visit of:
	and Greetings	Constellations	New Land &	Star Sensors &	09.00 - 12.00
	09.15 - 10.05		Maritime Missions	Wheels	WISTA
	Keynote 1 and 2				Science and
10.30 - 10.50 <u>Coffee Break</u>	10.05 - 10.40 <u>Break</u> and				Technology Center
10.50 - 12.10 <i>Papers</i>	Press Conference	Session 05	Session 09	Session 13	Berlin-Adlershof
	10.40 - 12.20 Session 01	Special Aspects I	Subsystems	Attitude Control	
	Programmatics			Systems	09.00 - 12.00
					GFZ
12.10 - 13.30 <u>Lunch Break</u>	Lunch Break 12:20 – 13:30				Geo Research
13.30 - 15.00 <i>Papers</i>	Session 02	Session 06 (Special)	Session 10	Session 14 13:30 - 15:20	Center Potsdam
	Hyperspectral &	Student	Bus Systems	New Missions II	Potsdam
	SAR Missions	Conference			
15.00 - 15.20 <u>Coffee Break</u>				Coffee Break 15:20 – 15:40	
15.20 - 16.40 <i>Papers</i>	Session 03	Session 07	Session 11	Session 15 15:40 – 16:40	
	New Missions I	Instruments	Special Aspects II	Results &	
				Lessons Learned	
16.40 - 17.40 <i>Panel/Poster</i>	Panel Discussion	Session Poster I	Session Poster II	Symposium	
	<i>Small Satellites as</i>			Summary	
	<i>building blocks for</i>				
	<i>new applications and</i>			Awards	
	<i>emerging space</i>				
	<i>nations</i>				
Sunday, April 3, 2011 19.00 - Social Event (Get-Together) 21.00 BBAW	Reception (19.00-23.00) Palais am Festungsgr.	IAA-Dinner (19.00) Regent- Hotel	Concerts	Film Presentation CineStar IMAX	

Timetable