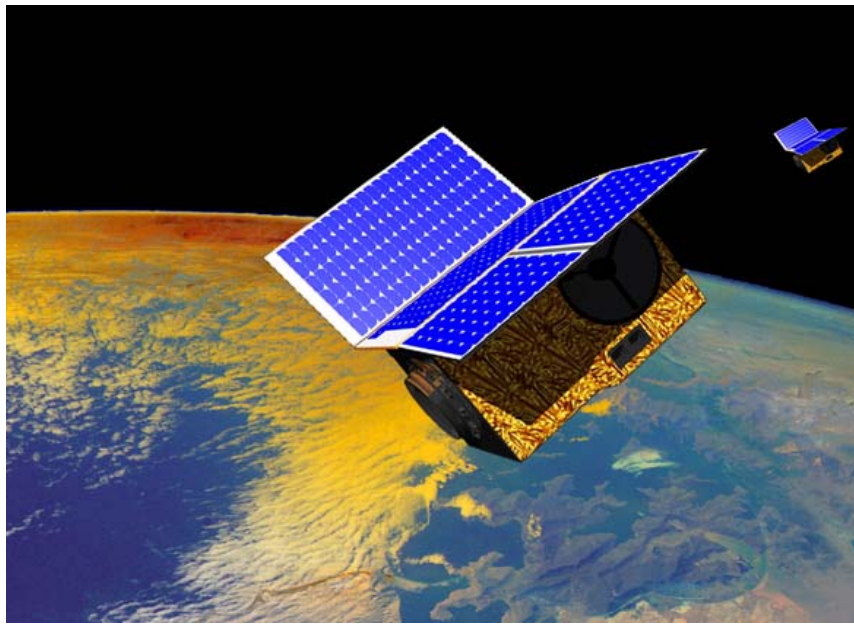


**7<sup>th</sup> IAA SYMPOSIUM**

**ON SMALL SATELLITES**

**FOR EARTH OBSERVATION**

**Final Program**



Composition picture: DLR

May 4 – 8, 2009

BBAW,  
Gendarmenmarkt

BERLIN, GERMANY



*International  
Academy of  
Astronautics*

Supported and hosted by



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## ***LOCAL ARRANGEMENTS***

### **Bernd Kirchner,**

Symposium and Program Co-ordinator,  
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### **Henriette Urban/Dietmar Hennig,**

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## Message of Greeting

from the Governing Mayor of Berlin, Klaus Wowereit, for the  
7<sup>th</sup> Symposium on Small Satellites for Earth Observation of the  
International Academy of Astronautics (IAA)  
in Berlin, May 4 – 8, 2009



***Klaus Wowereit***

It is a great pleasure for Berlin to be able to welcome for the seventh 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 2009.

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 benefits now 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'. The signature is written in a cursive, flowing style.

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



*European Office of Aerospace Research and Development,  
Air Force Office of Scientific Research, United States Air Force Research Laboratory  
<<http://www.london.af.mil>>*



## AGENDA

### 7<sup>th</sup> IAA Symposium on Small Satellites for Earth Observation

#### Sunday, May 3, 2009

16:00-20:00 Registration, BBAW<sup>1</sup>

19:00-21:00 Get-Together

#### Monday, May 4, 2009

08:00-09:00 Registration, BBAW

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

J.-M. Contant, IAA

J.-D. Wörner, DLR,

Germany

Honorary Chairman

09:15-09:30 **50 Years IAA**

J.-M. Contant, IAA

09:30-10:10 **Keynote Address:**

Sir Martin Sweeting,

SSTL, UK

“Small Satellites & Moore`s Law:  
implications for Earth Observation”

10:10-10:40 BREAK, PRESS CONFERENCE

10:40-12:10 **Session 01:**

**PROGRAMMATICS**

*Chair:* J.-M. Contant, IAA

*Rapporteur:* H.-P. Röser,  
Univ. of Stuttgart,  
Germany

12:10-13:30 LUNCH

13:30-15:00 **Session 02:**

**EARTH OBSERVATION MISSIONS 1**

*Chair:* A. Ginati, ESA

*Rapporteur:* S. Mostert, SCS,  
Stellenbosch,  
South Africa

15:00-15:20 BREAK

15:20-16:40 **Session 03:**

**INSTRUMENTS**

*Chair:* L. Maresi, ESA/ESTEC

*Rapporteur:* L. Fröbel, DLR,  
Germany

16:40-17:40 **Panel Discussion:**

**SMALL SATELLITES FOR EARTH  
OBSERVATION – COMMERCIALI-  
SATION POTENTIAL**

*Chair:* H. Stoewer, SAC,  
Germany

#### Tuesday, May 5, 2009

09:00-10:30 **Session 04: (Special)**

**REGULATORY ASPECTS OF  
SMALL SATELLITE MISSIONS**

*Chair:* K.-U. Schrogl, ESPI

*Rapporteur:* R. Kawashima,  
Axelspace Corp.,  
Japan

10:30-10:50 BREAK

10:50-12:10 **Session 05:**

**SPECIAL ASPECTS 1**

*Chair:* J. Esper, NASA/GSFC,  
USA

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

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:**

**ATTITUDE CONTROL SYSTEMS**

*Chair:* M. Ovchinnikov,  
RAS, Russia

*Rapporteur:* A. da Silva Curiel,  
SSTL, UK

16:40-17:40 **POSTER SESSION 1**

<sup>1</sup> Berlin-Brandenburgische Akademie der Wissenschaften

**AGENDA (cont'd)**

**Wednesday, May 6, 2009**

- |             |   |             |  |
|-------------|---|-------------|--|
| 09:00-10:30 | <b>Session 08: (Special)</b><br><b>DISTRIBUTED MISSIONS</b><br><i>Chair:</i> M. D'Errico, Univ. of<br>Naples, Italy<br><i>Rapporteur:</i> J. Esper, NASA/GSFC,<br>USA               | 10:50-12:10 | <b>Session 13:</b><br><b>SPECIAL ASPECTS 2</b><br><i>Chair:</i> P. Patterson, USU/SDL,<br>USA<br><i>Rapporteur:</i> C. Underwood,<br>SSTL, UK                          |
| 10:30-10:50 | BREAK   | 12:10-13:20 | LUNCH  |
| 10:50-12:10 | <b>Session 09:</b><br><b>SUBSYSTEMS</b><br><i>Chair:</i> S. Mostert, SCS, Stellen-<br>bosch, South Africa<br><i>Rapporteur:</i> K. Brieß, TU Berlin,<br>Germany                     | 13:20-15:00 | <b>Session 14: (Special)</b><br><b>NAVIGATION</b><br><i>Chair:</i> O. Montenbruck,<br>DLR/GSOC, Germany<br><i>Rapporteur:</i> J. Torley, Univ. of<br>Colorado, USA     |
| 12:10-13:30 | LUNCH   | 15:00-15:20 | BREAK  |
| 13:30-15:00 | <b>Session 10: (Special)</b><br><b>OPERATIONALLY RESPONSIVE<br/>SPACE</b><br><i>Chair:</i> J. Esper, NASA/GSFC, USA<br><i>Rapporteur:</i> R. Laufer, Univ. of<br>Stuttgart, Germany | 15:20-16:40 | <b>Session 15:</b><br><b>MISSION EXPERIENCES/<br/>LESSONS LEARNED</b><br><i>Chair:</i> M. Angulo, INTA,<br>Spain<br><i>Rapporteur:</i> A. da Silva Curiel,<br>SSTL, UK |
| 15:00-15:20 | BREAK   |             |  |
| 15:20-16:40 | <b>Session 11:</b><br><b>EARTH OBSERVATION MISSIONS 2</b><br><i>Chair:</i> A. da Silva Curiel, SSTL,<br>UK<br><i>Rapporteur:</i> J.-S. Chern, NSPO,<br>Taiwan, China                | 16:40-17:40 | <b>Symposium Summary:</b><br><i>Chair:</i> R. Sandau, DLR,<br>Germany<br><i>Chief Rapporteur :</i><br>E. Gill, TU Delft,<br>The Netherlands                            |
| 16:40-17:40 | <b>POSTER SESSION 2</b>   |             | <b>AWARDS</b>  |

**Thursday, May 7, 2009**

- 09:00-10:30 **Session 12: (SPECIAL)**  
**SMALL SPACECRAFT MISSIONS  
FOR LUNAR SCIENCE AND  
EXPLORATION**  
*Chair:* L. Alkalai, NASA/JPL, USA  
*Rapporteur:* R. Laufer, Univ. of  
Stuttgart, Germany

10:30-10:50 BREAK

**Friday, May 8, 2009**

09:00-12:00 Visit to:

**Technische Universität Berlin (TU Berlin),  
Aerospace Institute (ILR)**

or to:

**Berliner Elektronenspeicherring-Gesellschaft  
für Synchrotronstrahlung (BESSY)  
Berlin-Adlershof**

## **TECHNICAL PROGRAM**

### ***Session 1: Programmatic***

***Monday, May 4, 2009, 10:40 - 12:10***

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***Chair: J.-M. Contant, IAA    Rapporteur: H.-P. Röser, University of Stuttgart, Germany***

- The Integrated Application Promotion (IAP) – New ESA Program Initiative** IAA-B7-0101  
Ginati, A., European Space Agency (ESA)
- Overview on CNES Myriade microsattellites : in flight, under development and next** IAA-B7-0102  
Landiech, Ph., Rodrigues, P. and all micro satellite team, CNES
- In Orbit Demonstration Strategy based on Small Satellite Missions** IAA-B7-0103  
Strauch, K., Teston, F., Tobias. A., ESA/ESTEC
- First satellite of Small Demonstration Satellite Program of JAXA** IAA-B7-0105  
Hirako, K., Nakamura, Y., Hashimoto, H., JAXA, Japan

### ***Session 2: Earth Observation Missions 1*** ***Monday, May 4, 2009, 13:30 - 15:00***

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***Chair: A. Ginati, ESA    Rapporteur: S. Mostert, SCS, Stellenbosch, South Africa***

- Small Earth Observing Satellites Flying with Large Satellites in the A-Train** IAA-B7-0201  
Kelly, A. C., NASA/GSFC; Case, W. F., SGT Inc.; Quéruel, N., Maréchal, C., Barroso, T., CNES; Loverro, A., JPL
- IntaµSat-1 First Earth Observation Mission** IAA-B7-0202  
Angulo, M., INTA, Spain
- SPRITE-SAT: a University Small Satellite for Observation of High-altitude Luminous events** IAA-B7-0203  
Takahashi, Y., Yoshida, K. and SPRITE-SAT Development Team, Tohoku Univ. Japan
- VENµS (Vegetation and Environment monitoring on a New Micro Satellite)** IAA-B7-0204  
Crebassol, P., Ferrier, P., Dedieu, G., Hagolle, O., Fougnie, B., Tinto, F., CNES; Yaniv, Y., IAI, Israel; Herscovitz, J., RAFAEL, Israel

### ***Session 3: Instruments***

***Monday, May 4, 2009, 15:20 - 16:40***

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***Chair: L. Maresi, ESA/ESTEC    Rapporteur: L. Fröbel, DLR, Germany***

- High Resolution Optical Imaging Small Satellite Systems** IAA-B7-0301  
Tyc, G., Larson, W., Schulten, D., MDA, Canada; Butlin, T., Morris, N., Waltham, N., Tosh, I., RAL, UK
- Multi-Spectral Optical Scanners for Commercial Earth Observation Missions** IAA-B7-0302  
Schröter, K., Engel, W., Hoffmann, R., Kolbe, E., Schöneich, J., Jena-Optronik, Germany
- The vegetation instrument for the PROBA V mission** IAA-B7-0303  
De Vos, L., Moelans, W., Versluys, J., OIP, Belgium; Moreau, V., AMOS, Belgium; Jamoye, JF., Nanoshape, Belgium; Vermeiren, J., XenICS, Belgium; Maresi, L., Taccola, M., ESA/ESTEC
- Software defined LFM CW SAR receiver for microsattellites** IAA-B7-0304  
Ahmed, N., Underwood, C. I., SSC, UK

***Panel Discussion:***

***Small Satellites for Earth Observation – Commercialisation Potential***

***Monday, May 4, 2009, 16:40 - 17:40***

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***Chair: Heinz Stoewer, SAC, Germany***

***Panelists:***

Diane Evans, JPL, USA  
Michael Oxfort, RapidEye, Germany  
Patric Patterson, USU/SDL, USA  
Sias Mostert, SCS, South Africa  
Sir Martin Sweeting, SSTL, UK

***Session 4: (Special) Regulatory Aspects of Small Satellites Missions***

***Tuesday, May 5, 2009, 09:00 - 10:30***

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***Chair: K.-U. Schrogl, ESPI***

***Rapporteur: R. Kawashima, Axelspace Corp., Japan***

<b>Overview on regulatory aspects of small satellite missions</b> Schrogl, K.-U., ESPI, Austria	IAA-B7-0401
<b>National space legislation</b> Schmidt-Tedd, B., DLR, Germany	IAA-B7-0402
<b>Finding the balance - Optimum regulatory framework for space data in the information era</b> Smith, L. J., Leuphana Univ. Lüneburg, Germany	IAA-B7-0403
<b>Safeguarding the space environment</b> Williamson, R. A., Lukaszczyk, A., Secure World Foundation, USA	IAA-B7-0404

***Session 5: Special Aspects 1***

***Tuesday, May 5, 2009, 10:50 - 12:10***

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***Chair: J. Esper, NASA/GSFC, USA***

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

<b>Low cost earth observation flight operations systems</b> Molina Cobos, M. A., GMV, Spain	IAA-B7-0501
<b>SCALES - A System Level Tool for Conceptual Design of Nano- and Microsatellites</b> Aas, C., Zandbergen, B. T. C., Hamann, R. J., Gill, E. K. A., TU Delft, The Netherlands	IAA-B7-0502
<b>The First-MOVE Satellite – A pathfinder for future small satellites of the TU-München</b> Czech, M., Walter, U., TU München, Germany	IAA-B7-0503
<b>Design of a small educational satellite for the Italian high school students: The EduSAT project</b> Graziani, F., Univ. of Roma, Italy; Pulcrano, G., ASI, Italy; Battagliere, M. L., Piergentili, F., Santoni, F., Univ. of Roma, Italy; Mascetti, G., ASI, Italy	IAA-B7-0504

***Session 6: (Special) Student Conference Tuesday, May 5, 2009, 13:30 - 15:00***

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***Chair: L. Paxton, JHU/APL, USA***

***Rapporteur: H. Jahn, DLR, Germany***

<b>Testing of Critical Pico-Satellite Systems on the Sounding Rocket Rexus-4</b> Olthoff, C., Purschke, R., Rackl, W., Winklmeier, R., Czech, M., TU München, Germany	IAA-B7-0601
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<b>Onboard image quality assessment for a small low earth orbit satellite</b> van Zyl Marais, I., Steyn, W. H., du Preez, J. A., Univ. of Stellenbosch, South Africa	IAA-B7-0602
<b>Laboratory facility for simulation and verification of formation motion control algorithms</b> Ivanov, D., Moscow State Univ., Russia; Ming, Z., Walter, T., Univ. of Bremen, Germany, Zaramenskikh, I., RAS, Russia	IAA-B7-0603
<b>Asynchronous parallel reactive system for intelligent small satellite on-board computing systems</b> Kuwahara, T., Ziemke, C., Fritz, M., Univ. of Stuttgart, Germany; Eickhoff, J., EADS Astrium, Germany; Roeser, H.-P., Univ. of Stuttgart, Germany	IAA-B7-0604
<b>NanoSiGN - Nanosatellite for scientific interpretation of GNSS dual-frequency signals in the low Earth orbit</b> Pacholke, F., Vu, H. Q., Brieß, K., Kornemann, G., TU Berlin, Germany	IAA-B7-0605
<b>The COMPASS-1 Picosatellite in Space</b> Piepenbrock, J, Univ. of Applied Sciences, Aachen, Germany	IAA-B7-0606

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***Session 7: Attitude Control Systems***                      ***Tuesday, May 5, 2009, 15:20 - 16:40***

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***Chair: M. Ovchinnikov, RAS, Russia***    ***Rapporteur: A. da Silva Curiel, SSTL, UK***

<b>Star Sensor development based on the TUBSAT Experience</b> Buhl, M., Renner, U., TU Berlin, Germany	IAA-B7-0701
<b>Small sensors big choices</b> Leijtnens, J., de Boom, C. W., TNO science and Industry, Delft, The Netherlands	IAA-B7-0702
<b>PACE - Taiwan's First Nanosatellite for Evaluation of Momentum-Biased Attitude Control</b> Scholz, A., Miao, J.-J., Juang, J.-C., NCKU, Taiwan, China	IAA-B7-0703
<b>Robust and fault tolerant AOCS of the TET satellite</b> Terzibaschian, T., DLR, Germany; Yoon, Z., TU Berlin, Germany; Raschke, C., Astro- und Feinwerktechnik Adlershof, Germany; Maibaum, O., DLR, Germany	IAA-B7-0704

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***Poster Session 1***    ***Tuesday, May 5, 2009, 16:40 - 17:40***

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<b>SwissCube: The first entirely-built Swiss student satellite carrying an Earth observation payload</b> Borgeaud, M., Noca, M., Roethlisberger, G., Jordan, F., Choueiri, T., Steiner, N., Scheidegger, N., Space Center EPFL, Lausanne, Switzerland	IAA-B7-0205P
<b>Space system "Radiomet" for GLONASS/GPS navigation signal radio occultation monitoring of lower atmosphere and ionosphere based on super-small satellites</b> Vishnyakov, V., Romanov, A., Selivanov, A., Vinogradov, A., FSUE RISDE, Russia; Perykov, A., Pavelyev, A., Matyugov, S., Yakovlev, O., FIRE RAS, Russia	IAA-B7-0206P
<b>Real-Time Earth Observation Scenarios for Quick Response Services</b> Pietras, M, Fleischner, A., Wilde, M., Walter, U., TU München, Germany	IAA-B7-0207P
<b>Advanced Satellite with New System Architecture for Observation (ASNARO)</b> Ijichi, K., Mihara, S., Akiyama, M., Miyazaki, K., USEF, Japan; Ogawa, T., Narimatsu, Y., NEC Corp. Japan; Ito, O., NEDO, Japan	IAA-B7-0208P
<b>European Space-Based AIS System</b> Tobehn, C., te Hennepe, F., Wieser, M., OHB-System, Bremen, Germany; Hellenen, Ø., Olsen, Ø., FFI, Norway; Christiansen, S. E., Storesund, F., Kongsberg Seatex, Norway; Challamel, R., Thales Alenia Space, France	IAA-B7-0209P

## ***Poster Session 1 (cont.)***

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- SSTL's on-going programme for high resolution imaging from small satellites** IAA-B7-0211P  
Cawthorne, A., Gomes, L., Sweeting, M., SSTL, UK
- A Bi/Multi-Static Micro-Satellite Synthetic Aperture Radar (SAR) Constellation** IAA-B7-0212P  
Wanwiwake, T., STDA, Bangkok, Thailand; Underwood, C. I., SSC, UK
- The Study of Electromagnetic Parameters of Space Weather, Microsatellite "CHIBIS-M"** IAA-B7-0213P  
Klimov, S. I., IKI, RAS, Russia; Korepanov, V. E., ISR, Lviv, Ukraine; Novikov, D. I., IKI, RAS, Russia; Ferencz, Cs., Lichtenberger, J., Eötvös Univ., Budapest, Hungary; Marusenkov, A., ISR, Lviv, Ukraine; Bodnar, L., BL Electronics, Hungary
- Investigation of new physical phenomena in the atmospheric lightning discharges: Micro-satellite "CHIBIS-M"** IAA-B7-0214P  
Angarov, V. N., IKI, RAS, Russia; Garipov, G. K., SINP, Moscow State Univ., Russia; Gotlib, V. M., IKI, RAS, Russia; Gurevich, A. V., FIAN, RAS, Russia; Klimov, S. I., Rodin, V. G., IKI, RAS, Russia; Svertilov, S. I., SINP, Moscow State Univ., Russia; Zelenyi, L. M., IKI, RAS, Russia;
- Ground segment of low budget satellite "Chibis"** IAA-B7-0215P  
Angarov, V., Eismont, N., Gotlib, V., Nazarov, V., Nazirov, R., Rodin, V., IKI, RAS, Russia;
- Mission Analysis for the PRISMA Earth Observation Satellite** IAA-B7-0216P  
Razzano, E., Morea, G. D., Cipolla, S., Carlo Gavazzi Space S.p.A., Italy; Galeazzi, C., Varacalli, G. N., ASI, Italy
- Space remote sensing satellite system for disaster management with geographical limitation** IAA-B7-0217P  
Mirshams, M., Vafa, A. R., K. N. Toosi University of Technology, Tehran, Iran
- Venus micro satellite: Mission programming, data processing & data distribution, in the frame work of international cooperation and low cost management – concept and implementation** IAA-B7-0219P  
Poncet, M., Vadon, H., CNES, France
- Mission Design of the Dutch-Chinese FAST Micro-Satellite Mission** IAA-B7-0220P  
Maessen, D., Gill, E., Guo, J., Delft Univ., The Netherlands; Laan, E., TNO, The Netherlands; Moon, S., Cosine Res., The Netherlands; Zheng, G. T., Tsinghua Univ., Beijing, China
- The ROSA Mission** IAA-B7-0221P  
De Cosmo, V., Ananasso, C., Catalano, V., Garramone, L., Vespe, F., ASI, Italy
- The "Ulingo" Mid-Low Latitudes Observation (MILO) Mission** IAA-B7-0222P  
Ulivieri, C., Laneve, G., CRPSM, Univ. of Rome, Italy; Ortore, E., SAE, Univ. of Rome, Italy
- Integrated Design Based Plug-and-Play small SAR satellite project** IAA-B7-0223P  
Zhang, J., Shi, X., HIT, Harbin, China; Mu, D., NIET, Nanjing, China; Cao, X., Lan, S., HIT, Harbin, China
- The thermal determinator nano satellite concept** IAA-B7-0224P  
Rievers, B., Bindel, D., ZARM, Bremen, Germany; Dachwald, B., Plescher, E., Univ. of Aachen, Germany; Dittus, H., DLR, Germany
- Ground Station and Payload Data Center for TET-1** IAA-B7-0225P  
Richter, J., Schwarz, J., Damerow, H., Tegler, M., DLR/DFD, Germany
- SAR and Optical Earth Observation Missions for Fast Emergency Response** IAA-B7-0226P  
Ziegler, B., Tobehn, C., OHB-System, Germany; Mosebach, H., Staton, G., KT, Germany; Allan, P., Caves, R., MDA, Canada; Hartmann, R., Pillukat, A., Jena-Optronik; Germany

## ***Poster Session 1 (cont.)***

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- The Italian MIOSAT project for Earth Observation: phase A\B Mission Analysis challenges and results** IAA-B7-0227P  
Lavagna, M. Armellini, R., Politecnico di Milano, Italy; Agostara, C., Dionisio, C., Di Salvo, A., Rheinmetall Italia S.p.A., Italy
- German Russian Education Satellite - Mission outline and objectives** IAA-B7-0228P  
Bindel, D., ZARM, Bremen, Germany; Khromov, O., KIAM, RAS, Russia; Ovchinnikov, M., RISDE, Russia; Rievers, B., Rodrigues Navarro, J., ZARM, Bremen, Germany; Selivanov, A., KIAM, RAS, Russia;
- Collaborative Small Satellites Design Approach, a Model for Technology Cooperation between Developed and Developing Countries in Space Based Programs** IAA-B7-0230P  
Entezari, M. H., IROST, Iran
- OHB Satellites and Systems for Earth Observation Missions** IAA-B7-0231P  
Tobehn, C., Penné, B., Kassebom, M., Ziegler, B., Mahal, S., Greinacher, R., te Hennepe, F., OHB-System, Bremen, Germany
- University Microsatellites Equipped with an Optical System for Space Debris Monitoring** IAA-B7-0234P  
Cappelletti, C., Paolillo, F., Sapienza Univ. of Rome, Italy
- SEPSAT - A nanosatellite to observe parameters of space weather** IAA-B7-0236P  
Riebelmann, J., Arlt, F., Brieß, K., Köhler, K., Weise, J., ILR, TU Berlin, Germany
- Atmospheric monitoring with a constellation of small satellites** IAA-B7-0237P  
Stanley, C., Univ. of Surrey, UK
- Satellite Constellation Analysis and Design for Earth Observation Mission with Electro-Optical Sensors** IAA-B7-0238P  
Graziano, M. D., Second Univ. of Naples, Italy
- Application of microsatellites for remote sensing of woods of Siberia** IAA-B7-0239P  
Kosenko, V., Yakovlev, A., Popov, V., JSC ISS, Russia; Yurikova, E., Okhotkin, K., Kartzan, I., SibSAU, Russia; Sukhinin, A., KCS SB RAS, Russia
- The ALISEO payload for the small technological mission MIOSAT** IAA-B7-0305P  
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- PhytoMapper - Compact Hyperspectral Wide Field of View Instrument** IAA-B7-0306P  
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- Development of Spaceborne Small Hyperspectral sensor HSC-III for Micro Satellite** IAA-B7-0307P  
Aoyanagi, Y., Satori, S., HIT, Japan; Totani, T., Hokkaido Univ., Japan; Yasunaka, T., Uematsu Electric Co., Japan; Nakamura, A., AID MA Inc., Japan; Takeuchi, Y., Hokkaido Sat Inc., Japan
- New instrument for wave activity study** IAA-B7-0308P  
Korepanov, V., Dudkin, F., LCISP, Lviv, Ukraine; Lizunov, G., ISR, Kyiv, Ukraine
- Technical Development of Spectral Filters for SENTINEL-2** IAA-B7-0309P  
Schröter, K., Jena-Optronik, Jena, Germany; Schallenberg, U., MSO, Jena, Germany; Mohaupt, M., FIAOF, Jena, Germany
- Towards a Miniaturized Photon Counting Laser Altimeter and Stereoscopic Camera Instrument Suite for Microsatellites** IAA-B7-0310P  
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- A Plan of Distributed ISAR Satellite Imaging System aiming at space objects** IAA-B7-0311P  
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## ***Session 8: (Special) Distributed Missions***

***Wednesday, May 6, 2009, 09:00 - 10:30***

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***Chair: M. D'Errico, Univ. of Naples, Italy    Rapporteur: J. Esper, NASA/GSFC, USA***

- Earth Observation with SAR Satellite Formations: New Techniques and Innovative Products** IAA-B7-0801  
Krieger, G., Fiedler, H., Moreira, A., DLR, Germany
- Satellite formation for a next generation gravimetry mission** IAA-B7-0802  
Cesare, S., Parisch, M., Sechi, G., Thales ASI, Italy; Canuto, E., Politecnico di Torino, Italy; Aguirre, M., Massotti, L., Silvestrin, P., ESA/ESTEC
- EO Small Satellite Missions and Formation Flying** IAA-B7-0803  
Sephton, T., Wishart, A., Astrium Satellites Ltd, England; Rott, H., Nagler, T., ENVEO, Austria; Grafmueller, B., Astrium, Germany; Hall, D., Astrium, England; Robert, A., Astrium, France; Claessens, M., Verhaert Space, Belgium; de Nequeruela Alemán, C., GMV, Spain; Strauch, K., Gantois, K., ESA/ESTEC
- Relative Trajectory Design for Bistatic SAR Missions** IAA-B7-0804  
D'Errico, M., Second Univ. of Naples, Italy; Fasano, G., Univ. of Naples FedericoII, Italy

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***Wednesday, May 6, 2009, 10:50 - 12:10***

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- Increasing the data volume returned from small satellites** IAA-B7-0901  
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- Design of tensegrity structure as supporting structure of mesh-like deployable antenna for use in micro-satellites** IAA-B7-0902  
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- Flexible On-Board Data Handling for High Resolution Earth Observation Spacecraft** IAA-B7-0903  
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- In Orbit-Experience of Europe's Longest Flying Lithium-ion Batteries for Small-Satellites** IAA-B7-0904  
Simmons, N., ABSL, UK; Fredon, S., Melac, L., CNES

## ***Session 10: (Special) Operationally Responsive Space***

***Wednesday, May 6, 2009, 13:30 - 15:00***

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***Chair: J. Esper, NASA/GSFC, USA    Rapporteur: R. Laufer, Univ. of Stuttgart, Germany***

- Responsive space launch vehicles: a way ahead** IAA-B7-1001  
Buckley, S. J., Kirtland AFB, USA
- The 7-day solution: how ORS will answer the rapid call-up challenge** IAA-B7-1002  
Finley, C. J., Moretti, G., Kirtland AFB, USA
- Science and technology needs for ORS missions and execution strategy to achieve them** IAA-B7-1003  
Welsh, J. S., Wilkenfeld, J., Kirtland AFB, USA

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***Wednesday, May 6, 2009, 15:20 - 16:40***

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***Chair: A. da Silva Curiel, SSTL, UK    Rapporteur: J.-S. Chern, NSPO, Taiwan, China***

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- BEESAT - A Fault-tolerant Picosatellite Approach** IAA-B7-1103  
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- Small Satellite Constellations for Measurements of the Near-Earth Space Environment** IAA-B6-1104  
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- Use of aerodynamic forces to put spacecraft from high latitude launching site onto low equatorial orbit** IAA-B7-0510P  
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- A Simulated Environment for Developing Multi-task Software of Satellite** IAA-B7-0512P  
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- Dynamic Analysis of Axially Moving Beam-Type Appendage with End Mass** IAA-B7-0515P  
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- Reliability allocation and prediction for developing small satellite** IAA-B7-0517P  
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<b>High stability control of earth observation satellite based on Drag-Free Technology</b> Li, S., Xibin, C., HIT, Harbin, China	IAA-B7-0709P
<b>TUUSAT-1A Simulator Analysis and Design</b> Chern, J.-S., CIT, Hsinchu, Taiwan, China; Hong, Z.-C., Huang, Y.-J., Tamkang Univ., Taipei, Taiwan, China	IAA-B7-0710P
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<b>Implementation of a reliable data bus for the DELFI nanosatellite programme</b> Cornejo, N. E., Bouwmeester, J., Gaydadjiev, G. N., Delft Univ. of Techn., The Netherlands	IAA-B7-0908P
<b>Performance Investigations of SPT-20M Low Power Hall Effect Thrusters</b> Loyan, A. V., Maksymenko, T. A., STC SPE KhAI, Kharkiv, Ukraine	IAA-B7-0909P

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- Antenna Installed Performance on Satellite Platforms** IAA-B7-0912P  
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- A New Paradigm in Small-Satellite Battery Design** IAA-B7-0917P  
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- Temperature effects on the Alsat-1 NiCd battery performance** IAA-B7-1507P  
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- One year, seven satellites** IAA-B7-1508P  
da Silva Curiel, A., Cawthorne, A., Davies, P., Gomes, L., SSTL, Surrey, UK

## ***Session 12: (Special)***

### ***Small Spacecraft Missions for Lunar Science and Exploration***

***Thursday, May 7, 2009, 09:00 - 10:30***

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***Chair: L. Alkalai, NASA/JPL, USA    Rapporteur: R. Laufer, Univ. of Stuttgart, Germany***

- The Scientific Context for the Exploration of the Earth-Moon System** IAA-B7-1201  
Hiesinger, H., Univ. of Münster, Germany
- An Overview of the World Roadmap for the Exploration of the Moon** IAA-B7-1202  
Alkalai, L., NASA/JPL, USA
- German Lunar Exploration Orbiter (LEO): Providing a globally covered, highly resolved, integrated, geological geochemical, and geophysical data base of the Moon** IAA-B7-1203  
Jaumann, R., DLR/TU Berlin, Germany  
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van Gasselt, S., Claasen, F., Henselowsky, C., Michalik, H., Theil, S.
- World Space Team** IAA-B7-1204  
Spear, T.; NASA/JPL, USA

### ***Session 13: Special Aspects 2***

***Thursday, May 7, 2009, 10:50 - 12:10***

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***Chair: P. Patterson, USU/SDL, USA***

***Rapporteur: C. Underwood, SSTL, UK***

- The Rocket Balloon (Rocketball): Applications to Science, Technology, and Education** IAA-B7-1301  
Esper, J., NASA/GSFC, USA
- Low-cost launch services for micro satellites by means of utilization of Soyuz orbital stage** IAA-B7-1302  
Akhmetov, R. N., Novikov, V. I., TsSKB-Progress, Samara, Russia;  
Belokonov, I. V., SSAU, Samara, Russia
- TET-1 satellite bus for on-orbit-verification** IAA-B7-1303  
Eckert, S., Ritzmann, S., Schultz, C., Roemer, S., Astro-und Feinwerktechnik Adlershof,  
Germany; Bärwald, W., DLR, Germany
- Intersatellite Range Determination Using Multi-detectors Observation of Pulsars** IAA-B7-1304  
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### ***Session 14: (Special) Navigation***

***Thursday, May 7, 2009, 13:20 - 15:00***

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***Chair: O. Montenbruck, DLR/GSOC, Germany***

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

- Navigation needs for ESA's Earth Observation missions** IAA-B7-1401  
Roselló Guasch, J., Silvestrin, P., Aguirre, M., Massotti, L., ESA/ESTEC
- Benefits of Galileo for future satellite missions** IAA-B7-1402  
Enderle, W., European Commission, Brussels, Belgium
- Differential GPS: an enabling technology for formation flying satellites** IAA-B7-1403  
D'Amico, S., Montenbruck, O., DLR/GSOC, Germany
- Near-Real-Time Orbit Determination of LEO Satellites** IAA-B7-1404  
Hauschild, A., DLR/GSOC, Germany
- The scientific use of GNSS signals in space** IAA-B7-1405  
Wickert, J., Arras, C., Beyerle, G., Heise, S., GFZ, Germany; Jakowski, N., DLR, Germany;  
Rothacher, M., ETH Zürich, Switzerland; Schmidt, T., Stosius, R., GFZ, Germany

### ***Session 15: Mission Experiences/Lessons Learned***

***Thursday, May 7, 2009, 15:20 - 16:40***

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***Chair: M. Angulo, INTA, Spain***

***Rapporteur: A. da Silva Curiel, SSTL, UK***

- RapidEye – The first six months in orbit** IAA-B7-1501  
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Oxford, M., Widmer, P., RapidEye, Germany
- FORMOSAT-2 mission life SOH trending analysis** IAA-B7-1502  
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- Possibility of the IGRF model upgrade using microsatellite service magnetometer** IAA-B7-1503  
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- CHAMP Mission Results and Spin Off** IAA-B7-1505  
Zaglauer, A., EADS Astrium, Germany

*Chair: R. Sandau, DLR, 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, May 5, 2009, 19:00 at Käfer Berlin, Restaurant im Reichstag.

### **Special thanks go to the Student Paper Evaluation Committee:**

Leon Alkalai, NASA/JPL, USA

Klaus Brieß, TU Berlin, Germany

Jaime Esper, NASA/GSFC, USA

Einar-Arne Herland, ESA/ESTEC

Sias Mostert, Space Commercial Services, Stellenbosch, South Africa

Shinichi Nakasuka, University of Tokyo, Japan

Michael Ovchinnikov, Keldysh Institute of Applied Mathematics, Russia

Rainer Sandau, DLR, Germany

K. Thyagarajan, ISRO, India

James Torley, University of Colorado at Colorado Springs, USA

Craig Underwood, SSTL, UK

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Dannemann, F.	IAA-B7-0514P
Dannemann, F.	IAA-B7-0914P
Darrin, A.	IAA-B7-1104
Davies, P.	IAA-B7-1508P
de Boom, C. W.	IAA-B7-0702
De Cosmo, V.	IAA-B7-0221P
De Florio, S.	IAA-B7-0915P
de Negueruela Alemán, C.	IAA-B7-0803
Denk, T.	IAA-B7-1203
De Vos, L.	IAA-B7-0303
Dedieu, G.	IAA-B7-0204
Di Salvo, A.	IAA-B7-0227P
Di Salvo, A.	IAA-B7-0218P
Dionisio, C.	IAA-B7-0305P
Dionisio, C.	IAA-B7-0218P
Dionisio, C.	IAA-B7-0227P
Dittrich, L.	IAA-B7-0906P
Dittus, H.	IAA-B7-0224P
du Preez, J. A.	IAA-B7-0602
Dubourg, V.	IAA-B7-0505P
Dudkin, F.	IAA-B7-0308P
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Eckert, S.	IAA-B7-1303
Eckl, C.	IAA-B7-0511P
Eichentopf, K.	IAA-B7-1203
Eickhoff, J.	IAA-B7-0604
Eismont, N.	IAA-B7-0215P
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Ekre, J.	IAA-B7-0209P
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Engel, W.	IAA-B7-0302
Entezari, M. H.	IAA-B7-0230P
Escande, C.	IAA-B7-0505P
Esper, J.	IAA-B7-1301
Fasano, G.	IAA-B7-0804
Fazli, N.	IAA-B7-0902
Ferencz, Cs.	IAA-B7-0213P
Ferrier, P.	IAA-B7-0204
Fiedler, H.	IAA-B7-0801
Finley, C. J.	IAA-B7-1002
Flechtner, F.	IAA-B7-1203
Fleischner, A.	IAA-B7-0207P
Fougnie, B.	IAA-B7-0204
Fredon, S.	IAA-B7-0904
Fritz, M.	IAA-B7-0604
Galeazzi, C.	IAA-B7-1102
Galeazzi, C.	IAA-B7-0216P
Gantois, K.	IAA-B7-0803

<u>Name</u>	<u>Paper/Poster Reference*</u>
Garipov, G. K.	IAA-B7-0214P
Garner, P.	IAA-B7-0901
Garramone, L.	IAA-B7-0221P
Gaydadjiev, G. N.	IAA-B7-0908P
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Gill, E. K. A.	IAA-B7-0502
Gill, E.	IAA-B7-0220P
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Ginati, A.	IAA-B7-0101
Glassmeier, K.-H.	IAA-B7-1203
Gomes, L.	IAA-B7-0211P
Gomes, L.	IAA-B7-1508P
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Gotlib, V. M.	IAA-B7-0214P
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Grafmueller, B.	IAA-B7-0803
Grassi, M.	IAA-B7-0806P
Graziani, F.	IAA-B7-0504
Graziano, M. D.	IAA-B7-0238P
Greinacher, R.	IAA-B7-0231P
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Hänisch, R.	IAA-B7-0913P
Hannaford, N.	IAA-B7-1501
Hannemann, S.	IAA-B7-0310P
Harris, J.	IAA-B7-0310P
Hartmann, R.	IAA-B7-0226P
Hartogh, P.	IAA-B7-1203
Hashimoto, H.	IAA-B7-0105
Haslehurst, A.	IAA-B7-0901
Hauber, E.	IAA-B7-1203
Häusler, B.	IAA-B7-1203
Hauschild, A.	IAA-B7-0508P
Hauschild, A.	IAA-B7-1404
Heise, S.	IAA-B7-1405
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Helleren, Ø.	IAA-B7-0209P
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Herscovitz, J.	IAA-B7-0204
Hiesinger, H.	IAA-B7-1201
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Hirako, K.	IAA-B7-0105

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Hoffmann, H.	IAA-B7-1203
Hoffmann, R.	IAA-B7-0302
Hong, Z.-C.	IAA-B7-0710P
Hördt, A.	IAA-B7-1203
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Hsieh, M.-Y.	IAA-B7-0517P
Huang, A.	IAA-B7-0517P
Huang, Y.-J.	IAA-B7-0710P
Ijichi, K.	IAA-B7-0208P
Ito, O.	IAA-B7-0208P
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Jakowski, N.	IAA-B7-1405
Jalilian, Sh.	IAA-B7-0512P
Jamoye, JF.	IAA-B7-0303
Jamshidifar, A. A.	IAA-B7-0512P
Jaumann, R.	IAA-B7-1203
Jessberger, K.	IAA-B7-1203
Johansson, J.	IAA-B7-0911P
Johansson, J.	IAA-B7-0912P
Jordan, F.	IAA-B7-0205P
Juang, J.-C.	IAA-B7-0703
Kajon, D.	IAA-B7-0705P
Kartzan, I.	IAA-B7-0239P
Kassebom, M.	IAA-B7-0231P
Kassebom, M.	IAA-B7-0903
Kayal, H.	IAA-B7-1103
Kazimov, T. G.	IAA-B7-0512P
Keller, H. U.	IAA-B7-1203
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Kempf, S.	IAA-B7-1203
Khayyat, A. A.	IAA-B7-0515P
Khromov, O.	IAA-B7-0228P
Kitts, C.	IAA-B7-0520P
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Kuwahara, T.	IAA-B7-0604

<u>Name</u>	<u>Paper/Poster Reference*</u>
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Ortore, E.	IAA-B7-0222P
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Palme, H.	IAA-B7-1203
Palmer, P.	IAA-B7-0714P
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Pillukat, A.	IAA-B7-0226P
Pippi, I.	IAA-B7-0305P
Plescher, E.	IAA-B7-0224P
Pletner, S.	IAA-B7-0913P
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Poncet, M.	IAA-B7-0219P
Popov, V.	IAA-B7-0239P
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Rießelmann, J.	IAA-B7-0136P
Rievers, B.	IAA-B7-0224P
Rievers, B.	IAA-B7-0228P
Ritzmann, S.	IAA-B7-1303
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Rodin, V. G.	IAA-B7-0214P
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Rodrigues Navarro, J.	IAA-B7-0228P
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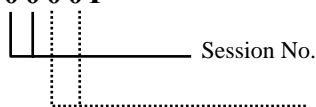
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Roeser, H.-P.	IAA-B7-0604
Roethlisberger, G.	IAA-B7-0205P
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Roselló Guasch, J.	IAA-B7-1401
Rothacher, M.	IAA-B7-1405
Rott, H.	IAA-B7-0803
Rotteveel, J.	IAA-B7-0708P
Sacchetti, A.	IAA-B7-1102
Sanders, B.	IAA-B7-0705P
Santoni, F.	IAA-B7-0504
Satori, S.	IAA-B7-0307P
Schallenberg, U.	IAA-B7-0309P
Scheidegger, N.	IAA-B7-0205P
Schmidt, T.	IAA-B7-1405
Schmidt-Tedd, B.	IAA-B7-0402
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Schöneich, J.	IAA-B7-0302
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Schumann, H.	IAA-B7-0506P
Schwarz, J.	IAA-B7-1506P
Schwarz, J.	IAA-B7-0225P
Sechi, G.	IAA-B7-0802
Segert, T.	IAA-B7-0518P
Selivanov, A.	IAA-B7-0228P
Selivanov, A.	IAA-B7-0206P
Sephton, T.	IAA-B7-0803
Sgroi, G.	IAA-B7-0218P
Sgroi, G.	IAA-B7-0305P
Shahrabi,	IAA-B7-0713P
Shi, L.	IAA-B7-0711P
Shi, X.	IAA-B7-0223P
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Silvestrin, P.	IAA-B7-0802
Silvestrin, P.	IAA-B7-1401
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Sohl, F.	IAA-B7-1203
Spear, T.	IAA-B7-1204
Spohn, T.	IAA-B7-1203
Spurrett, R.	IAA-B7-0917P
Srama, R.	IAA-B7-1203

<u>Name</u>	<u>Paper/Poster Reference*</u>
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Staton, G.	IAA-B7-0226P
Steiner, N.	IAA-B7-0205P
Steyn, J.	IAA-B7-1501
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Takeuchi, Y.	IAA-B7-0307P
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te Hennepe, F.	IAA-B7-0209P
te Hennepe, F.	IAA-B7-0903
Terzibaschian, T.	IAA-B7-0506P
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Theil, S.	IAA-B7-1203
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Tyc, G.	IAA-B7-0301
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van Mierlo, M.	IAA-B7-1101
van Zyl Marais, I.	IAA-B7-0602
Varacalli, G. N.	IAA-B7-0216P
Vermeiren, J.	IAA-B7-0303

<u>Name</u>	<u>Paper/Poster Reference*</u>
Versluys, J.	IAA-B7-0303
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Vinogradov, A.	IAA-B7-0206P
Vishnyakov, V.	IAA-B7-0206P
Vu, H. Q.	IAA-B7-0605
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Walter, U..	IAA-B7-0207P
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Wanwiwake, T.	IAA-B7-0212P
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Wickert, J.	IAA-B7-1405
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Wielinga, K.	IAA-B7-0310P
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Wieser, M.	IAA-B7-0209P
Wilde, M.	IAA-B7-0207P
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Wilkenfeld, J.	IAA-B7-1003
Wimmer-Schweingruber, R.	IAA-B7-1203
Winklmeier, R.	IAA-B7-0601
Wishart, A.	IAA-B7-0213P
Wishart, A.	IAA-B7-0803
Wu, A.-M.	IAA-B7-1502
Xibin, C.	IAA-B7-0709P
Xing, L.	IAA-B7-0311P

<u>Name</u>	<u>Paper/Poster Reference*</u>
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Yasunaka, T.	IAA-B7-0307P
Yoon, Z.	IAA-B7-0704
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Zackrisson, J.	IAA-B7-0911P
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Zaglauer, A.	IAA-B7-1505
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Zandbergen, B.	IAA-B7-0705P
Zaramenskikh, I.	IAA-B7-0603
Zelenyi, L. M.	IAA-B7-0214P
Zhang, J.	IAA-B7-0223P
Zhang, J.-X.	IAA-B7-1304
Zhang, S.-J.	IAA-B7-0711P
Zhao, D.	IAA-B7-1304
Zhao Deyong	IAA-B7-0519P
Zheng, G. T.	IAA-B7-0220P
Zheng, G. T.	IAA-B7-0805P
Zhou Haiyin	IAA-B7-0519P
Ziegler, B.	IAA-B7-0226P
Ziegler, B.	IAA-B7-0231P
Ziemke, C.	IAA-B7-0604

**\* I A A - B 7 - 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](http://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:

May 3, Sunday	16:00-20:00
May 4, Monday – May 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).

A selection of contributed papers will appear in the book of selected proceedings.

### ***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***

<b>Date/Time</b>	<b>Event</b>	<b>Venue</b>
<b>May 3, Sunday</b> 19:00 – 21:00	Get-Together (included in the registration fee)	Berlin-Brandenburgische Akademie der Wissenschaften (BBAW) www.bbaw.de
<b>May 4, Monday</b> 19:00 – 23:00 (meeting point BBAW)	Reception (included in the registration fee)	Zeiss Großplanetarium Berlin (Prenzlauer Allee 80, 10405 Berlin; after a short bus trip through the city of Berlin, you will reach the Planetarium)
<b>May 5, Tuesday</b> 19:00 – 23:00 (meeting point BBAW)	IAA-Dinner €90/person	Käfer Berlin, Restaurant im Reichstag Platz der Republik 1, 11011 Berlin
<b>May 6, Wednesday</b>	Concert: tbd	Konzerthaus Berlin Gendarmenmarkt 2, 10117 Berlin
<b>May 7, Thursday</b>	Film presentation (included in the registration fee)	CineStar Imax 3D im Sony Center Potsdamer Str. 4, 10785 Berlin

### ***Excursion on Friday, May 8*** (included in the registration fee)

09:00-12:00 Visit to

#### **Technische Universität Berlin (TU Berlin), Aerospace institute (ILR)**

The excursion will give an insight to the developments of space technology at TU Berlin. During the visit past, present and future missions will be explained. The tour will include presentation of the BeeSat labs and TU Berlin mission control center. Special highlight is the participation in a live pass of LAPAN TUBSAT the latest of the TUBSAT satellites.

Departure: 9:00 – 9:30 Boarding the bus in front of BBAW

09:00-12:00 Visit to

#### **Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung (BESSY).**

The Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung (BESSY) operates the only German 3rd generation synchrotron radiation facility. The storage ring BESSY II provides ultrabright photon beams from the long wavelength Terahertz region to hard X-rays with complete control of the polarization of the radiation and energy range. 46 beamlines offer a multi-faceted mixture of experimental opportunities at undulator, wiggler and dipole sources with excellent energy resolutions. The combination of brightness and time resolution makes BESSY the ultimate microscope for space and time, since both femtosecond time and picometer spatial resolutions are available.

Departure: 9:00 – 9:30 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

Fee: €22.00/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 14 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 pick you up 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: 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: €18.00/person

### **River Cruise on Landwehrkanal and Spree: a Sightseeing Tour by Ship - daily**

Duration: 3.5 – 4 hours, German- and English-speaking guided (on demand)

Experience the variety of architectural styles on our city cruise and discover that Berlin has more bridges than Venice. You will see the Oberbaum Bridge, Oberschleuse, Technikmuseum (Science Museum), Palace Charlottenburg, Spreebogen, Bellevue Palace, Haus der Kulturen der Welt, Government Quarter, Reichstag (Seat of German Government), Charité, Museum Island, Berlin Cathedral, Nikolai Quarter.

Departure: shipping pier Friedrichstraße/Reichstagufer  
between 10:00 and 14:00 every 50 minutes

Fee: €17.50/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 a 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: €37.00/person

<b>7<sup>th</sup> IAA Symposium on Small Satellites for Earth Observation</b>	<b>MONDAY May 4, 2009</b>	<b>TUESDAY May 5, 2009</b>	<b>WEDNESDAY May 6, 2009</b>	<b>THURSDAY May 7, 2009</b>	<b>FRIDAY May 8, 2009</b>
<b>09.00 - 10.30</b> <i>Papers</i>	09.00 - 09.30 <b>Welcome and Greetings</b> 09.30 - 10.10 <b>Keynote</b>	<b>Session 04</b> (Special) Regulatory Aspects of Small Satellite Missions	<b>Session 08</b> (Special)  Distributed Missions	<b>Session 12</b> (Special)  Small Spacecraft Missions for Lunar Science and Exploration	<b>Visit of:</b>  09.00 - 12.00 Technische Universität Berlin (TU Berlin) Aerospace Institute (ILR)  09.00 - 12.00 Berliner Elektronen- speicherring-Gesell- schaft für Synchro- tronstrahlung (BESSY) Berlin-Adlershof
10.30 - 10.50 Coffee Break	10.10 - 10.40 Break and Press Conference	<b>Session 05</b>  Special Aspects 1	<b>Session 09</b>  Subsystems	<b>Session 13</b>  Special Aspects 2	
<b>10.50 - 12.10</b> <i>Papers</i>	10.40 - 12.10 <b>Session 01</b> Programmatics				
12.10 - 13.30 Lunch Break				12:10 - 13:20 Lunch	
<b>13.30 - 15.00</b> <i>Papers</i>	<b>Session 02</b>  Earth Observation Missions 1	<b>Session 06</b> (Special)  Student Conference	<b>Session 10</b> (Special)  Operationally Responsive Space	13:20 - 15:00 <b>Session 14</b> (Special)  Navigation	
15.00 - 15.20 Coffee Break					
<b>15.20 - 16.40</b> <i>Papers</i>	<b>Session 03</b>  Instruments	<b>Session 07</b> Attitude Control Systems	<b>Session 11</b> Earth Observation Missions 2	<b>Session 15</b> Mission Experiences/ Lessons Learned	
<b>16.40 - 17.40</b> <i>Panel/Poster</i>	<b>Panel Discussion</b> Small Satellites for Earth Observation - Commercialisation Potential (H. Stoewer)	<b>Session Poster 1</b>	<b>Session Poster 2</b>	<b>Symposium Summary</b>  <b>Awards</b>	
Sunday, May 3, 2009 <b>19.00 - Social Event</b> (Get-Together) <b>21.00</b> BBAW	<b>Reception</b> (19.00-23.00) Zeiss Großplanetar.	<b>IAA-Dinner</b> (19.00-23.00) Käfer Rest. Reichstag	<b>Concerts</b>	<b>Film Presentation</b> CineStar IMAX	