

**3rd IAA Symposium on
Small Satellites for Earth Observation**

Berlin, Germany, April 2-6, 2001

SESSION 01 - PROGRAMMATICS

Chair: A. Valenzuela – IAA

Rapporteur: A. Tobias – ESA

The New Candidates for ESA Earth Explorer Core Missions

A. Tobias, J. Fuchs, W. Leibrandt – ESA/ESTEC

IAA-B3-0101

Lessons Learned: NASA and Small Satellites for Earth Science

M.R. Luther, C.C. Johnson – NASA/HQ, USA

IAA-B3-0103

**Earth Observation Program at the Khrunichev State
Research and Production Space Center**

I. Glazkova, B. Yurchenko – KHRUNICHEV, Russia

IAA-B3-0201

SESSION 02 - EARTH WATCH MISSIONS I

Chair: A. Tobias – ESA

Rapporteur: H. Jahn – DLR/WP

The Amazon Rainforest Monitoring Satellite - SSR

H. Carvalho, J. Kono, M.M. Quintino, C. E. Santana – INPE, Brazil

IAA-B3-0202

MEISAT (Multi-spectral Earth Imaging Satellite) Mission Analysis

H. Lee, B.J. Kim, S. Park – SaTReCi, South Korea

IAA-B3-0203

**High Resolution Radar with On-board Image Synthesis System
for Small Satellite**

O.N. Rzhiga, Yu.N. Alexandrov – RAS, Russia,

A.V. Gorbunov, A.V. Shafransky – ROSAVIACOSMOS, Russia,

Ya.Ya. Petrichkovich, T. Solokhina – ELVIS, Russia

IAA-B3-0205

On the Static and Dynamic Analysis of a Small Satellite (MESBAH)

M. Sedighi, B. Mohammadi – IROST, Iran

IAA-B3-1507

SESSION 03 - RESULTS AND LESSONS LEARNED

Chair: L. Paxton – JHU/APJ, USA

Rapporteur: B. Häusler – University of FAF, Germany

The Space Technology Research Vehicle 2 – Medium Wave Infrared Imager

S.J. Cawley, S. Murphy, A. Willig, P.S. Godfree – DERA, UK IAA-B3-0301

Microsatellites for Science and Technology: Gurwin-Techsat In-flight Experiments Results

M. Guelman, F. Ortenberg, A. Shiryaev, R. Waller – ASRI, Israel IAA-B3-0302

Mita: In Orbit Results of the Italian Small Platform and the First Earth Observation Mission, HYPSEO

P. Sabatini, R. Aceti, T. Lupi, G. Annoni, F. Dalla Vedova – CGS, Italy,
V.De Cosmo, F. Viola – ASI, Italy IAA-B3-0303

Flight Experiences with DLR-TUBSAT

St. Roemer, U. Renner – TU Berlin, Germany IAA-B3-0304

PANEL 1 - USER REQUIREMENTS AND EXPECTATIONS

Chairman: H. Stoewer – SAC, Germany

Members: J.-L. Fellous – CNES/CEOS, France
J. Herrmann – ASTRIUM, Germany
T. Mohr – EUMETSAT, Germany
A. Tobias – ESA

SESSION 04 - EARTH EXPLORER MISSIONS

Chair: S. Neeck – NASA/GSFC, USA

Rapporteur: H. Jahn – DLR/WP, Germany

CLOUDS - a Clouds, Aerosol, Radiation and Precipitation Explorer

B. Bizzarri – University of Rome, Italy,
K. Künzi – University of Bremen, Germany IAA-B3-0401

Atmosphere Climate Experiment ACE

S. Veldman, K. Lundahl – SSC, Sweden, P. Hoeg – DMI, Denmark,
F. Hass – TERMA ELEKTRONIK, Denmark,
P. Sinander – SES, Sweden IAA-B3-0402

A Small Glance to Earth from Space

S. Zoffoli, M. Crisconio, C. Musso, G.F. Bignami – ASI, Italy IAA-B3-0403

CHAMP - The First FlexBus in Orbit

A. Zaglauer, W. Pitz – ASTRIUM, Germany IAA-B3-0404

SESSION 05 - SPECIAL ASPECTS OF SMALL SATELLITES MISSION

Chair: K. Brieß – DLR/WP, Germany

Rapporteur: I. Rodionov – REAGENT, Russia

HYPSEO: Demonstration Mission for a New Earth Observation Hyperspectral Sensor

A. Foni – CNUCE, Italy, V. De Cosmo – ASI, Italy

IAA-B3-0805

Satellite Data Reception System at Multimission Ground Station

H. Damerow, J. Schwarz – DLR, Germany

IAA-B3-0502

Attitude Control and Stabilization System for the School Microsatellite

S.I. Klimov, V.N. Angarov, N.A. Eismont, M.N. Nozdrachev – RAS, Russia,

Yu.V. Afanasyev – Mag Sensors, Russia,

J. Rustenbach – MPI, Germany

IAA-B3-0503

Passive Control and Layout Optimization of Mesbah Small Satellite

S. Khoddam, M. A. Ardakani – IROST, Iran

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SESSION 06 (Special) - SMALL SATELLITE CONSTELLATION

Chair: R. Sandau – IAA

Rapporteur: L. Alkalai – NASA/JPL, USA

FUEGO: A Dedicated Constellation of Small Satellites to Detect and Monitor Forest Fires

D. Escorial, I.F. Tourné, F.J. Reina – INSA, Spain

IAA-B3-0601

WITTEX: A Constellation of Three Small Satellites that Meet Aggressive Requirements for Radar Altimetry

R.K. Raney, D.L. Porter, G.H. Fountain – JHU/APL, USA

IAA-B3-0602

Micro-Minisatellites for Affordable EO Constellations: RapidEye & DMC

Wei Sun, J.P. Stephens, M. Sweeting – SSTL, UK

IAA-B3-0603

Nano/Micro Satellite Constellations for Earth and Space Science

J. Esper – SWALES AEROSPACE, USA,

S. Neeck, J.A. Slavin, J. Leitner, W. Wiscombe, F.H. Bauer –

NASA/GSFC, USA

IAA-B3-0604

SESSION 07 - ADVANCED TECHNOLOGIES AND INSTRUMENTS

Chair: K. Janschek – TU Dresden, Germany

Rapporteur: J. Esper – SWALES AEROSPACE, USA

The Role of Emerging Technologies in Imagery for Disaster Monitoring and Disaster Relief Assistance

L.J. Paxton, J.-H. Yee – JHU/APL, USA

IAA-B3-0701

Low Cost Hyperspectral Imaging from Space

M.-C. Perkinson – ASTRIUM, England,

D. Lobb, M. Cutter, R. Renton – SIRA, England

IAA-B3-0702

Compact Fourier-Transform Imaging Spectrometer for Small Satellite Missions

B. Harnisch – ESA/ESTEC, W. Posselt, K. Holota – ASTRIUM, Germany,

H.O. Tittel, M. Rost – UNIVERSITY OF SIEGEN, Germany

IAA-B3-0703

A High-Resolution Multi-Spectral Imaging System for Small Satellites

E.-E. Kim, Y.-W. Choi, H.S. Yang – SaTReCi, South Korea,

A.A.A. Rasheed – ATSB, Malaysia

IAA-B3-070

PANEL 2 - NEW TECHNOLOGIES FOR SMALL SATELLITE MISSIONS

Chair: S. Neeck – NASA/GSFC, USA

Members: L. Alkalai – NASA/JPL, USA
P. Colomb – CONAE, Argentina
J. Esper – SWALES, USA
M. Oda – NASDA, Japan
L. J. Paxton – JHU/APL, USA
A. Tobias - ESA

SESSION 08 - EARTH WATCH MISSIONS II

Chair: A. Ginati – ESA

Rapporteur: K. Brieß – DLR/WP

The Russian Small Satellite for Hyperspectral Monitoring of Gas Pipelines

E. Dedikov – JSC Gazprom, Russia, N. Khrenov – RAS, Russia,

V. Lukyaschenko – TSNIMASH, Russia, R. Salikhov, A. Ponomarev –

NIIEM, Russia, M. Ovchinnikov – RAS, Russia,

I.L.J. Rodionov – REAGENT, Russia

IAA-B3-0801

Project MIMOSA - Final Stage of the Satellite Fabrication

R. Peresty, L. Sehnal – CzAS, Czech Republic

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A Conceptual Study on Ricesat

M. Ono, O. Isoguchi, S. Murai – RSTC, Japan

IAA-B3-0803

Global Fisheries Monitoring from Small Satellites

G.K. Hoye, T. Eriksen, B.T. Narheim, T. Wahl – NDRE (FFI), Norway

IAA-B3-0804

SESSION 09 - LOW COST MANAGEMENT ASPECTS

Chair: I. Tourné – INSA, Spain

Rapporteur: A. Tobias – ESA

COCONUDS - Two Years on

F.F. Verduijn, T. Algra – NLR, Netherlands , G.J. Close, C. Lee – SCIENCE

SYSTEMS, UK, B.J. Denore – GEOSYS , Spain,

J.B. Williams – NRI, UK

IAA-B3-0901

Hopes on Small Satellites

T. Hayashi – CHIBA, Japan

IAA-B3-0902

Innovative Engineering Processes and Production Methodologies to Reduce Development Cost of Future Satellites

C. Dionisio, A. Casola – ALENIA SPAZIO, Italy

IAA-B3-0903

Earth Observation Program, Should it Use a Reliable System or a Cost Effective System?

M. Oda – NASDA, Japan

IAA-B3-0904

SESSION 10 (Special) - NASA TECHNOLOGIES OF THE NEW MILLENNIUM

Chair: L. Alkalay – NASA/JPL, USA

Rapporteur: R. Sandau - IAA

An Overview of Flight Computer Technologies for Future NASA Space Exploration Missions

L. Alkalai – NASA/JPL, USA

IAA-B3-1001

Inserting New Technology into Small Missions

L.J. Deutsch – NASA/JPL, USA

IAA-B3-1002

Application of 3D Chip Stacking for Current and Future Small Satellite Missions

C. Val – 3Dplus, France

IAA-B3-1003

An Overview of MEMS-based Micropropulsion Developments at JPL

J. Mueller – NASA/JPL, USA

IAA-B3-1004

SESSION 11 - TECHNOLOGY DEMONSTRATION MISSIONS

Chair: L.J. Deutsch – NASA/JPL, USA

Rapporteur: W. Sun – SSTL, UK

ESA's Advanced Microsatellite Mission (AMM) Study

L. Alderson – ASTRIUM, England, C. Chaloner – SEA, England,

J. Howieson – ESA/Noordwijk

IAA-B3-1101

TOPSAT - High Resolution Imaging from a Small Satellite

P. Brooks – DERA, UK

IAA-B3-1102

The BIRD Mission is Completed for Launch with the PSLV-C3 in 2001

K. Brieß, W. Bärwald, F. Lura – DLR/WP, Germany,

S. Montenegro – GMD/FIRST, Germany, D. Oertel, H. Studemund,

G. Schlotzhauer – DLR/WP, Germany

IAA-B3-1103

Geo-Location of Transmitters Using Real Data, Doppler Shifts and Least Squares

C. Tobler de Sousa, H.K. Kuga, A.W. Setzer – INPE, Brazil

IAA-B3-1104

SESSION - POSTERS

Concept for a Small Satellite Mission SUNSAT-XE

B. Häusler – Universität der Bundeswehr, Germany

A. Schoonwinkel – University Stellenbosch, South Africa

J. Fiala – DLR, Germany

IAA-B3-0204P

Performance of WEOS Positioning System on Tracing Migration Pattern of Whales Evaluated by Computer Simulations

Y. Okamoto, T. Hayashi, S. Hosakawa, K. Yokoyama –

CHIBA INSTITUTE OF TECHNOLOGY, Japan

IAA-B3-0206P

Application of Small Satellites for High Precision Measuring Effects of Radio Wave Propagation

K. Igarashi – CRL, Japan,

N. A. Armand, A.G. Pavelyev, S.S. Matyugov, O.I. Yakovlev – IRE RAS, Russia,

Ch. Reigber, J. Wickert, K. Hocke,

G. Beyerle – GFZ Potsdam, Germany

IAA-B3-0207P

Some Aspects of ROCSAT-2 System Engineering

J.-S. Chern, A.-M. Wu, J. Ling – NSPO, Taiwan, China

IAA-B3-0210P

In-Orbit Results from the UoSAT-12 Minisatellite EO Mission

M.N. Sweeting – SSTL, UK

IAA-B3-0305P

Combined Space-Ground Autonomy for the Bird Small Satellite Mission

E. Gill, O. Montenbruck – DLR/GESOC, Germany,

H. Kayal, K. Brieß – DLR/WP

IAA-B3-0505P

- Small Satellites EMC Study**
F. Dudkin, V. Korepanov – LCISR, Ukraine IAA-B3-0507P
- Development of Multi-Satellite Image Data Receiving Software Using Object-Oriented Methodology**
W. Choi, D. Shin – SaTReCe, Korea IAA-B3-0508P
- Test Approaches for the Mechanical Qualification of the Small Satellite BIRD**
S. Ritzmann, M. Hartmann – ASTRO GmbH, Germany
B. Heym – DLR, Germany IAA-B3-0509P
- Data Management at Multimission Ground Segment**
H. Maass, K.-D. Mißling, R. Reißig – DLR, Germany IAA-B3-0510P
- An Experience of Developing Mission Critical Software for BIRD Attitude Control Using UML**
O. Maibaum – DLR, Germany, M.S. Kande – ISRO, India IAA-B3-0511P
- Method of Small Satellite Mass and Power Characteristics Application with Optoelectronic Equipment for Earth Remote Sensing (ERS)**
M. Mirshams – KNTU, Iran IAA-B3-0512P
- The Interferometric Cartwheel for ENVISAT**
H. Runge, R. Bamler, J. Mittermayer, F. Jochim – DLR, Germany,
D. Massonnet, E. Thouvenot – CNES, France IAA-B3-0607P
- BIRD IR Sensor Dynamic Adaptation for High Temperature Event Recognition**
W. Skrbek, K. Bachmann, W. Halle, E. Lorenz, M. Neidhardt,
D. Oertel, F. Schrandt, I. Walter, B. Zender – DLR/WP, Germany IAA-B3-0708P
- Earth Observation with Small Satellites at the FUCHS-GRUPPE**
B. Penné, C. Tobehn, M. Kassebohm,
H. Lübberstedt – OHB System, Germany IAA-B3-0806P
- Technological Aspects of Microsatellite-based Educational Programs**
S.I. Klimov, V.N. Angarov, M.B. Dobriyan, M.N. Nozdrachev,
V.G. Rodin, G.M. Tamkovich – RAS, Russia, A.A. Beliaev, Ye.A. Grachov,
O.R. Grigoryan, V.V. Radchenko – MSU, Russia IAA-B3-0905P
- Nano- and Microsatellites for Space Training**
M.N. Sweeting – SSTL, UK IAA-B3-0908P
- Commercial of the Shelf (COTS) Software Products for Small Satellite Mission Design, Simulation, Operation and Utilization**
T. Zehetbauer – DLR/HF, Germany IAA-B3-0909P

Design and Development of a Power Conditioning Unit for an Earth Observation Microsatellite

M. D'Errico – Seconda Università di Napoli, Italy,
M. Pastena, G. Perrone – Università di Napoli “Federico II”, Italy IAA-B3-1306P

Integrated Modulation/ Demodulation/ BER Testing/Data acquisition and storage system

Ph. Wallimann – SMP, France IAA-B3-1307P

The Officine Galileo Digital Sun Sensor

F. Boldrini, E. Monnini – OFFICINE GALILEO, Italy IAA-B3-1308P

Subsystem for Small Satellites under Development in the Institute of Atmospheric Physics, Prague, Czech Republic

J. Chum, F. Hruska, J. Vojta – CAS, Czech Republic IAA-B3-1309P

Satellite Magnetic Orientation and Stabilization System

S. Belyayev – ISR, Ukraine, N. Efimenko – Khartron-CONSAT, Ukraine,
V. Korepanov – ISR, Ukraine, N. Kudin – Khartron-CONSAT, Ukraine IAA-B3-1405P

Family of Reaction Wheels for Small Satellites

J. Eckler, M. Hartmann – ASTRO GmbH, Germany IAA-B3-1406P

Proposals on the 17F120 Spacecraft Use for the Launch of Small Spacecraft and In-Orbit Maintenance of Various Lightweight Payloads

A.V. Romanov – KB ARSENAL, Russia IAA-B3-1506P

MICROSIM

W. Hill, M. Steckling – ASTRIUM, Germany IAA-B3-1508P

SESSION 12 - EARTH WATCH MISSIONS III AND LAUNCH SYSTEMS

Chair: H. Jahn – DLR/WP

Rapporteur: G. Fountain – JHU/APL, USA

Low Cost Data Processing Ground Segment Conception for Global Vegetation Monitoring Applications

C. Carmona-Moreno, A. Palacios Orueta – JRC/Ispira, Italy IAA-B3-1201

An Introduction to NSPO and ROCSATs Missions

J.-S. Chern, L.-C. Lee, H.-C. Wang, F.-H. Chu – NSPO, Taiwan, China IAA-B3-1202

Main Trends of Small Satellites Development and Capabilities for their Piggy-Back Injections by Launch Vehicles of Khrunichev Space Center

E.I. Motorny, A.A. Nesterenko – KHRUNICHEV, Russia IAA-B3-1203

Commercial Operations of the Rockot Launch Vehicle for Small and Medium Payloads into Low Earth Orbit

M. Kinnersley, Y. Viertel – EUROCKOT, Germany,
K. Schefold – ASTRIUM, Germany IAA-B3-1204

SESSION 13 - SPACECRAFT SUBSYSTEMS

Chair: J. Esper – SWALES, USA

Rapporteur: K. Brieß – DLR/WP

Present-Day Tendencies in Small Satellite Thermal Control Design

V. Baturkin – NTU, Ukraine IAA-B3-1301

A Flexible, Transceiver-Based RF Communications System for Small Satellites

C.C. DeBoy, M.J. Reinhart – JHU/APL, USA IAA-B3-1302

Low Cost Small Space Boosters

M.I. Kislitsky – KB ARSENAL, Russia IAA-B3-1303

BIRD-Spacecraft Bus Controller

S. Montenegro – GMD/FIRST, Germany,
W. Bärwald – DLR/WP, Germany IAA-B3-1304

SESSION 14 - ATTITUDE CONTROL SYSTEMS

Chair: U. Renner – TU Berlin, Germany

Rapporteur: I. Rodionov – REAGENT, Russia

The Officine Galileo Autonomous Star Tracker

F. Boldrini, A. Landi – OFFICINE GALILEO, Italy IAA-B3-1409

Compensation of the Attitude Instability Effect on the Imaging Payload Performance with Optical Correlator

K. Janschek, V. Tchernykh, S. Dyblenko – TU Dresden, Germany,
B. Harnisch – ESA/ESTEC IAA-B3-1402

Design, Development and Test of the Attitude Control Subsystem for an Earth Observation Microsatellite

M. Pastena, M. Grassi – Università di Napoli “Federico II”, Italy IAA-B3-1403

BIRD Attitude Determination and Control System

T. Terzibaschian – DLR/WP, Germany IAA-B3-1404

SESSION 15 - SMALL SATELLITE BUS SYSTEMS

Chair: W. Sun – SSTL, UK

Rapporteur: U. Renner – TU BERLIN, Germany

MiniFlex Satellite Concept for Precursor and Commercial Missions

M. Gotsmann, M. Steckling – ASTRIUM, Germany,

E. Gill – DLR/GESOC, Germany

IAA-B3-1501

A Family of Platforms of Service Systems for Small Spacecraft

A.V. Romanov – KB ARSENAL, Russia

IAA-B3-1502

SAC-C Mission and the International AM Constellation for Earth Observation

R. Colomb, C. Alonso, I. Nollmann – CONAE, Argentina

IAA-B3-1503