

SYMPOSIUM SCHEDULE

12th IAA Symposium on Small Satellites for Earth Observation

Sunday, May 05, 2019

16:00-20:00 Registration, BBAW¹
19:00-20:00 Get-Together

Monday, May 06, 2019

08:00-09:00 Registration, BBAW

09:00-09:15 **Welcome:**
Representative Senate of Berlin
J.-M. Contant,
Secretary General IAA
Representative of DLR

09:15-10:00 **Keynote Address:**
F. Ongaro
ESA TEC Director

10:00-10:40 BREAK,

10:40-12:20 **Session 01:**
PROGRAMMATICS
Chairs:
F. Ongaro, ESA, NL
P. Patterson, USU/SDL, USA

12:20-13:30 LUNCH

13:30-15:00 **Session 02:**
MISSIONS I
Chairs:
A. da Silva Curiel, SSTL, UK
GP Sandhoo, NLR, USA

15:00-15:20 BREAK

15:20-16:40 **Session 03:**
SENSOR SYSTEMS
Chairs:
S. Neeck, NASA/HQ, USA
C. Underwood, SSC, UK

16:40-17:40 **Round Table:**
**Who rules space-based EO:
Business or Governments ?**
Chairs:
N. Frischauf, SpaceTec Partners, DE

Tuesday, May 07, 2019

09:00-10:30 **Session 04:**
CONSTELLATIONS/ FORMATIONS
Chairs:
O. Koudelka, TU Graz, AUT
M. Ovchinnikov, KIAM, RUS

10:30-10:50 BREAK

10:50-12:10 **Session 05:**
INTEGRATED APPLICATIONS
Chairs:
A. Court, TNO, NL
S. Mostert, SCS, ZAF

12:10-13:30 LUNCH

13:30-15:00 **Session 06:**
STUDENT CONFERENCE
Chairs:
S. Kennedy, OAI, USA
L. Paxton, JHU/APL, USA

15:00-15:20 BREAK

15:20-16:40 **Session 07:**
AOCS
Chairs:
W.H. Steyn, SUN, ZAF
T. Terzibaschian, DLR, DE

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

¹ Berlin-Brandenburgische Akademie der Wissenschaften

Wednesday, May 08, 2019

- 09:00-10:30 **Session 08:**
LESSONS LEARNED
Chairs:
J. Esper, NASA, USA
A. Zuccaro Marchi, ESA, NL
- 10:30-10:50 BREAK
- 10:50-12:10 **Session 09:**
ON-BOARD PROCESSING
Chairs:
M. Barschke, TU Berlin, DE
A. Rogers, Maxar, USA
- 12:10-13:30 LUNCH
- 13:30-15:00 **Session 10:**
NEW PLATFORMS
Chairs:
L. Alkalai, NASA/JPL, USA
H. Kuiper, TU Delft, NL
- 15:00-15:20 BREAK
- 15:20-16:40 **Session 11:**
INFRARED MISSIONS
Chairs:
L. Gratton, Colomb Inst., ARG
W. Halle, DLR, DE
- 16:40-17:40 **POSTER SESSION II**

Thursday, May 09, 2019

- 09:00-10:30 **Session 12:**
COMMUNICATIONS
Chairs:
S. Klinkner, IRS Stuttgart, DE
Z. Yoon, TU Berlin, DE
- 10:30-10:50 BREAK
- 10:50-12:10 **Session 13:**
GROUND SEGMENT
Chairs:
J.-N. Bricout, CNES, FR
K. Schilling, JMU Würzburg, DE
- 12:10-13:30 LUNCH
- 13:30-15:00 **Session 14:**
SPECIAL ASPECTS
Chairs:
R. Laufer, Baylor, USA
M. Saandar, MSPRS, MON
- 15:00-15:20 BREAK
- 15:20-16:40 **Session 15:**
DISTRIBUTED SYSTEMS
Chairs:
I. Belokonov, SSAU, RUS
S. Roemer, Antwerp Space, BEL
- 16:40-17:40 **Symposium Summary**
Chairs:
K. Briß, TU Berlin, DE
R. Sandau, IAA, FR
E. Gill, TU Delft, NL
Chief Rapporteur:
A. Rogers, Maxar, USA

AWARDS

Friday, May 10, 2019

- 09:00-13:00 **Excursion to:**
DLR Adlershof

Monday, May 06, 2019

08:00-09:00 Registration, BBAW

09:00-09:15 **Welcome:**
Representative Senate of Berlin
J.-M. Contant
Secretary General IAA
Representative of DLR

09:15-10:00 **Keynote Address:**
F. Ongaro
ESA TEC Director

10:00-10:40 BREAK

10:40-12:20 **Session 01: PROGRAMMATICS**
Chairs: F. Ongaro, ESA, NL
P. Patterson, USU/SDL, USA

IAA-B12-0101	Small Satellites and NASA Earth Science
	Steven P. Neeck (NASA, USA)
IAA-B12-0102	Advancing space technology in Africa - the transition from national programs to sustainable space programs
	Sias Mostert (SCS Space, South Africa)
IAA-B12-0103	Aspects of Small Satellite Programmatics of TU Berlin
	Klaus Briess, (TU Berlin, Germany)
IAA-B12-0104	Practical debris mitigation manual for developers of microsatellites and smaller satellites
	Darren McKnight, Christophe Bonnal, Peter Martinez, Toshiya Hanada, Rei Kawashima, Rene Laufer, Rainer Sandau, Alex da Silva Curiel (IAA)

12:20-13:30 LUNCH

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

Chairs: A. da Silva Curiel, SSTL, UK
GP Sandhoo, NLR, USA

IAA-B12-0201	Technologies for Small Optical Systems leading to Disruptive Innovations for Remote Sensing
	Alessandro Zuccaro Marchi, Luca Maresi (ESA ESTEC, Netherlands)
IAA-B12-0202	On-Orbit Greenhouse Gas Emissions Monitoring with the GHGSat Constellation
	Laura M. Bradbury, Michael Ligor, Robert Spina, Robert E. Zee (University of Toronto, Canada), Stephane Germain (GHGSat Inc, Canada)
IAA-B12-0203	PRETTY- A Passive Reflectometry and Dosimetry Mission Using a 3U CubeSat
	O. Koudelka, M. Wenger, A. Hörmer, R. Zeif (Graz University of Technology, Austria), H. Fragner, A. Dielacher, M. Moritsch (RUAG Space, Austria), P. Beck, C. Tscherne, M. Wind (Seibersdorf Laboratories, Austria), R. Walker, M. Martin-Neira (ESA ESTEC, Netherlands)
IAA-B12-0204	Measuring Earth's Energy Budget from a CubeSat
	William H. Swartz, Philip M. Huang (JHU APL, USA), Steven R. Lorentz (L-1 Standards and Technology, USA)

15:00-15:20 BREAK

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

Chairs: S. Neeck, NASA/HQ, USA
C. Underwood, SSC, UK

IAA-B12-0301	SHACS: Spatial Heterodyne Atmospheric Carbon-Dioxide Spectrometer
	Ikpaya Ikpaya, Craig Underwood (Surrey Space Center, UK)
IAA-B12-0302	High Performance EO Payload for Smallsats
	Roland Geyl, Daniel Farina (Safran Reosc, France), Jean-Philippe Girault (Safran Electronics & Defense, France)
IAA-B12-0303	Multispectral Time Delay Integration image sensor for high resolution earth observation
	Piet De Moor (imec, Belgium)
IAA-B12-0304	DEGIS – DLR Earth Sensing Imaging Spectrometer
	David Krutz, Ilse Sebastian, Ingo Walter, Burghardt Günther, Holger Venus, Michael Neidhardt, Bernd Zender, Simone Arloth, Matthias Lieder, Ute Grote, Andreas Wojtkowiak, Friedrich Schrandt (DLR Berlin, Germany), Ralf Reulke (Humboldt Universität, Germany), Rupert Müller (DLR Wessling, Germany)

16:40-17:40 **Round Table: Who rules space-based EO - Business or Governments ?**

Chairs:
N. Frischauf, SpaceTec Partners, DE

Tuesday, May 07, 2019

09:00-10:30 **Session 04: CONSTELLATIONS/ FORMATIONS**

Chairs: O. Koudelka, TU Graz, AUT
M. Ovchinnikov, KIAM, RUS

IAA-B12-0401	Constellation of Small SAR Satellites with Deployable Planar Antenna for Commercial Use
	Toshihiro Obata, Shinichi Nakasuka (University of Tokyo, Japan), Hirobumi Saito, Koji Tanaka, Makoto Mita (JAXA, Japan), Seiko Shirasaka, Keiichi Hirako (Keio University, Japan)
IAA-B12-0402	Novel Nanosatellite Cluster Deployment Strategy by Precise Orbit Insertion – Design, Verification and Flight Results
	Zizung Yoon, Walter Frese, Klaus Brieß (Technical University Berlin, Germany), Siegfried Voigt (DLR, Germany)
IAA-B12-0403	New Techniques in Spacecraft Modeling and Simulation Environments to Support Next Generation Satellite Constellations
	Stanley O. Kennedy, Jr., Alexander Dunn (Oakman Aerospace, USA)
IAA-B12-0404	Relative G&C for Autonomous Maintenance and Reconfiguration of a DSAR
	Salvatore Sarno, Marco D’Errico (University of Campania, Italy), Jian Guo, Eberhard Gill (Delft University of Technology, Netherlands)

10:30-10:50 BREAK

10:50-12:10 **Special Session 05: INTEGRATED APPLICATIONS**

Chairs: A. Court, TNO, NL
S. Mostert, SCS, ZAF

IAA-B12-0501	Integrated Applications: an overview from Space to Earth
	Andrew Court (TNO, Delft, Netherlands)
IAA-B12-0502	ESA ARTES and Integrated Applications
IAA-B12-0503	Small satellites and Integrated Applications
	Larry Paxton (Johns Hopkins University Applied Physics Laboratory, Maryland, USA)
IAA-B12-0504	Reactive Nitrogen in the environment

12:10-13:30 LUNCH

13:30-15:00 **Session 06: STUDENT CONFERENCE**

Chairs: S. Kennedy, OAI, USA
L. Paxton, JHU/APL, USA

IAA-B12-0601	An architecture for efficient processing and visualization of data from a space mission: MarconISSta case study
	José Manuel Díez, Fynn Boyer, Alexander Maximilian Bauer, Tim Malte Gräffje, Martin Buscher (TU Berlin, Berlin, Germany)
IAA-B12-0602	Moon Cubesat Hazard Assessment (MOOCHA) – An International Earth-Moon Small Satellite Constellation
	Alexandros Binios ^{a,b} , Janis Dalbins ^c , Sean Haslam ^d , Rusnė Ivaškevičiūtė ^e , Ayush Jain ^c , Maarit Kinnari ^a , Joosep Kivastik ^c , Fiona Leverone ^f , Juuso Mikkola ^a , Ervin Oro ^c , Laura Ruusmann ^c , Janis Sate ^g , Hector-Andreas Stavrakakis ^h , Nandinbaatar Tsog ⁱ , Karin Pai ^c , Jaan Praks ^a , René Laufer ^{j,k} (^a Aalto University, Espoo, Finland; ^b University of Helsinki, Helsinki, Finland; ^c University of Tartu, Tartu, Estonia; ^d Metropolia University of Applied Sciences, Helsinki, Finland; ^e Vilnius University, Lithuania; ^f Delft University of Technology, Delft, The Netherlands; ^g University of Latvia, Riga, Latvia; ^h National Technical University of Athens, Greece; ⁱ Mälardalen University, Västerås, Sweden; ^j Baylor University, Waco, Texas, USA; ^k University of Cape Town, Rondebosch, South Africa)
IAA-B12-0603	A Low-Cost, Portable, Easy-Assembly And Expandable SDR Ground Station
	Barbara Ojur, Peter Martinez (SpaceLab, University of Cape Town, South Africa)
IAA-B12-0604	Observing the Impact of Air Pollution in Dhaka City using APOSat
	Masrur Khan, Monirul Islam Pavel, Mustafa Jamil, Md. Tausif Rahman (BRAC University, Dhaka, Bangladesh)
IAA-B12-0605	Attitude and orbital dynamics fine coupling for high area-to-mass ratio satellites
	Cristiano Contini, Camilla Colombo (Department of Aerospace Science and Technology, Politecnico di Milano, Italy)
IAA-B12-0606	PCB design and layout for future TUPEX missions optimized for manufacture and verification
	Brian Treacy (TU Berlin, Berlin, Germany)

15:00-15:20 BREAK

15:20-16:40 Session 07: AOCS

Chairs: W.H. Steyn, SUN, ZAF
T. Terzibaschian, DLR, DE

IAA-B12-0701	Semi-Passive Three Axis Attitude Stabilization for Earth Observation Satellites using the Drag Maneuvering Device
	Sanny Omar, Camilo Riano Rios, Riccardo Bevilacqua (University of Florida, Gainesville, USA)
IAA-B12-0702	The ALSAT-2B Gyrostellar Estimator: 2 years In-Orbit Performance
	Haider Benzeniar (Algerian Space Agency, Algeria)
IAA-B12-0703	Approach for estimation of nanosatellite's motion concerning of mass centre by trajectory measurements
	Igor Belokonov, Ivan Timbai, Petr Nikolaev (Samara National Research University, Russia)
IAA-B12-0704	FDIR Handling in Eu:CROPIS ACS
	Olaf Maibaum, Ansgar Heidecker, Fabian Greif, Markus Schlotterer, Andreas Gerndt (German Aerospace Center - DLR, Germany)

16:40-17:40 POSTER SESSION I

Chairs: E. Gill, TU Delft, Delft, NL
T. Terzibaschian, DLR, Berlin, DE
J. Torley, University of Colorado, Colorado, USA

IAA-B12-0205P	CHAFF: CubeSat Hyperspectral Applications For Farming
	Callum Middleton, Craig Underwood, Chris Bridges (SSC, UK), Emma Woolliams, Nigel Fox (NPL, UK)
IAA-B12-0207P	Design and test of a COTS based imaging system for stereo-scopic meteor observations
	Jona Petri, Alexander Schmidt, Julia Zink, Sabine Klinkner (Institute of Space Systems, Germany)
IAA-B12-0208P	NExSat-1, a resource monitoring satellite made in Egypt
	Abou Bakr Elhady (National Authority for Remote Sensing and Space Sciences, Egypt), Björn Danziger (Berlin Space Technologies, Germany)
IAA-B12-0209P	Lagari, a high resolution satellite for environmental monitoring and disaster relief
	Başak Hassoy, Elif Dirgin (STM, Turkey), Matthias Buhl (Berlin Space Technologies, Germany)
IAA-B12-0210P	Maximizing CubeSat Payload Volume in Milli-gravity to Improve CubeSat Earth Observation from Space
	Maharshi Bhattacharya, José M. Díez, Brennan T. Lutkewitte, Hugh MacLellan, Sebastián Ospina, Nicholas P. Smith, Sebastian Grau, Martin Buscher, Jens Großhans (TU Berlin, Berlin, Germany)
IAA-B12-0305P	Miniaturized Radiation Detector Payloads Timepix for Small Satellites and Cubesats
	Carlos Granja, Jan Jakubek, Pavel Soukup, Daniel Turecek (Advacam, Czech

	Republic), Benedikt Bergmann, Stanislav Pospisil (Czech Technical University in Prague, Czech Republic), Jiri Kraus (Serenum, Czech Republic), Zdenek Dvorak (CSRC, Czech Republic)
IAA-B12-0306P	iSIM 170 QM and qualification test campaign
	Rafael Guzmán Llorente, Eider Ocerin Martínez, Aitor Conde Rodríguez, María Dasí Espuig (Satlantis Microsats SL, Spain)
IAA-B12-0308P	TDI CMOS Image Sensors for Earth Observation
	Philip Brown, Charles Woffinden, Paul Jerram (Teledyne-e2v, Chelmsford, UK)
IAA-B12-0406P	Feasibility Analysis of Low Earth Orbit Nanosatellite Formations with Limited Delta-V Budget
	Debdeep Roychowdhury, Yeerang Lim, Sascha Weiß (TU Berlin, Germany)
IAA-B12-0407P	CubeSat Formation Flying using Low Power Inter-Satellite Communication in Earth Observation Missions
	Roland Haber, Iurii Motroniuk (Center for Telematics, Germany), Klaus Schilling (Julius-Maximilians-University Wuerzburg, Germany)
IAA-B12-0408P	Single Nanosatellite Launcher SNL – High Precision Launch Container for Nanosatellite Networks
	Thomas Hellwig, Roy Bertfeld, Antje Deckert, Sebastian Scheiding (Astrofein, Germany)
IAA-B12-0705P	To boldly go where no Sunsensor has gone before
	Johan Leijten, Dick Broekmans, Stefan Schmidt, Johan Uittenhout (Lens R&D, 's-Gravendijkseweg 41b 2201B, the Netherlands)
IAA-B12-0706P	Debunking Sunsensor specifications
	Johan Leijten (Lens R&D, 's-Gravendijcks 2201CZ, the Netherlands), Jeroen Vandersteen (European Space Agency – ESA, the Netherlands)
IAA-B12-0707P	Cognitive Navigation
	Adam Yingling, Evan Ward, Trey Morris (Naval Research Laboratory, Washington DC, USA)
IAA-B12-0708P	Magnetic Attitude Control of a Spinning Spacecraft Flight Results and Lessons Learned from DLR's Compact Satellite Eu: CROPIS
	Ansgar Heidecker, Markus Schlotterer, Olaf Maibaum, Elisabeth Panzenboeck, Sebastian Löw, Markus Markgraf (German Aerospace Center – DLR, Germany)
IAA-B12-0805P	In-orbit differential drag control experiment on nanosatellite cluster: analysis and flight results
	Yeerang Lim, Zizung Yoon (Institute of Aeronautics and Astronautics, Technical University Berlin, Germany)
IAA-B12-0806P	About Ecoinformatics tools and GIMS-technology in the water quality monitoring
	Dao Van Tuyet (Vietnam National Space Center, Vietnam Academy of Science and Technology, Hanoi, Vietnam), Ngo Hoang Huy (Electric Power University, Hanoi, Vietnam), Vladimir F. Krapivin, Ferdenant A. Mkrtychyan, Vladimir V. Klimov, Vladimir Yu. Soldatov (Kotelnikov Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia)

IAA-B12-0808P	First in-orbit results from KazSTSAT
	Vladimir Ten (Ghalam LLP, Astana, Kazakhstan)
IAA-B12-1105P	Teledyne's High Performance Infrared Detectors for Space Missions
	Paul Jerram (Teledyne-e2v, Chelmsford, UK)

Wednesday, May 08, 2019

09:00-10:30 Session 08: LESSONS LEARNED

Chairs: J. Esper, NASA, USA
A. Zuccaro Marchi, ESA, NL

IAA-B12-0801	NASA IceCube: CubeSat Prototyping of a 883-GHz Radiometer for Cloud Ice Mapping
	Jaime Esper, Dong Wu, Brian Abresch, Brooks Flaherty, Chris Purdy, John Hudeck, Juan Rodriguez, Ted Daisey, Scott Heatwole, Robert Stancil, Thomas Johnson, Alexander Coleman, Negar Ehsan, Kevin Horgan, Jeffrey Piepmeier (NASA Goddard Space Flight Center, Greenbelt, USA)
IAA-B12-0802	Lessons Learned from Integrating the Dual-band Optical Transient Camera to Microsatellite RISESAT
	Hannah Tomio, Morokot Sakal, Toshinori Kuwahara (Tohoku University, Aramaki Aza, Sendai, Japan), Alfred Bing-Chih Chen, Ted Wei-Tai Liu, Mike Chih-Chen Tsai (Institute of Space and Plasma Sciences, National Cheng Kung University, Tainan City, Taiwan)
IAA-B12-0803	TechnoSat - Results from the first 18 months of operation
	Merlin F. Barschke, Julian Bartholomäus, Juan Maria Haces Crespo, Clément Jonglez, Philip von Keiser, Danilo Költzsch, Julius Leglise, Marc Lehmann, Christian Meumann, Steffen Reinert, Sven Rotter, Mario Starke, Philipp Werner, Lars Zander (Technische Universität Berlin, Institute of Aeronautics and Astronautics, Germany), Karsten Gordon (Spacegramming, Bad Wiessee, Germany)
IAA-B12-0804	InflateSail De-Orbit Flight Demonstration – Observed Re-Entry Attitude and Orbit Dynamics
	Craig Underwood, Ben Taylor, Richard Duke, Brian Stewart, Chris Bridges, Andrew Viquerat (Surrey Space Centre, University of Surrey, UK), Herman Steyn (Electrical & Electronic Engineering, Stellenbosch University, South Africa), Davide Masutti, Amandine Denis (Von Karman Institute for Fluid Dynamics, Sint-Genesius-Rode, Belgium)

10:30-10:50 BREAK

10:50-12:10 Session 09: ON-BOARD PROCESSING

Chairs: M. Barschke, TU Berlin, DE
A. Rogers, Maxar, USA

IAA-B12-0901	Using Docker in Process Level Isolation for Heterogeneous Computing on GPU Accelerated On-Board Data Processing Systems
	Nandinbaatar Tsog, Mikael Sjödin (Mälardalen University, Västerås, Sweden), Fredrik Bruhn (Mälardalen University, Västerås, Sweden and Unibap AB (publ) Uppsala, Sweden)
IAA-B12-0902	3U satellite bus SONATE for technology demonstration of autonomous payloads
	Oleksii Balagurin, Tom Baumann, Tobias Greiner, Hakan Kayal, Andreas Maurer, Thomas Rapp, Tobias Schwarz (University of Würzburg, Computer Science VIII, Space Technology, Würzburg, Germany)

IAA-B12-0903	Realtime Dynamic Target Pointing using Onboard Image Processing of Cloud Cover for Earth Observation Microsatellites
	Julie Ann Banatao, John Leur Labrador, Yuji Sakamoto, Kazuya Yoshida (Tohoku University, Sendai, Japan)
IAA-B12-0904	Multi-Mission Software Development for Small Spacecraft
	Karsten Gordon (Spacegramming, Bad Wiessee, Germany), Mario Starke, Philip von Keiser, Merlin F. Barschke (Technische Universität Berlin, Institute of Aeronautics and Astronautics, Berlin, Germany)

12:10-13:30 LUNCH

13:30-15:00 Session 10: NEW PLATFORMS

Chairs: L. Alkalai, NASA/JPL, USA
H. Kuiper, TU Delft, NL

IAA-B12-1001	Development of on-demand compact SAR satellite
	Hirobumi Saito (JAXA, Japan), Kei-ichi Hirako, Seiko Shirasaka (Keio University, Yokohama, Japan), Toshihiro Obata, Shin-ichi Nakasuka (the University of Tokyo, Tokyo, Japan), Shinobu Nakamura, Takeshi Tohara (Japan Science and Technology Agency, Tokyo, Japan)
IAA-B12-1002	Synthetic Aperture Radar on a nanosatellite - is it possible?
	Alex da Silva Curiel, Phil Whittaker, Rachel Bird, Andrew Haslehurst, Victoria Irwin, Andrew Cawthorne, Luis Gomes (Surrey Satellite Technology Ltd., Guildford, UK), Craig Underwood, Guglielmo Aglietti, Martin Sweeting (Surrey Space Centre, University of Surrey, Guildford, UK)
IAA-B12-1009	Stuttgart University's reliable, high-performance small satellite platform on its first mission "Flying Laptop"
	Sabine Klinkner, Steffen Gaisser, Jonas Keim, Kai-Sören Klemich, Michael Lengowski, Ulrich Mohr (Institute of Space Systems, University of Stuttgart, Germany)
IAA-B12-1004	STRATOS - A payload for 3U CubeSats that collects thousands of neutral atmospheric soundings per day
	O. Nogués-Correig 1, L. Tan 2, T. Yuasa 2, R. Marshall 1, J. Ringer 2, A. Warzyński 1, V. Irisov 3, V. Nguyen 3, T. Duly 3, S. Esterhuizen 4, D. Masters 3, D. Ector 3, J. Spark 1, J. Cappaert 1, P. Platzer 4 - (1 Spire Global UK Ltd., Glasgow, UK, 2 Spire Global Singapore PTE Ltd., Singapore, 3 Spire Global Inc., Boulder, USA, 4 Spire Global Luxembourg S.a.r.l., Luxembourg)

15:00-15:20 BREAK

15:20-16:40 Session 11: INFRARED MISSIONS

Chairs: L. Gratton, Colomb Inst., ARG
W. Halle, DLR, DE

IAA-B12-1101	The TUBIN mission within the context of present and future satellite-based fire detection systems
	Julian Bartholomäus, Marc Lehmann, Merlin F. Barschke (Technische Universität Berlin, Institute of Aeronautics and Astronautics, Berlin, Germany)

IAA-B12-1102	Cubesat K-Line fire detection for the Advanced Fire Information System
IAA-B12-1103	Infrared Remote-Sensing and Results of the DLR FireBIRD Mission Winfried Halle, Xavier Amigues, Wolfgang Bärwald, Ines Ernst, Christian Fischer, Susanne Koldewey, Andreas Kotz, Axel Lauterbach, Matthias Lieder, Thomas Säuberlich, Martin Schlicker, Christian Schultz, Friedrich Schrandt, Agnieszka Soszynska, Thomas Terzibaschian, Ingo Walter, Andreas Wojtkowiak (DLR, Institute of Optical Sensor Systems, Berlin, Germany)
IAA-B12-1104	Nanosat-based detection and tracking of launch vehicles Caroline Schweitzer, Norbert Scherer-Negenborn, Norbert Wendelstein, Karin Stein (Fraunhofer IOSB, Ettlingen, Germany), Clemens Horch, Max Gulde (Fraunhofer EMI, Freiburg, Germany)

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

Chairs: E. Gill, TU Delft, Delft, The Netherlands
T. Terzibaschian, DLR, Berlin, Germany
J. Torley, University of Colorado, Colorado, USA

IAA-B12-0906P	cPCI Serial Space Compliant Mass Memory Board with Integrated Data Processing Capabilities
	Harald Michalik (DSI Aerospace Technology, Bremen, Germany and IDA TU Braunschweig, Germany), Dietmar Walter, Gang Zhou, Rainer Preuss, Christian Dierker, Ole Bischoff, Elias Hashem (DSI Aerospace Technology, Bremen, Germany)
IAA-B12-0907P	SALSAT: Distributed software architecture for a Spectrum AnaLysis SATellite with modular payload capabilities
	Philipp Wüstenberg, Jens Großhans, Alexander Balke, Huu Quan Vu, Michael Pust, Klaus Briß Barschke (Technische Universität Berlin, Berlin, Germany)
IAA-B12-0908P	Test of the Autonomous Diagnostic System ADIA-Light aboard the Nanosatellite Mission SONATE
	Gerhard Fellingner, Timo Burger, Kirill Djebko, Eric Jäger (University of Würzburg, Würzburg, Germany)
IAA-B12-1005P	Design of the first Ukrainian PlantSat nanosatellite
	Vasyl Brykov, Elizabeth Kordyum (M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Kyiv, Ukraine), Boris Rassamakin (National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Ukraine), Natalia Zaimenko (M.M. Gryshko National Botanical Garden, National Academy of Sciences of Ukraine, Kyiv, Ukraine)
IAA-B12-1006P	A modular platform architecture to enable system level scalability
	Merlin F. Barschke (Technische Universität Berlin, Institute of Aeronautics and Astronautics, Berlin, Germany)
IAA-B12-1007P	TIM: An International Formation for Earth Observation with CubeSats
	Iurii Motroniuk 1, Anna Aumann 1, Ilham Mammadov 1, Alexander Kleinschrodt 2, Liu Minshi 3, Jiang Lianxiang 3, Louis Feng 4, Giovanni Beltrame 5, Klaus Schilling 2 - (1 Zentrum für Telematik e. V., Würzburg, Germany, 2 University of Würzburg, Lehrstuhl für Informatik VII (Robotik und Telematik), Würzburg, Germany, 3 Shandong Institute of Space Electronic Technology, Shandong, China, 4 SCS Space, Somerset West, Cape Town Western Cape, South Africa, 5 Ecole Polytechnique de Montreal, Montreal, Canada)

IAA-B12-1008P	Phase A Study for the Earth Observation and Technology Demonstration Cubesat SOURCE
	Robin Schweigert, Annika Stier (Small Satellite Student Society of the University of Stuttgart (KSat e.V.), Stuttgart, Germany), Dr. Michael Lengowski, Daniel Galla, Prof. Sabine Klinkner (Institute of Space Systems, Stuttgart, Germany)
IAA-B12-1205P	Design and analysis of the offset Parabolic Antenna to be used in C band Communication Satellites
	Abdelaziz Himeur, Ali Kara-Omar, Lahcène Hadj-Abderrahmane (Satellite Development Center, Oran, Algeria)
IAA-B12-1206P	High data-rate optical communication on CubeSats
	Christopher Schmidt, Benjamin Rödiger, Fabian Rein, Sriram Hariharan, Anil Morab, Christian Fuchs (German Aerospace Center (DLR), Institute of Communications and Navigation, Wessling, Germany), Philipp Biller (Tesat Spacecom, Backnang, Germany)
IAA-B12-1207P	Wireless intra-spacecraft communication with inspaWSN protocol stack based on IR-UWB
	Martin Drobczyk, Andre Lübken (German Aerospace Center, Institute of Space Systems, Avionics Systems Department, Bremen, Germany)
IAA-B12-1209P	Cost Effective High-speed X-band Transmitter Development
	Hyeun-pil Jin, Young-jin Joo, Jae-hoon Lee, Sung-min Park, Young-wook Sirl (Satrec Initiative Co., Ltd., Daejeon, the Republic of Korea)
IAA-B12-1305P	Urban green space, public health, and environment margin: thinking about management the greenness in making comfortable living city in the context of climate change
	Anh Kim Nguyen ^{1,2,3} and Yuei-An Liou ^{1,2} (¹ Center for Space and Remote Sensing Research, National Central University, Taoyuan City, Taiwan, R.O.C., ² Taiwan Group on Earth Observations, Hsinchu, Taiwan, ROC, ³ Institute of Geography, Vietnam Academy of Science and Technology, Hanoi, Vietnam)
IAA-B12-1307P	OPS-SAT – opening a satellite to the internet
	Dominik Marszk ¹ , José Luís Feiteirinha ² , Benjamin Fischer ³ , Daniela Taubert ⁴ , Thorsten Graber ⁵ , André Lofaldli ³ , Mehran Sarkarati ³ , David Evans ³ , Mario Merri ³ , ¹ IMS Space Consultancy GmbH, Darmstadt, Germany, ² Serco GmbH, Darmstadt, Germany, ³ European Space Operations Centre, Darmstadt, Germany, ⁴ LSE Space GmbH, Darmstadt, Germany, ⁵ Solenix Deutschland GmbH, Darmstadt, Germany
IAA-B12-1405P	Effective thermal testing and design solutions for PocketQube subsystems
	Timo Rühl, Jasper Bouwmeester, Eberhard Gill (Faculty of Aerospace Engineering, Delft University of Technology, Delft, Netherlands)
IAA-B12-1406P	ELSA-CS, a high-performance solar array for 6U CubeSats
	J. Watzinger, S. Masante, A. Lourenço (Space Structures GmbH, Berlin, Germany), G. van Ginkel (German Orbital Systems GmbH, Berlin, Germany)
IAA-B12-1407P	Delivery of Multiple Small Satellites via Soyuz-2 and Fregat
	Mila Savelyeva, Valeriya Barashkova (GK Launch Services, Moscow, Russia)

IAA-B12-1408P	Stratospheric Balloons: low-cost platforms for science and technology development
	Felix Friedl-Vallon (Karlsruher Institut für Technologie, Karlsruhe, Germany), Kristine Dannenberg (Rymdstyrelsen, Solna, Sweden), Philippe Raizonville, AndreVargas (CNES, Toulouse, France)
IAA-B12-1409P	Global launch booking system: why it is time to go online
	Ksenia Lisitsyna (Precious Payload Inc., Wilmington, USA), Andrey Maksimov (Precious Payload Inc., Dubai, UAE)
IAA-B12-1410P	Make Testing Simple Again
	Stefan Schmidt (TriasRnD, Noordwijk, the Netherlands)
IAA-B12-1411P	PAPELL: Mechanic-free Mechanisms by Ferrofluids
	Manfred Ehresmann, Georg Herdrich (Institute of Space Systems University of Stuttgart, Stuttgart, Germany) Franziska Hild, Kira Grunwald, Christopher Behrmann, Robin Schweigert, Adrian Causevic, Saskia Sütterlin, Nicolas Heinz (Small Satellite Student Society University of Stuttgart, Stuttgart, Germany)
IAA-B12-1412P	GUSDON (Global University Space Debris Observation Net-work): improvements in space debris optical monitoring offered by a global University network
	Fabio Santoni ¹ , Fabrizio Piergentili ¹ , Rei Kawashima ² , Paolo Marzioli ¹ , Marco Acernese ¹ (¹ Sapienza University of Rome, Rome, Italy, ² UNISEC-Global, Tokyo, Japan)
IAA-B12-1413P	IAA-GLOCECOHADIM AFRICA LIONSAT-1 PROJECT IN CAMEROON, AFRICA
	Tomukum Chia ¹ , Nang Lamberth Toh ² , Jayakumar Venkatesan ³ (¹ International Academy of Astronautics, France, ² Global Centre for Compliance, Hazards and Disaster Management, GLOCECOHADIM-Africa, Cameroon, ³ Valles Marineris International Private Limited, India)
IAA-B12-1414P	On-Orbit Verification of a Modular Propulsion System MICROJET 2000 in the framework of BIROS and BEESAT-4 Small Satellite Formation Flying Demonstration AVANTI
	Dr. Harry Adirim ¹ , Dr. Winfried Halle ² , Matthias Kreil ¹ , Michael Kron ¹ , Matthias Lieder ² , Thomas Terzibaschian ² , Sascha Weiß ³ (¹ Aerospace Innovation GmbH, Berlin, Germany, ² DLR, Berlin, Germany, ³ TU Berlin, Berlin, Germany)
IAA-B12-1506P	Distributed Synthetic Aperture Radar by Small Satellites: Modelling, Challenges, and Performance
	Alfredo Renga, M.D. Graziano, G. Fasano, R. Opromolla, G. Rufino, M. Grassi, A. Moccia (Department of Industrial Engineering, University of Naples “Federico II”, Naples, Italy), S. Sarno (Department of Engineering, University of Campania “Luigi Vanvitelli”, Aversa, Italy)

Thursday, May 09, 2019

09:00-10:30 Session 12: COMMUNICATIONS

Chairs: S. Klinkner, IRS Stuttgart, DE
Z. Yoon, TU Berlin, DE

IAA-B12-1201	Flight Results of MarconISSta: Monitoring and Analysis of Radio Frequency Use from Low Earth Orbit
	Martin Buscher, Max Kramer, Robert Marx, Alex Sullivan, Brian Treacy, Klaus Brieß (Technische Universität Berlin, Department of Aeronautics & Astronautics, Berlin, Germany)
IAA-B12-1202	Solving the chicken-and-egg problem for optical downlinks - a report on End-2-End approach
	Philipp Biller, Herwig Zech, Matthias Motzigemba (Tesat Spacecom, Backnang, Germany), Christopher Schmidt, Christian Fuchs (German Aerospace Center (DLR), Institute of Communications and Navigation, Wessling, Germany)
IAA-B12-1203	Novel Embedded Antenna Design for CubeSat and Small Satellite Platforms
	Manohar Deshpande (NASA Goddard Space Flight Center, Greenbelt, USA)
IAA-B12-1204	S-Net First Year in Orbit: Verification of a Nanosatellite Network in S Band
	Walter Frese, Zizung Yoon, Klaus Brieß (Department of Aeronautics and Astronautics, Technische Universität Berlin, Berlin, Germany), Siegfried Voigt (German Space Administration (DLR Raumfahrtmanagement), Bonn, Germany)

10:30-10:50 BREAK

10:50-12:10 Session 13: GROUND SEGMENT

Chairs: J.-N. Bricout, CNES, FR
K. Schilling, JMU Würzburg, DE

IAA-B12-1301	An Experience of Satellite UHF - Ground Stations as the Basis for Academic Cooperation
	Livio Gratton, Claus Rosito (Instituto Colomb, San Martín, Argentina), Martin Buscher, Sascha Kapitola (Technische Universität Berlin, Berlin, Germany), Apiwat Jirawattanaphol (Kyushu Institute of Technology, Fukuoka, Japan), Sebastián Marinsek (Instituto Antártico Argentino, San Martín, Argentina)
IAA-B12-1302	Payload Data Handling for a University Small Satellite Ground Segment
	Sebastian Wenzel, Jonas Keim, Sabine Klinkner (Institute of Space Systems (IRS), University of Stuttgart, Stuttgart, Germany)
IAA-B12-1303	Automatic Operation System with Reliability and Accessibility Design for Precursory Electric Field Observation CubeSat Demonstrator Prelude
	Ryo Futamata, Masahiko Yamazaki (Nihon University, Chiba, Japan), Masashi Kamogawa (Tokyo Gakugei University, Tokyo, Japan)
IAA-B12-1304	Automated Operations of BEESAT-9: A CubeSat with a Fluid-Dynamic Actuator and GPS receiver
	Sascha Kapitola, Sebastian Grau, Sascha Weiß (Technische Universität Berlin, Institute of Aeronautics and Astronautics, Berlin, Germany)

12:10-13:30 LUNCH

13:30-15:00 Session 14: SPECIAL ASPECTS

Chairs: R. Laufer, Baylor, USA
M. Saandar, MSPRS, MON

IAA-B12-1401	The UN COPUOS space sustainability guidelines in the context of small satellites
	Peter Martinez (Secure World Foundation (SWF), Broomfield, USA)
IAA-B12-1402	The Sunsensor of the future. Bragging spree or reality?
	Johan Leijten, Dick Broekmans, Stefan Schmidt, Johan Uittenhout (Lens R&D, 's-Gravendijckseweg, the Netherlands)
IAA-B12-1403	Hybrid Propulsion for Low-cost Access to Space
	Mario Kobald, Christian Schmierer (HyImpulse Technologies GmbH, Hardthausen, Germany)
IAA-B12-1404	The SWF Handbook for New Actors in Space
	Peter Martinez, (Secure World Foundation (SWF), Broomfield, USA)

15:00-15:20 BREAK

15:20-16:40 Session 15: DISTRIBUTED SYSTEMS

Chairs: I. Belokonov, SSAU, RUS
S. Roemer, Antwerp Space, BEL

IAA-B12-1501	PASSAT: Passive Bi-Static SAR Constellation – Progress and Trial Results
	Craig Underwood, Alex Dyer (Surrey Space Centre, University of Surrey, Guildford, UK), George Atkinson, Alp Sayin, Mike Cherniakov, Michail Antoniou (Department of Electronic, Electrical and Systems Engineering, University of Birmingham, Birmingham, UK)
IAA-B12-1502	CloudCT – Computed Tomography of Clouds by a Small Satellite Formation
	Klaus Schilling (Zentrum für Telematik, Würzburg, Germany), Yoav Y. Schechner (Technion – Israel Institute of Technology, Haifa, Israel), Ilan Koren (Weizmann Institute of Science, Rehovot, Israel)
IAA-B12-1503	Global Digital Elevation Model from a Formation of Small Synthetic Aperture Radar Satellites-Requirements and Opportunities of MirrorSAR-
	Josef Mittermayer, Gerhard Krieger (German Aerospace Center (DLR), Microwaves and Radar Institute, Wessling, Germany)
IAA-B12-1504	A Cubesat Based GNSS Constellation For Planetary & Earth System Exploration
	Norbert Frischauf, Manfred Wittig (SpaceTec Capital Partners, Munich, Germany), Otto Koudelka (Graz University of Technology, Graz, Austria)

16:40-17:40 Symposium Summary

Chairs:

K. Brieß, TU Berlin, DE

R. Sandau, IAA, FR

E. Gill, TU Delft, NL

Chief Rapporteur:

A. Rogers, Maxar, USA

AWARDS

Friday, May 10, 2019

09:00-13:00 Excursion to DLR Adlershof