



DASIA 2023

June 6th - 8th



Held at:

MELIÀ
SITGES

Organized by:



SITGES

DASIA 2023 Sponsors:



09:00-09:10 **Conference Opening and Welcome**
DASIA 2023 Chair

Advances in Processing

- chaired by Mario Montagna, Thales Alenia Space Italy

09:10-09:35 **GR740 Payload Controller Module – ADHA Compliant Next Generation Processing Module**
Presenter: Enrique García Núñez
Enrique García Núñez - Airbus Crisa, Spain

09:35- 10:00 **Space grade high density configuration memory boot manager**
Presenter: Stéphane Penain - 3D PLUS
Amira MAALOUF - 3D PLUS, France

10:00-10:25 **GR716: LEON3 mixed-signal rad-hard microcontroller**
Presenter: Fabio Malatesta
Fabio Malatesta, Fredrik Johansson, Jan Andersson - Frontgrade Gaisler, Sweden

10:25-10:50 **SPARC and RISC-V Multiprocessor System-on-Chip**
Presenter: Fabio Malatesta
Fabio Malatesta, Jan Andersson - Frontgrade Gaisler, Sweden
Roland Weigand - European Space Agency, The Netherlands

10:50-11:15 **Design of an Edge Computing Space Board through the example of a Reference Design based on Quad ARM® Cortex®-A72 processing module**
Presenters: Wilfrid Bertrand & Thomas Porchez
Wilfrid Bertrand, Thomas Porchez, Thomas Guillemain - Teledyne e2v Semiconductors, France

11:15-11 :45 **Coffee break**

11:45-12:10 **An In-Depth Description of the Radiation Data Package for the QLS1046-Space Edge Processing Module**
Presenters: Wilfrid Bertrand & Thomas Porchez
Wilfrid Bertrand, Thomas Porchez, Thomas Guillemain - Teledyne e2v Semiconductors, France

12:10-12:35 **Multichip High Performance Computational Node**
Presenter: Constantin Papadas
Ioannis Katelouzos, Grigoris Papoulis-Plantzos, Kostas Makris, Mateusz Mroczkowski, Constantin Papadas - Integrated Systems Development (ISD) SA, Greece Laurent Hili, Antonios Tavoularis, David Steenari – ESA/ESTEC, The Netherlands Tim Helfers, Richard Wiest - Airbus Defence and Space GmbH, Germany

12:35-13:00 **H2020 Mnemosyne project: 128 Mbit to 1 Gbit Radiation Hardening MRAM on FDSOI with both Serial and Parallel interface for space application**
Presenter: Pierre-Xiao Wang
Pierre-Xiao Wang, Charles Sellier, Cécile Marquet, Jeanne Tongbong – 3D PLUS, France, Paul Zuber – IMEC, Belgium, Simone Gerardin, Marta Bagatin – UNIPD, Italy, Lionel Gouyet – TRAD, France

13:00-14:00 **Lunch break**

14:00-14:25 **A SpaceFibre Routing Switch**
Presenter: Steve Parkes
Steve Parkes, Blair Winton, Pete Scott, Keith Carruthers, Dave Gibson - STAR-Dundee, UK Albert Ferrer, Alberto Gonzalez, Marti Farras - STAR-Barcelona,, Spain

14:25-14:50 **Reference Design: SAMRH71-Based Single Board Computer for Radiation-Hardened, Space-Grade Missions**
Presenter: James J. Bontempo
James J. Bontempo, David A. Thorndike, Gilead A. Kutnick - ZIN Technologies, OH USA

14:50-15:15 **ULTRA300: Rad-Hard FPGA with Integrated ADC/DAC Technology**
Presenter: Alp Kilic
Alp Kilic - Nanoxplore, France

Models & Tools - chaired by Ralf Gerlich - GSSE, Germany

15:15-15:40 **Automatic Generation of Integration Tests**
Presenter: David Lesens
David Lesens - ArianeGroup, France

15:40-16:05 **TEMU 3 and 4: A Real-Time GR740 Simulator**
Presenter: Daria Vorotnikova
Mattias Holm - Terma GmbH, Germany

16:05-16:30 **Using MA61C-EGSE, A Swiss Knife Tool For System Digital Validation**
Presenter: Saish Sridharan
Saish Sridharan, Ran Qedar - Space Products and Innovation GmbH, Germany

16:30-17:00 **Coffee break**

17:00-17:25 **From a TOMS to a Digital Twin**
Presenter: Lionel Brayeur
Lionel Brayeur, Sebastien Darrieux – Spacebel, Belgium Sophie Lacherade, Felipe Alves Suana, – CNES, France William Arrouy – Airbus Defence & Space,France Florian Viennet – Thales Alenia Space, France Keiichi Ito, Martin Canter - Omina Technologies, Antwerpen, Belgium

17:25 17:50 **Deploying PROMELA/SPIN-based test generation on RTEMS: a progress report**
Presenter: Andrew Butterfield
Andrew Butterfield - Lero - the Irish Software Research Centre, Trinity College Dublin, Ireland

17:50 18:15 **OSVAlDO: A Mission-level Environment for the Automatic On-Board Software Validation**
Presenter: Anna D’Orta
Sante Candia, Sabio Bucci, Anna D’Orta - Thales Alenia Space Italy

18:15 18:40 **Space System Digital Twin initiative: functional behavior of the satellite**
Presenter: Mario Montagna
Carlo Paccagnini, Laura Pasquale, Andrea Bufalino - Thales Alenia Space Italy

Data Bus - chaired by Hans-Jürgen Herpel
- Airbus Defence & Space, GmbH

- 09:00-09:25** **How to design a safe ethernet tsn network on spacecraft application**
Presenter: Massimo Barbero
Massimo Barbero - IRT Saint-Exupéry (segueded from Thales Alenia Space), Thierry Leydier - Virtualité Réelle, France, Philippe Cuenot - IRT Saint-Exupéry (segueded from Continental), France, Damien Fruchard -) IRT Saint-Exupéry (segueded from Airbus Defence and Space), France, Barthélémy Attanasio - Thales Alenia Space, France
- 09:25-09:50** **Productizing Ethernet Networks for Space Exploration**
Presenter: Ivan Masar
David Jelem, TTTech Computertechnik AG, Austria
- 09:50-10:15** **Advanced Ethernet Solutions for Space Applications**
Presenters: Nicolas Ganry
Jerome Bourguignon, Simon Dumortier, Luca Cattaneo - Microchip Technology Inc., France; Thomas Porchez, Wilfrid Bertrand - Teledyne e2v, France
- 10:15-10:40** **A Complete Set of SpaceFibre IP Cores in the New Generation of FPGAs for Space**
Presenter: Alberto Gonzalez Villafranca
Alberto Gonzalez Villafranca, Albert Ferrer Florit, Marti Farras Casas - STAR-Barcelona, Spain, Steve Parkes - STAR-Dundee, UK
- 10:40-11:10** **Coffee break**
- Software** - chaired by Ioana Eballard
- ArianeGroup France
- 11:10-11:35** **Platform independent Star Tracker Library – ASTROLib**
Presenter: Ingolf Steinbach
Falk Ahlendorf, Ingolf Steinbach, Johannes Wilde - Jena-Optronik GmbH, Germany
- 11:35-12:00** **HERMES project: development of a software ecosystem for NG ULTRA FPGA**
Presenter: Patricia López Cueva
Patricia López Cueva - Thales Alenia Space, France, Franck Wartel - Airbus Defence and Space France, Kassem Chouayakh - NanoXplore, France, Aridane Álvarez Suárez - Fent Innovative Software Solutions – FentISS, Spain
- 12:00-12:25** **HERMES mission software: from design to implementation of the finite state machine**
Presenter: Andrea Brandonisio
Andrea Brandonisio, Margherita Piccinin, Andrea Colagrossi, Giovanni Zanotti, Stefano Silvestrini, Michèle Lavagna - Politecnico di Milano, Italy Roberto Bertacin - Agenzia Spaziale Italia, Italy
- 12:25-12:50** **On-board Software Randomisation with TASA**
Presenter: Leonidas Kosmidis
Alvaro Jover Alvarez - Barcelona Supercomputing Center (BSC), Spain Leonidas Kosmidis, Marc Sole Bonet, Matina Maria Trompouki - Barcelona Supercomputing Center (BSC) and Universitat Politecnica de Catalunya (UPC), Spain Fabrice Cros, Fabrice Cros - Airbus Defence and Space SAS, France

12:50-13:50 **Lunch break**

- 13:50-14:15** **The ring-buffer ROS2 executor: a novel approach for real-time ROS2 Space applications**
Presenter: Dr. Pablo Ghiglino
Dr.Pablo Ghiglino, Guillermo Sarabia - Klepsydra Technologies AG Zurich, Switzerland
- 14:15-14:40** **A deterministic filesystem and cfdp architecture for satellite software systems**
Presenter: Fausto D'Antonio
Tomas Di Cocco, Andrea Bufalino, Fausto D'Antonio, Gianluca Calicchia, Gabriele Cianetti, Sante Candia - Thales Alenia Space Italy
- 14:40-15:05** **Safe OBCP Definition Language for On-board Application Procedures**
Presenter: Anna D'Orta
Sante Candia, Mattia Micozzi, Sabio Bucci, Tomas Di Cocco, Andrea Bufalino, Fausto D'Antonio - Thales Alenia Space Italy
- 15:05-15:30** **Multicore software framework gr740 and hypervisor based**
Presenter: Fausto D'Antonio
Andrea Bufalino, Tomas Di Cocco, Fausto D'Antonio, Sante Candia - Thales Alenia Space Italy
- 15:30-15:55** **Multicore software (MCSW) building block reusability - the MILBUS 1553 use case study**
Presenter: Fausto D'Antonio
Fausto D'Antonio, Tomas Di Cocco, Andrea Bufalino, Sante Candia - Thales Alenia Space Italy
- 15:55-16:25** **Coffee break**
- 16:25-16:50** **SANDI: A Comprehensive Framework for Satellite Reference Database Validation**
Presenter: Malik Khalfallah
Malik Khalfallah - Airbus Defence and Space, France
- 16:50-17:15** **Caught in the net: Reliable adaptive routing in mesh-based on-board networks – are we there yet?**
Presenter: Ralf Gerlich
Ralf Gerlich, Rainer Gerlich - Dr. Rainer Gerlich System and Software Engineering, GSSE, Germany, Sergio Montenegro - Julius-Maximilians-University, Germany, Michael Bädorf - DLR, Germany
- 17:15-17:40** **How to Upgrade your Flight Software to ECSS Category A**
Presenter: Andoni Arregui
Andoni Arregui - GTD GmbH, Germany
- 17:40-18:05** **Open standard Middleware - A concept for Space?**
Presenter: Swen Walleser
S. Walleser, J. Herpel, T. Stingl, H. Selegard - Airbus Defence and Space, Germany, S. Stuecklin, H. Morgenstern - University Albstadt-Sigmaringen, Germany
- 18:05-18:30** **The Exomars Rover Mission Management Software for Operations Planning on Mars**
Presenter: Laura Boi
Laura Boi, Andrea Merlo, Francesco D'amico, Christian Tempera – Thales Alenia Space Italia, Yuri Yushtein – ESA/ESTEC, The Netherlands
- 18:30-18:55** **Open Source software for professional use - who cares?**
Presenter: Matthias Göbel
Matthias Göbel, Sebastian Huber and Thomas Dörfler - embedded brains GmbH & Co. KG

Data handling (AI, ML etc.) - chaired by Uwe Hoch
- Airbus Defence & Space GmbH

AVIONICS - chaired by Philippe Miramont - CNES, France

- 09:00-09:25** **Design of the Emirates Lunar Rover File Transfer Protocol Library**
Presenter: Mohammed Saeed Khoory
Mohammed Saeed Khoory, Mohammed Al Zaabi - Mohammed Bin Rashid Space Center, UAE
- 09:25-09:50** **Remote Direct Memory Access Over SpaceFibre**
Presenter: Dave Gibson
Dave Gibson, Andrew MacLennan, Stuart Mills, Steve Parkes - STAR-Dundee, United Kingdom
- 09:50-10:15** **An Adaptive Digital Beamforming Receiver implementation on a FPGA for Space Applications**
Presenter: Eduardo Ortega Sánchez
Eduardo Ortega Sánchez, Agustín Martínez Hellín, Alejandro Vicente, Óscar Rodríguez, Manuel Prieto, Pablo Parra, Antonia Da Silva, Sebastián Sánchez - Universidad de Alcalá, Spain
- 10:15-10:40** **Intelligent optimization of software AI inference**
Presenter: Dr. Pablo Ghiglino
Dr. Pablo Ghiglino, Mandar Harshe - Klepsydra Technologies AG Zurich, Switzerland
- 10:40-11:10** **Coffee break**
- 11:10-11:35** **Machine Learning on Telecommunication Satellite**
Presenter: Tim Helfers
Michael Petry, Andreas Koch, Martin Werner, Uwe Hoch, Tim Helfers, Richard Wiest, Airbus Defence & Space GmbH, Germany
Martin Werner - Technical University of Munich, Germany
- 11:35-12:00** **It's the data, stupid! Constructive and analytical quality-assurance for AI-based space systems**
Presenter: Ralf Gerlich
Ralf Gerlich - Dr. Rainer Gerlich System and Software Engineering, GSSE, Germany, Sergio Montenegro - Julius-Maximilians-University, Germany, Carsten Plasberg
FZI Research Center for Information Technology, Germany
Michael Bädorf - DLR, Germany
- 12:00-12:25** **SMOS HR Processing Study**
Presenter: Alexandre Mège
Alexandre Mège - Airbus Defence & Space SAS, France
- 12:25-12:50** **On-Board Processing for Communication Satellites – Principles and Challenges**
Presenter: Tim Helfers
Tim Helfers - Airbus Defence and Space GmbH, Germany
Robert Hughes - Airbus Defence and Space Ltd, United Kingdom
- 12:50-13:50** **Lunch break**

- 13:50-14:15** **Avionics for HyMOVE: A Modular Orbital Transportation System for Small Satellites**
Presenter: Emilio Miranda
Sergio Montenegro, Michael Strohmeier - University of Würzburg,, Germany, Paola Breda, Michael Vogel, HyImpulse Technologies GmbH, Germany
- 14:15-14:40** **UWB Localization for Martian Swarm Exploration**
Presenter: Cedric Liman
Cedric Liman, Sergio Montenegro - University of Würzburg, Germany, Patrick Henkel - ANAVS GmbH, Germany
- 14:40-15:05** **Multi Master Multi-Protocol CAN Bus implementation in UAE's First Lunar Rover Mission**
Presenter: Ahmed Salem Belal Salem
Ahmed Salem Belal Salem - Mohammed Bin Rashid Space Center, UAE
- 15:05-15:35** **Coffee break**
- COTS evaluation & implementation**
- chaired by Carsten Joergensen, Terma A/S
- 15:35-16:00** **New Space Challenges: plastic and COTS based solutions developed in Europe**
Presenter: Simon Dumortier
Nicolas Ganry, Simon Dumortier - Microchip France, Ronan Dillon - Microchip Ireland, Ralf Olbert - Microchip Germany
- 16:00-16:25** **Towards Space-NAS: Mixed Criticality Approach for NAS-like Mass Memory Units including Video-Streaming Capabilities**
Presenter: Lei Jia
Ulf Kulau, , Lei Jia, Elias Hashem, Ole Bischoff, Jochen Rust - DSI Aerospace GmbH, Germany
- 16:25-16:50** **How to design a Highly Reliable On-Board Computer with only COTS components**
Presenter: Vilhelm Geijer
Vilhelm Geijer, Viktor Fägerlind, Andreas Billström, Patrik Sandin, Thomas Badinand - Beyond Gravity, Sweden
- 16:50-17:15** **Evaluating the Computational Capabilities of Embedded Multicore and GPU Platforms for On-Board Image Processing**
Presenter: Leonidas Kosmidis
Francisco J. Cazorla Barcelona Supercomputing Center (BSC), Spain - Ivan Rodriguez, David Steenari, Matina Maria Trompouki, Leonidas Kosmidis - Barcelona Supercomputing Center (BSC) and Universitat Politecnica de Catalunya (UPC), Spain David Steenari - European Space Agency (ESA), The Netherlands
- 17:15-17:40** **Use of Heterogeneous Computing Systems and Partitioned Operating Systems in Space Applications**
Presenter: Oliver Ruiz Dorantes
Thierry Maudire, SYSGO SAS, France, Damir Bartakovic, SYSGO GmbH, Germany
- 17:40-18:05** **Utilizing Commercial Off-The-Shelf (COTS) Components for High-Demanding Applications in In-Orbit Servicing Missions**
Presenter: Alessandro Scarciglia
Alessandro Scarciglia, Ivan Cappelluti, Marco Lapolla, Andrea Merlo - Thales Alenia Space Italia, Antonino Bongiovanni - Politecnico di Torino, Italy
- 18:05-18:15** **Conference closure**

LOCATION

MELIA SITGES

Joan Salvat Papasseit, 38,
Sitges, 08870 Spain

https://www.melia.com/en/hotels/spain/sitges/melia-sitges?utm_medium=organic&utm_source=uberall&utm_content=dynamic



REGISTRATION

Advance An electronic registration form is accessible via https://docs.google.com/forms/d/e/1FAIpQLSfngRs_E4JAjnWTwJIVADtBw_QpbgnJGczl1FLtX36fofEJpA/viewform?usp=sf_link or contact us at dasia@eurospace.org. Send the filled in form to Eurospace before April 30th, 2023. This applies both to participants and to the booking of stands.

On site The Conference Secretariat will open in the morning on June 6th, 2023 at 8:00 for late conference registration and for arrival registration and handout of conference material including a USB-stick with the program and related abstracts.

CONFERENCE FEES

Participants A **Conference fee of 940 €** is requested from all participants, including speakers and chairmen. This fee will include lunches, coffee breaks, gala dinner and handling of proceedings.

Students are kindly asked to contact Eurospace before making any registration at dasia@eurospace.org

Exhibitors The fee for an **Exhibitor Display** is **2 500 €** and includes one attendance fee for the Conference. Additional conference registration fees are offered at discount price: 25% for the first additional 2 registrations, and 50% after that.

Sponsors Sponsor packages are available at: dasia@eurospace.org

PAYMENT

Cheque French banks only: in Euro to the order of EUROSPACE payable in a French Bank to be sent to: **EUROSPACE, 22 rue du Quatre Septembre 75002 Paris.**

Cash In Euro at the conference.

Credit Card In Euro. Payment by **VISA, MASTERCARD, MAESTRO, UnionPay, DINERS CLUB, DISCOVER, JCB.**

Bank Transfer In Euro to the order of EUROSPACE
IBAN: FR76 3006 6100 9100 0103 6680 148 – B.I.C: CMCIFRPP
C.I.C. Paris – Agence Bosquet – 16 ter avenue Bosquet – F-75007 PARIS.

Charges on bank orders shall be borne by the sender

HOTEL RESERVATION

A block reservation has been made at special conference rates at Melia Sitges hotel.

Participants are strongly advised to book their room as soon as possible.

After May 15th, reservations will be on normal request and upon availability.

CANCELLATION

Refunds of 50% will be made if a written request is received **before May 6th 2023, at the latest.**

No refunds will be made for cancellations received **after this date**, but substitutions will be possible.

LANGUAGES

English will be the working language of the Conference. The time allocated for each presentation will include a discussion at the end

PAYMENT & BANK FACILITIES

Travel and exchange arrangements can be made by the Concierge of the Hotel. An ATM is available within the hotel.

PROCEEDINGS

Until **1st of July 2023** authors will have the opportunity to convert their abstract into a final paper to be provided at dasia@eurospace.org.

In addition the presentation prepared for the conference is very welcome.

Those documents will be provided to participants from July 15th upon request.

CHAIRMAN & PROGRAMME COMMITTEE

Chairman

Mr. Pierre Lionnet
Eurosace

L.	Beugnet	Airbus Defence & Space SAS
A.	Canals	CS Group
P.	Dandre	Thales Alenia Space France
S.	Duncan	Thales Alenia Space UK
I.	Eballard	ArianeGroup France
G.	Estaves	Thales Alenia Space France
D.	Felbach	OHB System AG
B.	Frezouls	CNES
J.	Fuchs	ESA/ESTEC
R.	Gerlich	GSSE
S.	Habinc	Cobham Gaisler
H-J.	Herpel	Airbus Defence & Space GmbH
U.	Hoch	Airbus Defence & Space GmbH
Ch.	Honvault	ESA/ESTEC
C.	Joergensen	Terma A/S
U.	Kulau	DSI Aerospace Technology GmbH
D.	Lagarde	Thales Alenia Space
Ch.	Lemercier	Airbus Defence & Space France
B.	Leroy	Airbus Defence & Space France
P.	Miramont	CNES,
M.	Montagna	Thales Alenia Space Italy
J-L.	Poupat	Airbus Defence & Space France
Ch.	Steiger	ESA/ESTEC
F.	Warfelmann	Airbus Defence & Space GmbH
A.	Zadeh	ESA/ESTEC

ORGANIZING COMMITTEE

Conference Manager

Ms. Nathalie Aleaton
EUROSPACE
22, rue du Quatre Septembre 75002 Paris Tel.: +33 (0)6 21 47 16 27
e-mail: dasia@europspace.org

Conference Support

Mr. Angel Cuellar
EUROSPACE
22, rue du Quatre Septembre 75002 Paris Tel.: +33 (0)6 51 56 05 67
e-mail: angel.cuellar@europspace.org