



13th ESA Workshop on Avionics, Data, Control and Software Systems (ADCSS2019)

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12 – 14 November 2019
ESA/ESTEC

ALI ZADEH

The Data Systems, Microelectronics
& Component Technology Division

JOACHIM FUCHS

The Software Systems Division

SAMIR BENNANI

The GNC, AOCS & Pointing Division

Organiser by Marco Rovatti

On-Board Computers &
Data Handling section

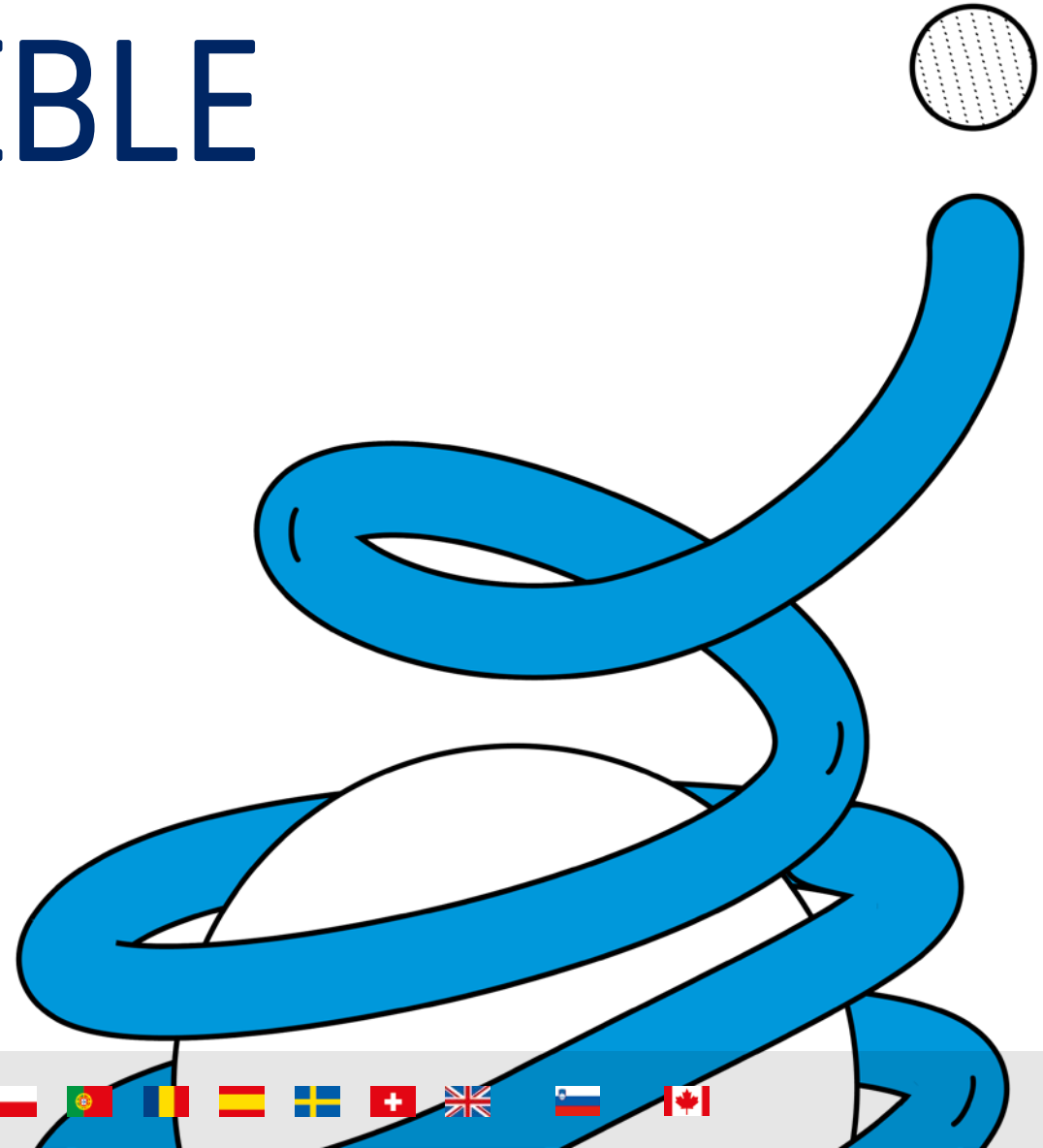
Jean-Loup Terrailon

Chair SAVOIR Working Group

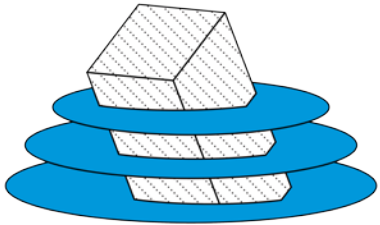
Organising the Savoir Status together with CNES



WE MAKE FUTURE MISSIONS POSSIBLE TODAY.

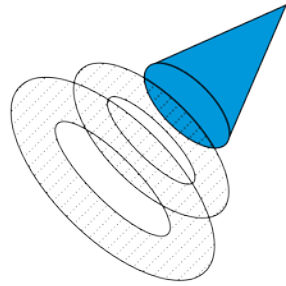


ESA TECHNOLOGY DEVELOPMENT TARGETS



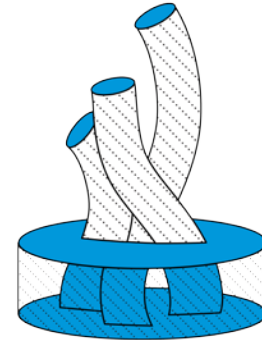
1/3 REDUCTION IN BUILD TIME BY 2023

A 30% improvement of s/c development time by 2023. Fully digitise the workflow. Increased flexibility, scalability and adaptability based on modular space system designs.



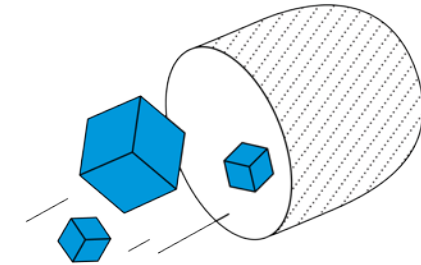
REDUCE SPACE COSTS BY A FACTOR OF TEN

allow end-to-end cost efficiency improvement by one order of magnitude to the user when considering space as a service.



INCREASE INNOVATION AND ADOPTION BY 30%

Double technologies demonstrated at TRL [8/9] per year by 2021. Reduce the time from TRL 4/5 to TRL 7/8 by 50%. Double the use of COTS in ESA spacecraft by 2021



BECOME SPACE-DEBRIS NEUTRAL BY 2030

We develop the technologies that allow us to leave the space environment to the next generation in better shape than we found it.

High performance multi core SoC

- Higher Avionics Integration
- Modular Architecture - Standard Modules
- Associated presentations:
- Very Integrated Avionic Architecture Roadmap for space application
- Brave Large processing board
- FATI (ADS and TAS)
- SpaceVPX (VITA 78), SpaceVNX (VITA 74.4) and the future of Open Architecture Space Systems: Both Large and Small.

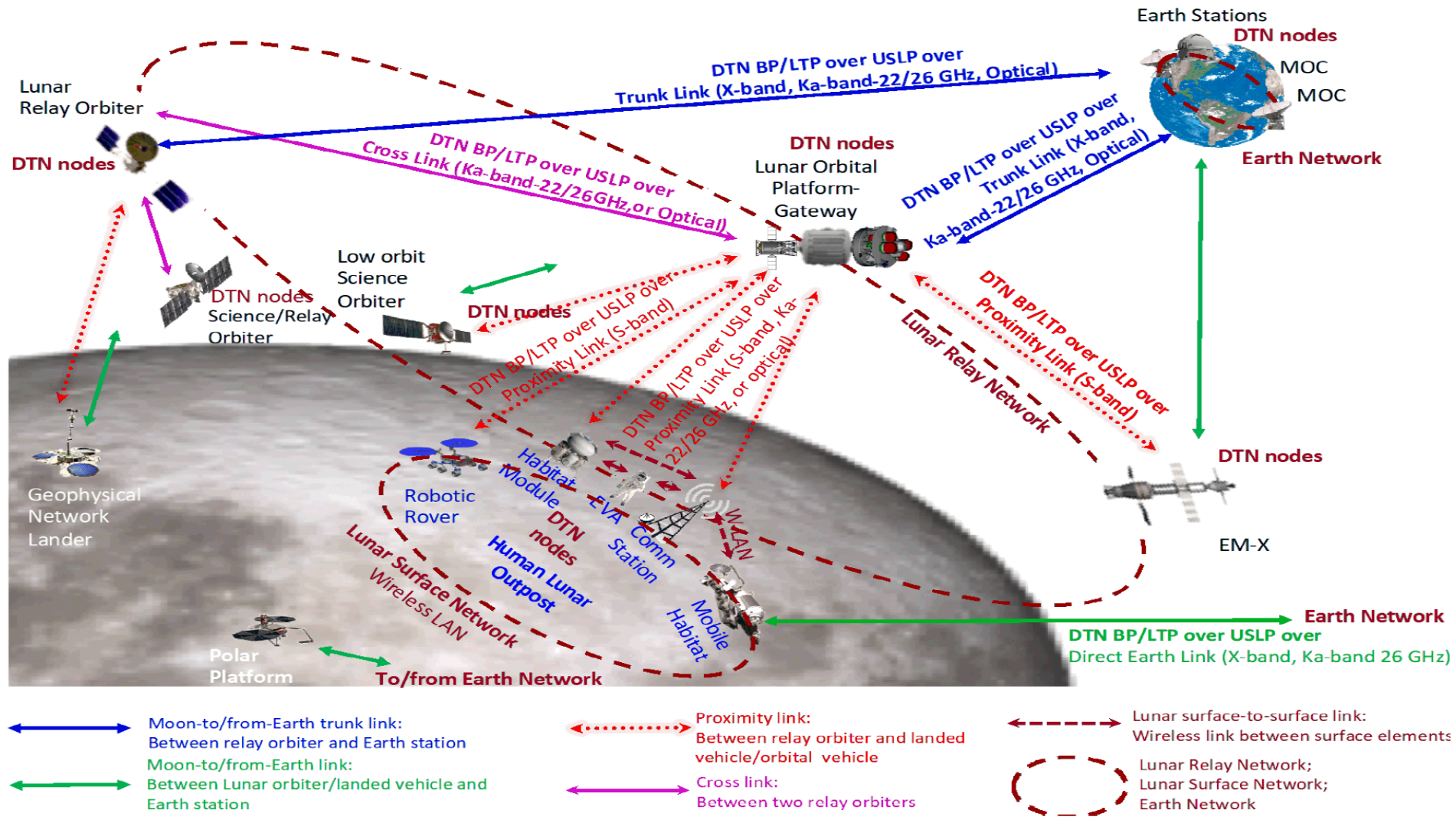
→ BRAVE FPGA NanoXpolore



→ GR740 Cobham Gaisler

Terrestrial Technologies for Space

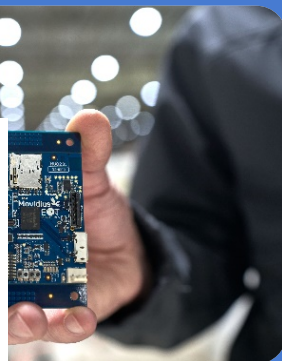
Figure 1. Future Lunar Communications Architecture – A Conceptual View



Artificial
 → As for
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 → Associat
 → Artificial
 → CloudS
 → Artificial
 → Radiati
 for spa
 → Etherne
 → Introdu

Cube

→ Cubesat avionics – Can we learn from them – Can they learn from us?



2 Intel chip –
 at CERN by ESA

ery – COTS board



Model Based Software / System Engineering

- Link between SW and Systems Engineering increasing
- Closely related to digitization efforts at all levels
- Actual implementation and progress reported since last event in 2016
- Aspects of governance to be highlighted to ensure sustainability of related ecosystem
- **Associated presentations:**
- Model-based software engineering – the state of affairs at ESA
- Open Standards and Software for Dynamic System Simulation – Modelica
- Capella and Arcadia - Ariane 6 experiences



→ [ESA image gallery](#)

GNC, AOCS & Pointing

- Autonomy
- Vision Based Navigation

→ Associated Presentations

- AOCS/GNC Autonomy and FDIR – Airbus challenges and way forward
- CAMERA–LIDAR HAZARD DETECTION AND AVOIDANCE SYSTEM: FLIGHT TEST RESULTS
- GENEVIS: A Full Software Vision-Based Navigation (VBN) solution for precise landing



→ ESA image gallery – SMOS Star Tracker

EXHIBITORS



Cobham Gaisler AB



INDES - Integrated Development Solutions BV



Microchip Technology Inc.



Satsearch



SkyLabs d.o.o.



TTTech Computertechnik AG



THANK YOU

- Special Thanks to all participants
 - Around 157 Participants
- Thanks to all presenters, exhibitors and session conveners
- Torbjörn Hult – Key note speaker today at 14:00.
- Special thanks to Marco Rovatti for organizing ADCSS 2019 together with
 - Kathleen Gerlo, Milena van Schendel and Monique Hansen-Daniel
 - Jean-Loup Terrailon for support and organizing SAVOIR session
 - Benedicte Girouart, Massimo Casasco, Marcel Verhoef for support to the organisation

