

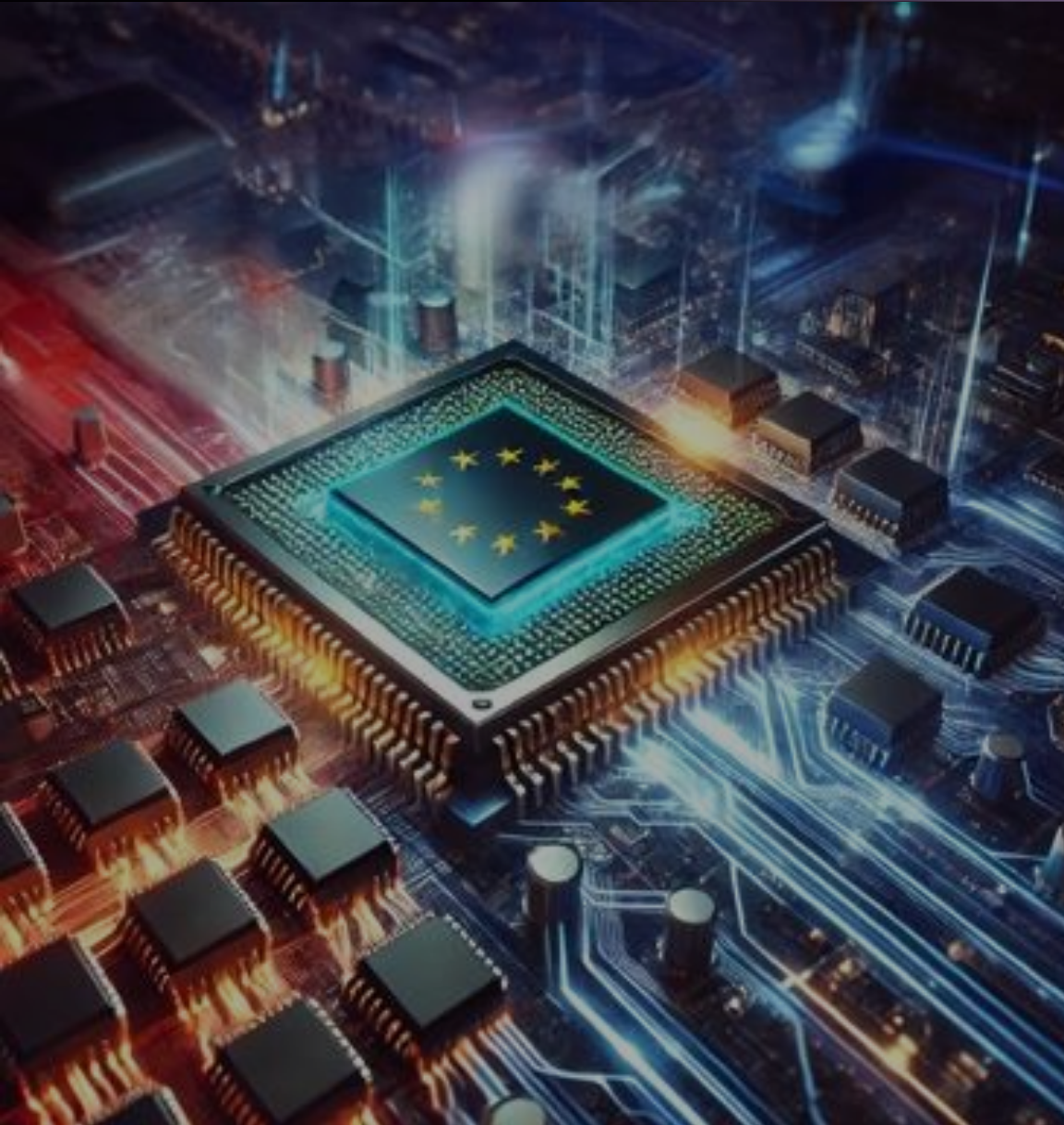
N7 Collaboration between Gaisler and NX

February 2026

Edouard Lepape

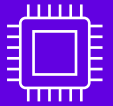


Who Are We?



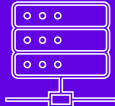
- ✓ **French Based Company : Paris, Montpellier, Grenoble**
- ✓ **140+ Employees with more than 90% R&D Engineers**
- ✓ **Offer products for Hi-Rel markets**
- ✓ **3 different products offering:**
 - **High reliable SoC FPGA**
 - **ASIC design services**
 - **Silicon IPs**
- ✓ **ITAR Free Technology**
- ✓ **Focus on Space & Defense markets**

Main Products Offerings



FPGA

- SoC FPGA and FPGA
- Only European solution
- Focus on key differentiators
- Focus on Space, Defence and Avionics markets



IPs

- Silicon proven IPs in 28nm FD-SOI and 7nm FinFET
- DDR Phy
- eFPGA
- SSTL I/Os
- PLL
- Rad-hard standard cells libraries

ASIC

- NXDS offers Turnkey Service for complex ICs
- Restricted area for secured design environment
- Strong expertise in FD-SOI
- ARM partner

Key Differentiators



Radiation Hardened



Trusted / Security



European Supply chain

Design and validation of **Ultra-Reprogrammable sOCs**

- Specify and design the next generation of ultra-reprogrammable SoC (ULTRA 7) taking benefit of lesson learnt from NG-ULTRA project
- Validate the SoC on a rad-hard demonstrator in 7nm FinFET technology from TSMC
- Validate reliability and radiation hardening performance of 7nm FinFET
- Introduce SiP concept for space application



This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement N°101004206

Design and validation of Ultra-Reprogrammable sOCs

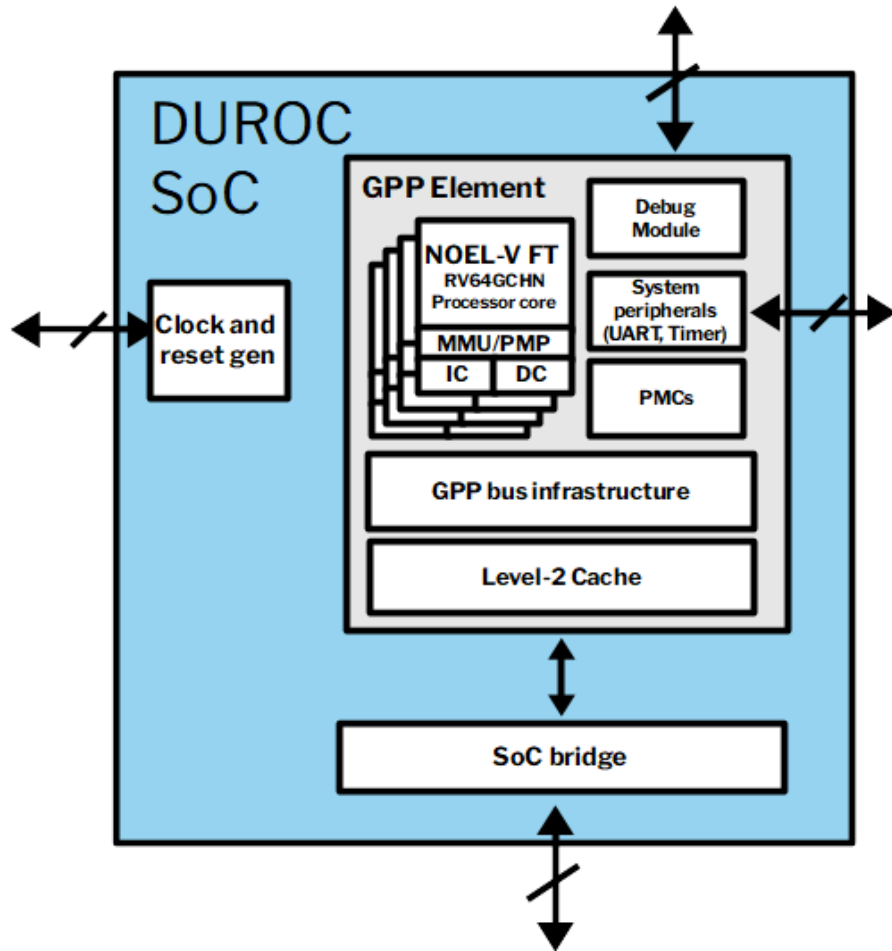


Design and validation of **Ultra-Reprogrammable sOCs**

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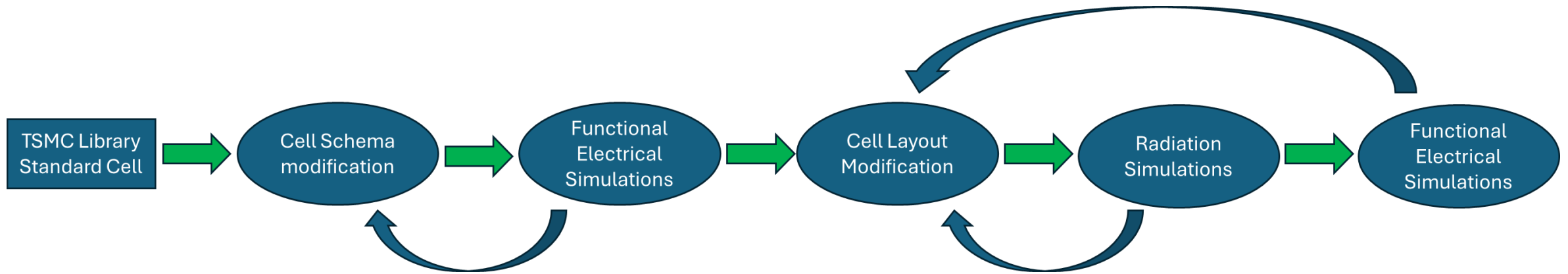


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- Based on Frontgrade Gaisler General Purpose (GPP) element
 - Four 64-bit dual-issue NOEL-V FT RISC-V core
 - Private level-1 cache
 - Shared level-2 cache
- Radiation Constraints
 - TID test up to 150krad
 - Single Event Latchup (SEL): Target LET > 80 MeV.cm²/mg.
 - Single Event Upset (SEU) for FF : target LET > 62 MeV.cm²/mg.
 - Single Event Functional Interrupt (SEFI): target LET > 62 MeV.cm²/mg.
- Thermal Constraints
 - Operational Temperature Range: -40°C to +125°C.
- Samples in Q4 2025

Standard Cell Radiation Hardening flow

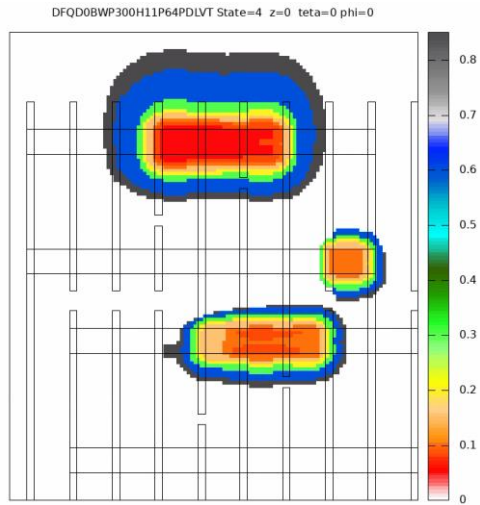


- TSMC foundation standard cells
 - 3 different “flavors” : SLVT, LVT and SVT
 - 2 different families: High Density (HD) and High Speed (HS)
- NX’s first hardening target:
 - LVT (good power vs. performance trade-off)
 - Development with both HD and HS
- Success criteria: Radiation performance as best as we can (target immunity)

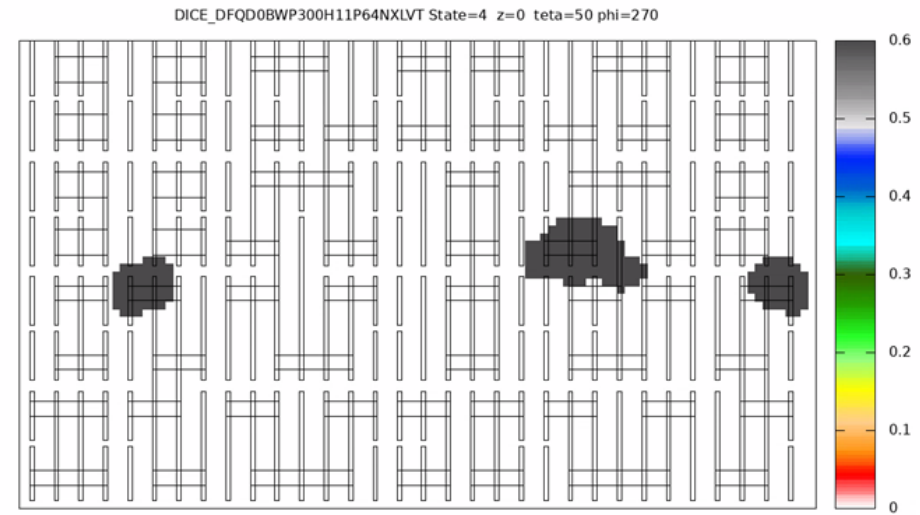
Rad-Hard Standard Cell Performance

- **DICE based D-Flop families**

- High speed (HS – 300H11P64) and High-Density (HD -240H8P57) Families)
- Standard, Scan, Reset and synchronizer variants
- Radiation performance verification with TFIT (cross-section, roll and tilt angles)



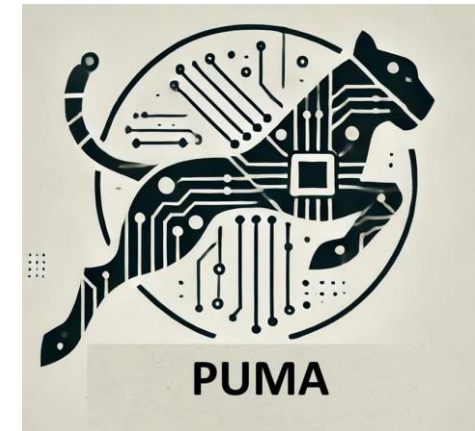
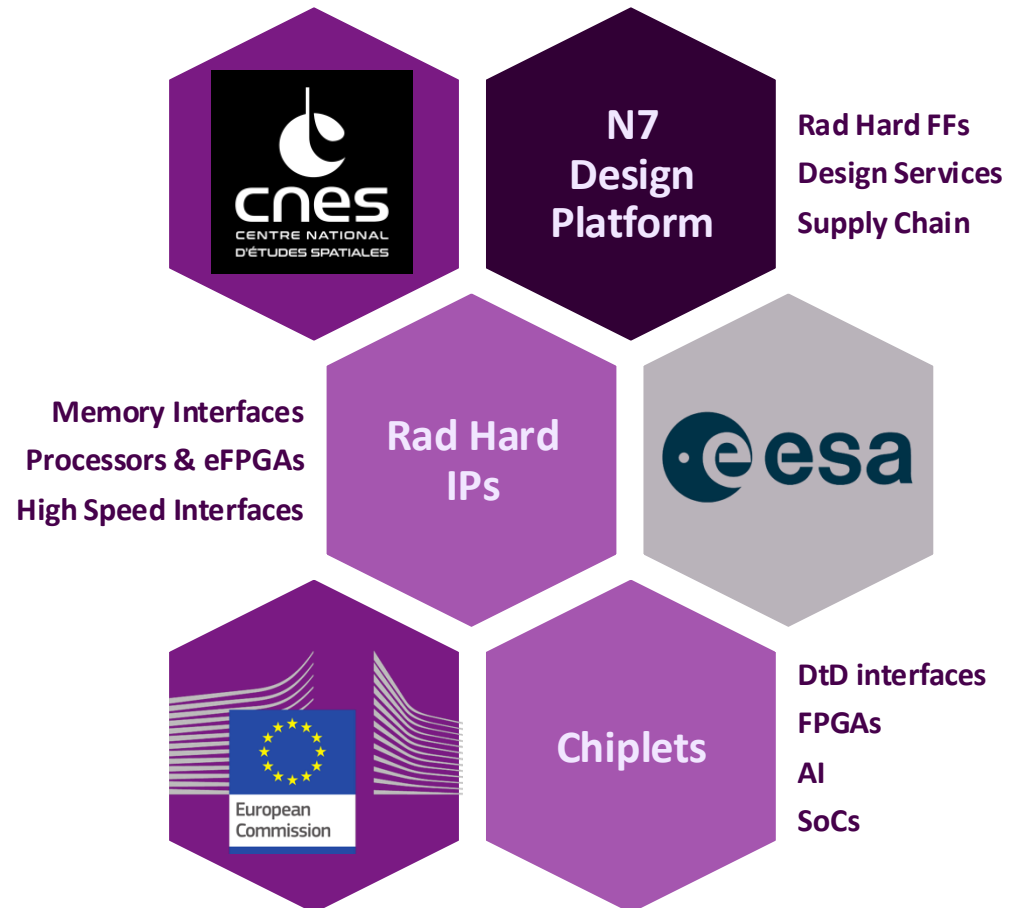
High-Speed TSMC D Flip-Flop



High-Speed NX DICE D Flip-Flop

- DICE DFF vs. standard DFF area ratio: $\times 6$
- Radiation hardening overhead in a critical path: $\sim 6\%$
- Compatible TSMC standard cell frame and all existing cells.

For the benefit of Ecosystem: European Space-Ready N7 Design Platform



Thank You

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