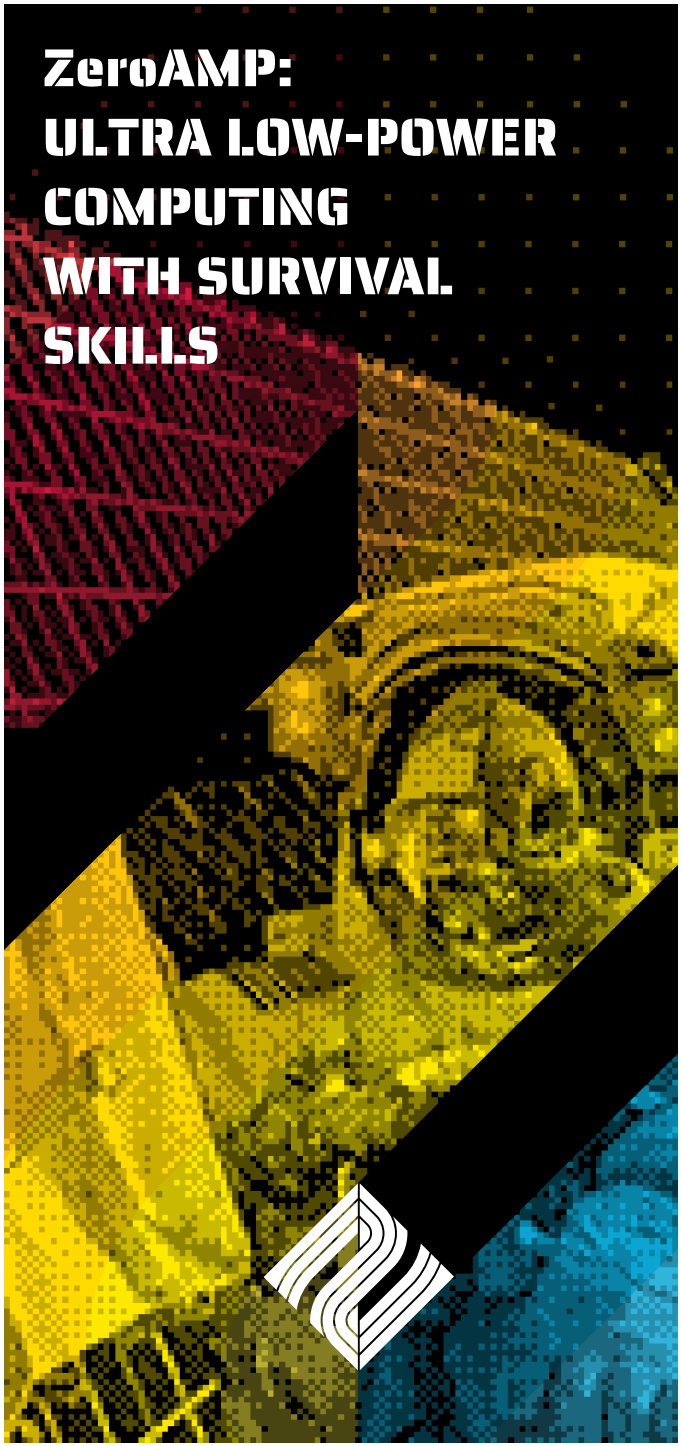
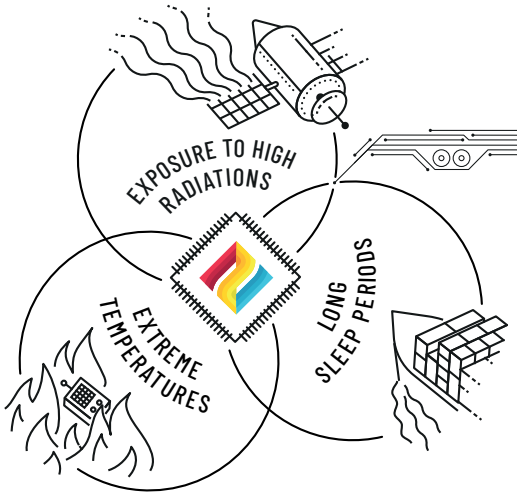
ZeroAMP: ULTRA LOW-POWER COMPUTING WITH SURVIVAL SKILLS



In ZeroAMP, we aim to produce versatile nano-electro-mechanical (NEM) switches, capable of surviving extremely hostile conditions, with no leakage power consumption.



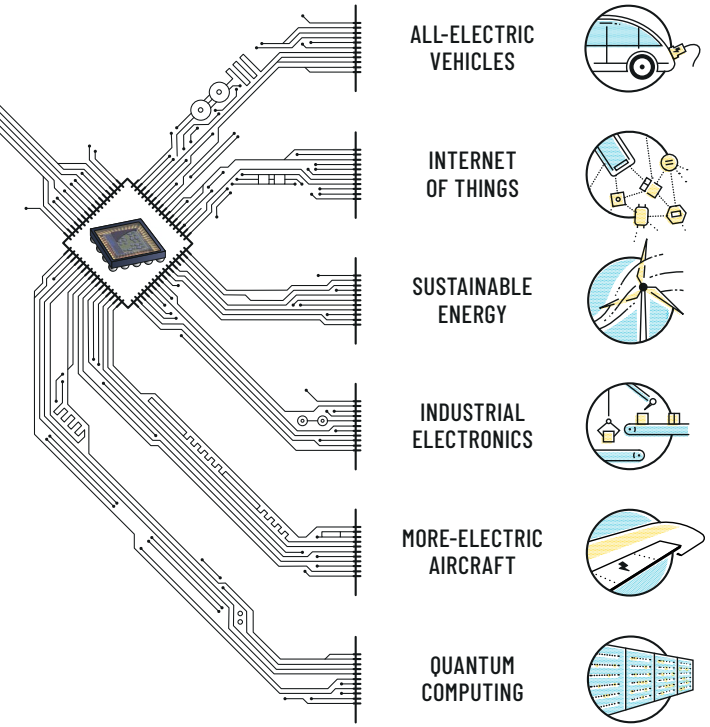
The goal of ZeroAMP is to develop logic and memory circuits using NEM switches for emerging applications demanding zero standby power, operating temperatures up to 300°C, and radiation hardness.

We are an industry-led project covering the entire commercial supply chain, as well as advanced R&D.

If you want to get in touch, drop us a message at info@zeroamp.eu

EXPLOITATION STRATEGIES

Various emerging applications utilize ultra-low power sources and operate in harsh environmental conditions, where transistors cannot perform efficiently.

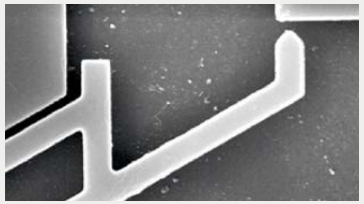


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 871740 (ZeroAMP).

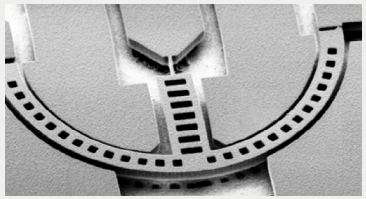
IMPLEMENTATION

Novel zero-leakage NEM switches

Development of energy efficient circuits using NEM logic switches with zero-leakage current and bistable memory switches, based on new designs and materials, able to operate across the full temperature range.



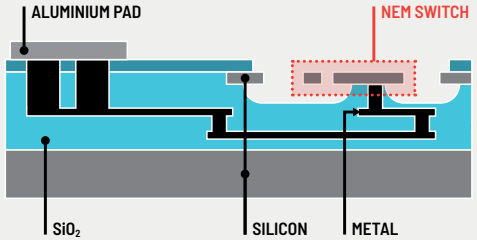
Prototype of a NEM logic switch with zero leakage in the off state due to air gap



Bistable memory switch that retains the switched state through van der Waals forces

Integration

Development of an ultra-high-density 3D stacking technology for the large-scale integration of NEM switches, on a multi-layer interconnect stack situated below the NEM switches.



Schematic of a NEM switch Integrated Circuit

Packaging

Development of a wafer-level process for hermetic sealing of the NEM switches to ensure long-term reliability at high temperatures.

DEMONSTRATION

Energy-efficient Field Programmable Gate Array for harsh environments at Technology Readiness Level 4

Development of an FPGA demonstrator with >10k logic and memory switches in the same die, to produce efficient, reprogrammable logic circuits that retain their programmed state when switched off.

Energy-efficient non-volatile memory for harsh environments at Technology Readiness Level 4

Development of a robust 16 kb non-volatile memory, based on a bistable memory switch that retains the switched state through stiction (van der Waals forces).

OUR PARTNERS

A well-balanced cluster of enterprises and institutions

Microchip Technology
Caldicot – UK

X-FAB MEMS Foundry GmbH
Erfurt – Germany

AMO GmbH
Aachen – Germany

University of Bristol
Bristol – UK

KTH Royal Institute of Technology
Stockholm – Sweden

CSEM
Neuchâtel – Switzerland

SCIPROM
St-Sulpice – Switzerland

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