PROJECT INFORMATION

Project Acronym : ORION

Project Coordinator : Dr. T. Alexoudi

Project Start Date : 18/10/2018

Duration : 36 months

Contract Number : 585

CONTACT

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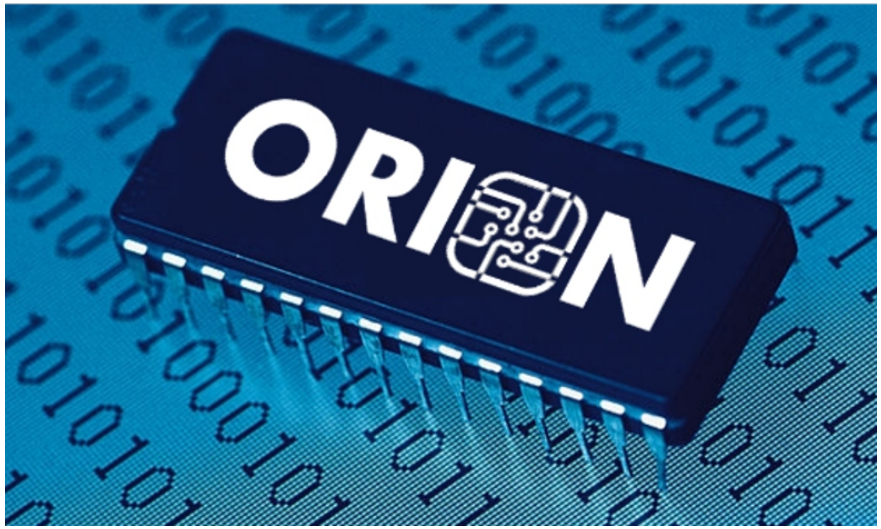
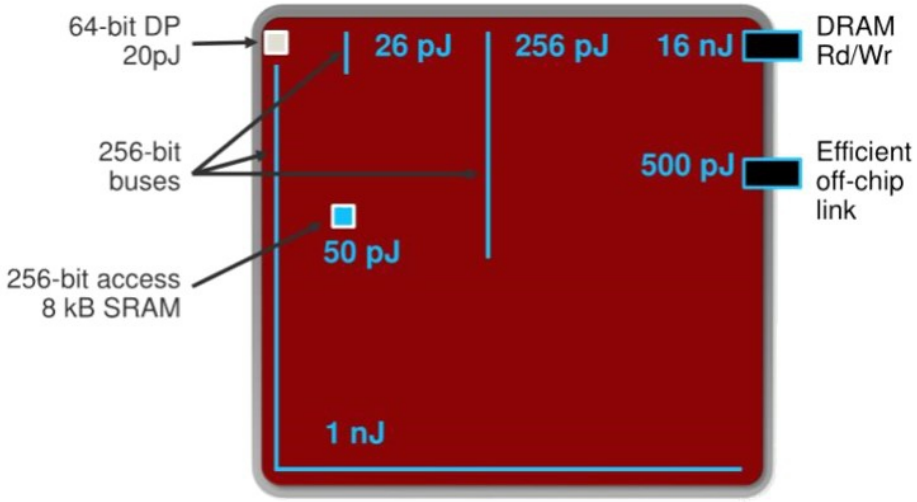
H.F.R.I. Hellenic Foundation for Research & Innovation

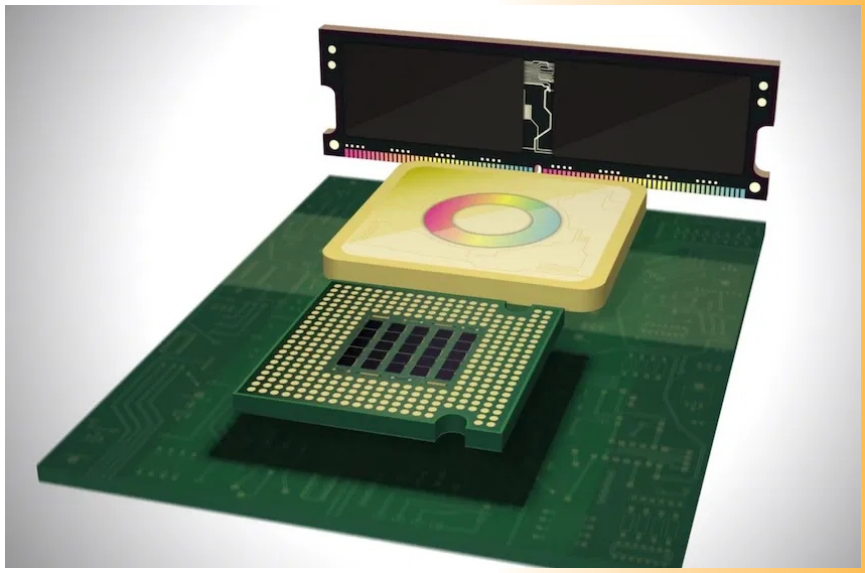
GSRT GENERAL SECRETARIAT FOR RESEARCH AND TECHNOLOGY



ORION

Optical Random-Access Memories for Low-Latency High Throughput and Energy Efficient Disintegrated Computing Architectures





The story:

Current architectures rely to a large degree on data movement , without having the necessary infrastructure to support this in an energy-efficient way. This means that today fetching operands is much more energy-consuming than computing! At the same time Memory bandwidth continues to be a critical bottleneck, with the most efficient way for improvement still relying on the deployment of wider memory buses.

ORION's vision

ORION proposes a novel solution by separating processor chips from interconnect, cache memory and DRAM elements, leading to a high-throughput, reconfigurable and modular setting where processing cores, cache memories, DRAMs and interconnects will comprise disjoint modules and can dynamically re-distribute data, tasks and resources.

ORION's objectives:

1. Design and evaluate the performance of an energy-efficient 1kByte 40GHz optical cache <10fJ/bit energy consumption,

2. Demonstrate the first optical cache har'sdware prototype

3. Build a disintegrated high-throughput computing architecture based on reconfigurable and unified L1 optical cache.