



HPC SPIN-OFFS

OVERVIEW



**Barcelona
Supercomputing
Center**
Centro Nacional de Supercomputación



INTRODUCTION

Spin-offs are a fundamental tool in the Technology Transfer to the market. The Innovation and Business Development Unit at BSC provides support to researchers in creating their spin-offs and actively participates in the process by offering information, training, and serving as a link to the entrepreneurial ecosystem. Here you will find a brief summary of eleven active Spin-offs in the Barcelona HPC ecosystem.



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nostrum
biodiscovery



Mitiga

ELEM



NEARBY
COMPUTING



Qbeast



ILIMANJARO
QUANTUM · TECH



NEXTMOL



FRONTWAVE
IMAGING



X4HPC
Xarxa d'IT-D4 per la Supercomputació

#flexiic
FLEXIBLE ORGANIC INTEGRATED CIRCUITS

microonics®

OVERVIEW. Nostrum Biodiscovery is a spin-off from the Barcelona Supercomputing Center (BSC-CNS) and the Institute for Research in Biomedicine (IRB), two of the most recognized Spanish international research centers. Nostrum Biodiscovery provide advanced technologies in Molecular Modelling,

TEAM.



Octavio Gracia
CFO



Victor Guallar
CSO



Gloria Diaz
CLO



Ezequiel Mas
COO

SOLUTIONS. Two areas of focus:

1. Therapeutics, e.g. small molecules design, targeted protein degradation, antibodies, immunologics and nucleic acids,
2. and bio-based chemistry as in enzyme engineering.

Nostrum Biodiscovery's customer-tailored solutions are based on state-of-the-art proprietary and 3rd-party software, combined with the latest development on AI. They use best in-class Molecular Modeling for data augmentation and fine-tuning of dedicated machine-learning algorithms. With a focus on efficiency, innovation, and accessibility, Nostrum Biodiscovery is committed to providing cutting-edge solutions to the global scientific community. We have now clients in more than 12 countries and are currently expanding in Asia, Latin America while strengthening our presence in the US and Europe.



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MITIGA SOLUTIONS



OVERVIEW. Think extreme temperatures and rainfall, coastal and riverine flooding, scorching heatwaves, persistent droughts, raging wildfires, and extreme winds. Mitiga's goal is to help navigate a world where extreme, large-scale events are becoming more frequent, where the steady drumbeat of accumulating impacts from smaller events can't be ignored, and where the geography of hazard distribution is constantly shifting.

TEAM



Dr. Alejandro Martí
CEO



Dr. Mauricio Hanzich
CTO

SOLUTIONS. EarthScan™

Mitiga's comprehension of climate risk relies heavily on the **data quality** upon which their models are trained. To achieve this, they employ cutting-edge measurements of vegetation, weather dynamics, and topography, enabling them to offer a comprehensive and precise insight into hazards in the physical world.

Utilizing **high-performance computing**, they have the capacity to generate millions of scenarios annually, enabling evaluation and refinement of their models on a large scale.

Their **EarthScan™** technology harnesses the latest machine learning transfer techniques to assess hazards and risks in regions with limited data, drawing from insights derived from data-rich areas. This approach allows them to bridge data gaps universally, thus designing their models with a truly global reach.



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OVERVIEW. Virtual human beings are created in ELEM. They harness the power of mathematical modeling on high-performance computing. They replicate physiological systems in the cloud through a simulation code to test and improve medical devices and drug efficiency. Their disruptive use of supercomputers in medicine in a fast, cost-effective, and replicable way opens up a world of opportunities for medical innovation.

TEAM.



Christopher Morton
CEO & Co-founder



Mariano Vázquez
CSO & Co-founder



Guillaume Houzeaux
Co-founder



José María Cela
Co-founder

SOLUTIONS. Alya

Cardiovascular System. The ELEM's Virtual Heart incorporates the three fundamental physics: electrical activity, mechanical deformation and fluid mechanics, coupling them tightly and bi-directionally. Their models include chambers and vasculature, which the code can simulate under different conditions of health, disease, and treatment.

Respiratory System. Their Virtual Respiratory System simulates high-definition fluid mechanics from face down to several bronchi levels. Different respiratory cycles can be analysed to assess the drug-delivery action of inhalers and nebulizers thanks to a very efficient particle transport scheme.



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OVERVIEW. Nearby Computing delivers Edge Computing end-to-end management and automation solutions through its orchestration platform NearbyOne. Service providers and enterprises can leverage NearbyOne to manage their daily Edge or distributed computing operations and enable disruptive use cases to be deployed across any organization.

TEAM.



Josep Martí
CEO



David Carrera
CTO

SOLUTIONS.

NearbyOne has proven to be the most complete, versatile, and best-performing edge automation platform in the market.

Its single pane of glass allows users to rapidly provision nodes, allocate resources, and fully manage the lifecycle of their edge nodes, as a service. NearbyOne provides an unrivaled customer experience orchestrating all tiers of the network: **infrastructure, network functions, and applications.**



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OVERVIEW. Qbeast focuses on Big Data analysis with Data Leverage, providing valuable insights while accessing only the minimum amount of raw data. The key focus of the research team was to merge the scalability and flexibility of Big Data software with the superior efficiency of HPC technology. This union gave birth to a new and innovative architecture for storing, organizing, and analyzing data.

TEAM.



Cesare Cugnasco
CEO



Paola Pardo
Tech Lead



Nicolás Escartín
COO

SOLUTIONS.

Data Skipping. The usage of an index helps avoid reading the entire dataset, reducing the amount of data transfer involved and speeding up the query.

Approximate Queries. Qbeast enables approximate queries, the ability to provide approximate answers to queries at a fraction of the cost of executing the query.

File Optimization. When writing new data, the file layout could be harmed, producing lots of small files or heavily large ones, making uneasy to retrieve the results with the less noise possible. Optimization fixes the overflowed areas and improves the query useful payload by reading more fine-grained files.



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OVERVIEW.

Qilimanjaro is a full-stack quantum computing company that aims at maximizing current technology capabilities to provide practical quantum advantage in a shorter time frame by following a unique strategy through the analog model of quantum computation.

TEAM.



Marta P. Estarellas
CEO



Víctor Canivell
VP of Strategy



Albert Solana
CBO



Pol Forn Díaz
CTO

SOLUTIONS.

Qilimanjaro develops quantum computing platforms, focusing on analog QASIC (quantum app-specific devices). They aim at **maximising the current capabilities of quantum technology by developing quantum computers co-designed for a particular function or application**: they bring together the target use-case with the design of (1) quantum algorithms and (2) superconducting chips. Their first MVP is to be released in 2024.

In the meantime they do **algorithm co-design with several clients from the logistics, finance and energy sectors**, to understand the market needs and drive quantum chips development through its **QaaS (Quantum as a Service)**. In 2024 they will provide cloud access to their users to Qilimanjaro's platforms (including) classical, quantum-analog and digital backends.

To ease the interaction between the user and the device Qilimanjaro contributed to the development of a **full-stack programming framework named Qibo**. Qilimanjaro offers a deployment and integration service to **install quantum computers on-premise**, as well as **train on its operation and maintenance**. They have deployed their services in the United Arab Emirates (2022) and in Spain (2023) through the Barcelona Supercomputing Center.



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OVERVIEW. Nextmol develops atomistic simulation tools and data analysis to accelerate the design of new chemical products. Those tools characterize the behavior of chemical molecules, predicting their performance, and identifying the best candidate molecules to meet specific physicochemical properties, through computer-based methods without the need to synthesize the molecule.

TEAM.



Dr. Mónica de Mier
CEO



Dr. Stephan Mohr
Scientific Director



Sergi Cortes
CTO



Dr. Rémi Pétuya
Senior R&D Engineer

SOLUTIONS.

Nextmol provides cloud-based molecular modeling & artificial intelligence for chemical innovation

Molecular Modeling. Accuracy and universal applicability with individual atoms and characterization of chemicals on the most fundamental level.

Multilevel. Nextmol incorporates multiple levels of theory to cover a broad range of physico-chemical phenomena.

Artificial Intelligence. Their Machine Learning algorithms can be trained with your experimental data or with simulation-generated data.

High Performance Computing. Nextmol uses HPC to provide its clients the most advanced hardware.



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OVERVIEW. Frontwave Imaging offers an easily accessible software as a medical device (SaMD) that generates high-quality and high-resolution 3D ultrasound images of the breast to improve diagnostics.

TEAM.



Susana Castel
CEO



Josep de la Puente
CTO



Lluís Guasch
CSO



Òscar Calderón
CDO

SOLUTIONS. Ubiware

Safe. Ultrasound imaging does not expose patients to harmful ionising radiation, and allows early detection for patient of all ages, as well as monitoring.

HPC-Driven. The solution is supercomputer-based, easily deployable on the Cloud and accessible from anywhere.

High Resolution. The reconstruction algorithm produces sub-millimeter MRI-like resolution images of breast acoustic properties.

Software as a Medical Device. Easily accessible tool with a UX designed alongside medics, for medics.

Dense Breasts. Can image dense breasts – where mammography fails - as well as normal breasts for all ages.

Cost Competitive. Low costs of image reconstruction with continuous reduction over time as computation gets better and faster.



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MISSION. EAS optimizes HPC and AI data centers energy efficiency through software services. They reduce the data center energy bill and its CO2 emission, while providing installation, configuration, training & support for EAR software to optimize your data center energy & performance

TEAM.



Luigi Brochard
CEO



Julita Corbalan
CTO

SOLUTIONS. Energy Aware Runtime (EAR)

Power and environmental system monitoring and job accounting: monitoring both the system and the applications.

Transparent **runtime application performance** and **power monitoring**. They ensure nodes are performing as expected through periodic checks. EAR reduces the cluster power consumption by about 10% while minimizing performance penalty

Dynamic application and cluster energy optimization through simple energy policies.

Smart cluster energy and power capping to ensure the cluster does not consume more than what users decide.



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OVERVIEW. Reinventing the world of electronics with a revolutionary organic and flexible technology that enables a new generation of sensors and logic based on solution deposited functional inks at a low temperature, on low-cost substrates to make organic integrated circuits.

TEAM.



August Arnal
CEO - CTO



Jordina Juvanteny
CFO



Joan Plana
CIO



Eloi Ramon
Scientific Advisor

SOLUTIONS.

The circuits offered by FlexiIC rely on the Organic Electronics (OE) technology. Their potential is guaranteed by current applications -such as OLEDs in displays in the global market. Instead of the mainstream electronics, the OE are made from organic materials being able to be transparent, physically flexible, and fabricated continuously on a roll to produce low-cost electronics.

FlexiICs offers a platform to implement ultra-low-cost and flexible integrated circuits for specific applications at a fraction of the cost and fast fabrication. Moreover, our chips can be easily integrated into thin-film electronic components to create novel solutions.



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OVERVIEW. Through a 360º and personalized service, Microomics' goal is to promote knowledge of the impact of microbial communities and -omics technologies. Through their developments, they seek to promote strategic alliances in emerging sectors.

TEAM.

- **Miguel Ramirez.** BDM-Sales & Marketing Manager
- **Luca de Vincenti.** Commercial Delegate Northeast Zone
- **Alfredo García Martínez.** Commercial Delegate Southeast Area
- **Ana Mayo.** Commercial Delegate Central Zone.

SOLUTIONS.

Microomics is located in the Research Institute – Hospital de la Santa Creu i Sant Pau (Barcelona), with a Business Office at Parque Científico de Madrid (Campus Cantoblanco-UAM), which provides a scientifically stimulating environment and a sustained growth framework.

Involved by the international research center CRG (Center for Genomic Regulation, www.crg.es) and by ICREA (Catalan Institution for Research and Advanced Studies, www.icrea.cat), Microomics currently combines a mixed business model where service and innovation go hand in hand, contributing to the development of our own service and product, as well as new knowledge in the analysis of microbial communities.



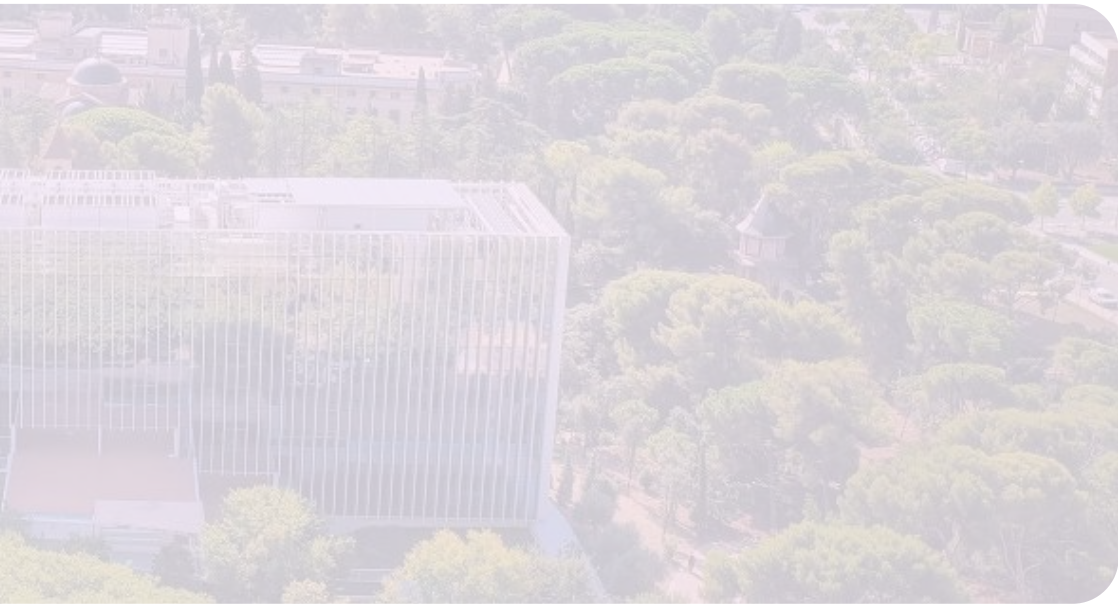
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BSC is a public consortium composed of:



