Press contact for the consortium:
Renan Picoreti Nakahara
Tel.: +330675209176
E-mail: renan.picoreti@davincilabs.eu

EQUALITY consortium selected by the EU's Horizon Europe Program to develop quantum algorithms for industrial applications

The project brings together scientists, innovators, and industrial players and will receive a cumulative six-million-euro funding from the European Commission over the next three years.

Berlin, February 23, 2023 – The EQUALITY[1] consortium comprising Airbus, Capgemini, Da Vinci Labs, Fraunhofer ENAS, German Aerospace Center, INRIA, Leiden University and PASQAL, has been selected by the EU's key funding program for research and innovation, Horizon Europe, to develop innovative quantum computer algorithms that are aimed to solve strategic industrial problems.

By transforming current industrial interest into widespread adoption, EQUALITY's objective is to solidify the link between strategic European industries and the emerging quantum ecosystem, while also contributing to technologies which are critical to the green transition. This project is one of three submissions selected out of a total of 51. The partners will receive a cumulative six-million-euro funding from the European Commission over the next three years.

The consortium will target eight industrial use cases that can benefit from the quantum-enabled speed-up – each computationally complex and faced routinely by the industrial partners. These are airfoil aerodynamics, battery design, fluid dynamics, space mission optimization, materials design, multidisciplinary optimization, space data analysis and fuel cell design. The computational requirements are enormous, forcing today's engineers to use simplistic models or rely on expensive build-and-test cycles. This is exemplified in aerodynamics, where it is more feasible to test models in a wind tunnel than solving the difficult equations involved in simulations. Similarly complex situations are also found in Li-ion batteries and fuel cell simulations.

The opportunity provided by quantum computers to tackle such questions computationally promises a competitive edge for European industry. Moreover, energy-efficient aerodynamics and more durable and affordable batteries are critical to propelling these industries towards zero emissions.

Born in Europe over 100 years ago, quantum physics brought forth a technological revolution, enabling inventions such as semiconductors, lasers, fibre optics, and other technologies that are today ubiquitous in our lives.

[1] EQUALITY stands for Efficient 'QUAntum ALgorithms for IndusTrY'

Quantum computers can perform several operations that are too difficult, or even impossible, for regular processors. And as they approach widespread commercial application, they open up market opportunities in several sectors.

The use of today's quantum hardware, however, requires grappling with the limitations of this nascent technology. These bottlenecks limit the application of quantum computers to solve industrial problems.

Note to Editors:
EQUALITY consortium is led and coordinated by Capgemini. Communication and dissemination on the program are led by Da Vinci Labs.

About Airbus
Airbus is an international pioneer in the aerospace industry and a leader in designing, manufacturing and delivering aerospace products, services and solutions to customers on a global scale. We believe that it's not just what we make, but how we make it that counts; promoting responsible, sustainable and inclusive business practices and acting with integrity. Our people work with passion and determination to make the world a more connected, safer and smarter place, on the ground, in the sky and in space.
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About Capgemini
Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided everyday by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of 360,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering and platforms. The Group reported in 2022 global revenues of €22 billion.
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About Da Vinci Labs
Da Vinci Labs is a research and incubation structure inspired by Leonardo da Vinci. It's interdisciplinary and humanistic approach aims to respond in a competitive way to the ecological challenges of tomorrow, and to bring out the future champions of deeptech, in particular in the field of quantum technologies, artificial intelligence and synthetic biology. To do this, Da Vinci Labs participates in European collaborative research projects and builds a technological infrastructure in Touraine which will be made available to researchers and entrepreneurs ready to tackle our major societal challenges.
www.davincilabs.eu

About Fraunhofer Institute for Electronic Nano Systems
The Fraunhofer Institute for Electronic Nano Systems ENAS is the specialist and development partner in the field of Smart Systems and their integration for various applications. Fraunhofer ENAS has specialized on the challenge of combining micro and nano sensors, actuators and electronic components with interfaces for communication and a self-sufficient energy supply to form smart systems, thus supporting the Internet of Things and the ongoing digitalization. Fraunhofer ENAS develops single components, manufacturing technologies and system concepts, system integration technologies and actively supports the technology transfer for and with its customers.
www.enas.fraunhofer.de

About German Aerospace Center
DLR is the Federal Republic of Germany's research centre for aeronautics and space. They conduct research and development activities in the fields of aeronautics, space, energy, transport, security and digitalisation. The German Space Agency at DLR plans and implements the national space programme on behalf of the federal government. Two DLR project management agencies oversee funding programmes and support

knowledge transfer. Climate, mobility and technology are changing globally. DLR uses the expertise of its 55 research institutes and facilities to develop solutions to these challenges.
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About INRIA
As a technology institute, Inria supports the development of numerous software products, sometimes making a global impact via the open source model. Because technology start-ups are powerful channels for research outcomes, Inria also supports entrepreneurial risk-taking and start-up creation (Deeptech). Firmly established on major university campuses and in industrial ecosystems, the Institute is at the heart of the digital revolution.
www.inria.fr

About Leiden University
Leiden University was founded in 1575 and is one of the leading international research universities in Europe. The University has seven faculties and a campus in both Leiden and The Hague. The university motto is Praesidium Libertatis – Bastion of Freedom. And there are five broad clusters of science areas distinguished (fundamentals of science; health and wellbeing; languages, cultures and societies; law, politics and administration; life sciences) and one overarching research theme (artificial intelligence).
www.universiteitleiden.nl

About Pasqal
PASQAL builds quantum computers from ordered neutral atoms in 2D and 3D arrays to bring a practical quantum advantage to its customers and address real-world problems. PASQAL was founded in 2019 by Georges-Olivier Reymond, Christophe Jurczak, Professor Dr. Alain Aspect, Nobel Prize Laureate Physics, 2022, Dr. Antoine Browaeys, and Dr. Thierry Lahaye. PASQAL has secured more than €40 million in financing, combining equity and non-dilutive funding.
https://pasqal.com