

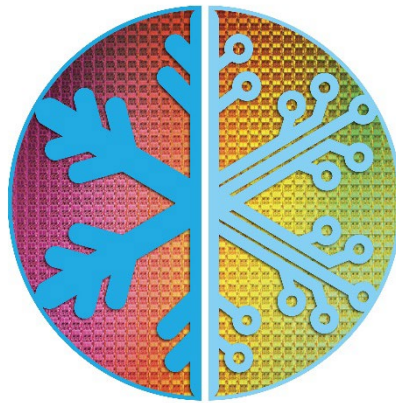
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Advanced Research on Cryogenic Technologies for
Innovative Computing



ARCTIC

ARCTIC - Deliverable report

D7.1 - Demonstrators' specifications

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About ARCTIC

The rise of quantum technology has opened the eyes of the ICT industry with respect to cryogenics. It is considered an enabler bringing in quantum functionalities and enhanced system performance and we are observing a massive growth of cryogenics from coolers to cryogenic electronics and photonics. ARCTIC is a joint effort of top European RTOs, industrial fabrication facilities, and leading application partners (23 industrial among which 14 SMEs, 7 RTO, 6 academic), sharing the vision to take a joint EU step towards the era of cryogenic classical and quantum microsystems. We aim to close the gap between qubit research and interfacing control machinery, highly needed for scaled-up quantum systems. The main goal of ARCTIC is to develop scalable cryogenic ICT microsystems and control technology for quantum processors. The technologies developed will have applications in many fields from sensing to communication, leading to important cross-fertilization that will strengthen the forming European ecosystem on cryogenic classical and quantum microsystems. ARCTIC will advance semiconductor technologies and materials, and tailor these for QT requirements and cryogenic applications. Multi-scale physics and data-driven models, cryogenic PDK modelling, device characterization, circuit design activities will support the development of cryogenic microelectronics. We will develop quantum processor platforms and broaden the applicability of microelectronic devices and circuits for cryogenic operation by developing cryo-compatible ultra-low loss substrates and thin-films, microelectronic and photonic circuits, semiconductor packaging and heterogeneous-integration techniques and benchmark the developed technologies.

Scientific and Industrial ARCTIC-demonstrators and applications are driving our developments enabling the European industry to maintain and expand its leading edge in semiconductor components and processes and QT and strengthen sustainable manufacturing technologies.

ARCTIC consortium members



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Publishable summary

This deliverable contains the specification of all the demonstrators in the ARCTIC project.

