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# M3Or3I-02: [Invited] Functional Amortization of Cryocooling

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Demand for data processing and computation has been rising dramatically since the invention of electronics. Increasing system-wide power efficiency will support sustainability and UN Strategic Development Goals 4, 7-9, and 11-15. Superconductor electronics are emerging in quantum sensing—for data collection and processing; quantum computing—including qubits, controls, and readout; and hybrid environments for high performance computing and artificial intelligence training. Amortizing cryocooling via intelligent choices of the right materials systems doing the right functions at the right temperatures to optimize the use of wall power for the entire system, especially in large systems, could create optimally efficient systems. This talk will explore options and encourage functional analysis and system design where cryocooler development engineers and superconductor electronics system engineers, both quantum and classical, work in concert targeting overall power efficiency.

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