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To Whom It May Concern,

I am writing to express my keen interest in the PhD position in experimental superconducting quantum computing at Chalmers University of Technology, in collaboration with the Wallenberg Centre for Quantum Technology (WACQT). I am currently completing my MSc in Electronics Engineering at the University of Pisa and will be graduating this summer. My academic journey has been deeply intertwined with quantum research — with a particular focus on superconducting qubits — and I am eager to advance my expertise within the innovative, interdisciplinary framework at Chalmers.

During my studies, I have devoted considerable effort to understanding and manipulating quantum systems. My BSc thesis, *“Dispersive Readout of the Transmon Qubit”*, sparked my interest towards quantum measurement techniques. Currently, my MSc thesis involves designing and implementing an FPGA-based control and characterization system for a superconducting Transmon qubit. These projects, along with my work on Qubase — a superconducting qubit pulse sequencer developed in collaboration with the QICK project at Fermilab — have provided me with valuable hands-on experience in navigating the complexities of quantum state control.

Aside from these specialized projects, I have gained solid technical expertise in quantum computing from my work with platforms such as Qiskit. My research work in superconducting qubit characterization and pulse sequence design has not only enhanced my understanding of quantum coherence but also provided me with a solid analytical framework with which to tackle the issue of scalability of quantum devices. Moreover, my background in electronics engineering gives me a strong knowledge in nanoscale device integration technologies and RF integrated circuit design.

In addition to my technical background, I have cultivated personal qualities that I believe are essential for success in a PhD program. My academic and professional experiences have instilled in me a strong sense of discipline, creativity and perseverance. As

Chief Technology Officer for a student FSAE team, I led the electronics and AI divisions, coordinating complex projects and navigating challenges that demanded both analytical problem-solving and collaborative teamwork. These experiences have not only refined my technical abilities but have also taught me the value of leadership, clear communication, collaboration and resilience when faced with setbacks.

Looking forward, I am eager to explore new methodologies for enhancing qubit coherence and scalability through the interplay of nanofabrication, material science and advanced electronics. My decision to pursue a PhD stems from the profound impact I believe quantum computing will have across various scientific disciplines, such as atomic-scale simulations, much like classical computing has revolutionized scientific methodologies. Given the current state of the field, superconducting qubits represent one of the most promising approaches to realizing practical quantum computation, and I am keen to be part of the research efforts driving this progress. I am particularly interested in developing novel strategies for quantum error correction and noise reduction in superconducting circuits — a field where I believe my background in both theoretical principles and practical system design will be especially valuable. I am convinced that the dynamic and interdisciplinary research environment at Chalmers is the ideal setting for such endeavors. Working alongside leading experts at WACQT, I am excited by the prospect of contributing to projects that push the boundaries of what is currently achievable in quantum computing.

I am particularly drawn to WACQT's superconducting qubit research - especially on large-scale multi-qubit devices - and the potential to work in a very collaborative, interdisciplinary environment. I believe that being part of this vibrant academic community will not only nurture my research aspirations but also allow me to grow as a scientist and contribute meaningfully to the global effort to realize practical quantum computing systems. I think my technical background in quantum measurements, as well as my electronics engineering and embedded systems experience, positions me well to contribute to the research goal at Chalmers University.

The professors who are guiding me in my master thesis work would be glad to serve as a reference for my profile: Professor Massimo Macucci (massimo@mercurio.iet.unipi.it) and Professor Stefano Di Pascoli (stefano.di.pascoli@unipi.it).

Thank you for considering my application. I look forward to the opportunity to discuss how my background and passion for superconducting qubit research align with the goals of Chalmers University of Technology and WACQT.

Yours Faithfully,

Leonardo Bove