

Institute of Advanced Sciences, Quantum Information Research Center 先端科学高等研究院 量子情報研究センター

20th Seminar of Quantum Control Integrated Circuit Lab 量子制御電子集積回路ラボ 第20回セミナー

Date: 14:40 – 15:40, February 3 (Tuesday) 2026

日程: 2026年2月3日 (火) 14:40~15:40

Place: Seminar Room 2 (Electrical and Computer Eng. Bldg. 4th floor)

場所: 演習室 2 (電子情報工学棟 4 階)

High-Fidelity Control of Small-Gap Superconducting Qubits

Prof. William D. Oliver

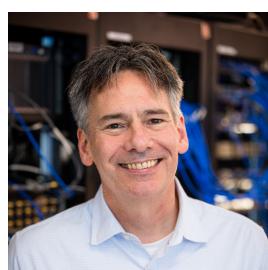
Massachusetts Institute of Technology

High-Fidelity Control of Small-Gap Superconducting Qubits [1,2]. In the case of single-qubit gates, we go beyond restrictions associated with the rotating-wave approximation by accounting for the carrier-envelope phase drive and fixing it through pulse timing. The timing aspect is closely related to our earlier work on universal nonadiabatic baseband control of composite (dual-rail) qubits [3].

[1] [PRX Quantum 5, 040342 \(2024\)](#) | [arXiv:2406.08295 \(2024\)](#)

[2] [Physical Review X 13, 031035 \(2023\)](#) | [arXiv:2304.06087 \(2023\)](#)

[3] [Physical Review X 10, 041051\(2020\)](#) | [arXiv:2003.13154 \(2020\)](#)



William D. Oliver is jointly appointed the Henry Ellis Warren (1894) Professor of Electrical Engineering and Computer Science and Professor of Physics at the Massachusetts Institute of Technology. He serves as the Director of the Center for Quantum Engineering and as Associate Director of the Research Laboratory of Electronics. He is a Principal Investigator in the Engineering Quantum Systems Group at MIT campus. He provides programmatic and technical leadership targeting the development of quantum and classical high-performance computing technologies. Will's research interests include the materials growth, fabrication, design, and measurement of superconducting qubits, as well as the development of cryogenic packaging and control electronics involving cryogenic CMOS and single-flux quantum digital logic.

From 2003-2023, Will also worked at Lincoln Laboratory — most recently as a Laboratory Fellow (2017-2023) — with the Quantum Information and Integrated Nanosystems Group. Over those 20 years, Will was instrumental in growing the quantum group to its present levels. In February 2023, Will stepped down from this position, due to a perceived organizational conflict of interest with his outside professional activities. Nonetheless, he and the EQuS group maintain a strong collaborative relationship with the Laboratory.

Will is a Fellow of the American Association for the Advancement of Science (AAAS), the American Physical Society (APS), and a Senior Member of the IEEE. He serves on the National Quantum Initiative Advisory Committee, the US Committee for Superconducting Electronics, and is an IEEE Applied Superconductivity Conference (ASC) Board Member.

Will received his Ph.D. in Electrical Engineering from Stanford University, his M.S. in Electrical Engineering and Computer Science from MIT, and a B.S. in Electrical Engineering and B.A. in Japanese from the University of Rochester (NY).