

Superconducting Damascene Interconnects for Quantum Circuits

Researchers at The University of Alabama have demonstrated a metal-exchange process that converts conventional Cu-filled damascene structures into superconducting Sn interconnects. The process is compatible with standard semiconductor damascene fabrication, and superconductivity was experimentally demonstrated in 200-nm-wide Sn lines with a transition temperature of 3.7 K. The approach has also been demonstrated with In, and phase-diagram-based guidelines described in the work suggest additional metal pairs that could be explored using the same strategy. The process may therefore provide a path toward planarized, multilevel superconducting interconnects for scalable quantum circuits and packaging. The work, “Superconducting Damascene Interconnects from Electrodeposition and Solid-State Metal Exchange,” was recently published in the *Journal of The Electrochemical Society*: <https://doi.org/10.1149/1945-7111/aea500>.