

THE POWER OF TECHNOLOGICAL PROMISES: QUANTUM TECHNOLOGIES AS AN EMERGING FIELD

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Abstract:

New technologies and the technological promises that accompany them often seem to offer opportunities for profound transformations of the existing hierarchies, institutions, and established norms. They offer social scientists a window into moments when those promises and narratives are still in flux and being tailored to the interests and needs of potential audiences. In this sense, the emerging quantum sciences are presented as a possible area of contestation for shifting techno-economic relations on the international level. However, major transformations are never contained in the strict bounds of international relations and geopolitics. There have been ongoing efforts to democratize these technologies, and the public interest has been growing steadily since such devices became accessible through cloud access by IBM in 2016.

The field of Quantum Computing and Information (QC) emerged as the product of the paradigmatic Cold War Sciences--Computing, Quantum Mechanics, and Information Science--and paralleled the development of classical cryptography and computing. QC seeks to exploit the properties of quantum mechanics--such as superposition and entanglement--to produce computers or other technologies capable of surpassing the computing ability of classical computers. Practitioners offer competing models of how such computers might be built and have different ideas about what the potential of such computation power would mean, and what sort of future it portends. Functional quantum computers now exist, but none have enough "qubits" or technical capabilities to realize the grand promises of QC. In the past few decades, practitioners in QC have transmuted their field from science fiction into institutionalized fact. Even though working quantum computers fulfilling the promises of the field do not yet exist, both governments and private industry have been pouring money into QC. Since governments worldwide believe QC poses an important national security concern, QC is funded not only by giant tech companies such as Alibaba, Baidu, Google, Microsoft, and IBM but also by state actors like the US, China, EU, and Israel. The US government alone proposed about \$1.3 billion for QC while the global public spending is expected to exceed \$20 billion.

This panel aims to understand this new project and the conditions of its possibility. How do such scientific fields move from science fiction to institutions? What kinds of technological promises successfully create networks invested in building these institutions? What specific infrastructures need to be in place? What promises does this new field make, what mode do actors articulate them in, and how do they become credible? We welcome researchers from any field of study that wishes to contribute to this discussion.

Key words:

quantum technologies, technological promises, emerging technology