Randall K. Kirschman

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Professional Career (Primary positions are **bold**)

Private Practice (1982–present)

Consulting, teaching, and writing in the areas of microelectronic hardware. Miniaturized electronic components and associated materials, processing and fabrication technology. Also electronics for unusual environments, particularly extreme temperatures both low (cryogenic) and high. Research and development related to semiconductor materials, devices, and instrumentation.

Clients have included:

Jet Propulsion Laboratory, Eaton Corporation, Teledyne, Stanford University, GPD Optoelectronics, and others.

Projects have included:

Advising on design and fabrication of microwave integrated circuits. Design and evaluation of advanced technology for assembly and packaging of microwave integrated circuits.

R & D of specialized electronics to improve performance of MRI (magnetic resonance imaging) equipment.

Advising on assembly technology for electronics for spacecraft operating in extreme temperatures as well as design, assembly, and evaluation of precision optoelectronic hardware for a spacecraft telescope.

Design, advising on fabrication, and evaluation of innovative transistors based on magnetic properties of electrons.

Design, advising on fabrication, and evaluation of specialized transistors, for cryogenic operation to amplify signals from ultra-sensitive sensors.

Note: a number of project and clients are not listed because of the proprietary nature of the projects.

Staff (1998–present)
Department of Physics, University of Oxford (England)

Advising on design, fabrication, and evaluation of spin-electronics devices.

Visiting Senior Research Fellow (Fall 1989–Winter 1991)
Institute of Cryogenics, University of Southampton (England)

Developed signal-processing electronics for operation at low temperatures in wind tunnels.

Visitor (Spring 1988)
School of Electrical and Electronic Engineering, Nanyang Technological Institute (Singapore) (Now Nanyang Technological University)

Lectured to staff and industry on microelectronic materials and processes and superconductivity. Advised staff on research and facilities for thin-film and hybrid microelectronics.

Lecturer (Fall 1987 and Fall 1988)
School of Engineering, Santa Clara University (California, U.S.A.)

Presented course on superconducting materials and technology.

Manager of Processing Laboratory (1979–1982)
Eaton Corporation, Electronic Instrumentation Division

Responsible for planning, establishing, and managing a processing facility for R&D fabrication of thin-film hybrid microwave components. Supervised regular laboratory personnel and trainees, designed techniques and equipment, and advised on fabrication methods and electrical and mechanical design.

Member of Technical Staff (1978–1979), Senior Scientist (1971–1978)
Jet Propulsion Laboratory

Carried out research and development in the areas of thin films, microfabrication, semiconductive and superconductive materials and devices. Specific projects included:

Developed technology and performed experimental research on thin-film superconductive microcircuits, requiring sub-micrometer dimensions, nanovolt electrical measurement and liquid-helium environment.

Established software for computer-aided layout of microcircuits.

Collaborated on experimental studies of thin films prepared and analyzed in ultra-high vacuum (10^{-10} torr) in space simulator.

Fabricated and investigated ultra-sensitive infrared monolithic-silicon bolometers prepared by micromachining for ground and space astronomy.

Evaluated silicon-on-sapphire integrated circuit technology relative to NASA requirements, including device processing and testing.

Visiting Associate, Applied Physics (1976–1979)
California Institute of Technology

Collaborated with Institute faculty and staff on projects in microfabrication, thin films, cryogenics, and superconducting devices.

Education

Ph.D. Physics and Electrical Engineering (1972), M.S. Physics (1969)
California Institute of Technology

B.S. (Highest Honors) Engineering Physics (1966)
University of California (Berkeley)

Awards, Honors, and Memberships

Keeley Visiting Fellow, Wadham College, Oxford (1996–1997).

International Advisory Editor for *Cryogenics* journal (1988–present).

NASA Certificates of Recognition for Computer-Aided Layout of Microcircuits (1980) and Superconducting Microcircuit Technology (1976).

Member of Phi Beta Kappa, Sigma Xi, Tau Beta Pi.

Current memberships: IMAPS—International Hybrid Microelectronics and Packaging Society (formerly ISHM), Cryogenic Society of America.

Publications and Presentations

Please refer to separate Publications List regarding papers, conference presentations, and course presentations.

Books edited: *Low-Temperature Electronics* (IEEE Press, 1986) and *High-Temperature Electronics* (IEEE Press, 1998).

Personal

Born 28 April 1944, California, U.S.A.; Citizen of U.S.A.

27 August 2001