



# Paul Penfield, Jr.

Paul Penfield is Professor of Electrical Engineering, Emeritus, in the [Department of Electrical Engineering and Computer Science, MIT](#), and is affiliated with the MIT [Microsystems Technology Laboratories](#).

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## Contact information

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## More Information

- More complete [contact information](#)
- Biography in words (below)
- Major current project, Information and Entropy (below)
- Detailed [CV](#) (under construction)
- List of publications in all areas
  - [Recent](#)
  - [through 1959](#)
  - [1960 - 1969](#)
  - [1970 - 1979](#)
  - [1980 - 1989](#)
  - [1990 - 1999](#)
  - [2000 - 2009](#)
  - [2010 - 2019](#)
- Descriptions of [current projects](#) and [past projects](#)
- Web sites I have helped start and maintain:
  - [MIT EECS](#) (MIT Department of Electrical Engineering and Computer Science), started September 15, 1994
  - [MIT EVAT](#) (MIT Committee on Education Via Advanced Technologies), started October 24, 1994
  - [Paul Penfield, Jr.](#) (this site), started November 29, 1994

- [ECEDHA](#) (Electrical and Computer Engineering Department Heads Association), formerly known as NEEDHA (National Electrical Engineering Department Heads Association), started December 13, 1995
  - [The Spectrum Singers](#), started January 19, 1996
  - [First Parish Church in Weston](#) (Weston, Massachusetts), started November 29, 2000
  - [MIT EECS UG](#), for rising sophomores to select advisor, started April 22, 2002
  - [The Penfield Family](#), started December 18, 2001
  - [6.050J / 2.110J](#) (MIT course Information and Entropy), started November 19, 2002
  - [Beyond Bliss Yoga Center](#), started January 12, 2003
  - [Penfield Cottage](#), started January 30, 2003
  - [MIT EECS Faculty](#), started March 17, 2005
  - [My immediate family](#)
  - Some [honors and awards](#)
  - [Penfield Family](#) Web site
  - [Penfield Cottage](#) Web site
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## Information and Entropy

A freshman course, now under development, presents the concepts of information and entropy in a way that gives students valuable models with which to interpret the world. Information is a fundamental quantity that, like energy, can be converted from one form to another, transmitted from one place to another, or stored for later use. One form of information in physical systems is known as entropy, a quantity that obeys one of the most profound and mysterious of all physical laws, the Second Law of Thermodynamics. By treating entropy as a form of information, we can make the Second Law accessible to freshmen. They see examples of reversible and irreversible processes in computation, communications, and thermodynamics. The first offering of the new course took place in Spring 2000, and since 2003 the course has been offered jointly by the MIT Department of Mechanical Engineering and Department of Electrical Engineering and Computer Science. More information is available from the [course home pages](#) for years 2003, 2004, and 2005.

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## Narrative biography

Professor Penfield was born May 28, 1933 in Detroit, Michigan. He received the B.A. degree (cum laude) in [physics](#) from [Amherst College](#), Amherst, Massachusetts in 1955, and the Sc.D. degree in electrical engineering from [MIT](#) in 1960.

He joined the MIT faculty, in the [Department of Electrical Engineering and Computer Science](#) (EECS), in 1960. He served as Associate Head of the Department from 1974 to 1978, and as Director of the Microsystems Research Center from 1985 to 1989. From 1989 to 1999 he served as Head of the Department. He was Dugald C. Jackson Professor of Electrical Engineering from January, 2000 until his retirement in June, 2005.

His technical interests have included solid-state microwave devices and circuits, noise and thermodynamics, electrodynamics of moving media, circuit theory, computer-aided design, APL language extensions, integrated-circuit design automation, and computer-aided fabrication of integrated circuits.

Professor Penfield is a Fellow of [the Institute of Electrical and Electronics Engineers](#) (IEEE), and former Chairman of the Boston Section. He received from IEEE the Centennial Medal in 1984, the Circuits and Systems Society Darlington Prize Paper Award in 1985, and the Circuits and Systems Society Golden Jubilee Award in 1999. He is a member of the [National Academy of Engineering](#) (NAE), the [American Physical Society](#) (APS), the [Audio Engineering Society](#) (AES), the [Association for Computing Machinery](#) (ACM), and [Sigma Xi](#). He is the author of five books and dozens of articles in his various fields of interest. He has been a consultant for many companies, and between 1980 and 1995 served as a Director of GenRad, Inc. During 1996-97 he served as President of the [National Electrical Engineering Department Heads Association](#) (NEEDHA) and in March, 2000 received its Outstanding Service Award. In 1998 he received the Fellow Award from the [International Engineering Consortium](#). In 1998 he organized the [Building 20 Commemoration](#), to remember and honor MIT's Building 20, for which he received the 1999 Presidential Citation from The Association of Alumni and Alumnae of MIT.

Professor Penfield lives in Weston, Massachusetts with his wife Barbara. He is a member of the [American Fern Society](#) and the [Hardy Fern Foundation](#), and has a particular interest in field identification of ferns, fern allies, and fern hybrids.

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