

The George W. Woodruff School of Mechanical Engineering at Georgia Tech Presents The Annual Harold W. Gegenheimer Lecture Series on Innovation

Featuring:

George N. Hatsopoulos
Founder, Chairman of the Board, and Chief Executive Officer
Thermo Electron Corporation

Speaking About:

Thermo Electron and the Spin-Out Business Design

Thursday, October 29, 1998, 3:30 P.M.

Manufacturing Research Center Auditorium
Georgia Tech Campus, 811 Ferst Drive

(A reception will be held immediately after the lecture in the MARC Atrium.)

Biographical Sketch



George N. Hatsopoulos is the founder, chairman of the board, and chief executive officer of Thermo Electron Corporation. Since its founding in 1956, Thermo Electron has grown into an international company recognized as a world leader in environmental monitoring and analysis instruments and a major producer of paper-recycling equipment, biomedical products, including heart-assist and mammography systems, alternative-energy systems, and other products and services related to environmental quality, health, and safety.

After graduating from the National Technical University of Athens, Dr. Hatsopoulos attended MIT, where he received his bachelor's (1949), master's (1950), engineer's (1954), and doctoral (1956)

degrees, and continued his association with the Institute until 1990, serving as senior lecturer.

Dr. Hatsopoulos is a member and former chairman of the American Business Conference, the executive committee of the National Bureau of Economic Research, the Corporation of MIT, and was a member of the board of directors of Bolt Beranek and Newman Inc. from 1990 to 1996. He is also a board member of several other organizations, including the Concord Coalition, Congressional Economic Leadership Institute, American Council for Capital Formation Center for Policy Research, and College Year in Athens, and serves as a trustee to the Maliotis Foundation.

From 1982 through 1989, Dr. Hatsopoulos was a member of the board of the Federal Reserve Bank of Boston, serving as chairman from 1988 through 1989. He also served as a member of the Governing Council of the National Academy of Engineering from 1988 to 1994. He is a fellow of the American Academy of Arts and Sciences, the American Institute of Aeronautics and

Astronautics, the American Society of Mechanical Engineers, and the Institute of Electrical and Electronics Engineers.

He has testified at numerous congressional hearings on national energy policy and capital formation, and has served on many national committees on energy conservation, environmental protection, and international exchange. Among his academic and professional honors, Dr. Hatsopoulos received the Heinz Award in 1996 for helping enhance technology, the economy, and employment. He also received the Pi Tau Sigma Gold Medal Award in 1961 for outstanding achievement in the field of engineering for the years 1950 to 1960; the honorary degree of Doctor of Science from the New Jersey Institute of Technology in 1982; Doctor of Humane Letters from the University of Lowell in 1991; and Doctor of Science from Adelphi University in 1994. In 1989, he was named Businessperson of the Year by New England Business magazine and Inventor of the Year by the Boston Museum of Science. In 1994, he was named Man of the Year by the Alpha Omega Council, and received an Environmental Business Award for Industry from the New England Environmental Business Council Inc. and Company of the Year Award from the Boston Business Journal.

He is the principal author of Principles of General Thermodynamics (1965), and Thermionic Energy Conversion, Volumes I (1973) and II (1979). He has published more than 60 articles in professional journals.

Synopsis of the 1998 Gegenheimer Lecture

In the past fifty years, the United States has been exceptionally successful in creating new industries, ranging from xerography to personal computers, that resulted from technology innovations. Most new technology firms, however, were started in garages and not within established big companies; indeed, many were started by entrepreneurs who walked out of big firms. A likely cause of this phenomenon is that talented entrepreneurs are greatly attracted and motivated by the process of building their own business and reaping significant rewards. This is happening despite the fact that a large number of startups fail for reasons unrelated to the merit of their business such as, for example, access to capital.

In 1983, Thermo Electron developed and implemented a novel corporate structure that offers innovators both the advantages of new startups and the resources of an established large corporation. The Wall Street Journal called this the "spin-out" strategy to differentiate it from the "spin-off" strategy increasingly practiced by large corporations in the United States.

The spin-out structure calls for all of the parent's divisions with well-defined and promising business plans to be incorporated into subsidiaries and to sell a minority of the outstanding shares to the public. The spin-out - rather than the parent - keeps the proceeds of the sale to finance its growth. Thus, the parent acts as a venture capital group or investment trust. Whereas venture capital firms often collect the cash and leave entrepreneurs to their fate, here the parent acts as an incubator. For a flat fee, it supplies its spin-outs a variety of services, such as banking, legal, taxation, accounting, investment banking, management of human resources and risk, and it is committed to keeping a controlling interest indefinitely.

Since 1983, when this structure was put in place at Thermo Electron, the company's compound return to stockholders has averaged 28 percent per year. Today, Thermo Electron makes everything from power plants to artificial hearts and analytical instruments. At present, the

group includes 23 spin-outs — and spin-outs of spin-outs — with aggregate sales of over \$4 billion, employing 24 thousand individuals in 23 countries.

About the Lecture Series

The Lecture Series on Innovation was established in 1995 through an endowment from Mr. Harold W. Gegenheimer (Class of 1933) to support student programs that encourage creativity, innovation, and design. Through the lecture series and support of capstone design projects, students are exposed to processes that stimulate creativity and lead to inventions and patents. The previous Gegenheimer lecturers were:

1995	Dr. Jerry M. Woodall	Distinguished Professor of Microelectronics at Purdue University	<i>Necessity Is the Mother of Invention, But Curiosity and Persistence Make It Happen</i>
1996	Mr. Burt Rutan	President and CEO of Scaled Composites, Inc.	<i>Innovation: Use It or Lose It</i>
1997	Dr. Jim Adams	Professor at Stanford University	<i>Creativity Versus Control: Their Impact on Innovation</i>

About the Woodruff School

The Woodruff School of Mechanical Engineering is the oldest and second largest of the ten divisions in the College of Engineering at Georgia Tech. The School offers academic and research programs in mechanical engineering, nuclear and radiological engineering/medical physics, paper science and engineering, and bioengineering. The enrollment includes 1674 undergraduates and 696 graduate students. Studies are directed by a full-time staff of 72 professors, ten joint faculty, 23 research faculty, and five academic professionals, who are supported by 43 staff members. The George W. Woodruff School of Mechanical Engineering is the only educational institution to be designated a Mechanical Engineering Heritage Site by the American Society of Mechanical Engineers. For more information about the Woodruff School contact:

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