

The
Fannie
and John

National Symposium

Catalyzing the Future

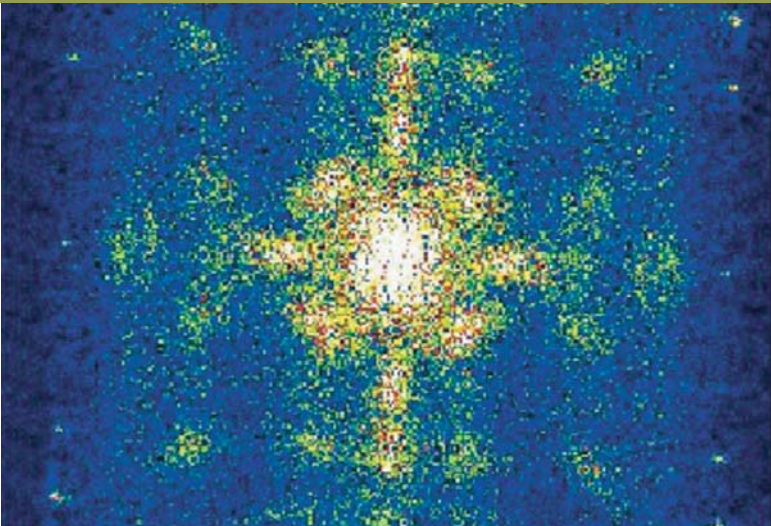
March 18–20, 2005

The Fairmont San Jose

San Jose, California

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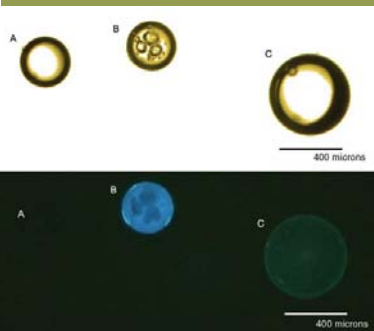
FOUNDATION



YOU ARE INVITED

The Fannie and John Hertz Foundation Board and Staff warmly invite you to our first national symposium of Fellows and Friends. This symposium is an opportunity for you and other talented individuals to meet, obtain new knowledge and discuss major problems facing humanity. Most importantly, such gatherings allow us to develop lasting personal relationships with In-school Fellows, Alumni Fellows, the speakers and our special guests.

The title Catalyzing the Future was chosen because energetic, positive people have disproportionate effects on progress in so many areas. You are a unique group of such people with special technical gifts, who do catalyze remarkable events.



John F. Holzrichter
President
Hertz Fellow 1969

Gregory H. Canavan
Chairman of the Board
Hertz Fellow 1968

SCHEDULE

Friday, March 18

- 3:00 pm** Check-In and Registration
- 3:30-4:30 pm** Welcome and Western Fellows Poster Presentations
- 5:00 pm** **Dr. John S. Foster, Jr.**
Defense R & D Past, Present, and Future
- 6:00 pm** Reception
- 7:00 pm** International Buffet Dinner
- 8:45 pm** **Dr. Leroy Hood**
Systems Biology: The Networks of Life

Saturday, March 19

- 7:30 am** Continental Breakfast
 - 9:00 am** Eastern Fellows Poster Presentations
 - 10:00 am** **Professor Douglas Osheroff**
Basic Research and How Can It Help Us to Meet the Challenges Facing Mankind?
 - 12:00 pm** Lunch
 - 1:00 pm** **Mr. Peter Schwartz**
Next Scientific Revolution
 - 2:00-5:00 pm** Conversations With...
Dr. Jay C. Davis
Is there a Future in Arms Inspections?
Dr. J. Doyne Farmer
How a Physicist Approaches Economics
Dr. Alex Filippenko
Dark Energy and the Runaway Universe
Dr. William "Danny" Hillis
Conversations on Massive Computing and Storage
Professor Seth Stein
Science in Internet Time: Studying the December 2004 Sumatra Earthquake and Tsunami
Dr. Lowell Wood
The Shape of Some Things to Come
 - 5:30 pm** Alumni Poster Presentations and Reception
 - 7:00 pm** Dinner and Awards
- ### Sunday, March 20
- 7:30 am** Continental Breakfast
 - 9:00 am** Informal Breakout Sessions
First Job, Starting a Business, Applying for Grants, etc.

SPEAKER BIOGRAPHIES



Dr. Jay C. Davis

Founding Director of the Center for Accelerator Mass Spectrometry at Lawrence Livermore National Laboratory

During his tenure at Lawrence Livermore National Laboratory, Dr. Davis and his team built the most advanced and widely used accelerator mass spectrometry lab in the world.

Dr. Davis has authored more than 80 publications and has been granted numerous patents. He participated in two UN inspections of Iraq in 1991, and briefed the UN Security Council on his findings. For his contributions to national security as founding Director of the Defense Threat Reduction Agency, he was twice awarded the Distinguished Public Service Medal, DoD's highest civilian award.

He is on the Board of Directors of the Fannie and John Hertz Foundation and of ANSER Corporation, chairs the review committee for the Los Alamos nuclear weapons program, and is a member of the University of Chicago Board of Governors for Argonne National Laboratory.

Dr. Davis received his BA in Physics from the University of Texas (1963), MA in Physics from the University of Texas (1964), and PhD in Physics from the University of Wisconsin (1969).



Dr. J. Doyne Farmer

McKinsey Professor, Santa Fe Institute

With a background as one of the pioneers of 'chaos theory' and a principle force behind time series-based directional forecasting methods for use in automatic trading of financial instruments, Professor Farmer co-founded and is former co-president of the Prediction Company.

While an Oppenheimer Fellow at the Center for Nonlinear Studies at the Los Alamos National Laboratory, Professor Farmer created the complex systems group. He has also made important theoretical contributions in complex systems, including machine learning, a model for the immune system, and the origin of life.

Professor Farmer co-developed the films *A Friendly Introduction to Strange Attractors* and *Mixing Properties of Chaotic Attractors*. He also created the video *The Sounds of Chaos*, and co-authored the screenplay *The Eudaemonic Pie* (Warner Bros. Pictures).

Professor Farmer received his BS in Physics from Stanford University (1973) and his PhD in Physics from the University of California, Santa Cruz (1981).



Professor Alex Filippenko

Professor of Astronomy; University of California, Berkeley

Professor Filippenko and his collaborators discovered a new class of exploding star, obtained some of the best evidence for the existence of small black holes in our Milky Way Galaxy, and found that other galaxies commonly show vigorous activity in their centers that suggest the presence of super-massive black holes.

For teaching, Professor Filippenko has received several awards, including many times being voted "The Best Professor on Campus." Academic honors include the Newton Lacy Pierce Prize of the American Astronomical Society, the Robert M. Petrie Prize of the Canadian Astronomical Society, and the Carl Sagan Prize for Science Popularization.

Professor Filippenko is the co-author of *The Cosmos: Astronomy in the New Millennium*.

After receiving his BS in Physics from the University of California at Santa Barbara (1979), Professor Filippenko earned his PhD in Astronomy (1984) and a Hertz Foundation Fellowship, 1979-1984 from the California Institute of Technology.



Dr. John S. Foster, Jr.

Chairman of the Boards of GNK Aerospace Transparency Systems and Technology Strategies and Alliances

Dr. Foster has been Vice President, Science & Technology and member of Board of Directors at TRW; Director of Defense Research and Engineering for the Department of Defense; Advisor to the 15th Air Force; Director of Lawrence Livermore National Laboratory; and Associate Director of the Lawrence Berkeley National Laboratory. Dr. Foster has served on numerous advisory boards, including the President's Science Advisory Committee, the President's Foreign Intelligence Advisory Board, and the Defense Science Board.

A few of his numerous honors and awards include the Department of Defense Eugene Fubini Award, the Founders Award from the National Academy of Engineering, and the Enrico Fermi Award.

Dr. Foster received his BS degree from McGill University, Montreal (1948), PhD in Physics from the University of California, Berkeley (1952), and Honorary Doctor of Science from the University of Missouri.

SPEAKER BIOGRAPHIES



Dr. William "Danny" Hillis

Co-founder and Chief Technology Officer, Applied Minds

Dr. Hillis is co-founder of Applied Minds, a company that invents, designs, creates and prototypes high-technology products and services for a broad range of applications. Previously, Dr. Hillis was Vice President of Research and Development at Walt Disney Imagineering and a Disney Fellow. Before that, he co-founded Thinking Machines Corp., a leading innovator in massively parallel supercomputers and RAID disk arrays.

While completing his PhD at MIT, Dr. Hillis pioneered the concepts that form the foundation of most supercomputers, as well as the RAID disk array technology used to store large databases. Dr. Hillis holds over 50 U.S. patents and is the designer of a 10,000-year mechanical clock.

Dr. Hillis received a Hertz Foundation Fellowship at MIT from 1978-1984, is a recipient of the Hertz Foundation Thesis Prize, and is on the Board of Directors of the Fannie and John Hertz Foundation.



Dr. Leroy Hood

President and Co-founder, Institute for Systems Biology

At Caltech, Dr. Hood and his colleagues created the DNA and protein sequencers and synthesizers that laid the technological foundation for contemporary molecular biology. The DNA sequencer played a crucial role in mapping the human genome.

Dr. Hood founded and was Chairman of the Department of Molecular Biotechnology at the University of Washington, and co-founded the Institute for Systems Biology. He received the prestigious Lemelson-MIT Prize, the Kyoto Prize in Advanced Technology, and the Lasker Prize. He is a member of the National Academy of Sciences, the American Philosophical Society, the American Association of Arts and Sciences, and the Institute of Medicine. Dr. Hood has also played a role in founding numerous biotechnology companies, including Amgen, Applied Biosystems, Systemix, Darwin and Rosetta.

Dr. Hood received his MD from Johns Hopkins School of Medicine (1964) and PhD in Biochemistry from the California Institute of Technology (1968).



Professor Douglas Osheroff

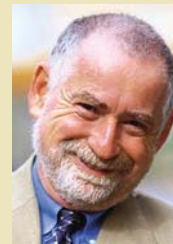
Professor of Physics and Applied Physics, Stanford University

In 1996, Professor Osheroff and his two PhD professors at Cornell shared the Nobel Prize in Physics for their discovery of three superfluid phases of liquid Helium-Three—the neutral analogs to superconductivity in metals. Professor Osheroff spent fifteen years as a member of the technical staff at AT&T Bell Laboratories where he became the head of the Low Temperature and Solid State Research Department.

In 1992, Professor Osheroff was named the J. G. Jackson and C. J. Wood Professor of Physics at Stanford University where he continues to study the behavior of matter near absolute zero.

In 1991, Professor Osheroff developed a special interest in education and has received Stanford's Gores Award for excellence in teaching.

Professor Osheroff received his BS in Physics from the California Institute of Technology (1967) and PhD in Physics from Cornell University (1973).



Mr. Peter Schwartz

Co-founder of Global Business Network; Partner, the Monitor Group

Peter Schwartz is an internationally renowned futurist and business strategist specializing in scenario planning. He works with corporations, governments, and institutions to create alternative perspectives of the future and develop robust strategies for a changing and uncertain world. Peter is also a venture partner of San Francisco-based Alta Partners, a member of the Council on Foreign Relations, and a member of the board of trustees of the Santa Fe Institute, the Long Now Foundation, and the World Affairs Council.

Mr. Schwartz is the author of *Inevitable Surprises* (2003), *The Art of the Long View* (1991), co-author of *The Long Boom* (1999), *When Good Companies Do Bad Things* (1999), and *China's Futures* (2001). He served as a script consultant on the films *The Minority Report*, *Deep Impact*, *Sneakers*, and *War Games*.

Mr. Schwartz received his BS in Aeronautical Engineering and Astronautics from Rensselaer Polytechnic Institute.

SPEAKER BIOGRAPHIES



Professor Neil J. Smelser

Director of the Center for Advanced Study in the Behavioral Sciences, Stanford, California

Professor Smelser is one of the world's leading authorities in the Social Sciences. He has authored several seminal texts spanning topics as diverse as *Social Change in the Industrial Revolution* (1959); *Theory of Collective Behavior* (1962); *Problematics of Sociology* (1997); and *The Social Edges of Psychoanalysis* (1999).

Professor Smelser is Professor Emeritus of Sociology, University of California, Berkeley, a Rhodes Scholar, a former President of the American Sociological Association, and a member of the National Academy of Sciences.

In 2002, Professor Smelser was honored with the Mattei Dogan Foundation Prize for his distinguished career in Sociology.

Professor Smelser received his BA in Social Relations from Harvard College (1952), a BA in Philosophy, Politics, and Economics from Oxford University (1952), a PhD in Sociology from Harvard University (1958), and graduated from the San Francisco Psychoanalytic Institute (1971).



Professor Seth Stein

Professor of Geology, Northwestern University

Professor Stein received the James B. Macelwane Medal of the American Geophysical Union, is a Fellow of the American Geophysical Union and Geological Society of America, and is named to the Institute for Scientific Information's Highly Cited Researchers list. He was Scientific Director of the University NAVSTAR Consortium and was a member of the Executive Committee of the Incorporated Research Institutions for Seismology. Professor Stein founded Northwestern University's Environmental Science program.

During his career, Professor Stein wrote a seismology textbook and edited numerous books about plate boundary zones and the Mesozoic Pacific. He has authored more than 100 scientific publications focusing on his primary interests in seismology, plate tectonics, and space geodesy.

Professor Stein received his BS in Earth and Planetary Sciences from the Massachusetts Institute of Technology (1975), his MS and PhD in Geophysics from the California Institute of Technology (1977, 1978), and a Hertz Foundation Fellowship, 1979-1984.



Dr. Lowell Wood

Physicist, University of California Lawrence Livermore National Lab

Dr. Lowell Wood is a member of the Director's Technical Staff at the University of California's Lawrence Livermore National Lab, where he has worked in a variety of capacities for the past 40 years. Dr. Wood has served as an interviewer of applicants for the Fannie and John Hertz Foundation, which supports graduate studies in the applied physical sciences, and as an officer and member of the Board of Directors of the Hertz Foundation.

He continues to serve on various advisory groups supporting the legislative and executive branches of the federal government. Dr. Wood's professional interests center in the applications of science and technology to national security problems and extend more generally to national issues having a significant technical component.

Dr. Wood received his Bachelor's degrees in Chemistry and Math (1962) and PhD in Astrophysics (1965) from the University of California at Los Angeles.

FOUNDATION SENIOR OFFICERS

Your Hosts for the Symposium



Dr. Gregory H. Canavan

Chairman of the Board, Fannie and John Hertz Foundation, Senior Fellow and Scientific Advisor of Los Alamos National Laboratory
Dr. Canavan was previously Director of the Office of Inertial Fusion and Special Assistant to the Chief of Staff at the Department of Energy. He was a USAF White House Fellow and an American Physical Society Fellow. Dr. Canavan has been active with the Air Force Space Command Independent Strategic Assessment Group (ISAG), NASA Earth Systems Science and Applications Advisory Committee, the American Association for the Advancement of Science, USAF Scientific Advisory Board, the White House Science Council Military Committee, and SDIO Advisory Committee.

His current research interests are stochastic processes, missile defense, and arms stability.

Dr. Canavan received his BS in Mathematics from the USAF Academy, an MBA from Auburn University, and a MS and PhD in Applied Science from the University of California at Davis. He received a Hertz Foundation Fellowship at the University of California at Davis, 1968-1969.



Dr. John Holzrichter

President, Fannie and John Hertz Foundation

Prior to becoming President of the Hertz Foundation in 1999, Dr. Holzrichter directed the Lawrence Livermore National Laboratory's internal research program for 12 years. He also continues to serve as a senior scientist at the Lawrence Livermore National Laboratory, and as a research professor at the University of California at Davis.

He has published over 75 papers and monographs on lasers, fusion, force microscopy, and speech recognition, and holds 9 patents. His present work is concerned with research management and with new methods of speech recognition and speaker verification.

Dr. Holzrichter received a BS with Honors in Applied Mathematics and Engineering Physics from the University of Wisconsin in 1964 and a MS and PhD in Physics from Stanford University in 1971. He received an A. E. Sloan Fellowship, a Fulbright Fellowship (Heidelberg 1965), and a Hertz Foundation Fellowship at Stanford University, 1969-1971.

INFORMATION

The Fairmont Hotel

170 South Market Street
San Jose, California 95113
408-998-1900

Airport Information

San Jose International Airport (SJC) is located three miles (5km) from the hotel.

Airport Shuttle

• Call (650) 697-0701 or 1 (800) LIMO OUT or log on to Bauer's SJC Express website. The one-way transfer costs \$10.00.

Taxi Service

Taxis to and from San Jose International Airport cost approximately \$15.00–\$20.00.

Driving Directions

From San Jose International Airport (SJC):

- When exiting the airport make a right onto Guadalupe Parkway (HWY 87 South) and continue on to the Park Avenue Exit.
- Make a left on Park Avenue and continue down 3 blocks.
- Make a right turn on South Market Street.
- Make a U-Turn around Plaza de Cesar Chavez Park.
- The Hotel will be on the right side between San Carlos Street and San Fernando Street.

From San Francisco International Airport (SFO):

- At the Airport Exit take 101 north a short distance.
- Take the exit for I-380 West. (If you take a rental car, the I-380 exit is very close to this area – just ask directions at the counter)
- At the top of the hill as I-380 climbs going west, take I-280 exit south to San Jose.
- After Guadalupe Parkway, look for the Vine St./Almaden Blvd. exit.
- Turn left at the bottom of the off ramp onto Vine Street.
- Go to San Carlos Street, turn right.
- Turn left when you come to South Market Street, The Fairmont Hotel will be on your right.

Parking

- There is a \$22.00 fee for overnight parking at The Fairmont.
- Overflow garages are within close proximity to the Hotel.

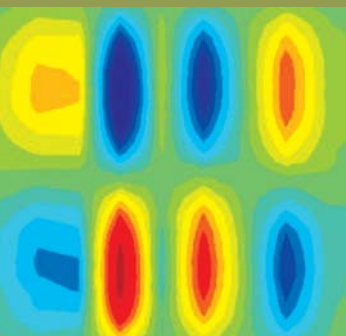
Questions?

Please visit our website at www.hertzfoundation.org or contact Robin Roth at robin@hertzfoundation.org or (925) 373-1642.

ABOUT THE HERTZ FOUNDATION

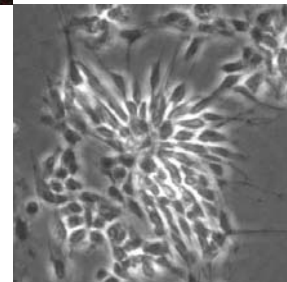
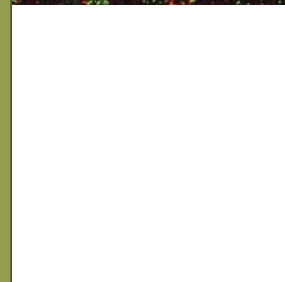
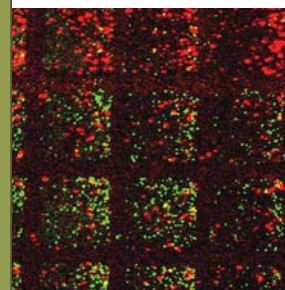
Since 1963, the Fannie and John Hertz Foundation has identified and empowered many of the nation's most remarkable graduate students in the applied physical sciences. Offering them freedom to express their genius, the Hertz Fellowship helps these outstanding students realize their creative potential and fulfill their commitment to solving important problems of humankind.

Hertz Fellows are leaders in their fields and make major contributions to medicine, industry, education, public service, and national security. With a history of important accomplishments and a future that holds great promise, the Fannie and John Hertz Foundation has much to celebrate.



Images in order of appearance: Andrew Houck, Harvard University, *Metamaterials*; J. C. Seamus Davis, Jennifer Hoffman (Hertz Fellow), Kyle McElroy, U.C. Berkeley, *HITc Quasiparticle Interference*; Joseph Rule, University of Illinois, *Stress-Responsive Polymeric Beads*; Edwin Gerber, Princeton University, *Extratropical Circulation*; Jessica Chuang (Hertz Fellow), C. Yoshina-Ishii, S. G. Boxer, Stanford University Chemistry Department, *Sorted Array of DNA-Tethered Proteoliposomes*; Lily Kim, MIT, *Neuronal Rosette*; S. D. Hart, G. R. Maskaly (Hertz Fellow), B. Temelkuran, P. H. Pridoux, J. D. Joannopoulos, Y. Fink, MIT, *External Reflection from Omnidirectional Dielectric Mirror Fibers*.

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