

# WELCOME

The **New Jersey Inventors Hall of Fame** (NJIHof) honors inventors, innovators and companies that have contributed to improving society and changing our lives.

Learn more about the history of some famous New Jersey inventors.



New Jersey Inventor's Hall of Fame  
Annual Awards Dinner Banquet  
October 18, 2012  
W Hotel Hoboken, NJ 07030

## 2011 Hall of Fame

# Arthur A. Gertzman



Mr. Arthur A. Gertzman served the Musculoskeletal Transplant Foundation (MTF) in Edison, New Jersey as Executive Vice President of Research & Development and Chief Scientific Officer from 1996 to 2009. He now works part time for MTF as Vice President of Allograft

Technology with responsibility for managing the Foundation's intellectual property. Mr. Gertzman worked for Ethicon, Inc, a Johnson & Johnson company in Somerville, New Jersey, leaving as Corporate Director, Technical Services in 1996. He served in R & D, Process Engineering and technology transfer across all five of the Ethicon U.S. plants. At Ethicon, he focused on product development of medical devices in surgical sutures and meshes, surgical staples and staplers, and large scale, automated processes for producing, packaging and sterilizing such devices. Mr. Gertzman holds forty-five issued U.S. patents, with nineteen pending in the U.S. The technologies represent a wide range of polymeric surgical implants, application of donated bone and soft tissues for orthopaedic and sports medicine applications and the applied science underlying demineralized bone materials. Mr. Gertzman has been recognized as an expert in allograft technology and is called on for technical consulting and peer review of papers submitted to technical journals.

He has taught allograft science at medical school seminars and Grand Rounds. His current scientific interests include application of human, allograft mesenchymal stem cells and human tissue matrices for novel applications in orthopaedic, plastic and sports medicine surgery. Arthur lives in Flemington, New Jersey with his wife Gloria; they have three children and ten grandchildren.

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2011 Hall of Fame – Pioneer Status

# Dr. Lynn Schneemeyer



Dr. Lynn F. Schneemeyer is a distinguished chemist specializing in the design, synthesis and characterization of new materials, specifically in the areas of superconducting, magnetic, electronic, and optical materials and devices. In 22 years at Bell Laboratories, Dr. Schneemeyer authored over 250 scientific publications and holds 21 patents. She earned her PhD in inorganic chemistry from Cornell University, and conducted postdoctoral research at M.I.T. She earned her undergraduate degree at the College of Notre Dame in Maryland. While with Bell Laboratories, Dr. Schneemeyer managed multi-million dollar research collaborations among diverse corporate partners, and was involved in technology licensing for a Fortune 100 company. She subsequently joined the National Science Foundation as program officer and was responsible for peer review of submitted proposals, as well as coordination and management of programs for support of multidisciplinary research for the chemical sciences. Dr. Schneemeyer has held a visiting professorship at Rutgers University, and served as an adjunct professor at Columbia University. She was Vice Provost for Research and Graduate Education at Rutgers-Newark before moving to Montclair State University as Associate Dean for Academic Affairs.



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## 2011 Hall of Fame

# Dr. John Siekierka



Dr. John Siekierka is Sokol Professor of Medicinal Chemistry and Director of the Sokol Institute of Pharmaceutical Life Sciences at Montclair State University. Dr. Siekierka has spent over 25 years conducting research in immunosuppressive and anti-inflammatory drug discovery. Prior to joining Montclair State University in 2007, he was Director of Research and Development at the Center for Biomaterials and Advanced Technologies at Johnson & Johnson where he directed research in the development of drug device combination technologies. Dr. Siekierka also held positions as Senior Research fellow and head of Immunosuppression Research at Johnson & Johnson Pharmaceutical Research and Development, as well as senior research positions at Merck Research Laboratories and the Roche Institute of Molecular Biology. Dr. Siekierka is a noted author and speaker who has published over 70 works in scholarly journals and has presented at numerous scientific conferences and symposia. His research has led to discoveries that have resulted in sixteen patents including the mechanism of action of the immunosuppressive drug, sirolimus, and for his contributions to the development of the Cypher™ Sirolimus-Eluting Stent. Dr. Siekierka is the recipient of several awards including Johnson & Johnson's highest award for research, the 2003 Johnson Medal for the discovery and development of the Cypher™ Sirolimus-Eluting Stent. His research interests at Montclair State are in molecular parasitology and development of drugs for neglected diseases. Dr. Siekierka is a graduate of Seton Hall University (B.S.), City University of New York (M.S.) and New York University (Ph.D.).



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## 2011 Hall of Fame

# Charles Pedersen



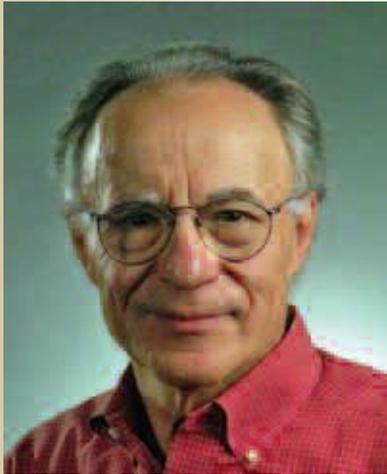
Charles J. Pedersen received a Master's degree in organic chemistry from the Massachusetts Institute of Technology in 1927, and began his career with DuPont at the Chambers Works' Jackson Laboratory in Deepwater, New Jersey. One of his early accomplishments was to improve the process for making the "antiknock" gasoline additive, tetraethyl lead. He also discovered the first "deactivators" that countered the degrading effects of heavy metals in gasoline, oils and rubbers. During a period of 10 years, he filed for some 30 patents for antioxidants and other products. In 1946, Mr. Pedersen was promoted to research associate and, thereafter, pursued his own research projects. In 1959, Mr. Pedersen transferred to the DuPont Experimental Station in Wilmington, Delaware, where he joined the Elastomers Department. It was there that he discovered crown ethers, and in 1967, he published two works that are now considered classics describing the methods of synthesizing crown ethers. Mr. Pedersen retired from DuPont in 1969. He shared the Nobel Prize in Chemistry in 1987.



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## 2011 Hall of Fame

# Dr. Arno Penzias



Dr. Arno Allan Penzias is an American physicist and Nobel laureate in physics. Born in Munich, he and his family fled Nazi Germany and they eventually settled in the Garment District of New York City in 1940. He graduated from Brooklyn Technical High School in 1951 and received a Bachelor's degree from the City College of New York in 1954. From Columbia University, he received his Master's degree in 1958 and his Ph.D. in 1962.

Dr. Penzias went on to work at Bell Labs in Holmdel, New Jersey, where he and Robert Woodrow Wilson discovered radiant energy leftover from the Big Bang. In this regard, the pair worked on ultra-sensitive cryogenic microwave receivers intended for radio astronomy observations. In 1964, on building their most sensitive antenna/ receiver system, the pair encountered faint radio noise striking Earth equally from every direction, which they could not initially explain. Such noise was far less energetic than the radiation given off by the Milky Way galaxy, so they assumed that their system was subject to interference by terrestrial sources, such as radar and radio broadcasts. They tried, and then rejected, the hypothesis that the radio noise emanated from New York City and other sources. An examination of the microwave horn antenna showed it was full of pigeon droppings (which Penzias described as "white dielectric material"). After the pair removed the guano buildup, the noise remained. Having rejected all sources of interference, the pair published a paper announcing their findings. This was later identified as cosmic microwave background radiation (CMB), which was expected billions of years after the Big Bang. This discovery by Dr. Penzias and Wilson is one of the most important in the history of astronomy as it allowed astronomers to confirm the Big Bang theory and to correct many of their previous assumptions about it. In 1997, Dr. Penzias joined New Enterprise Associates as a Venture Partner.



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## 2011 Hall of Fame

# Dr. Robert Wilson



Robert W. Wilson is a Senior Scientist at the Smithsonian Astrophysical Observatory of the Harvard Smithsonian Center for Astrophysics in Cambridge, Massachusetts. Mr. Wilson is technical leader of the Sub-Millimeter Array, an 8-element synthesis radio telescope built by SAO in conjunction with ASIAA near the summit of Mauna Kea, Hawaii.

Dr. Wilson received a B.A. "With Honors in Physics" from Rice University in 1957 and a Ph.D. from the California Institute of Technology in 1962. After a year at the Caltech Owens Valley Radio Observatory as a postdoctoral fellow, he joined Bell Laboratories as a technical staff member.

Dr. Wilson's early work was in the fields of Galactic radio astronomy and precision measurement of radio source strengths. He is best known for his part in the discovery in 1964 of the 3~K cosmic black body background radiation, thought to have originated in the early stages of the Big Bang. In 1970, he and his co-workers extended radio spectroscopy of the interstellar medium to short millimeter wavelengths where they discovered a number of interstellar molecules including carbon monoxide. The resulting field of molecular astronomy has greatly increased our knowledge of how stars and planets form out of interstellar gas. The SMA on which he is currently working and the international ALMA array, which is about to come online in Northern Chile, are examples of instruments built to exploit this discovery.

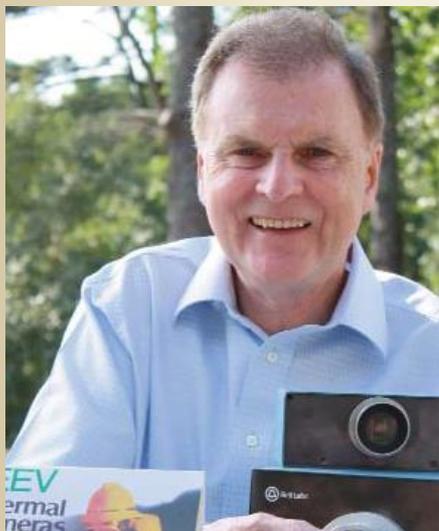
At Bell Labs, Dr. Wilson used astronomical techniques to measure earth-space propagation for satellite communication at centimeter and infrared wavelengths, made infrared propagation measurements along a terrestrial path, and conducted patentable work in wireless communications and optical networking. He is a co-recipient of the Henry Draper Medal from the U.S. National Academy of Science and the Herschel Medal from the Royal Astronomical Society, London and the 1978 Nobel Prize in Physics.



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## 2010 Hall of Fame

# Dr. Michael Tompsett



Before moving to New Jersey from England, Dr Michael Tompsett developed an ultra-high-vacuum analytical system, used to study the growth of ultra-thin films. That technology is still used today in solid-state lasers and high-speed transistors. He also invented a thermal-imaging camera tube that has been deployed globally for military night-vision, fire-fighting and search-and-rescue. Another of his inventions is the basis for contemporary night-vision imagers. At AT&T Bell Laboratories, Murray Hill, NJ from 1969 to 1989 Dr. Michael Tompsett designed and demonstrated the first image sensor known as a Charge Coupled Device (CCD). He alone has the first patent for CCD imaging. He led the development of the first linear and area charge coupled imaging devices, and the world's first CCD color television cameras. (This invention and the development were cited for the 2009 Nobel Prize for Physics). Dr Tompsett's inventive acuity also let in the development of mobile phones, scanners and digital cameras. Ten years ago, Dr Tompsett started his own electronic medical records company, TheraManager LLC, in New Providence, NJ.



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2010 Hall of Fame

# Dr. Andrew Chraplyvy



Dr. Andrew R. Chraplyvy received the B.S. degree in physics from Washington University, St. Louis, Missouri, and the M.S. and Ph.D. degrees in physics from Cornell University. Since 1980, he has been with Bell Laboratories, where he currently is Optical Networks Research Vice President. Dr. Chraplyvy holds over 30 patents in the areas of lightwave systems and fiber optics. He is a Bell Labs Fellow, Marconi Fellow, member of the National Academy of Engineering, Fellow of the Optical Society of America, and Fellow of IEEE. He is the recipient of the 2009 Marconi Prize, 2003 John Tyndall Award, the 1999 Thomas Alva Edison Patent Award, the 1999 New Jersey Inventor of the Year Award, the 1998 Lucent Technologies Patent Award, and the Bell Laboratories President's Gold Award on four separate occasions.



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## 2010 Hall of Fame

# Dr. Robert Tkach



Dr. Robert W. Tkach is Director of the Advanced Photonics Research department at Bell Laboratories, Alcatel-Lucent, Crawford Hill Location. His research has involved dispersion management, optical amplification, optical networking, and high-speed DWDM transmission systems. Prior to rejoining Bell Laboratories in 2006, he has been: CTO of Celion Networks, Division Manager at AT&T Labs - Research, and a Distinguished Member of Technical Staff at AT&T Bell Laboratories. He has been General Co-Chair of OFC, Vice-President of OIF, Associate Editor of the Journal of Lightwave Technology and on the IEEE LEOS Board of Governors. He received the Thomas Alva Edison Patent Award from the R&D Council of New Jersey and is a Fellow of the Optical Society of America, the IEEE, and AT&T. He received the 2008 John Tyndall Award and in 2009 he was elected to the U.S. National Academy of Engineering and was awarded the 2009 Marconi Prize and Fellowship.



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## 2010 Hall of Fame

# Dr. Kenneth Walker



Dr. Kenneth L. Walker is Executive Vice President of Luna nanoWorks, a division of Luna Innovations. He was previously the head of Optical Fiber Research at Bell Labs where he had responsibility for optical fiber research, process development and scale-up. He also initiated and lead the development of Specialty Photonic Devices business in Lucent Technologies. Kenneth grew this group from a research concept to a multi-hundred million dollar business and played a key role in the divestiture of OFS from Lucent. Kenneth was inducted into the National Academy of Engineering in 2002, and was honored as an Optical Society of America fellow in 2003. He has a BS from CalTech and a MS and PhD in Chemical Engineering from Stanford University. He holds over 50 patents.



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2009 Hall of Fame

# Dr. Edward Taylor



Princeton University Professor Emeritus Taylor has spent much of his career seeking the therapeutic potential of folic acid inhibitors, which offered the prospect of disrupting the ability of tumor cells to process folates and synthesize DNA. The challenge was to find compounds that would disrupt folic acid processing only in cancer cells while leaving healthy ones alone. By end of 2008, the drug, Alimta, stood as the most successful new cancer drug, based on sales, in history.



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2009 Hall of Fame

# Yvonne Claeys Brill



Yvonne C. Brill expanded the frontiers of space operations through innovations in rocket and jet propulsion, especially in rocket propulsion systems for geosynchronous communication satellites. Two aspects of Ms. Brill's invention are of special significance: she conceived of a new rocket engine, the hydrazine resistojet, and she foresaw the inherent value and simplicity of using a single propellant. Her invention resulted not only in higher engine performance but also increased reliability of the propulsion system and, because of the reduction in propellant weight requirements, either increased payload capability or extended mission life. This invention was subsequently commercialized, and the hydrazine resistojet thruster became a standard in the industry. As a result, Ms. Brill has earned an international reputation as a pioneer in space exploration and utilization.



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2008 Hall of Fame

# Dr. Herman Sokol



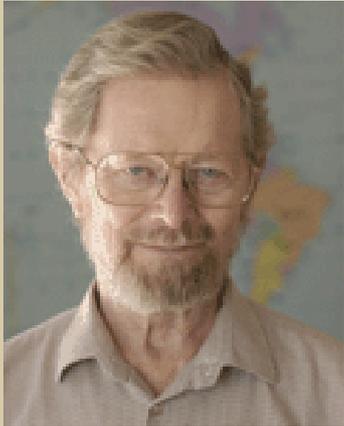
Dr. Herman Sokol was part of a team of researchers at Heyden Chemical Corporation, NJ, who discovered the antibiotic tetracycline in the early 1950s. He was responsible for the development of the basic processes for manufacturing the antibiotic and these processes are still in use today worldwide as tetracycline remains one of the most prescribed antibiotic medication.



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2008 Hall of Fame

# Dr. George Smith



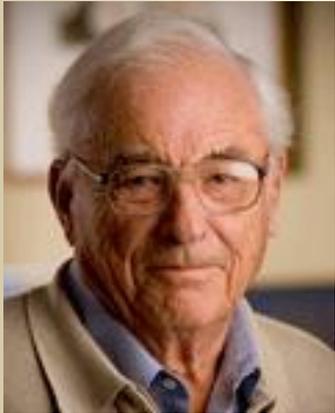
Dr. George Smith performed research at Bell Labs from 1959 to 1986. For much of this time, he led research aimed at creating novel lasers and other semiconductor devices. Working together with fellow Bell Labs researcher, Dr. Willard Boyle, he designed and developed the first Charge-Coupled Device (CCD) in 1969. CCD technology transforms patterns of light into useful digital information. Since its invention, the CCD has spawned significant new industries and markets by enabling a wide range of products.



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2008 Hall of Fame

# Dr. Willard Boyle



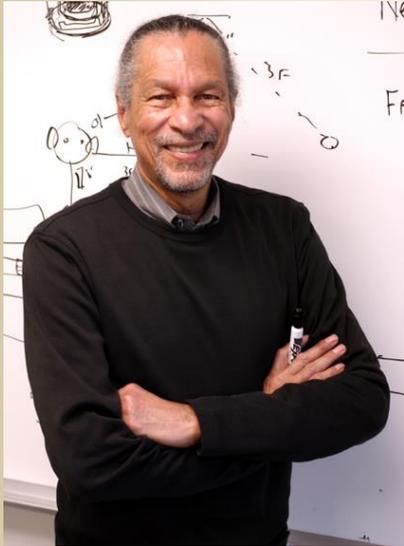
From 1953 to 1979, Dr. Boyle led Bell Labs research in optical and satellite communications, digital and quantum electronics, computing, and radio astronomy. Working together with fellow Bell Labs researcher, Dr. George Smith, he designed and developed the first Charge-Coupled Device (CCD) in 1969. CCD technology transforms patterns of light into useful digital information. Since its invention, the CCD has spawned significant new industries and markets by enabling a wide range of products.



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2008 Hall of Fame

# Dr. James West



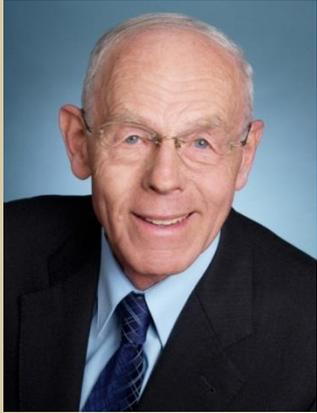
In 1962, Dr. West and Dr. Gerhard Sessler invented the electret microphone. The microphone became widely used because of its high performance, accuracy, and reliability, in addition to its low cost, small size, and light weight. Ninety percent of today's microphones are electret microphones, and they are used in everyday items such as telephones, hearing aids, camcorders, and tape recorders.



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2008 Hall of Fame

# Dr. Gerhard Sessler



In 1962, Dr. Sessler and Dr. James West invented the electret microphone. The microphone became widely used because of its high performance, accuracy, and reliability, in addition to its low cost, small size, and light weight. Ninety percent of today's microphones are electret microphones, and they are used in everyday items such as telephones, hearing aids, camcorders, and tape recorders.



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2008 Hall of Fame

# Dr. Eugene Gordon



Dr. Gordon invented the solution for making semiconductor lasers sufficiently reliable for long haul fiber optic communications and has also contributed in the use of laser technology in medical applications including vision correction.



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2006 Hall of Fame

# Dr. Daryl M. Chapin



Daryl Chapin, with Bell Labs colleagues Calvin Fuller and Gerald Pearson, invented the first practical device for converting sunlight into useful electrical power. Today, the silicon solar cell powers devices from hand held calculators to the Mars Rover.

Chapin was born in Ellensburg, Washington. He earned a bachelor's degree from Willamette University and a master's degree from the University of Washington. He joined Bell Labs in 1930, after teaching physics at Oregon State College for a year.

At Bell Labs, Chapin initially studied magnetic materials. During World War II, he focused on underwater sound devices and magnetic recording. In early 1953, in an effort to find new sources of power for transistor telephone systems, he began to investigate the direct conversion of solar energy into electrical energy. The solar battery was first demonstrated on April 25, 1954. In 1959, Chapin so simplified the process of making solar cells that it became one of Bell Systems' Science Experiments performed by high school students around the U.S.

Chapin was a Bell Labs scientist for over 40 years. After retiring, he continued to invent and was working on a new board game for the blind at the time of his death.



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2006 Hall of Fame

# Dr. Calvin S. Fuller



Chemist Calvin Fuller co-invented the silicon solar cell with physicists Daryl Chapin and Gerald Pearson. Building on Albert Einstein's theories about the photoelectric effect, the three scientists' solar battery has powered everything from the space program to the Internet.

Born in Chicago, Fuller received his B.S. and Ph.D. degrees in physical chemistry from the University of Chicago. He joined Bell Labs in 1930, where his work included research in organic insulating materials and investigations of the molecular nature of polymers. Beginning in 1948, Fuller's research focused on semiconductors and the development of semiconductor devices. His work yielded a method of diffusing impurities into the surface of a silicon wafer, a technique fundamental to producing the solar battery and other silicon devices.

The solar cell is composed of an array of thin silicon wafers that contain minute traces of boron, which creates electrical charges when stimulated by light. The solar cell helped advance the space program by allowing space vehicles to utilize readily-available sunlight. And, reversing the cell's process and converting electrical signal into light allows data to be carried via the fiber optic lines that transmit information across the Internet.



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2006 Hall of Fame

# Dr. Gerald L. Pearson



Gerald Pearson's fundamental research in semiconductor materials led to his invention, with Daryl Chapin and Calvin Fuller, of the silicon solar cell—the first practical device that converted solar energy into electrical power.

Pearson was born in Salem, Oregon. He earned a bachelor's degree in mathematics and physics from Willamette University, and a master's degree in physics from Stanford University. He began his career in 1927 as a research physicist with Bell Labs. His early work there on temperature-sensitive resistors led to thirteen patents and had an important impact on the telecommunications industry.

Shifting the focus of his research at Bell Labs to semiconductor materials, Pearson carried out a series of experiments that were essential to the development of models of semiconductor behavior. His work on silicon rectifiers—electronic components that control electrical current—led to the invention for which he is best known, the silicon solar cell, which became the power source of satellite communications and numerous other applications.

After retiring from Bell Labs, Pearson returned to Stanford, where he set up one of the first university programs in compound semiconductor research. He actively continued his work until the age of 78.



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## 2006 Hall of Fame

# Dr. Henry Orestein



Awarded almost 100 U.S. patents, Henry Orenstein has brought happiness to many children with his safe, novel and educational toys. He began inventing toys about 52 years ago. The inventions that he is most proud of are: Johnny Lightning cars, his unique dolls, and the popular line of Transformer action figures. The Johnny Lightning 500 cars and battery-less system made by his company, Topper Toys, Elizabeth, N.J., provided children with a fun way to increase their hand / eye coordination, along with developing quicker hand responses.

Mr. Orenstein brought new life to toy dolls by giving them human appearance such as blinking eyes, simulated hair growth, and reaction to light, pressure and temperature. In so doing, the doll becomes more exciting, attractive, educational and appealing to children.

In 1995 Orenstein was issued U.S. Patent 5,451,054 for an invention some might consider to be a toy for adults. Orenstein licensed this technology to Fox, NBC and other TV networks enabling poker tournaments to be displayed to an audience using a table having stations for receiving and scanning the image of each player's down cards. The display can identify the down cards of the players to the audience without revealing the information to the other players so that the audience can fully observe the strategy of each player.

As a holocaust survivor and throughout his life, Henry Orenstein has not only endured, but also succeeded as an inventor, an author and philanthropist. He has authored several books, including *I Shall Live*, an account of his life changing experiences during World War II. And his Henry and Carolyn Sue Foundation supports hundreds of families and elderly individuals with grants for food, medical supplies, and other needs.

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## 2006 Hall of Fame

# Dr. Dennis Ritchie



Ritchie was born in Bronxville, New York. His father was Alistair E. Ritchie, a longtime Bell Labs scientist and co-author of *The Design of Switching Circuits* on switching circuit theory. He moved with his family to Summit, New Jersey, as a child, where he graduated from Summit High School.

Ritchie graduated from Harvard University with degrees in physics and applied mathematics. In 1967, he began working at the Bell Labs Computing Sciences Research Center, and in 1968, he received a PhD from Harvard under the supervision of Patrick C. Fischer, his doctoral dissertation being "Program Structure and Computational Complexity".



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## 2006 Hall of Fame

# Kenneth Thompson



Thompson was born in New Orleans. He received a Bachelor of Science in 1965 and a master's degree in 1966, both in electrical engineering and computer science, from the University of California, Berkeley.

In the 1960s, Thompson and Dennis Ritchie worked on the Multics operating system. While writing Multics, Thompson created the Bon programming language. The two left the Multics project when Bell Labs withdrew from it, but they used the experience from the project, and in 1969, Thompson and Ritchie became the principal creators of the Unix operating system. At this time, Thompson decided that Unix needed a system programming language and created B, a precursor to Ritchie's C.

Thompson had developed the CTSS version of the editor QED, which included regular expressions for searching text. QED and Thompson's later editor contributed greatly to the eventual popularity of regular expressions, previously regarded mostly as a tool (or toy) for logicians.

Thompson's style of programming has influenced others, notably in the terseness of his expressions and a preference for clear statements.

In late 2000, Thompson retired from Bell Labs. He worked at Entrisphere, Inc as a fellow until 2006 and now works at Google as a Distinguished Engineer.

Thompson was elected to the National Academy of Engineering in 1980 for "designing UNIX, an operating systems whose efficiency, breadth, power, and style have guided a generation's exploitation of minicomputers.



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## 2005 Hall of Fame

# William Trager



William Trager, Ph.D., achieved the first continuous cultivation in vitro of the human malaria parasite. This scientific breakthrough paved the way for research to understand the physiology, biochemistry, and immunology of the deadly parasite and to ultimately develop a vaccine to prevent or control malaria. Dr. Trager's principle research contributions to parasitology span three main areas: insect physiology, host-parasite relationships, and the physiology of the erythrocytic stages of malaria parasites. He developed the first bacteria-free culture system for mosquito larvae which led to a series of papers on larval nutritional requirements and devised culture methods for silkworm, mosquito, and tsetse fly tissues.

In addition to making numerous ground-breaking discoveries, Trager found time to support the scientific societies to which he belonged. He served as President of both the American Society of Parasitologists and the American Society of Tropical Medicine and Hygiene, and also served in an advisory capacity for the World Health Organization, and the National Institute of Allergy and Infectious Diseases.

William Trager is a founding member of the Society of Protozoologists and was the first Editor of The Journal of Protozoology. He has had a distinguished career in protozoology research, publishing more than 210 scientific papers, authoring two books, and earning numerous prestigious awards for his many outstanding achievements.

In 1998, the Society of Protozoologists established The William Trager Award for Outstanding Paper of the Year, in recognition of his revolutionary discoveries and prolific contributions to the field.



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2005 Hall of Fame

# Howard J. Ellison

Professor Howard Ellison was the founder of the modern asparagus-breeding program at Rutgers University. He pioneered a number of innovative asparagus breeding strategies and methods, including all-male hybrid breeding. Asparagus is dioecious, with male and female flowers borne on separate plants. Studies have shown that the male plants live longer, begin production earlier, are more resistant to disease and significantly out yield the female plants. Although asparagus breeders have recognized the advantages of male plants for some time, they've had difficulty breeding all-male hybrids until Prof. Ellison developed an innovative breeding strategy.

Prof. Ellison meticulously identified the growing and environmental conditions conducive to the development of hermaphrodite flowers. He was then able to use the hermaphrodite flowers to produce seeds for "supermales." Since the supermales could only produce male seeds, this allowed asparagus breeders to produce all-male hybrids. Twenty-one of the all-male hybrids with superior traits such as high yield, high disease resistance, and good spear morphology, were patented. Several of these hybrids, including Jersey Giant, Jersey Knight, and Jersey King, are among the most productive and adaptable asparagus hybrids ever developed and are now being grown all over the world. Prof. Ellison's innovative breeding strategies have allowed asparagus growers to increase their yields and profitability, and have helped to spawn a highly successful New Jersey seed company, Jersey Asparagus Farm, one of the top three asparagus seed companies in the world.



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## 2005 Hall of Fame

# Clarence D. Chang



Mobil research team, Clarence Chang, Dr. Anthony Silvestri and William Lang, were charged with doing exploratory research to open new frontiers in fuel and petrochemical technology. In 1972, while conducting an investigation of the reaction pathways of polar organic compounds on acidic zeolites, the key experiment was conceived that led to the discovery of the conversion of methanol to hydrocarbons, including gasoline-range, high-octane aromatics, over the synthetic zeolite ZSM-5. This discovery became the basis of the Mobil Methanol-to-Gasoline (MTG) Process, the first synfuel process to be commercialized in 50 years, and sparked worldwide interest and research that continues to this day. In 1985, it was commercialized in New Zealand as the Gas-to-Gasoline Process, in response to the Arab Oil Embargo and the ensuing energy crisis. The process operated successfully for a decade before being suspended due to the end of the energy crisis and declining crude oil prices. However, because methanol can be made from any gasifiable carbonaceous material, such as coal and biomass, the MTG process may again play a vital role in a future of dwindling oil and gas resources.

This patent and associated patents revealed a new way to manufacture gasoline, bringing greater security and self-sufficiency to gasoline-reliant consumers, nations and the world at large. A graduate of Harvard, Clarence D. Chang is the author of over 60 papers and encyclopedia chapters, as well as a book, Hydrocarbons from Methanol. For his discovery, he was awarded the American Chemical Society 1992 E.V. Murphree Award and the North American Catalysis Society 1999 Eugene J. Houdry Award among other honors. He holds over 220 U.S. patents.



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## 2005 Hall of Fame

# Anthony J. Silvestri



Mobil research team, Clarence Chang, Dr. Anthony Silvestri and William Lang, were charged with doing exploratory research to open new frontiers in fuel and petrochemical technology. In 1972, while conducting an investigation of the reaction pathways of polar organic compounds on acidic zeolites, the key experiment was conceived that led to the discovery of the conversion of methanol to hydrocarbons, including gasoline-range, high-octane aromatics, over the synthetic zeolite ZSM-5. This discovery became the basis of the Mobil Methanol-to-Gasoline (MTG) Process, the first synfuel process to be commercialized in 50 years, and sparked worldwide interest and research that continues to this day. In 1985, it was commercialized in New Zealand as the Gas-to-Gasoline Process, in response to the Arab Oil Embargo and the ensuing energy crisis. The process operated successfully for a decade before being suspended due to the end of the energy crisis and declining crude oil prices. However, because methanol can be made from any gasifiable carbonaceous material, such as coal and biomass, the MTG process may again play a vital role in a future of dwindling oil and gas resources.

This patent and associated patents revealed a new way to manufacture gasoline, bringing greater security and self-sufficiency to gasoline-reliant consumers, nations and the world at large. A graduate of Harvard, Clarence D. Chang is the author of over 60 papers and encyclopedia chapters, as well as a book, Hydrocarbons from Methanol. For his discovery, he was awarded the American Chemical Society 1992 E.V. Murphree Award and the North American Catalysis Society 1999 Eugene J. Houdry Award among other honors. He holds over 220 U.S. patents.



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## 2005 Hall of Fame

# William H. Lang



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## 2005 Hall of Fame

# Gerard A. Alphonse



Gerard Alphonse, Ph.D. joined RCA in 1959 and has been a pioneer in a wide variety of technical areas. He worked on the development of superconductive devices and made numerous original contributions in the development of photochromic cathode ray storage and projection tubes, holography in photo-refractive media, broadband acoustic-optic deflectors, holographic data storage, ultrasonic imaging for medical diagnostics, video discs, and optical disc media development. In 1986 he invented and demonstrated the world's highest performance super-luminescent diode (SLD.) This device is a broadband semiconductor light source and a key component in the next generation of fiber optic gyroscopes, low coherence tomography for medical imaging, and external cavity tunable lasers with applications to fiber optic communications.

Dr. Alphonse has also been involved in education and taught engineering for 16 years in the Electronic Physics Department of LaSalle University's Evening Division, and served four years as Department Head. He also taught electrical engineering at the College of New Jersey.

Dr. Alphonse is the author and co-author of over 120 technical papers and holds over 50 U.S. patents. He has received four David Sarnoff Outstanding Achievement Awards, among many other awards and honors. He retired from Sarnoff in January 2003 to pursue his interest in consulting for high tech start-up companies.



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2004 Hall of Fame

# Dr. Corrado Dragone

Dr. Corrado Dragone invented and improved the wave-guide grating router, also known as the "Dragone router", a corner stone of modern wavelength-division-multiplexing (WDM) technology. WDM technology has revolutionized high-capacity long-distance optical fiber transmission, a multi billion-dollar industry, allowing for information capacities that are unprecedented. Dr. Dragone's invention is commercially used by most of the primary system vendors. The Dragone router is a key enabling component of WDM, allowing the combining (multiplexing) of several channels carried by different wavelengths onto a single fiber, and the subsequent de-multiplexing at the receiving end. Dr. Dragone's powerful invention also allows for the integration of several functions, including multiplexing, on a single chip supporting a photonic integrated circuit. The integration leads to important reduction of the packaging cost of optical transmission technology, from today's long haul applications to the shorter-range metropolitan and access telecom networks.

With Lucent Technologies/Bell Labs since 1961, Dr. Dragone's main areas of research were in the fields of microwave techniques, integrated optics and light-wave communications. He has published numerous articles on these subjects and holds over 60 patents with several pending. His Lucent Technologies Wavelength Router won the 1996 Photonics Circle of Excellence Award. He is the co-recipient of the IEE/LEOS Engineering Achievement Award for the conception, design and reduction to the practice of novel wave-guide array devices and their applications to WDM networks. He is a recipient of the Bell Labs Distinguished Technical Staff Award, and was elected an IEEE Fellow for his contributions to the theory, design and application of microwave antennas.



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## 2004 Hall of Fame

# James M. Early



Photo Courtesy of Ed Sharpe -  
Archivist for SMECC

Dr. James Early, an electrical engineering pioneer, gained international respect and recognition for his early research in transistors and semiconductors. During the 1950s, he made theoretical contributions such as discovering an aspect of the behavior of bipolar transistors, known as the "Early Effect". Transistor designers used the effect for faster transistor performance, which was crucial for applications like television, the FM transistor radio and early military radar.

He remained at Bell Labs for 18 years before joining Fairchild Camera and Instrument in Palo Alto, California in 1969. He became director of the Fairchild Research Center and under his guidance, the company developed commercial charged coupled devices, which were used in early military reconnaissance satellites.

While working at Bell Labs, he created the oscillator transistor for the first United States satellite, led the development of solar cells and transistors for the Telstar I satellite, and participated in the original integrated circuit work at the laboratory. He holds 14 patents, mostly related to transistors and semiconductors.

Dr. Early earned his Bachelor of Science in pulp and paper manufacturing in 1943 for the New York State College of Forestry in Syracuse. After serving in the Army, he went on to graduate school at Ohio State where he received his PhD in 1951. After Dr. Early retired in 1986, he made audio recordings of technical books so that blind engineers could learn material, too.

Early was not limited after retirement though; he was a Fellow of the American Association for the Advancement of Science (AAAS) and a member of the American Physical Society (APS). He received the Technikon and Distinguished Alumnus Awards from Ohio State University and the J.J. Ebers Award from the IEEE Electron Devices Society. He served IEEE and its IRE predecessor on the first transistor standardization committees and was active in the annual device research conferences as well (Dirjish 2012).

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## 2004 Hall of Fame

# Samuel Leeds Allen



Samuel Leeds Allen inventor and manufacturer of the Flexible Flyer sled, for over one hundred years the best selling and most famous American sled. Allen was born at Philadelphia to Quaker parents: John Casdorp Allen, a prominent druggist, and Rebecca Smith Leeds, his wife. In 1861, Allen moved to Ivystone, a farm, which his father owned, near the village of Westfield in Cinnaminson Township, New Jersey. On November 22nd, 1866, Samuel Leeds Allen and Sarah Hooton Roberts were married in Moorestown Friends Meeting House. Allen's revolutionary sled was developed and tested at Westtown School and Ivystone. Many throughout the years have chosen "Breidenhart", his home across from Stokes Hill in Moorestown Township, New Jersey, as the birthplace of the Flexible Flyer. However, "Breidenhart" wasn't built until 1894, five years after the Flexible Flyer was introduced.

Allen was awarded almost 300 patents for a wide range of farming machinery, including the fertilizer drill, seed drill, potato digger, cultivator, furrower, pulverizer, grass edger and numerous other farm implements. In order to provide year-round employment for his workers producing farm equipment, Mr. Allen sought to create a product that could be sold during the winter. His passion for sledding led him to develop a series of sleds and sled improvements. Allen was issued U.S. Patent number 408,681 on August 13, 1889 for the Flexible Flyer.



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## 2004 Hall of Fame

# Walter J. Krupick

Walter J. Krupick invented the two-axis, dynamically turned gyroscopes (Gyroflex and Conex Gyro) which provided a new, low-cost, highly reliable solution to gyroscopic sensors for navigation. This versatile device has guided aircraft, missiles, spacecraft, the gunner's line of sight in tanks and has been used in Air Force, Navy and Army equipment. It has been the most widely used gyroscope for inertial navigation during the 1970s and 1980s. The unique feature of the dynamically tuned rotor gyroscope is a frictionless two-axis flexure suspension, which serves to support the inertia wheel, drive it up to synchronous speed and provides an isoelastic support. Over 50,000 two-axis dynamically turned gyros have been constructed at Kearfott. They have been used extensively over the last 35 years and will continue to be used until the year 2030. The revenue Kearfott enjoyed as a result of this product is estimated at more than several billion dollars.

Mr. Krupick has been with Kearfott Guidance and Navigation Corporation for over 51 years and has designed most of the sensor products manufactured there. He has been issued 22 patents related to inertial sensor products, including floated gyros, two-axis flexure suspended gyros, accelerometers, torque motors, synchros, flexure suspensions and the Gyroflex Gyro.

He has served as Vice President and General Manager of the Gyrodynamics Division and was honored as "Engineer of the Year" in 1988 for his outstanding technical contributions in the development of inertial navigation sensors.



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## 2004 Hall of Fame

# Col. William R. Blair



Col. William R. Blair is the well-known inventor and "father" of radar in the United States. Radar is the method by which the position of distant and "invisible" objects, such as enemy aircraft, are detected by reflected radio waves with enough speed and accuracy to be able to use immediate intervention, such as by anti-aircraft gunners. Col. Blair conceived and developed his radar theory during the 1920s and 1930s while the Director of the Research and Engineering Division of the Signal Corps. But because it was invented during World War II, it was important to maintain the secrecy of such a weapon. Therefore, the government ordered that the patent not be applied until after the war was over.

When Col. Blair applied for the patent in 1945, it was challenged by two parties and took a special legislative act, patent office hearings and a great deal of research, before it was determined that Col. Blair was, indeed, the inventor and finally received his patent in 1957. The Army called the patent "as important and far reaching in its military application as the first U.S. patent issued on the telephone was to commercial communications."

Before entering government services, Col. Blair was a high school principal and an associate in mathematics. He entered the University of Chicago as a student and assistant instructor. He graduated in 1906 with a doctorate in Philosophy and entered the government services with the U.S. Weather Bureau the same year. Following entry of the U.S. into World War I, Blair was commissioned a major, first assigned to the Aviation Corps in France, but then transferred to the Signal Corps in 1918. He remained in the service after the war as a career officer and scientist. He retired in 1938.



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2004 Hall of Fame

# Dr. Meredith C. Gourdine



Physicist and engineer, Dr. Meredith G. Gourdine, is best known for his ground breaking work in the research of electrogasdynamics and for his invention of various electrostatic precipitator systems including the engineering technique called "Incineraid", which aids the removal of smoke from burning buildings, and a method used to disperse fog from airport runways. These systems clear the air by introducing a negative charge to air-born particles. Once negatively charged, the particles are electromagnetically attracted down to the ground to have their former place taken by fresh air. Dr. Gourdine held 70 patents that deal with thermal management and the conversion of gas to electricity. He applied his work in electrogasdynamics to circuit breakers, acoustic imaging, air monitors and coating systems, as well as the Focus Flow Heat Sink, which is used to cool computer chips.

In the 1960s Dr. Gourdine founded the research and development firm, Gourdine Systems, in Livingston, New Jersey and in 1973, he established Energy Innovations in Houston, Texas, to produce direct energy conversion devices. The companies he founded worked on purifying the air and converting low-grade coal into inexpensive, transportable and high-voltage electrical energy. They produced a commercial air-pollution deterrent, a high-powered industrial paint spray and a device to eliminate fog above airports.

Before becoming a physicist and engineer, Dr. Gourdine was a gifted athlete, and won the 1952 Olympic silver medal for the long jump. He received a Bachelor of Science degree at Cornell University in 1953 and a PhD in Engineering Physics from the California Institute of Technology in 1960.



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2002 Hall of Fame

# Ike Blonder



Over the years, Blonder Tongue Laboratories, Inc. employed thousands in several locations, including Newark and Westfield, before taking root in Old Bridge where it continues to operate. Blonder, who earned a master's degree in physics from Cornell University, and Tongue, who holds a master's in electrical engineering from Polytechnic University, sold their stakes in 1989. Semi-retired, each remains active in the electronics field.



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2002 Hall of Fame

# Ben Tongue



Tongue's patented fixed-tuned circuit utilized four vacuum tubes in an amplifier that provided 17 decibels of low-noise amplification over the entire 76-MHz Very High Frequency band, more than any other booster amplifier then in production. Blonder invented an inexpensive thermal relay that connected the booster to the television so both could be controlled from the same power source, an unusual convenience for the time.

The inventor-entrepreneurs later expanded their business to design products for master antenna systems for schools and hotels and to invent Ultra-High Frequency converters, outdoor home antennas, microwave products, satellite receivers, test equipment, signal-distribution products, and a host of other inventions that earned 39 patents for Blonder and 34 for Tongue. They even launched their own UHF television stations. WB7B of Newark became the nation's first successful subscription television outlet and Paterson's WXTV was the first successful Spanish-speaking station in the 50 states.



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## 2002 Hall of Fame

# Herwig Kogelnik



The seminal research of Herwig Kogelnik in lasers and optoelectronics provides much of the foundation for today's optical telecommunications systems. As theorist and administrator at AT&T and Bell Laboratories since 1961, he became a major catalyst for scientific understanding of lasers, holographic data storage, and multichannel optical networks that make the Internet possible. His distributed feedback (DFB) lasers were considered important when developed, but now they are recognized as essential pathways of modern optical communications.

In the 1970s, Kogelnik and collaborator Charles Shank designed DFB lasers that provide spectral control with single, dedicated wavelengths. This feature proved pivotal in expanding underground fiber capacity, particularly when wavelength division multiplexing (WDM) was introduced in 1995. As director of Bell Labs' Photonics Research Laboratory, the laser pioneer led development of WDM, a technology that today allows as many as 160 channels to traverse a DFB laser.

Without WDM and DFB, huge demand for data capacity in communications networks might have so far outrun supply that the Internet could have ground to a halt. Other Kogelnik contributions include thin-film waveguides, optical cross-connects, and coupled wave theory - formulas that gave optics researchers vital mathematical tools for improving data storage in holograms.

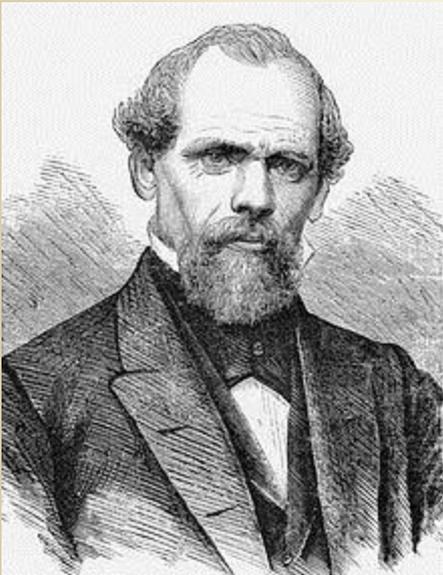
Retired from administrative work since 1997, the holder of more than 40 patents has turned exclusively to photonics research, especially an old passion - getting WDM systems to work at higher capacities. Born in Austria, he holds a doctor of technology degree from the Vienna University of Technology and a D.Phil. degree in physics from Oxford University. In 2001, Kogelnik received the IEEE Medal of Honor, the highest award given by the Institute of Electrical and Electronics Engineers



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## 2002 Hall of Fame

# John Augustus Roebling



A 19th century pioneer in suspension bridge construction, John Augustus Roebling is best remembered for designing the Brooklyn Bridge, although all his successes were literally tied to his invention of twisted wire rope. With improvements, this cable is still used in industries ranging from shipping and railroads to elevators, cable cars and airplanes.

Formally trained as a civil engineer in his native Prussia, Roebling began developing his cable to replace less sturdy hemp hawsers used to haul canal boats up inclined railways. In 1842, he received his first patent for a method of spinning the wire while maintaining tension on all strands. But as revealed in his college thesis, his dream was to build suspension bridges, an infant technology that drew withering criticism from established civil engineers.

By 1848, Roebling had silenced his critics by using his cable to build several suspension bridges, mostly in Pennsylvania. In 1855, he drew their admiration by constructing a two-level, 825-foot span over the Niagara River for both rail cars and road vehicles.

In the same year, he invented the vertical rope-spinning machine with variable lag, a product that revolutionized bridge building and attracted nearly all the world's wire rope market. In later years, the machine would enable engineers to strand telegraph wire and wire supports for power shovels and airplanes, as well as design lighter, stronger elevators, cable cars, and suspension bridges.

The machine cleared the path for constructing the world's longest suspension bridge - the 1,595-foot Brooklyn Bridge. But after designing the East River span, the nation's greatest bridge builder was fatally injured on the job in 1869. Roebling's son, Washington, completed the project in 1883.

Today, the Roebling legacy spans the world - from huge suspension bridges like the Golden Gate to the cabled power shovels that dug the Panama Canal.



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## 2002 Hall of Fame

# Anthony E. Winston

From tooth pastes and deodorizers to laundry detergents and fungicides, Anthony Winston has invented an enormous variety of hygiene, cosmetics and pollution-control products that have improved the lives of millions. In a three-decade career, the research chemist has earned 95 patents, most of them for necessities found in most modern households.

Winston's research into the cleaning properties of baking soda alone has earned him 13 dental patents. He developed pastes, powders, gels and tartar-control agents that have proven exceptionally effective in plaque removal and tooth whitening. These extremely low-abrasive treatments have also shown some surprising anti-microbial effects and potential for gingivitis control.

More recently, Winston developed a technology for strengthening tooth enamel, preventing cavities, alleviating sensitivity and repairing acid-damaged teeth through an application called remineralization. Under his 15-patent process, a combination of calcium and ions of phosphate and fluoride are applied to the teeth through pastes, chewing gums and mouth rinses to replenish needed minerals.

The inventor's crop-protection products, which account for 21 patents, use bicarbonates to kill pathogenic fungi. Unlike other conventional fungicides, many of which are carcinogenic, his have proven environmentally safe, and the fungi have been unable to build resistance to them. Winston also has developed an aerosol, bicarbonate-salt-based deodorizer, an ear wax removal aid, environmentally safe metal cleaners, water treatment technologies, and laundry detergents and additives.

A research fellow for Church & Dwight, the parent company of Arm & Hammer, he has invented most of his products for this brand. A native of England, Winston joined the company in 1970 after receiving an undergraduate degree in chemistry from Nottingham University and conducting research for British and Israeli manufacturers. The author of several technical papers, the inventor co-authored the 1996 book, Handbook of Aqueous Cleaning Technology for Electronic Assemblies.



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## 2001 Hall of Fame

# Dr. Gerald Ash



New Jersey native Gerald R. Ash, who was born in Paterson and lived for many years in West Long Branch, started working for AT&T Bell Laboratories in 1976 as a member of the technical staff. Since 1998, he has been a district manager of strategic standards at the AT&T Labs, Middletown.

Ash has made unique contributions to the telecommunications industry by inventing three dynamic routing schemes, which were patented from 1982 to 1995. His schemes, based on algorithms which he created with his colleagues, reroute calls to avoid delays due to network congestion during peak times such as holidays or natural disasters.

Dynamic Nonhierarchical Routing (DNHR), the first of his routing schemes, completes calls by accessing the available network bandwidth without the limitation of hierarchical routing rules. The routing changes with the time of day to optimize bandwidth utilization and to maximize completion rate. Reduced costs and better service have resulted.

Real-time Network Routing (RTNR) provides real-time adaptation of network routing to changes in traffic. This ultimately improves network reliability and robustness while minimizing capital investment. End-to-End Class-of-Service (ECOS) facilitated the introduction of key service protections and premium service quality in an efficient and cost-effective manner.

Ash, who was named a fellow of the Institute of Electrical and Electronic Engineers in 1993, received his bachelor's degree from Rutgers University, New Brunswick, and his master's and doctoral degrees from California Institute of Technology, Pasadena, CA, all in electrical engineering.



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## 2001 Hall of Fame

# Dr. Harold Black



In 1927, the late electrical engineer Harold S. Black (1898-1983) formerly of Summit, was on a ferry heading toward his office in New York City when an idea that would change the course of electronic communications popped into his head. His idea was for a "negative feedback amplifier," whereby distortion is eliminated by feeding back part of the communication signal into the amplifier. At the time of his invention, Black worked at Western Electric's West Street Labs, New York City, the forerunner of Bell Telephone Laboratories.

Black sketched his idea on the only paper available to him then, a copy of The New York Times. He had been researching the solution to distortion in amplified sound for almost four years before this breakthrough. It was probably the most significant patent of some 347 patents granted to him.

Early in his career, Black was assigned the task of reducing amplifier distortion so that a large number of multichannel amplifiers could be hooked up in random to carry telephone calls over longer distances. The job required an amplifier superior to any then existing. Many other researchers before Black were aware of this need. On that fateful morning in 1927, Black realized that by utilizing negative feedback, he could obtain a desired reduction in distortion at the expense of a sacrifice in amplification.

The theory was first used to improve long-distance telephone service, and has recently been applied to fields such as biomechanics, bioengineering, digital computers, artificial limbs for the disabled, automatic controls for wheel chairs, and high fidelity sound reproduction. Many new weapons systems, such as radar-directed bombing and radar-controlled missiles, depend on negative feedback for their success. Black was inducted into the National Inventors Hall of Fame, Akron, OH, in 1981. He was awarded the Worcester Polytechnic Institute's highest honor, the Robert H. Goddard Award in 1981 for recognition of outstanding professional achievements. He also received 10 medals, 11 fellowships, nine awards and numerous honors. Black wrote Modulation Theory, published in 1953.

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2001 Hall of Fame

# Dr. Donald L. Campbell



Born in Clinton, Iowa, in 1904, Donald L. Campbell, Bay Head, has always been fascinated by inventing and solving problems. Campbell spent 41 years with Exxon, 25 of them with Exxon Research and Engineering Company. In September 1999, Campbell was inducted into the National Inventors Hall of Fame, Akron, OH. In October 1999, he received the Ronald H. Brown American Innovator Award, presented by the U.S. Commerce Department's Patent and Trademark Office, Washington, D.C. He attended Iowa State University, Ames, Iowa, and Massachusetts Institute of Technology and Harvard Business School, Boston. When he retired in 1969, Campbell had amassed 30 patents for Exxon.



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## 2001 Hall of Fame

# Dr. Homer Z. Martin



Martin worked from 1937 until his 1973 retirement as a research chemical engineer at Exxon Research and Engineering Company. His accomplishments include garnering 82 patents. Martin received a bachelor's degree in chemical engineering from the Armour Institute of Technology, Chicago, in 1931, and master's and doctoral degrees in chemical engineering from the University of Michigan, Ann Arbor, MI. Upon retiring to Sun City, AZ in 1973, he joined the Sun City Symphony and Musicians clubs, Fine Arts Society, Doctor's Quartet, Sun City Chamber Group, and Men's Golf Association. He was a member of the American Chemical Society and American Institute of Engineers.



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2001 Hall of Fame

# Dr. Eger V. Murphree



Born in Bayonne in 1898, Murphree moved to Kentucky with his family as a youngster. He received a bachelor's degree in chemistry and mathematics and a master's degree in chemistry from Kentucky University. Upon receiving his degrees, he worked for several years as a high school teacher and football coach, then he attended MIT. In 1924, he worked at Solvay Process Company as a chemical engineer, and in 1930, joined what was then Standard Oil Development Co. of New Jersey. From 1947 to 1962, he served as president of Standard Oil Development Company, renamed Esso Research and Engineering in 1955. In 1956, he was given the job of directing military projects related to the guided-missile program.

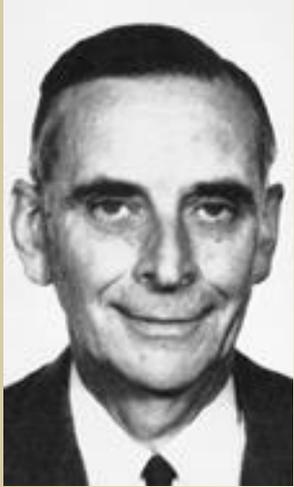
He served one year as special assistant to former U.S. Secretary of Defense Charles Wilson. Murphree, who also served as a member of the committee that organized the Manhattan Project, was widely recognized as a leader in the fields of synthetic toluene, butadiene and hydrocarbon synthesis, fluid catalytic cracking, fluid hydroforming, and fluid coking.



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2001 Hall of Fame

# Dr. Charles W. Tyson



Born in Chicago in 1900, Tyson received his bachelor's and master's degrees in chemical engineering from Massachusetts Institute of Technology. He served as director of the petroleum development division before his appointment in 1961 as special assistant to the vice president of Exxon Research and Engineering. At his retirement in 1962, he held 50 patents.



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## 2001 Hall of Fame

# Dr. Abdul Gaffar



Dentists and researchers say the most significant breakthrough for dental health since the introduction of fluoride in the 1950s was the 1988 discovery of Colgate Total, the nation's first antibacterial toothpaste. Longtime Princeton resident Abdul Gaffar, a researcher and executive since the early 1970s at Colgate-Palmolive Company, Piscataway, invented the four patents which contributed to the product's discovery and success. Gaffar is now vice president for growth technology development for the company.

When Colgate Total was introduced in the United States in 1998, Business Week magazine hailed it as one of the year's best products. It is the first multi-benefit product approved by the U.S. Food and Drug Administration for the control of dental infections; 31 dental associations around the world have endorsed it because it's been clinically proven to reduce gingivitis (advanced gum disease) up to 30 percent. Studies show that by using Colgate Total, consumers can not only save their teeth, but up to \$875 million in annual dental care costs. Moreover, an additional \$400 million is estimated to be saved from the decline in treatment for advanced periodontal disease, which the use of this special toothpaste can prevent.

The active ingredient in Colgate Total is triclosan, an antibacterial agent. Gaffar's invention of a copolymer delivery system for triclosan allows the antibacterial agent to stay on teeth as it acts to destroy bacteria that tries to invade the teeth and gums. Triclosan remains on the teeth for up to 12 hours between brushings, preventing formation of bacterial plaque - the precursor of gingivitis. Gaffar earned a doctorate in immunochemistry/microbiology from Ohio State University, Columbus, a master's degree in bacteriology/chemistry from Brigham Young University, Utah, and a bachelor's degree in chemistry/bacteriology from the University of Karachi, Pakistan.



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## 2001 Hall of Fame

# Dr. Arun Netravali

Westfield resident Arun Netravali, Ph.D., president of Lucent Technologies Bell Laboratories, Murray Hill, since 1999, is a leader in the field of digital technology. His 1983 patented invention, "The Video Signal Interpolation Using Motion Estimation," improved high definition television (HDTV) plus benefited the delivery of broadcast television, compact discs, digital video displays, and the Internet. The algorithmic principles he used in his patent provide the basis for coding and decoding various digital video signals.

Prior to Netravali's invention, efforts to code and transmit video in digital format encountered significant obstacles. Earlier coding algorithms obtained substantial compression ratios but created problems like blurring and other undesirable artifacts, especially in rapid motion scenes.

Netravali realized that the required transmission bandwidth for digitally coded, full-motion video could be reduced, without the loss of image quality, by computing estimates of the displacement of objects in the pictures. In particular, he showed that displacement estimates are best-formed recursively, with updates being formed only in moving areas of the picture.

Netravali received his undergraduate degree from the Indian Institute of Technology, Mumbai, India, and his master's and doctoral degrees in electrical engineering from Rice University, Houston. He holds an honorary doctorate from the Ecole Polytechnique Federale, Lausanne, Switzerland. The co-author of two technical books and the editor of a collection of technical papers, all about digital video, he has also written and co-authored more than 150 scholarly journal articles. He holds more than 70 patents in computers as well as digital video technology. His awards include a 1994 EMMY for the HDTV Grand Alliance and more recently in 2000, the Frederick Philips Award from the Institute of Electrical and Electronic Engineers.



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## 2001 Hall of Fame

# Dr. Glen A. Reitmeier

Former Ewing resident and Trenton native son Glenn A. Reitmeier, a researcher and manager at Sarnoff Corporation, Princeton since 1977, has been an important inventor and a critical advocate for the creation of high definition television (HDTV). His 1992 patent, "An HDTV Compression System," described the key system architecture for a packetized transport layer that makes digital television a flexible delivery system for all types of digital data.

The layer has become a crucial part of the United States standard for digital high definition television and the MPEG-2 standard, established by the Moving Picture Experts Group (MPEG). MPEG (pronounced M-peg) is the name of the family of standards used for coding audio-visual information (e.g., movies, video, music) in a digital, compressed format.

Reitmeier has contributed to digital television developments like object coding and wavelet image compression in MPEG-4, advanced MPEG-2, compressed bitstream processing, improved integrated circuits for digital television receivers, and the integration of video in computers. He holds 45 patents in digital television technology, with other patents pending.

Starting in 1989, Reitmeier led the development of the Advanced Digital HDTV system, one of four competing digital HDTV systems vying to become the next standard for television in the U.S. After successful testing of the system, he became a key member of the Digital HDTV Grand Alliance, a group of representatives formed in 1993, with representatives from seven prominent U.S. organizations that had developed competing digital HDTV systems. The Grand Alliance, which received the encouragement of the U.S. Federal Communications Commission, created a best-of-the-best of competing systems to create a U.S. standard for HDTV.

Later, Reitmeier took a leading role in the Advanced Television Systems Committee (ATSC), the industry-wide organization which formalized the alliance's work to gain FCC approval in 1996. To date, Canada, Mexico, Korea and Taiwan have also adopted the ATSC

standards. Reitmeier received his bachelor's degree in engineering from Villanova University, Villanova, PA, and his master's degree in systems engineering from the University of Pennsylvania Moore School of Electrical Engineering, Philadelphia. He was an adjunct faculty member in the department of electrical engineering at Villanova University from 1980 to 1989. Since 1995, he has lived in Yardley, PA with his wife Elaine and their two children.

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## 2000 Hall of Fame

# Dr. Albert Ballman

In the 1960's when increasing quantities of quartz crystals were being used in electrical devices, Ballman and Laudise's invention, "Synthetic Quartz Growth," provided a method for producing faster-growing, higher quality, electronic-grade, synthetic quartz crystals. The crystals produced by their process are used to perform electrical functions that previously could only be achieved with natural quartz.

Further, their work underlies the hydrothermal method for growing the quartz crystals used as frequency filters in telephony as well as timing devices in watches and in the clocks of computers and other electronic devices. In addition, an entire generation of telecommunication switching and communications switching systems was based on Ballman and Laudise's technology.

Holder of a BS degree in Chemistry from Rutgers University, Albert Ballman worked in the field of crystal growth at Bell Labs locations in Holmdel and Murray Hill, NJ, for 36 years prior to retiring in 1986. During his years at Bell Labs, he received 32 patents and published over 100 papers dealing with crystal growth. Ballman is a member of the American Crystal Growth Association.

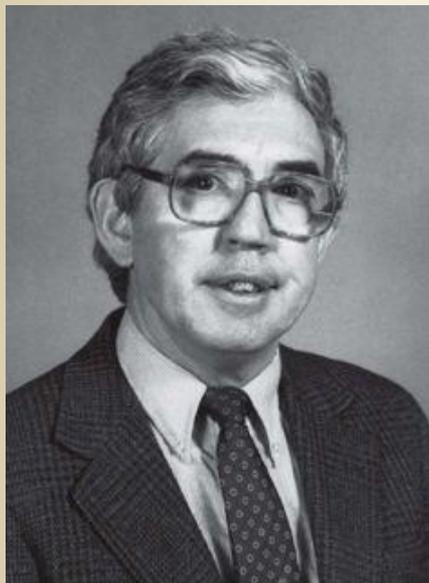
Holder of 13 patents, author of the classic book, "The Growth of Single Crystals," and publisher of over 200 articles on crystal growth, Robert Laudise was Adjunct Chemical Director at Bell Labs, responsible for all chemical projects prior to his death in 1998. He was also an Adjunct Professor of Material Science at MIT and Adjunct Professor of Ceramics at Rutgers University. In addition, he received numerous awards and recognition for his work in crystal growth.



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# Dr. Robert Laudise



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Previous to their invention, breakthroughs in speeding up growth of synthetic crystals had been made. But the crystals produced were often of poor quality, with imperfections that tended to interfere with their use in electronic systems. Ballman and Laudise found that by growing the quartz crystal in a hydrothermal solution containing lithium crystals, the imperfections could be considerably reduced, thereby greatly enhancing the crystal's suitability for electronic systems. Their invention received a patent in 1967.

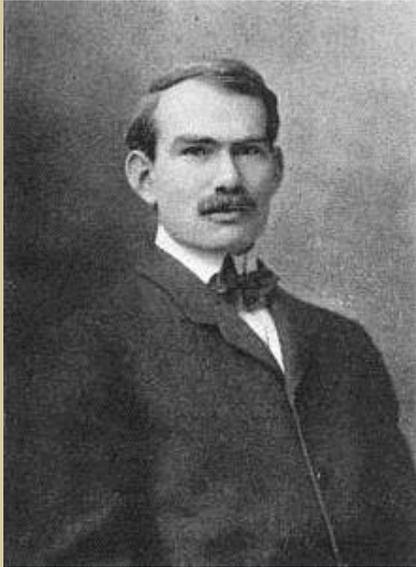
Laudise received a BS in Chemistry from Union College, Union, NJ, and a PhD in Organic Chemistry from Massachusetts Institute of Technology. He was a member of the American Philosophical Society, a Fellow of the American Academy of Arts and Sciences, and a member of several technical organizations. In 1989, the International Organization for Crystal Growth designated their prize for experimental crystal growth the Laudise Prize.

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## 2000 Hall of Fame

# Dr. Lee de Forest



In the early 1900's, the great requirement for further development of radio was an efficient and delicate detector of electromagnetic radiation. It was John A. Fleming's invention of the so-called electronic valve that provided the clue de Forest needed. The most serious difficulty of the Fleming valve was that it was relatively insensitive to changes in the intensity of electromagnetic radiation. Moreover, the Fleming valve could act only as a rectifier and not an amplifier.

The simple but revolutionary, innovation that Lee de Forest incorporated in his audion tube was a third electrode inserted between the cathode and the anode, making the tube much more sensitive to electromagnetic radiation. Also important, it acted as an amplifier. Using his audion tube, De Forest was able to broadcast experimentally both speech and music.

De Forest's invention also made possible long-distance telephone. He discovered that if one triode was connected to the input of another and a chain was formed, the triodes could be used to amplify and repeat weak voice frequency signals. This made intercontinental telephony possible. Realizing the implications of de Forest's discovery, American Telephone and Telegraph Company (AT&T) acquired the rights to the Audion.

De Forest next turned his attention to the development of talking pictures. By the early 1920's, he succeeded in devising an electrical-optical method of recording sound waves on film so that they could be rebroadcast in synchronization with pictures. On April 12, 1923, de Forest presented the first commercial talking picture at the Rivoli Theater in New York City. Although at first most major film studios ignored the invention, by 1926, Warner Brothers, Fox and other film companies began to use it and the era of sound motion pictures was launched.

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## 2000 Hall of Fame

# Martin Goetz

Martin A. Goetz is internationally recognized as the holder of the first software patent in 1968 and as the "Father of the Software Industry" for his development and marketing of the first commercial software product, Autoflow, which was patented in 1970. These patents established the concept of proprietary software, a concept that has permitted the growth of the multi-million dollar software industry, among the fastest growing segments of the U.S. economy. Prior to 1970, all computer software was considered a service, bundled with computer hardware and given away free.

Autoflow was a spur to the growth of the computer software industry in another way. It was licensed around the world, proving that software could be priced separately from hardware. Goetz played a leading role in the unbundling of software by the leading computer manufacturer of the day, IBM, which helped pave the way for firms like Microsoft.

Autoflow was the first software product of Applied Data Research (ADR), Princeton, NJ, the pioneering software firm co-founded by Goetz in 1959 that became a \$200-million company traded on the New York Stock Exchange prior to its acquisition by Ameritech. During his 28 years with ADR, Goetz served as Senior Vice president, President of ADR's Software Products Division and in 1984 became President.

A native of New York City, Goetz earned a Bachelor's and Master's degree in Business Administration at The City College of New York. Goetz began his career as a programmer for Sperry Rand in 1954 and joined IBM in 1958 prior to co-founding ADR.

After leaving ADR, Goetz became an independent consultant as well as business "angel." He currently is an active investor in software and Internet companies and is an advisor to many of the companies that he invests in.



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## 2000 Hall of Fame

# Simon Lake



Simon Lake, distinguished marine engineer, played a major role in the development of the modern submarine. He is credited with the development of the basic submarine technologies essential for safe and successful operation of such boats. These include the even-keel hydroplanes, ballast tanks, divers' compartments, periscope, twin-hull design, and much more. His advancements were adopted worldwide by the early 1900's. Lake's 1893 submarine design offers such novel features as a pressurized air compartment through which the crew could, by donning diving suits, readily leave and enter the vessel while submerged.

Born in Pleasantville, NJ, Lake was the son of Christopher J. Lake, owner of a foundry and machine shop, whose father was the Honorable Simon Lake, a founder of Atlantic City and Ocean City, NJ. Simon Lake and his brothers built the first highway and bridge to Atlantic City and were instrumental in having the first railroads established in both cities. An earlier ancestor, John Lake, founded Gravesend, now South Brooklyn, NY. And on his mother's side, Lake is descended from Jeremy Adams, a founder of Hartford, CN.

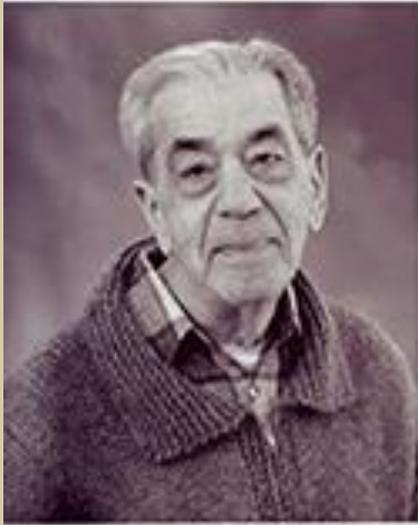
Educated in the High School of Toms River, NJ; Clinton Liberal Institute, Fort Plain, NY, and in the Mechanical Course at Franklin Institute, Philadelphia, PA, Lake entered his father's foundry and machine shop and later became his partner. Prior to work on submarines, Simon Lake invented a steering gear, drudge and other vessel appliances used by fishing and oyster vessels in the Chesapeake and Delaware bays.



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## 2000 Hall of Fame

# Arthur Nobile



Arthur Nobile's patent for the invention, medical use, and production of the steroids prednisone and prednisolone was one of the most significant advances in medicine during the mid-twentieth century. These highly effective anti-inflammatory drugs have saved many lives, alleviated much suffering, and have become indispensable in treating autoimmune diseases like rheumatoid arthritis, Addison's disease, and lupus.

Prior to Nobile's work, the steroid cortisone was the primary treatment for rheumatoid arthritis but had unpleasant side effects. In 1950, Nobile succeeded in using bacteria to oxidize cortisone to prednisone and hydrocortisone to prednisolone, yielding effective treatments with minimal negative reactions. Modifications of the prednisolone molecule have resulted in compounds to treat asthma, psoriasis, ulcerative colitis, cerebral edema caused by cancer, and skin disorders.

Born in Newark, New Jersey, Nobile studied at San Diego State University and University of California at Davis before earning his A.B. from the University of California at Berkeley. The discovery of prednisone and prednisolone heralded a new area of chemical synthesis, creating a multi-billion dollar industry based on the use of microbes to manufacture drugs.



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## 2000 Hall of Fame

# Alan White



Alan D. White helped develop and patented the Helium-Neon (HeNe) Gas Laser, the first visible light laser. It is the ubiquitous red laser used in supermarket scanners, in transits at construction sites, in interferometers for measuring distances, in auto body repair shops to straighten frames, in security systems, holography and gyros that guide satellites, rockets, missiles and planes.

The HeNe laser is also widely employed in laboratory and industrial settings, where for example, it is used to align other lasers and instruments, for testing optical quality, for demonstrating diffraction, counting and measuring the size of particles such as cells (cytometry), and for many other scientific purposes.

White's HeNe laser came at a time when the first lasers had just been invented in the late 1950's. A laser, actually an acronym for "light amplification by stimulated emission of radiation," occurs when constituent atoms of a gas are excited and kept in that state for a period of time. The excited gas emits radiation in the invisible portion of the electromagnetic spectrum. In 1962, White, working with his colleague, J. Dane Rigden at Bell Telephone Laboratories, Murray Hill, NJ, was able to get a mixture of helium and neon to radiate in the visible portion of the electromagnetic spectrum by building a laser cavity that was optimum for creating a red laser. With a few other adjustments, they were able to make the light more monochromatic or "more red."

White is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and in 1984, along with Rigden, received the IEEE's David Sarnoff Award. ESS is a trademark of Lucent Technologies.



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