



01 DAVID PAYNE WINS MARCONI PRIZE

03 FOUR ADDED TO MARCONI BOARD OF DIRECTORS

04 MARCONI SPRING FORUM

06 2008 MARCONI SYMPOSIUM AND AWARD DINNER

The Marconi Society *Marconigram*

A PUBLICATION PRODUCED BY THE MARCONI SOCIETY AT COLUMBIA UNIVERSITY

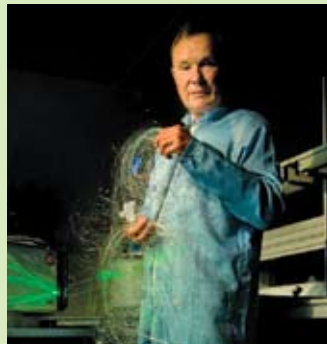
HE HELPED BUILD "THE BACKBONE OF MODERN HIGH SPEED DATA TRANSMISSION"

David Payne, Fiber Optics Pioneer, Wins Marconi Prize

Professor David N. Payne, an internationally distinguished research leader in photonics and Director of the Optoelectronics Research Centre (ORC) at the University of Southampton in the UK, has been named the 2008 Marconi Fellow and prize-winner for his pioneering work in the field of fiber optoelectronics and fiber telecommunications, the backbone of modern high speed data transmission.

The award and accompanying \$100,000 Prize will be presented at the Annual Marconi Society Award Dinner on September 26, 2008 at the Royal Society in London, UK.

Of the many major advances developed by Payne's research group, the best known is the invention of the erbium-doped fiber amplifier (EDFA), a type of



Payne holds optical fiber developed by his research group at ORC

optical amplifier that overcame the problem of transmitting data over large distances, providing the basis for today's fiber optic telecommunications systems.

Payne, 63, was born in England, and brought up in Africa. He completed his primary and secondary education in Zambia

and returned to England to attend the University after a stint as a commissioning engineer for English Electric. This shaped his lifelong pragmatic, application-focused approach to research and entrepreneurial efforts.

He earned a Bachelor of Science degree in Electrical Power Engineering at the University of Southampton in 1967. In 1968 he pursued a diploma in Quantum Electronics – and in 1976 a Ph.D in Photonics – and has been a member of the University of Southampton's faculty for 40 years.

Payne's contributions in the fields of fiber optics and photonics have had a major impact on areas ranging from telecommunications and optical

CONTINUED ON PAGE 2

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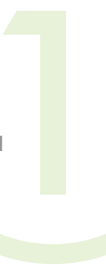
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FIBER OPTICS PIONEER IS 2008 MARCONI FELLOW



sensors to nanophotonics and optical materials. Many of the special fibers used today resulted from his work, as example, the fiber used in optical fiber gyroscopes. His widely-adopted invention of the erbium-doped fiber amplifier (EDFA) propelled remarkable Internet growth by enabling the transmission of vast amounts of data through the use of multiple optical wavelengths.

Since 1995, Payne has been Director of the ORC, founded in 1989, but his history with the group extends much further into the past. Payne began working on the laser in 1961, and was one of the first to take on development of silica optical fibers to advance the development of long distance light communication. As one of the first Ph.D. students in the field now known as photonics, Payne was given the seemingly impossible task of reducing the losses in optical fibers to an acceptable level for long distance telecommunications.

Says Payne, "I was incredibly fortunate to be offered the opportunity to work as one of the first in optical telecommunications.

It created the high speed connected world and its outstanding success has been one of man's greatest achievements. Without optical fibers and amplifiers it is hard to imagine the Internet we know today."

As well as detailing many new fiber fabrication techniques and new ways to characterize the resulting fibers, Payne is credited with pointing out the advantages to optical telecommunications of operating at the wavelength of minimum chromatic dispersion. Payne and his colleagues invented the first practical optical fiber amplifier, making long distance optical communications cost-effective, since many signals could be easily sent hundreds of miles without requiring electronic conversion. The increased long distance bandwidth available at low cost helped fulfill a major prerequisite for the formation of the Internet.

Payne's recognition by the Marconi Society extends beyond academia to his achievements as an entrepreneur, which Marconi Society Chairman Robert Lucky calls "an important component of

the Marconi Prize-winner selection criteria. We look for scientists who, like Marconi himself, have had the vision not only to make breakthrough discoveries, but to apply these successfully for the benefit of mankind."

Payne's activities have led to the development of numerous companies, creating jobs and wealth in the local community and facilitating worldwide commerce and knowledge-sharing. He perfectly fits the profile of a Marconi Fellow."

In all, there are ten photonics companies in the Southampton area that owe their existence to the ORC. Payne also is inventor and co-inventor on over 20 patents and applications.

Among the numerous awards and honors Payne has received are the top American, European and Japanese prizes in photonics. He has been honored with the UK Rank Prize for Optics, the US Tyndall Award (1991), the Benjamin Franklin Medal for Engineering (1998), the Japan C&C Foundation Award, an Eduard Rhein Laureate (Germany) and the Mountbatten Medal of the

IEE (2001). In 2004 he was the recipient of the Kelvin Medal of the eight major engineering institutions for distinction in the application of science to engineering, and in 2007, he received the IEEE Photonics Award, the first awarded outside the USA. Most recently he was elected to the Russian Academy of Sciences as one of only 240 foreign members. Payne is a Fellow of the Royal Society and the Royal Academy of Engineering.

Payne and his wife Vanessa live in Hamble, Southampton. They have two sons, Stuart (26) and Ross (23). Stuart is pursuing a career in software support, while Ross plays semi-professional football. With his wife, Payne travels widely and particularly loves the Far East. He is an accomplished cook and scours the world on his travels for unusual ingredients for theme parties. He is also something of an amateur mechanic, motorcyclist and DIY enthusiast, perhaps a legacy from his heavy engineering days – as well as being an 'early adopter' of the latest electronics.

DECEMBER 16, 1917 - MARCH 19, 2008

In Memory of Sir Arthur C. Clarke

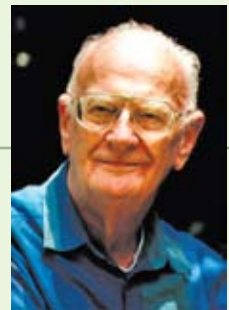
The world lost a true visionary with the death of Marconi Fellow Sir Arthur Charles Clarke on March 19, 2008. A noted science fiction author, inventor, and futurist, he was most famous for his novel *2001: A Space Odyssey*, which became an iconic movie directed by Stanley Kubrick. Far more important, however, was his role

as the first person to specify in detail both the great potential and the technical requirements for using geostationary satellites for global communications. Throughout his life he promoted the benevolent use of advanced space technology.

Sir Arthur received the Marconi Prize and Fellowship in

1982, and also won the Franklin Institute Gold Medal in 1994, along with a nomination that year for a Nobel Prize. He spent his later years in Sri Lanka, where he used his Marconi Prize to create the Arthur C. Clarke Center for Modern Technologies.

In 2007, he gave perhaps his last interview for a tribute video to



Gioia Marconi Braga, presented at the 2007 Marconi Awards Gala. You can hear the tribute and Clarke's comments on our website at: www.marconisociety.org.

MARCONI FAMILY TIES REESTABLISHED

Four Added to Board of Directors

Michael Braga, John Cioffi, David Payne and Joseph Traub have joined the Marconi Society Board, effective March 27, 2008.

Michael Braga, a Pulitzer-nominated journalist with nearly two decades of reporting and editing experience, is the son of the late Gioia Marconi Braga, Marconi Society Founder, and grandson of Guglielmo Marconi. Fluent in Spanish and well-versed in Latin American economics and history, Braga began his journalism career in Venezuela in the mid-80s, writing for several agricultural publications and later reported for the Buenos Aires Herald.

For 14 years, he worked for a series of business publications in Florida, including the Sarasota Herald-Tribune, which he joined in 2001. His trend-setting stories there exposed financial scandals in insurance, high technology and real estate, and he was promoted to Deputy Business Editor in 2007.

John Cioffi, the 2006 Marconi Prize Winner and Fellow, is the Hitachi America Professor of Engineering at Stanford University whose pioneering research helped create DSL (digital subscriber line) circuits. His research has led to dozens of income-producing ventures and more than 70

patents. He recently founded ASSIA, Inc. to provide centralized management of DSL services for phone companies and serves as the company's Chairman.

An IEEE Fellow, as well as a member of the National Academy of Engineering's Network Systems and Communications Panel, Cioffi sits on the Board of Directors of ClariPhy Communications, Inc., Teranetics Communications, and ASSIA Inc. and on the Advisory Boards of Amicus, Wavion and Portview Ventures.

David Payne, the 2008 Marconi Fellow and the Director of the Optoelectronics Research Centre (ORC) at the University of Southampton in the UK, is internationally renowned as a research leader in photonics. His successful entrepreneurial efforts have helped establish nine photonics companies and he has received the top American, European and Japanese prizes in photonics, a rare achievement.

He won the Institute of Electrical and Electronics Engineers (IEEE) 2007 Photonics Award, and he received the UK Rank Prize for Optics and the prestigious US Tyndal Award. A Franklin Laureate (USA) and, most recently, an Eduard Rhein Laureate (Europe), Professor

Payne is also a Fellow of the Royal Society and the Royal Academy of Engineering.

Joseph F. Traub is the Edwin Howard Armstrong Professor of Computer Science at Columbia University, External Professor at the Santa Fe Institute and Chair of the Computer Science and Telecommunications Board of the National Academies. From 1971 to 1979, he headed the Computer Science Department at Carnegie Mellon University.

He started his pioneering research on what is now called information-based complexity in 1959. His current focus is on quantum computing. He is the author or editor of ten books and some 120 journal articles. His numerous honors include election to the National Academy of Engineering and the Emanuel R. Piore Gold Medal from IEEE.

"We're honored to add such distinguished new members to the Marconi Society Board at a time when we are going through a major transition and extension of our mission," said Robert Lucky, Marconi Society Chairman. "Their fresh thinking and insight already have helped revitalize the Board's approach. I look forward to serving with them."

FORMER MARCONI SOCIETY PRESIDENT

John Jay Iselin Dies at 74

John Jay Iselin, who served as President of the Marconi Society from 2000 until his retirement at the end of 2006, died in Manhattan on May 6th of pneumonia. He was 74.

Iselin, known to everyone as "Jay," not only left his mark on the Marconi Society, but helped to define public television as we know it today. As Director of WNET (Channel 13), one of the nation's preeminent public television stations – he broadened the station's offerings in culture, science and news.

A Harvard graduate, he worked for Newsweek and WNET. He then spent ten years as President of Cooper Union, a college located in New York's East Village, where he led a successful \$50 million capital campaign, created several endowed professorships and broadened the Board of Trustees. He left to head the Marconi Society in 2000.

He is survived by Lea, his wife of 51 years, and five children and 13 grandchildren.



Michael Braga



John Cioffi



Joseph Traub



David Payne

Cryptography Changed The Way We War

On March 27th, Marconi Fellows, Board Members and friends gathered at the University Club of New York for the Annual Marconi Spring Forum. This year's speaker was noted cryptography expert David Kahn, widely regarded as the world's leading expert on the history of code. The author of *The Codebreakers*, a book Marconi Fellow Whitfield Diffie called "the most important influence on my work," presented a talk on "How Radio Made 'Intelligence' Matter."

"It wasn't until modern times that intelligence gathering began to matter to military commanders, David Kahn told this year's Marconi Spring Forum audience. In fact, throughout history, it rarely made a difference in key battles. But with the advent of radio, all that changed.

"Radio meant the ability to communicate easily with troops – a tremendous advantage on the battlefield," Kahn said. But it also meant that you could easily be overheard.

"Thus began the cat-and-mouse game of signal interception

and encryption – and it attracted 'the smartest guys in the world,' said Kahn."

"It was the start of World War I and the Russians were advancing on Germany. They were sending messages back and forth between the northern and southern (First and Second) armies during the crucial Battle of Tannenberg. Germany intercepted their messages – sent in the clear, apparently, because the Russians didn't have time to distribute ciphers to all their troops – and was able to defeat them," Kahn said.

It was a wake-up call for the Allies; it was the first time – but not the last – that encryption or a lack of it played a decisive role in the outcome of a WWI battle. Another important example was the Battle of Caporetto, in which Austria intercepted and decoded key intelligence regarding the Italian forces, leading to enormous losses (11,000 were killed, 20,000 wounded and 275,000 were taken prisoner). So decisive was the Italian defeat that it led to the creation of a Supreme War Council to improve cooperation

and strategy among the Allies.

"At this point," said Kahn, "it was becoming clear that the ability to solve and read the enemy's communications was critical to success. Both sides began to pour more resources and brainpower into the task. One result was an ingenious new encryption system dubbed ADFGVX by the French because only those letters appeared in the cryptograms of the new field cipher used by the German Army for its supreme offensives of the spring offensive of 1918.

Fortunately for the Allies, ADFGVX was eventually broken by brilliant French Army Lieutenant Georges Painvin. It was an extraordinary triumph that required a vast amount of statistical analysis – all of it done by hand. As a result of his work, the French army was able to discover where the Germans intended to attack in their Spring Offensive, and to hold them back. This was one of the most significant moments of the war," Kahn told the group.

World War I also was the

setting for what Kahn calls "by far the most significant event in the history of intelligence." At the beginning of the war, the Russians had recovered from a stranded German cruiser, the Magdeburg, a German Kriegsmarine code book which they gave to the British. It helped teach the British about codebreaking. Later, the British army intercepted and solved a German message to Mexico that, when given to President Wilson, was made public and turned the tide of U.S. isolationist sentiment and brought them into the war.

In the message known as the Zimmermann Telegram, the Germans revealed to the Mexican leaders their plan to use unrestricted submarine warfare to overpower the Allies. Realizing this might bring America into the war on the Allies' side, Germany's foreign minister, Arthur Zimmermann, urged Mexico to join the war against the United States in that event, and offered them a "prize" of the "lost states" of New Mexico, Arizona and Texas after Germany's victory. Six weeks after the message became



Whitfield Diffie



James and Lis Massey



David Kahn, Forum Speaker



Federico and Elvia Faggin

public, Congress declared war on Germany. The Zimmermann Telegram had turned the tide of U.S. isolationist sentiment and brought the country into the war. It had incensed Americans so greatly that they finally mobilized to join the battle, which tipped the balance to the Allies.

“These events,” said Kahn, “illustrate the enormous impact cryptography has had on world events – and presumably continues to have today.”

During a lively question and answer session, the audience took the conversation into the legal

and political arena, discussing the implications of current U.S. “eavesdropping” on telecommunication traffic between its citizens and foreign nationals – and whether the policy had resulted in any successful interceptions of data. While most agreed that the U.S. needed to do some level of monitoring of foreign communications, there was considerable trepidation about the current breadth of the program.

“We don’t know the triumphs because they don’t tell us,” said Marconi Fellow and Chairman Robert Lucky. But another



Paul Baran and Rosalind Whitehead

audience member disagreed. “It was completely obvious to some what would happen in Iraq – but the U.S. government was incapable of accepting what they learned,” he said, implying that merely gathering intelligence is useless unless we are capable of acting on it.

Diffie, the 2000 Marconi Prize Winner for encryption, was blunt about his concern that allowing the government to monitor any foreign transit message – and giving immunity to the telecommunications companies who perform the spying – goes too far. “It simply undermines accountability,” he

pointed out. The discussion also touched on the future of encryption. Thirty years after the invention of Public Key Encryption, which has made encryption widely available and used in electronic commerce, people still have little awareness of it and often don’t use it when it could benefit them. Why? “The answers vary, but it all comes down to a compromise between usability and security,” says Diffie. “The expansion of communications has outrun the protection of communications throughout human history,” he said.



Jim Finerock and Hatti Hamlin, Public Affairs Director



Patricia and Jonathan Darnell

A "ROYAL" AFFAIR TO BE HELD IN LONDON

2008 Marconi Symposium and Award Dinner

The 2008 Symposium and Award Dinner and festivities – four days of exciting public activities – will take place in and around London, starting on September 24th. The marquee events, the Marconi Symposium and Award Dinner, are scheduled for Friday, September 26th at the Royal Society.

The Symposium will include presentations from world experts on the status of the optical global internet today, including the technology expected to create the next-generation backbone

superhighway needed to propel the continuing explosive growth of the Internet.

The UK is a perfect host city for the first non-American venue since September 2004 (Bologna, Italy) because it is home not only to the 2008 Marconi Fellow, David Payne, but also to some of the best collections of Marconi memorabilia. The Society also gratefully acknowledges the assistance of Marconi Fellow and Board Member Sir Eric Ash in planning and coordinating the many events that will take

place – especially in securing the legendary Royal Society, founded in 1660.

Those planning to attend also will have the opportunity to participate in a number of tours and other entertaining activities, including a private barge tour with lunch on board; a docent-led visit to the Imperial War Museum, which features an extensive library of war-related books and recorded interviews, plus a remarkable collection of war memorabilia and equipment; a visit to the world's first codebreaking center, Bletchley

Park, with a private tour of Marconi memorabilia and comments by one of the world's leading authorities on encryption history; a private-capsule ride on the popular "London Eye" (also known as the Millennium Wheel); and a National Theatre performance of "War Horse."

In order to lock in adequate space and tickets at current prices, we need your registration for all events by August 20th. Online registration is available starting June 20th from our website (www.marconisociety.org).

MARCONI SOCIETY LONDON EVENTS

Marconi Society Award Celebration

Open to the Public

Wednesday, September 24

London Eye. Ride in a private capsule on a 443 ft. tall ferris wheel, the largest in Europe. Also known as the Millennium Wheel.

Private Barge Tour of a London Canal. A two-hour cruise with lunch served on board.

Imperial War Museum Tour. Special docent-led tour featuring extensive library of books and recorded interviews, military vehicles, weapons, war memorabilia.

Thursday, September 25

Bletchley Park Tour. Visit the world's first large-scale codebreaking center, home to the largest collection of Marconi memorabilia. Includes lunch and private tour of Marconi collection with commentary by David Kahn, renowned authority on encryption.

American Embassy. Reception in the Grand Hall at the American Embassy, Grosvenor Square.

War Horse. Performance at the National Theatre: a new production of Michael Morpurgo's acclaimed novel.

Friday, September 26

Marconi Symposium, "The Future of Optical Communication." Full-day event at the private Royal Society. Hosted by the University of Southampton, the Fondazione Marconi, Ericsson, British Telecom and the Marconi Society.

Marconi Award Dinner. Gala Award Dinner at the Royal Society to honor the 2008 Marconi Fellow, David Payne. Four Marconi Young Scholar Awards also will be presented.



A private capsule on "The Eye," Europe's largest ferris wheel



Stephen Tall, Nancy Collins (Marconi Executive Director) and Richard Ovenden (Director of Special Collections) at the Bodleian Museum in Oxford

REGISTER BY AUGUST 20TH TO GUARANTEE PRICING

Advance Registration

To register for all or some of the London events, please go online at www.marconisociety.org. You will find all events and prices, and you may register by filling in your selection of activities and your credit card number. You can also indicate if you need reservations at the Cavendish Hotel. Reservations are limited, and to help us with our planning, we would appreciate an early registration.

MARCONI HEADQUARTERS IN LONDON

Cavendish Hotel

We have been able to get a special rate of \$458 a night at the Cavendish Hotel in London. Located in the heart of Picadilly, the hotel is a short walk to the Royal Society where the Symposium and Award Dinner will be held. Please confirm your registration online when you sign up for the events and you will be included in our block of rooms. To view the hotel's web site, go to www.thecavendishlondon.com.



Bletchley Park is home to the world's first large-scale codebreaking center



Sir Eric Ash will host the Welcome Dinner at the private Garrick Club

FOUR HONOREES WILL ATTEND 2008 AWARD DINNER IN LONDON

Young Scholars Award Program Launched

Ron Rivest, the 2007 Marconi Fellow, has provided the impetus for the Marconi Society to launch a new program, the Young Scholars Award, to honor and inspire young scholars doing promising work in the field of communications.

Rivest generously donated \$25,000 of his 2007 Prize as seed money for the program, and also agreed to serve on a selection panel which includes: Marconi Fellows John Cioffi, Leonard Kleinrock, Ron Rivest and Columbia Professor Joseph Traub.

The four honorees are: Hao Zou, a Stanford University senior in Electrical Engineering; Rafael Pinaud Laufer, a Ph.D student in the Computer Science Department at the University of California,

Los Angeles (UCLA); Jay Kumar Sundararajan, a graduate student at the Laboratory for Information and Decision Systems, Massachusetts Institute of Technology; and Salman Abdul Baset, a fourth year Ph.D student in the Computer Science Department at Columbia University.

Zou, a 2008 Recipient of the Stanford Deans' Award for Academic Accomplishment, joined Electrical Engineering Professor John Cioffi's research group in 2007, becoming involved in the investigation of re-use of home power lines to transmit data signals at very high speeds throughout a home. His work already has had an impact on 10 million DSL customers.

Brazilian-born Laufer obtained both his B.S. and M.S. degrees

in Electrical Engineering from the Federal University of Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil. During work on his thesis, he developed a new IP traceback system against anonymous denial-of-service (DoS) attacks in the Internet. The research also led to a generalization of the Bloom filter theory, which was used for a secure and efficient network path coding in forwarded packets. Currently, he is a Ph.D student in the Computer Science Department at UCLA. His major research interests are distributed systems, networking, and operating systems.

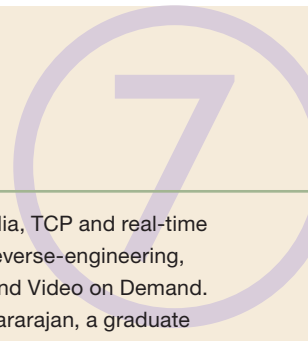
Baset, a fourth year Ph.D student in the Computer Science Department at Columbia University, is interested in

multimedia, TCP and real-time media, reverse-engineering, Skype, and Video on Demand.

Sundararajan, a graduate student at the Laboratory for Information and Decision Systems at MIT, is working on switching theory, network coding, information theory, scheduling and wireless networks.

"The outstanding quality of all four students makes me proud to have been able to jumpstart this new program for the Marconi Society," said Rivest. "The work they are doing promises great things for the future."

The honor includes a \$4,000 cash award plus travel expenses to attend and be recognized at the Award Dinner in London on Friday, September 26, at the Royal Society.



FOUR DAYS OF FESTIVITIES IN LONDON

Fondazione Guglielmo Marconi to Co-sponsor 2008 Symposium and Award Ceremony

The Fondazione Guglielmo Marconi will co-sponsor four days of festivities surrounding the 2008 Marconi Award Dinner and Symposium, to be held September 24 to September 27 in and around London.

The Fondazione, based at Villa Griffone in Bologna, Italy where Marconi first conducted his world-changing experiments, shares the Marconi Society's mission to promote research in the field of telecommunications, as well as to undertake initiatives aimed at recognizing and preserving the scientific and societal contributions of Guglielmo Marconi.

"We are delighted to have the opportunity to work together with this prestigious organization with whom we share many values and goals," said Robert Lucky, Marconi Society Chairman. "We hope it is the beginning of a larger collaboration to encourage and provide recognition for the importance of research in the fields of telecommunication and the Internet."

Dr. Romano Volta, Marconi Society Board member and President of Associazione Industriali Bologna, a group that works closely with and supports the Fondazione, said, "We always have hoped that we could create a formal relationship with the Marconi Society, and this may well be a first step in that process."

THE MARCONI SOCIETY

The Marconi Society was established in 1974 through an endowment set up by Gioia Marconi Braga, daughter of Guglielmo Marconi, the Nobel laureate who invented the radio (wireless telegraphy). The Society is best known for its \$100,000 Marconi Prize, awarded annually to an outstanding individual whose scope of work in telecommunications science and technology influences the principle of "creativity in service to humanity" that inspired Marconi. Through symposia, conferences, forums and publications, the Marconi Society promotes awareness of major innovations in communication theory, technology and applications with particular attention to understanding how they change and benefit society.

Additional information about the Marconi Society and the Marconi Fellows can be found at:
www.marconisociety.org.

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Marconi Society, Inc.
Columbia University
500 West 120th Street
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