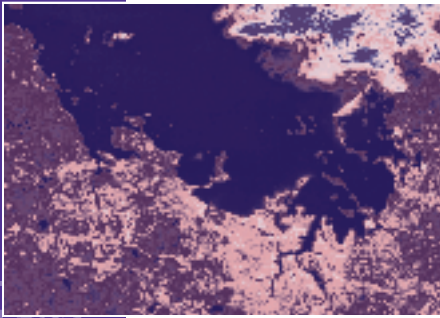


PACESETTER

News From the Office of Technology Policy ■ Summer 1997



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Commerce Secretary Daley Keynotes USIP Signing Ceremony

TA Leads Task Force

At the Connecticut Annual Technology Dinner in Plantsville, CT, this June, Commerce Secretary William M. Daley and Connecticut Governor John Rowland signed an agreement to officially establish the United States Innovation Partnership (USIP).

According to Daley, the Administration believes that in order to sustain our global economic leadership into the 21st century, we must develop and implement an integrated national innovation strategy. This strategy must accomplish three goals. First, the assets within the borders of the U.S. that attract global investment and the business activity of the world's multinational corporations must be strengthened. Second, the assets that will help businesses based in the U.S. to grow and create high-wage jobs must be strengthened. Third, we must build our capacity for innovation.

USIP can help implement the strategy by integrating the respective strengths of the federal and state



governments and weaving them into a seamless innovation system. This will make it easier for the private sector to capitalize on technol-

ogy. "We have the pieces; now we must fit them together into a coherent whole," Daley declared.

The partnership will facilitate a close working relationship between the federal government and the states to better use national science and technology resources in support of technology-intensive, state-based economic growth.

In addition, it will facilitate direct collaboration between high-level state and federal officials in order to



■ Daley talks with Conn/Step exhibitors.

promote innovation in the public and private sectors, create new jobs and help advance 21st century technologies.

The agreement to form USIP was announced by the White House and the nation's governors in February, 1997. Governor Rowland is a lead governor for technology for the National Governor's Association. The partnership is the result of efforts by representatives of 24 states, working through the National Governors' Association and an inter-agency task force headed by the Commerce Department's Technology Administration.■

Graham Mitchell Releases OTP Report On Korea

Dr. Graham R. Mitchell, Assistant Secretary for Technology Policy, released a new report from the Office of Technology Policy (OTP) entitled "Korea's Strategy For Leadership In Research and Development" at the U.S.-Korea Business Council's 10th Annual General Conference held in Washington, D.C. in June.

Key observations of the research include:

- Korea is determined to upgrade its technological infrastructure and improve its competitiveness by implementing a systematic, integrated globalization strategy that harnesses the strengths of business, academia, media, and government.

- Korea employs a wide variety of methods of technology transfer, ranging from licensing and stock purchases to academic exchanges and research databases.

In addition to releasing the report, Dr. Mitchell spoke about his visit to Korea as head of the APEC Science and Technology Ministerial last year. The U.S.-Korea Council represents the vast majority of Fortune 500 companies that do business in Korea as well as the Chairmen of Korea's largest companies.

OTP reports are available on-line at: www.ta.doc.gov or by calling the OTP publications request line at: 202.482.3037.■



■ Graham R. Mitchell

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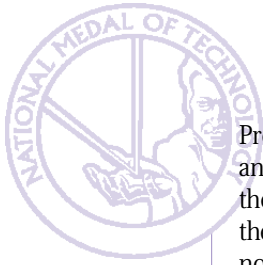
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■ Commerce Secretary William M. Daley and Connecticut Governor John Rowland sign the agreement establishing USIP.



The 1997
National Medal of Technology Winners

President William Clinton announced the 1997 recipients of the National Medal of Technology, the nation's highest honor for technological achievement. "This year's Medalists are exemplary leaders in research, innovation and imagination," President Clinton said. "Their achievements have opened new scientific frontiers, enabled new products, and created new capabilities that have transformed our lives and that will shape our future."

The 1997 National Medal of Technology winners are:

■ **Norman R. Augustine**
Chairman, Lockheed Martin Corporation

Citation

For visionary leadership in maintaining the United States' pre-eminence in the aerospace industry and for identifying and championing solutions to the many challenges in civil and defense systems.

Contribution Category
Technology Management

Norman Augustine's career has spanned more than 30 years of government and private sector leadership. Along the way he has pioneered numerous technological innovations that have helped make America's fighting forces the best equipped in the world.

Starting as chief engineer in 1958 with Douglas Aircraft Company, Augustine moved to the Defense Department in the mid-1960s to become Assistant Director of Defense Research and Engineering. Leaving for a stint in the private sector with LTV Missiles and Space Company, he rejoined government in the 1970s as the Assistant Secretary of the Army. Augustine joined Martin Marietta in 1977, rising to chief executive officer

and chairman. He led this technology-intensive enterprise through bold mergers and acquisitions that culminated in the creation of one of the world's leading diversified technology companies, Lockheed Martin.

Augustine has chaired numerous national panels tasked with identifying solutions to the complex challenges America has faced in maintaining its technological leadership.

He received his BS and MSE from Princeton University in aeronautical engineering. He was elected to Phi Beta Kappa, Tau Beta Pi and Sigma Xi. He holds numerous honorary doctor degrees and awards including the Princeton University James Madison Medal, the National Academy of Engineering's Bueche Award, the American Institute of Aeronautics and Astronautics' Goddard Medal, the American Association of Engineering Societies' National Engineering Award, the Institute of Electrical and Electronics Engineers' Carlton Award, the Department of Defense Distinguished Service Medal, and the Air Force Exceptional Service Medal.

■ **The Team of Vinton Gray Cerf and Robert E. Kahn**

Vinton Gray Cerf

Senior Vice President of Data Architecture, MCI

Robert E. Kahn

President, Corporation for National Research Initiatives

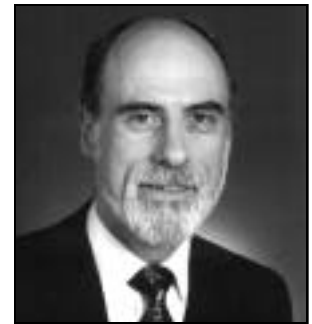
Citation

For creating and sustaining development of Internet Protocols and continuing to provide leadership in the emerging industry of internetworking.

Contribution Category
Technology Transfer

When Vinton Cerf and Robert Kahn published their seminal paper on

internetworking via packet switching technology in 1974, few shared their vision of a world where computer systems communicated with each other. Computer systems were proprietary. Distributed computing was still years away and personal computers did not exist. The first local area network was still an experiment called Ethernet. Yet Cerf and Kahn had the vision to realize the tremendous potential of computers communicating and the know-how and perseverance to make such a vision a reality. Toward that end,



■ Vinton Gray Cerf

they developed internetworking standards that led to the birth of the Internet. They believed that wide-area networks could interconnect by means of "gateways" linking nets and an end-to-end protocol called "Transmission Control Protocol (TCP)."

In the decade that followed, they led the development of a working TCP and refined it into TCP/IP (Internet Protocol). They also assured its rapid dissemination by using TCP/IP as a standard for the U.S. defense computer network (ARPANET). Cerf and Kahn pioneered not just a technology, but an economical and efficient way to transfer that technology. They steadfastly maintained that their internet working protocols would be freely available to anyone. TCP/IP was deliberately designed to be vendor-independent to support net-



■ Norman R. Augustine

"These five medalists deserve our highest tribute. Their work and vision embodies the vital link between technology and innovation, principles that remain top priorities of this Administration."

William M. Daley,
Commerce
Secretary

working across all lines of computers and all forms of transmission.

TCP/IP enabled the creation of a network of networks known as the "Internet." Free access to those standards allowed the marketplace to elevate the Internet from an obscure research tool into an inter-network boasting some 30 million users worldwide.

Vinton Cerf has a BS in mathematics and computer science from Stanford University, and an MS and PhD in computer science from the University of California at Los Angeles. His career has spanned government work for the then-secret Defense Advanced Research Projects Agency to his current position as Vice President of Data Architecture for MCI. He has been honored with the Association for Computing Machinery Systems Software Award for TCP/IP, induction into the Datamation Hall of Fame; the Electronic Frontier Foundation Pioneer Award; the Institute of Electrical and Electronics Engineers' Koji Kobayashi Award for TCP/IP and the UNIFORM Award.



■ Robert E. Kahn

Robert Kahn has a BEE in electrical engineering from City College of New York and an MA and PhD in electrical engineering from Princeton University. From 1972 to 1986, he was the Program Manager and Deputy Director of the U.S. Defense Advanced Research Projects Agency Information Processing Techniques Office. In 1986, he became President of the Corporation for National Research Initiatives. He has been honored with the American Federation of

Information Processing Society's Harry Goode Memorial Award; the President's Award from the Association for Computing Machinery; the Public Service Award from Computing Research Board, and twice he has received the Secretary of Defense Meritorious Civilian Service Award.

■ **Ray M. Dolby**

Chairman of the Board, Dolby Laboratories, Inc.

Citation

For inventing technologies that have dramatically improved sound recording and reproduction, fostering their



■ Ray M. Dolby

adoption worldwide, and maintaining a vision that has kept the world listening.

Contribution Category

General Product and Process Innovation; Technology Transfer

Few individuals have had more effect on sound recording and reproduction for the past 30 years than American inventor Ray Dolby. From the cassettes we enjoy in our car stereos to the latest digital sound in movie theaters, the world hears music and sound better because of Ray Dolby and the company he founded, Dolby Laboratories Inc. of San Francisco.

Since 1965, consumers have purchased more than six-hundred million audio products that incorporate Dolby technologies, with Dolby sound earning more than \$250 million in royalty income. Over 90 percent of that money has come from outside the U.S. More than 6,000

feature films have been released with Dolby encoded soundtracks, and more than 33,000 movie theaters worldwide have installed the equipment to play them.

Dolby did not gain household name recognition overnight. It took vision to recognize and effectively demonstrate new recording and listening formats. It took the decision to manufacture professional audio equipment on the one hand, and to license consumer products on the other. And it took setting up not only R&D, engineering and manufacturing facilities, but also unique licensing and film sound programs. All of which has made the Dolby trademark synonymous with audio excellence.

Ray Dolby holds a BS in electrical engineering from Stanford University and a PhD in physics from Cambridge University. He has been honored with an Academy Award of Merit ("Oscar"), as well as scientific and engineering awards from the Academy of Motion Picture Arts and Sciences. He is a Fellow and Past President of the Audio Engineering Society in which he has been awarded the Silver and Gold Medals. Among other honors, Dolby has also received the National Academy of Recording Arts and Sciences "Grammy" Award and the National Academy of Television Arts and Sciences "Emmy" Award.

■ **Robert S. Ledley**

Professor, Georgetown University Medical Center

Citation

For pioneering contributions to biomedical computing and engineering, including inventing the whole-body CT scanner, and for his role in developing automated chromosome analysis for prenatal diagnosis of birth defects.

Contribution Category

General Product and Process Innovation

"I hope that the Medal will demonstrate how important technology is to the U.S. and will stimulate young people to enter the fields of engineering, computers and biotechnology."

Robert S. Ledley



■ Robert S. Ledley

Robert Ledley has applied emerging computer technology to meet the rapidly evolving needs of biomedicine. He invented and manufactured the first whole-body computerized scanner to visualize internal organs. This technology revolutionized diagnostic radiology and medical imaging, positioned the U.S. first in the field, and set standards for computerized tomographic scanners.

Ledley also developed the instrumentation and computer algorithms for automating chromosome analysis used in diagnosing genetic diseases. These advancements initiated the field of automated chromosome analysis for prenatal diagnosis of birth defects and, most recently, for detecting human genetic traits such as the propensity for cancer.

Ledley has an MA in mathematical physics from Columbia University and a DDS in Dentistry from New York University. His career spans 47 years and began in 1950 as a First Lieutenant in the U.S. Army Dental Corps. He has worked as a physicist and mathematician for the National Bureau of Standards, a research ana-

lyst and instructor for Johns Hopkins University, a staff member of the National Research Council of the National Academy of Science; and President and Chief Executive Officer for Digital Information Services Corporation.

He currently serves as the President of the National Biomedical Research Foundation; Chairman of the Board of Directors for Potomac Medical Systems; and Director of Medical Computing and Biophysics and Professor of the Department of Radiology and Physiology and Biophysics for Georgetown University Medical School. Ledley holds over 60 patents in the U.S. and worldwide and has authored numerous articles and books. He was inducted into the Inventors Hall of Fame in 1990 and received the Gold Medal for Meritorious Service to Georgetown University that same year. He is a Fellow of the New York Academy of Sciences and a Founding Fellow of the American College of Medical Informatics. ■

EPSCoT Seeks To Fill The Technology Gap

One U.S. Innovation Partnership (USIP) goal is to build the capacity of states to sustain economic growth and create jobs through the development of technology-intensive industries.

Throughout the U.S., powerful industrial sectors built on a family of technologies have blossomed in distinct regions of the nation. These regional clusters create jobs and generate sustainable economic growth. Many can point to past federal R&D investments as a source of the indigenous infrastructure that makes such growth possible.

Other regions lack the scientific and technological infrastructure that serves as a catalyst for the formation of clusters and for attracting global investment. They have been noticeably under-represented in the receipt of federal R&D funds. These are the states that the Experimental Program to Stimulate Competitive Technology (EPSCoT) serves.

EPSCoT will foster the development of indigenous technology assets and promote economic growth through stronger linkages and cooperation among federal, state and local governments, universities, industry groups and other economic development organizations.

To ensure that the program is consistent with the goals of states, the Technology Administration is soliciting input from the states before developing the final structure of EPSCoT.

It is anticipated that five to seven grants would be awarded the first year. Awards would be made on a competitive, cost-shared, merit basis. The grants would help create or build upon unique technology infrastructures to achieve long-term systemic changes in the state's R&D environment and the ability of organizations to participate in national R&D initiatives. ■



Call for New Nominations

If you know of an individual, team or company deserving of recognition for outstanding technological innovation and leadership, send for a 1998 National Medal of Technology Nomination Packet.

Nominations will be accepted for achievements that have strengthened the American economy and standard of living through:

- Product and process innovation
- Technology transfer
- Advanced manufacturing technology
- Technology management, and/or
- Human resource development

Nomination packets for individuals/teams or companies/divisions are

available through mid-September 1997. Nominations for 1998 must be submitted to the Office of Technology Policy no later than close of business October 17, 1997. ■

For more information or to receive your 1998 National Medal of Technology nomination packet, contact: Katie Wolf, Director National Medal of Technology, Office of Technology Policy Room 4228

14th & Constitution Avenue, NW, Washington, DC 20230

Phone 202.482.5572

e-mail nmt@mail.ta.doc.gov

URL www.ta.doc.gov/Medal

Graham Mitchell Reports on the People's Republic of China

I was pleased to accept the invitation to visit China as a participant in the U.S.-China Civil Industrial Technology Initiative—the first seminar to be held as a joint activity following the signing of a 1996 agreement between the Chinese State Science and Technology Commission and the Technology Administration here at the Department of Commerce.



■ Graham Mitchell meeting with Xu Guanhua, Vice Minister for Industrial Technology.

During the trip, I saw both Beijing and Shanghai and visited components of China's science and technology system including the Chinese Academy of Science (CAS), national engineering research centers and technology developments zones.

At the seminar, we listened to presentations on China's policies and programs for industrial technology innovation, including their Productivity Promotion Centers which are modeled after our own Manufacturing Extension Program. Because the Chinese government has reduced its financial support for fundamental research and is encouraging technology commercialization, scientists must learn how to manage a small business and to commercialize technology.

China's technocrats are committed to technology-driven economic growth. They are searching worldwide for ways to enable non-state owned

enterprises to produce advanced technology products; to enable scientists to develop emerging technologies; to reinvigorate state-owned enterprises through automated manufacturing; and to create employment for displaced workers by shifting them to the non-state sector.

One trip objective was to see the application of China's technology policy to the management of activity in "techparks." I found that technology commercialization efforts within the techparks are focused on information technologies, biotechnology, advanced materials and manufacturing automation.

In general, China's technology innovation system is vertically integrated within academia, industrial ministries, and administrative organs such as the State Science and Technology Commission. Horizontal linkages between the "compartments" are weak. At the State Council, high level macroeconomics policy coordination occurs, but inter-agency interaction and coordination at lower levels does not appear to occur regularly.

As many Westerners would expect, China's "non-state sector" is struggling to emerge. China's new "high-tech enterprises" are not privately owned companies. They are usually collectively owned by the local government and either a university-based research institute or a CAS-based research institute. Individuals are allowed to own shares, but the portion held by individuals is relatively small.

San Huan New materials, Inc. is an interesting example of how the CAS commercialized its research on rare earth magnets. Mr. Ho Boping, Vice President, attended our presentations at the Chinese Academy of Science. We discussed the company's devel-

opment of rare earth magnet batteries for use in electric vehicles.

China holds 80% of the world's rare earth resources. San Huan's production capacity for rare earth magnets is 400 tons per year, representing 45% of the total PRC output and ranking first in domestic market share. In 1993 GM/ Magnequench and San Huan concluded an exclusive licensing agreement which allows San Huan to export its products free of patent infringement claims in particular markets. San Huan Inc. has developed rare earth magnet batteries for use in an electric bicycle, car, and minivan.

Development of electric vehicles is a national key technology commercialization project. By the year 2000, the SSTC predicts that the auto industry will be able to produce 3,000–5,000 electric vehicles and establish two or three demonstration areas. The Chinese government has provided Qinghua University and San Huan financial support to develop a van for use in urban areas.

All in all, I found China to be pleasant and fascinating. I saw research institutes that are generally off-limits, as well as the required tourist stops including the Great Wall. It is an obvious prediction to say that China will continue to offer competition and partnerships for some time to come. ■



■ Street scene inside Yu Yuan (Jade Garden) in Shanghai, a restored historical area.

NEW SPACE: THE BEGINNING OF AN ERA

by Mary L. Good, former Under Secretary for Technology and
Keith Calhoun-Senghor, Director of Office of Air & Space Commercialization, Technology Administration

Outer space has changed. Forever. While virtually no one was looking, space turned a significant corner and became just another place to do business.

This is not to say that space has realized its full economic potential. Far from it. There are technological hurdles to be overcome before doing business in space becomes as routine as doing business in, say, Singapore. But the truth is that businesses using space-based products and services such as satellite telecommunications, satellite imagery and Global Positioning System (GPS) location signals probably touch our lives today more directly and more frequently than business conducted in Singapore.

Yet, public perception of space is frozen in time somewhere after the first moon landing and reflects where we were 20 to 30 years ago, rather than where we are now, or more importantly, where we are heading.

We have already entered an era of New Space, which differs dramatically from the previous era of traditional aerospace in three significant ways.

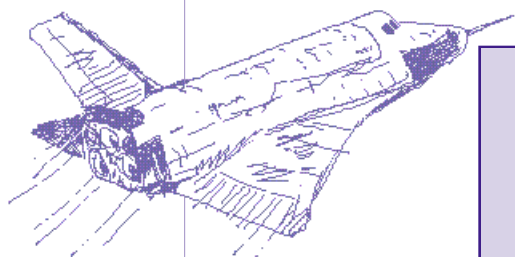
- New Space is privately funded and commercial in nature. New Space products and services are designed, priced and distributed in ways to satisfy direct consumer demands. The proposed mobile telecommunications constellations, existing direct-to-home broadcasting businesses or consumer GPS receivers are classic examples. While its heritage is rooted in the early NASA and military space programs, New Space is not based on government requirements or built to government specifications.

- New Space is international. Doing business off the Earth's surface forces firms in the era of New Space to look beyond national boundaries. The large size of private investments also encourages New Space firms to seek regional and global partnerships. With Cold War ideology no

longer a barrier, New Space players are now free to form alliances with international partners who bring access to mass markets, new technologies, distribution networks and/or critical financing. The result is the emergence of entities that blur the once clear distinctions among individual national space programs. Recent satellite imagery distribution agreements, telecommunications services agreements and international launch consortia bring these issues into sharp relief.

- New Space is the Earth's new economic frontier. New Space is about making money for investors here on Earth. It is a source of limitless potential in satellite imagery, GPS products, new launch development, telecommunications and space tourism. New Space is about exploiting the technology base we have invested billions of dollars developing and providing consumer oriented products, services and revenues here on

continued on page 7



The Office of Air & Space Commercialization is making sure U.S. industry is in position to seize the commercial opportunities in space.

Introducing The Office of Air & Space Commercialization

STRENGTHENING U.S. COMPETITIVENESS IN COMMERCIAL SPACE

The Office of Air & Space Commercialization (OASC) is a new addition to the Technology Administration in 1997. It was created in 1988 as the Office of Space Commerce, the principal unit for the coordination of space-related issues, programs, and initiatives within the Office of the Secretary of Commerce.

As part of the Administration's technology team, the OASC continues to promote policies which foster the growth and international competitiveness of the U.S. commercial space sector and the commercial use of space by U.S. private industry.

Technological advance and innovative thinking are opening a whole universe of opportunities for private industry in space. The commercial potential of technologies such as satellite imagery, Global Positioning System (GPS) products, new launch developments, telecommunications and space tourism are just beginning to be explored. The OASC is making sure U.S. industry is in position to seize the commercial opportunities in space. ■

The Fifth International Conference on Japanese Information in Science, Technology and Commerce

The July conference on Japanese Information in Science, Technology and Commerce explored recent trends in the information industry and how such trends may affect foreign entities desiring greater access to Japan and other Asian markets.

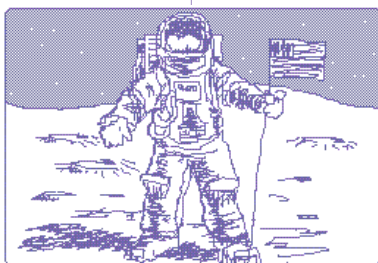
“The globalization of the economy, together with the development of information technologies such as the Internet, have made the exchange of information more fluid than in previous years. At the same time, many of those wishing to do business in Japan, be they in the public or the private sector, are not fully aware of what information is available, nor how it can be accessed and leveraged to achieve competitive advantage,” said Phyllis Genter Yoshida, Director of International Policy, Office of Technology Policy (OTP).

New Space from page 6

Earth—improving crop yields and estimates through satellite imagery, aiding drivers with car navigation systems, assisting insurance companies and relief workers with disaster assessments using before and after images, tracking and visualizing moving cargoes, producing accurate terrain and elevation maps for utilities and mapping populations for market assessments—on a global scale.

This next frontier of information technology is the result of

Congressional legislation, the President’s 1994 commercial remote sensing policy, the President’s 1996 GPS policy, his 1996 National Space Policy, and a series of other Administration policies designed to create a stable and predictable policy



The objective of the conference was to communicate to government, academia and industry that a ready infrastructure exists which allows for the systematic access of information on Japan and the Asia Pacific region. “The Japanese have traditionally employed information as a strategic tool,” continued Yoshida. “American businesses also can benefit from creating a systematic approach to gathering information, which may then be used as part of an overall competitive strategy.”

The three-day conference featured six panel presentations addressing a full spectrum of information-related issues, including approaches and techniques to competitive intelligence; the growth of the Internet and electronic commerce; sources of strategic information; and changes in Japanese information disclosure.

framework for this important commercial sector.

Former Commerce Secretary Ron Brown used to tell the story of ice hockey great Wayne Gretzky, who was once asked what made him such a phenomenal player. Gretzky thought for a moment and then replied, “I skate to where the puck is going to be.” Secretary Brown used that story to illustrate how the success of the U.S. as a nation is directly related to its ability to be the first to get to “where the puck is going to be;” not where it is now or where it was, but where it is heading.

There are two messages here. First, the U.S. Government is beginning, and must continue, to treat New Space as an important industry segment where data is tracked and ana-

lyzed in much the same way as commodities futures or crop reports. The Government must continue to pay attention to, and plot the trajectory of, New Space products and markets so businesses can intelligently anticipate the future and be the first to get to where the puck is going to be.

lyzed in much the same way as commodities futures or crop reports. The Government must continue to pay attention to, and plot the trajectory of, New Space products and markets so businesses can intelligently anticipate the future and be the first to get to where the puck is going to be.

Topical presentations included: intelligence gathering using the Internet; venture capital investing for new science and technology ventures; the use of patent information to increase Japanese market share; and the effects of government deregulation in Japan.

The conference was sponsored in part by OTP. ■

Abstracts of papers are available at: <http://www.ta.doc.gov/asiapac/joho.htm>

To request a copy of the conference preprints call 202.482.6805.

Second, in this era of New Space, most information technology firms and financial investors would do well to wake up to the fact that some time between the end of the Cold War and the announcement of President Clinton’s umbrella National Space Policy, we crossed over into a new phase of global business. The era of New Space is already here.

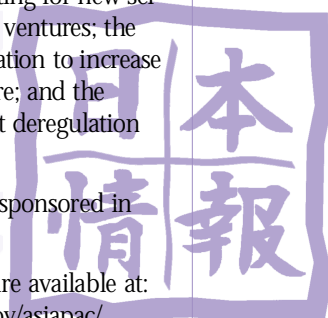
The challenge before us is defining how the Administration and Congress can best work together to help investors and U.S. companies exploit the opportunity before us through policy stability, facilitating international standards, deregulation and the promotion of space-based industries. ■

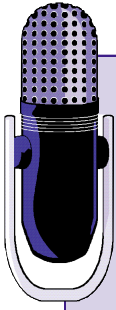
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Something to Talk About! In the Next PACESETTER

UPCOMING ARTICLES

- The Office of Technology Policy and the Information Technology Association of America address the shortage of information technology workers.
- An excerpt from the recently released report ***The Global Context for U.S. Technology Policy*** explores the relationship between U.S. technology policy and the rapidly changing world environment.

UPCOMING REPORTS

- The Office of Technology Policy releases ***Meeting the Challenge: U.S. Industry Faces the 21st Century: The U.S. Biotechnology Industry*** this fall in San Diego, CA.
- Information and statistics obtained from the recent official visit to China will be included in ***Innovation and Technology Policy in the People's Republic of China***.

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