

# Science + Technology

## IN CONGRESS

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### Bush Budget Outline Leaves Little Room for Research

The fiscal year (FY) 2002 budget blueprint released by President Bush on February 28 may lack details, but the framework it sets out leaves little room for research and development (R&D) funding. The scientific community and its supporters in Congress are bracing for bad news when the administration releases its detailed budget request on April 3.

While the president has shown strong support for biomedical R&D at the National Institutes of Health (NIH) and military R&D at the Department of Defense (DOD), most other R&D agencies expect flat funding or slight increases that do not keep up with inflation.

In his February 27 budget address, President Bush called on Congress to "finish the job" of doubling the NIH budget over the five years between FY 1998 and 2003. The budget blueprint does indeed keep NIH on this track, requesting an unprecedented \$2.8 billion (13 percent) increase to \$23.1 billion.

The president also made a passing reference during the budget speech to his intent to increase military R&D. The budget outline requests an overall increase in the DOD budget of 4.8 percent to \$310.5 billion, and it proposes a \$2.6 billion increase in FY 2002 (and \$20 billion over five years) for R&D in new technologies. (FY 2001 DOD

R&D is \$41.8 billion.) It is unclear, however, how much of the increase would go to basic or applied research as opposed to development, or how much of the increase would be devoted to the administration's high priority of developing a national missile defense system. It is also unclear whether there will be offsetting cuts in other DOD R&D programs.

The large increases at NIH and DOD may well push total federal R&D to \$95 billion. Total federal R&D reached a record \$90.9

billion in FY 2001, a 9.1 percent increase over FY 2000.

Other agencies will not fare so well, however. Despite an estimated \$5.6 trillion surplus over the next ten years, the Bush budget would allow discretionary spending to grow only at the projected rate of inflation, with a slightly higher 4.0 percent or \$25 billion increase in FY 2002 to \$661 billion. Nearly \$22 billion of the FY 2002 increase would go to DOD, the Department

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### Medical Privacy Debate Escalates

The battle over medical privacy escalated recently as Health and Human Services (HHS) Secretary Tommy Thompson postponed enactment of federal privacy regulations scheduled to take effect last month. The regulations, which were mandated by the 1996 passage of the Health Insurance Portability and Accountability Act (HIPAA), represent the first ever federal medical privacy protection plan. According to Secretary Thompson, the Clinton Administration's failure to submit the regulations for congressional review led to the postponement. However, advocates say that this decision could compromise the long-awaited rules.

When Congress passed HIPAA in 1996, its essential aim was to ensure equitable health care coverage for individuals with preexisting medical conditions. However, also known as the Electronic Data Interchange (EDI) standards, HIPAA was designed to ensure "administrative streamlining" within the health care industry. Under HIPAA, health plans must computerize patient medical data and increase the efficiency of their record transfer systems by Oct. 16, 2002. Although explicit health privacy rules were not imposed under HIPAA, many believed that increased computerization would heighten the risk of medical

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#### FEATURES

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*"Congress must increase the federal investment in science. No science, no surplus. It's that simple."*

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# Senate Bill Would Revamp Approach to Science Education

The education bill that passed the Senate Health, Education, Labor, and Pensions (HELP) Committee unanimously March 8 would revamp the federal government's role in science and math education, eliminating a program designed to help science and math teachers while creating a new kind of partnership involving colleges and universities.

The bill, entitled the Better Education for Students and Teachers (BEST) Act, would reauthorize programs funded under the Elementary and Secondary Education Act of 1965 (ESEA) by following the general framework laid out in President Bush's education plan, *No Child Left Behind*. In an effort to give states more flexibility, the bill would consolidate some 50 Department of Education programs into five general funding areas.

Among the specific programs that would not be reauthorized is the Eisenhower professional development program, which in FY 2001 directed \$250 million to professional development for science and math teachers. In its place, the bill establishes a broader "Teacher Quality" initiative.

In addition to funds for professional development, this larger initiative includes a new math and science partnerships program that would enable state and local education agencies to join with institutions of higher education in order to improve math and science standards, curricula, and teacher preparation and training.

According to the president's plan, "The Higher Education Community recognizes that it has a vested interest in working to improve elementary and secondary math and science achievement." The proposed partnerships could address three problems: "too many teachers teaching out-of-field; too few students taking advanced coursework; and too few schools offering a challenging curriculum and textbooks."

It is unclear, however, if these partnerships will go forward as part of ESEA as the Senate bill provides, or if Congress will follow the president's budget blueprint and establish them as part of the National Science Foundation (NSF). The budget blueprint requests \$200 million for funding of the partnership program within NSF, \$110 million of which would be redirected from existing NSF education programs.

A competing ESEA proposal, dubbed the "Three R's" bill (S. 303 and H.R. 345), has been put forward by the House and Senate New Democrat Coalition. This plan would also eliminate the Eisenhower program in favor of a larger "Teacher Quality" grant.

The House Science Committee, meanwhile, held a hearing on science and math education that featured testimony from three recipients of the 2000 Presidential Award for Excellence in Science and Mathematics Teaching. Asked by the committee for their views on how the federal government can help improve K-12 science and math education, each of the teachers

described a pressing need for federal support in recruiting and retaining good teachers. Two gave particular emphasis to federal support of professional development programs, and one highlighted a need to develop better student assessments.

Jonathan Brenner, a fourth witness, who was a participant in the "Teach for America" program, which recruits recent college graduates to teach in under-resourced public schools, implored the committee to "establish and foster a national ethic that declares, without hesitation, that the education of our children is second to nothing. Some argue that we should be worried about protecting our country from a foreign missile strike," he continued. "While this may be a valid concern, I contend that we should be more concerned about the fact that most of my sixth grade students did not know how to use a 12-inch ruler."

The members of the committee heaped praise on teachers in general and the witnesses in particular, and at the suggestion of Science Committee Chairman Sherwood Boehlert (R-NY), they took the unusual step of giving the witnesses a standing ovation at the conclusion of their testimony.

At the end of the hearing, Rep. Boehlert gave other Presidential Awardees in attendance a chance to make brief comments from the audience. About a dozen seized the opportunity. Their suggestions ranged from making teaching tax exempt to teaching math to children when they are young, because "math is a language," and children who do not start learning a language before they are ten will always speak with an accent.

While the BEST bill signals a new federal approach to education policy, the most controversial education issues, such as vouchers, will not be addressed until the legislation reaches the Senate floor in late April. The House Education and the Workforce Committee is expected to mark up its own education bill in the coming weeks. ●●●

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## FOR MORE INFORMATION:

*BEST bill:* [www.senate.gov/~labor/Legislation/Ed\\_Draft/ed\\_draft.htm](http://www.senate.gov/~labor/Legislation/Ed_Draft/ed_draft.htm)

*Bush Plan:* [www.whitehouse.gov/news/reports/no-child-left-behind.html](http://www.whitehouse.gov/news/reports/no-child-left-behind.html)

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## R&D Credit May Become Permanent

President Bush and the 107th Congress may establish the Research and Experimentation Tax Credit as a permanent feature of the Internal Revenue Service tax code. Also known as the R&D tax credit, the legislation was first enacted in 1981 with the goal of stimulating private research and development. Since its creation, Congress has renewed the credit in two or five year increments and it is currently set to expire in 2003. Many in industry have complained that this impermanence diminishes the power of the credit by negating the ability to incorporate it into long-term planning. In his recent tax plan, President Bush included a provision to permanently extend the credit and there is substantial support in Congress for such a measure. Companion bills (S.41 and H.R. 41) to make the credit permanent have been reintroduced by Sen. Orrin Hatch (R-UT) and Rep. Nancy Johnson (R-CT). Sens. Pete Domenici (R-NM) and Jeff Bingaman (D-NM) also plan to introduce a bill that would, in addition to making the credit permanent, provide larger credits for small business, research performed at national labs, and collaborative research between private industry and universities. If the tax credit is made permanent it is projected to reduce corporate taxes by \$50 billion between FY 2004 and 2011. ●●●

# AAAS Annual Meeting: Genetic Discrimination; S&T at State

*The 2001 AAAS Annual Meeting, which took place February 15-20 in San Francisco, featured a broad range of presentations in many areas of science. Below are excerpts from two talks of particular interest to policymakers.*

Rep. Louise Slaughter (D-NY), author of H.R. 602, the Genetic Nondiscrimination in Health Insurance and Employment Act, spoke about genetic discrimination:

Most of us would agree at the outset that genetic discrimination is wrong. There may, however, be a few of you who are unsure or would like to play devil's advocate. Let me take a few moments to explain why I believe discrimination based on predictive genetic information should be illegal.

1. *Genetic science is not yet fully understood.* Immediately following the discovery of the first breast cancer gene, scientists estimated that having this gene conferred an 85% risk of developing breast cancer. Within two years, however, the risk had been downgraded to only 50%. Over time, we will further refine our understanding of these and other genes, as well as the interplay among genes and the impact of the environment. Using genetic information to discriminate at this point in time is so inaccurate as to be almost useless – especially in the context of determining who should get a job, or who should be eligible for affordable insurance.

2. *Having a predictive gene does not necessarily mean you will ever get sick.* And even if you do, the disorder might not develop for 10, 20, or 30 years. No one should be passed over for a promotion at work or lose their insurance coverage simply because they might get sick someday. This leads us logically to the next reason, which is:

3. *We all have genetic flaws.* Dr. Francis Collins, Director of the National Human Genome Project, is frequently quoted as saying every human being is estimated to have between 5 and 50 significant genetic mutations, making us all ultimately unemployable and uninsurable. By allowing genetic discrimination to persist, we effectively penalize the people who happen to have the genes that were discovered first.

4. Both employers and insurers have managed to do just fine for many years without having access to genetic information. In case you have not noticed, the insurance industry is highly profitable, and

has been for decades. Today, very little "individual underwriting" goes on – that is, determination of insurance rates based on specific individuals' health. Most Americans receive their coverage through group plans that base their estimates on actuarial estimates of the incidence of health problems. Furthermore, very little – if any – genetic information has any bearing on an individual's ability to perform a given job. Employment decisions should be based on a person's job performance and merit, not his or her genes.

*In the face of this uncertainty, the logical course is to ban all genetic discrimination, rather than allowing a "Wild West," anything-goes atmosphere to prevail.* The abuse of genetic information has the potential to destroy individuals' careers and do long-term damage to their and their families' health. We must err on the side of caution and ban all genetic discrimination in health insurance and employment.

Dr. Norman P. Neureiter, Science and Technology Advisor to the Secretary of State, spoke on "The State of Science at State":

In the broadest terms, our mandate is to raise the overall awareness of the [State] Department to the importance of [science and technology (S&T)] in foreign policy and to assure that S&T considerations are fully integrated into the foreign policy process. Those are fancy words, but how does one make it happen? Clearly priority number one was reach out to build the closest possible relationship with the outside science and engineering community, to make available to the Department the finest scientific advice and counsel in the world. I want to see what I call a superconducting busbar between you in the S&T community and the foreign policy machinery at State.

Our approach here has been to set up across the Department an S&T Policy Network – with a designated individual in each bureau responsible for S&T issues. I see this network as a two-way channel – to find out what their issues are and to demonstrate how our office – with the support of all of your organizations on the outside – can be useful to them. Secondly, we also

need to draw on your counsel to look over the horizon on behalf of the bureaus – to anticipate what big issues are coming down the road that will intersect their foreign policy agendas in the future. Wouldn't it have been nice to be ahead of the curve of international public opinion on biotechnology and GMO's; or HIV/AIDS, or mad cow disease?

The exciting thing about this job is that every day there is something new. Some people have suggested that we pick three areas where we want to have a major impact and concentrate on them. That may be good advice, but I am not going to take it – at least not now. If we do, we will become another specialized office, of which there are many already in State. The way we are trying to work is to pick issues we think are important, or simply to take one of the many that appear daily, find someone in state (and there is usually someone) who is interested in it or maybe already working on it. Then we encourage them, support them, maybe guide them, even maybe intercede on their behalf to see that it gets done. That way, they get the credit, we have been useful and S&T are embedded at least a nanometer deeper into the fabric of the Department.

## AAAS NOTES

- MAY 3-4, 2001  
*Science and Technology in the New Administration, 26th Annual AAAS Colloquium on Science and Technology Policy, Omni Shoreham Hotel, Washington, DC.*  
>>> [www.aaas.org/spp/colloqu.htm](http://www.aaas.org/spp/colloqu.htm)
- NOW AVAILABLE ...  
*AAAS Science and Technology Policy Yearbook 2001, a concise yet comprehensive source of information on current policy issues affecting science and technology.*  
>>> [www.aaas.org/spp/yearbook](http://www.aaas.org/spp/yearbook)

## Budget Blueprint

*Continued from page 1*

of Education, and NIH, leaving all other discretionary programs with flat funding.

Although the National Science Foundation (NSF) enjoyed a 13 percent increase in its budget and its R&D funding in FY 2001, the FY 2002 budget blueprint would barely provide an increase. The total NSF budget would be \$4.5 billion, just \$56 million or 1.3 percent above FY 2001. The president proposes an expansion of NSF's science and mathematics education activities, so NSF R&D (three-quarters of the agency's budget) would stay even with FY 2001 or even decline. The budget proposes a new multidisciplinary mathematics research initiative, but there are no details on how the

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nanotechnology and information technology research initiatives—for which NSF is the lead agency—would fare.

The National Aeronautics and Space Administration (NASA) would see its total budget increase by 2 percent to \$14.5 billion in FY 2002 after a nearly 5 percent increase in FY 2001. NASA's R&D (two-thirds of the agency's budget) would see a similar increase. The only specific figure in the budget blueprint is a proposed 64 percent increase to \$476 million for the Space Launch Initiative. The blueprint proposes increases in the International Space Station, the Mars program, and Earth Observing System satellites, but there would be reductions in other areas, including cancellations of the X-33 and X-34 vehicles and a mission to Pluto.

The most precipitous decline in R&D funding could come at the Department of Energy's (DOE) Office of Science. DOE would see its total budget decrease 3 percent to \$19.0 billion in FY 2002, likely squeezing its R&D programs (\$8.0 billion in FY 2001, 12 percent more than FY 2000). The blueprint promises a 5 percent increase for the Stockpile Stewardship program, the core of

DOE's defense R&D activities, but it is unclear how the agency's nondefense Science and Energy R&D programs will do.

Although details are not available in the budget blueprint, it is rumored that steep cuts are also being considered for the Department of the Interior's lead science agency, the U.S. Geological Survey (USGS; \$883 million budget in FY 2001, more than 60 percent of which is R&D). The *Wall Street Journal* reported on February 16 that USGS was "fighting to stave off a threatened 22% cut" from FY 2001.

The Commerce Department's budget would decline 6 percent in FY 2002 to \$4.8 billion, putting a squeeze on its R&D programs as well, which comprise one-fifth of its total budget. The Bush Administration would eliminate the \$145 million Advanced Technology Program, which has been targeted for elimination by House Republicans in previous years.

Criticism of Bush's approach to R&D funding has come from many corners. In a March 9 *New York Times* op-ed article, former President George H.W. Bush's science advisor Dr. D. Allan Bromley wrote that the proposed budget "jeopardizes the nation's ability to achieve" Bush's three central goals of improved education, a tax cut, and a restructured military.

"Both the tax cut and the spending that would support educational and military buildups depend upon an estimated \$5.6 trillion surplus over the next 10 years," Bromley wrote. "Where is all that money coming from? There are several sources, but the major driver of our nation's economic success is scientific innovation." After accounting for inflation, NSF, NASA, and DOE, "the three primary sources of ideas and personnel in the high-tech economy," receive cuts.

"The proposed cuts to scientific research are a self-defeating policy," Bromley concluded. "Congress must increase the federal investment in science. No science, no surplus. It's that simple."

Criticism has also surfaced on Capitol Hill. "This budget request remains sketchy, but what we do know suggests that our science programs will not receive adequate support from the Bush Administration," said Rep. Lynn Rivers (D-MI), a senior Democrat on the House Science Commit-

tee. "I hope that the administration will reconsider its requests for NSF and NASA."

Sen. Jeff Bingaman (D-NM), meanwhile, expressed dismay about the DOE request. "This proposal appears to cut programs—such as basic science, renewable energy, and oil and gas research and development—by about \$1 billion," he said. "Clearly, we don't know all the details of the plan, nor do we know where a majority of the cuts will fall, but it's hard to see how we can have a comprehensive energy strategy while making cuts to R&D." In addition, he said, "I'm concerned about what kind of impact these cuts could have on our [national] labs."

Expressions of support for federal R&D programs have not been limited to the Democratic side of the aisle. At a March 6 hearing on NIH funding, Senate Budget Committee Chairman Pete V. Domenici (R-NM) praised Health and Human Services Secretary Tommy Thompson for increasing the NIH budget, but went on to say, "You can't increase one piece of science in America ... and leave the other kinds of research in the doldrums. ... You can't cut the DOE's research programs and think that the

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*"You can't cut the DOE's research programs and think that the NIH is going to succeed at curing all of our ills."*

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NIH is going to succeed at curing all of our ills."

A detailed analysis of the Bush Administration's stance toward the federal government's R&D programs will not be possible until the complete budget request is released on April 3, but it seems clear that for several key R&D agencies, any significant FY 2002 budget increases will have to originate in Congress. ●●●

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### FOR MORE INFORMATION:

*President Bush's Budget Blueprint:*  
[www.whitehouse.gov/news/usbudget](http://www.whitehouse.gov/news/usbudget)

*AAAS R&D Budget and Policy Program:*  
[www.aaas.org/spp/R&D](http://www.aaas.org/spp/R&D)

## CONGRESSIONAL RESEARCH SERVICE

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*Copies of CRS reports for congressional use are available by calling 202/707-7132.*

- **Science and Technology Issues Facing the 107th Congress: First Session (RL30869)**  
This report examines science and technology issues likely to face the 107th Congress. Issues examined include: R&D funding disparities; genetic privacy and property law; global climate change; NASA's bid to develop next generation reusable launch vehicles; military space R&D; internet privacy; voting technology reform; prescription drug pricing; and management of wireless technology proliferation.
- **The Arctic National Wildlife Refuge: The Next Chapter (IB10073)**  
This issue brief presents the various factors contributing to the recent debate over oil development within the Arctic National Wildlife Refuge (ANWR). Beginning with a brief history of ANWR, the report covers: current legislative choices; geological variables; development options; environmental quality management; subsistence use; and legislation.
- **Encryption Technology: the Debate in the 105th and 106th Congresses (RL30836)**  
This report provides an overview of debate and legislation leading to modifications of U.S. encryption policy in the 1990's and 2000. Included are: an examination of industry and government concerns; legislative action in the 105th and 106th Congress; the key recovery debate; export restrictions; and the final Clinton Administration encryption guidelines.
- **Marine Protected Areas: An Overview (RS20810)**  
This report provides a brief overview of issues relating to marine protected areas (MPA's). The report examines the various definitions of a MPA, and includes a legislative summary regarding MPA's.
- **Endocrine Disruption: An Introduction (RS20778)**  
This report brings to attention the effect of "endocrine disruptors" on human and non-human organisms. Included are: a brief background on the current state of knowledge regarding endocrine disruptors; the tenuous nature of certain research involving disruptors; and past and present legislative and congressional action on the subject.
- **Military Space Activities: Highlights of the Rumsfeld Commission Report and Key Organization and Management Issues (RS20824)**  
This report provides a summary of the findings and suggestions of the Rumsfeld Commission. The report examines the following: the concept of a "Space Force"; organization within the Department of Defense (DOD) and intelligence community; and organization of space-based national security within the White House.

## GENERAL ACCOUNTING OFFICE

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*Copies of GAO Publications are available online at [www.gao.gov](http://www.gao.gov) or by calling 202/512-6000.*

- **Defense Acquisitions: Space-Based Infrared System-low at Risk of Missing Initial Deployment Date (GAO-01-6)**  
This report analyzes the Air Force's new Space-Based Infrared System-low (SBIRS)-low satellite system and the reasons that the system will most likely not meet requirements specified by Department of Defense (DOD) for its anti-ballistic missile project.
- **Health Privacy: Regulation Enhances Protection of Patient Records but Raises Practical Concerns. (GAO-01-387T)**  
This testimony examines the effectiveness of proposed medical privacy regulations recently produced by the Department of Health and Human Services. It outlines the regulations and projected impacts on patients, the health care industry and medical researchers. Practical considerations regarding compliance difficulty are also included.

## THE NATIONAL ACADEMIES

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*Government offices may obtain single complimentary copies by calling the Office of Congressional and Government Affairs at 202/334-1513. Others may order copies from the National Academy Press (800/624-6242, [www.nap.edu](http://www.nap.edu)).*

- **Clearing the Smoke: The Science Base for Tobacco Harm Reduction (ISBN: 0-309-07282-4)**  
This book explores various products designed to help people quit smoking. It addresses difficulties in evaluating whether such products truly reduce the health risks of some tobacco products and explores various questions involved with assessment of the efficacy of these products.
- **Crossing the Quality Chasm: A New Health System for the 21<sup>st</sup> Century (ISBN: 0-309-07280-8)**  
This book makes an urgent call for fundamental change in the nation's health care system. It recommends a sweeping redesign of the system and provides overarching principles – suggesting specific direction for policymakers, health care leaders, clinicians, regulators, purchasers, and others.
- **Improving the Quality of Long-Term Care (ISBN: 0-309-06498-8)**  
This book takes a comprehensive look at the quality of care and life in long-term care environments. An analysis of the current state of long-term care is undertaken, identifying problem areas and offering recommendations for federal and state policymakers. The book also includes recommendations on setting and enforcing standards of care, strengthening the caregiving workforce, managing reimbursement issues and enhancing the quality of long-term care in general.

# scientific definitions

1. The act of making clear and distinct.
2. the act of stating a precise meaning or significance.

## COMPUTING TERMS

**COMPUTER** A device that computes, especially a programmable electronic machine that performs high-speed mathematical or logical operations or that assembles, stores, correlates, or otherwise processes information.

**COMPUTER CHIP (INTEGRATED CIRCUIT)** A microelectronic semiconductor device consisting of many interconnected transistors and other components; constructed ("fabricated") on a small rectangle (a "die") cut from a Silicon (or for special applications, Sapphire) wafer known as the "substrate." The die is connected into a package using gold wires which are welded to "pads," usually found around the edge of the die.

**TRANSISTOR** A three terminal semiconductor device used to control or increase an electric current; the fundamental component of most electronic circuits. Transistors and other components are interconnected to make complex integrated circuits such as logic gates, microprocessors and memory.

**MICROPROCESSOR** A silicon computer chip that contains a CPU (central processing unit). At the heart of all personal computers sits a microprocessor. Microprocessors also control the logic of almost all digital devices, from clock radios to fuel-injection systems for automobiles.

**MOORE'S LAW** The observation, made in 1965 by Intel co-founder Gordon Moore, that each new memory integrated circuit contained roughly twice as much capacity as its predecessor, and each chip was released within 18-24 months of the previous chip. If this trend continued, he reasoned, computing power would rise exponentially with time. Moore's observation has held and is still the basis for many performance forecasts, but as transistors become smaller and smaller, a physical limit will eventually be reached. This is expected to happen within the next several decades, and alternative computing methods, such as quantum and molecular computers, have been proposed as a way of reaching beyond this limit.

**QUANTUM COMPUTING** A type of computer which uses the ability of quantum systems, such as a collection of atoms, to be in many different states at once. In theory, such superpositions allow the computer to perform many different computations simultaneously. Such machines have not yet been built.

**SUPERCOMPUTER** The fastest type of computer. Supercomputers are employed for specialized applications that require immense amounts of mathematical calculations, such as weather forecasting or animated graphics.

**MAINFRAME** A powerful, physically large computer capable of supporting hundreds, or even thousands, of users simultaneously. While a supercomputer channels all its power into executing a few programs as fast as possible, a mainframe uses its power to execute many programs concurrently.

SOURCES: [www.webopedia.com](http://www.webopedia.com), [www.foldoc.org](http://www.foldoc.org), [www.dictionary.com](http://www.dictionary.com)

## Medical Privacy

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information abuse. As a result, HIPPA mandated that HHS take on the task of drafting health privacy regulations. Further, HHS was given the power to implement the regulations if Congress was unable to pass its own health privacy legislation within a three-year grace period. In 1997, former HHS Secretary Donna Shalala completed the proposed health privacy regulations, and in October of 1999, when no health privacy legislation had managed to make it above the subcommittee level, then-President Clinton and Secretary Shalala announced the regulations and opened them for public comment. The final rules were published in the *Federal Register* on December 28, 2000.

Under the new regulations, patients are able to view and copy their health records and may request that incorrect information be changed. Individuals are also able to request a history of authorized disclosures of their information and may request that restrictions be placed on its dissemination. In addition, the regulations require health care providers to obtain written consent from patients for the use or disclosure of information in their medical records. Finally, the new rules allow providers to be held accountable for information that is improperly used or distributed. According to testimony by Leslie G. Aronovitz of the General Accounting Office, "The regulations will act as a federal floor in establishing standards affecting the use and disclosure of personal health information." As a result, they will affect virtually every patient, health plan, physician, pharmacy and medical researcher in the country.

Proponents of the regulations say that the new rules are long overdue and will increase the public's trust in the medical research and health-care communities. Trust that increasing computerization does not translate to increased transparency of personal records, say advocates of the regulations, is imperative to the reliability and continued success of medical research and health care in the United States. Proponents fear that without the type of protection afforded by the regulations, patients will increasingly be unwilling to share sensitive information that could be used against them in employment or health coverage decisions. As Janlori Goldman, di-

rector of Georgetown University's Health Privacy Project recently testified before the Senate Health Education Labor and Pensions (HELP) Committee, "We have mapped the genome, but people are afraid to get tested. The internet can deliver cutting-edge research and health-care services, but people are unwilling to trust their most sensitive information in cyberspace."

Patients' rights groups say that the current lack of protection forces people to be wary of what they tell both researchers and caregivers. According to the Health Privacy Institute, their concerns are not unfounded. The Institute's website says that medical records are currently less protected than either credit reports or video rental records. Proponents believe this lack of protection is unacceptable if reliable information is to be expected from patients and subjects. "[A]stonishing breakthroughs [in medical research] cannot go forward without the full trust of the American people, who want an assurance that their privacy will be protected," said Ms. Goldman.

Opponents of the proposed regulations include health-care providers, health plans, pharmacies, health clearinghouses, medical research facilities and various medical associations. Although most opponents agree that there is a need for increased medical privacy, they are convinced that the drastic changes and levels of ambiguity contained in the proposed regulations would make implementation and compliance impossible. As Jane Greenman of the Association of Private Pension and Welfare Plans told the Senate HELP Committee, "Successful compliance with these regulations throughout our healthcare system is not possible given the rules' current complexity and ambiguity."

Critics are also concerned that the new rules might compromise patient care and

place an unbearable cost burden on the health care industry. John P. Houston, a lawyer at the UPMC Health System in Pittsburgh sees the regulations as "so restrictive that they could impede patient care and disrupt [the] essential operations" of hospitals and research facilities. Sen. Pat Roberts (R-KS) declared that he was "stunned and terribly worried" by the rules. He used the example of small rural medical clinics already "struggling to keep their doors open." Sen. Roberts says that forcing these clinics to adhere to stringent regulations would force them to either forego patient care or close down completely.

Larger health care providers are worried that implementation of the new regulations would be a financial burden far exceeding the HHS cost projections. They also complain that the two-year compliance grace period given under the regulations is unfeasible considering the magnitude of the required changes.

Opponents also question whether the regulations will actually protect patient privacy. In a recent letter to Secretary Thompson, House Majority Leader Dick Armey (R-TX) cited a section of the new regulations that would allow the federal government unrestricted access to personal medical records in order to monitor compliance. In his letter, Rep. Armey stated that although touted as a protector of privacy, "the proposed HIPAA regulations...may actually have the opposite effect, putting private personally identifiable information at greater risk than exists today. What has not been widely reported are the rules' new mandates requiring doctors, hospitals, and other health care providers to share patients' personal medical records with the federal government," Rep. Armey said.

Advocates respond that the proposed regulations have been extensively reviewed

and amended since 1999. They point out that over 52,000 comments were addressed by HHS, many of which were from the health care community itself. Instead of dawdling over the same issues, they say, it would be most efficient to put the rules into place as quickly as possible and allow problems to be addressed as they come up. As Gary Claxton, the Clinton administration official who led the writing of the rules, told the *New York Times*, "People in the [health care] industry should get on with the business of carrying out the rules, but instead they want to keep talking forever...They are not interested in giving patients control or even a say over how their personal medical information is used."

Just prior to Secretary Thompson's postponement decision, and in keeping with its pledge to review Clinton era regulations, the Bush Administration required that the rules be re-examined. Although Secretary Thompson cites the Clinton Administration's failure to submit the regulations as the primary reason for the delay, he said that the additional public comment period would ensure that they "work as intended throughout the complex field of health care, without creating unanticipated consequences that might harm patients..."

Ultimately, by postponing the regulations Thompson has placed himself in the unenviable position of having to decide whether or not to implement them one month hence on April 14. If after reviewing the expected deluge of comments, he decides against implementation, the issue of medical privacy will be back to square one, and as Shannah R. Koss, a health expert from I.B.M put it, "it will be incredibly difficult for any politician to stand up and say, 'I don't support the public's right to health care privacy. That's not a winning proposition.'" ●●●

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## Heard off the Hill

**Robotic Fish** • Scientists at the Massachusetts Institute of Technology have created the world's first muscle-powered robot. Dr. Hugh Herr and Dr. Robert Dennis

attached frog muscle to a 12 cm long robotic fish and watched as it flipped and flopped its way into history. The fish "expired" shortly after the experiment, a problem that the two scientists intend to remedy by installing a stomach and circulatory system. Regardless, Dr. Herr and his colleagues at MIT's biomechatronic group are encouraged by the success of their osteichthyotic friend. They hasten to add, however, that it will probably be some time before fisherman are cleaning their nets of robotic refuse.

---> *New Scientist, February 21, 2001*

**World's Smallest Fan** • A duo of mechanical engineers at the University of Colorado at Boulder has built an eight-bladed fan no larger than a grain of sand. Graduate students Paul E. Kladitis and Ryan Linderman built the microfan for use in future miniature machines. With blades measuring less than half a millimeter in length, the fan can revolve at an impressive 180 revolutions per minute. Although this might not be enough to cool a supercomputer, it certainly has been enough to blow attention on the two young scientists.

---> *New York Times, March 15, 2001*

**Wind Chill a Load of Hot Air** • For more than 25 years weather forecasters have used the wind chill to tell people how cold it really feels. Scientists are now saying that wind chill is one misconception that has gone on long enough. The wind chill index attempts to measure the rate of heat loss by the body as wind blows across it at different temperatures and speeds. Scientists Maurice Bluestein and Randall Oszevisk are now saying that the current wind chill index is usually off by more than 15 degrees, and that number increases with wind speed. A task force led by the National Weather Service and spearheaded by the two engineers will recalculate the index before next winter. Perhaps next winter meteorologists will be right about at least one thing.

---> *Washington Post, March 12, 2001*

**Vanishing Code** • A computer science professor at Harvard University has designed and mathematically proven an unbreakable code. According to creator Dr. Michael Rubin, the secret to the code's impregnability is that it literally vanishes before your eyes. While most codes used today rely on complex key systems for security, Dr. Rubin's code employs an astronomically large stream of information coupled with precisely timed access points to encode and decipher a message. Once the precise access time passes, the code – and the message it contained – vanishes. Thus far, Dr. Rubin says he has no intention of marketing his discovery. Instead, he says, it was purely for the challenge.

---> *New York Times, February 20, 2001*