

Jailed for More Than Four Months, Physicist Faces Deportation Threat

By Ernie Tretkoff

In what he describes as a Kafkaesque nightmare, Branislav Djordjevic, a Serbian physicist and software engineer, recently spent over four months in jail in Virginia for an inadvertent immigration violation. Though he was released on bond in late December, he still faces possible deportation.

APS leaders and its Committee on International Freedom of Scientists (CIFS) have written letters to immigration authorities on his behalf and continue to support his case, but the outcome remains uncertain.

Djordjevic, 48, came to the US from Yugoslavia in April 1991. Then a PhD candidate in physics in Belgrade, he planned to spend a semester as a visiting scholar at Michigan State University, working with Michael Thorpe.

Soon after his arrival in the US, war broke out in Yugoslavia. Djordjevic had been politically active against Milosevic, and learned that military police had raided his home in Belgrade. Friends warned him not to return. With the help of an immigration lawyer in Michigan, he filed for political asylum in the US. Djordjevic remained at Michigan State, studying amorphous diamond, a carbon-based material that has properties similar to diamond but is cheaper to produce and is useful in many industries, including automobiles, razor blades, and



Photo Credit: Ernie Tretkoff

At home after his release from prison, Branislav Djordjevic holds his son Marko, while his wife Dragana, his daughter Milica, and Dragana's uncle look on.

semiconductors. He developed a computer model of the material that was "the biggest model at the time, and still attracts a lot of attention," he said.

After completing his PhD in 1996, he went to work for a small computer software company in Michigan, and then moved to the Washington, DC area to accept a job as a telecommunications software specialist with Verizon.

He bought a house in Falls Church, VA, and lived there with his

wife, Dragana, (whom he met in Yugoslavia and married in the US), their two children, both of whom are US citizens, and Dragana's disabled uncle, also a US citizen.

In May 2002, Djordjevic was granted an approval notice for an H1-B visa, which would have been valid through 2004, but his former attorneys never followed procedures for him to receive the visa. Verizon also sponsored Djordjevic for a green card, and he was in the process of

See DEPORTATION on page 2

Amy Flatten is New APS Director of International Affairs

Amy Flatten, formerly with the Office of Science and Technology Policy (OSTP), has joined the APS as its new Director of International Affairs.

Flatten begins her new position February 1, 2004, replacing Irving Lerch, who established the Society's international efforts more than ten years ago and retired in December [see APS NEWS, January 2004]. Since receiving her PhD in Engineering Science and Mechanics from the Georgia Institute of Technology, Flatten has worked in private industry, academia, and the Federal government. Since 1995, Flatten has also held a faculty position with the Johns Hopkins Part-Time Engineering and Applied Sciences Program, where she received the 2000 Excellence in Teaching Award.

Serving nearly five years with the OSTP, Flatten branched

beyond the scientific disciplines of her fiber optic PhD research to manage a breadth of international S&T initiatives involving government, academia, and industry on behalf of the President's Science

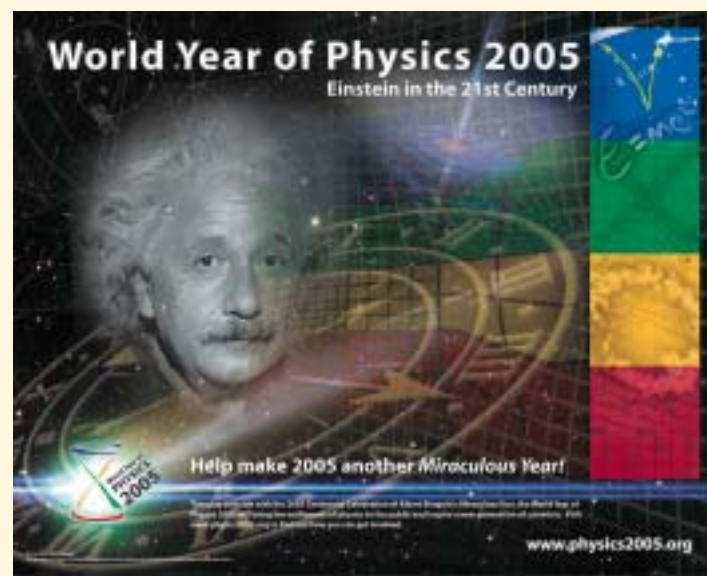


Photo Credit: Lalena Lancaster

Advisor. As OSTP's lead on US-Russian scientific relations, she particularly focused upon US-Russian physics cooperation, where she promoted new opportunities for collaborative research and worked with diverse government representatives at all levels to remove obstacles to establishing a Memorandum of Understanding in High Energy and Nuclear Physics. Her responsibilities have also required multiple trips to Moscow for meetings with Russia's S&T Ministry to establish high-priority scientific issues for the US-Russia Joint S&T Committee, co-chaired by Russia's S&T Minister and the US President's Science Advisor.

In addition to her bilateral activities with Russia, Flatten was responsible for bringing together multiple Federal agencies to advance UNESCO's S&T activities after President Bush

See FLATTEN on page 4



Free WYP Poster Inside

Included in this month's APS News is a poster advertising the World Year of Physics, which will take place in 2005. But it's not early—there is good reason to display it in 2004. The whole idea of the World Year of Physics is to get the word out about the importance and excitement of physics to the general public. And the only people who can do that are the members of the physics community, who have to begin planning in 2004 if the effort is to succeed.

The poster is attractive, and worth putting up for that reason alone. But its main purpose is to remind our members, whether they are in industry, universities, or national labs, to participate in the 2005 celebration. Much more information, and suggestions for how to participate, are available at the WYP web site, www.physics2005.org.



INSIDE THE BELTWAY: A Washington Analysis

Holding the Reins of Power Doesn't Mean You're in Control

By Michael S. Lubell, APS Director of Public Affairs

It was supposed to be a slam dunk. The Republicans controlled the House, the Senate and the White House. And President Bush was riding high after the March invasion of Iraq toppled Saddam Hussein with few American fatalities.

Washington was poised for a GOP Trifecta: getting the President's budget passed on time and intact, enacting long-awaited energy legislation, and seizing Democratic turf by fixing Medicare and making prescription drugs available to the elderly.

By year's end, the Republicans had succeeded in achieving only the last goal. The Energy Bill remained stalled by regional differences over ethanol supports and MTBE indemnities. And most of the appropriations bills never made it through the Senate.

Democrats, as might be expected, offered little help. In the Senate, they peppered their rivals with sniper fire,



using parliamentary maneuvers and filibusters to tie up legislation, block several key judicial appointments and hold up selected Executive Branch appointments. They succeeded in their mischief because Republicans held a mere two seat advantage and, more often than not,

could not muster the 3/5 super majority need to close off debate.

At the start of the session, congressional leaders pledged to have all thirteen appropriations bills

See BELTWAY on page 3

Highlights

12

The Back Page

William A. Wolf on the impact of current visa restriction on national security.



Members in the Media

"You would never think going home and turning on the faucet that something so familiar could contain so many stories."

—Wendy Zhang, *University of Chicago, on studying how drops drip, The Baltimore Sun, December 1, 2003*

"There are some indications that the X(3872) may be the first example of a new type of subatomic particle, one where two more ordinary particles attach to each other, similar to the way atoms stick together to form molecules. If so, this is the first glimpse of a whole new realm of subatomic physics."

—Stephen Olsen, *University of Hawaii, The Honolulu Advertiser, December 3, 2003*

"At the present moment, there is to the best of my knowledge no model that explains all of the data."

—Lawrence Cardman, *Thomas Jefferson National Accelerator Facility, on the possible discovery of a five-quark particle, New York Times, December 30, 2003*

"Under the most favorable distribution model, we can say at the 95 percent confidence level that this first generation of gravitational wave detectors could register a neutron star merger every one to two years."

—Vicky Kalogera, *Northwestern University, Times-Picayune (New Orleans, LA), December 4, 2003*

"We don't basically know what 99 percent of the universe is. This mine is a telescope into that new world."

—Jordan Goodman, *University of Maryland, on plans to develop an underground laboratory in the Homestake gold mine, The Boston Globe, January 2, 2004*

"We'll never go to these stars. These cosmic rays deliver the material right to our doors."

—Bob Binns, *Washington University, on Trans-Iron Galactic Element Recorder, or TIGER, a cosmic ray experiment in Antarctica, St. Louis Post-Dispatch, December 25, 2003*

DEPORTATION from page 1

adjusting to permanent resident status.

Then in December 2002, the INS denied Djordjevic's appeal for asylum. The law requires applicants denied asylum to leave the country within 30 days or apply for a new judgment. Djordjevic's former lawyer failed to notify him, and left the country, dropping his case entirely. So the 30 days had long since expired by the time he learned of the denial.

On July 30, 2003, at about 5 a.m., when immigration authorities raided the family's house and arrested Djordjevic, he still did not know what the problem was.

He was taken to jail and held for months as legal proceedings dragged on, because the government considered him a flight risk. "That I was a flight risk was really a ridiculous argument," said Djordjevic. "When I heard that, it was like someone telling me snow is black."

Since Djordjevic's immigration troubles began in Michigan but he was being held in Virginia, the government raised arguments over which court had jurisdiction to release him on bond, complicating and delaying the case.

Djordjevic's lawyer, Douglas Wachholz, called the case one of the most complicated he'd seen in 30 years, though he added that "The

immigration system is fraught with problems. There's not a lot in the system that's clear."

During his months in jail, Djordjevic often felt discouraged by the seemingly endless legal battle and uncertain outcome, and was most distressed by the separation from his family, especially his two children, ages 5 and 7, who were not allowed to visit him.

"Every day I feel enormous pain and stress from not being able to hug my kids for so long time, and not even knowing when they will release me," he wrote in a letter from jail to Irving Lerch, then Director of APS International Affairs, and now retired.

Describing the conditions in Hampton Roads Regional Jail, Djordjevic wrote, "For four and half months I have not seen the daylight, or taken a breath of fresh air. Neon lights are always on in this place, so you feel like [you are] living in a deep basement."

Officers allowed Djordjevic only the core of a ballpoint pen to write with. An air conditioner constantly blasted air directly into his face as he tried to sleep. Authorities denied his requests for confession and communion with a priest from his Eastern Orthodox church.

"I felt I was halfway to the grave,"

See DEPORTATION on page 11

This Month in Physics History

February 9, 1990: Death of George de Mestral

Sardonic talk show host David Letterman delighted millions across the country when he attached himself to a wall of Velcro as part of his late night antics, inspired by a quirky bar-room pastime of tossing midgets onto similarly constructed walls. Today, Velcro is everywhere, rivaling the zipper in its ingenuity and the extent to which it has permeated our daily lives. But it wasn't your Uncle Milton (or Frank, or Harold, or any number of distant relatives that seek to lay claim to its origins) that invented this unique little gadget. It was a Swiss engineer named George de Mestral.

Born in June 1907 in Lausanne, Switzerland to working class parents, as a young boy de Mestral was fond of both the great outdoors and coming up with new inventions. In fact, at the age of 12, he designed a toy airplane and received his very first patent for it. By working odd jobs, he paid for his studies at the Ecole Polytechnique Federale de Lausanne, focusing on engineering. After finishing school he took a job in the machine shop of a Swiss engineering company, which still left him sufficient leisure time to pursue his first love of inventing.

In 1948, de Mestral took a two week holiday from work to go game bird hunting. While out with his Irish pointer in the Jura Mountains, he was plagued by cockleburs, which stuck relentlessly both to his hunting pants, and to his dog's fur. It was so difficult to disentangle the tenacious seed pods that de Mestral was intrigued, and examined them under a microscope. He noticed that the exterior of each burr was covered with hundreds of tiny hooks that "grabbed" into loops of thread or fur. Inspired by Nature's ingenuity, he conceived of a similar man-made fastener based on the design.

He conferred with numerous fabric and cloth experts in Lyon, France—then the worldwide center for the weaving industry—but most were skeptical that the idea would work. In his early attempts, the loops were too big for the hooks, or vice versa. But one weaver shared de Mestral's love



Photo Credit: Françoise and Charles de Mestral

George de Mestral, holding a strip of Velcro®

of invention and, working on a small loom by hand, managed to weave two cotton tapes that, when pressed

together, fastened just as strongly as the burrs did. Eventually de Mestral discovered that nylon, when sewn under infrared light, formed nearly indestructible hooks, and this eventually replaced cotton as the primary material.

De Mestral called his invention Velcro, from the French words VELours (meaning "velvet") and CROchet (meaning "hook") and applied for a patent with the Swiss government, which was granted in 1955; he received subsequent patents in Germany, Great Britain, Sweden, Italy, Holland, Belgium, France, Canada and the US. The trademark name Velcro was officially registered on May 13, 1958. By then, de Mestral had quit his job with the engineering firm and obtained a \$150,000 loan to perfect the concept. He established his own company, Velcro S.A., in Switzerland to manufacture his new hook and loop fasteners, which contained 300 hooks and loops per square inch.

Since mass production proved problematic with existing manufacturing technology, de Mestral designed a special machine to duplicate the hooks and loops. By the end of the 1950s, textile shuttle looms were able to mass produce the product. Introduced in 1960, Velcro was not an immediate success, but it was adopted by the aerospace industry as an aid to getting in and out of bulky space suits. But then manufacturers of children's

clothing and sports apparel realized the possibilities, and soon the company was selling over 60 million yards of Velcro per year, making de Mestral a multimillionaire. He died on February 9, 1990, and was inducted into the National Inventor's Hall of Fame in 1999.

From a purely scientific standpoint, Velcro belongs to a class of materials called polymers, which contain many chemically bonded units which are themselves bonded

together to form a solid. Traditionally made of out of nylon, Velcro can be made out of other materials as well, such as plastic, stainless steel and silver, which provide unique properties, such as flame retardance and the ability to withstand higher temperatures. Today, Velcro is

used in sneakers, backpacks, jackets, wallets, watchbands, blood pressure cuffs, and toys like child safe dart boards. It even helped hold a human heart together during the first artificial heart surgery.

But Velcro is more than just a convenient fastener for consumer goods. It is also an excellent example of the emerging field of biomimicry, which studies models and concepts found in Nature, and uses them as inspiration for new designs and processes to solve very human problems. Sonar is another example: the technology was inspired by the way whales and dolphins navigate in water, and how bats employ echolocation by emitting high pitched sounds to navigate in the dark. Some scientists are studying spider silk, which is ten times stronger than steel would be at that thickness, in hopes of imitating those properties. The ultimate goal of biomimicry is to create products, processes and policies that are well adapted to life on Earth in the long term.

Further Reading:

Official Velcro web site: <http://www.velcro.com>

Freeman, Allyn, and Golden, Bob. *Why Didn't I Think of That? Bizarre Origins of Ingenious Inventions We Couldn't Live Without*. John Wiley & Sons, 1997.

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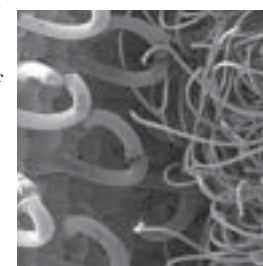


Photo credit: James Elstrom

Velcro® under the microscope

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The Sleep-Retardant Properties of My Ex-Girlfriend

By Ryan Shaun Baker

The importance of a good night's sleep cannot be overestimated. Getting more than 7 hours of sleep a night helps in retention and deep encoding of information, which is essential in graduate school. Also, getting sufficient amounts of sleep results in a better mood and a greater level of happiness. Given this, I decided to conduct a study on those factors which influenced the amount of sleep I was getting, in order to determine how to

get more sleep. One factor which I predicted would have especially large effects was my girlfriend at the time, Hermina.

Over the course of 28 consecutive nights, I collected data on the number of hours of sleep I obtained, and on a number of factors that might potentially affect the amount of sleep obtained. These variables included:

- Whether or not I had read in bed that night.
- Whether it was a weeknight or weekend night.
- Whether I had gone drinking.
- Whether I had attended a social event.
- Whether I had been feeling ill the previous day.
- Whether I had an academic deadline.
- Whether I was returning a graded homework assignment in the class I TA the next day.
- How late in the day my first meeting or class was.
- How much sleep I had gotten the night before.
- How much sleep I had gotten the previous two nights.
- Whether or not I had slept at Hermina's apartment or my own.

I used these variables in order to develop a regression model to explain the amount I slept. The final regression model was $S = -2.018H + 7.47$

In essence, what this model means is that I got an average of two hours and one minute less sleep when I slept at Hermina's apartment rather than my own. This is clear evidence for Hermina's sleep-retardant properties.

After obtaining these results, the appropriate course of action became clear. I spoke to Hermina and explained my study and its results, as well as the importance of getting sufficient sleep.

I concluded by explaining that, due to her sleep-retardant properties, I could not continue to sleep with her, an act she termed "breaking up."

I should mention that Hermina suggested that my data, being from an observational study rather than an experimental study, only shows correlations rather than causation, and that it was quite possible that I had only chosen to sleep at her apartment on nights when I was less tired, or that I had actually chosen to get less sleep on nights when I had come to her apartment.

Seeking the Right Balance

Lately our Zero Gravity columns have been overwhelmingly male-oriented. The current one is an example, as was last month's which had 3 physicists talking baseball. In November we reprinted a New Yorker column by Woody Allen so stereotypically male that we received a number of letters in protest.

We need help. We'd love to print humor about science written from a female point of view. But we've had a hard time finding any. Readers with examples they'd be willing to share can simply send them to letters@aps.org. We will be very grateful.

She proposed that, instead of taking hasty action, we conduct an experimental study where we flip a coin each night to determine whether I would sleep at her apartment or my own, in order to prove a causative effect.

Obviously, I rejected this suggestion. Although this study is insufficient to conclusively prove Hermina's causative role, this strong a correlation, and the importance of getting enough sleep, are sufficient together to suggest that action needs to be taken expeditiously.

BELTWAY from page 1

ready for the President to sign by October 1, the beginning of Fiscal Year 2004. But by June it became clear that, although the House might be able to meet the deadline, the Senate surely wouldn't.

As the dog days of August approached, a new deadline was set: November 11, Veterans' Day, when Congress planned to adjourn for the year. That, too, turned out to be a dose of misplaced optimism.

Fiscal Year 2004 began with only three appropriations bills signed into law: Defense, Homeland Security and the Legislative Branch. The rest of the government went onto a month-long Continuing Resolution. For civilian science, that meant that no new projects could be started.

On October 31, Congress was forced to pass another Continuing Resolution, since Senate appropriations action remained stalled. Legislators would repeat the process three more times, before both houses adjourned at the beginning of December. By then, the President had signed only three more appropriations bills: Military Construction, Interior and Energy and Water. And congressional leaders had given up all hope of passing the remaining seven bills individually.

On November 25, House Senate conferees announced a deal on an Omnibus Bill to fund all of the programs left hanging. The House returned from an extended Thanksgiving recess for one day on December 9 and adopted the measure, leaving it ready for January Senate consideration.

Apart from setting a record for deficit spending, the \$373 billion bill established a new mark for congressional pork, by some estimates,

I would like to conclude by encouraging others to embark on this sort of data-collection activity in their own lives. By helping me identify and eliminate the foremost factor reducing the amount of sleep I get, it has enriched my life. I believe it will enrich your life as well.

Ryan Shaun Baker is with the Human-Computer Interaction Institute at Carnegie Mellon University.

References

1. *Are You Getting Enough Sleep?* [pamphlet], University of Iowa Student Health, 2001.
 2. *Wellness: A Lifetime Commitment*, Patricia A. Floyd, et al., Hunter Textbooks, 1991.
 3. *Uncoupling: Turning Points in Intimate Relationships*, Diane Vaughan, Vintage Books, 1990.
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almost \$40 billion worth. Without a doubt this left bean counters at the Office of Management and Budget fuming. And it exploded the myth that only Democrats are big spenders, especially when it comes to parochial district and state projects.

The first session of the 108th Congress might not have been the exemplar of good government, but science came out of the legislative chaos in far better shape than most Beltway pundits thought it would. Many of us were convinced that Congress, faced with a tsunami of red ink, would heed White House demands for discretionary budget restraint and trim science funding. That did happen in the case of the Defense Department's 6.1 basic research program which took a 0.9% hit, the NIST labs operating budget which lost 2.0% and USDA research programs, which absorbed a 5% cut.

Elsewhere, though, science budgets expanded modestly: by 3.1% at NIH, 3.6% in the case of the DOD's 6.2 applied research program, 3.8% at the DOE's Office of Science, 5.0% at NSF and 5.7% at NASA Science, Aeronautics and Exploration.

One big loss occurred on the authorization side. The R&D portion of the Energy Bill would have set the DOE Office of Science on a doubling path, mimicking the NSF authorization legislation that the President signed into law in December 2002. Whether Congress will be able to break the Energy log jam during the second session and establish the principle that the interdependence of the sciences demands parity in funding research across disciplines remains to be seen. What seems more likely is that legislative chaos will be the norm once again during 2004.

Editor's Note: Please send ethical questions for Jordan Moiers or comments to: ethics@aps.org, or by mail to Jordan Moiers, c/o APS News, One Physics Ellipse, College Park, MD 20740. Contributors should identify themselves, but their names and addresses will be held strictly confidential unless they request otherwise. The opinions expressed in this column are not necessarily those of either the APS or APS News.

Here's a real dilemma, and how I handled it (not quite right).

While waiting for a referee's report on a paper of mine, I received (from the same journal) for review a paper with substantial overlap (but obviously independent of mine). The subject was [a field of theoretical physics] in which reviewing is notoriously capricious and often malicious. I was afraid that my paper would be rejected, while I knew, based on a casual glance, that I would write a favorable review of the paper submitted to me. In that event, the author of the other paper would receive priority and all the credit, even though we had both done similar work, independently and simultaneously. What should I have done? Should I have withdrawn as referee of the paper sent me (relieving me of the conflict of interest, but exposing the other author to a possible negative review, and myself to the risk that he would receive a favorable review and myself a negative one)?

What I actually did was to delay reviewing the paper sent me until I received a review of mine, which turned out to be favorable. Then I immediately wrote a (justified) favorable review of the paper sent me. How could I ensure that both papers were published promptly, so that credit would be shared, without exposing either myself or the other author to the risks of an unpredictable review?

(Name and address withheld)

Jordan Moiers responds:

As you point out, the way that you handled your dilemma was not quite right. I understand your concerns; peer review is hardly perfect, and may indeed be capricious and malicious on occasion. But the best way to ensure the integrity of a system based on mutual trust of professionals is to strive to maintain our individual integrity. Although the outcome in this particular case was benign, in delaying your review you potentially exposed yourself to the temptation to commit even greater transgressions. After all, what would you have done if your own paper had been rejected while you sat on the paper you were asked to referee? Would you have been tempted to write an unfavorable review of a paper (which you believed should have been published) in order to level the playing field? Pardon me for pointing out the obvious irony, but the very act of delaying your response effectively contributed to the capriciousness and maliciousness that concerned you in the first place. There are, however, better reasons than my nagging for you to approach the dilemma differently than you did, as *Ask the Ethicist* discovered in a recent interview with Stanley Brown, editorial director of APS journals. "Simultaneous submissions of papers with significant overlap are fairly rare," says Brown. "Sometimes we learn about the overlap from the authors themselves. Usually the journal editors discover the similarity." There is no guarantee that journal editors will catch every instance, but Brown believes that they catch most of them. In the case of *Physical Review Letters* in particular, editors are assigned to oversee submissions based on subject matter, and they are very likely to notice similarities between papers.

Once they identify papers with significant overlap, editors will often arrange to send the submissions together to the same referees, ensuring that the papers get consistent treatment. Assuming that similar papers are accepted for publication the same issue of a *Physical Review* journal, the papers are generally published back-to-back in order of the submission date. The discovery of the top quark at Fermilab was one notable instance in which simultaneous, similar submissions were published adjacently. Should you have recused yourself from refereeing a paper similar to your own? "No," says Brown. "Referees should certainly make us aware of potential conflicts, but it doesn't necessarily pose a problem. We have had referees step down of their own accord for that reason, although it's not very common. We can potentially coordinate things to ensure that the process is equitable." Historically, there have been many occasions that independent scientists have proposed theories or announced discoveries essentially simultaneously. If anything, the frequency of simultaneous submissions of similar works seems likely to increase thanks to the rapid communication that is the hallmark of the information age, as well as the free flow of ideas promoted by conferences and workshops. I hope you take some comfort in the fact that Stanley Brown and the other APS journal editors are prepared to handle such events as fairly as possible.

Finally, you should bear in mind that while a single referee's opinion is highly influential, you cannot guarantee that a paper will or will not be published based on your actions. Nor can you ensure that either your own paper or one that you are refereeing will not be subject to an unpredictable (i.e. unfavorable) review by another referee. That's the great thing about the peer review system when it's working properly—no single person has absolute control over the decision to publish. On the other hand, by making the journal editors aware of the situation you can improve the likelihood that both papers will be addressed in a uniform fashion. In the event that you again find yourself reviewing a paper that you believe has substantial overlap with another paper under review (whether it's yours or someone else's that you may be familiar with), you should let the journal editors know about it as early as possible. You'll keep your conscience clear while helping to make sure that the occasionally imperfect peer review process is a little less capricious and malicious.

LETTERS

UC Campus Maintains Commitment to Physics

We are writing regarding the article "California Physics Departments Face More Budget Cuts in an Uncertain Future" [APS News, December 2003] to correct some confusion regarding UC Davis and to convey the campus's commitment to its physics department.

The article's *Science* magazine quote regarding UC Davis' potentially losing 72 faculty slots actually refers to the College of Agricultural and Environmental Sciences, which suffered a state-targeted 30% budget cut. The general campus fared much better as enrollment growth has so far been funded in full and UC Davis is in a growth phase—its freshman class is the largest in the UC system this year and has been for the past several years.

Because of this growth phase and because the administration recognizes the importance of the quality of the physics department to the campus as a whole, the department is being allowed to maintain the momentum of its current buildup.

Hungarian Ruler not a Fascist Dictator

In "This month in physics history" [APS News, November 2003] we are told that in the 1920s "Hungary was ruled by a virulently anti-semitic fascist dictator".

This is false.

Admiral Nicolaus Horthy was elected according to internationally accepted and constitutional rules to become Regent of Hungary, and he led the country by a then acceptable (but imperfect and occasionally repressive) form of parliamentary democracy from 1920 to 1944 (when he was arrested and imprisoned by the German Nazis).

He was autocratic and an avid anticommunist (quite understandable considering the terrible six

Not Wise to Ignore Engineering

I would like to comment on the report of the Energy Department 20 year plan on the back page of your December 2003 issue. I am concerned that the top priority was given to the subject of fusion power.

It is customary in R&D projects that involve major future engineering problems to work on the present technical problems and delay the consideration of the engineering. In effect saying "Lets cross those bridges when we come to them". The purpose of this note is to say that procedure is not always wise.

My illustrative example stems from the Air Force Nuclear Airplane program many years ago. The Navy had found successful applications for nuclear power in the Nuclear Submarine and the Nuclear Carrier. The Air Force decided to explore the possible applications to its mission. A substantial team of scientists and engineers was assembled in several different technical areas. Early in the program someone remarked that of course the Nuclear Airplane must not crash. The reaction of the participants in the program was that the problem lay far in the future and not an appropriate consideration at the time.

It is fortunate that technical

Earlier this year the department successfully recruited National Academy of Science member Zach Fisk in condensed matter experiment and also completed its Cosmology Initiative, highlighted by the recruitment of NAS member Tony Tyson.

On the heels of the Cosmology Initiative, the department launched the High Energy Frontier Theory Initiative (HEFTI). It is recruiting now for HEFTI and for a high energy experimentalist to prepare for the LHC discovery era.

When Zach Fisk and Tony Tyson come onboard in 2004, one junior-faculty slot each will be allocated in their respective areas. Even in these difficult budget times, UC Davis remains committed to strong support and growth for our physics department.

**Barry Klein,
Winston Ko
Davis, CA**

The authors are respectively Vice-Chancellor for Research and Dean of Mathematical and Physical Sciences at UC Davis.

months suffering of the country during a "Proletarian Dictatorship" preceding Horthy's coming to power).

In fact, the first two years of his reign were marked by some low-level populist folk-violence, which he eventually put under control. He was never "virulently anti-semitic". In fact, during the apocalyptic year 1944 he saved the lives of about 200,000 Jews in Budapest. Despite his many shortcomings and errors, he was never a "fascist" and never a "dictator". History should not be rewritten by journalists — nor indeed by anybody else.

**Paul Roman
Ludenhause, Germany**

problems forced the cancellation of that program after only a few years, but even so it absorbed a not insignificant portion of the Air Force R&D budget. Suppose that technical problems had not stopped the project. It might have gone on for years, finally culminating in a first flight test airplane. Now is the time to cross that bridge. We can always hope for breakthroughs that will minimize a problem, but gravity will not likely go away. Human error and human inability to see the future are problems that will not go away. At that time an assessment of probabilities of a crash and the resultant damage to the environment would have almost certainly led to the final cancellation of the program.

I am aware that various groups have given some consideration to the future engineering problems of fusion power, often from an adversarial viewpoint. It seems to me that it is appropriate at this time for the Department of Energy to assign some group to make an honest and thorough assessment of those problems with the same vigor that is being put into solution of today's technical problems.

**Phillip R. Carlson
Pasadena, CA**

What Really Happened That Morning in Georgia?

Regarding the letter from Berol Robinson in the November APS News, under the heading "Saw Flash Two Time Zones Away", I must disagree with the conclusion that the writer saw light from the first nuclear bomb explosion at Trinity, New Mexico.

As a person who has seen a ship with a mast 50 feet high disappear over the horizon at a distance of 20 to 25 miles, I intuitively felt that it would be impossible to see light from the

Trinity explosion at Macon, Georgia.

Macon is approximately 23 degrees of longitude and 1,400 miles from the Trinity Site. A "back-of-the-envelope" calculation (aided by a pocket calculator) shows that the horizontal line-of-sight from Macon passes approximately 330 miles above the earth's surface at Trinity site.

Neither the explosion itself nor the light reflected from clouds over Trinity could have

been seen at Macon.

Some of the brilliant light from the explosion may have traveled upward to the altitude of 330 miles and in principle have been viewable from Macon. But there is effectively nothing at that altitude to scatter the light into a path toward Macon. Ninety-nine percent of the atmosphere is below 31 miles altitude.

**Bernard D. Kern
Lexington, KY**

Berol Robinson replies:

To interpret this unique observation, I assumed a light path from Trinity to my eye somewhat different from that suggested by Professor Kern. I imagined forward scattering in/on a layer at altitude H, about halfway between Trinity and Warner Robins (over eastern Texas, between Dallas and Texarkana). H comes out to be about 85 km.

What is up there?

The body of reported sightings of light-scattering layers at high altitude dates from before the turn of the 20th Century; they were invoked originally to explain the after-twilight phenomenon called "noctilucent clouds".

An early review by Robert K. Soberman appeared in *Scientific*

American in June, 1963. All scattering layers above about 50 km are now called mesospheric. Sunlight reflected from mesospheric clouds has even been seen from above, according to the reports of Soviet Cosmonauts.

Gary Thomas published an extensive review paper in *Reviews of Geophysics* in November, 1991 (pp. 553-575).

There is in fact a practical application of the mesospheric layer in astronomy. Reflecting telescopes with adaptive optics (in which the shape of the parabola is continuously modified in an effort to minimize the effect of atmospheric turbulence) require a relatively bright "guide star" to drive the adaptive optics system. But a suitable guide star is not available

in every field of view. An artificial guide star was developed for the Lick Observatory by Claire Max and her co-workers at Lawrence Livermore National Laboratory (see p.1649 in the September 12, 1997 issue of *Science*).

Laser light, at the wavelength of the sodium D line, is projected upwards through an auxiliary telescope fixed to the main telescope; it is resonantly absorbed by sodium in the mesospheric layer at about 95 km and re-emitted to form the artificial guide star.

When viewed from the side, the artificial guide star is about three kilometers long (thickness of the mesospheric layer), but it varies from night to night in intensity, in height and in length.

Stuyvesant Teachers Definitely Above Average

Regarding the Viewpoint by Howard Greyber on Stuyvesant High School [APS News, December 2003]: for the most part, it was a pretty good overview of my time spent at Stuyvesant (Class of February, 1951), but I am disappointed by the claim that the teachers were average.

One could not be any further

from the truth in this respect. All of the teachers with whom I interacted were of a very high caliber; they were extremely dedicated educators and always spent much of their own time with us (after hours) to be sure we understood and absorbed everything they threw at us.

In my own case, I took two years

each of chemistry, biology, and physics. Where else could one have such an experience? Certainly not at Bronx Science or at Brooklyn Tech. Our program was as full as we wanted it to be and our teachers motivated us as no others could do.

**Jack Cazes
Boynton Beach, FL**

FLATTEN from page 1

announced that the US would rejoin.

She also led OSTP's management of US agency participation in the Global Science Forum of the Organization of Economic Cooperation and Development (OECD). This involved building and maintaining relations with the scientific community, industry and academia for a broad range of projects, such as the OECD's Task Force on Radio Astronomy and the Radio Spectrum to protect scientific research opportunities while supporting the satellite communications industry's commercial interests.

Flatten has served in OSTP during both the Clinton and Bush Administrations, and has joined the US President's Science Advisor for ministerial-level meetings throughout the world. Her international career opportunities and personal interests have entailed extensive travel to both developed and developing countries on 5 continents.

As one of her major accomplishments while serving with OSTP, Flatten designed, directed and launched a national awareness cam-

paign, "Global Science and Technology Week (GSTW)." Here she recruited and led over 40 public and private organizations, including essentially every Federal S&T agency, to develop new educational materials, high-profile events, and national activities to excite K-12 students across the United States about the global nature of science. GSTW conveyed to young Americans that by studying math and science in their local communities, they are also part of a larger international science and technology enterprise. She also designed and directed GSTW's successor, "Excellence in Science, Technology and Mathematics Education Week (ESTME Week)." ESTME Week was recently designated by OSTP as a national priority that should be permanently institutionalized under the National Science and Technology Council. Flatten is hoping to bring this experience with outreach to bear on the APS' planned activities for the upcoming World Year of Physics in 2005, among other areas.

Prior to joining the Federal

government, Flatten held private sector positions with high-tech corporations in Washington, DC, including Booz-Allen Hamilton and AT&T Solutions. In January 1998, she joined the Office of International Affairs at the National Telecommunications and Information Administration, which operates under the auspices of the US Department of Commerce. There, she collaborated with government and industry for telecom policy development in multinational settings such as the International Telecommunications Union (ITU) of the United Nations.

A year later, she was recruited to OSTP. "Having the chance to serve in the White House Office of Science and Technology Policy was a tremendous opportunity. I now look forward to applying my experiences from government, academia, and private industry to the international interests of the American Physical Society and to serving its membership as the Director of International Affairs."

ANNOUNCEMENTS

DRAFT WORDING
APS Bylaws Amendment*Regarding Electronic Approval of Council Resolutions*

Passed: First Council Vote: November 2, 2003

In 2003, the Council had two occasions to consider issues that were brought before it between meetings. It became clear that some sort of procedural guidelines were necessary to govern electronic discussion and voting on issues under these circumstances.

The APS Constitution and Bylaws Committee met via telephone conference call to draft such guidelines and have approved the following wording of an article to be added to the APS Bylaws. The draft wording of this amendment was approved by the Council on November 2, 2003, with the provision that the following changes be included: "... a statement that the Executive Officer will attempt to communicate with Council members regarding votes using all reasonable means and the three days indicated in paragraph 5 be changed to read "three working days".

APS members may address their comments on this amendment to: governance@aps.org.

ARTICLE XV — Electronic Approval of Council Resolutions

Time sensitive items of some urgency may be brought to the Council electronically for discussion and vote between scheduled meetings. In such cases, the following procedures should be used:

1. Upon approval of the President, a resolution may be sent to Council members for discussion and action.
2. Members of the Council should be given 5 days for discussion before any vote is taken.
3. If 10% or more of the Council members object to conducting a vote on the resolution electronically, the procedure will be suspended and the item placed on the agenda for the next regularly scheduled Council meeting.
4. If the President deems that the issues raised during the discussion period merit it, he or she may appoint a small committee to revise the resolution in keeping with the discussion.
5. The resolution, in its original or revised form, will then be sent to the members of Council, who will have 3 working days to vote. The Executive Officer shall use all reasonable means to contact every Council member. For the electronic vote on the resolution to be valid, at least 60% of Council members must vote, and the majority of those voting must approve it.

Prize & Award
Nominations**Otto Laporte Award****DEADLINE: 02/10/04**

Established as an APS award in 1985, but existed as a division lectureship prize for twelve previous years. The award is to recognize outstanding contributions to fluid dynamics and to honor Otto Laporte.

Purpose: To recognize outstanding research accomplishments pertaining to the physics of fluids.

Fluid Dynamics Prize**DEADLINE: 02/10/04**

Established in 1979 with support from the Office of Naval Research.

Purpose: To recognize and encourage outstanding achievement in fluid dynamics research.

Marshall N. Rosenbluth
Outstanding Doctoral
Thesis Award**DEADLINE: 04/01/04**

Established in 1985 (originally as the Simon Ramo Award) and endowed in 1997 by General Atomics Inc.

Purpose: To provide recognition to exceptional young scientists who have performed original thesis work of outstanding scientific quality and achievement in the area of plasma physics.

Contact Information:<http://www.aps.org/praw/>**New Job Web Site for APS**

If you're looking to fill or find a job, the new APS Online Job Center at <http://careers.aps.org> is your one-stop shop. Jobseekers and employers alike will find the APS Job Center, which now receives over a million hits from 20,000 unique visitors monthly, to be an invaluable resource.

The APS Job Center contains hundreds of new jobs posted monthly and offers a database of thousands of resumes. It covers all physics fields plus related fields such as materials science, computing, biology, chemistry, and engineering.

EMPLOYERS

Whether you're an HR manager or a member of technical staff looking to hire, you can take advantage of valuable services for a low cost.

For example, you can:

- Post multiple job descriptions
- Receive job applications online
- Track how often your job is viewed
- Fill out an Employer profile section, which allows company information to appear at the bottom of each ad you post.
- Create automatic resume alerts—when the perfect person for the job posts her resume
- Search the resume database by keyword and geographic location to find someone ideal for the position

JOBSEEKERS

Jobseekers have access to a variety of services that take the hassle out of finding a job that's tailored to their skills.

As a job seeker you can:

- Create your online profile once and allow prospective employers to find you, or;
- Maintain confidentiality until you are ready to apply for a position
- Search jobs by multiple criteria
- Apply for jobs directly online to save time and paper
- Store multiple copies of resumes for different kinds of jobs
- Create automatic job alerts—you'll be contacted as soon as your dream job is posted.

If you have any questions about any of the services, please contact us at jobs@aps.org.

APS SEEKS HEAD OF MEDIA RELATIONS

The APS seeks a media relations professional to promote physics in the popular media. Based at APS Headquarters in College Park, MD, this position will develop and coordinate all media relations for APS.

Responsibilities include working as part of a team that identifies physics news stories, locates press contacts in the physics community, and pitches the stories to the national media.

Opportunities to travel exist.

The qualified applicant will have at least a bachelor's degree in science, and preferably additional scientific work experience (physics a plus).

Considerable experience interacting with the media is necessary. Excellent oral and written communication skills are required. Competitive starting salary and outstanding benefits package offered. Visit our website at: www.aps.org.

To apply, send cover letter including salary requirement, resume, and contact information for three professional references via e-mail, fax or conventional mail to:

American Physical Society

One Physics Ellipse
College Park, MD 20740-3844
Attn: Joe Ignacio, Director of Human Resources
E-mail to: personnel@aps.org
Fax to: (301)699-8144

APS Membership Department News**New Member Benefit for 2004**

APS will offer a new journal benefit to members in 2004. APS Member Article Packs will be available for \$50, allowing members 20 APS journal article downloads (excluding *PROLA* and *RMP*). This is a considerable savings on single APS article downloads. Look for more information in your 2004 Renewal Packet.

In addition, APS members can already purchase AIP Journal Packs at a 50% discount on <http://store.aip.org/articlepacks/>.

2004 APS Member Directory

Members will be contacted at the end of the year and asked to request either a paper or CD-ROM copy of the 2004 Directory. Members will have to notify APS of their choice by February 23, 2004, to receive one of the available versions. Online directory access is always available at <http://www.aps.org/memb/enter-directory.html>.

Contact Information:
301-209-3280

APS Bulletins

Starting in 2004, the APS Membership Department will no longer be processing orders for APS Bulletins. The paper version will be distributed onsite at meetings to attendees. Open access to all APS Bulletins (current and archived) will be available online at <http://www.aps.org/meet/>.

membership@aps.org

DEPORTATION from page 2

he said in an interview at his house in January. "It was another world. I don't wish this experience to my worst enemy. It was painful, stressful, and humiliating, especially the separation from family."

Soon after Djordjevic's arrest, Thorpe and other physicists who had known Djordjevic in graduate school alerted the APS to his case. APS President Myriam Sarachik wrote a letter to Secretary of Homeland Security Tom Ridge asking him to support Djordjevic's release, and CIFS wrote letters to the Bureau of Immigration and Customs Enforcement. Friends and supporters also set up a website, which includes news of the case, a petition to Tom Ridge, and a request for contributions to Djordjevic's defense fund. [People can contribute to the Djordjevic defense fund at <http://www.freedjordj.org>].

Lerch said he sent letters to various officials, especially immigration authorities and the Department of Homeland Security. He also attended a hearing in the Virginia Eastern District Court, and wrote an affidavit arguing

that Djordjevic was a productive member of society, whose talents were very much needed in the US.

Edward Gerjuoy, chair of CIFS, was also active in trying to help Djordjevic. "The argument I've been trying to make, and we did make in our letters, is that here is a PhD physicist, educated in this country, at public expense. He has been gainfully employed. The government has made no allegation that he was involved in terrorism, or that he has a criminal record," said Gerjuoy, who is both a lawyer and a physicist. "Why are we deporting this guy? He has some extremely specialized skills that are very important to the US."

But all the letters APS sent "have gone into the void," said Gerjuoy. Either there was no response, or the response was a form letter that essentially said the government could give out no information about the case because of privacy issues. "We got no useful response from any government person we wrote to on this case."

Nonetheless Djordjevic felt

thankful for all the support he received. "I am just without words to express gratitude for the help I've already received from the APS and my colleagues, and also from neighbors. I had support from everyone but the government. They expressed compassion for me. That's what I see as the greatness of this country."

Finally, on December 23, after he had spent 146 days in jail, the 6th circuit court ordered Djordjevic released on bond. "I feel like I came back from dead," he said. "When I got out, I found myself in a paradise. When you come out, you really understand the beauty of this world. I still feel very strange. It's hard to explain."

Djordjevic's children, who had been told he was on a business trip, also perked up when he returned. "The kids started laughing like normal kids again only when I came home. They're so happy I'm here that they won't leave me alone."

Still, Djordjevic's battle is not over. An appeals court must now decide whether to deport him. His wife gets nervous every time the phone rings, fearing bad news.

Djordjevic worries about the possibility of being sent back to Serbia, which would mean uprooting his family, harming his career, and leaving the community he has become part of. "All major events in my life happened in this country. We feel this country is our home," he said. "I feel really blessed that I've met so many good people here. I feel even more attached to this country, in spite of my experience in jail."

After spending time reflecting on the case, Djordjevic does not see anything he could have done to prevent what happened. "I cannot think how I could do better. I did my best to comply with all the laws. I was simply another victim of the stressful period after 9/11," said Djordjevic.

People can help Djordjevic most now by publicizing his case, said Gerjuoy. "Essentially it's important that the government realize that this is an unpopular action, and one which is not only inhuman, from Djordjevic's standpoint, but also contrary to the best interests of the US."

Wachholz suggests people write

to Congress, and to the DHS. "People need to stand up," he said. "I think there's a greater threat to our liberties from our own government than from the terrorists."

While Djordjevic was extremely unfortunate, more cases like his may arise, said Lerch. "There are other people at risk because of the Patriot Act. There are a lot of people in jail who should not be. I think that this is going to continue to be a problem and may even grow as more and more people get caught up in this."

Lerch pointed out that half of physics doctorates granted in the US went to foreign-born scholars. "Clearly this immigrant talent is absolutely central to the health and welfare of our enterprise," he said.

"Every academic research community should monitor its members," Lerch said, "When a case comes before them, they should do everything they can to support their colleagues and their families. Very often, they can provide expert testimony to the courts. There's a great deal that any community can do."

The Back Page

The Impact of Current Visa Restrictions on National Security

By William A. Wulf

In the last few years the Presidents of the National Academies¹ have issued joint statements on various subjects. Three of these statements^{2,3,4} have dealt with differing aspects of maximizing our national security by achieving the right balance between apparently conflicting goals.

There is no question that the balance point between openness and secrecy, for example, needed to be re-examined subsequent to the attacks on the World Trade Center and the Pentagon. The balance that made sense for the cold war and involving two technologically advanced superpowers was not appropriate for the asymmetric relation between a superpower and a terrorist network. But it still needs to be a *balance*! Our security depends on both protection of certain sensitive information and on continual advances in science and technology—and those advances in turn depend upon an appropriate open exchange of information.

In much the same way, we need to re-examine the balance point for the ease with which foreign scientists and engineers can travel to this country. As with openness it is a balance point. As the Academies' Presidents said in our December 2002 statement: "To make our nation safer, it is extremely important that our visa policy not only keep out foreigners that intend to do us harm, but also facilitates the acceptance of those who bring us considerable benefit."

Recognizing that some measures may need to be taken to reduce the possibility that a terrorist will be admitted to the country, we need to also recognize that keeping everyone out would deprive us of the many contributions that immigrants have made to our security and prosperity. Without people like Einstein, Fermi, von Braun—all immigrants—we would not have become a superpower, nor would we enjoy the scientific and engineering leadership from which our prosperity flows. More recently, students have come to our major research universities, stayed, and become leaders of academia and technology-based industry. Those that return to their home countries and attained leadership positions are also among our best ambassadors.

Although there is some evidence of improvements in processing visas, the list of those that have been prevented from entering the country is, at best, embarrassing. It includes eminent scholars that have been to the US many times before, including foreign members of the Academies. Large numbers of outstanding students who contribute to both our research enterprise and our economy have also been excluded.

Unfortunately, the data is still inadequate to make an accurate assessment of the impact of the new,



William A. Wulf

stricter visa regulations on the travel of scholars into the US. The head of the consular affairs office at the Department of State has testified before congress that 90% of the cases are being cleared within 30 days.

At the same time, however, the Department of State statistics show that the number of visas issued for all visitors to the United States has dropped from 6.9 million to 4.9 million, since 2001. There is no way to know whether the decline for scientists and engineers is greater or smaller than this approximately 30% overall decline. It's also impossible to know whether the decline is due to discouragement with the process, a feeling that the US may not be the free, open society that we have claimed to be, or something else.

The survey conducted by The Association of American Universities (AAU), NAFSA: Association of International Educators, and the National Association of State Universities and Land-Grant Colleges (NASULGC) shows that the visa application and granting processes dictated by the government are beginning to have a discernable impact on the number of international students on US campuses and could lead to a significant decline in the decades-long increase in international students and faculty on US campuses.

There is also a host of anecdotal evidence of other unintended side effects of the current policy that may be damaging the US innovation system. At least some international research conferences, for example, are being shifted to sites in other countries because of the perceived hassle of the present visa system.

Specifically, for example, the International Astronomical Union and the International Union for Pure and Applied Physics are concerned enough about the problem to recommend that their meetings not be held in the United States.

Similarly, there is fear that future major international instrumentation will not be sited in the US because they will become inaccessible to foreign researchers.

Certainly some existing collaborations between US and foreign researchers have been strained.

Alas, we have no data on the extent of these problems.

At least some of the problem arises as much from implementation as from policy. If a consular officer grants a visa to an individual who later commits a terrorist act, that officer may be subject

to department review and serious disciplinary action. There are no offsetting incentives to facilitate scientific or technical exchanges.

Thus, there is a strong incentive for the consular officer to be conservative even though that might not maximize the national interest. Compound this with the fact that the State Department has not been given adequate resources to meet the increased workload, so the treatment of applicants is sometimes given short shrift.

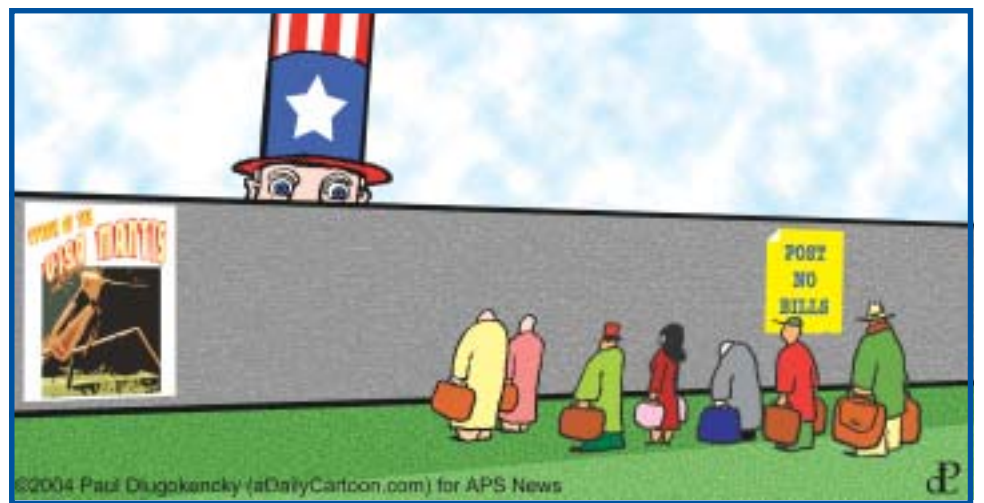
Finally, there is also considerable evidence that the implementation of policy is not consistent around the world. Some embassies, for example, hold passports while the process is being adjudicated, making it impossible for that person to leave the country until the process is complete.

To help with difficult cases, the National Academies have created an International Visitors Office (IVO). The cases monitored by the IVO show a similar trend to that reported by the AAU *et. al.*

Overall, our sense is that the process of getting a visa has improved slightly, and that those people with sufficient time and patience will eventually prevail in obtaining a visa. The IVO is seeing more and more long-term cases getting cleared each week as the communication between agencies, such as State and the FBI, improves.

been done. We also need to recognize that the visa situation is not occurring in a vacuum. Together, the visa policies and implementation, the USA Patriot Act, the SEVIS (Student and Exchange Visitor Information System) program, etc., are projecting a collective image that is not inviting.

Recent testimony at hearings sponsored by the Senate Foreign Relations Committee indicated that restrictive visa policies are taking a severe toll on the tourist industry. Witnesses spoke about the image of "fortress America." The hassle of showing up in person for a cursory interview (in Beijing, five overworked consular officers conduct 700 interviews per day!), being subjected to fingerprinting, and paying a non-refundable application fee of



Sorters Tackle Record Number of Abstracts



Photo Credit: Lalena Lancaster

Legions of dedicated volunteers are shown hard at work at APS headquarters in December as they sort the record-breaking 6100 abstracts for the March meeting in Montréal, March 22-26.

Nonetheless, the average time to clear these "difficult" cases is more like 6 months than 30 days.

Some improvements in the system are worth mentioning, especially the State Department decision on 7 October 2003 that allows security checks to be good for one year. In other words, those who have successfully gone through a "Visas Mantis" security check (the process by which the government reviews visa applicants whose work or studies involve sensitive technologies) may now leave the country and return without undergoing a new Mantis review for a period of one year.

Another positive trend is the willingness of government officials to begin to work with the National Academies on a system that will recognize foreign scientists who are participating in international, government-sponsored research collaborations and provide these scientists with long-term, multiple-entry visas. These discussions are just beginning and but we are pleased with the positive reactions we have received so far.

Despite these potential improvements, however, we need to recognize that damage to the US reputation as an open and welcoming country may have

\$100 causes many people to conclude that coming to the United States is simply not worth it—even if we can reasonably assure success once the application is in the works.

The goal should be to maximize our national security! The only way to do that is with a sensible policy balance that keeps out those that would do us harm while admitting those that will enhance our security. We haven't achieved that balance yet. It is urgent that we do so. At risk is our country's leadership in education and research in science and technology. Also at risk is our economy and national security.

William Wulf is the president of the National Academy of Engineering, and vice chair of the National Research Council.

Footnotes

1. *The National Academy of Sciences, The National Academy of Engineering, and the Institute of Medicine.*

2. *Balancing Openness and Secrecy at the US Weapons Laboratories, November 19, 1999*

3. *Science and Security in an Age of Terrorism, October 18, 2002.*

4. *Current Visa Restrictions Interfere with US Science and Engineering Contributions to Important National Needs, December 13, 2002.*