Latest Research in BECs, MgB$_2$, Among March Meeting Highlights

The biggest physics meeting of the year, the APS March Meeting, was held March 18–22, 2002, in Indianapolis, Indiana at the Indianapolis Convention Center. An estimated 5000 talks were delivered.

The March Meeting is traditionally a showcase for important fundamental physics as well as the kind of practical research that shows up — five, ten, or even 20 years later — in the productive labor-saving devices we take for granted.

This year's conference was no exception, as speakers presented the latest research results in Bose-Einstein condensates (page 3), physics-based tools for medicine (page 6), and the future of information technology. In addition to the technical sessions—several highlights of which are described below—there were also a series of workshops on Sunday, including one on career planning and development (page 3) and successful strategies for women physicists (page 1).

**Hopes for a Hole-Doped Metal Superconductor**

Last year a new record was set for a superconductor transition temperature, 40 K, for an all-metal compound. Much more is known now about these MgB$_2$ materials. There is now hope that a related compound, LiBC, might operate at temperatures at high as 100 K, as much as twice as high as MgB$_2$.

At the APS meeting, Warren Pickert of UC Davis pointed out that the interactions that are the essence of superconductivity, the Cooper pairing, can arise from the interactions between electrons and concerted flexings (phonons) in the material lattice, are potentially twice as strong in LiBC than in MgB$_2$, especially if holes (the momentary vacancies left behind by departed electrons) can be injected into the sample by a “field-effect” process.

This is a common procedure in transistors, where a gate electrode forces holes into a channel between the other two electrodes, thus enhancing the conductivity in that region, inducing a metallic state and producing superconductivity.

A field-effect setup helped to boost the superconducting transition temperature in a crystal of carbon-60 molecules up to 117 K last year.

**Tera赫z Imaging: A New In-spezion Technology**

Physicists are still discovering useful regions in the rainbow spectrum of electromagnetc radiation. One such region is the realm of terahertz radiation. It is a common procedure in physics to compare differences between regions around the world, many new insights were gained. A list of these tutorials was passed unanimously by the delegates and can be read, along with a further list of recommendations, at [http://www.if.ufrgs.br/~barbosa/conference.html](http://www.if.ufrgs.br/~barbosa/conference.html).

Concern over the low number of women in physics worldwide was one of the underlying themes at a groundbreaking international conference on women in physics, held 7-9 March in Paris, France, organized by the International Union of Pure and Applied Physics (IUPAP). More than 300 delegates — about 15% male, and another 15% or more women in their early careers — in 65 national teams gathered to discuss such issues as attracting more girls into physics, balancing family and career, and getting more women into the physics leadership structure. Their job was not only to try understanding the severe under-representation but also to develop and implement strategies to increase women’s participation in the physics community. By comparing differences between regions around the world, many new insights were gained. A list of these tutorials was passed unanimously by the delegates and can be read, along with a further list of recommendations, at [http://www.if.ufrgs.br/~barbosa/conference.html](http://www.if.ufrgs.br/~barbosa/conference.html).

**Women Physicists Explore Survival Skills at March Meeting**

Looking around at a physics conference like the March Meeting, it is not difficult to see that there are not many women attendees. Indeed, it has been no secret that women are severely under-represented in physics. To address this issue, the Committee on the Status of Women in Physics (CSWP), for the first time, hosted a special workshop on the Survival Skills for Successful Women Physicists in conjunction with the March Meeting. The hall-day workshop was held on Sunday, March 17 and was chaired by APS Executive Officer Judy Franz and Dongji Li of Argonne National Laboratory. A total of 42 people, evenly distributed among all three shifts.

**Physicists Achieve Molecular BEC, Coexistent “Fermi Sea”**

A molecular Bose-Einstein condensate (BEC) has been achieved by Carl Wieman and his colleagues at the University of Colorado. Wieman reported at the APS March Meeting in Indianapolis that his team had observed a quan-um superposition of diatomic molecules and dissociated atoms in a trap.

**Highlight**

Mike Devries (a high school student at South Anchorage High School) was named the APS Student Poster Award Winner.

**Survival Skills at March Meeting**

Women Physicists Explore

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While the conference may be over, the work certainly isn’t. The teams returned home with renewed commitment. “I have never been to any conference as interfering as this one… from the beginning to the end,” wrote Corinna Kaucsh, a delegate from PARIS WORKSHOP on page 4.
"It’s important to stay on top of the industry, but if you bet wrong, you can be out of business in a very short time."—George Neustadt, Harvard, on why nanotechnology will be important to industry. The Futurist, March 1, 2002.

What the Internet allows us to do is open a whole new realm of tests that are either inaccessible or would be very difficult to conduct on Earth."—Robert Bluhm, Colby College, UPSI News March 6, 2002.

We’ve chosen what on the face of it ought to be the world’s worst laser medium—a reflective powder that’s difficult to energize—and we’ve managed to get continuous ultraviolet laser activity for the first time.


"There’s no doubt in my mind that superpositions are real. This is one of the essential properties of matter."—Anton Zeilinger, University of Vienna, on the difficulty of detecting quantum superpositions. New Scientist, March 9, 2002.

"I didn’t realize when I woke up this morning that I was going to die tonight."—Eric Cornell, NIST Boulder, on his testimony proving science education, we've managed to get continuous ultraviolet laser activity for the first time.


"If the pitcher’s mound was level with home plate, it would be harder for the pitcher to throw consistent strikes. Players intuitively know how to take into account gravity."—Alan Nathan, University of Illinois, Washington Times, March 14, 2002.

"The U.S. has conventional military forces that dwarf those of all possible adversaries combined. If the U.S. plans to resort to nuclear weapons to fight far weaker opponents, what does that tell those who do not yet have nuclear weapons?"—Kurt Gottfried, Cornell University, on plans by the Bush Administration to bolster U.S. nuclear arsenal. USA Today, March 14, 2002.

"If you tell me there’s a warhead in New York, it’s just hopeless. You just hope you never get to the point where you have to take down one of those in a city."—Steven Feffer, University of Maryland, on the difficulty of detecting weapons of mass destruction.

This Month in Physics History

May 24, 1844: Morse and the Telegraph

Sometimes technological innovation can come from the most unlikely sources. Samuel Finney Breese Morse was born in Charlestown, Massachusetts, in 1791, the son of a local pastor. He was not trained as a scientist, nor was he a professional artist. Although largely an indifferent student, his interest was piqued by the then newly-developing subject of electricity. After graduating from Yale in 1810, he lived in England, studying art, exhibiting his work at the Royal Academy in 1813 and spending roughly 10 years as an itinerant artist specializing in portraiture, unaware that his passing interest in electromagnetism would eventually revolutionize global communication.

The electric telegraph makes use of the relationship between magnetism and electricity. By the early 1820s, the Italian scientist Alessandro Volta invented an electric current that made an electric current available. In 1820, the Danish physicist Hans Christian Oersted discovered that an electric current can cause a magnetic needle to move. This principle is the basis of the telegraph, in which a current is varied systematically according to a code. [A telegraph key is moved up and down; it makes or breaks an electric circuit and transmits a signal as a series of electric pulses.] In 1825 the British electrician William Sturgeon invented the electromagnet, and physicists William F Cooke and Charles Wheatstone, working together in Great Britain, used this discovery to develop a rudimentary telegraph in 1837.

Morse returned to the U.S. on the S.S. Siberia from another period of art study in Europe, Morse overheard a conversation about the newly discovered electromagnet and conceived his own version of an electric telegraph, which ultimately proved to be more successful than the British version for a number of reasons, most notably its simple operation and relatively low cost, and eventually was adopted as the standard technique Morse created his first model telegraph in 1835 and after the next several years perfecting his invention with two colleagues, Alfred Vail and Leonard Gale. His electromagnetic machine worked by clicking dashes and dots to create a break current between the machine’s battery and receiver. By 1843 he received government funding for his invention and constructed a mini-telegraph system along a railroad line between Washington, D.C., and Baltimore, MD. On May 24, 1844, the first telegraph message was transmitted: "What hath God wrought!"

Morse is also credited with the development of the International Morse Code, a system of dots and dashes that can be used to send messages by a flash lamp, telegraph key, other or rhythmic device. The most famous Morse Code signal signifies distress: dot dot dash dash dash dot (SOS). While wire telegraphs were long ago replaced by new technologies, Morse code is still used by professionals and amateurs alike in radio telegraphy.

By 1869, the first telegraph connected the East and West Coasts, and by the decade’s end, the Associated Press began operations to deliver news throughout the world. Outside newspaper offices in major cities around the country, crowds would gather around a huge wall of telegraph wire and read election results transmitted by telegraph. In the early 1900s, thousands of Western Union Telegraph Company offices were opened in small and large towns, connecting an ever-expanding frontier of the U.S. The telegraph became the world’s primary communica-
Workshop Seeks News Ways to Prepare Students for the Job Market

The APS Committee on Professional Development spearheaded a special half-day workshop just prior to the March 11-13 Meeting in Indianapolis, entitled "Careers in Industry: Preparing Your Students." The workshop was organized to help department chairs and APS Career and Professional Development Liaisons grapple with how to better prepare their students to compete in today's job market.

The academic job market for physics is the strongest it has been in at least a decade, with estimated 300 tenure and tenure-track positions per year, according to APS committee members. Education and Employment Statistics Division, who presented some of the latest findings, to be featured in an upcoming report. However, he cautioned that not all such positions are filled, and that academia hires from all sec-

The MIT researchers have created a "Fermi sea" — a hypothetical system of fermions with energy quantum states possible. The Pauli-exclusion principle forbids such systems from occupying any of the low-energy states.

The MIT experiment, the first time such a "degenerate Fermi sea" has coexisted with a large BEC. One reason scientists are interested in how fermions behave at low temperatures is whether the atoms can be coaxed (by adjusting the forces between them) into forming Cooper pairs, becoming a superfluid.

Ketterle also reported the propagation of a condensate in a magnetic waveguide. First, his group made a two-dimensional gas of atoms. Then, the cold atoms became a Bose-Einstein condensate, or a BEC, in a magnetic trap, and finally loaded it into a microtrap on a printed circuit board.

The micro-trap could be used to study how such systems behave at low temperatures. The MIT researchers plan to extend the "Fermi sea" to higher-dimensional systems, where it may be possible to create a two-dimensional quantum gas of fermions.

The MIT researchers are also working on creating a "Fermi sea" using fermions in a magnetic field. They hope to create a Fermi gas with a density of atoms that is less than half the density of the fermions in a non-interacting gas.

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First authorship does not determine real leader

It is curious how long the controversy over C.-S. Wu's role in the famous experiment on par- ticles has persisted (APS News, December 2001 and February 2002). I recall hearing a long time ago that when the experiment was over and the paper was completed, the team was to de- cide who would be first author. After an embarrassingly long silence somebody suggested that it should be the only lady on the team – Mme Wu. Nobody ob- jected, and the paper appeared without her name first.

This case, important for the his- tory of physics as it might be, revives the question of the order of authors on a joint paper. When I was doing my Ph.D. at University College London, my supervi- sor, Mike Seaton, told me that his rule was to put the authors in al- phabetical order, except when it was the first paper of one of the authors (in order to encourage the beginner). I have been applying this rule throughout my career and it works very well.

In every joint research project there is a principal collaborator who contains the work on the subject. Under most circumstances this rule does not do injustice to the real leader. As a matter of fact, my long time senior part- ant guest of honor, he (the count) will chair the table wherever he may be sitting.

Petar Grujeic, Belgrade, Yugoslavia

Book may redefine what's rational

In his Viewpoint in the February APS News, Pakistani physicist Fervez Haddoody advises that the interests of the United States lie in “rationally dealing with complaints against its interna- tional behavior.” Would be the only one who reads this as an at- tack on US support of Israel, in view of the steady stream of anti- Semitic propaganda from this part of the world! I invite Profes- sor Haddoody to read the book From Time Immemorial by Joan Peters, to get a different slant on what he conceives to be rational.

Elmer Eisner
Houston, Texas

In a startling development in the world of tabletop fusion, a controversial experiment at Oak Ridge National Laboratory appears to have been confirmed at a beauty parlor in Swampscott, Massachu- setts. The Oak Ridge experiment, reported in the March 8 issue of Sci- ence, claimed to achieve fusion in a beaker of deuterated acetone. Bubbles were created in the acetone by a pulsed neutron beam, and these bubbles were made to expand and then collapse cata- strophically by applying an intense sound wave to the liquid.

Patrons of Gladys’s Hair and Nail Salon on Main Street in Swampscott were astounded to see that their everyday establishment had been captured into the forefront of cut- ting edge scientific research.

“You’d thought we’d found the Higgs Boson or something,” said Emily McTavish, who has been having her hair done at Gladys every Wednesday as long as anyone can remember. “This tabletop fusion stuff just seems to send the press completely off the deep end.”

And indeed, borders of me- dia, their notebooks and cameras readied themselves through every inch of the small salon with its four vinyl-covered chairs, old fashioned hair dryers, and small dressing area strewn with out-of-date Readers’ Digest and Woman’s Day magazines.

Rodney Colquist, a physicist who hails from the University of Wisconsin-Madison, was the one who discov- ered what was going on when his wife, Samantha, came home after her appointment at Gladys in a frenzy of excitement and disbelief.

She had sat down in the number- one chair, and confessed to Gladys that she wanted to change the color of her nails from deep red to bright pink. Samantha’s nails had been deep red for years, so Gladys, figuring that it might be hard to get the layers of polish off, brought out a new brand of “Can- do heavy-duty nail polish remover” imported from Canada.

“Little did Gladys realize,” Colquist explained, his eyes danc- ing in an appreciation of the tron of the “Handy-Dandy beauty,” that heavy-duty meant made with heavy water that had been left over from filling the vessel of one of Canada’s nuclear reactors. The stuff was almost pure deuterated acetone.

Gladys carefully removed Samantha’s watch from her wrist, and dipped the fingers of her left hand into the bath of polish remover.

Colquist explained that Samantha’s watch was an heir-loom, handed down from her mother, with an old-fashioned rad- iosactive dial that glows in the dark. “The numbers had been get- ting dim, so I took it down to the lab to repair them just last week,” he said. “I read somewhere that very pretty powerful, because even though it was a few inches away, that watch was irradiating the acetone and creating lots of tiny bubbles inside the liquid.”

Then Gladys started telling Samantha the latest gossip about how oldman McTavish had just lost his wife of 51 years and run off with a young waitress from Marblehead that he’d met on a fish- ing trip the month before.

Samantha could not contain her surprise.

Hoo-Hoo-EEE!

Did Louise have any idea?

Gladys was just about to tell Samantha that Louise McCollycudd was actually glad to be rid of the old weasel at last, when she noticed a strange expression on Samantha’s face.

“Gladys,” Samantha said, her voice a hoarse whisper. “Some- thing weird is going on. When I screamed just now, this polish re- mover heated up a good ten degrees. And when I screamed again, it got really hot!”

Gladys dipped her own hand into the liquid. It still felt warm.

“Go ahead,” she said, “do it again.”

“Yee-HAW!”

Samantha screamed with all her might. Heads turned clear down to Boys Bait and Tackle Shop two blocks away. Both women hastily pulled their hands away as the pol- ish remover started to boil.

Asked what he planned to do next, Colquist said he had originally thought of reporting the results in a paper for Physical Review Letters. PRL is a journal that physicists “really respect,” he said. “But then I thought the better of it. Why risk getting the paper rejected by the referees? I decided to submit it to Science Magazine.”

Princeton Meeting Honors Wheeler’s Contributions to Physics

His interest in quantum reality. The joint winner was Brian Swietojanski, who paid tribute to John Wheeler’s many physics insights.

At the heart of the meeting was the keynote speech by the always interesting Anton Zeilinger (Vienna), who paid tribute to John Wheeler’s many physics insights. One of those ideas was a proposal for a “delayed choice” experiment in which the dissipation of wave- like interference effects brought about by the experimenters effort to determine which of several possible paths a particle took in going from one place to another might be avoided by delaying the observa- tion of the path until the particle (or wave) had already made its mark.

Zeilinger has carried out just such an experiment with entangled pho- tons in a setup he referred to as a “Heisenberg microscope.”

Several speakers addressed the persistent problem of bringing quantum mechanics and general relativity into a single framework. Prominent

issues here include the fate of infor- mation supposedly lost inside black holes; comparisons of string theory with the rival quantum loop gravity theory, which holds that space is not a mere platform for interactions but is itself a sort of dynamical thing, how gravity behaves in extreme environments and the effort to detect gravity waves.

One purpose of the meeting was to promote freelwheeling de- bate on all of the above issues, including the role of human con- sciousness in the measurement process. Young scientists were es- pecially encouraged to engage in this debate, for which scholarships were given for attending the meet- ing. In fact, a Young Researchers’ Competition was held for papers on quantum reality. The joint win- ners, from among 64 entries, were Raphael Bousso from U.C. Santa Barbara and Fotini Markopoulou- Kalamaris from the University of Waterloo in Canada.

—Philip P. Schieve
Farmers in Elk City, Oklahoma woke up this morning to the tough job of nurturing their wheat crop through another month of drought. And they will do it, as usual, with the hope that the sun will come out. Yet, how can they do this without greater financial support? At least 10 consecutive years have seen a record number of tornadoes wreak havoc. But my state isn’t alone. The rest of the country also faces disastrous weather events. In fact, while the nation’s center has been struggling through drought, the Eastern Seaboard has endured record floods. Last summer, the citizens of Grundy, Virginia saw the Levisa River roar down their main street. As the nation struggles to cope with these weather cataclysms, the federal government has stepped up. A program has focused on calculating if increasing carbon dioxide in the atmosphere will cause more extreme weather events in the U.S. 100 years from now. In fact, President Bush has been using this research to develop his recently announced policy of carbon reduction. His policy has carefully considered the scientific predictions. But the scientific predictions become more precise, the president will advance the policy appropriately. He challenges our best scientists to turn some of their attention to shorter-term climate and weather variabilities and proceed the kind of assessments and resiliency research that would coordinate vulnerability research across the U.S. Global Change Research Program. The office will assess those regions of the U.S. that are the most vulnerable to climate change and climate variability. And it will fund scientific research that will lead to greater preparedness.

By Alaina G. Levine

A Climate Change Policy For America

By J.C. Watts, Jr.

The federal Global Change Research Program has carefully considered the climate change and climate variability, including changing demographics and shifts in the natural weather patterns. The federal Global Change Research Program seeks to understand long-term climate change, and the extent to which human activities contribute to these changes, but federal programs must also begin researching strategies that can immediately help Elk City, Grundy and thousands of other vulnerable towns scattered across the country deal with extreme weather.

Call it a “no regrets” strategy. It is a strategy that best serves America. It is a climate policy that can be enacted right now, and, in the face of a scientific agreement on the magnitude and extent of the impact on the climate of increasing carbon dioxide in the atmosphere. And, it is a policy that recognizes the environmental benefits that can contribute to a community’s vulnerability, including changing demographics and shifts in the natural weather patterns. 

I fully support our nation’s scientific effort that seeks to understand the impact of increasing carbon dioxide on the future climate. That work will continue. In fact, President Bush has been using this research to develop his recently announced policy of carbon reduction. His policy has carefully considered the scientific predictions. As the scientific predictions become more precise, the president will advance the policy appropriately. He challenges our best scientists to turn some of their attention to shorter-term climate and weather variabilities and proceed the kind of assessments and resiliency research that would coordinate vulnerability research across the U.S. Global Change Research Program. The office will assess those regions of the U.S. that are the most vulnerable to climate change and climate variability. And it will fund scientific research that will lead to greater preparedness. The office will be charged with examining:

• severe weather events;
• annual and inter-annual climate events, such as the El Niño Southern Oscillation;
• sea level rise and shifts in the hydrological cycle; and
• natural hazards, including tsunami, drought, flood and fire; and
• alteration of ecological communities.

As a result of this program, I foresee a stronger partnership between scientists at the cutting edge of climate research and city planners who are on the front lines of the battle with nature’s violent side.

Unfortunately, the citizens of Grundy couldn’t wait for the results of this program. The rising waters have forced them to make a quicker decision. Lackering other options, the town decided to blast the top of a mountain of Elk City, just on the other side of the Levisa River. When that new space is cleared they will pack up every home, shop and stop right and move across the river.

The citizens of our nation’s most vulnerable communities must have more options than simply packing up and moving. When this program is established and some of the nation’s best scientists are working to provide solutions to local planners, our country will be better served. When people know what to expect, I know that they will make the right choices for themselves and their children. While we must continue to anticipate and solve the challenges of tomorrow, let’s get to work on the problems of today.

Rep. J.C. Watts, Jr. (R-Oklahoma) is chairman of the House Republican Conference.

Public Relations for Physics Departments: Convincing the Community that Quarks Are Cool

The Fundamentals of Launching a PR Program

By Alaina G. Levine

A strong public relations program can be of great importance to a physics department. Not only can effective PR improve the reputation of an individual department, but it can also serve the broader physics community by convincing the public that quarks, quantum dots, and nanostructures are cool. Building a positive reputation with the many constituents that a physics department serves can lead to greater media exposure, improved quality of student applicants, community and industrial partnerships, and even financial support.

It isn’t difficult to create a strategic public relations program for your department, but it does take planning and commitment of resources. But before you begin to implement PR tactics, you must first determine your audience, an alumni relations program, public outreach, or an external board of advisors, there are some fundamentals of public relations that must be understood and remembered.

1) Establish the goals of your PR program. Don’t enter into the PR game haphazardly. You must identify what your goals are before you begin to think about what tactics to take. Some of your goals might be to inform researchers in Elk City, K-12 and college students about what about your alumni? And prospective students? How about parents, teachers, K-12 kids, and government and industrial representatives and organizations? And of course, one cannot forget the general public, the greater physics and scientific community. In designing a public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy towards. Identify whom you want to receive the message you are delivering and this will give you the much-needed focus that your strategy deserves.

Great PR is all about building strong relationships. You will derive greater benefit from your public outreach by identifying them, and cultivating those relationships to achieve your PR goals.

2) Identify, remember, and build relationships with your publics. Whom does your department serve? Certainly you have internal constituents such as faculty, students, staff. But what about your alumni? And prospective students? How about parents, teachers, K-12 kids, and government and industrial representatives and organizations? And of course, one cannot forget the general public, the greater physics and scientific community. In designing a public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy to. A physics department also needs to build its brand in order to create public support and interest. The most basic promise of a physics department to its publics is to provide leadership in teaching, research, and outreach, but of course there can and should be more to it. By building your brand with your constituents, you can greatly add to the successful and strategic growth of your department.

3) Build your brand. One doesn’t often equate a brand with a physics department, but it can be one of the most important tools you have in your public relations toolbox. A brand is a promise: people rely on a brand because they know the one down the street from yours can’t deliver the same coffee every week. Their brand is the promise (and success as a company) depends on this promise. A strong public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy towards. Identify whom you want to receive the message you are delivering and this will give you the much-needed focus that your strategy deserves.

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A strong public relations program can be of great importance to a physics department. Not only can effective PR improve the reputation of an individual department, but it can also serve the broader physics community by convincing the public that quarks, quantum dots, and nanostructures are cool. Building a positive reputation with the many constituents that a physics department serves can lead to greater media exposure, improved quality of student applicants, community and industrial partnerships, and even financial support.

It isn’t difficult to create a strategic public relations program for your department, but it does take planning and commitment of resources. But before you begin to implement PR tactics, you must first determine your audience, an alumni relations program, public outreach, or an external board of advisors, there are some fundamentals of public relations that must be understood and remembered.

1) Establish the goals of your PR program. Don’t enter into the PR game haphazardly. You must identify what your goals are before you begin to think about what tactics to take. Some of your goals might be to inform researchers in Elk City, K-12 and college students about what about your alumni? And prospective students? How about parents, teachers, K-12 kids, and government and industrial representatives and organizations? And of course, one cannot forget the general public, the greater physics and scientific community. In designing a public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy towards. Identify whom you want to receive the message you are delivering and this will give you the much-needed focus that your strategy deserves.

Great PR is all about building strong relationships. You will derive greater benefit from your public outreach by identifying them, and cultivating those relationships to achieve your PR goals.

2) Identify, remember, and build relationships with your publics. Whom does your department serve? Certainly you have internal constituents such as faculty, students, staff. But what about your alumni? And prospective students? How about parents, teachers, K-12 kids, and government and industrial representatives and organizations? And of course, one cannot forget the general public, the greater physics and scientific community. In designing a public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy to. A physics department also needs to build its brand in order to create public support and interest. The most basic promise of a physics department to its publics is to provide leadership in teaching, research, and outreach, but of course there can and should be more to it. By building your brand with your constituents, you can greatly add to the successful and strategic growth of your department.

3) Build your brand. One doesn’t often equate a brand with a physics department, but it can be one of the most important tools you have in your public relations toolbox. A brand is a promise: people rely on a brand because they know the one down the street from yours can’t deliver the same coffee every week. Their brand is the promise (and success as a company) depends on this promise. A strong public relations program, it is absolutely necessary to remember whom you are targeting your PR strategy towards. Identify whom you want to receive the message you are delivering and this will give you the much-needed focus that your strategy deserves.

Great PR is all about building strong relationships. You will derive greater benefit from your public outreach by identifying them, and cultivating those relationships to achieve your PR goals.

4) Any public interaction makes you a representative of science. Physics Department PR holds a lot of power. Every time your department is represented in public, either via a newspaper article about your research, or an outreach program for the general public, not only represent your own department, but also the one down the street from yours. You represent all of physics, all physicists, and even all of science and scientists as well. You have the ability to build support, both financial and nonfinancial, for your department in addition to the wider scientific community. Need the kind of publicity your interaction with them is the first and only taste of science. Always keep this in mind when you execute any PR campaign.
Researchers Present New Physics-Based Medical Imaging Techniques

Medical light has long drawn on physics-based techniques for a variety of imaging, measurement and testing applications. Several researchers described the latest developments in this area at the 2002 APS March Meeting in Indianapolis.

Micro-tesla MRI was reported by Robert McDermott, a member of JLAB's group to perform atomic spectroscopy in nuclei in space while a burst of radio waves explores the nucleus energy levels by clarifying the frequencies and contrast enhancement will disclose the nucleus' position to a trained observer.

In addition to establishing chemical identity, MRI can also be turned into an imaging method by carefully watching the timing and the location of the re-emitted radio waves.

A tumor, say, will have a slightly different water density from surrounding healthy tissue. Computer processing and contrast enhancement will disclose the tumor's position to a trained observer.

Survival Skills, from page 1

used in all levels from senior faculty to graduate and undergraduate students, attended the workshop.

Four highly respected women from the physics community gave invited talks in the first part and served as the panelists in the second part. Mildred Dresselhaus of MIT, Krist Halvathaw of ONR, Barbara Jones of IBM Almaden, and Beverly Hardline of ANL addressed a variety of issues such as establishing scientific identity and developing a successful career in research, finding funding for research programs, balancing family and career, and advancing professionally to achieve various levels.

The second part featured a professional trainer, Sandy Shulllman of Executive Development Group, who led a lively discussion on leadership and gender issues in science and encouraged the participants to actively interact during the workshop.

NSF helped launch the group, which will be incorporated into the broader community, CSWP will put the proceedings of the workshop into an electronic publication resource.

The participants noted that they took away information that will be of great value as they continue in their careers, and they are eager to recommend the workshop to the others. They also suggested increasing the discussion time, which could allow for more time devoted to the future programs.

Due to the success of this first workshop and the strong demand for future ones, CSWP has decided to continue the program, alternating between the March and April Meetings, as part of the CSWP regular program.

Media, from page 2

For retired physicists possessing an unraveled valuable record of knowledge that ought to be published! James Goff and Richard Stromboorne of the Mid-Atlantic Retired Physicists Group believe that the MASPG or starting a similar group in your area, contact Trish Lettieri.

Group Seeks to Spur Publications by Retired Physicists

Do retired physicists possess an unraveled valuable record of knowledge that ought to be published? James Goff and Richard Stromboorne of the Mid-Atlantic Retired Physicists Group believe that the MASPG or starting a similar group in your area, contact Trish Lettieri.

For more information on MASPG or starting a similar group in your area, contact Trish Lettieri at lettieri@aps.org 301-209-3272

Party Animals

The latter was on its way to the studio of James's mother, Elizabeth Cowan-Riordon, an artist and art teacher who was among those chosen by the District of Columbia Commission on the Arts and Humanities to paint a collection of 100 elephants and 100 donkeys. Comprising a public arts project called "Party Animals," these have been placed on display at various locations around Washington, and will later be auctioned off with proceeds going to benefit the activities of the commission.

Steve Egglell and Brian Todd of Case Western Reserve University presented a new technique for obtaining submucosal infusion information about proteins. Investigating aggrecan, a cartilage protein important in osteoarthritis, the researchers used a technique that combined AFM with genome information and transmission electron microscopy data.

All of the data were integrated by using a sophisticated image processing technique to provide a best guess at the 3D structure. The resulting refined structure yielded new information on the molecule, showing distinct locations of links to molecular-scales mechanisms of mechanical flexibility.

The researchers hope to combine their results with AFM-measured force fields around cartilage proteins to link the biochemical and mechanical properties of cartilage with its molecular structure. This approach has the potential to provide information on molecular-scale mechanisms of mechanical flexibility.
**ANNOUNCEMENTS**

### APS Undergraduate Physics Student Competition

#### 2002 Apkér Awards

For Outstanding Undergraduate Student Research in Physics

Endowed by Jean Dickey Apker, in memory of LeRoy Apker

**DESCRIPTION**

Two awards are normally made each year. One to a student attending an institution offering a Physics PhD and one to a student attending an institution not offering a Physics PhD.

- **Recipient** receive a $5,000 award; finalists $2,000. They also receive an allowance for travel to the APS National Meeting.
- **Recipients’ and finalists’ home institutions** receive $5,000 and $1,000, respectively, to support undergraduate research.
- **Recipients, finalists and their home physics departments** will be presented with plaques or certificates of achievement. The student’s home institution is prominently featured on all awards and news stories of the competition.
- **Each nominee** will be granted a free APS Student Membership for one year upon receipt of their completed application.

**QUALIFICATIONS**

- **Students** who have been enrolled as undergraduates at colleges and universities in the United States at least one quarter/semester during the year preceding the JUNE 15, 2002 deadline.
- **Students** who have an excellent academic record and have demonstrated exceptional potential for scientific research through an original contribution to physics.
- **Only one candidate** may be nominated per department.

**APPLICATION PROCEDURE**

The complete nomination package is due on or before JUNE 15, 2002 and should include:

1. A letter of nomination from the head of the student’s academic department.
2. An official copy of the student’s academic transcript.
3. A description of the original contribution, written by the student such as a manuscript or reprint of a research publication or senior thesis.
4. A 1000-word summary, written by the student, describing his or her research.
5. Two letters of recommendation from physicists who know the candidate’s individual contribution to the work submitted.
6. The nominee’s address and telephone number during the summer.

**FURTHER INFORMATION**

See http://www.aps.org/prizes/apker/index.html

**DEADLINE**

Send name of proposed candidate and supporting information by JUNE 15, 2002 to: Dr. Alan Chodos, Administrator, Apker Award Selection Committee, The American Physical Society, One Physics Ellipse, College Park, MD 20740-4544. Telephone: (301) 209-3268, Fax: (301) 209-3652, email: chodos@aps.org

### Contributions Acknowledged Online

APS recently initiated a special web page to acknowledge the generous contributions from the Society’s individual donors. During 2001, an impressive number of APS members provided an annual gift in conjunction with their membership renewal, including more than 800 donors who gave $100 or more. Many of these individuals also supported APS prizes and funds-raising efforts. By making a contribution, APS members help further the Society’s education and outreach initiatives, international affairs programs, public information efforts and recognition of scientific accomplishments through prizes and awards. We wish to express our thanks to all of these individuals.

The listing can be viewed by APS members on the Development Department’s webpage at http://www.aps.org/development/donors.html

### MEETING BRIEFS

#### Texas Section

The Texas Section held its annual spring meeting March 7-9 at Stephen F. Austin State University in Nacogdoches, Texas and featured a program of general sessions on physics frontiers and innovations, as well as nine hands-on workshops for physics teachers. There were four plenary presentations on the role of Texas physics departments in preparing K-12 teachers; physics education as an expansion effort; transistors; NMR action studies of enzymes and signaling proteins; and featured a performance by a string quartet and a presentation by Tom Cvetkovic, artist/CEO of Chromagem, Inc., a multinational hologram manufacturer.

#### Ohio Section

The APS Ohio Section held its annual spring meeting April 12-13 at Youngstown State University in Ohio, organized on the theme of photon-induced processes. The program included invited lectures on such topics as manipulating matter with light, as well as a talk by best-selling author Lawrence Krauss on the future of life in an ever-expanding universe. There was also a special “Town Meeting” session on Saturday morning focusing on physics education. Friday evening’s reception and banquet was held in the renowned Butler Museum of American Art and featured a performance by a string quartet and a presentation by Tom Cvetkovic, artist/CEO of Chromagem, Inc., a multinational commercial high-volume hologram manufacturer.

#### New York State Section

The APS New York State Section held its annual spring meeting April 12-13 at the University of New York College at Oneonta, focusing on issues related to energy and the environment. Friday afternoon featured a session on alternative energy sources, such as fuel cells, plasma for fusion energy, internal confinement fusion research and nuclear power, followed by a banquet and lecture on renewable energy. Saturday’s sessions covered such topics as energy-efficient solid state lighting, photovoltaic devices from organic semiconductors, clean coal technology, solar energy, and solar-powered cars.

### Einstein Prize

**Purpose:** To recognize outstanding accomplishments in the field of gravitational physics.

**Nature:** The prize consists of $10,000 and a certificate citing the contributions of the recipient. It also includes an allowance for the recipient to travel to a meeting of the Society to receive the award and deliver a lecture. It will be awarded biennially.

**Establishment & Support:** The prize was approved by the APS Council May, 1999, and was established by the Topical Group on Gravitation. It is supported by friends of the Topical Group.

**Rules & Eligibility:** The award, usually to a single individual, is for outstanding achievement in theory, experiment or observation in the field of gravitational physics. It is open to any scientists, worldwide. Nominations will remain active for three years. Members of the Topical Group on Gravitation Executive Committee shall not be eligible for nomination while serving on the Committee.

**Nomination Deadline:** The deadline for submitting nominations for the 2003 Prize is July 2, 2002. Five (5) copies of each nomination and supporting documentation should be sent to the Chair of the 2003 Selection Committee: Clifford M Will (Chair), Dept. of Phys, Washington Univ, CB 1105, St Louis MO 63130-4899, Phone (314) 935-6244, Fax (314) 935-6269, Email: CMW@WUPHYS.WUSTL.EDU
The Status of the African-American Physicist in the Department of Energy National Laboratories

By Keith H. Jackson

The National Society of Black Physicists (NSBP) has been concerned about the small number of African-Americans with higher scientific or professional appointments at Department of Energy funded national laboratories. NSBP has also become frustrated with the overall lack of participation of Historically Black Colleges and Universities (HBCUs) in DOE-funded scientific user facilities such as high energy physics and nuclear facilities, Synchrotron Light Sources, and the Spallation Neutron Source. As a result of these concerns, the Technical Executive Officer of NSBP began to collect data which were placed before the American Physical Society Committee on Minorities (COM). The American Physical Society Committee on Minorities formally took up the issue but first wanted to verify the data provided by NSBP and to expand the study to include Hispanic physicists. COM enlisted and received the full support of both the National Society of Hispanic Physicists and the National Society of Hispanic Physicists (NSHP).

Our data show that in general African-Americans are less than 0.5% of the Ph.D. physicists employed at the DOE labs, African Americans make up nearly 2% of the physicists faculties across the United States, including the facilities of HBCUs. Looking at data compiled by Professor Donna Nelson at University of Oklahoma, we find that the percentage of African-Americans on the faculties of the top 50 physics departments is much smaller (≤ 0.06 to 0.0% of total). These data mean many important things. Many universities can placement of African-American physicists in DOE-funded national laboratories? The labs should become intimately familiar with the universities and the DOE funded national laboratories? The DOE labs are government-owned bodies which have obligations which may protect the laboratory or on the research staff of the national laboratory or on the research staff of the national laboratory.

The lab won't open the spigot to minority scientists who have not been inventive and aggressive in recruiting domestic African-American and Hispanic-American scientific talent. What more important mission could there be for an organization that would claim to be a national laboratory?

Many of our colleagues would assert the "pool" or "external availability" of American-Americans with Ph.D. in physics is unimportant. But there is, for example, a top 10 university that has graduated over 34 African-Americans with Ph.D in physics since 1974. This university also manages DOE-funded laboratory. There is not a single African-American physicist in the physics or applied physics faculty. This may not be surprising, but in addition there is not a single African-American Ph.D.-level physicist on the staff of the national laboratory or on the research staff of the university.

The labs should become intimately familiar with the universities and the DOE-funded national laboratories. Diversity officers of program leadership responsibilities, the lab diversity officer. In our survey and follow-up research we have found that this is a fundamental disconnect at the national laboratories. Diversity officers often are not scientists and have few informal contacts among working scientists. We found that most of their job is to satisfy contractual obligations which may protect the laboratories from lawsuits but do not help to diversify the lab scientific workforce.

There is also a problem with senior lab personnel somehow equating K-12 science outreach efforts with diversity efforts. The labs will bring in high school children for a day of show and tell, but will not invite serious scientists to review panels and policy boards. The idea is that exposure to science will somehow stimulate these students to major in science when they enter college. However a student of color might quickly come to the conclusion that science is not a viable career path. A student will see it is not a pipeline issue but more of a spigot issue. The lab won't open the spigot to hire a person of color.

Diversity efforts at the national laboratories have to include the actual participation of domestic scientists with actual hiring and leadership responsibilities. The labs should be serious about the metric for the lab diversity officer. In our survey and follow-up research we have found that this is a fundamental disconnect at the national laboratories. Diversity officers often are not scientists and have few informal contacts among working scientists. We found that most of their job is to satisfy contractual obligations which may protect the

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### DOE Funded Laboratory

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<th>Laboratory</th>
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Total: 3372

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By Keith H. Jackson, a physicist at Lawrence Berkeley National Laboratory, is the Technical Executive Officer of NSBP. By Keith H. Jackson, a physicist at Lawrence Berkeley National Laboratory, is the Technical Executive Officer of NSBP. APS News welcomes and encourages letters and submissions from its members responding to these and other issues. Responses may be sent to: letters@aps.org.