LA Hosts 2005 APS March Meeting

Attendees who shiver through last year's March meeting in Montréal will instead hear the land of palm trees and perpetual sunshine in 2005. The APS March Meeting will take place in Los Angeles, March 21-25.

This is typically the largest physics meeting of the year with approximately 6000 participants, and will include more than 90 invited sessions and 550 contributed sessions, covering the latest research in areas represented by the APS divisions of condensed matter physics, materials physics, polymer physics, chemical physics, biological physics, fluid dynamics, laser science, computational physics, and atomic, molecular and optical physics. Also taking part will be the APS topical groups on Instrument and Measurement Science, Magnetism and Magnetic Materials, Shock Compression of Condensed Matter, Statistical and Nonlinear Physics, as well as the forums on Industrial and Applied Physics, Physics and Society, History of Physics, International Physics, Education, and Graduate Student Affairs.

In honor of the World Year of Physics 2005 and the centennial of Einstein's "miracle year," special sessions will be devoted to physics of Einstein's "miracle year." Special sessions will be devoted to physics of Einstein.

Heckman, Hodas Capture 2004 APS Apker Award

Two undergraduates, one from Princeton and the other from Williams College, have been chosen as the recipients of the 2004 LeRoy Apker Award of the APS.

The Award is given annually for outstanding research accomplishments to two students, one from a PhD-granting institution, and one from an institution that does not offer the PhD. The nominees are narrowed to six finalists (See the December 2004 issue) and the recipients are determined after a day of interviews of the entrants by the selection committee.

Jonathan Heckman of Williams College and Jonathan Honckman of Princeton University have been chosen as the recipients of the recipients.

Is He the Oldest Fellow of Them All?

Taken at the recent Fellows' reception in College Park, MD (see story on page 6) this photo shows APS Executive Officer Judy Franz (center) flanked by two unrelated Shapiros, Anatole on the right and Maurice on the left. Maurice Shapiro was elected to APS Fellowship in 1946, making him the longest-serving Fellow of whom we are aware. Does he indeed hold the record? APS News would like to hear from others whose Fellowships is of a similar, or perhaps even older, vintage. Anyone who was elected an APS Fellow prior to 1950 is invited to contact the APS at 203-227-3244 or johnston@aps.org for a special commemorative gift.

New Optical Devices, Techniques Highlight Laser Science Meeting

3-D reality, a new technique for internal fingerprints, and a fiber optic probe for detecting precancerous cells were among the highlights at the 2004 Frontiers in Optics/Laser Science XX meeting, the annual meeting of the Optical Society of America, held October 10-14 in Rochester, NY. The Laser Science XX meeting serves as the annual meeting of the APS Division of Laser Science and provides an important forum for the latest work on laser applications and development, spanning a broad range of topics in physics, biology and chemistry.

The conference plenary session featured three visionary speakers and a keynote presentation from Senator Hillary Rodham Clinton (D-NY). Kerry Vahala of Caltech provided a tour of tiny devices for confining and controlling light. Watt Webb of Cornell University discussed recent advances in imaging and studying tiny biomolecular structures using the whole range of the electromagnetic spectrum.

The University of Rochester’s Emil Wolf traced optics history from the 1860s to the 21st century to present a new development in which he played a major role: a new optical device, each chapter has a special quantized property called the electric charge; quarks can carry the color charges red, blue or green.

And finally, it is not possible to produce a device that has fundamental quantum mechanics (QCD), a companion to quantum electrodynamics (QED), the crown jewel of modern physics, which describes the interactions of the electromagnetic force with matter.

QCD describes the strong force, also known as the color interaction, which holds together the quarks that make up the elementary constituents of the atom (protons and neutrons). The existence of quarks has been confirmed since the 1960s, but scientists discovered a couple of strange features. First, quarks have electric charges that are a fraction of the proton’s—1/3 or +2/3—something scientists have yet to explain.

Second, in addition to its electrical charge, each quark also has a special quantized property called the color charge; quarks can carry the color charges red, blue or green.

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"It's very unfortunate that missile defense has become a sort of political litmus test. Ballistic missiles are by far the least likely way that the United States would be attacked with a nuclear weapon. It's this politicization of missile defense that has led to what I think is a vast, dramatic misallocation of resources." — Edward W. Markey, Massachusetts Senator, Orlando Sentinel, October 17, 2004

"String theory leads in a remarkably simple way... to a reasonable rough draft of particle physics that requires gravity. But the argument is so long and woundy that there are great ways to get through the draft, and it's frustratingly difficult to get the second draft..." — Ed Witten, Institute for Advanced Study, Dallas Morning News, October 25, 2004

"We will never be able to use fundamental theory to calculate the radius of the earth's orbit, and we may never be able to use fundamental theory to calculate the vacuum energy." — Steven Weinberg, University of Texas at Austin, Dallas Morning News, October 25, 2004

"The best thing you could hope for is black holes..." — Harold Ogen, Indiana University, on what the LHC might produce, Dallas Morning News, October 25, 2004

"It combines rational and irrational motivations... It's just raw, in-your-face weirdness. It combines rational and irrational motivations... It's just raw, in-your-face weirdness." — Robert Crease, SUNY Stony Brook, on Euler's equation, "The New York Times", October 24, 2004

"I think the general physics community, they're a little bored with the equation. It risen to the level of icon that people no longer pay attention to..." — Neil deGrasse Tyson, Hayden Planetarium, on the equation, "The New York Times", October 24, 2004

"Just like primitives, people fetishize. They see this stuff worn by tough, powerful people, and they fetishize. They see this stuff worn by tough, powerful people, and they fetishize. They see this stuff worn by tough, powerful people, and they fetishize." — Robert Birgeuna, University of California, Berkeley, on a new synchrotron facility in Saskatoon, Toronto Star, October 21, 2004

"If you were asked to exercise in a room where the level of radioactivity was hundreds of times higher than the national radiation protection board, I'm sure students would be demanding the facility be shut down. Yet similar circumstances exist in group exercise settings, the only difference is in the aerobics class the radiation is acoustic energy, and the affected organ is very specific, your ear." — Eugenie V. Mielczarek, George Mason University, on university health levels in exercise classes, WAMU radio, October 15, 2004

"There's not one chart. People will self-organize their tables..." — Julio Ottino, Northwestern University, on plans for a "Complexity Dinner", Chicago Tribune, October 11, 2004

"Say you had some in a box, and you pulled one out and weighed it, and it weighed m1. Then you pulled out another one, and it weighed m2, it isn't a situation where a neutrino is m1... it is a situation where the neutrino is 50% one mass and 50% another. This seems surprising, but it is perfectly natural..." — Pierre and Marie Curie's electrometer. Pierre and Marie Curie shortly after their wedding.

Three years later discovered the piezoelectric effect with his older brother, Jacques.

They found that when pressure is applied to certain crystals, they generate electrical voltage, and when placed in an electric field, those same crystals became conductive. They used this effect to build a piezoelectric quartz electrometer to measure faint electric currents, which Marie would use in her research. Pierre later discovered a fundamental relationship between magnetic properties and temperature, today, the temperature at which such permanent magnetism disappears is known as the Curie point.

It was Marie who encouraged Pierre to write up his work as a doctoral thesis. He received his PhD in 1895, along with a promotion to a professorship at the Municipal School, and the couple married three months later.

For her own doctorate, Marie chose to focus on the mysterious uranium rays, discovered in early 1896 by Henri Becquerel, a few months after Wilhelm Roentgen's discovery of X-rays. Marie performed numerous experiments confirming Becquerel's observations that the electromagnetic radiation from uranium rays are constant, regardless of whether solid or pulverized, pure or in a compound, wet or dry, or whether exposed to air or to water. She also validated his conclusion that those minerals with a higher proportion of uranium emitted the same radiation.

And she took those findings one step further, forming the hypothesis that the emission of rays by uranium compounds was an atomic property of the element uranium—something built into the very structure of its atoms. She coined the term "radioactivity" to describe this unique effect, which she also found to be constant.

Intrigued by his wife's findings, Pierre joined forces with her. Marie and Pierre found that uranium ores, pitchblende and chalcopyrite, were much more radioactive than pure uranium, and concluded that their highly radioactive nature was due to as yet undiscovered elements. As a team, they went on to count and rate the substances in these ores and then used the electrometer to create a "trace" of the minute amount of unknown radioactive element among the fractions that resulted. They discovered that one fraction was strongly radioactive, so even though it chemically behaved like bismuth, it had to be something new. They named this new element "polonium".

In December 1898, they discovered a second new element in a barium fraction, which they named "radium." To prove to a skeptical scientific community that the unknown elements existed, the Curies had to isolate it. They took Marie over three years to isolate, one-tenth of a gram of pure radium chloride, and she never succeeded in isolating polonium because of its very short half-life—138 days. Even as she was performing her work..."


**NOBEL PRIZE**

from page 1

Wilczek discovered initially asymptotic freedom to an extent so profound that, for some reason, the closer quarks come to each other, the weaker the color charge between them. When quarks are far apart, the force is so weak that they behave much like free particles. This behavior is called asymptotic freedom. When quarks move apart, the force remains essentially constant as the distance between them increases, thereby preventing quarks from escaping as free particles. This happens because the force carrying particles (gluons) interact not only with quarks, but also with each other. Asymptotic freedom made it possible to calculate the dynamics of quark-gluon plasma, a state that exists in the early universe.

**LASER SCIENCE**

from page 1

recently developed unified theory of color singularity, which predicts key properties of light waves. Sena- tor Clinton also spoke, touching on the impact of optics in the state of New York.

**FINDING A VEIN**

Finding a vein, necessary for administering intra- venous solutions, can often be difficult. A new device, called a Vein Contrast Enhancer (VCE), uses sen-sitive infrared sensing to find the vein beneath the skin. This technology is based on medical knowledge that veins are lying right on top, making it easy for a nurse to make an injection on the impact of optics in the state of New York.

**WYP**

to test their predictions. James Riondino, APS Head of Media Relations, hosted the skateboard event. Member John Gastineau, of Verizon Software and Technol-ogy, worked on the data capture equipment for the skateboard challenge. When asked to work on the project, “I was a little apprehensive, because acceleration is something I was a little uncomfortable with,” he said. But these middle school students were able to handle the challenge. The video and photography of the students showed the students what’s really going on, said Gastineau.

**ISSUE: RESEARCH FUNDING**

Before Congress recessed for the election, it set aside a study of four FY 05 appropriation bills to the President for signature: Defense, Commerce, Military Construction, Foreign Operations and Legislative Branch. In a post-election session, Congress will wrap most of the remaining nine bills into a single appropriation or extend a Continuing Resolution. Prior to the recess, the Senate Appropriations Committee approved a 3% increase over FY04 for NSF, counterign the House cut of 2%. The Senate Committee was also much kinder to NASA than the House, funding it at $135 million more than the request. The Senate Appropriations Committee joined the House in approving a restoration of funding for the NIST core programs that suffered major cuts in last year’s omnibus bill.

**ISSUE: SCIENTIFIC ADVICE TO CONGRESS**

At its October 23 meeting, PAPO established a subcommit-tee, chaired by Peter Eisenberger, to review various proposals for supplementing the means by which Congress receives scientific and technical advice, among them bills introduced by Senator Bingaman (D-NM) and Representative Holt (D-NJ) that can be downloaded from the Office of Public Affairs website. The Eisenberger subcommittee will discuss its findings and recommendations at the PAPO January meeting.

**ISSUE: VISAS**

The State Department reported significant improvement in visa processing beginning in September, including a decrease in visa mants clearance delays, that has impinged on the ability of foreign students and scholars to enter the US in recent years. APS continues to monitor the visa processing system and advocate implementation of real-time nodal databases in a joint statement issued this spring along with more than 30 other science and univer-sity organizations.

**ISSUE: MOON-MARS**

At its October 23rd meeting, PAPO approved a policy report on the Administration’s Moon-Mars initiative and sent the report to the Executive Board for final action.

Log on to the APS Website ([http://www.aps.org/public_affairs](http://www.aps.org/public_affairs)) for more information.
I read with interest the “Back Page” in the October 2004 APS News, and believe the stories contained therein detract the perceptions of LANL employees with those of some members of the public. I feel that the misconception of employees being security violators is extreme and unrepresentative. I believe that the issue is more significant than the stories may suggest.

Information security is wide-spread with many corporations; much of the information is “Confidential,” and a leak could permit competitors an advantage. A government also has its secrets. A security plan has two components, institutional and personal. Institutional security means the locks the work; the fences are secure, the guards are alert and well trained; unauthorized people are not allowed in, etc. Personal security is the responsibility of the individual and is based on whether he chooses to violate that trust then he is subject to sanctions. No one enjoys security, but he accepts it when he is hired on as a part of the job; if one really does not like it, he can quit. DOE security has two layers; if one “goofs,” like it, he can quit. DOE security has secure; the guards are alert and well trained; unauthorized people are not allowed in, etc. Personal security is the responsibility of the individual and is based on whether he chooses to violate that trust then he is subject to sanctions.

A measure of the seriousness of a security incident is whether sensitive information got out. A safe file left open in a secure area is probably harmless because it is unlikely that that information would get into the wrong hands. Klaus Fuchs, a German and naturalized British subject, worked at the Manhattan Project at Los Alamos; he gave the secret plans to the German spy ring; the device, which was used at Trinity, was appropriated US citizen from Taiwan, a citizen of the People’s Republic of China; no evidence of military national security information? The major offenders are frequently former employees, who he was.

Lee made a comment to the media that “anyone at LANL cheated on security, it is extremely awkward and expensive. An attempt to enforce the laws would have expected half of them to go to jail. We are not. We were very conscientious about safeguarding classified material in all forms. The response by the Congressional investigating committee members described by Rhon shows a complete lack of understanding of workers at the Lab and what goes on at a world class research institution. Kudos to Rhon Keinigs for speaking out.

Richard D. Dick, Albuquerque, NM

No Lack of Security at Los Alamos

As a 30-year employee at the Los Alamos National Lab, now retired, I applaud the piece by Rhon Keinigs in the October 2004 issue of the APS News. My experience at LANL and the security that goes with working there is the same as he described. During my career at LANL I worked on classified and unclassified programs and security was NOT lax. We were very conscientious about safeguarding classified material in all forms. The response by the Congressional investigating committee members described by Rhon shows a complete lack of understanding of workers at the Lab and what goes on at a world class research institution. Kudos to Rhon Keinigs for speaking out.

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Science: Just the Facts, Please

When I read the “Letters” column in the August/September 2004 issue of APS News, I could not believe that they were referring to the results of a 1919 radioactivity experiment, as reported in the read in the June issue, which I remembered as a reasoned discussion on the proper place of scientific endeavor in a democratic society. I have now gone back to reread his words and find that the letters deal with only a few paragraphs out of more than 20 in the article. The complainers seem to forget that religion is a matter of “belief only. Our Constitution guarantees the right to practice our religious beliefs freely but not to impose them on anyone else. Suggesting otherwise, as Dr. Varmus so ably makes clear, would deal with the “facts” of nature. Continued attempts to claim that gravitational force is repulsive because all experience and experiment shows it to be attractive. Any theory based on the assumption that gravitational repulsive force is bound to fail. The attractive force is repulsive because all experience and experiment show it to be attractive. Any theory based on the assumption that gravitational force is repulsive is bound to fail. Stephen Rosenblum

San Jose, CA

Atmosphere at Los Alamos Celling Stiffened

Rhon Keinigs’ description of Los Alamos labs does not square with my impression. While Los Alamos used to be one of the most exciting places to work for a scientist, back in the 1970s, it was an atmosphere in which it was possible to work. It was in a place in which little interesting physics is done and in which office politics kills creativity. Most of the reason may be the difference in context: Back in the 1940s, all the scientists had other places they could call home and their time at Los Alamos was not their choice to be made. Nowadays Los Alamos employees have nowhere but the lab to call home. The real estate is expensive and there is only one employer in town mak- ing for a high stakes individual financial situation. Back in the 1940s, the Nazis and the Japanese were devils to be fought with all imaginable fire power—not too long on the mission of the lab used to be something like “making safer nuclear weapons,” a semi-oxy- moral salve for any scientist.

I worked in three different groups. In one of them, about 30 people turned out 2-3 per week.

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Physics Enlightens the World, and Battles Light Pollution Too

By Ernie Tretkoff

One of the main international events celebrating the World Year of Physics (WYP) will have the additional benefit of raising awareness about the dangers of light pollution, which is a problem of particular concern to astronomers and astrophysicists. The phrase "Physics Enlightens the World," will consist of a relay of light beams around the globe in one night, starting in a single location and registering their light signal. "This would be a very powerful 'skytracer' floodlights to light up the night sky of the Geneva-Origins Exploratorium's website on a virtual field trip" took place in Geneva, Switzerland, to the American Museum of Natural History and the Hayden Planetarium, and was also intrigued by television science shows like Mr. Wizard.

Semper says he had good science teachers in elementary school, and his father pursued hobbies like radio and electronics. Electricity and magnetism especially captivated Semper. "That was really what pulled me into the world of physics," he says. Semper also enjoyed building experimental apparatus. He went to graduate school at Johns Hopkins, where he studied solid state physics, then went on to use his skills in building detectors for high energy particle physics at CERN in Geneva, Switzerland, to the biodiversity in the jungles of Belize, to the extreme environments of Antarctica.

The site includes live webcasts and interviews with scientists, as well as explanations of the ideas behind the science and pictures of
APS Fellows Enjoy College Park Event

Fellows and to sample refreshments, they heard about APS activities from APS President Helen Quinn, Executive Officer Judy Frates, and Director of Education Ted Hodapp, and Director of Public Affairs Michael Jablonski.

In the photo at upper left, Luis Orozco and Steven Rolston chat with Ted Hodapp (right). The photo at upper right shows Sammye and P.K. Williams together with Walter Faust and William Wallenmeyer. The photo in the bottom left features Zachary Levine, Peter Mohr, and Anna Davis. And in the middle right image, Susan Gross and Gerald Epstein enjoy a moment with APS Director of International Affairs Amy Flatto.

APS Fellows in the Washington, DC area turned out in force for a reception at the American Center for Physics in College Park, MD on October 26. In addition to having ample time to chat with their fellow physicists, Fellows were able to enjoy refreshments and learn about the various activities of the American Physical Society.

Sounds of the Subway

New York City is famous for the broad diversity of its cultural venues, particularly world class performance halls like Carnegie Hall and Lincoln Center. But the city's most popular performance space can be found in its vast underground network of subway stations.

"Ask any New Yorker and you'll get an earful of recommendations on the best stations, the best players, and how much to tip," says Alex Case, director of Fermata Audio + Acoustics, Portsmouth, NH, and a professor at Berklee College of Music in Boston.

Case himself is something of a connoisseur when it comes to subway acoustics. He's done extensive studies of local musicians who regularly play in subway stations, using portable digital recorders to capture their on-the-fly performances.

Not all subway stations are created equal. Subway buskers choose their locations carefully, avoiding stations with a steady stream of announcements, or major hubs with more than one line running through them. Delays might be irritating for commuters, but for the performers they are goldmines, giving them an extended performance period in between trains. And Case has found that the buskers instinctively seek out locations near hard walls and under low ceilings, so their music is amplified above the din of the station.

Case doesn't find this at all surprising. Subway walls are typically made of rigid heavy materials like tile, stone, steel, and concrete. These materials are better at reflecting sound waves, allowing sound levels to build up naturally, with no need for microphones or loudspeakers.

As a result, subway listeners are immersed in a babel of echoed sound known as reverberation. The same sound, heard up close, can be much less reverberation. Reverberation is the critical element in the design of all performance spaces, whether mainstream opera houses or alternative spaces like the subway. It's the same reason why so many people enjoy singing in the shower. It just so happens that the sort of space that is durable, easy to clean, and graffiti resistant also happens to sound reflective, says Case. "The musicians wallow in it. The commuters variably, I guess, avoid or ignore it."

So if subway stations are such terrific acoustical environments, how come it's so hard to understand the announcements over the public address system? Case says that because amplifying speech requires far less reverberation than music. The same phenomenon that sustains musical notes by building up sound reflections causes speech to become muddy and unintelligible. The reflections all mix together, so that individual words can't be deciphered. Add in the reverberation of amplification, and the reverberation is so strong that the announcer might as well be speaking with a mouthful of marbles.

That's why acousticians like Casea lor their designs to the specific needs of performance spaces. Large opera houses like Boston's Symphony Hall or Carnegie Hall have different acoustical needs than, say, Broadway theaters. For the latter, says Case, his designs stress spaces with minimal absorption, lowering the amount of sustaining reverberation the space adds to a speaking voice. "This makes it easier for listeners to follow the spoken word, syllable by syllable," he says.

Concert hall design isn't just about the strategic conservation of sound energy inside the performance space. A great deal of effort is also spent on suppressing the noise and vibration of the surrounding city, not to mention noise from modern amenities—the heating and air conditioning equipment, elevators and plumbing—all of which can seriously detract from the pleasure of a performance. No one wants to hear a subway rumbling or a toilet flushing in the middle of Wagner's "Ring" cycle.

For Case, the most appealing feature of alternative performance spaces like the subway is their broad accessibility, compared with conventional opera houses, which tend to be somewhat elitist. He estimates that some 7 million passengers ride the New York subway every day. Even if only 1 in 10 passengers pay attention to the music, it still adds up to about 700,000 listeners per day, from every conceivable social demographic. Carnegie Hall and Lincoln Center would have to sell out 54 shows every day, on all six main stages, just to complete the subways. The subway is a performance of the people.

APKER Award from page 1

Princeton receives the Award for research at a PhD granting institution. His senior thesis, in an active area of string theory, was done under the supervision of Steven Gubser, and is entitled "Large $N$ Charged Sectors of the Ads/CFT Correspondence."

At Princeton, Heckman received the physics department's Kusaka Memorial Award for undergraduate research, and was awarded a Phi Beta Kappa and Sigma XI. He is currently pursuing a PhD in theoretical high energy physics at Harvard University.

The Award for research at a non-PhD institution goes to Nathan Hodas of Williams College. He graduated with Highest Honors from page 5 and Instruments to work in high energy physics for a few years.

When a job at the Exploratorium opened in 1977, Semper decided to take it. "It was always important in teaching nonscientists science," says Semper, explaining his reasons for moving out of the lab and into the museum.

— Courtesy of Physics Central.com
A concurrent need to prepare the next generation of nuclear physicists to lend scientific and technical expertise to public policy issues.

QUALIFICATIONS include a PhD or equivalent in physics or a closely related field, a strong interest in science and technology policy, and some experience in developing professional knowledge toward the solution of societal problems. Fellows are required to be US citizens and members of the APS.

TERM OF APPOINTMENT is one year, beginning in September of 2005 and concluding September 30, 2006. Fellows are compensated by AAAS. Fellows have considerable freedom in choosing congressional assignments.

A stipend of $50,000 is offered in addition to allowances for relocation, in-service travel, and health insurance premiums.

APPLICATION should consist of a letter of intent of approximately two pages, a list of key publications, a two-page resume, and three letters of reference. Please see the APS website (http://www.aps.org/public_affairs.fellows.html) for detailed information on materials required for application and other information on the program.

ALL APPLICATION MATERIALS MUST BE POSTMARKED BY JANUARY 17, 2005 AND SHOULD BE SENT TO THE FOLLOWING ADDRESS:

APS Congressional Science Fellowship Program c/o Jackie Beamon-Kiene APS Executive Office One Physics Ellipse College Park, MD 20740-3843

MEETING BRIEFS

Lasers

LASER SCIENCE from page 3

celled by the focus of each pixel of light as the display projects different objects. The device can control all the pixels in the display as it scans by changing the focus of that beam very quickly—in this case, two-dimensional pictures refreshes. Viewers can converge their eyes and focus their eyes at the same distance—just like when viewing real objects. Also as in real life, so now we want to see the objects—the display changes the lights intensity and color, so a “high-resolution picture can be painted right onto the retina,” Schowengert said.

Sheding New Light on Embryos

Chi-Kun Sang of the National Taiwan University presented a new high-resolution optical technique for imaging the embryonic development of quail and human embryos. The light beam can scan numerous important cell features such as the neural tubes, structures which form into the spinal cord, spine, and brain.

Called “harmonic optical microscopy,” the technique scans infrared laser light across the living specimen, which then generates a hologram and two-dimensional images. The future of Nuclear Physics.

The growing evidence that neutrinos have mass has caused nuclear physicists to contemplate the first significant revision to the Standard Model in several decades. Stuart Freedman (University of California, Berkeley) described the conclusions and recommendations of a recent study of the preparation of a high-energy neutrino program, sponsored jointly by the APS Division of Nuclear Physics, the Nuclear Science Education Foundation, and the Physics of Light.
Rebuilding Science in Iraq, One Scientist at a Time

By Alexander Dehgan

[Editor’s Note: Alexander Dehgan is an AAAS Science and Technology Fellows Program (STF) fellow working in Iraq under a U.S. program designed to direct scientific instruments into new scientific areas. This short-form article is adapted with permission from a telephone interview conducted by AAAS senior writer Edward W. Lemmon on 2 September 2004.]

When I arrived in Baghdad, Iraqi science was in a complete state of disarray. This was due to the devastating effect of three wars on the country’s infrastructure, the random risks to individuals that scientists endured, the fact that we would hear about against one another, and the random selection of equipment, which seemed every piece of equipment was taken or destroyed, dealt the final blow. We also had certain numbers of scientists that were high-level Party members. Many scientists had any ties to the West, which was considered a heresy. The West was considered the enemy. We had to compartmentalize. There were many, many years of what went on under Saddam’s leadership. We are rebuilding for decades, for many years of what has gone wrong in the country.

At the third meeting of this scientific advisory council, we saw that the scientific community were sitting around the table and I was trying to get the Iraqis to prioritize what was the most important projects that they needed to work on. And people kept going on to Iraq’s scientific and technical community, this means what has happened under the previous regime.

Second, we need to unite the community to work on the rebuilding of the country and addressing the substantial problems I mentioned, such as the environment. Third, we need to rebuild and equip Iraq’s laboratories, universities and scientific institutions. The key is this: we must work on the most important projects that we need to work on. And people kept going on to Iraq’s scientific and technical culture that is based on merit, transparency, and independence of scientific thought and overcome what has happened under the previous regime.

The challenges facing the Iraqi scientific community are many. It is clear that we need to work on the power structure, on sanitation, on the environment, which has been used as a weapon in the last 15 years. We need to work on building an economy that provides stability and incentives for the Iraqi people to participate in their country. Science and technology will play an integral role in developing these things. We need to rebuild Iraq’s agriculture and we need to work on the development of Iraq’s scientific community. We need to work on the rebuilding of the country and addressing the substantial problems I mentioned, such as the environment. Third, we need to rebuild and equip Iraq’s laboratories, universities and scientific institutions. The key is this: we must work on the most important projects that we need to work on. And people kept going on to Iraq’s scientific and technical culture that is based on merit, transparency, and independence of scientific thought and overcome what has happened under the previous regime.

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