

Earth & Space Sciences Awards

Best Student Paper Award

Brian E. Anderson of the Geophysics Group (EES-11) was awarded the Best Student Paper Award in Engineering Acoustics at the 153rd meeting of the Acoustical Society of America in June 2007. The award is given to a student or recent graduate (as in Anderson's case) based upon the quality of both the content of the paper and its presentation. The award included a \$300 cash award. Anderson's paper consisted of work he did as an acoustics Ph.D. student at Penn State University and was entitled "Grating lobe reduction in transducer arrays through structural filtering of supercritical plates" (*Journal of the Acoustical Society of America*, vol. 121, p. 3059, May 2007).

Transducer arrays are limited in usable frequency bandwidth on the upper end by the appearance of an aliasing effect that results in grating lobes. Grating lobes cause operational confusion for technologies that rely on arrays as they send sound into unintended directions on transmit and increase sensitivity at undesired angles on receive. The paper investigates the idea of eliminating or reducing grating lobes by placing a very stiff and lightweight plate in between the array and the medium to which the array is coupled to. The plate acts as an angular filter to suppress radiation/sensitivity at large angles relative to normal incidence. Grating lobes are reduced as long as they are located in the suppression region. [Work done at the Applied Research Laboratory at The Pennsylvania State University and sponsored by ONR Code 333, Dr. David Drumheller.]

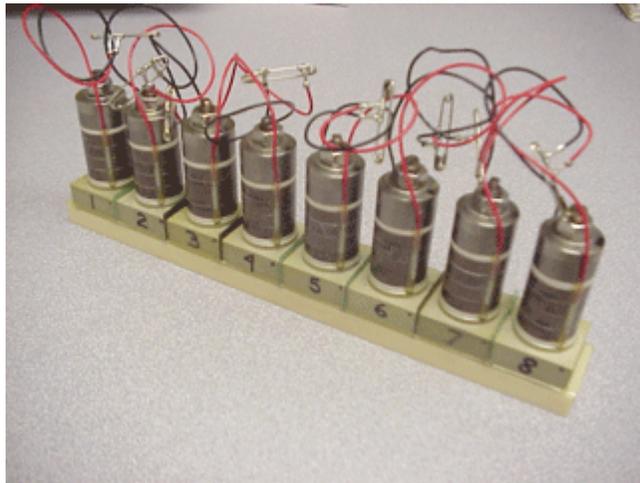


Figure: Photograph of a SONAR Tonpitz array bonded onto an advanced ceramic alumina bar. The alumina bar provides the advantageous angular filter to suppress grating lobes at large angles.

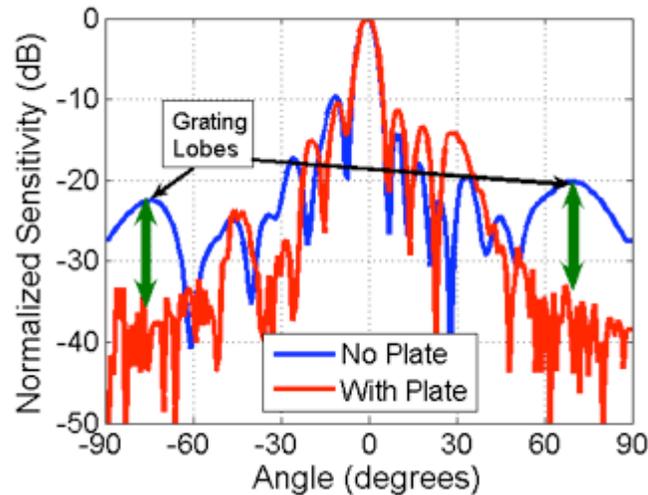


Figure: Measured beam patterns for the array pictured in Figure 1 without and with the alumina bar (labeled as “with plate”) in place. Note the significant reduction in the grating lobes (green arrows) and the tradeoff increase around +30 degrees due to a phenomenon called sound-structure coincidence.

Mike Fehler receives Distinguished Service to the Seismological Society of America Award

The Seismological Society of America (SSA) gave Mike Fehler (EES Division Leader) the Distinguished Service to SSA Award during the 2007 SSA annual meeting in Kona, HI. He received the award for serving as the SSA Journal editor for nine years. This award honors individuals who have made outstanding contributions to the work of the Society. Fehler gave a Society-wide address at the annual luncheon, titled “The Role of Scientific Societies in the 21st Century.” As the outgoing president of the SSA, Fehler presented Nafi Toksoz (MIT), EES-11 collaborator and former EES Division Review Committee Chair, with the Harry Fielding Reid Medal. This recognition of the SSA is for outstanding contributions in seismology and earthquake engineering.



Photo: Mike Fehler (right) presenting the Harry Fielding Reid Medal to Professor Nafi Toksoz

Jasper Vrugt Wins Soil Science Society of America Early Career Award



Jasper A. Vrugt, a J. Robert Oppenheimer Postdoctoral Fellow who is jointly sponsored by EES-6 and T-7, has been awarded the S-1 Early Career Award from the Soil Science Society of America (SSSA) in Soil Physics. This award recognizes scientists who have made outstanding contributions in soil physics within six years of completing their Ph.D. degree. Vrugt has been cited for his seminal contributions on parameter estimation in vadose zone hydrology, frequency domain analysis, and development of multidimensional root-water-uptake models. His current research interests are in advanced optimization methods applied to computationally intensive, high-dimensional models, with applications in a wide variety of fields, including weather forecasting, hydrology, transport in porous media, and epidemiology. The award was given at the annual S-1 Business Meeting, New Orleans, November 4 - 7, 2007.

LANL Career Development Mentoring Award

The Women's Diversity Working Group sponsors the Career Development Mentoring awards to promote career development of women at the Laboratory by recognizing and applauding mentors who exhibit exemplary informal or formal mentoring. Mentor nominees may be male or female, but the employee being mentored must be female. LANS regular employees, limited-term employees, or contract workers of the Laboratory are eligible to be nominated. The mentor-mentee relationship may be formal or informal.



EES Division technical staff member and acting division leader Cathy Wilson is the recipient of a 2007 Career Development Mentoring Award. Cathy has been an exemplary mentor by providing valuable research guidance, career advice, and opportunities for professional advancement. Despite numerous other time commitments that have contributed to professional achievements, it is evident that Cathy values the role of a mentor. As such, Cathy has left an important and indelible impact on at least one young career female engineering student. She advises on how to optimize knowledge gained with producing quality research deliverables. Taking into account a mentoree's learning curve and applicability of that experience to future work, Cathy advocates learning certain tools and skills over others. Cathy seeks channels to disseminate research and makes an effort to keep mentorees abreast of funding opportunities and conferences that are relevant to research interests. Collaborative work has been presented numerous times over the past year, gaining exposure that is advantageous to the mentoree's career. She provides trusted advice on career options from both a personal and professional perspective, proving invaluable to mentoree career decisions. Cathy is rightly recognized by this award for her mentoring capabilities.

Students Selected for the DOE Science and Energy Research Challenge

LANL students were selected to participate in the SERCh, to be held November 9-10, 2008 at ORNL. The DOE Office of Science sponsors the program and covers all travel expenses for the student and adviser. This prestigious and rigorous National poster competition is open to all undergraduate students who conducted DOE-related science research. Twelve of the 100 students DOE selected are from LANL. The Challenge includes a poster competition in six main categories: life science, energy, computational science, engineering, environmental science, and physical science. The EES student competed for scholarships in each category in addition to a single, overall grand prize scholarship of \$10,000. EES SERCh participants are listed below.

Student	Mentor	School	Poster Title
Joseph R. Koby	James Ten Cate (EES-17)	New Mexico Tech	Limitations of the Preisach Model: Experiments on Sedimentary Rocks

Joseph Koby's (EES-17) experimental work with mentor Jim TenCate was to look at repeated stress-strain curves of various sandstones and limestones and study the time and rate dependence of the hysteresis loops, essentially observing and quantifying an effect known since the 1940s called elastic aftereffect (analogous to magnetic after-effect) for typical oil and gas bearing rocks. Joseph's work is included in a Geophysical Research Letter to be submitted by the end of this month. The work was supported by an LDRD-ER with TenCate co-PIs with Donatella Pasqualini (EES-16) and Salman Habib (T-2).

Award for Integrating Scientific Data into Yucca Mountain License Application

Douglas Weaver (EES-7) was one of the SNL 15-member team recipients to receive a Sandia National Laboratories Recognition Award for integrating 20-plus years of scientific data into the License Application for the proposed Yucca Mountain Waste Repository. SNL is the DOE Office of Civilian and Radioactive Waste Management Lead Laboratory for Repository Systems. The



lead laboratory is responsible for producing a sound technical basis and defensible Nuclear Regulatory Commission (NRC) license application for the world's first geologic repository for the disposal of high-level radioactive waste and spent nuclear fuel. The lead lab team completed nearly four years of technically challenging work in less than two years, meeting DOE's commitment to Congress and the Nation to submit a license application for Yucca Mountain on or before June 30, 2008.

Student Symposium Awards - Earth and Space Science-2009

Benjamin Linhoff, EES-14, collected groundwater samples from domestic wells throughout the Santa Fe region for analysis at LANL. He used GIS, geochemical modeling, and data analyses to investigate the source and distribution of uranium. The results suggest that cation exchange is an important process mobilizing uranium (VI) within aquifer systems and that groundwater isotope signatures of uranium are consistent with natural sources. Approximately 50% of the wells have uranium concentrations exceeding EPA's drinking water standard. EES-14's Patrick Longmire is Benjamin's mentor.

Irena Ossola, EES-16 investigated model simulations to explain the release of carbon dioxide (CO₂) and methane (CH₄) from permafrost into the atmosphere. Microbes generate CO₂ and/or CH₄ through the breakdown of stored carbon compounds within the shrinking permafrost, making CO₂ and CH₄ available for release into the atmosphere. Models and research of the permafrost's active layer cycle and microbe development provide a better understanding of the future implications of climate change as a result of permafrost melting. Bryan Travis of EES-16 mentors Irena.

Jasper Vrugt Wins Young Outstanding Scientist Award

Jasper Vrugt, a J. Robert Oppenheimer Postdoctoral Fellow who is jointly sponsored by EES-16 and T-5, was selected to receive the 2010 Outstanding Young Scientist Award from the European Geophysical Union (EGU).



This Award recognizes young scientists who have made significant contributions to any field of geosciences within seven years of completing their Ph.D. degree. Vrugt was cited for his seminal and highly cited contributions on the development of general-purpose algorithms and numerical approaches that aim to better extract information from the mismatch between model predictions and observations to quantify individual error sources and improve theory, understanding and predictability of environmental systems. Vrugt has made significant contributions to four distinct disciplines: soil physics, parameter estimation (model calibration), uncertainty estimation (Bayesian statistics), and hydrology. At LANL he is researching model diagnostics and evaluation problems in geophysics, atmospheric chemistry, and eco-hydrology. He and his collaborators have started to publish papers on bird migration, electrical resistivity tomography, and magnetic resonance imaging.

A few months ago Elsevier, publisher of many scientific journals, selected Vrugt to be in the Top 50 of most talented young people from the Netherlands. This selection, including a short interview with Vrugt, appears in the June 6, 2009 issue of *Elsevier, The Netherlands*.

Breast Cancer Imaging Research Wins the Cum Laude Poster Award March 3, 2010

Microcalcifications, often the earliest signs of breast cancer, are not palpable lumps. X-ray mammography is the only imaging modality routinely used for detecting breast microcalcification; however, X-rays cannot be used frequently due to the potential danger of ionizing radiation. In addition, it is less effective in women with dense breasts, particularly young women. Ultrasound imaging could be an attractive, safe alternative tool for cancer detection and diagnosis if its image quality is improved.

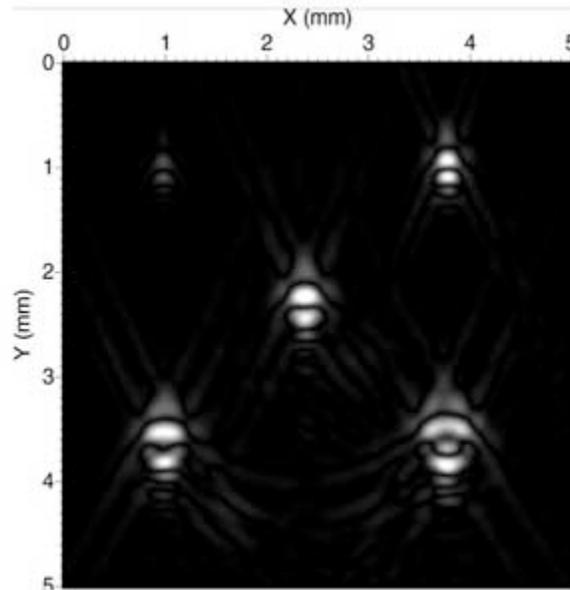


Figure: Magnified image demonstrates the high-resolution imaging capability of LANL's novel ultrasound imaging method to detect five breast microcalcifications inside a cancerous mass of a breast phantom. The image sizes of microcalcifications match well with their real sizes ranging from 80 to 520 microns. A mass with three to five microcalcifications is considered to be suspicious.

Lianjie Huang (EES-17) and collaborators from the Imperial College London and radiologists from the University of New Mexico (UNM) Health Sciences Center are conducting research to develop novel ultrasound-imaging methods for breast-microcalcification detection. They presented a poster on their ultrasound breast-microcalcification detection work at the SPIE Medical Imaging Meeting in San Diego, CA, and won the "Cum Laude Poster Award." The researchers used numerical breast phantoms to demonstrate that their novel imaging methods produce high-quality, high-resolution ultrasound images, clearly showing microcalcification (Figure). They will apply their imaging methods to patient ultrasound data acquired at the UNM Hospital. The research could significantly enhance ultrasound's ability to detect microcalcifications, and provide a powerful tool for reliable, safe, and frequent exams without ionizing radiation for women with a higher risk of breast cancer. Therefore, these imaging improvements could enhance early breast cancer detection and save lives. The researchers have received two previous awards at SPIE Medical Imaging meetings (2007, 2008) for their accomplishments.

The Breast Cancer Research Program of the DOD Office of the Congressionally Directed Medical Research Programs supports the work.

McDowell and Smirnova Receive DOE Early Career Awards January 20, 2010

Underscoring the Obama Administration's commitment to invest in innovation and research, DOE Secretary Steven Chu announced that 69 scientists from across the nation will receive up to \$85 million in funding under the American Recovery and Reinvestment Act for five-year research grants as part of DOE's new Early Career Research Program. The new effort is designed to bolster the nation's scientific workforce by providing support to exceptional researchers during the crucial early career years, when many scientists do their most formative work.

The researchers will receive funding for salary and research expenses. Beginning with the next fiscal year, DOE's Office of Science plans to continue the program, choosing new candidates on an annual basis, and supporting them under annual appropriations. To be eligible for an award, a researcher must be an untenured, tenure-track assistant professor at a U.S. academic institution or a full-time employee at a DOE national laboratory, who received a PhD within the past ten years. Research topics are required to fall within the purview of the Office of Science's six major program offices. Awardees were selected from a pool of 1,750 university- and national laboratory-based applicants. Selection was based on peer review by outside scientific experts..

Nate McDowell (EES-14) received the award for his proposal "An Integrated Theory on the



Mechanisms of Vegetation Survival and Mortality During Drought".

His goal is to develop and test a unified theory of vegetation mortality and survival during drought. The experimental work and theory will be used to simulate vegetation mortality and survival and their feedbacks on region and global climate. He received a PhD in Tree Physiology in Oregon State University and came to LANL as a Director's Postdoctoral Fellow in 2003. McDowell became a staff scientist in the Earth and Environmental Sciences Division in 2004. He studies the inter-dependency of plant and ecosystem water and carbon cycles and their response to climate and disturbance. McDowell serves on advisory committees for the National Science Foundation, DOE, and LANL. He

is an associate editor for two international journals and has testified before Congress regarding DOE's climate change research.

Evgenya Smirnova (ISR-6) received the award for her proposal "Advancing Our Understanding



of Photonic Band Gap Structures for Accelerators". Her objective is to advance Photonic Band Gap (PBG) accelerator technology for use in the next generation of particle accelerators for high-energy physics.

Superconducting PBG accelerator technology could also deliver extremely intense, short-wavelength laser radiation needed for free-electron lasers. As part of her PhD research in Physics from Massachusetts Institute of Technology, Smirnova came to LANL as a visiting student in 2003 to work on the cold testing of the PBG accelerator. In 2005 she joined the ISR-6 group as a Director's

Postdoctoral Fellow, and she became a staff member in 2007. Smirnova is developing new W-band PBG devices and metamaterial devices at THz frequencies. She received the American Physical Society Outstanding Doctoral Thesis in Beam Physics Award and is a recipient of LANL awards (LAAP Team Award, Distinguished Performance Award, and Star Award).

Technician of the Year - Emily Kluk-March 31, 2009

Emily Kluk of EES-14 is a member of the Geochemistry and Geology Research Laboratory team. This team engages in experimental geochemistry for both fundamental geochemical research and customer driven applied science. Kluk prepares samples and maintains an x-ray fluorescence instrument for analyzing trace elements in rocks and soils, and prepares samples for an x-ray diffraction unit. She also is the waste management coordinator and ALARA coordinator, and she took on the position as EES and ADCLES lead for the Worker Safety and Security Teams. Kluk consistently shows a high level of dedication and a willingness and ability to do what it takes to meet program deadlines.

Her contributions have led her to be included as co-author on a large number of reports and peer-reviewed papers.



All-Star Vestrand Noted With Fellows Prize

We are pleased to announce that Tom Vestrand of ISR-1 has won the Fellow's Prize for his scientific papers using all-sky monitoring to catch short-term astrophysical transients while they are happening. In a series of papers in Nature, he discovered that the sharp pulses in gamma-ray bursts also emit in the optical band. This measurement of the emission at energies 10^8 times lower than the gamma-rays has allowed key parameters of the physical process to be constrained, providing strong evidence for the underlying process.

The night sky seems deceptively constant. In fact, wide field of view images of the sky contain a myriad of time variable sources: meteors, asteroids, airplanes, satellites, and flare stars, as well as distortions caused by hot pixels in the camera and clouds. Tom and his team has developed a system of stereo telescopes and accompanying software that can process in real time more than a terabyte of images every week and find the real astrophysical transients such as gamma-ray bursts within a very complicated haystack. This combination of robotic telescopes and smart computer processing led to the discovery of prompt optical emission in gamma-ray bursts and promises to be a technology that will dominate time domain astrophysics as well as contributing to national security.

Sharp SABRS Team Wins Accolades

The Nuclear Nonproliferation R&D program's Space and Atmospheric Burst Reporting System (SABRS) team's excellent effort in prosecuting the SABRS project and the conceptual design report has resulted in an outstanding review and many accolades. Here are some of the Review Committee's remarks:

- All committee members were extremely impressed with the technical quality of the work. Some even went so far as to say, "I loved the design."
- But beyond that, they were even more impressed with the quality of the people. One member exclaimed that this was as fine as any space development team he had ever seen. The Program Manager stated that the quality of the people immeasurably increased his confidence in the success of the project.
- A veteran technologist entered the review wondering what all the bright, new scientists, engineers and technicians knew and was firmly convinced that, "They knew quite a bit."
- All noted that there are no identifiable technical show-stoppers, although the schedule/finance phasing is a cause for concern.
- Our Sandia colleagues noted that S/W should be a major milestone, but also noted that the SABRS/ICADS teaming is so much better than any similar collaborations have been that it should serve as a model for our future interactions.
- An influential committee member was so impressed with the design that he stated whatever it cost in terms of money and personal sacrifice was well worth the investment. More specifically, the modularity of the design which afforded flexibility in development, basing mode, and performance was extremely impressive. Now onward to the construction of the qualification unit.

2007 Aviation Week Program Excellence Award

The Defense Support Program (DSP), to which Los Alamos has made numerous contributions, has been nominated for the 2007 Aviation Week Program Excellence Award dedicated to recognizing excellence in meeting the nation's security needs. As noted in the nominating package, "DSP is one of the most successful space programs in U.S. history, performing well in multiple dimensions: cost, schedule, satellite longevity, and most importantly, in mission success." The efforts of Los Alamos' Space Nuclear Explosion Monitoring (SNEM) team are cited as making a principal contribution to the 36-year success of DSP. The SNEM team, comprising members from the International, Space and Response (ISR) and Earth and Environmental Sciences (EES) divisions, develops and builds ten instruments designed to monitor the occurrence of atmosphere and space nuclear explosions, while continuously measuring the space environment at geosynchronous altitude (40,000 km). Currently, the 23rd and final DSP satellite is being readied for a 28 August launch from Cape Canaveral AFB. In addition to the Los Alamos-provided operational sensors, DSP-23 will carry an advanced space validation experiment called the Space and Atmospheric Burst Reporting System (SABRS).

Honors in ISR-1 to Three

Peter Gary has been selected to be a Fellow of the American Physical Society, an honor that is limited to just 1/2 of 1 percent of its members. His citation reads: "For his fundamental and definitive contributions to our understanding of collisionless wave-particle interactions in the solar atmosphere, the interplanetary medium, and all astrophysical plasmas"

Richard Epstein has been elected a Fellow of the Optical Society of America for "pioneering the field of solid-state optical refrigeration."

Geoff Reeves has been appointed an Associate Editor of the *Journal of Geophysical Research for Space Physics*.

Integrated Optical Biosensor System Patent Issued

The Integrated optical biosensor system (IOBS) invented by Karen M. Grace, Martin R. Sweet, Roy M. Goeller, Leland J. Morrison, and Jerome D. Kolar (all in ISR-4); and Wynne Kevin Grace (C-CPS) has been granted U.S. patent 7,289,207. The new system provides an integrated apparatus that is simple to operate, enabling an individual who is not highly technically trained to produce timely, accurate results. The biosensor apparatus is smaller than conventional biosensor systems and is sufficiently portable to operate in the field and at point of care settings. Furthermore, the biosensor is inexpensive to build, purchase, and maintain. Biosensors are devices that detect chemical or biological species with high selectivity on the basis of molecular recognition. Biosensor technology incorporates technological improvements in a variety of disciplines, including biochemical methodologies (e.g., organic synthesis, molecular biology) and electronics. The potential market for application of biosensor technology is enormous and includes detection and diagnostics in the health care industry and environmental monitoring.

He's The Guy

Josef Koller (ISR-1) has been appointed as topical editor for the Journal of Geoscientific Model Development in the subject area of solar-terrestrial sciences. This brand new journal, published by the European Geosciences Union, can be accessed at <http://www.geoscientific-model-development.net> and is an international scientific journal dedicated to the description, development and benchmarking of numerical models of the Earth System and its components. The journal has an innovative two-stage publication process: In the first stage, papers pass through a rapid access peer-review and are immediately published on the journal website where they are subjected to a public discussion by the scientific community. In the second stage, a peer-review process is completed and, if accepted, the final revised papers are published in the main Journal of Geoscientific Model Development.

AIP Chooses Los Alamos GRB Conference for 1,000th Issue Honor

The American Institute of Physics has published the proceedings of a Los Alamos-sponsored conference on Gamma-Ray Bursts (GRB) and they have chosen that it to be their 1000th volume because of the high profile of the discipline and importance of the conference. ISR division organized the Gamma-Ray Bursts 2007 conference this last November; ISR-1 members Mark Galassi, David Palmer, and Ed Fenimore are the editors. It was a conference with great scientific vitality, bringing more than 200 scientists from around the world to Sante Fe.



Gamma-ray bursts (GRBs), the most powerful explosions in the universe, are possibly the most vibrant research area in the world of astrophysics. GRBs were discovered by Los Alamos scientists in what is now ISR division over 30 years ago, and their origin is still a mystery. Their study requires the development of self-directing closed-loop satellites, fast robotic telescopes and subtle

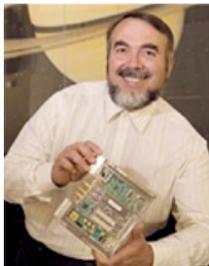
communication networks, as well as new theoretical understanding of stellar explosions and mergers. LANL plays a key role in US and international efforts in all these areas of GRB research.

RBSP Needs 3D

A new grant has been awarded to researchers in ISR-1 by NASA's Living With a Star (LWS) Program. PI Sorin Zaharia will work with ISR-1 colleagues Vania Jordanova and Yue Chen on developing and testing a self-consistent, realistic three-dimensional physics model of the magnetic field in the inner magnetosphere of the Earth. Accurate knowledge of the magnetic field is crucial for understanding and predicting the dynamics of the radiation belts, formed of high-energy particles that can be extremely hazardous to satellites. The modeling from this research will be used to interpret observations from the upcoming Radiation Belts Storm Probes (RBSP) NASA mission, for which Los Alamos is one of the instrument teams, and will also leverage work in TR's Space Situational Awareness Program.

R&D 100 Award

Mark Dunham of ISR-DO won R&D Magazine's 2009 R&D 100 Award. Recognized as the "Oscars of Invention" by the Chicago Tribune, these awards honor the top 100 proven



technological advances of the past year. Taking radio into space: **TeraOps Software Radio** moves the concept of software-defined radio into space, where it can be used to extend dramatically the lifetimes of electronic systems aboard satellites and in space payloads. The components that make up the TeraOps Software Radio are compact, lightweight, cost-effective, and -most important--adapted from commercial off-the-shelf products. Mark Dunham (left) of the Lab's International, Space, and Response group and Michael Pigue of Space Instrumentation Systems developed the technology.

STAR Awards

The LANL Star Award is given by the Women's Diversity Working Group and the Office of Equal Opportunity and Diversity. This award is given to women who go above and beyond the call of duty in the performance of their job functions, who have achieved scientific or technical success, who make important contributions to the community, or who are stars in other ways. Wendee Brunish was one of several women who received a 2007 Star Award:



Wendee Brunish, Team Leader for EES-11, was recognized for her communications skills both one-to-one and in group meetings. She has an exceptional ability to ensure that each person understands tasks and action items. Brunish was also cited for her work to promote EES-11 group members. In addition, she was recognized for her community service, which extends from increasing awareness of women's issues to her very demanding work with search and rescue.

Outstanding Student Paper award at American Geophysical Union Meeting

Saikiran Rapaka, a Graduate Research Assistant in EES-6, received an Outstanding Student Paper award for his presentation titled, "Critical Times for the Onset of Density-Driven Convection in Anisotropic Porous Media" at the American Geophysical Union (AGU) 2006 Fall Meeting. Sai is currently pursuing his Ph.D. at Johns Hopkins University.

EES-11 Poster, "Super-Resolution Ultrasound Tomography: a Preliminary Study with a Ring Array," wins award at SPIE Medical Imaging 2007 Symposium

An international medical-imaging collaboration, headed by Lianjie Huang (EES-11), won Honorable Mention Poster Award at the Medical Imaging 2007 Symposium of the International Society for Optical Engineering, held in San Diego, California, February 17-22. Huang's collaboration is developing a novel technology for ultrasound tomography. This technology has already demonstrated significant improvements in ultrasonic image resolution. The poster detailing this technology was one of 133 posters in the special session on "Physics of Medical Imaging," most of which dealt with enhanced diagnostic imaging of tissue. This is the first experimental demonstration of an image resolution better than a quarter of ultrasound wavelength obtained using the factorization method and a ring transducer array.

Huang and his team are conducting research to tackle the imaging problem that most breast cancers in women with dense breasts are undetectable by mammography, the only routine screening tool for breast cancers. The research team has made significant progress toward detection of those cancers using novel ultrasound tomography. Huang and his collaborators Y. Quan (Stanford), R. G. Pratt (Queen's University, Canada), F. Simonetti (Imperial College, London), and N. Duric (Karmanos Cancer Institute, Michigan), presented two talks and two posters on their novel ultrasound breast-cancer imaging techniques at the conference. The titles of their conference papers are: "Time-of-flight ultrasound tomography using bent rays," "Tomography with ultrasound waveforms," "Super-resolution ultrasound tomography," and "Reflectivity imaging for heterogeneous breasts." Simonetti, Huang, Duric, and O. Rama (Karmanos Cancer Institute, Michigan) coauthored the winning poster, "Super-resolution ultrasound tomography: a preliminary study with a ring array." LDRD supported the research.

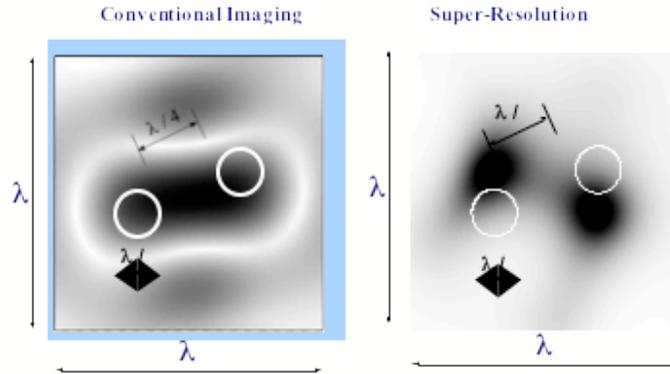


Figure: Comparison of monochromatic images of two nylon wires at 1 MHz, scanned with a ring transducer array. The left panel is the image obtained using a conventional ultrasound imaging method with diffraction stacking, which demonstrates that it cannot resolve the two wires separated only by a quarter of ultrasound wavelength. The right panel is the super-resolution imaging result obtained with the factorization method, which clearly shows the images of two wires.

EES-14 Scientist Recognized for Student Outreach

Julianna Fessenden-Rahn (EES-14) was recognized for technical contributions and her outreach efforts to students. She was instrumental in developing carbon sequestration programs for the Laboratory, and she has a lead role in developing LANL's efforts in the vital scientific areas of Monitoring Measurement and Verification, nuclear forensics, and isotope signatures of nuclear processing. According to her nominator, what sets her apart is "her extreme dedication to student education." She organized and led two educational programs focused on the environment.



She co-led the Research Experience in Carbon Sequestration summer program for two years and taught in it for several more. She also founded the Accord Pueblos Summer Environmental Science Program, which brings in tribal youth to study environmental science with LANL scientists.

Technologist of the Year Emily Schultz-Fellenz

Emily Schultz-Fellenz of EES-16 was selected as ADCLES' Technologist of the Year. Emily was selected for her ability to work independently in demanding technical areas with little guidance, her ability to work across organizations to lead and meet critical LANL operational requirements, and her ability to maintain an extremely high level of professionalism both within and outside the Laboratory. According to her nominators, Emily is not only a high-performing supporter, she is a go-to person in a leadership role who carries substantial responsibility for LANL's technical credibility while also developing new work scope, promoting innovative ideas, and interacting independently and effectively with sponsors, regulators, and colleagues.

Over the past year, Emily has made vital contributions and served as the LANL Point of Contact for the geology of seismic hazards, a role that involves a high degree of institutional risk and impact. In this role, she has worked with the Defense Nuclear Facilities Safety Board and completed significant work to renew LANL's Hazardous Waste Facility Permit issued by the New Mexico Environment Department.

Emily was also selected due to her involvement in professional and Laboratory service and for her commitment to mentoring. Emily is an active member of two professional society committees, serves as the EES Division Student Liaison, is a member of the LANL Student Program Advisory Committee, and is a committee member for selecting the LANL Star Award and Women's Career Development Mentoring Award recipients.



Photo: Neu and Schultz-Fellenz

Technician of the Year George Perkins

George Perkins has been selected as ADCLES' Technician of the Year for his exceptional work and for taking initiative beyond the usual tasks of a technician and based on his proven ability to rise to the challenge of being a lead technician in two IRMS laboratories. In both labs, he has the responsibility to maintain the instruments, run the daily samples, and troubleshoot any problems that arise with the instruments. George has also taken the initiative to teach masters/bachelors level students, technical staff members, and other technicians on how to run the instruments.

George's technical contributions are significant: he has created new methods for running solid/liquid/gas samples, coauthored 4 papers, presented material at international and regional conferences, and is working to expand beyond the sample processing/analyses that he is currently doing and start leading new efforts in statistical QA-QC in DHS and DOE-NA-22.



Photo: Neu and Perkins

LANL Garibaldi Team Receives Certificate of Appreciation from NNSA

The LANL Garibaldi Team led by Kevin Mitchell (C-PCS) has been awarded a Certificate of Appreciation from the NNSA Office of Nonproliferation Research and Development for their recent field tests at the Nevada Test Site. The team members include Herb Fry, John Jolin, Cliff Hewitt, Brian McVey (C-PCS), Xinxin Zhao (C-NR), Tom Gamble (C-CDE), Roger Petrin (ISR-3), Steve Love (ISR-2), Lee Balick (ISR-2), Brad Henderson (ISR-2), Derek Armstrong (XCP-4), and Scott Smith (EES-16).5/25/10

Charlotte Rowe of Geophysics receives Star Award

Charlotte Rowe of Geophysics (EES-17), received the Star Award. "The Star award recognizes women who go above and beyond in the performance of their job functions, who have achieved scientific or technical success, who make important contributions to the community, or who are stars in other important ways. The LANL Star recognition is awarded annually by the Women's Employee Resource Group in conjunction with the Work Environment Diversity Working Group and the Office of Equal Opportunity and Diversity."

Active Laboratory Fellows:

Birn Joachim, ISR-1
17

Feldman W., ISR-1

Johnson Paul A., EES-17

Chylek Petr, ISR-2

Fenimore Ed, ISR-1

Theiler James, ISR-2

Colestock Patrick L., ISR-2
ISR-1

Gary S. Peter, ISR-1

Thomsen Michelle,

Epstein Richard, ISR-1

Jacobson Abe, ISR-2