December 2020 Newsletter

SRI International

Alumni Association

333 Ravenswood Avenue • M/S AC-108
Menlo Park, CA 94025-3493

Voicemail: 650-859-5100
Email: steering-committee-alumni@sri.com
Web page: https://alumni.sri.com

MESSAGE FROM ARCHIVES CHAIRMAN DON NIELSON

Don Nielson

While this year has been a real downer for most of us, you can find a bit of solace in this year's final issue of your newsletter. Although we were denied our annual October reunion at SRI, we did use one of this year's pervasive alternatives, a virtual gathering, to honor our Hall of Fame selections for 2020. Four alumni were added to our distinguished list. Virtual or not, the proceedings went well, as several watchers and participants noted. As they say, it is fitting and proper that we do this, but, of course, such recognition never happens unless someone takes a moment to submit a deserving nominee. You can find the procedure and further encouragement on page 16.

You will be happy to know that most of the important undertakings at SRI that Caren Rickhoff presents are relevant to the current epidemic. Since all exponential threats are best dealt with in their earliest stages, the first project, sponsored by DARPA, addresses the need to get more effectively ahead of subsequent pandemics in the synthesis and distribution of therapeutics. Then read of an NSF grant for exploring how viruses learn to adapt to and to proliferate in their hosts—in this case, us. The third offering describes an SRI start-up using AI in ways you would never guess. SRI speech recognition researchers have really extended themselves in applying that technology to the ability to diagnose and track the severity of respiratory problems like those caused by the COVID virus. Incredibly, very large data samples of annotated symptoms like cough, wheezing, and shortness of breath can, with other diagnostics, help in the early diagnosis of ailments and the progress to recovery.

Aspects of SRI's history unfold in a couple of interesting stories. One is a pointer to an autobiographical tale about how one person found fulfillment at SRI—so much so that he wrote a book about it. Norm Nielsen's story is full of adventure but also implicitly charts his professional growth at SRI. The book is an interesting read whether or not you have a technological bent.

While many of you have probably heard of SRI's facility in Greenland, you may have no idea that it operated there for 35 years! To enlighten you about this remote and successful experimental site, one of its most stalwart participants, Mary McCready, offers an explanation of how it came to be as well as an extensive look inside its operations. To round out her story, we also have what we hope is the first of other personal recollections from those who visited the site of what made it an interesting place to be. This first one is from Tom Lovelace. Quite by accident, you'll find that the exploits of Norm Nielsen and the activity of Hall of Fame awardee Murray Baron while he was in Sweden both have linkage to the Greenland facility.

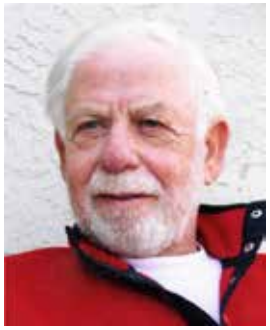
Finally, we got a surprise from an article in the local San Jose paper about SRI colleague Al Nagy. Al, while engaged at SRI for 45 years, had spent the majority of his spare time at the highest leadership levels in his community of Newark. If you're tired of the rancor that surrounds elected officials, this account will warm your heart. My own recollection of Al is that he was a calm, thoughtful, and approachable manager in that part of SRI that gave us the tools of project accountability.

As we now face a holiday season that may be more sparse and isolated than any we can recall, maybe it is time to break out a list of things we can still be grateful for. Doing so is provably good medicine.

2020 SRI Alumni Hall of Fame Recipients

Four former SRI staff members, Murray Baron, Joyce Berry, Paul Finnigan, and Pat Henry, were inducted into the SRI Alumni Hall of Fame in October. Normally this award would be received at our annual reunion, but since the current pandemic prevented holding it there was a special Zoom meeting on October 15 to acknowledge the recipients. They received this honor in recognition of their exceptional contributions to the success of SRI. Following are their complete citations.

Murray Baron



Throughout his 41-plus years at SRI, Dr. Murray Baron exhibited exemplary technical and organizational leadership. On the technical side are his contributions to ionospheric research and his role in the unique acquisition of data on the effects of nuclear explosions on radar systems. On the organizational side are his leadership of Europe's first high-latitude tristatic ionospheric incoherent-scatter facility and leadership of SRI's Radio Physics Laboratory, Geoscience and Engineering Division, Advanced Development Division, and Radio Science and Engineering Division.

After joining SRI in 1959, Murray introduced digital computers to process the data from a study of dynamic ionosphere effects on radars to detect transpolar missile attacks, in a polar environment plagued by the natural aurora background. Thereafter, on Johnston Island Murray led the capture and processing of the first radar data from high-altitude nuclear explosions over the remote central Pacific. Murray returned to the auroral zone to continue assessing radar performance and led SRI's first use of incoherent electron scatter, a new technique for probing the ionosphere. Ultimately, the SRI scatter radars were located in Alaska and in Greenland, where they operated for 11 and 35 years, respectively. These successes led to an award to SRI for construction of phased-array radars that are still operating in Canada and Alaska and also to the operation of the Arecibo Observatory radio telescope in Puerto Rico. Murray brought to SRI the leadership and staff to ensure Arecibo ongoing success that resulted in approximately $200 million in revenue.

From 1982 to 1985, Murray served as the second director of Europe's first high-latitude endeavor, EISCAT (European Incoherent Scatter Scientific Association), overseeing the development of its nascent radar systems into robust, reliable technologies and adopting new algorithms for data acquisition and processing that enabled better physical insights.

On his return to SRI, Murray excelled in leadership positions until his retirement in 2001. Since then, he has been a consistent leader in the SRI Alumni Association.

Joyce Berry

During the 24-year existence of the SRI Alumni Association, one person has been dedicated to its success more than any other: Joyce Berry. The duration and span of her contributions are huge, both in the formal work she performed and in the myriad informal roles she took on as needed. Joyce invariably did them all well.

Joyce not only maintained all the membership records, but also wrote a Membership Data Manual, which proved helpful when she was training her replacement. Joyce designed and assembled the Association's newsletter from 2001 through 2009. Her leadership at the annual reunions, Spring Fling events, and Hall of Fame awards was impressive: Among other things, she provided ways for tracking and reliably creating name tags for the many reunion and Spring Fling attendees, produced the Hall of Fame certificates and posters that documented the inductees' contributions, and maintained a record of each year's inductions. In all she did, Joyce set a standard of excellence for those who follow her.

While this nomination accentuates Joyce's contributions to the Association, she also had a notable career at SRI. Joyce began her career in 1965 as a report typist and later became a report coordinator for Poulter Laboratory. In 1977 she became the supervisor of the centralized Technical Illustration group. After the group was decentralized in 1978, Joyce became the supervisor of the Physical Sciences Division Report and Proposal Service and was also asked to resume her role as Poulter Laboratory report coordinator, positions she held until her retirement in 1997. Joyce's superior organizational skills and multiple other talents

were invaluable in expeditiously producing accurate reports and proposals. Her work ethic was highly valued by the report authors and resulted in reports that received regular accolades from SRI clients.

Paul Finnigan

In 1966, when SRI had about 2,000 employees, the institute was in a precarious financial position because it lacked consistent project accounting procedures. Increasing project overruns were red flags to the federal government, SRI's largest client, and were leading to significant losses. A project control system was needed to identify revenue sources, track related expenditures, and monitor the cash flow of individual projects. Paul Finnigan was hired to lead a program to develop such a system.

As a first step, Paul's team quickly conducted a financial audit and was shocked to find that the outstanding invoices represented an estimated total of roughly half SRI's annual revenues!

The team spent several months analyzing SRI's operations and drafting specifications for the Project Status Report, the now familiar and ubiquitous PSR at the core of all SRI projects. Paul was charged with executing the measures that were essential to establish financial control. Some measures seemed draconian to the staff but were necessary. For example, all staff member credit cards were rescinded to reel in uncontrolled and untracked spending; future purchases required the controller's personal signature. A travel company also was engaged to ensure that all travel costs were reimbursable according to contract specifications.

Development and implementation of the PSR brought full accountability to SRI projects and led to financial stability. Paul's appointment as controller resulted in a financial model that accurately forecasted weekly cash flow, and a year later SRI was profitable and had achieved positive cash flow.

The entire management team admired the efforts to set SRI on a sound financial footing. Paul was appointed to serve on committees that set the direction of the institute, and he was also invited to join the Management Systems Division where the team promoted SRI's Management Information System concepts to SRI clients worldwide.

John Patrick Henry

During the 1970s and 1980s, SRI was at the forefront of energy technology research and was a major contributor to the national and international dialogue about energy management. Much credit is due to Pat Henry, who provided outstanding leadership in addressing critical U.S. and global energy supply and use issues. Pat worked tirelessly to build the SRI Energy and Resources Center (the Energy Center) into a leading multidisciplinary technology-based energy strategy consulting practice that had far-reaching impacts on decision makers in the private sector and those involved in setting government energy policy and allocating energy research funds. In fact, in the 1970s the new Department of Energy asked SRI's Energy Center team to help in developing the first national energy model.

To address national energy issues, original research data were needed, and Pat's team had to explore previously unmined technological research resources. The Energy Center's projections and innovative analyses led multiple international energy companies to support its research, and the team's annual presentations attracted hundreds of corporate participants from all organizational levels. For these presentations, Pat engaged multidisciplinary experts from across SRI to present results on topics such as global resource recovery methods (mining, hydrocarbons, solar, and all other options) and costs, energy technology systems and their technical and economic uncertainties, global economic uncertainties and sensitivities, water resources, and environmental constraints. The scope and quality of the analyses were impressive, especially considering the limited public domain information available and the time available to complete each analysis.

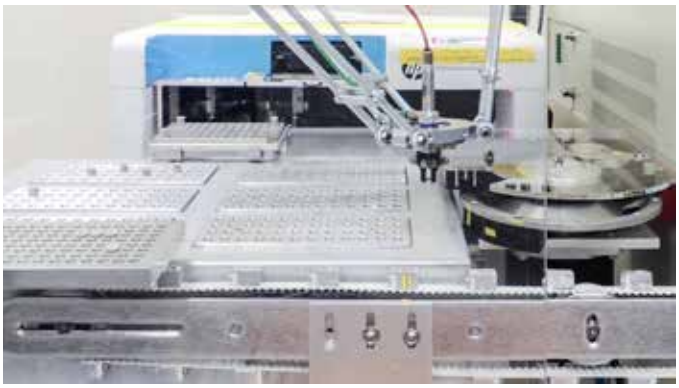
Some of the Energy Center's findings were at times controversial and had important implications for public policy and companies' strategic directions. Pat did not shy away from presenting results of "good objective analysis work," even when they may have contradicted conventional wisdom.

Pat was a visible figure on the national scene, helping better define energy challenges and issues. His assemblage of collaborative teams of technical experts and savvy business professionals from across SRI to address important societal and business challenges not only led to a successful working model at SRI, but also launched many distinguished careers.

ProSyn: The SynFini Extension Designed to Rapidly Develop Pandemic Treatments

SRI has received a $4.3 million grant from the Defense Advanced Research Projects Agency to create ProSyn™, a novel tool for producing the therapeutic small molecules needed for quick responses to biological threats and pandemics, such as COVID-19. SRI will collaborate with Rutgers University's Department of Chemical and Biological Engineering and Center for Structured Organic Particulate Systems to create and test ProSyn.

ProSyn will be an agile, rapidly deployable extension of SynFini™, SRI's fully automated synthetic chemistry system that designs and synthesizes chemical molecules. ProSyn will translate processes developed on SynFini to desired production levels, providing "just-in-time" and scalable manufacturing capacity. The Rutgers team, led by Drs. Fernando J. Muzzio and Ravendra Singh, will apply its expertise in process modeling to streamline scale-up from laboratory to manufacturing production.



The COVID-19 pandemic has highlighted limitations in the production and delivery of the treatments necessary to respond to a worldwide public health crisis. Predicting and stockpiling appropriate therapies before the outbreak of a novel virus is nearly impossible. As an extension of the SynFini system, ProSyn could reduce the need to stockpile antiviral agents and drugs commonly used in intensive care units and provide a faster response to emergency health situations, including new diseases.

"Throughout the COVID-19 pandemic, it has become overwhelmingly clear that there is a desperate need for technologies that can quickly discover therapeutics against new infectious diseases and, importantly, rapidly manufacture them at scale to make them broadly available," said Nathan Collins, Ph.D., chief strategy officer of SRI's Biosciences Division and the principal investigator for the ProSyn project. "With the addition of ProSyn, the SynFini suite may be able to address both needs."

This material is based upon work supported by the Defense Advanced Research Projects Agency (DARPA), under Contract No. HR001119C0108.

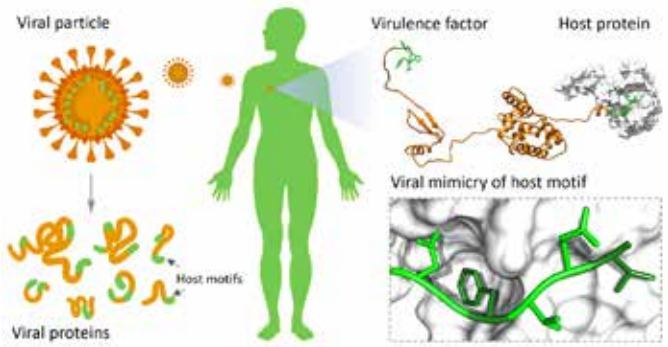
Sources:

SRI Press Release: https://www.sri.com/sri-international-awarded-4-3m-from-darpa-to-create-rapid-response-therapeutic-manufacturing-system/press-release/

Additional information: SynFini is described in the SRI Alumni Association Newsletter published in April 2020.

Identify the Copycat and Stop the Virus

The COVID-19 pandemic demands intensive fundamental research to decipher how the SARS-CoV-2 virus has adapted to infect humans and spread globally. SRI received a National Science Foundation (NSF) grant through the Grants for Rapid Response (RAPID) program to develop a first-of-its-kind system for classifying viruses based on the various ways they mimic their biological hosts (for example, humans) to successfully infect and spread. This research is expected to uncover new insights into how SARS-CoV-2 and other viruses mimic human biology to facilitate infection and adaptation strategies.



Previous research has revealed that host mimicry is essential for viral infection mechanisms, yet tools are currently lacking to comprehensively identify and classify signatures of host mimicry in viral sequence data. Recognizing patterns of biological mimicry among viruses may allow scientists to better understand specific viruses' preferred hosts and infection pathways and thereby provide valuable information for drug discovery and development. The SRI team will train a machine-learning algorithm to create a

system for classifying target viruses and then evaluate the algorithm's precision using SARS-CoV-2 as a test case.

RAPID is a mechanism the NSF uses to provide funds for urgent research that addresses unexpected disasters or events such as the COVID-19 pandemic.

Sources:

SRI website: https://www.sri.com/sri-receives-nsf-grant-to-create-new-viral-classification-system/announcements/

NSF Award Website: https://www.nsf.gov/awardsearch/showAward?AWD_ID=2034772&HistoricalAwards=false

SRI Spin-off CurieAI Transforms COVID-19 Case Management

SRI Ventures start-up CurieAI developed a platform that physicians are using to better manage a variety of respiratory conditions including chronic obstructive pulmonary disease, asthma, and fibrosis. This platform is based on the Curie system, technology licensed from SRI's Speech Technology and Research (STAR) Lab. Curie originated from technologies developed by the STAR Lab, including machine learning and natural language processing, subsets of artificial intelligence (AI).

Recently, CurieAI released a first-of-its-kind AI-driven platform designed to assist in the monitoring and management of respiratory conditions arising from COVID-19. This Curie system has been adopted to monitor inpatients and outpatients at San Carlos Apache Healthcare Corporation (SCAHC), which serves a population of 20,000 on a reservation in Peridot, Arizona.

Continuous inference of breathing patterns in terms of various digital biomarkers of respiratory health is an extremely complex AI problem. The AI system must handle the variability from both device and room acoustics, including background noise, and detect respiratory-health biomarkers with high accuracy and reject everything else; that is, it must have high sensitivity and specificity.

The Curie system uses a novel multistage architecture, custom signal analysis modules, and an ensemble of deep learning models (a combination of models used in parallel and in series). The system was trained using more than one million hours of data. This proprietary database provided more than 16 million annotated symptoms covering 18 different biomarkers, including different types of cough, sneeze, heavy breathing, wheezing, shortness of breath, and grunt-exhale, all of which can be combined with other vital signs to provide deep insight into patient health, indicating the level of respiratory distress. Curie consistently achieved >98% accuracy on both sensitivity and specificity over a wide range of complex test scenarios.

In the clinic, the Curie system continuously monitors breathing patterns and provides a daily objective assessment of the level of respiratory distress an individual patient is experiencing. This assessment provides the physicians with actionable insights on the disease state severity, condition progression, and early detection of any deterioration in the condition.

"We have seen direct correlation with Curie to be able to predict if a patient is improving or having more severe symptoms," said Dr. James Darragh, chief medical officer at SCAHC. "The first patient I specifically recollect was a patient who had already been treated with remdesivir and dexamethasone. We saw the Curie monitor turn into a red or warning level, and we repeated a chest x-ray and saw that it was significantly worse. This discovery led to our successful use of the COVID convalescent plasma with subsequent recovery of the patient which may have not been possible without Curie monitoring the patient."

"While the results are early and further research is required, the Curie technology has demonstrated that it can help stretched medical personnel stay in front of the disease and could assist them with important therapeutic choices they have to make," said Manish Kothari, president of SRI.

Sources:

SRI Dish website: https://medium.com/dish/curie-ai-transforming-the-standard-of-care-for-chronic-respiratory-conditions-including-covid-19-51fd96dec124

SRI Press Release: https://www.sri.com/press-release/sri-ventures-spin-off-curieai-transforms-covid-19-case-management-at-san-carlos-apache-healthcare-corporation/

Advancing New Male and Female Contraceptive Products

SRI was awarded a Biological Testing Facility (BTF) contract of up to $40 million from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) to complete discovery and preclinical development of new contraceptive compounds. Under the five-year contract, SRI is responsible for all preclinical support services necessary to progress toward the development of high-quality, safe, and effective male and female contraceptive products.

The NICHD is the lead US agency for the conduct of basic, clinical, and epidemiologic research to develop new contraceptive methods and to evaluate existing methods. The NICHD's BTF fulfills a unique role in bridging the discovery and optimization of contraceptive agents to approval of contraceptive drugs.

"Through this contract, our team at SRI has the opportunity to apply our state-of-the-art facilities and extensive expertise in support of NICHD's important global health goals," said Toufan Parman, senior director of toxicology and immunology at SRI and the principal investigator for the NICHD contract.

As the BTF selected to fulfill this contract, SRI will conduct in vitro receptor and cell-based assays; in vivo efficacy studies; antifertility/fertility assessments; endocrine activity, toxicity, and absorption-distribution-metabolism-excretion profiling; drug metabolism and pharmacokinetics profiling; formulation development; testing of novel delivery systems and devices; drug product manufacturing and stability assessments; and all other activities related to preclinical development of products that may be tested in humans for contraception or therapeutic indications.

SRI has been providing preclinical services as the sole development contractor to the NICHD since 2009.

Source:

SRI Press Release: https://www.sri.com/sri-international-awarded-40-million-nichd-contract-for-pre-clinical-development-of-new-male-and-female-contraceptive-products/press-release/

A Career at SRI: Norm Nielsen's Memoir

By Don Nielson

Among us SRI alums there is a varying degree of affinity for the place, depending on too many dimensions to list. But if you spent most or all of your professional life at SRI, there is good reason to believe that it was a beneficial and rewarding experience. So it is with Norm Nielsen who came to SRI in 1957 and spent his entire career here. And an exciting and rewarding career it was—so much so that he wrote a memoir about it, a book he recently published entitled *Sawdust to Stardust* (Figure 1).

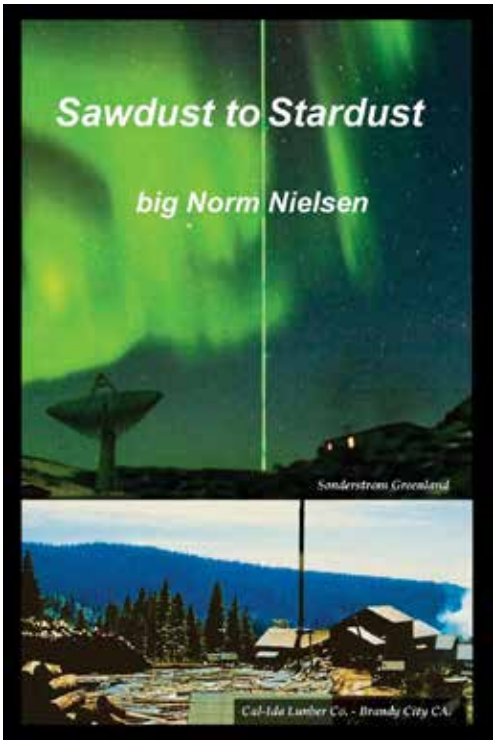


Figure 1. Front cover of Norm's memoir.

Norm had just been discharged from the Air Force with some background in the electronics of the day and was looking for a job that included travel and interesting work. Being from California, he went to San Francisco and began looking at ads for electronic technicians. Not knowing quite why, he answered one that gave no indication of who posted it other that it was on behalf of an "outstanding employer." He was surprised that the interview took him down the Peninsula to a more favorable climate and to the halls of SRI. But he was at once comfortable with what he found and essentially never looked back. He had found a home with friendly, helpful colleagues and very interesting work (Figure 2).

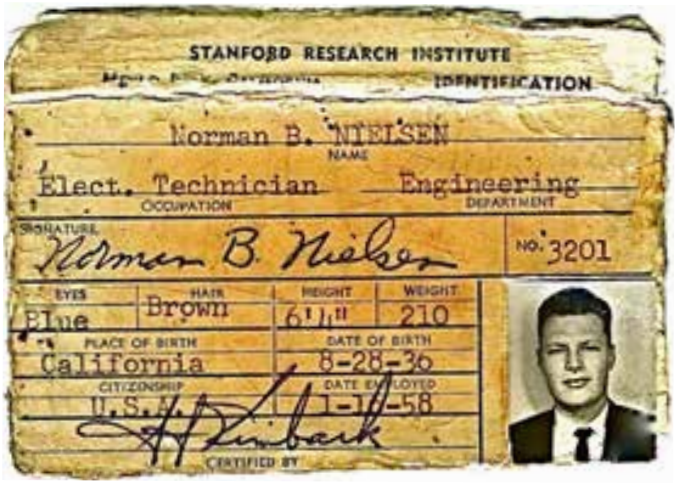


Figure 2. Norm's original SRI ID card.

His SRI world began in the area of radio research and operations, both for probing the upper atmosphere (where "stardust" impacts our earth) and for communications, dominated in that day by long-range circuits. Satisfying his lust for travel, this work took him to and let him explore places like Alaska, the West Indies, Cuba (the April 2015 issue of this newsletter tells of Norm and his cohorts there), Florida, New Jersey, and Hawaii, all in a period of five to six years. Norm's photograph of SRI's floating lab shows how much scientific abuse movie star Constance Bennett's original yacht could take (Figure 3). It was deployed more

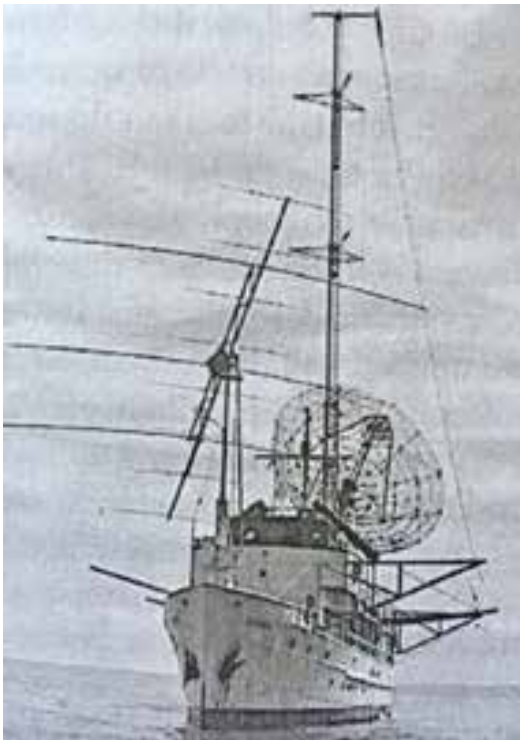


Figure 3. The floating laboratory Acania.

than once from the South Pacific to the Caribbean (see the April 2017 issue for more about the *Acania*).

Then surfaced one of the little-acclaimed features of SRI, its diversity of work. As projects in the radio field were dying down or, as was the case, in the midst of a huge transformation, Norm was guided by his supervisor to another part of SRI's Engineering Group that was dealing with the new field of lasers. Lasers are exceedingly versatile tools, and this specialty would be their use in a radar-like setting called lidar. There, Norm would successfully perfect first the operation and then the construction of these new measurement systems including all the complex optics that goes with them. He would spend the rest of his time at SRI on this thrilling intellectual ride with plenty of the fieldwork that he craved.

In many respects, using lidar resembled his earlier work with radar, but in probing a vast new world that radar couldn't see. First there was the atmosphere above us and its weather. Then came the detection and tracking of pollutants in all manner of places using all manner of platforms for the field measurements. Ships, vans, aircraft, and even a perch atop a nearly 1,600-foot tower in the Nevada desert were locations he learned to navigate. Norm would discover new exotic places like Kwajalein Atoll in the South Pacific to measure missile reentry vehicles, the snows of Greenland at SRI's facility at Sondrestrom Fjord probing the upper atmosphere, and—perhaps the culmination of his contributions—in Antarctica to examine ozone depletion (Figure 4).

Figure 4. Norm in Antarctica operating a lidar receiver through a homemade 24-in telescope.

But to me one of the most interesting and meaningful aspects to Norm's career stems from how SRI is a place for self-realization. By embracing the responsibilities placed before him, Norm worked his way from technician into the professional ranks at SRI. As a senior research engineer, he wound up giving invited papers in his field of lidar science. Reflecting back, he says in the book that SRI had a reputation for letting reliable people work unsupervised, knowing the job would get done! That is a gift to those who want to grow there.

Oh! If you're wondering about where "sawdust" came from, Norm started his working life in a California sawmill. It is really an interesting read if you, like Norm, grew fond of SRI and are looking for why. *Sawdust to Stardust* is available on Amazon.

The Sondrestrom Radar – A Brief History

By Mary McCready

The Sondrestrom Upper Atmospheric Research Facility, located just north of the Arctic Circle near the west coast of Greenland, was operated by SRI for 35 years, from 1983 to 2018. Initially, a three-frequency radar was built in 1962 to measure the effects of nuclear weapons on radio-wave propagation in the South Pacific. Later, a more powerful radar was built at Stanford and shortly thereafter moved to Alaska in 1972 to study auroral structuring in the ionosphere. After 11 years in Alaska, it was relocated to Greenland to explore the auroral cusp and the dynamics of the polar cap boundary.

The Original Plan – Defense-Related Research

In the early 1960s, in advance of the US-USSR nuclear test ban treaty, the US government began preparing for above-ground nuclear tests over the South Pacific Ocean. Of particular concern were the global effects of high-altitude (above 50 km) nuclear detonations on radio communications and radar. SRI's Radio Physics Lab was funded by the US Department of Defense (DoD) to study the effects of these detonations on radar performance. In 1962, SRI fielded a multifrequency (400, 800, 1,200 MHz) radar in the South Pacific on Johnston Island to study those effects on defense radar systems. Although those studies successfully collected unique and useful data on *effects* produced by the high-altitude detonations, they could not obtain fundamental information on *causes*—the underlying physics that led to the observed effects.

Shortly after the conclusion of the tests, SRI realized that the new incoherent scatter radar (ISR) technique, which had been recently postulated and demonstrated, would get at the fundamental data needed to understand the underlying ionospheric physics associated with high-altitude detonations. If the United States were ever to repeat the high-altitude nuclear tests, an ISR—with the capability of measuring plasma densities, temperatures, and motions—would be a much better diagnostic of the fundamental processes that produced the observed radar effects. With that in mind, the US government funded SRI to design and build a transportable ISR. Thus, if nuclear tests were resumed, a fully capable diagnostic radar would be available to move to the test region for observation of the effects. The ISR that was built at Stanford University, California, for this readiness program ultimately was moved to Chatanika, Alaska, and then to Sondrestrom, Greenland.

SRI built and tested that 1,290-MHz radar (Figure 1) on the Stanford University campus in Palo Alto. There, SRI's engineers and scientists could easily develop and practice the use of the radar together with data processing and analysis techniques. After some months of operation, it became apparent that performing measurements in a relatively benign mid-latitude environment was useful only to a certain extent. Preparing for operations in the much more dynamic nuclear-disturbed environment would require moving the radar to a location where the ionosphere in many important ways simulated the nuclear environment.

Figure 1. The 27-m ISR antenna at Stanford University, California.

The First Move – To the Auroral Zone

SRI scientists suggested that the structuring of the ionospheric plasma by the aurora might affect radio-wave propagation in much the same manner as a high-altitude nuclear detonation. The DoD agreed and funded the move to Chatanika, 30 miles north of Fairbanks, and also funded the initial operating costs. This placed the radar, shown during construction in Alaska in Figure 2, under the

nighttime section of the average auroral oval where auroral ionospheric disturbances could be observed frequently. The Chatanika Radar was operated from November 1971 to March 1982 and recorded an average of 100 hours of data monthly. Many radar experiments supported scientific sounding rockets that were launched from the nearby Poker Flat Research Range.

Figure 2. The assembly of the ISR in Chatanika, Alaska, in 1971.

Because the initial radar operations in Alaska produced significant new information on the auroral ionosphere, many scientists from across the United States became interested in using it for their own research. Concurrently, the probability of further high-altitude nuclear tests diminished and DoD interest in the facility declined. Because of the growing purely scientific interest, the National Science Foundation (NSF) increased its involvement in the project, and eventually the radar operations were fully funded by the NSF and the user community became international. The facility, shown in Figure 3, also supported a small number of optical instruments, providing complementary data sets.

Figure 3. The Chatanika ISR, November 1981 (photo by C. Heinselman).

During the radar's time in Alaska, six European countries formed a consortium to design and build a three-dish ISR system in Scandinavia called the EISCAT (European Incoherent Scatter) Radars. In a tristatic system, one site transmits and all three receive. This technique of measuring the ion motion from three points removes the spatial/temporal ambiguity inherent in a monostatic (one-dish) system. The placement of the three dishes in northern Norway, Sweden, and Finland put the EISCAT Radars also under the nighttime auroral oval, in a very similar geomagnetic location as the Chatanika Radar.

SRI and the scientific community felt that many of the questions regarding auroral zone physics and aeronomy had been addressed and that the remaining questions would be well addressed by the EISCAT Radars. However, measurements from Chatanika during magnetic storms (when the auroral oval was expanded) had revealed new phenomena in the region poleward of the auroral oval, particularly near the boundary of the auroral oval and the polar cap. In addition, satellite measurements were showing perplexing ionospheric-magnetospheric interactions in the region of the noontime auroral oval, also called the cusp or cleft region. Because of community interest and support, in 1979 the NSF directed SRI to examine the feasibility of moving the Chatanika Radar to a location that would enable routine measurements of the noontime auroral oval and of the boundary between the nighttime auroral oval and the polar cap. Such a move was practical only because the radar had, from the start, been designed to be transportable.

The Second Move – To the Cusp

During the feasibility study for the move, siting criteria were established based on both scientific and logistical considerations. Only sites in northern Canada and Greenland met those criteria. At that time, Greenland already hosted a large number of geophysical sensors along the west coast and had established a tradition of supporting scientific investigations into ionospheric phenomena. Continuing this tradition, a memorandum of understanding was reached to establish a research facility in Greenland near the US Air Base of Sondrestrom. (The village had the Danish name of Søndre Strømfjord, which the Air Force had "Americanized" to Sondrestrom. With the closure of Sondrestrom Air Base in 1992 and the transition to Greenland Home Rule, the village is now called by its Greenlandic name of Kangerlussuaq.)

The Chatanika Radar was thus moved to Greenland in 1982, and the Sondrestrom Upper Atmospheric Research Facility was established. Operations ceased at Chatanika in March 1982 and began in Sondrestrom in February 1983—less than a year later! This effort was led by Dr. John Kelly and was impressively completed on time and on budget. Figure 4 shows part of the dismantling of the antenna in Chatanika.

Figure 4. The removal of the reflector and torque tube from the gun mount, preparatory for shipping the ISR system to Greenland (photo by C. Heinselman).

During the move process, modifications were made to the radar system. The most visible was the enlargement of the parabolic dish from 27 m to 32 m. With a new shaped subreflector (for the existing Cassegrain feed), the net result was an improvement in both efficiency and gain—from 43% to 48% and from 47 dB to 49 dB, respectively.

The facility was located where the local hills provided shielding from possible interference for the sensitive radar receivers, approximately 15 miles west of the air base. This meant that the facility needed housing for the site crew and its own power plant. The power plant had two 180-KW diesel generators for routine use and a 600-KW generator used to power the 3-MW radar during its operations.

The site crew performed data archiving, troubleshooting, and upgrades as needed. The site crew usually included a mechanic who was also competent in plumbing, vehicle maintenance and repair, and HVAC systems and had the ability to deal with all the things that go wrong at a facility in the arctic. Most years, the site crew comprised four staff members. The majority of site crew came from Denmark or SRI Menlo Park for a one-year commitment, and a surprising number stayed longer or returned for another "tour of duty."

Becoming a Facility

With the move to Greenland, the scope of the project was expanded to include specific support for other scientific instrumentation—a stable floor for optical benches, multiple roof domes, and the floor space and power capacity to host additional instruments. Thus, Sondrestrom became a true scientific research facility that included the radar as its key component. The facility had a suite of instruments that contributed to high-latitude upper atmospheric studies, including an SRI lidar system (Figure 5). This lidar system enabled middle atmosphere research, reaching up to 90 km altitude.

Figure 5. The Sondrestrom Upper Atmospheric Research Facility, showing the 32-m fully steerable parabolic dish, Rayleigh lidar beam, and aurora on a moonlit night (photo by C. Heinselman).

The Sondrestrom Radar passed under the average auroral oval at noontime and was within the polar cap at midnight. The monthly average of radar operations increased from 100 hours to 160 hours, for a total of 46,000 hours of ionospheric data. The first years of measurements revealed as least as many questions as answers. In the winters of 1985 and 1987, sounding rockets were launched from the nearby rocket range and the wealth of data resulted in many scientific publications. All research done at the facility is available to the public and is published in the open literature. Data from the facility have been used in over 80 Ph.D. dissertations and many hundreds of peer-reviewed journal articles.

Scientists from around the world used the measurements made at Sondrestrom, and many brought their own unique instruments for that work. Figure 6 shows the general layout of the site and the locations of many of the upper atmosphere research instruments it supported. The

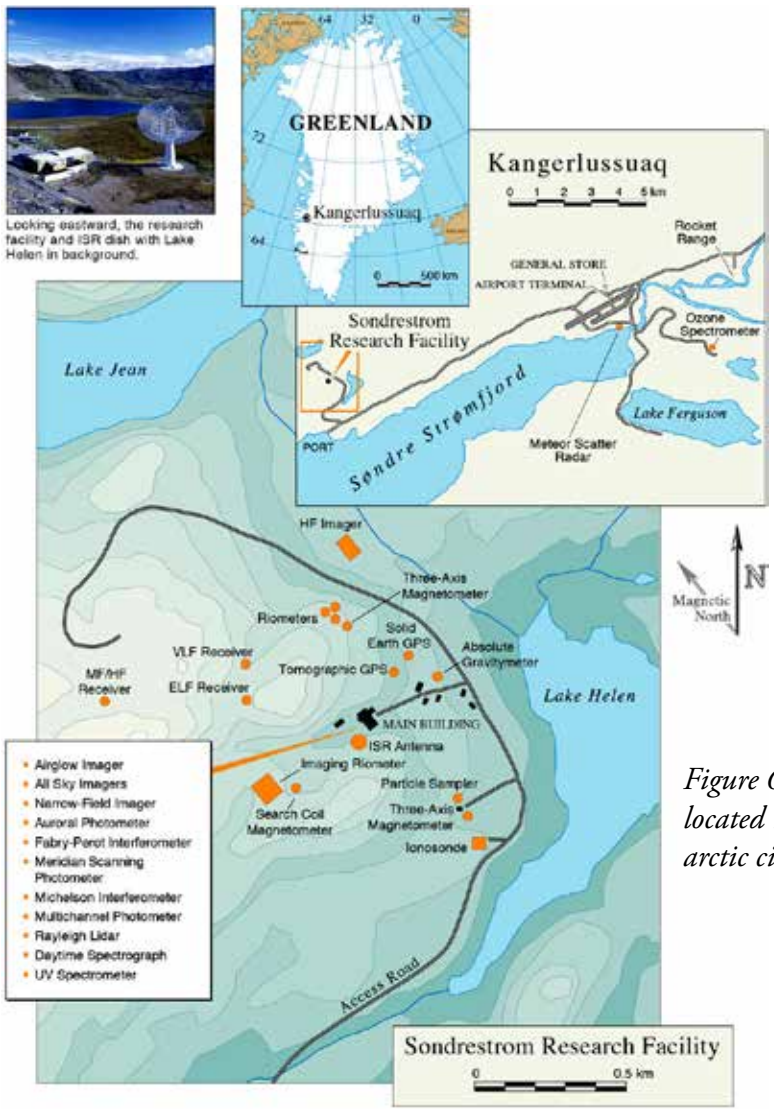


Figure 6. The Sondrestrom Research Facility, located near Kangerlussuaq, just inside the arctic circle on the west coast of Greenland.

facility also supported instruments not involved in upper atmospheric research. Some of the scientific systems were funded by US agencies other than the NSF (e.g., National Aeronautics and Space Administration, National Oceanic and Atmospheric Administration, National Center for Atmospheric Research), and some of them were from institutions in other countries. This suite of collocated instruments grew over the years from a handful of dark-sky optical instruments to dozens of instruments from over two dozen institutions.

Some of the numerous topical areas supported by the Sondrestrom facility include:

- Storms and substorms
- Auroral boundaries and particle energetics
- Electrodynamics and neutral dynamics
- Plasma structures and forms
- Mesosphere/lower thermosphere/ionosphere phenomena
- Middle atmosphere properties
- Ion and neutral thin layers
- Noctilucent cloud studies

Mary McCready worked on the project for 44 years – from 1974, when the radar was in Chatanika, Alaska, to 2018, when the Sondrestrom, Greenland, facility was decommissioned. In 1976, she became the first female SRI assigned to live at a remote field site. She also spent more than two years living at the Greenland facility, in addition to many multiweek trips annually to each facility. Always involved with processing the radar data for the user community, she also served as site crew, site supervisor, logistics coordinator, and eventually principal investigator. An added bonus was trips to some of the other ionospheric radar facilities – Arecibo (Puerto Rico), Jicamarca (Peru), Millstone Hill (Massachusetts), and Sodankylä (Finland).

Sondrestrom Stories

This is the first in a series of articles we hope to include in subsequent issues of the Alumni Newsletter about SRI staff who spent time at the Sondrestrom Research Facility. Thanks to Tom Lovelace for submitting this first article recollecting his time in Greenland.

My Greenland Adventure

By Tom Lovelace

While working at SRI, I had the opportunity to work at a National Science Foundation field site in Greenland operated by the Sondrestrom group within the Engineering Division's Geoscience and Engineering Center, which supported the radar site. My future wife, Teri Dabbs, worked as a scientific programmer in that group. We were heading into the 1989 Christmas holiday, and the radar site was looking for a maintenance person to fill in for a few weeks and possibly longer if it worked out. The remote site typically had six to eight full-time residents. They lived in four mobile homes, and everyone worked in a high-bay building (Figure 1). Other site crew members whom I worked with and became friends with are Craig Heinselman, Denise Rust-Heinselman, John Jørgensen, and Anette Sørensen.

Figure 1. Looking down on the Sondrestrom radar site in Greenland.

We hosted visiting scientists who came to take data with the incoherent scatter radar. The data were collected to help understand ionospheric activity just above the Arctic Circle, where there is lots of activity. I guess you could say they were studying the aurora borealis. One of the activities the visiting scientists loved was playing American football. We would all pile into the site vehicles and drive out on the frozen fjord. It was a lot of fun (Figure 2)!

Figure 2. "Football" players after our flag football game on the frozen fjord.

About 10 miles away from the site was the small town of Sondrestrom, which had a commercial airport with flights from Denmark, a US Air Force base with facilities that we had access to (PX, pool, restaurant), and the Ro Club, which was situated on a picturesque lake. The Ro Club was open only during the summer. It was a great place to get away for the afternoon. We could take kayaks out on the lake or enjoy great food in the restaurant.

I ended up staying six months, and Teri stayed just short of a full year. I enjoyed living and working in such an unusual environment where I would routinely see musk ox, reindeer, and the colorful dancing aurora and would live with either sun practically 24 hours a day or darkness 24 hours a day, depending on the season. On the summer solstice, I participated in the annual midnight baseball game, which was a fun tradition, hosted on base.

One adventure I will always remember is a snowmobile trip I took with John, Craig, and Craig's brother, who was visiting. Craig wanted to take his brother to the coastal town of Sisimiut, which was about 80 miles away, so the four of us took off on snowmobiles toward the coast (Figure 3). The idea was for John and me to escort Craig

and his brother halfway, then turn around and head back to the site. The trip back took forever. I had no idea which way to go because it all looked the same: snow-covered tundra. Thank goodness nothing happened to John, as I was completely dependent on him for direction back to the site. I got some frostbite on that trip.

Figure 3. Snowmobile adventure to Sisimiut.

Teri and I took a couple of trips. On one we went by helicopter to Sisimiut for the weekend to celebrate Teri's birthday, and on another we took a day trip in a helicopter to Paradise Valley. Craig and Denise were expecting their first child, and Denise had gone to Sisimiut for the delivery about six weeks before her due date and was staying with a family. Our trip to Sisimiut coincided with her stay there. The father of the family she was staying with offered to take us on a boat ride, which turned out to be an adventure in itself. We went down a fjord where we had to maneuver through large broken pieces of ice in order to get to a very remote village where we were able to meet real locals (Figures 4 and 5). We went inside one of the homes and were surprised to see them watching a Disney movie on a VCR connected to a large TV! Did I mention that no one we met all weekend could speak English? The helicopter trip to Paradise Valley was a great tour of the Greenland ice cap.

These are the highlights that I remember most. I'm so glad I had this opportunity.

Figure 4. Charming village down a fjord from Sisimiut where we met a family watching Disney tapes on TV.

Figure 5. Fisherman we met on our adventure by boat to the village outside Sisimiut.

A Second Career in Public Service: Al Nagy

On October 19, shortly before the US November election, the San Jose *Mercury News* published an article about SRI alumnus Al Nagy. Al spent most of his working life—some 45 years—at SRI managing the area that monitored and accounted for the institute's financial performance. What the *Mercury News* article highlighted was Al's running for reelection as mayor of Newark, a city immediately across San Francisco Bay from SRI headquarters.

What was noteworthy about this was that Al was up for reelection for his *fifth* consecutive two-year term as Newark's mayor. In two of the prior elections, he ran unopposed, and in this election he won with about 77% of the votes. Clearly, this speaks well of his reputation in Newark.

Al has done so much for the city that sometimes this 79-year-old is referred to as "Mr. Newark." After joining SRI, Al moved to Newark and spent the first dozen or so years there volunteering and doing community service projects. In 1980, not necessarily interested in politics but still wanting to serve his city, he ran for city council and won. That began a string of 40 consecutive years of service on the council and as mayor, with at least two more years now in the offing. The *Mercury* said Al's is very likely the longest consecutive mayoral tenure in the Bay Area.

According to the article, "[Al] was recognized as the city's Volunteer of the Year in 2009, was a founding board member of both the Viola Blythe Community Service Center and the Newark Library League, and currently serves on a local graffiti cleanup team. He's also a member of the local Rotary." Combining that with his elected duties pretty much defines Al as a giver to whatever needs doing.

Photo credit: Bay Area News Group

Al's public service philosophy is straightforward: "You do your job every day and the people will remember that," and "I'm just trying to do what I feel is best for our community. That doesn't mean I'm always right or wrong." He doesn't believe in spending a lot of money campaigning, perhaps in the neighborhood of a few thousand dollars, and a healthy portion of that may be his own.

Congratulations, Al!

Note: It is virtually certain that part of Al's function at SRI was compiling the Project Status Reports, the creation of which came from Paul Finnigan, who is described earlier in this issue.

HALL of FAME

Who Do You Believe Made an Exceptional Contribution to the Success of SRI? Nominate That Person for the SRI Alumni Hall of Fame!

The SRI Alumni Hall of Fame honors former staff members who made exceptional contributions to the success of SRI.

All former staff members are eligible, but nominees should meet the following criteria:

- Significant, lasting contributions to the success of SRI
- Contributions recognized by staff, management, or clients
- Contributions in any area of research, management, or service, such as
  - Establishing a new laboratory or a new field of research
  - Performing an outstanding recognized service
  - Clearly demonstrating qualities of leadership, vision, and creativity
- What did the person leave behind?
  - Enhanced reputation for SRI
  - New or enhanced research, business, or support activity or facility.

Please prepare a write-up of about 300 words indicating how your nominee meets these criteria. If you have questions about the nomination process, members of the Steering Committee will be happy to answer them. Send the write-up or questions to steering-committee-alumni@sri.com or SRI Alumni Association, 333 Ravenswood Avenue, AC-108, Menlo Park, CA 94025-3493.

The distinguished inductees are further honered by having their names engraved on brass plates permanently displayed on a wooden plaque in the I Building foyer. Current-year inductees also have their framed citations and photos mounted next to the wooden plaque (see photo below).

The Alumni Association Needs Your Help

The Alumni Association has openings for Steering Committee members and encourages you to lend your support. As a committee member, you will interact with former SRI colleagues as you help plan events, work on the archives, edit the newsletter, or help keep track of the association's finances. We currently need volunteers, in particular, to fill the following positions:

- Hall of Fame chairperson
- Newsletter coordinator or managing editor
- Editor(s)

If you would be interested in volunteering for one of these positions or would like further information, please send a message to steering-committee-alumni@sri.com.

Wanted: Your Submissions

We welcome articles and shorter items from all Alumni Association members to be considered for publication in the newsletter. Have you done something interesting or traveled to interesting places? Received any awards or honors? Your fellow alumni want to know! Please send items to steering-committee-alumni@sri.com.

The SRI Alumni Association welcomes new members:

Donald Cooley
Leslie Hokama
Mary McCready
Kathryn Todd

And welcomes back previous members:

Ron Kunzelman
Stephen McElfresh

We look forward to your participation in the Alumni Association and hope to see you at our next group event.

Directory Addendum

The enclosed directory addendum (covering the period August 1 to November 30, 2020) contains new members and corrections. Please add it to your 2020 Directory.

CREDIT UNION NEWS

Thelma Ann Barrett*

Ann Barrett died at the age of 93 on July 23, 2020.

Ann was born in Westmoreland, Kansas, the second daughter of Glenn and Velma Huffman. She graduated from Broderick Elementary School in May 1940 and Wamego High School in May 1944. After graduation, she worked for the construction firm of Lozier, Broderick & Gordon at the Hercules Powder Company and lived in Lawrence, Kansas. After World War II ended, she and a girlfriend moved to Berkeley, California, where Ann met her husband, Bert J. Barrett, in 1948. They were married in 1949.

Ann and Bert lived for many years in Redwood City, California, where they raised their family of four sons and were active in community affairs. After being a stay-at-home mother for many years, Ann started working at SRI in1967, where she remained for 25 years, retiring in October 1992. Ann and Bert moved to San Ramon, California, in 1996.

Ann is survived by her sons, Michael, Robert, Kevin, and John; seven grandchildren; and four great grandchildren. Her husband, Bert, preceded her in death in 2002.

Based on an obituary published in the East Bay Times *on July 26, 2020.*

Earl George Blackwell

Earl Blackwell died May 3, 2020, at his residence in Sonora, California. He was 89 years old.

Earl began his career at SRI in the Huntsville, Alabama, office in May 1970. He transferred to the Menlo Park, California, office in 1973, where he led a program to improve the effectiveness of the US Navy's Intercontinental Ballistic Missile (ICBM) test and training ranges. Earl consistently contributed to significant improvements in US leadership in the development of military systems and the training of our armed forces personnel. Earl was well known and highly respected nationally for his development of systems to provide high-accuracy, real-time measurement applications using the satellite-based Global Positioning System (GPS) assets. One of these, Exploitation of Differential GPS for Guidance Enhancement, culminated more than 17 years of research and innovative techniques that spawned various related projects.

Earl's approach to new technical challenges was unconstrained and creative, enabling him to consider all potentially feasible alternatives while never missing the big picture. His professional and innovative approach was considered outstanding by all who worked with him—management, staff, and clients.

Earl was also a noted a mentor and teacher, with his ability to instruct through technical discussions and freewheeling exchanges. Everyone on Earl's project teams received an invigorating, creative experience that helped rapidly expand their systems development and engineering skills.

Based on SRI Alumni Association Hall of Fame commendation (https://alumni.sri.com/halloffame.html).

Richard Churchill Honey*

Richard "Dick" Honey, a research scientist at SRI for 40 years, died on March 1, 2020, at the age of 95.

Dick was born to John K. and Margaret F. Honey in Portland, Oregon, between brothers Don and Dave. After joining the US Navy Reserve, he attended the California Institute of Technology to study physics and then went on active duty via the V-12 Navy College Training Program in 1943, graduated in 1945, and was discharged in 1946. He attended Stanford University on the GI Bill, as he was always grateful to note, where he earned a Ph.D. in electrical engineering in 1953.

In 1952, Dick married Helen Waugaman, built a home in Portola Valley, California, and raised five children. After Helen's death, he married Jo Anne Kipp and was embraced by a new family.

Dick began his SRI career as a senior research engineer in 1952 and ended it as a senior principal scientist on his retirement in 1992. Dick's accomplishments include numerous fundamental technical contributions in such areas as antennas, lasers, lidar (light radar), and ocean optics. For example, working with Dr. Ted Jones, Dick developed and patented the first wide-band omnidirectional antenna

for direction-finding applications, an antenna still in use today. Dick's work with lidar built a strong reputation for SRI in exploration of the upper atmospheric and oceanic applications of laser technology. He was known for strong theoretical skills but was noted particularly for his hands-on approach. When it came time for someone to do the deep dive to verify an undersea experiment, Dick was always the first to volunteer.

In the late 1960s, working with a group of ophthalmologists from Stanford University and the Palo Alto Clinic, Dick and his team examined the use of lasers in retinal surgery and developed the first standards for laser retinal exposure. (Dick's boss, SRI Vice President Don Scheuch, became one of the first to benefit from this procedure when he suffered a detached retina in a tennis accident.) Dick served on the first American National Standards Institute committee for establishing eye protection standards.

During his life, Dick received many honors. He was an SRI Hall of Fame Awardee; Life Fellow, Institute of Electrical and Electronics Engineers (IEEE); Fellow, Optical Society of America; and recipient of various Department of Defense and Army, Air Force, and Navy commendations.

Through it all, Dick kept sailing. His epic sailing journey after the war from Nova Scotia to San Francisco (detailed in *Blue Planet Times*, "Changing Dreams in Midstream") was followed by cruising, racing in San Francisco Bay, and taking countless friends out to enjoy some wine on the water. He also shared his love of the outdoors in backpacking and skiing trips with his children.

Above all, Dick was a kind, gentle, and welcoming soul. He liked nothing more than to make himself useful. Always generous with his knowledge and help, he enriched the lives of all who encountered him.

Dick is survived by his wife, Jo Anne Kipp; children, Leslie, Steven, Laura, and Janine; two grandsons; and stepchildren, Greg, Michele, Eric, and Leslie.

Based on an obituary published in the San Francisco Chronicle on *March 18, 2020, and the SRI Alumni Association Hall of Fame commendation (https://alumni.sri.com/halloffame-archive.html#1999)*

For the *Blue Planet Times* description of Dick's sailing adventure, refer to http://www.blueplanettimes.com/changing-dreams-in-midstream/

Walter Eric Jaye*

Walter Jaye—formerly Walter Jakubowski—died November 9, 2020, at his home in Menlo Park, California, at the age of 95.

By any measure, Walter had a remarkable life: He was a Holocaust survivor, a decorated World War II veteran, and an outstanding research scientist for 36 years at SRI in the field of radio and radar systems in the Radio Physics Laboratory.

Walter was born in Berlin, Germany, in 1925. Being Jewish in Nazi Germany with the Holocaust brewing around them, his family saw the imminent danger of remaining and, in 1934, fled to Belgium. When the Nazis arrived there in 1940, they sent the family to an internment camp in France. In 1942, only months before they were taken to Auschwitz where they later died, his parents managed to have Walter and his sister transferred to a nearby rural camp. From there, his sister escaped to Switzerland, and soon Walter escaped and was sheltered by a loyal French community that kept him safe from Vichy patrols. Walter then traveled to Spain and eventually England, where he trained as a member of the Free French forces. His French division was sent to North Africa and then returned to England to join with General Patton in the invasion of Normandy in 1944. His division participated in the liberation of notable French cities and ultimately Paris.

After the war, Walter returned to college in France. He came to the United States on a student fellowship and earned his B.S. in electrical engineering with honors in 1951 from the University of Rhode Island and his M.S. in electrical engineering from Stanford University in 1952. After a stint at Sierra Electronics, he joined SRI in 1956. Walter became a US citizen in 1959.

Walter's research at SRI began on the 60-foot radar in the Stanford foothills (the Dish) when communications via meteor trails were being explored. That work was interrupted by the launch of Sputnik, and Walter and his colleagues scurried to obtain the first radar echoes from a man-made satellite (at least outside the Soviet Union). Within a few years, the United States was engaged in upper atmosphere nuclear tests in the Pacific Ocean where SRI and Walter would become engaged in exploring their

potential impacts on our radar and radio communications systems. Over a decade or so, monitoring these pervasive and complex Pacific tests by the United States and later the French occupied much of Walter's professional career. Since the Soviets were also engaged in such testing, Walter lent his expertise to the US intelligence community as well.

After retiring from SRI, Walter received the premier award for service to France, the Chevalier de la Légion d'Honneur, on October 14, 2015, at the French Consul General's residence in San Francisco in recognition of his service in the liberation of France 70 years earlier. What a wonderful capstone to his life.

Walter was preceded in death by his much-loved sister, Ruth, and he is survived by his loving wife, Diana; daughter, Laurie; son, Eric; granddaughter, Isabella; and several cousins and nieces.

Based on an obituary published in the San Francisco Chronicle *November 11, 2020; details on his wartime experiences described in the* SRI Alumni Association Newsletters *published in December 2015 (pages 12 and 13) and April 2018 (page 4).*

Vladimir Joseph Kovalik

Vladimir Joseph Kovalik died on February 15, 2020, in Monterey, California, at the age of 91.

Vladimir was born in Poprad, a small town in what then was eastern Czechoslovakia. He was 10 years old when the Germans invaded Czechoslovakia. In 1944, when he was 16, Vladimir was captured by German soldiers but later escaped to return to Slovakia. A few years later, he was captured by Russians and incarcerated; after an attempted escape, he was put on a train to Siberia but made an arduous and daring escape from a train depot into Czechoslovakia. Then, after a dangerous months-long trek across Czechoslovakia and East Germany, he and a friend snuck into West Germany, where Vladimir found safety in a camp for displaced persons. There he met Nada Skidmore, a recent Stanford graduate from Oregon who was volunteering at the camp; they fell in love and married, and Vladimir moved with Nada to the United States.

Vladimir excelled at Portland State University with a major in economics and went on to earn master's degrees in economics and physics at Stanford University. On graduation, Vladimir joined SRI, where he put his knowledge of physics to work advising the US Army in weaponry at Fort Ord, near Monterey Bay in California. While there, he helped develop the rocket-propelled grenade, or RPG. He and Nada settled in, had a family, and bought a house in nearby Pacific Grove.

After leaving SRI in the mid-1960s, Vladimir worked for the US State Department as an economic advisor to General Westmoreland in Viet Nam. A few years later, however, his love of the outdoors and memories of rafting in his teens led him to river rafting. He became a seasoned whitewater outfitter and innovator, developing state-of-the-art river rafts and life jackets. Together with Nada, Vladimir published several books on oceanography.

Vladimir was predeceased by his wife, Nada, and is survived by his children, Kim, Kyle, and Karen.

Based on an obituary published in Stanford Magazine, *July 2020; details on his lifetime published in the article "Remembering Vladimir Kovalik" by Dick Linford at https://www.whitewaterguidebook.com/remembering-vladimir-kovalik/.*

Robert William Peters*

Robert "Bob" Peters died at the age of 80 on September 22, 2020, surrounded by his family. Bob foresaw the potential of Silicon Valley, enjoyed a diverse career that spanned business consulting and semiconductors, and cultivated lifelong friendships along the way.

Bob was born in San Jose, California, to Kathleen and William Peters and grew up among the fruit orchards. Bob often worked along with his father at his plumbing and construction company and was to take it over. However, the sudden death of his father when Bob was 14 years old changed the course of his life.

Bob attended St. Leo's grammar school and Bellarmine College Preparatory, where he ran cross country and achieved many academic awards. Thereafter, he graduated from Santa

Clara University with a degree in electrical engineering. After graduation, he fulfilled his ROTC commitment in the US Army at Fort Monmouth, New Jersey, working in the Satellite Division of the Signal Core. Two months into his army training, he married his high school sweetheart, Carol.

After his Army commitment, Bob attended the Harvard Graduate School of Business. On graduating, he returned to the West Coast to work for Hewlett-Packard in the Frequency and Time Division. Several years later, he moved to SRI where he worked for 10 years developing the cable and telecommunications systems. During his tenure at SRI, he consulted internationally.

Bob was an avid sportsman who participated in the Honolulu Marathon, skied Squaw Valley, and hiked the Tahoe Rim Trail. One of his memorable adventures was hiking the Tour Du Mont Blanc in Switzerland with two buddies. Above all else, Bob loved Lake Tahoe and attempted one slalom water ski event each summer into his 70s.

Bob believed that education could improve the lives of those less fortunate, and throughout his life he supported the Jesuit education institutions that shaped his intellectual and moral development. He was on the Board of Regents of Bellarmine College Prep and President of the Alumni Council and a Trustee for Santa Clara University; he supported the Jesuit Nativity School for middle school children and Cristo Rey High School; and he served on the Catholic Charities Board of Directors. Bob was a member of the Knights of Malta, a charitable organization that serves the poor and the sick in the community and volunteered at Martha's Kitchen and John XXIII.

Bob always greeted people with a warm smile which made them feel comfortable. He valued his lifelong friendships with classmates at St. Leo's, Bellarmine, and Santa Clara. Bob was, in the Jesuit tradition, "A Man for Others," with his gracious, enthusiastic, thoughtful, and loving way of working with others. He mentored many people and shared his professional expertise in fund development.

Bob leaves behind his wife of 59 years, Carol; children, William, Steve, and Carrie; and seven grandchildren. The family thanks staff of Kensington Place and Pathways Hospice for their loving care of Bob.

Based on an obituary published in the San Jose Mercury News *on October 8, 2020.*

Dorothy Ellen Stewart*

Dorothy Stewart died on October 25, 2019, at the age of 95 at the Holiday Park Plaza in Portland, Oregon.

Dorothy was born in Albany, Oregon, and graduated from Oregon State University in Corvallis in 1945 with a B.S. in business and industry. While at university during the war, she volunteered with the Red Cross, Farm Crops, and the Agriculture Department. After graduation, she worked in the Oregon State University Seed Certification Office until 1949, when she moved to Portland, Oregon, where she worked for GMAC and Chipman Chemical Company.

In 1956 Dorothy started working with SRI in the Portland office under the tutelage of George Black, who knew her from her university days. In 1959 she transferred to SRI's Menlo Park Office to work as a research analyst in the Social Sciences Research Center. She later transferred to the Education Division where she was a senior research analyst until she retired in 1989.

After retiring from SRI, Dorothy volunteered at the Fine Arts Museum of San Francisco and the Cantor Center for the Arts, and she was a member of the Committee for the Arts at Stanford University. Dorothy was an active member of the SRI Alumni Association from the year she retired until her death. From the time she moved to SRI Menlo Park until she returned to Portland, Dorothy lived in Palo Alto, California.

Dorothy is survived by her niece, Shelley D. Stewart, and by her nephews and their families: William (Bill) D. Stewart and his wife, Maureen Huntley, and their daughter and four grandchildren; David L. Stewart and his wife, Audrey Heffron, and their two sons; Mark R. Stewart; and Scott E. Stewart and his daughter and son.

Based on information provided by Maureen Huntley, Carolyn Estey, and Annette (Kim) Chapman.

Mary Kiki Wilcox

Mary Wilcox died at the age of 92 on August 3, 2020, in Palo Alto, California.

Mary was born in San Francisco, California. She received her B.A. from the University of California at Berkeley and Ph.D. from Stanford University. She was a teacher and principal in the San Francisco Unified School District for 20 years and a senior researcher at SRI for 10 years.

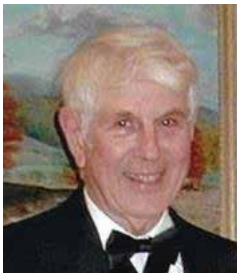
In her later years, Mary experienced the continuing gifts of music in her life as a violinist in small chamber music groups, including Fiume de Musica and the Channing House Trio. Also, to her delight Mary found joy and purpose in her volunteer music program in the Health Center of her senior community, Channing House. She described these experiences in her book, *A Song Just for Me: Stirred by Music to Conversation and Compassion*, published in 2014.

During her later years, Mary felt increasing gratitude for the support and blessings of her loving family and cherished friends who transformed her concerns into blessings upon blessings.

Mary was predeceased by her husband, Wallace (Wally) Wilcox, in 1999 and is survived by stepchildren Lee, Timothy, and Wendy; five grandchildren; eight great grandchildren; siblings Chrisie Koras Kuno, Bess Kerhoulas, and Gus Anastole; and many nieces and nephews.

Based on an obituary published in the San Francisco Chronicle *on August 9, 2020.*

Robert Craig Whitten, Jr.*



Robert "Bob" Whitten, Jr., died on May 21, 2020, in Cupertino, California, at the age of 93.

Bob was born in Bristol, Virginia, and grew up in Towsen, Maryland. On graduation from Towsen High School, he entered the US Merchant Marine Academy at Kings Point, New York, and graduated in 1947. He was then commissioned as an Ensign in the US Naval Reserve.

In 1950, Bob was called into active duty with the outbreak of the Korean War and was stationed on the USS *Ozbourn* in San Diego, California, where he met his wife, Sally. He left active duty in 1953 to continue his education at the University of Buffalo, where he was elected to Phi Beta Kappa. Bob earned a Ph.D. in nuclear physics at Duke University in 1959. Then Bob and Sally moved to Sunnyvale, California, where he took a position with SRI. In 1968, he began working for NASA as a research physicist in atmospheric physics and remained there until his retirement in 1989. After retirement, Bob consulted for the SETI Institute until 2008.

During his career, Bob published hundreds of articles, several scientific books, and two novels. In addition, he was a member many professional organizations, including the American Geophysical Union and the American Institute of Aeronautics.

Bob was very proud of his Scottish and Southern heritage and was actively involved with many organizations promoting these cultures. He also remained active in civic organizations affiliated with the military. He enjoyed exploring other countries and cultures and traveled extensively with Sally throughout the world.

Bob will be remembered for his contributions to science, his unwavering patriotism, and most of all, his love for his family. He will be greatly missed by all who knew him.

He is survived by Sally, his wife of 67 years; his son, Craig, and daughter, Lisa; four grandchildren; three step-grandchildren; and four great grandchildren

Based on an obituary published in the San Jose Mercury News/San Mateo County Times *on June 13, 2020.*

*Member of the SRI Alumni Association

The SRI Alumni Newsletter is published three times a year (in April, August, and December) by the SRI Alumni Association.
Editorial committee: Mimi Campbell and Caren Rickhoff
Design & layout: Linda Hawke-Gerrans

NEW MEMBERSHIP IN THE SRI ALUMNI ASSOCIATION

December 2020

Please consider joining the SRI Alumni Association. The association was founded in 1996 to provide former staff members the opportunity to keep in touch with SRI and their colleagues, to support the institute in a variety of ways, and to help perpetuate SRI's traditions and values.

SRI Alumni Association members enjoy many activities and services:

- **Alumni Association Newsletter**—Published three times a year, giving news about SRI programs, Alumni Association activities, and individual members (see past issues at https://alumni.sri.com/newsletter.html).
- **Membership Directory**—A regularly updated resource of contact information for association members.
- **Annual Reunion Meeting**—An opportunity for:
  - Socializing with other Alumni Association members.
  - Viewing the Alumni Hall of Fame Induction ceremony.
  - Hearing a prominent SRI speaker describe an important SRI project or organizational development.
- **Spring Fling**—A picnic or visit to a Bay Area point of interest; past trips have been to the Computer History Museum, the Hiller Aviation Museum, NASA-Ames, and the California Academy of Sciences.
- **SRI Archives**—Association members maintain and catalog SRI's photographic and nonproject archives.

We encourage you to participate in the SRI Alumni Association. Your first year's membership is free. Your membership thereafter will be $25 per year. By completing and returning the application below, you will be enrolled and will receive future issues of the newsletter and invitations to all alumni events. Please indicate how you would like your information to appear in the Membership Directory. If you prefer that some or all of your contact information not be published in the directory, please indicate your preference below. Also, please indicate whether you would prefer receiving the newsletter as an electronic copy (PDF, which saves the association printing/mailing costs) or as a hard copy. If you prefer to complete an application online, please do so at https://alumni.sri.com/join.html.

SRI ALUMNI ASSOCIATION NEW MEMBERSHIP ENROLLMENT ***(Please don't use for renewing your membership) First Year's Membership Free!***

Date: _____

Publish contact information in the Membership Directory: Yes ☐ No ☐

Publish address: Yes ☐ No ☐ / Publish email: Yes ☐ No ☐ / Publish telephone: Yes ☐ No ☐

Please indicate how you would like to receive copies of the newsletter: Electronic via email: ☐ Hard copy via mail: ☐

Name: _____ SRI ID no.: _____ Division: _____

Address: _____ Email: _____

City: _____ State: _____ Zip code: _____

Telephone: Land: (____) _____ Mobile: (____) _____

Date of retirement or when you left SRI: _____

Mail to: SRI Alumni Association, 333 Ravenswood Avenue, M/S AC-108, Menlo Park, CA 94025