

# Alumni Association



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## MESSAGE FROM ARCHIVES CHAIRMAN DON NIELSON



*Don Nielson*

It was another good year for the Alumni Association. Although I was unfortunately committed elsewhere with family, I heard nothing but good things about the reunion. For the first time in a long while, we got the pleasure of hearing from SRI's CEO. Everyone I asked said how much they enjoyed Bill Jeffrey's informative remarks on where SRI is now and where it is headed. Thank you, Bill!

The early part of this issue covers the reunion and those who brought it about. For those who live afar, I hope that in Gary Bridges' gallery you will see faces you recognize and remember and that you will be inclined to join us. The Hall of Fame inductees are also covered. Caren Rickhoff enlightens us about some of the research activities SRI now has under way, and I hope you are still a bit surprised by the diversity of the projects SRI is able to undertake. And Spot has suddenly, though not mysteriously, reappeared.

The History Corner is full, but please plow through it to learn of important activities you probably never have heard about. Thanks to Mike Boldrick for lifting the veil on SRI's long-term contributions to the nation's major missile test ranges and even pointing the way forward to commercial launches. (Gird yourselves for a few acronyms!) One of you kindly told us of SRI's being mentioned in the September *Smithsonian* magazine. An interesting and little-known story emerged proving the benefit of your awareness to the news we provide. Your tips and other inputs are always welcome! Finally, the 50th anniversary of SRI's most celebrated event

to date occurred as this newsletter was going to press. You can read about what observances were planned by both SRI and the Computer History Museum.

As another year closes, it is time to thank those of you who make the Alumni Association possible: from those who contribute directly, to those who support us by being members, and to those who have offered their experiences for all of us to read and enjoy. If you are local and have the inclination, there is a role for you in helping us continue to keep the lights on. In closing, please pencil in the Spring Fling on your calendar, and have a memorable and enjoyable holiday season.

A handwritten signature in black ink, appearing to read 'Don'.



## The 2018 Alumni Annual Reunion

What a reunion!

We had food, we had conversation, we had new Hall of Fame inductees, and we had the CEO. All in all, more than 80 people enjoyed a great reunion on October 18th. It began in the International Building foyer with food and conversation. As usual, the SRI-provided food was excellent and the conversation flowed. After about an hour, we entered the dining room, where the formal program began, ably emceed by Murray Baron.



First on the program was CEO Bill Jeffrey. He spent about 20 minutes telling us about exciting new projects, their funding, and the expectations for them. It was great learning from Bill what the future of SRI will be like.

*CEO Bill Jeffrey.*

Next, we learned about the new Hall of Famers. First, there were John R. Strickland and Mimi G. Erskine. Together, they basically saved the Chemical Economics Handbook by converting it from strictly a data compilation activity to a detailed marketing research compendium dubbed by users as “the Bible” of the chemical industry.



*John Strickland.*



*Mimi Erskine.*



*Edwin Kinderman.*

Then Ed Kinderman, who came to SRI in 1956, was inducted. An expert in nuclear energy technologies, he directed diverse energy-related programs of the Applied Physics Laboratory, while personally conducting research on nuclear safety issues, as well as nuclear threats and proliferation.

After the Hall of Fame inductions, we had distribution of door prizes, donated by the Credit Union. And then it was time for dessert and coffee, with more time for conversation. As always, a good time was had by all, as is evident from the excellent photos taken by Gary Bridges.

As always, thanks are due to the many people who contributed to the success of this event. The reunion was coordinated by Augustina Biosic and Joyce Berry, who greeted the attendees as they arrived, and was staged by Arturo Franco, Roberto Vidales, Kerri Carder-McCoy, and their SRI Conference Services crew. Martha Agreda, Linda Jansen, Katie Kaattari, and Sally Longyear staffed the reception table. Linda Hawke-Gerrans created the reunion flyer and the Hall of Fame poster; Joyce Berry produced the Hall of Fame awardees' certificates, as well as the name tags for attendees. Thank you all!







## SRI and Ayehu Join Forces to Develop the Next Generation of Automated IT Processes

Under a recent licensing agreement, SRI and Ayehu, Inc., will apply SRI's machine learning and artificial intelligence (AI) technology to Ayehu's next-generation information technology (IT) automation and orchestration platform, which is designed to help enterprises combat the growing shortage of skilled IT and security technology professionals. Ayehu's software helps reduce labor-intensive, manual IT and security tasks by providing an intuitive platform that automates key processes such as system, network, and security incident investigation and remediation, as well as application tasks. Ayehu's AI-powered automation platform fully mimics repetitive manual work processes of humans without requiring any coding or scripting.

In collaboration with SRI, Ayehu will enhance the AI capabilities of its IT automation and orchestration platform to include deeper levels of dynamic rules, mapping and matching tickets and incidents with resolution processes. This innovation in intelligent process automation will allow the creation of a self-learning, self-driving enterprise.

The SRI press release is at <https://www.sri.com/newsroom/press-releases/san-jose-calif-july-18-2018-ayehu-provider-leading-ai-powered-it-automation>.

## SRI and MarketsandMarkets Announce Strategic Innovation Collaboration to Enhance Market Insights

MarketsandMarkets and SRI will collaborate to bring more comprehensive marketplace and revenue intelligence, analyses, research, and development services to clients across the globe in all industries, advanced technologies, and information sciences.

MarketsandMarkets provides quantified, business-to-business (B2B), competitive intelligence research on high-growth, emerging niche markets. Combining MarketsandMarkets' intelligence services, including market sizing, forecasting, technology assessments and roadmaps, and competitive analysis, with SRI's broad technical subject matter expertise, the two organizations will leverage research capabilities to broaden their coverage. They will also conduct focused workshops and other events for their global clients.

"Combining SRI's cutting-edge technology innovation with MarketsandMarkets' business-focused research is a powerful combination that will guide our clients to new use cases and

business opportunities," said Shelly Singh, chief operating officer of MarketsandMarkets.

The SRI press release is at <https://www.sri.com/newsroom/press-releases/marketsandmarkets-and-sri-international-announce-strategic-innovation>.

## SRI Initiates Clinical Testing of a Vaccine Against Venezuelan Equine Encephalitis

In April 2018, SRI was awarded \$4.7 million to manufacture and conduct clinical testing on a potential new vaccine against Venezuelan equine encephalitis (VEE), a serious viral infection for which there is currently no commercially available vaccine. In August, SRI initiated dosing in the clinical trial.

The VEE virus (VEEV) is a type of alphavirus that typically causes mild to severe influenza-like symptoms, but can progress to serious neurological complications such as insomnia, seizures, confusion, and coma. Military service members can be exposed to VEEV when deployed to regions where the virus is endemic (for example, Central and South America), or where aerosolized VEEV could be used as a biological weapon.

Approximately 90 healthy adult participants will be enrolled and treated at SRI's 9,200-square-foot clinical trials unit in Plymouth, Michigan, which includes an investigational pharmacy, a sample-processing laboratory, and amenities to accommodate extended overnight stays for research participants. The trial will be completed in approximately 15 months. SRI is conducting the clinical trial under an agreement sponsored by the U.S. Army's Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense (JPEO-CBRND) Medical Countermeasure Systems (MCS) Joint Vaccine Acquisition Program (JVAP).

The VEEV vaccine initially was developed and manufactured by the National Institute of Allergy and Infectious Diseases as part of an interagency agreement with JVAP. SRI manufactured the finished vaccine product in its Good Manufacturing Practice-certified production facility in Menlo Park. SRI holds the investigational new drug (IND) application for the vaccine, with plans to transfer the IND to the U.S. Government at completion of the trial.

*The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official policies or endorsements, either expressed or implied, of the U.S. Government.*

The SRI press releases are at <https://www.sri.com/newsroom/press-releases/sri-international-awarded-47-million-agreements-manufacture-and-test-vaccine> and

<https://www.sri.com/newsroom/press-releases/sri-international-initiates-clinical-trial-testing-vaccine-against>.

### **SRI Will Lead the Coordination Hub for the National Science Foundation's Network to Enhance U.S. STEM Leadership**

SRI was awarded a 5-year, \$10 million grant from the National Science Foundation's (NSF) INCLUDES program, a national initiative focused on broadening participation in science, technology, engineering, and mathematics (STEM) in the United States. The program seeks to effectively develop talent nationally, particularly among those in underserved populations, with the goal of enhancing U.S. leadership in STEM.

SRI's Education Division will lead the multi-institution NSF INCLUDES Coordination Hub to build and support a national network of people working to improve equity in STEM. The NSF INCLUDES Hub will provide leadership development and other technical assistance, share learning across the network, and develop common measures to help understand the collective impacts of network members' efforts.



"Our team is proud to lead this new network focused on expanding access to STEM education and workforce participation," said Timothy Podkul, Ph.D., principal education researcher at SRI and director of the Hub.

"The Coordination Hub will be critical for helping NSF INCLUDES fulfill its promise of establishing a national network to broaden participation in STEM," said Sylvia James, NSF deputy assistant director for education and human resources.

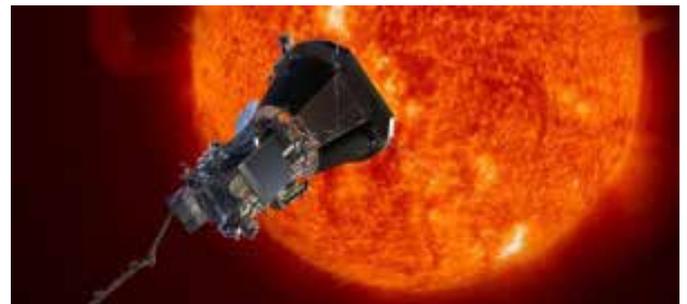
SRI's partners in the NSF INCLUDES Hub are the Education Development Center; Westat, Inc.; Quality Education for

Minorities Network; Equal Measure; the Constellations Center for Equity in Computing at the Georgia Institute of Technology; and Digital Promise Global. ORS Impact will serve as the Hub's external evaluator.

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The SRI press release is at <https://www.sri.com/newsroom/press-releases/sri-international-lead-coordination-hub-national-science-foundations>.

### **SRI and TowerJazz Provide CMOS Imager in NASA's Parker Solar Probe Mission**



SRI and TowerJazz, a global specialty foundry leader, collaborated on a high-performance complementary-metal-oxide-semiconductor (CMOS) imager for the U.S. Naval Research Laboratory (NRL) that is now part of NASA's Solar Probe mission heading closer to the Sun than any other manmade object.

The NASA probe, launched in August 2018 to better understand how the Sun affects our solar system, carries four instrument suites to characterize the dynamic region close to the Sun. One of those instruments, NRL's Wide-Field Imager for Solar Probe (WISPR), is the only imaging instrument and contains two coronagraph telescopes incorporating SRI's active-pixel CMOS detectors. The CMOS imagers are 2k x 2k radiation-hardened sensors, designed and integrated into focal-plane arrays by SRI, built using TowerJazz's advanced and customized 0.18 μm CMOS image sensor technology.

These space-qualified CMOS sensors can capture high-resolution images of the Sun's atmosphere (or corona), including coronal mass ejections and solar wind. The images may provide a unique vantage point to help forecast space weather events that can have dramatic effects

on communications, power grids, and other essential technologies on Earth.

A video on WISPR is available at <https://www.youtube.com/watch?v=w3ngdm6GTbc>.

The SRI press release is at <https://www.sri.com/newsroom/press-releases/towerjazz-and-sri-international-provide-cmos-imager-launched-nasas-parker>.

### It's Baaacck!

The gargoyle has returned! If you don't immediately recognize this exclamation, perhaps you are too young or you haven't read the August 2016 issue of this newsletter. The SRI gargoyle, named Spot for no earthly reason, has reappeared casting its eerie shadow high up on the south wall, west end of Building A. It is as though this phantom creature has a knack for appearing and disappearing across SRI history. If you still don't understand, read the account and learn about one of SRI's most famous legends at [https://www.sri.com/sites/default/files/brochures/aug-16\\_2016\\_newsletter.pdf](https://www.sri.com/sites/default/files/brochures/aug-16_2016_newsletter.pdf).



Spot also made a cameo appearance at the 2016 annual reunion, as reported in the December 2016 newsletter: <https://www.sri.com/sites/default/files/brochures/dec-16.pdf>.

It would be helpful if its appearance had some correlation with the weather, the U.S. gross domestic product, the size of the unfunded California debt, or even how well SRI was doing. If any correlation or reason exists at all, you are invited to be the first to discover it.

Spot's reappearance, as far as we can tell, begins and ends with the fact that SRI's current CEO, Bill Jeffrey, liked the story and ordered it resuscitated. So, from the wall in Receiving it flew to its present perch to challenge the newer staff to puzzle about it all over again. SRI has yet to invent a Spot remover up to this task!

## From the Cold War to SpaceX: SRI's Long Association with Cape Canaveral and Vandenberg AFB

By Michael Boldrick

The Cold War was heating up in 1979 when the Department of Defense (DoD) awarded the *Strategic Systems Test Support Study* (SSTSS) contract to SRI. That same year, the Soviet Union invaded Afghanistan, prompting the *Bulletin of the Atomic Scientists* to advance its Doomsday Clock from 9 minutes to **7 minutes to midnight**.

Concurrently, the United States and the Soviet Union were modernizing their strategic forces. Two legs of the U.S. Nuclear Triad, Air Force ICBMs and Navy submarine-launched ballistic missiles (SLBMs), were nearing the flight test phase of development. The Air Force's Eastern and Western Test Ranges (ETR and WTR) needed to expand their footprints to test a new generation of missiles that could fly farther and deploy more reentry vehicles (10 for Air Force's MX and 12 for the Navy's Trident II) than their predecessors. The SSTSS sought cost-effective options for such expanded testing capabilities.

Dr. Jim Means, Technical Director for the Eastern and Western Ranges, served as chairman for the study. SRI's Earl Blackwell was responsible for coordinating the technical work of the tri-service participants and for preparing the final report and recommendations for the SSTSS Executive Committee. SRI staff members Gene Erb, Gary Baker, Harvey Album, Mel Wright, Judy (Seiders) Richardson, and Jack Willet assisted Earl in performing the 28 study tasks.



*MX launch from a silo.*

The new MX ICBMs would launch from modified Minuteman silos at Vandenberg AFB in central California, with impact near the Kwajalein Missile Range (KMR) in the Marshall Islands.

The Navy's Trident II SLBM would be flight qualified by launches from submerged Ohio-class submarines 50 miles off the coast of Cape Canaveral. Trident test warheads would impact at Broad Ocean Area (BOA) targets in the North

Atlantic or near British-owned Ascension Island in the South Atlantic.



*Trident launch from a submarine.*

As far as data capture was concerned, existing capabilities of the Eastern and Western Ranges were mostly adequate for the new missiles during development testing. The rub would come later, when the Strategic Air Command and the Atlantic Fleet conducted operational testing in which trajectories had to mimic those used for war planning. This required longer missions that would fly beyond then-existing Western and Eastern Range instrumentation limits. The only way to solve this problem was to expand the "playing field" by moving the "outer fence" farther from "home plate," or the launch point. The most practical way was through new BOA targets, where data would be collected from mobile instrumentation aboard range support ships or aircraft operating in the new terminal areas.



*Range support ship.*

The launch ranges had access to two modified C-135 Advanced Range Instrumentation Aircraft (ARIA) that could support space and missile systems worldwide with telemetry collection and relay. The Navy had a similar capability aboard smaller P-3C Extended Area Test System (EATS) aircraft that could record telemetry and score reentry vehicle impacts using the Sonobuoy Missile Impact Location System (SMILS), which relayed triangulated acoustic splash data to the aircraft. The P-3s could also sow

an array of sonobuoys across the target area ahead of the launch.

A cost-effective solution to collect data in remote ocean areas became the major focus of the SSTSS. According to guidance from the Executive Committee, selection of alternative solutions for the expanded range operating areas would be based on performance that met user requirements with the least technical risk and lowest cost to the nation. The Committee lauded SRI's efforts in economic analysis, led by Judy Richardson, as the key determinant in selecting preferred approaches.

The two-year effort was conducted in a stair-step approach: (1) Identify range user current and future requirements, with emphasis on the latter. (2) Note deficiencies in instrumentation coverage and propose solutions including new capabilities. (3) Evaluate alternatives and select a "best approach" by performing technical and economic comparisons and estimating life-cycle costs for preferred alternatives. (4) Develop an implementation plan for the WTR and ETR.

The final SRI study report was briefed to Admiral Isham (Sam) Linder, Director of Defense Test and Evaluation, and was very well received. It proposed better ways to demonstrate the capabilities of two modern strategic missiles that would be pointed at the Soviet Union.

Meanwhile, the Cold War continued to simmer. In 1981, the *Bulletin of the Atomic Scientists* reset the Doomsday Clock to **4 minutes to midnight**.

The Eastern and Western Ranges implemented many of the recommendations proposed by SRI and the SSTSS tri-service Executive Committee. The Trident II SLBM and the MX ICBM were successfully tested in full view of Soviet sea and space assets.

By the end of the decade, the Berlin Wall fell, ending the Cold War. In 1990, the Doomsday Clock was rotated back to **10 minutes to midnight**.

SRI's performance during the SSTSS impressed a new client with the capabilities of our staff, as well as the variety of technologies and innovation resident within SRI.

Following the successful SSTSS, DoD initiated plans to combine the assets of the Eastern and Western Ranges under the title of Spacelift Range System (SLRS). These plans recognized the need to standardize and automate test range infrastructures, lower operating costs to attract commercial

launch customers, and provide Space Shuttle launch and landing services on both ranges. This effort spawned a number of contracts that SRI executed. The largest, the multiyear Range Standardization and Automation (RSA) contract (1996-2006), was initiated to implement the requirements of the SLRS.

SRI became a subcontractor to Lockheed Martin for the duration of the RSA contracts. These contracts led to the establishment of an SRI team at Vandenberg AFB, with additional support from Menlo Park. Key staff and their responsibilities included Jim Means, who joined SRI after retirement as a Government Senior Executive Service 2 employee, to become the Range Safety Advocate. Other staff included Gerry Shaw, Joe Nemeth, and Jeff Claxton (Range Safety Engineering), Greg Zacharitz (Instrumentation Engineering), Steve Smith (System Requirements Analysis), Judy Richardson (Life-Cycle Costs), and Ken Day (Range Engineering). I provided management and leadership of the efforts from Menlo Park.

Other contracts were activated to continue development and operations of the Western Range. SRI staff members Martin Prochazka, Jonathan Brown, Emily Best-Parker, Brandon Badgley, and Kipp Peppel all supported the Western Range development efforts through the RSA contract and operations through a contract with ITT Federal Electric Corporation.

The SRI teams at Vandenberg provided a solid foundation of engineering and range instrumentation skills and expertise and established SRI's presence on California's Central Coast. At the same time, the Engineering Group at SRI was evaluating locations to establish a software engineering and development group to complement staff and programs in Menlo Park. With a strong engineering presence already at Vandenberg, the decision was made in 2000 to open the Software Engineering office in San Luis Obispo, which is still active.

One task of the RSA contracts was to provide range support services for Space Shuttle and commercial launches. A new launch pad then under construction at Vandenberg would allow the Space Shuttle to insert military surveillance satellites into polar orbit.

This could not be done at Cape Canaveral since the launch hazard caution area would include populated areas, thus restricting Shuttle launches to equatorial orbits.

Vandenberg juts far enough out into the Pacific Ocean that the 89-degree polar orbits don't overfly land until

they reach the South Pole. However, the Space Shuttle never launched from Vandenberg because of the January 28, 1986, Challenger disaster at Cape Canaveral. Instead, the Vandenberg Space Launch Complex was modified and now supports Delta IV Heavy rockets for military satellite payloads.



*Vandenberg AFB Space Launch Complex.*



*John Prausa (standing) joined SRI alums (left to right) Ken Day, Mike Boldrick, Jim Means, and Gerry Shaw on August 28th, 2018, at Jacks in Old Orcutt, California (near Santa Maria). Later in the day they toured the Vandenberg AFB launch complex.*

Another important aspect of SLRS and RSA was to support commercial space launch operations, and, as we know from recent news, this has been highly successful.

A video at <https://www.youtube.com/watch?v=zw4X8p5zVZE> shows the tremendous success of the programs SRI played a major role in that attracted commercial customers to former military launch ranges. The October 7, 2018,

SpaceX Falcon 9 Rocket launch from Vandenberg put an Argentine earth observation satellite into polar orbit and flew the expended first stage backwards for a soft landing near the launch pad for refurbishment and reuse on a future launch.

SRI's long association with U.S. Launch Ranges spanned an era that saw the end of the Cold War and the commercialization of space for nonmilitary international earth observation and communications satellites. And the era isn't over yet!

*Mike Boldrick joined SRI in 1987 after a distinguished 25-year career in the U.S. Air Force. At the time of his retirement from the Air Force, Colonel Boldrick was leading the Air Force Operational Test & Evaluation Center's MX Test Team at Vandenberg AFB. At SRI, Mike managed the growth of programs and staff at Vandenberg AFB for the Systems Development Division of the Engineering Group; he retired in 2014 as the Executive Director of the Instrumentation and Simulation Program. Mike was inducted into the SRI Alumni Hall of Fame in 2016.*

**The Way We All Use Computers Today Began 50 Years Ago**

*By Don Nielson*

Before December 9, 1968, computers were used mainly as elaborate and very expensive calculators or perhaps data processors, albeit with varieties of flexible stored programs. True, because of their expense, the notions of computer sharing were afoot, but barely. It was on that date that SRI's visionary Doug Engelbart and his wonderfully creative staff of the Augmentation Research Center gave what has come to be famously known as "The Mother of All Demonstrations." It took place in the Civic Auditorium in San Francisco before more than a thousand people, and it was revolutionary in its conceptual expanse. Moreover, and importantly, it foreshadowed the way virtually all computing would be done—that is, interactively, making the resources it provided seem as though they were yours exclusively.

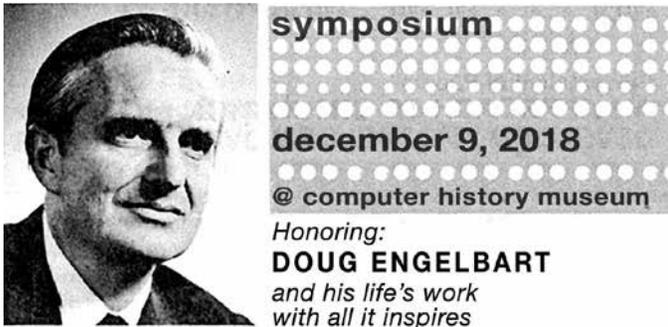
Enabling that notion to continue and become the dominant computing paradigm was made possible by the decreasing cost and increasing power of computer hardware until the computer itself could actually be yours. Engelbart envisioned that this new "machine" could come to augment virtually

every task you needed to perform, computational or not. It was the gateway to the knowledge of the world and how to find, interact with, and communicate your particular slice of it.

This month marks the 50th anniversary of that world-altering demonstration, and there will be reviews and celebrations of it. Some are taking place at SRI, some at the Computer History Museum in Mountain View, and some in other places not always predictable.

A specially prepared documentary on the Engelbart story called, appropriately, “The Augmentation of Douglas Engelbart” was shown at SRI locations on December 4th. This documentary will be viewable by the public, but the details are still forthcoming. Also, a panel discussion among Internet luminary Vint Cerf; SRI alum Adam Cheyer, who brought us Siri; and one of the Engelbart team, Jeff Rulifson, was held on December 7th.

The events at the Computer History Museum (<https://www.computerhistory.org/>) consisted of an all-day technical symposium on the exact anniversary of The Demo, December 9th, followed by a more public celebration at the museum on the evening of December 12th.



Much more information on The Demo, including links to videos, can be found at <https://theDemoat50.org/> or with the hashtag #theDemoat50 on social media. I hope you will look at the information even if this newsletter arrives a bit after the events. When we learn about the public airing of the documentary, we will alert you via email or via the newsletter.

Among SRI’s many important achievements throughout its history, The Mother of All Demonstrations is likely to be—and perhaps remain—SRI’s most important contribution to the world.

## The Roots of Online Search and Interactive Computing at SRI

By Don Nielson

Alumna Barbara Camph was reading a recent issue of *Smithsonian* magazine and advised us of an unusual piece. Its author, April White, claimed that a Google search using the phrase “inventor of search” did not find the two men from SRI who she thought deserved the honor for work they did in 1963. Her research had led her to SRI research engineer Charles Bourne and programmer Leonard Chaitin.



Figure 1. Charles P. Bourne in 1965.

Given that the year was 1963, the ability to search a remote digital knowledge base was developed and demonstrated before computer networking, including the ARPANET, even existed. And just like many other SRI projects that simply met clients’ needs and then made way for another project, this effort was forgotten even by its leader, Charles Bourne—until, that is, he was interviewed in 2015 for an oral history at the Computer History Museum in Mountain View.

To understand the situation better, I obtained from SRI’s manager of archiving, Lisa Beffa, a copy of the final report on the project. Dated November 1963, the report is titled *Research on Computer Augmented Information Management*. As you might guess from that title, the project, funded in part by the Air Force Systems Command, fell very early under the existing SRI program on human augmentation led by Doug Engelbart. Doug is acknowledged in the foreword of the report, and the insights in the report were prescient about how such information search should develop.

The purpose of the work was to give the Air Force a means to search for specific content in its increasingly large trove on Soviet technology. It was the Cold War, and efficiency dictated being able to rapidly search that trove. To that end, SRI developed an experimental system using a time-share computer with input and output capability and remote terminal access—in this case, via a keyboard and a small cathode ray tube display (see Figure 2). The computer was located in Santa Monica and the terminal at SRI.



Figure 2. Unknown person at terminal of CDC-160A.

From the report's abstract we learn that procedures were established for storing and retrieving machine-readable records that included memos, diagrams, correspondence, and reports generated by the user group. These served as the basis for an experimental machine file that permitted the reading of natural text from the file material. Studies were made of methods to automatically determine alternate search prescriptions and display these to the inquirer. Search could be initiated using any character string you wanted. Files that were inputted could be kept private to their author or shared for collaborative use as desired. The project was done in collaboration with other projects from the Air Force Office of Scientific Research and the Advanced Research Projects Agency (ARPA). ARPA could well have been pulling all the strings because it would pass funding through Air Force labs. In this case, J. C. R. Licklider, the ARPA project officer, was interested in remote search. SRI had been supporting such investigations since 1959.

Because Bourne's approach involved the remote retrieval of file (document) or even subfile information, it may sound a bit like Google. But this was so early in the digital revolution that they had to create searchable material in a specific format. Still, it was designed to accommodate a large and very capable information management system. Google, of course, takes advantage of a freely offered, fully digital world of all types of information ready and waiting to be searched. Nevertheless, according to Bourne in his oral history, this was "the first demonstration anywhere of remote on-line interactive searching of text or bibliographic data." Once they proved this feasibility, Licklider pulled the

plug after only five months, saying that the proof of concept was sufficient.

Regarding the SRI hardware, the report mentions the use of SRI's CDC-160A computer to help form and manage inquiries via a telephone line to the very much larger computer in Santa Monica. You can see a bit of the 160A and the attached CRT terminal in Figure 2. The system had a 32-character by 32-line display and a keyboard, supplemented by a pair of five-fingered keysets and a light pen (not shown). The latter two could be used together for pointing and command input.

The presence of the 160A and the mention of the keysets immediately suggest commonality with and the concurrent use of that same machine as the first ever platform for the development of interactive computing in general, all under the leadership of Doug Engelbart. A much clearer picture of the overall setup for interactive computing at SRI is shown in Figure 3. This picture was taken in early 1965 (roughly two years after Figure 2), and notice what is there: a much larger primitive (radar) display, a keyboard, a command button set, and, notably, the first computer mouse—made of wood! That development, plus the software that enabled the interaction and gave it purposeful work, became the foundation of Engelbart's celebrated demonstration in December 1968 that is recognized as the dawn of a comprehensive approach to interactive computing. By the way, Bourne says in his oral history that, based on his leadership role in the American Documentation Institute, he told the leaders of the Fall Joint Computer Conference in San Francisco that he could get Doug to demonstrate his system. He did, and he was chairman of the session that included The Mother of All Demos!



Figure 3. Environment at SRI for the development of interactive computing, March 1965. (Notice the first mouse.)

But the Bourne-Engelbart relationship at SRI goes back a bit farther. They both came to SRI in 1957 from UC Berkeley, with Bourne arriving first. Both were members of the same lab and curious about the technical information explosion. As evidence of their feeling their way into this possible world of computer-accessible information, in early 1958 they co-wrote an article called “Facets of the Technical Information Problem” for the *SRI Journal*. The seven-page article looked comprehensively at the burgeoning accumulation of technical information and what it implied for the future. One important account in the article was SRI’s January 1958 submission to the President and selected members of Congress informing them of the need for a “National Technical Information Service.” This was to be a national service for “the collection, processing, storing, retrieval, and dissemination of scientific and technical information from both foreign and domestic sources.” In 1988, Congress created a service by that exact name in the Department of Commerce, with a more limited scope covering all technical research sponsored by the U.S. Government.

Finally, returning to the general problem of managing the approaching avalanche of technical information, the authors anticipated much about what a system to deal with it must face. Their analysis appeared as more than 120 questions that needed to be answered to better understand the problem and how to proceed. With some relevance, the evolving software system developed later by Engelbart’s Augmentation Research Center reflected this thinking. For example, virtually all of the center’s development work was placed in a structured journal, making it all searchable.

Though I was familiar with Engelbart’s work, I was almost totally unaware of Bourne and his accomplishments, both at SRI and after leaving SRI. The transcript of his oral history at the Computer History Museum is viewable at <https://archive.computerhistory.org/resources/access/text/2017/10/102737964-05-01-acc.pdf>.

The 1958 article is also online at <https://web.stanford.edu/dept/SUL/library/extra4/sloan/mousesite/Archive/Facets1958.html>.

Quite obviously, Charles Bourne is another SRI alumnus who has made significant contributions to the world of information technology.

## Helping the Blind to “See”

*By Don Nielson*

In 1956, Jim Bliss was working at SRI and enrolled in an electrical engineering master’s program at Stanford. When he graduated, he left for MIT and a doctorate. His advisor there interested him in devices for the blind, and for his thesis he explored whether a blind person’s kinesthetic senses could support communications. He graduated there in 1958, but in the process he met a blind person there who helped him get a research contract in that field. Winning it enabled him to return to SRI to further explore tactile communication, the ability of your fingers to recognize patterns, including text. He formed a small group at SRI to explore that area.

By chance, in about 1961 Jim met John Linvill, an electrical engineering professor at Stanford, who was laboring over how he could invent a device that would enable his blind daughter, Candace, to read. His motivation was, in part, to help free his wife from having to transcribe written text into Braille. Mutual interest turned into collaboration that was off and running. Over the next five years, using money from several government agencies, they developed the Optacon, short for optical-to-tactile converter.



*Candace using the Optacon.*

It was a device that enabled Candace and other blind people to read plain text, but it was also more broadly useful, at least to Candace. It worked by converting a two-dimensional

optical image into a corresponding image of vibrating pins. These pins could be “read” by placing one’s fingers over the plane of pins and moving the optical scanning wand across the page with the other hand. For a time, SRI tried to keep up with the demand for the Optacon, but meeting the demand required another solution. So, in 1971 Jim formed a company called Telesensory Systems to market the Optacon. By 1991, it had worldwide sales of \$20 million and 200 employees. By the time the Optacon was discontinued in 1996, largely because of the advance of optical character readers, it had sold 20,000 units in 30 countries.

During its development and quite naturally, Candace became the first to test and then help evaluate the device,

and she used it throughout her life. She went on to get a Ph.D. in psychology from Stanford and became a clinical psychologist at Kaiser Hospital in Redwood City. Though blind, she lived a very normal life with family and even loved to go tandem biking with her husband, exploring many parts of the South Bay and abroad. She played several musical instruments, as well. Thanks, Jim Bliss!

Candace passed away in July 2018. If you want to know more about this amazing lady, check her obituary here:

<https://www.paloaltoonline.com/obituaries/memorials/candace-linville-berg?o=5567>

## ALUMNI NEWS

### Heads Up! 2019 Spring Fling

The Spring Fling is tentatively being planned for mid-May at the Hiller Aviation Museum in San Carlos. Details will follow in the April newsletter, along with the official invitation and sign-up sheet.



### Wanted: Your Submissions

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

### Directory Addendum

The enclosed directory addendum (covering the period August 1, 2018, to November 30, 2018) contains new members and corrections. Please add it to your 2018 Directory.



The SRI Alumni Association welcomes new members:

Nancy M. Bradford  
 John Cornwell  
 William Croft  
 Ian Foley  
 James Hogan  
 Erik Lillevoid  
 Gwen McAlister  
 Steve McElfresh  
 Gregory Myers  
 John Sisto  
 Mary Tanga  
 Jonathan Thomas  
 Iram Weinstein  
 Paul Zaman

And welcomes back previous members:

Alan Eagle  
 Brock Hinzmann

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

# 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. We are seeking nominations for Hall of Fame candidates by June 1, 2019.

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](mailto:steering-committee-alumni@sri.com) or SRI Alumni Association, 333 Ravenswood Avenue, AC-108, Menlo Park, CA 94025-3493. Again, the due date is June 1.



*Happy Holidays  
from the  
SRI Alumni Association*

CREDIT UNION NEWS

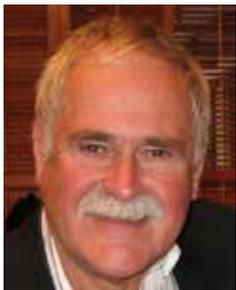
Deck The Halls  
with **HIGHER RATES**

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\*APY=Annual Percentage Rate (Rates posted as of 12/01/2018)

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**CERTIFICATES**

### Daniel Spencer Allan



Daniel Allan, a former SRI telecommunications specialist, died July 24, 2018, at age 78. He survived metastatic prostate cancer for two years and remained full of life and in good spirits to the end.

Born in Detroit, Michigan, Dan spent his early years in Dearborn during the 1940s. He excelled in school and was valedictorian of his Rochester High School class of 1958 before attending Yale University, where he received his B.S. in physics in 1962. He then earned an M.S. degree in semiconductor physics from Purdue University in 1964, during which he got his first “dream job” as night-shift operator of the school’s new mainframe computer, the massive IBM 7090. Two more dream jobs followed—a summer job at Los Alamos, New Mexico, working with nucleonic systems and then a permanent position at the NASA Jet Propulsion Lab in Pasadena, California, where he helped develop NASA’s Deep Space Network, used to communicate with astronauts and satellites that explored the solar system and beyond. After he earned an M.S. in engineering-economic systems from Stanford University, Dan started a 30-year career at SRI in 1976 as a telecommunications consultant, playing a key role in developing Kuwait’s telecommunications system, as well as the statewide telecommunications network for Alaska. For both work and pleasure, he traveled through much of Europe, the Middle-East, Asia, South America, and Australia.

Though Dan considered himself a true engineer in terms of his stubbornness and ingenuity, his passions reached farther and included cooking, wine, music (the Yale Glee Club, the Society of Orpheus & Bacchus, and the Yale Alumni Chorus), theater (lead roles in Gilbert and Sullivan operettas with the Stanford Savoyards), and the outdoors. Among his favorite memories were camping with family and close friends in the Minarets region of the Sierras and at Wonder Lake in full view of Denali. He considered the wilderness to be his “church.”

Dan was a true character and will be remembered by all who knew him for his tall tales, outrageous stories, and countless 25-cent bets over dubious claims. He delighted in absurdity, often pointing it out with mock sternness: “Now wait just a minute...”, an indulgent drawl “You guys...”, or, best of all, with his wonderful hearty laugh. He took pride in

being the loudest, most embarrassing dad on the sidelines of his children’s childhood sports games and taught them how to spot BS from a mile away, which backfired on him beautifully and often. His only regret was never winning the Nobel Prize—which might have happened, he would quip, if he hadn’t peaked quite so early. Despite that one concession, he considered his life to be one exceptionally well lived.

Dan is survived by his wife of 35 years, Elizabeth (Liz), son Timothy, daughter Nora, sister Catherine, and brother Andrew, as well as his niece, nephews, cousins, and their children scattered widely through the West and around the globe.

*Based on an obituary published by the San Francisco Chronicle.*

### Donald Christian Lorents\*



Donald Lorents, a former staff scientist and long-time resident of Palo Alto, died August 3, 2018, at age 89.

Don was born in Bagley, Minnesota, in 1929. He received his undergraduate degree in mathematics at Concordia College, where he met his wife, Doris, and went on to complete his Ph.D. in physics at the University of Nebraska.

After joining SRI in 1959, Don pursued a long, distinguished career in experimental and theoretical atomic and molecular physics, including electron-atom and ion-atom collisions. He also served for 10 years as Director of the Molecular Physics Laboratory (MPL) at SRI. In 1972, he demonstrated a unique example of the practical benefits of basic research, when he used his experience with scattering experiments on helium and argon ions to formulate the excitation mechanism for production of excited states in dense rare gases, which is the basis for rare-gas excimer lasers. This led to an extensive laser development and application program that was a major part of MPL’s activity for the next 10 years. Later, he led a program to produce, characterize, and use carbon fullerene molecular clusters and their derivatives. Don was named an SRI Fellow in 1985 in recognition of his work in high-energy laser development,

and he was inducted into the SRI Alumni Hall of Fame in 2013.

Don enjoyed many hobbies, including biking, hiking, skiing, genealogy, cactus gardening, and music. He sang in the choir at the Unitarian Universalist Church of Palo Alto, was a founding member of the SRI Institooters band, and played trumpet in the Peninsula Symphonic Band.

Don was pre-deceased in 2013 by Doris, his wife of 60 years. He spent the last five years of his life in the company of Elizabeth (Jake) Feinler, a friend and loving companion to the end. He is survived by his brother, Alden; two daughters, Christine and Nancy; and three granddaughters, Kaelyn, Karolina, and Rachel.

A video shown at Don's celebration of life is at [https://www.youtube.com/watch?v=E\\_L6QvJQ0rA](https://www.youtube.com/watch?v=E_L6QvJQ0rA).

*Based on an obituary published by the Palo Alto Weekly.*

### Sarah "Sally" O'Hare\*



Sally O'Hare, a former SRI accounting specialist, died at the old Mills Hospital in San Mateo on October 3, 2018, after a long battle with Alzheimer's and other complications. She was 80 years old.

Born in 1938, Sally spent her childhood and most of her young adult years living in Redwood City. She attended

Mt. Carmel School and Notre Dame High School, class of 1955. In 1957, she married Frank O'Hare at Mt. Carmel Church in Redwood City. After marriage, they lived most of their lives in Menlo Park, where they raised their four children. Sally joined SRI in Menlo Park in 1987 and retired in 2011.

Sally was a member of Nativity Parish in Menlo Park for more than 45 years and was extremely active in a variety of parish activities. She will be remembered for her love of family, especially her children and grandchildren, and

her love of sports, especially the SF Giants and Stanford women's basketball team. She will be fondly remembered as "Gramma Sally" to the many kids/young adults whose lives she participated in. And no discussion of Sally is complete without mentioning her love of Starbucks Caramel Frappuccinos!

Sally is survived by her children, Jim, Patrick, John, and Kellie; her grandchildren, Frankie, Caitlin, Matthew, Kristen, Michael, and Hailey; and her brother, Richard (Dick) Homan.

*Based on an obituary on the Dignity Memorial website.*

### Sylvan Rubin\*



Sylvan Rubin, a former SRI staff scientist, died May 25, 2018, at age 99.

Sylvan was born in Brooklyn, New York, but during the Depression the family moved to Los Angeles, where Sylvan graduated from high school and received scholarships, first to UCLA and then to Caltech. After he graduated in 1947 with a Ph.D. in nuclear physics, he worked for the U.S. Army to develop solid-fuel rockets.

In 1948, Sylvan joined SRI, where his career included designing educational systems, educational software for children, new computer languages, ocean route planning, and teaching ADA. He retired from SRI in 1974.

An avid camper and hiker, Sylvan imbued his family with a love of the outdoors. He served on the boards of the Co-op Grocery Stores and the Unitarian Universalist Church of Palo Alto, where he met Sylvia Whitcher, whom he married after the death of his first wife, Hallie.

Sylvan is survived by Sylvia, his daughter Cindy and son Kim, granddaughters Sophie and Alissa, and Sylvia's children and grandchildren.

*Based on an obituary published by the San Jose Mercury News.*

**Felix Teisseire Smith, Jr.\***

Felix Teisseire Smith, Jr., a former research scientist at SRI, died October 15, 2018, at age 98, after a brief hospital stay.

Felix was a third-generation San Franciscan, born in the Cow Hollow neighborhood. He attended the Thacher School in Ojai, Williams College, Harvard Law School, and Harvard

Graduate School, where he earned a Ph.D. in physical chemistry. He served during World War II in Washington, D.C., for the U.S. Navy and then briefly practiced law. After he joined SRI in 1956 as a research scientist, his primary career involved specializing in low-energy collisions and the theory behind the virial equation on the properties of fluids. He retired in 1984 as a Scientific Fellow.

Felix was active in Berkeley's Pacific Center, the San Francisco Hiking Club, the Palo Alto Madrigal Chorus (for which he sang bass), the S.F. Pride Safety Subcommittee, and the Transactional Analysis community. He also continued to do research, publishing a paper on symmetry in special relativity in the journal of the Fondation Louis de Broglie. Felix will be remembered for his brilliance and his rigid adherence to a strict personal code of ethics.

Felix is survived by his husband, Frederick Teti, and by his brothers Nathan and Lawrence and their families.

*Based on an obituary published by the San Francisco Chronicle.*

**James Ralph Young**

James Ralph Young, a former SRI research engineer, died peacefully at Stanford Hospital on June 30, 2018, at age 88.

Jim was born in Rushville, Illinois, in 1930. The family later moved to Sterling, Illinois, where Jim graduated from Sterling High School. He enrolled at the University of Illinois in Urbana,

where he earned his bachelor's, master's, and Ph.D. degrees in electrical engineering. He enlisted in the U.S. Army for

three years before finishing his Ph.D. After graduating, Jim accepted a position at New Mexico State University in Las Cruces, New Mexico. As a professor in the engineering department, he started the university's first computer science program. He joined SRI in Menlo Park in 1963. After retiring as a senior research engineer in 1991, Jim worked for several years with his good friend Lynn Comeskey at Mac & Lou Construction in Palo Alto.

Jim met Frances Baird in El Paso, Texas, while he was stationed at Fort Bliss. They were married in El Paso in 1952. Jim and Frances lived in Palo Alto for 63 years, raising their three children. They began attending First Presbyterian Church of Palo Alto in 1965, where he was an active member until very recently, singing in the choir, playing his trumpet, and serving in several leadership positions over the years.

Jim was an accomplished musician and avid golfer. He taught himself to play the trumpet as a young boy after finding his father's instrument in the attic of the family home. He helped pay for his education by playing in dance bands in Chicago and beyond. He played regularly with Nova Vista Symphony and West Bay Opera, and started a six-person brass group that performed in local churches. While living in Las Cruces, Jim taught himself to play golf by reading books by several professional golfers. He enjoyed playing in the SRI Twilight League at Palo Alto municipal golf course for many years. Jim bicycled to SRI for most of his career; he also enjoyed motorcycling and photography.

Jim is survived by his wife, Frances; daughter Sarah; son David; grandsons Matthew and Andrew; granddaughter Mara; great-granddaughter Alitzelle; brothers Richard and John; and six nieces.

*Based on an obituary published by Palo Alto Online.*

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\*Member of the SRI Alumni Association

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