August 2021 Newsletter

SRI International

Alumni Association



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MESSAGE FROM ARCHIVES CHAIRMAN DON NIELSON



Don Nielson

If you dig into SRI's past, it doesn't take long to learn that many if not most of its important contributions are destined to lie hidden. Contributing to the early phases of change offers some leverage, but the consequence might not be apparent for a long time, if ever. An article in this issue brings one of those leverage points into view. We're grateful to

Paul Masson for giving us an account of how, with SRI's help, NASA came to embrace the privatization of space flight. While the billionaires launch themselves, so to speak, SpaceX exemplifies the ongoing, substantive contributions that the SRI-influenced redirection seeded in NASA decades ago. Beyond those early and direct influences, notice how SRI staff easily moved on to continue guiding and managing the effort under new auspices. This "outflow for continuity" has always been a feature of SRI and the staff whose commitment to project success transcends the Institute. Oh, and don't miss William Grindley's personal and unique picture of SpaceX's founder.

Dramatic changes are in store for SRI itself. Beyond the SRI news about important research in drug discovery and the now critical challenges of online education, there is SRI's announcement about a complete redesign of its campus! You will see the rudiments of the new plan but there is much left to reveal, particularly its implications for the future of the Institute in both derived income and the type of research conducted. More information will be forthcoming, but if you've an urge to respond we have initiated a new reader feature, "Letters to the Newsletter," you are free to use.

Then there was the beauty of Filoli in the spring. A good bunch of you turned out to enjoy it and the company of colleagues. The lunch was delicious, and the event felt open and inviting. Those who worked to make it that way are mentioned just ahead of the Gary Bridges imagery.

Along with the new invited letters section there is one more addition intended to give you some insight into projects and research areas under way at SRI beyond its news releases. The "Ongoing Research at SRI" section will do that, and the first offering is from Patti Schank about how an SRI team investigates the challenges facing many students.

Finally, there is the upcoming annual reunion. The Alumni Steering Committee has again voted to make it free to members. For nonmember alumni who would like to attend, their \$25 fee will also become their first year's membership fee in the association. Please put October 21 on your calendar and let us know you are coming! Let's hope that the COVID nightmare will not resurge and interfere. I hope there's none among you informed alumni still unvaccinated.

Thursday

21 October The Annual Reunion is on October 21, 2021. Please see the announcement on page 17. The invitation flyer for the event is enclosed with this mailing.

LETTERS TO THE EDITOR

We are pleased to introduce a new feature in this issue, "Letters to the Editor." The first letter is from Barry Minkin, who wrote in response to the obituary for Dennis Finnigan in the last issue.

We would love to hear from you, too, so please send your thoughts and comments to steering-committee-alumni@sri.com.

Dear fellow alumni,

I was so sad to hear about Denny's death. He was a very special man who provided a spark of vitality, excitement, brilliance, class, and fun whenever he was around. I was proud that he would occasionally keep in touch with me years after we left SRI. I liked and greatly admire this man. Let me share an experience I wrote about of working with him on a project in Denmark on a typical gloomy cold February. This and other stories about my wonderful time at SRI are found in my autobiography, *Playing with Dust*.

Cold Danish

One of our vice presidents, Denny Finnegan, had developed great relationships in Scandinavia. He brought SRI projects from SAS, Volvo and many others. He was eventually knighted in Sweden and SRI had a Sir Denny. I was asked to consult with one of his Danish clients, ISS in Copenhagen, the world's largest service company that did everything from cleaning airports to managing hotels worldwide. They were considering getting into the conference center business and wanted to provide insights and strategic planning to their key executives including their president.

I flew in the day before and was walking and window shopping in the closed, quaint retail area. It was a dark, deserted, freezing February night and no one was around me. That was until I saw a flash of a man run past me, stopping about 10 yards ahead. He looked at me and said, "You must be an American." Startled, I looked down to check myself out and said, "How did you know?" He replied, "No one but an American would be walking in this cold with such a broad smile on his face."

He asked me to come quickly with him, and we headed to a down stairway on the pedestrian walkway about a block away. I was hit with a blast of loud tuba music and dozens of beer-drinking patrons in a large restaurant bar with at least 10 large, polished wooden tables. Many of the patrons were standing on the tables, beer steins in hand, singing and dancing. It was warm and wild. My guide explained that dancing and singing were the way the closed-up natives endured the gray, cold months. After a period of time, I too was watching and listening and swaying to the polka music from the top of a table. For the older set, tea dances where couples would dress up and dance were also a Copenhagen tradition.

The next evening Denny arrived and he took me to a historic restaurant and introduced me to Aquavit. Not being a drinker, I was reluctant to partake, but now being with royalty how could I refuse? So I drank a shot of this liquor. Denny said that would never do when we meet Poul Andersen, the ISS president. He then poured another shot of the clear liquid and said to drink it but to never take my eyes off his. After a few more tries, I was very ready to go back to the hotel and sleep.

The next couple of days we spent at the ISS conference center, a beautiful retreat outside the city. Breakfast was a buffet of cheeses, fish, granola and thick black and rye breads. But what I enjoyed most was the homemade yogurt that they displayed in large glass bowls. It was the best I've ever had. Before I left, I got a chance to show off my newlyacquired Aquavit toasting skills with the ISS president.

I toast to you, Sir Denny! Barry Minkin

Spring Fling at Filoli

It was a happy crowd of about 80 SRI alumni and guests who shared the pleasure of assembling for a few hours at Filoli for the 2021 Spring Fling. The weather was pleasant, as was the company, and the grounds at Filoli are always inspiring.

The picnic tables provided a sense of privacy, albeit at the cost of reducing the mingling that usually occurs when we gather. Also, wearing masks, by now second nature to all of us, gave this particular event a different feel.

It takes many hands to make alumni events a reality and a success, particularly during a pandemic. Dave Harvey and Augustina Biosic met with Filoli's Director of Events to discuss logistics beforehand. Gary and Gay Bridges and Don Shockey brought 80-plus box lunches to Filoli. Augustina, Martha Agreda, Casey Chesterfield, Chris Padilla, and Gay Bridges fought the wind to tape the tablecloths on the picnic tables and helped clear the tables after lunch.

Augustina and Linda Jansen worked for weeks updating the list of attendees, and Linda produced the beautiful nametags. Augustina and Linda were also welcoming hostesses, checking in the attendees, distributing the nametags, and guiding everyone to the picnic tables.

A sincere thank you to you all!

These photographs, thanks to Gary Bridges, provide a visual memory of this "day of masks and flowers." Perhaps we'll look back on this Spring Fling as a capstone of the past year of quarantine, as well as a preview of our lives from here on.

See you all at our next event—the reunion in October.



2021 SPRING FLING (Continued)



2021 SPRING FLING (Concluded)



NEWS FROM SRI

SRI Reveals a Major Plan to Renovate its Campus



Early renderings of the redeveloped campus at SRI International's Menlo Park headquarters. Courtesy Lane Partners.

The Public Announcement

SRI has announced plans to redevelop its 63-acre Menlo Park headquarters by adding housing and opening areas to the public. SRI is collaborating with the city of Menlo Park and with Lane Partners, a commercial real estate investor, developer, and operator that focuses on the Bay Area. Early plans for the development, to be called Parkline, are as follows:

- Ten acres of the property would be dedicated to residential development, which could accommodate at least 400 new housing units. Some of the housing would be a mix of market-rate units and units affordable to low-income households.
- Approximately 28 acres of the property would be publicly accessible open space, and drawings show bike routes running through the property and along Ravenswood Avenue that could more safely connect cyclists to Menlo-Atherton High School and Ringwood Avenue.
- The property currently has about 38 buildings that are all enclosed within a security fence. The redeveloped site would reduce the number of buildings to eight or nine. No additional square feet of office or research and development space would be built.
- Six highly sustainable office/R&D buildings would replace nearly 1.1 million square feet of outdated and inefficient commercial buildings, with no increase in commercial space. Two or three of the current buildings would be kept for laboratory and research and development uses.
- The height of some buildings would increase to five stories from the current three and four stories.

Additional Insight and Some Concerns

By Don Nielson

SRI is turning 75 years old, and over the years there have been a few rumbles of an updated or modernized SRI campus, of new buildings or a more unified architecture, and even of room for a modest museum about its accomplishments. Models were built, the City of Menlo Park was engaged, but nothing happened. We all know why: insufficient capital due to an inadequate and reliable surplus or adequate line of credit. From time to time new buildings were built, but a campus overhaul was beyond reach. However, options can change if SRI is willing to place the value of its land on the table.

On June 1, SRI announced its intentions to embark on a campus-wide renovation. But there is a catch. To acquire the needed resources, SRI is partnering with a developer. That partnering, together with Menlo Park and community-aimed public access to portions of the new campus, means SRI will have to guard its long-term interests closely. While this is an initiative of the SRI board and present administration, future needs have been defined by the division leadership and a staff advisory committee has also been formed. It will be an unfolding story, but what was revealed in the press release raised some concerns to me, some of which are keyed to the proposed layout shown on page 7 and some of which have been assuaged through recent interaction with SRI.

The most important new information is that the land will not be sold but will be offered under a 99-year ground lease. While that is a very long time, the arrangement leads to a large up-front payment and ongoing rental income that increases over time. If SRI can use that to foster new initiatives in people and promising research and not to subsidize operations, it will be a boon long awaited by the Institute.

One concern posed by the layout is simply physical presence. The project name, Parkline, ostensibly doesn't reveal SRI at all. Surrendering the imposing presence of the world headquarters of SRI International on a main Menlo Park thoroughfare for what might be tenant-like status would seem an unnecessary sacrifice. SRI should be seen as the principal occupant of the site rather than an occupant revealed only on a signboard out front. While Buildings B-1 or B-6 might help retain that presence, apparently SRI's occupancy is now hidden within the redevelopment, even to the rear. Imagine someone arriving at Parkline and having to ask directions to where they might find one of the world's foremost research institutes!

NEWS FROM SRI (Continued)

Another concern is space allocation. Some public access and the mixed use are understandable avenues for the project to pass Menlo Park approval. And the housing part of the allocation is separable in the plot plan below. But mysteriously, only three existing SRI buildings will be retained (B-7, B-8, and B-9), none of which hold the office and developmental lab space that now exist in Buildings A, B, and E. Indications are that the division directors and administrative staff have put forward the type and amount of space they need and that those three remaining buildings, in some configuration, will be adequate for all Menlo-based SRI! That implies a lot of currently unoccupied floor space, which is true, and perhaps modest, if any, growth. Clearly, choosing and building the right kind of space should enable rather than dictate the type of research SRI will engage in.

This leads to one other concern: Will the occupancy costs SRI will face be as an owner or as a renter? The plan stipulates that the SRI-retained buildings are not subject to the ground lease arrangement and thus may be freely adapted to future needs. But it would seem prudent to hold some additional land for unanticipated uses, including growth. If not, the market-based cost for off-site projects will arise and care should be taken in that regard to control SRI's overall cost of doing business.

Finally, buried in all this may be an implication that the Institute is headed for largely an information and biochemical research future. No high bays, no machine and craft shops, no field or large-scale projects, and consequently no future radars, lidars, robotic systems, or internet vans—just offices and lab space. Hopefully, there will be more. But clearly, such a significant physical transformation carries implications regarding the future of SRI. As the boldest venture in its history, let's hope a well-conceived plan emerges that will help support new visions, increase its competitiveness, and serve the unfolding needs of a diverse research institute.

Sources:

Bradshaw, Kate. "Proposal to redevelop SRI International campus and add housing in the works." *The Almanac*, 1 June 2021. https://almanacnews.com/news/2021/06/01/ proposal-to-redevelop-sri-international-campus-in-the-works

Parkline website. https://menloparkline.com/



Parkline project site showing proposed office buildings, residential complexes, and parking structure. Courtesy Lane Partners.

SRI and Sanofi Join Forces in Drug Discovery and Research

SRI entered into a research collaboration with Sanofi, a global pharmaceutical company that engages in the research and development, manufacture, and marketing of therapeutics for patients. Sanofi has three principal activities: pharmaceuticals, consumer healthcare, and vaccines. With headquarters in Paris, France, Sanofi is the holding company of a consolidated group of more than 250 companies and has offices, research laboratories, and production facilities in approximately 90 countries.

Sanofi will leverage SRI's SynFini[™] platform, an artificial intelligence (AI)-guided automated synthetic chemistry system, to discover and develop lead candidates in its multiple high-profile drug discovery programs. SRI's SynFini platform combines AI and automation to accelerate small-molecule drug discovery and development and thereby deliver new drugs to the clinic faster and more economically. The platform has three components (SynRoute[™], SynJet[™], and AutoSyn[™]) that work seamlessly together to automate synthetic route design, reaction screening and optimization, and production of target molecules.

"The goal of the SynFini platform is to create a new paradigm in the approach to drug discovery," said Nathan Collins, chief strategy officer of SRI's Biosciences Division and head of the SynFini program. "We look forward to working with Sanofi in applying our AI-guided automation platform to drive the rapid and efficient discovery of therapeutics for high-profile targets."

The SRI-Sanofi collaboration will also use SRI's recently implemented DASL[™] (deep adaptive semantic logic) AI-guided molecular design tool for multiparametric optimization in hit-to-lead and lead optimization. Using reasoning-guided deep neural networks, DASL efficiently predicts drug designs from the sparse data sets that are typically available in drug discovery.

Sources:

SRI press release, July 7, 2021. https://www.sri.com/ press-release/sri-international-enters-drug-discovery-andresearch-collaboration-with-sanofi/

DASL: See *Creating Integrated Circuit Designs Better and Faster* in the April 2021 SRI Alumni Association Newsletter.

SynFini: See COVID-19 Under Attack: SRI and Iktos Combine

Forces to Accelerate Development of New Antiviral Therapies in the April 2020 SRI Alumni Association Newsletter.

New Research Center Addresses Inequities in College Online Learning

SRI Education and the Community College Research Center (CCRC) at Columbia University's Teachers College launched a new research center, thanks to a \$10 million award from the US Department of Education's Institute of Education Sciences.

SRI and CCRC are partnering with Achieving the Dream (a national leader in championing evidence-based institutional improvement with a network of more than 300 colleges) and nine broad-access colleges. The objective is to conduct research on how education technology and instructional strategies can bolster students' skills for managing their own learning.

"It's an amazing opportunity to partner with CCRC to strengthen teaching and learning for all students," said Deborah Jonas, director of SRI's Center for Education Research & Innovation. "With Achieving the Dream and our partner colleges, the center will promote cross-sector knowledge sharing and national uptake of the evidencebased training resources the team will develop."

The partners' research findings will form the basis of a national engagement and professional learning program to help higher education leaders and instructors adopt teaching strategies and effectively use online course tools to help students develop self-directed learning skills.



"Faculty and student input will help shape the center's research and guide us in sharing findings in ways that strengthen teaching and learning," said Jonas. "When we involve faculty and students from the beginning, we better

NEWS FROM SRI (Concluded)

understand how we can help make effective practices easier for instructors to adopt."

The new center brings together two key trends in higher education. Colleges and universities are increasingly recognizing that explicitly teaching planning and study skills can help more students successfully complete courses and stay in college. At the same time, experts predict that schools will be offering far more online courses as campuses emerge from the pandemic.

The center is funded under Grant R305C210003 from the Institute of Education Sciences, US Department of Education, to SRI International.

Sources:

SRI's The Dish, 30 June 2021. https://medium.com/dish/ new-research-center-aims-to-address-inequities-in-onlinelearning-in-college-44d686c6d4b7

SRI press release, 6 July 2021. https://www.sri.com/press-release/new-research-center-aims-to-address-inequities-in-online-learning-in-college-2/

SRI Ventures Launches Vitrina AI: Connecting Video Content Buyers and Sellers Across the World



SRI Ventures, the corporate venture arm of SRI International, recently launched the portfolio company Vitrina AI, which offers the first platform to track deals across the global video entertainment industry. Powered by an artificial intelligence (AI) software-as-a-service platform, Vitrina AI connects video content producers, service providers, and buyers to more than 60,000 companies across the globe. Access to such information through one comprehensive, easy-tonavigate resource will allow companies to execute safe, secure, and speedy transactions, an impossibility without such a platform.



Under incubation at SRI since 2019, Vitrina AI built a powerful search engine that disentangles a mix of industry databases, media reporting, and other public repositories to create a streamlined search process that enables users to find studios, distributors, content service providers, broadcasters, and streaming companies globally. At launch, Vitrina AI will cover more 30 countries and can rapidly scale up to include more markets thanks to SRI's innovative AI, machine learning, and natural language processing technologies that generate unified structured data sets from disparate sources. Users can search by market, genre, and major local players and also monitor long-term content transaction trends. Buyers can leverage the platform to connect directly with studios, distributors, production, and content-adaptation services worldwide and can use Vitrina AI's virtual deal rooms for secure negotiations.

"Currently, the international video content exchange process is opaque, cumbersome, and expensive. Between challenges like language barriers, varying legal structures, and different business and cultural norms, it remains arduous to source, distribute, and adapt content across borders," said Atul Phadnis, CEO and founder of Vitrina AI. "With Vitrina AI's proprietary platform powered by SRI's AI technology, we have created a solution that will significantly expedite and simplify cross-border dealmaking by bringing industry intelligence, company connections, and negotiation capabilities all under one platform."

Vitrina AI has already begun to build excitement with a recently completed seed funding round, led by Unlock Venture Partners, with additional investment from institutional investors.

Source: SRI press release, 23 June 2021.

We are introducing a new section in this issue, "Ongoing Research at SRI." The first article is courtesy of Patti Schank.

We welcome articles from all groups at SRI. If you have an article you would like us to include in a future newsletter please send it to steering-committee-alumni@sri.com.

SRI's Behavior Research to Support Students' Success in School

More than one of every five students has or is at risk of having an emotional or behavioral disorder that can hinder learning and relationships. SRI's Student Behavior Research Team evaluates schoolwide and classroom programs that are intended to promote a positive school climate, appropriate behavior, and student well-being. The team posts news and information about this work on the Student Behavior Blog (studentbehaviorblog.org) for educators, administrators, school social workers, counselors, parents/caregivers, students, and other researchers. The following describes the work in more detail.

What the Student Behavior Research Team studies

A student having academic challenges or behavior problems at school may be dealing with a larger underlying issue that educators may not be aware of. The SRI Student Behavior Research Team studies emotional, social, and behavioral issues, such as depression or ADHD, as well as stressors, trauma, or other problems students may face in their daily lives.

With proper support, students with these challenges can still experience success at school. Educators have demonstrated that explicitly helping students improve their coping skills and behaviors can lead to improvements in school attendance, academic achievement, and graduation rates. However, many questions remain about which supports and programs work best for specific school environments and student populations.

Work in classrooms and schools

To do its evaluations efficiently, effectively, and in culturally competent ways, the SRI Student Behavior Research Team builds partnerships with school administrators, teachers, program developers, and mental health practitioners. These partnerships also are critical to ensuring a focus on highpriority issues and practical solutions that meet students' needs. Here are examples of questions the team addresses:

- What types of emotional and behavioral supports are most effective in helping students cope with daily frustrations and obstacles?
- What programs are most effective in ameliorating the effects of emotional and behavioral disorders?
- Which students benefit most from certain programs, and which students benefit least or not at all?
- What are some things teachers and administrators can do to get the best results from a program?
- How can schools sustain high-quality programs and positive outcomes over time?
- How much do programs cost? What are the financial costs and human resource costs to schools to implement programs?

The five most common types of programs the team evaluates are the following:

- 1. Social-emotional learning programs. Socialemotional learning programs teach students the skills to understand and regulate emotions, build positive relationships, and make responsible decisions. For example, social-emotional skills help students cope when they are feeling angry or frustrated.
- 2. School climate programs. School climate refers to the quality and character of school life. A positive school climate is one where students and staff feel safe and engaged. Positive school climate has been linked to higher attendance and graduation rates. Schoolwide programs intended to establish clear and consistent rules and routines can help improve school climate.
- **3. Trauma-informed programs.** Students who have witnessed or experienced traumatic events such as abuse, poverty, or family/community violence or substance use are at greater risk of developing behavioral, social-emotional, and academic difficulties. These students often report depression, anxiety, and even somatic symptoms that can be extremely disruptive to their

school life. Trauma-informed programs integrate knowledge about trauma and its impacts with skilland resiliency-building so that students can address and manage their symptoms in and out of school.

4. Bullying/violence prevention programs. Aggressive and violent behaviors cause physical and emotional harm and interfere with academic functioning for both victims and perpetrators. Fighting and violence among students also contribute to an unwelcoming, unsafe school climate. Effective schoolwide anti-bullying programs often have a multipronged approach, with components targeting the administration (e.g., school discipline and supervision), classroom (e.g., bullying discussions and activities), and individual (e.g., anger and conflict management approaches, parent involvement).

5. Dropout prevention programs. Academic failure and ongoing social, emotional, and behavioral difficulties can lead to a student's dropping out of school. Dropout prevention programs provide early support for at-risk students by engaging them in the school and surrounding community, improving academic and social skills (e.g., conflict resolution, problem-solving), and assigning a caring adult role model or mentor to prepare for a successful college and career life.

INTERNATIONAL JOURNAL

Shut in by COVID-19 regulations and foul weather last winter, Peter Weisshuhn reread *London's Strangest Tales*, a book he had bought years ago (Tom Quinn; Portico, London, England; 2008). It goes back centuries, presenting stories of unusual practices, events, and fashions of the famous and about important buildings, markets, pubs, and clubs, which he found informative and entertaining.

Peter (and your Alumni Newsletter editors) thought the story of "The Church That Went to America" would be of interest to any traveler planning a trip to England or across the United States, once air travel takes off again.

Many of us are familiar with the church St Martin-in-the-Fields because of the concerts performed by the Academy of St Martin in the Fields conducted by Sir Neville Marriner. But there is more that distinguishes this church. First, it truly did stand "in the fields" when its construction was finished in 1724: It was not within a town but on agricultural land. Second, architect James Gibbs defied tradition by erecting the steeple at the west rather than east end of the church. People liked this change so much that the design became very popular. Word spread to the United States, and offers of great sums of money prompted some members of Gibbs's architecture firm to travel there. Those architects followed American settlers as they went west and built replicas of St Martin's along the way.



St Martin-in-the-Fields church at Trafalgar Square, London.

SRI International's Role in Commercial Space Transportation: Designing NASA's Business Partnership Model for Commercializing Space

By Paul Masson, Managing Director, StarNet LLC

A privately owned space capsule called *Dragon* operated by Elon Musk's SpaceX Corporation docked at the International Space Station on May 31, 2020. This event was hailed in the US media as "the first time a privately built and owned spacecraft carried astronauts to the space station in its more than 20 years of existence," with the NASA administrator declaring, "NASA is not going to purchase, own and operate rockets and capsules the way we used to...we're going to partner with commercial industry."^{1*}



SpaceX's Crew Dragon Demo-2 spacecraft, with NASA astronauts Bob Behnken and Doug Hurley onboard, approaching docking with International Space Station on May 31, 2020. Photo credit: NASA.

This change is the outcome of a federal policy from the 1980s to transition from government-owned to commercially operated space transportation and services. A key element of this transition was conceived in the International Building courtyard in the spring of 1983, when a team of SRI professionals led by Jim Wilhelm was brainstorming solutions to NASA's industry outreach and came up with the recommendation to adopt public-private partnerships to implement the transition. Beyond SRI's institutional role, a small network of SRI alumni were hired by NASA to operationalize the public-private partnership mechanisms that were eventually used to build the US commercial spaceflight industry.

US Space Policy: From Government Owned to Public-Private Partnerships

The American moon landings had marked the successful conclusion of a decade-long quest to lead the world in space launch and operations capability. The US effort was led by NASA, which was organized as a core of civil servants at field centers that coordinated an army of private sector contractors into a series of mission programs. The first program, Mercury, was designed to determine whether a human could survive in space; the second program, Gemini, was designed to determine whether two astronauts could maneuver in space and link up with orbiting vehicles; the third program, Apollo, was designed to fly astronauts to the moon for exploration and return them safely to earth.²

Congress equipped NASA with a massive budget and expansive authority to enter into any form of business agreement necessary to achieve the agency's mission objectives. The authority, broadly called Space Act Authority, contained unusual provisions, including "enter into and perform such contracts, leases, cooperative agreements and other transactions as may be necessary in the conduct of its work."³ This broad authority enabled NASA to build the network of scientists, technologists, and contractors to design and implement each mission.

The successful moon landing achieved two major goals for the United States, first to undertake a peaceful exploratory mission and second to demonstrate US rocket capability for cross-global delivery. With accomplishment of these two goals and the nation moving into political disputes over the economy, funding NASA's network of for-profit contractors and salaried researchers was no longer sustainable.

Rather, the creation of a space shuttle capable of undertaking a variety of missions was adopted for NASA. The idea was straightforward: create a multipurpose space transportation vehicle for exploration, research, and in-space servicing. Both development and operations costs exceeded projections, however, leaving subsequent administrations with the decision of whether to continue or further scale back US space transportation capabilities.

One solution to the high cost of space exploration was to spin off NASA's space flight and operations capabilities to commercial organizations, as had been done with the individual technology transfer spinoffs. NASA had a long history of small projects with private sector organizations that transferred knowledge and expertise for communications and weather observation satellites. The commercial spinoff

^{*}Numbered footnotes are at the end of the article.

idea was adopted as policy under the Carter administration, which issued an update for space policy that included the guidance, "The United States will encourage domestic commercial exploitation of space capabilities and systems for economic benefit to promote the technological position of the United States."⁴

The Reagan administration decided to expand on this policy by directing NASA to define and implement "space commercialization." In a July 4, 1982, speech, President Reagan promised to "provide a climate conducive to expanded private sector investment in civil space activities."5 Throughout the remainder of 1982, Reagan administration advisors continued to formulate directives for policies and programs that resulted in NASA offering to lease space launch vehicles and engage in cost-shared technology development for "the first successful private launch in the United States."6 In 1983, the Reagan administration began its next step toward implementation of the new policy when NASA drew up guidelines to establish a Space Commercialization Task Force. The task force members sought out national specialists in technology utilization and commercialization. The search led them to SRI's Technology and Innovation Management Center, with a project team led by Jim Wilhelm working with key colleagues David Keaton and Marcelo Hoffmann.

Solutions Sought: SRI Retained to Advise NASA

NASA's Space Commercialization Task Force had a mandate to shift from the agency's network of cost-plus-markup contractors to a model that supported the emergence of a commercial space transportation and services industry. This type of total transformation had never been attempted in US history. While the government had been an investor or anchor client in the emerging railway, telegraph, and aviation industries, it had not had to convert an entire government-run function into one driven by commercial market incentives.

NASA Administrator James M. Beggs's mandate to the task force was daunting: develop "an agency-wide policy and integrated program plan for enhancing NASA's ability to encourage and be responsive to commercialization endeavors. The Task Force will identify specific commercialization initiatives which should be taken to lessen the barriers and increase incentives for private sector investment and involvement in civil space activities."⁷

The task force managers decided to create an outreach program to encourage private companies' involvement in

civil space activities, including direct investments and private operations.⁸ The outreach program had four objectives:

- 1. To raise interest in the US private sector about space commercialization.
- 2. To inform the private sector about relevant space commercialization opportunities, endeavor agreement options, and incentives.
- 3. To establish a two-way communication channel between the private sector and NASA for all space commercialization matters.
- 4. To guide companies to space commercialization commitments and investments via appropriate endeavor agreement options.

The mandate from Administrator Beggs had a new feature for NASA: a requirement that the outreach include connections with companies, entrepreneurs, venture capitalists, finance companies, and insurance companies to increase commercial adoption and incentivize investment.⁹

The Space Commercialization Task Force compiled NASA's first inventory of agreements with private sector companies for possible space commercialization and found 10 different approaches used through five different offices, many with different principles and business practices. The task force, with SRI's analyses, drew two strategic conclusions:

- Coordination and consistency—NASA needed to coordinate the multiple business mechanisms through one unit following an integrated strategy.
- New business mechanisms—-NASA needed new mechanisms to incentivize private sector investment. The task force recommended:
 - Multi-company research groups
 - Cost or intellectual property (IP)-sharing projects.

The strategic conclusions raised a further question: how to design, build, and implement NASA capabilities for both a business unit focused on commercialization *and* the multi-company research groups or cost-shared projects. To answer these questions, SRI invited the NASA task force to Menlo Park for brainstorming.

One Proposed Solution: Adopt R&D Limited Partnerships

An SRI team of 18 specialists brainstormed with the NASA managers for a week to generate outreach mechanisms along with details for implementation. The meetings were

held during the spring transition to summer, floating between the I Building conference rooms and the courtyard. Group sessions led to small breakout groups and further brainstorming. A long list of commercialization outreach tools was generated but with a short list of ones that would link to private companies and investors.

I joined the meetings as a financing specialist from the Corporate Financial Services (CFS) consulting unit. The best idea from the field of finance was to use R&D partnerships between NASA and private companies to transfer and commercialize technology, because that mechanism automatically attracted entrepreneurs, early-stage capital, and institutional finance. The task force members expressed interest in the idea but wanted details: What is an R&D partnership, how would it be organized, how would it attract private capital, and would it work given national politics?

Beyond the Concept: Designing a Cost- and IP-Shared R&D Partnership

The designing of a public-private R&D partnership fell to me, and I immediately turned to colleagues from the CFS consulting unit. I spent time talking with Alan Biller, John Cox, and Syed Shariq along with Pat Sullivan in the Management Consulting Group. After a careful allocation of sold time and incentives, such as lunch tickets during ice cream Fridays, I collected the group wisdom and generated a basic description for R&D public-private partnerships that eventually made its way to NASA's new commercialization unit, Code C.

A by-product of this teaming was a knowledge relationship that would last after we left SRI. Three of us—Pat Sullivan, Syed Shariq, and I—eventually reconnected under NASA funding to advocate for, design, and implement the partnership mechanisms that were used by SpaceX, Northrop Grumman, and other emerging space commercialization companies.

NASA Implementation: Team at Ames Begins Legal Research, Forms Program

NASA Ames, a regional research center in northern California, adopted the recommendation to form multiclient research groups along with R&D limited partnerships. Ames senior managers solicited ideas from their personnel on ways to implement R&D partnerships. Ames Chief Counsel J. Henry Glazer formed a team of legal specialists and technologists under the concept of "Joint Enterprises" to identify the legal authority, mechanisms, and implementation for R&D partnerships that went beyond the existing Joint Endeavor Agreements pioneered by McDonnell Douglas and NASA in 1983. By 1986, Glazer had formed his team and added now former SRI employee Syed Shariq. The Ames team completed a legal analysis concluding that R&D partnerships could be implemented in multiple forms, using NASA's existing Space Act Authority similarly to the Joint Endeavor Agreements.¹⁰

The Ames managers moved to implement the concept through the San Francisco State University Foundation. The idea was to create a nonprofit program, the Joint Enterprise Institute, that would form both R&D partnerships and multi-client research programs centered around universities. The Joint Enterprise Institute became a three-year NASA Joint Sponsored Research Program (JSRP) within the NASA Technology Utilization organization.¹¹ The JSRP was moved from the Joint Enterprise Institute to a nonprofit called American Technology Initiative (AmTech) that was formed in July 1989 and funded by a three-year cooperative agreement between NASA Ames Research Center and the AmTech board. NASA assigned Shariq to AmTech to act as the initial chief executive officer with primary responsibility to lead the policy advocacy for the JSRP within NASA.

SRI Alumni Reconvene: NASA Hires SRI Alumni

Two other members of the SRI knowledge network had left the institute and joined the MAC Group consulting organization. Pat Sullivan had joined MAC and done a strategy for the Ames Research Center, which included an action to test new mechanisms of incentivizing investment in space commercialization. I joined MAC as a general management consultant in 1988 and became a pro bono advisor to Shariq on the formation of the Joint Sponsored Research Program and AmTech.

I joined Shariq at AmTech for three years, he advocating the concept of multi-party R&D within NASA and I building the JSRP business agreement process and implementation operations. I was teamed with two attorneys who had been interns at NASA Ames, David Lloyd, who handled the legal and operational elements of the AmTech relationship with NASA, and Karen Robbins, who researched the law, developed IP guidelines, and drafted agreements under the business model developed to implement the JSRP. The program's partnership models, legal research, and operational implementation guidelines were incorporated into NASA's management system by the late 1990s.¹²

New Era: Commercial Orbital Space Transport

The NASA JSRP was adopted by NASA's Commercial Orbital Transportation Services (COTS) initiative, which coordinated private companies' development of vehicles for the delivery of crew and cargo to the International Space Station. The program was announced on January 18, 2006, and successfully flew all cargo demonstration flights by September 2013.

NASA signed agreements with SpaceX and Rocketplane Kistler (RpK) in 2006 but later terminated the agreement with RpK because of insufficient private funding. NASA signed an agreement with Orbital Sciences in 2008.

NASA's final report considered the COTS program an unqualified success and a model for future public-private collaboration. Compared with traditional costs-plus contracts used by NASA, such as the \$12 billion Orion (spacecraft) contract, the unprecedented efficiency of the \$800 million COTS investment resulted in "two new U.S. medium-class launch vehicles and two automated cargo spacecraft."¹³

Epilogue: Complete Experience of a Lifetime

The privately owned spaceship VSS *Unity*, launched from the New Mexico spaceport on July 11, 2021, carried Virgin Galactic employees, including founder Sir Richard Branson, to an altitude similar to that of Alan Shepard's 60 years earlier. The vehicle was designed by Scaled Composites and drew technology from a half-dozen public-private partnerships to design, test, and launch the unique spacecraft. Virgin Galactic, which had signed its first partnership with NASA in 2007, inked additional partnerships with NASA in 2020 to develop a next generation of high-speed vehicles for commercial use. Branson tweeted of the trip, "It's the complete experience of a lifetime."¹⁴



The VSS Unity starting its propulsion after being disconnected from the carrier aircraft. Photo credit: Virgin Galactic.

Another privately owned spacecraft called *New Shepard* launched from a Texas spaceport nine days later, on July 20, aboard a Blue Origin rocket that carried founder Jeff Bezos and three other crew members including "the oldest and youngest people to ever have flown in space."¹⁵ The *New Shepard* rocket engine had been developed through a public-private partnership between NASA and Blue Origin, using the same authority adopted by NASA's Joint Sponsored Research Program.



Blue Origin's launch of New Shepard on July 20 in West Texas. Photo credit: Blue Origin.

Both founders tweeted the experiences were the confirmation of lifelong dreams. Those experiences were also the confirmation of an idea posited nearly 40 years earlier at SRI.

- 1. "SpaceX's Historic Encore: Astronauts Arrive at Space Station," Associated Press, May 30, 2020; accessed July 8, 2021.
- 2. Roger Bilstein, Orders of Magnitude: A History of the NACA and NASA, 1915 to 1990, NASA History Series, NASA SP-4406.
- 3. NASA enabling legislation, subsection 203(C).
- 4. White House Fact Sheet, June, 1978; in Michael A. G. Michaud, *Reaching for the High Frontier*, Ch. 12, Praeger Publishers, 1986.
- National Space Policy, Civil Space Program, Private Sector Participation (Sec. 3.4.B), NSDD-42, July 4, 1982, NASA Historical Reference Collection; accessed July 23, 2021.
- "Origins of the Commercial Space Industry," US Department of Commerce, Federal Aviation Administration, p. 1; retrieved July 23, 2021.
- 7. SRI International, NASA Space Commercialization, Outreach Program Plan, NASA Contract NASW-3823, January 31, 1984, p. 1.
- 8. Ibid., p. 1.
- 9. Ibid., p. 3.

HISTORY CORNER (Concluded)

- J. Henry Glazer, "The Expanded Use of Space Act Authority to Accelerate Space Commercialization Through Advanced Joint Enterprises Between Federal and Non-Federal Constituencies", *Rutgers Computer and Technology Law Journal*, Vol. 12, No. 2, 1987.
- Joint Sponsored Research Program, Space Technology Innovation, NASA Office of Space Access and Technology, Vol. 3, No. 6, November/December 1995, p. 7.
- NASA Advisory Implementing Instructions, NAII 1050-1, Sec. 1.6, Funded Agreements, Effective December 30, 1998.

- "NASA Releases COTS Final Report" (press release), NASA 2014-06-03; accessed July 14, 2021.
- 14. "Richard Branson Reaches Edge of Space: It's the complete experience of a lifetime," CNBC News, July 11, 2021; accessed July 12, 2021.
- 15. "Jeff Bezos Reaches Space on Blue Origin's First Crewed Launch," CNBC News, July 20, 2021; accessed July 21, 2021.

The Renter

By William Grindley

In 1995, we rented the top two floors of the former water tower at our 150-year-old Atherton home (now called The Fennwood Estate) to a nice young man who was going to Stanford Graduate School in chemistry. Nearly every morning, I would meet him in our parking lot with my jumper cables to help him get his ancient BMW running. It was not difficult for me, as I had left SRI and worked from my home office (a pioneer in that). He was always polite and courteous.

After six to eight months, he told us he wasn't going to continue at Stanford. Rather, he and a friend were starting a company to put maps on the web and asked if we wished to invest. The minimum investment exceeded what my wife and I thought we could "stretch" for at the time. We declined. But my wife told him of a friend who had made millions of dollars by starting semiconductor companies and gave our renter the name and telephone number. (Our friend invested and three years later got back 20 times his original principal.)

Some months later, our renter left. We haven't seen him since. Our daughter, however, now a governess for a wealthy family, saw him recently when he attended a social function at her employer's home. She reminded him that he had lived in our tower. He remembered and said he wanted to thank her parents for being kind to him. That renter was Elon Musk!

While that experience and \$3.75 will get you a Grande Latte at Starbucks, it was encouraging to our family that his courtesy towards our daughter evidenced a kindness and some level of humility that Elon is not always recognized as having. Because we know the "human side" of Elon Musk, and having lived 50 years in the world's center of innovation, we know what it takes to disrupt a major world industry such as that of petroleum-based transport. So, we do wish that the *New York Times* would recognize that AI for Tesla guidance is a work in progress; that if its recent front-page story is read carefully, the "injured party" could also be guilty of that tragedy; and when compared with other automakers, Tesla's crash rates might not be so newsworthy. The Times "got it wrong" several years ago with a story on Tesla and had to retract its consultant's findings. Perhaps it will have the courage to admit there are two or more sides to its most recent hit on Tesla.



Elon Musk repairing his BMW's broken window in 1995 with parts bought from a junkyard.

Photo credit: Sissi Cao, "Elon Musk's Mom Posts Rare 1995 Photo Showing the Tesla CEO Fixing His First Car," Observer, 12/12/19.

ALUMNI NEWS

2021 Annual SRI Alumni Reunion in Menlo Park



SRI Alumni Association members who will be in the Bay Area on October 21 are encouraged to come to the annual reunion. It will be held in the International Building from 4:00 until 7:00 p.m. The program will include a report

on the status of the Institute and a technical presentation. A special feature of the reunion will be the induction of David R. Crosley and John Kelly into the Alumni Hall of Fame. You can count on sumptuous hors d'oeuvres, excellent drinks, delightful conversation, and plenty of door prizes.

This year the reunion is free of charge for one alumni member and one guest. Your additional guests are welcome to attend at a charge of \$25 each. As an added bonus, paying guests who are former SRI employees but aren't currently members of the association will have their entrance fee go toward one year of association membership.

An invitation to the reunion with sign-up form is included with this mailing; members receiving electronic distribution will need to print the sign-up form from their email attachment. Please complete the form and return it with your details and payment for any additional guests by October 15.

Alumni Association Membership Renewals Due by November 30

It's almost time to renew your SRI Alumni Association membership for 2022. Membership renewal forms will be mailed to association members in **mid-October**. The fee is \$25 per member, due by **November 30, 2021**. All members who renew on time will be included in the 2022 Alumni Directory, which will be issued in January.



The SRI Alumni Association welcomes new members:

Pat Byrge Curt Carlson Daniela Torre Gibney Barbara Heydorn Bruce Morley Nora Ongpin Jeff Thayer

And welcomes back previous members:

Sophie Essabhoy Joe Grippo Thomas Horan Ruth Krasnow Harry Pettis Sarita Skidmore

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 April 1, 2021, to July 31, 2021) contains new members and corrections. Please add it to your 2021 Directory.

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.

David L. Pirogowicz



David Pirogowicz, 69, died on May 6, 2021, in Santa Clara, California, after an eight year battle with frontotemporal dementia/ primary progressive aphasia.

Born in Akron, Ohio, to Edward and Lois Pirogowicz, David graduated from Ellet High School in 1970. After completing a degree in industrial technology from Kent State University, he joined the US

Naval Reserve and moved to California where he worked in management for Xerox, followed by a long career as a purchasing agent for SRI.

David was an avid runner, with many years running 30-, 50-, and 100-milers in some of the toughest ultraruns across the country. He enjoyed woodworking, traveling, walking his dogs, and spending time with family and friends. David was a prolific volunteer. He donated more than 200 units of blood platelets to the Stanford Blood Bank and volunteered at nursing homes, as well as devoting countless hours over 20 years at Heart of the Valley Services for Seniors to help the elderly remain in their homes.

David leaves behind his loving wife, Terry; brothers, Michael and Eric; sister, Susan; and yellow lab, Frank.

Based on an obituary published by Akron Beacon Journal on May 16, 2021.

Note: At press time we learned of the deaths of three other former SRI staff members—**George Ganschow***, who died on May 7, 2021, **Bill Opsahl**, who died on July 24, 2021, and **Gina Trask**, who died on August 3, 2019. Their obituaries will be published in the December 2021 newsletter, or when more complete information is available.

Charles Stancomb*



Charles Stancomb died peacefully at home with his family around him on December 28, 2020, following a stroke. He was 78 years old.

Born in April 1942, Charles was educated from 1955 to 1960 at Wellington College, Berkshire, a well-known English boys public boarding school, where he was Head of School and of the combined

Cadet Force and was captain of the cricket, rugby, hockey, and athletics teams. Charles went on to the University of Cambridge college Peterhouse where he studied economics and began to race cars in local Formula 3 events. After graduating in the early 1960s, Charles formed the racing team Squadra Tartaruga with three friends and competed on major European tracks with some success. However, when the realities of funding such an operation began to loom, all four friends had to rejoin the mainstream.

Charles first joined Plessey, the giant electronics company of the time, and after a few years started his own import company. He also marketed a family version of the *Encyclopaedia Britannica* during this time and thereafter continued to surprise his family with his extensive knowledge.

Then, with his Wellington and Cambridge friend Michael Spicer (later Lord Spicer), Charles set up Economic Models, a business advisory company. With the government being one of their main clients, company offices were in Westminster (central London), and the company prospered until eventually being taken over.

Charles joined SRI on May 1, 1987, as head of the European Business Intelligence Center in Croydon, England. Applying his marketing skills, he built the European market for the center's Scan and TechMonitoring services, particularly in Germany, Italy, and Spain. As a founding member of the SRI spinout Strategic Business Insights in 2001, Charles also contributed business acumen and experience to a team of mainly science and arts graduates.

Charles was always a conscientious and hard worker, with an office groaning under the weight of paper covered with tightly written facts and figures. Somehow, he knew where everything was. In the office, as at home, people came first, and Charles always had time to listen, encourage, and advise. All this made for a happy and productive team.

Colleagues of Charles remember him not only for the well-understood financial spin he always brought to Scan meetings, but also for the fun family BBQs in Sussex, where he and his wife, Pat, moved to be part of a small family farm. This change of home lifestyle resulted in many trips to SRI's Croydon car park to deliver packages of fresh trout, pork, and lamb. If you were lucky, you got to spend time with Charles fly fishing, at which he excelled. His love of the sport was matched by his kindness and patience in teaching the uninitiated. A great raconteur, Charles had wonderful stories of his annual salmon fishing holidays in Scotland and racing (and crashing) Mini Coopers around Europe's race tracks.

After Charles's retirement in February 2006, he was a frequent invited participant at Croydon Scan meetings for

many years, when he could pull himself away from the trout ponds.

At home, aside from his lifelong love of fishing, Charles followed the stock market and loved jazz, fine wines, crime novels, and premium coffee. And to the end he was never without his "ciggs and lighter" and trademark cravat.

Charles was preceded in death by his wife, Pat Langmead. He is survived by his brother, Anty, and sisters, Jenny and Paddy; four children (Kate, Sarah, James, and David); five grandchildren (Sophie, Michael, Elizabeth, Anna, and Robert); and one great grandson (Mark).

Based on correspondence with the family and colleagues.

*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

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 \Box No \Box		
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: \Box Hard copy via mail: \Box		
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Mail to: SRI Alumni Association, 333 Ravenswood Avenue, M/S AC-108, Menlo Park, CA 94025