

# INNOVATOR



# LETTER FROM THE EDITOR



## ***Innovation - The Seeds of Success***

by Bob DelZoppo, Assistant Vice President, Advanced Technology Programs

For more than 50 years, SRC has been an innovator in research and technology development. With an enduring commitment to our customers' mission, and a steadfast determination to take on the most difficult challenges, SRC's efforts cultivate success for our defense, environment and intelligence customers. Of the many elements that nourish our success, and ultimately our customers', none is more important than innovation.

This edition of the *Innovator* showcases two categories of innovation in which SRC is rooted: research and technology and product innovation. Each of these innovation models has a different purpose and each provides a unique value proposition for our customers.

Research and technology innovation provides an opportunity to advance knowledge, sprout ground-breaking technologies, and expand capabilities for our existing and future customers. SRC's Advanced Technology Initiatives Program (ATIP), for example, focuses on research and

technology innovation to solve grand challenge problems. These initiatives are high-risk/high-reward research projects that have the potential to offer a significant breakthrough for our customers. In this edition, you'll read about the success of our ATIP in the exciting area of bioforensics.

Another example of our research and technology innovation is SRC's cyber initiative. This strategic corporate investment is focused on designing, building and deploying cyber-focused technology, affordable, operationally-relevant data sets and rapid-response prototypes of new capabilities.

Product innovation is a key to our mission, as it provides the opportunity to add value to our customers' operational programs and directly benefit the warfighter. One notable example of product innovation is the Counter Remote Controlled Improvised Explosive Device Electronic Warfare (CREW) Duke system; the highest-performing, most widely-deployed and cost-effective counter-IED system protecting our soldiers against roadside bombs. To foster this type of innovation, SRC invests in a product pipeline that includes new ideas, enhancements and product related technology development.

In this edition, we'll also introduce you to the Joint Biological Tactical Detection System (JBTDs), an exciting and potentially revolutionary new product that offers several innovative features in detection technology, and an example of SRC's emphasis on chemical and biological defense.

The value that SRC offers to our customers through research and technology, and product innovation is made even greater through the ability to bring innovations directly to the field. As an example of a third category of innovation, business model innovation, SRC formed a manufacturing subsidiary, SRCtec, to offer our customers complete lifecycle solutions through manufacturing, deployment and sustainment of our life-saving products.

From research and technology, to manufacturing and logistics, we offer innovative, mission critical solutions that contribute to the success of our customers and help keep America safe and strong!

Letter from the Editor	2
Key Initiatives	3-4
Internships	5
Collaboration	6
Employee Profile	6
Patents	7
Events	7





### *A Unique Approach to Chem-Bio Detection*

SRC has been selected to provide a JBTDS prototype. Leveraging our experience in electronic systems, chemical and biological threat assessment and information technology, the system detects and identifies hazardous aerosols and bio agents potentially encountered by military personnel in theater. Our prototype is an automated, lightweight, battery-operated, networked warning system designed to rapidly detect, sample and identify biological weapons. It fills a critical gap for our warfighters in theater, to assist in critical decision-making, and support potential homeland-defense missions.

The prototype uses an independent modular open systems approach, facilitating easy and rapid reconfiguration to counter emerging biological warfare threats or to support new missions. The system is an affordable solution, capable of providing near-real-time detection of biological events. It leverages existing commercially available technologies, and unlike other systems, it can be employed with a minimal amount of training by personnel in tactical environments across multiple operational locations.

### *Focused on Solutions for Customer Cyber Challenges*

As a thought leader in cyber research and development, we provide engineering and analytical expertise in support of our government customers including the U.S. Department of Homeland Security, U.S. Air Force and the Office of the Director of National Intelligence.

In addition to operating Immigration and Customs Enforcement's (ICE) Security Operations Center, we conduct comprehensive security assessments on ICE networks and applications. We are helping to develop ICE's comprehensive cybersecurity continuous monitoring strategy, combining the best of government regulatory guidance, industry best practices, and lessons learned from our experiences with other agencies and the commercial sector.

Leveraging technology originally developed by SRC for use in other environments, we are able to better support customer cyber operations. Our engineers are focusing on the challenges of mission awareness, machine-assisted risk assessment, cyber intelligence, decision support and Internet-scale data correlation and analysis.

Looking towards the future, we are investing in virtualization and cloud computing research. Our engineers are designing and deploying a multi-tenanted cloud that will support protected enclaves for our government customers. Our approach integrates alternative virtualization technologies with innovative techniques to manage, monitor and secure the heterogeneous cloud.





### **Leveraging Experience For IEW Development**

The U.S. Army's Integrated Electronic Warfare (IEW) program offers many opportunities for innovation related to advanced EW systems, integrated EW operation, advanced signal processing algorithms and wideband RF systems. Leveraging SRC's successful CREW Duke, Advanced Ground EW System (AGES) and Duke Technology Insertion (DTI) programs, we are well prepared to support next-generation IEW systems.

AGES demonstrations have shown our capabilities with networked EW operations; advanced, coordinated and collaborative jamming; integration of direction finding and electronic surveillance subsystems; emitter location; and improved operation with Blue Force communications systems. These demonstrations are defining the Army's future IEW requirements.

We have designed, built and tested an upgrade to the CREW Duke Primary Unit that will implement many of the IEW capabilities demonstrated in the AGES systems. This upgrade, known as the DTI program, is a significant first step in the deployment of an operational IEW system.

Through customer funded development programs and complimentary internal investments, we will continue to push the technology limits of IEW to provide improved capabilities to the warfighter.

### **Bioforensics Help Track Where Something Has Been**

SRC has invented a way to use environmental biological signatures as a means of determining where someone or something has been. This exciting new capability, developed through the ATIP, is a great example of how innovative research and development can meet the critical challenges and needs of our customers.

Our scientists have developed a rapid, highly-sensitive, DNA-based approach to identify targeted particulates by analysis of highly-specific regions of their genomes. Using this approach, once the source organism is identified, its distribution data is extracted from an in-house global species distribution database, another innovation created during this effort. The identity and distribution data are then geospatially analyzed using methods that address both ecological and statistical biases, and reported visually to the user in a novel graphical user interface. The interface provides the identities of the particulates, their distributions, and geo-statistical information on the likely locations of the object or person's travel history.

This new capability includes a wide range of biotechnologies and bioforensics applications that address critical challenges in law enforcement, customs, border control, homeland security and intelligence analysis.



# INTERNSHIPS

SRC's research internships enable tomorrow's leaders to work in highly-collaborative, multi-disciplinary teams to generate novel approaches to grand challenge problems that are revolutionary rather than evolutionary.

Typical internships allow students to gain applied knowledge in a given field. Our research internships, however, offer students the freedom to explore possibilities with subject matter experts on nationally significant research projects.

Interns come from a variety of academic backgrounds, including aerospace engineering, biological sciences, bio-engineering, chemistry, computer science, computer engineering, electrical engineering, mechanical engineering, environmental science, mathematics, physics and speech pathology.

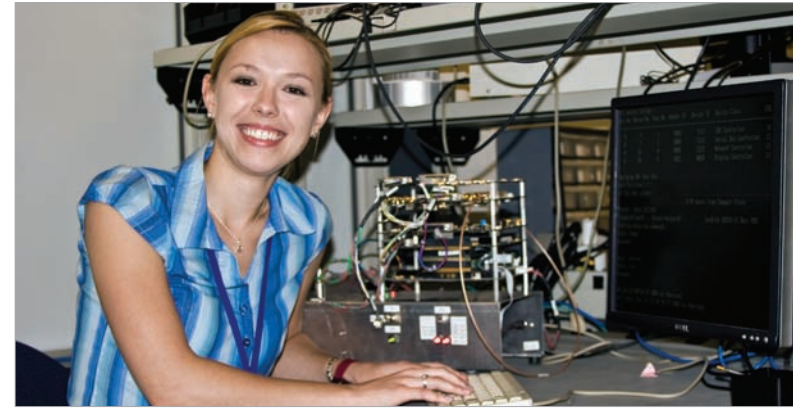
Recruited from wide range of institutions such as Clarkson University, Cornell University, Georgia Tech, Massachusetts Institute of Technology, Rensselaer Polytechnic Institute, Rochester Institute of Technology, State University of New York at Buffalo and the University of Virginia, interns participate in a 12-week program, and each is assigned a senior mentor.

"Having a person with experience for guidance is invaluable," noted Joseph Lee, a computer scientist/ATI intern from MIT.

The combination of mentorship, with the freedom to explore the limits of possibility, is the fuel which drives the innovation in the ATI internship program.

"Our ATI continues to benefit from the openness and energy that these high-caliber interns bring. We are yielding tangible results in the lab and seeing improved model development and prototyping, thus accelerating our progress," attested Bob DelZoppo, AVP of advanced technology programs.

Through the synergy of diversity, brilliance and collaboration, research interns have re-imagined the limits of the possible resulting in a new roadmap of innovation for SRC.



## Faculty Immersion Program Brings Fresh Perspective

SRC and Syracuse University (SU) established a faculty immersion program in July 2011 to increase collaborative research. The program brings together multidisciplinary teams to work toward solving problems of national significance, in areas such as defense and the environment.

The faculty immersion program allows for SU faculty and SRC scientists and engineers to experience a “fresh perspective” in their research. The program aims to build a portfolio that establishes Syracuse as a “go-to” research hub. It also enhances student experiential education programs in ways that will better prepare tomorrow’s graduates for successful careers at SRC and similar companies.

Active research areas that are incorporated into this program include counterterrorism, cybersecurity, chemical-biological defense and alternative energy.

### CITeR Membership

SRC is now an industry member of the Center for Identification Technology Research (CITeR), a National Science Foundation (NSF) Industry/University Cooperative Research Center. CITeR is dedicated to the research of human biometric recognition and credibility assessment. The center currently has sites at West Virginia University, the University of Arizona and Clarkson University. In this collaboration SRC will be working with Clarkson University researchers in the area of standoff biometrics.

# EMPLOYEE PROFILE

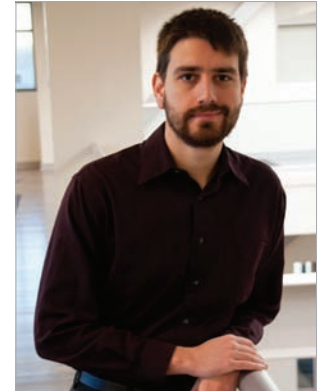
## Adam Lowe, Principal Research Scientist

### What is your current job/function at SRC?

I run the Biotechnology ATI. It’s a mixture of both practicing science and business management. I help guide SRC’s bio-tech research which is focused on solving national challenge problems.

### What are some of your achievements?

- Patent pending: Enhanced On-Chip SERS Based Biomolecular Detection Using Electrokinetically Active Microwells
- Published six scientific papers
- Received a \$25,000 grant on DNA mutation detection research from the Cornell University Nanobiotechnology Center
- Cornell Presidential Life Science’s Fellow
- Authored upcoming scientific book chapter on protein purification
- Received distinction as one of the Top 30 Most Dynamic Grads at Cornell
- Chaired the Cornell BR Ventures Technical Advisory Board



### How did you get to where you are today?

I’ve always been interested in biology and chemistry and the point where those two disciplines meet. I received my bachelors degree in biology from Salisbury University and then went on to receive my Ph.D. in microbiology from Cornell University. While pursuing my doctorate, I managed the Cornell Biologics Production Facility that develops cancer vaccines for clinical trials. I found that I really liked applying science to functional needs. I wanted to pursue an opportunity where I could apply my knowledge of biology, chemistry and materials science and that offered leadership responsibility in a scientific field.

### What attracted you to SRC?

I chose SRC because of my desire to work in industry. I was really impressed with the smart and genuine people that work here and the mission statement of the company was something that I could stand behind. I was given an opportunity to run an Advanced Technology Initiative at SRC – and the challenge and freedom to explore and grow this new area was an exciting situation.

### What technology areas are you focusing on?

I’m currently focused on some next-generation chem-bio and bio-nanotech ideas for the intelligence community. The problems we’re looking to solve are some of our nation’s most challenging – they are truly advanced, next-generation ideas.

## *At the Forefront of Cybersecurity Incentives*

In June 2011, SRC, Inc. and George Mason University's Center for Infrastructure Protection and Homeland Security presented the Workshop on Cybersecurity Incentives, co-chaired by SRC's Daniel Arista and Tim Clancy, to address cybersecurity as it becomes an increasing threat for our nation's security.

This important workshop centered on the lack of clear and consistent governance and accountability for cybersecurity breaches, and facilitated discussions towards making owners of information systems more aware and motivated to employ measures to mitigate future cybersecurity breaches.

The workshop discussions focused on how markets, incentives and laws affect each other, and how liability and responsibility are determined. It aimed to promote the prioritization of security in risk management decision making; improve the understanding of institutional designs that create incentives for security; and explore implementable cybersecurity governance mechanisms at the enterprise and national levels.

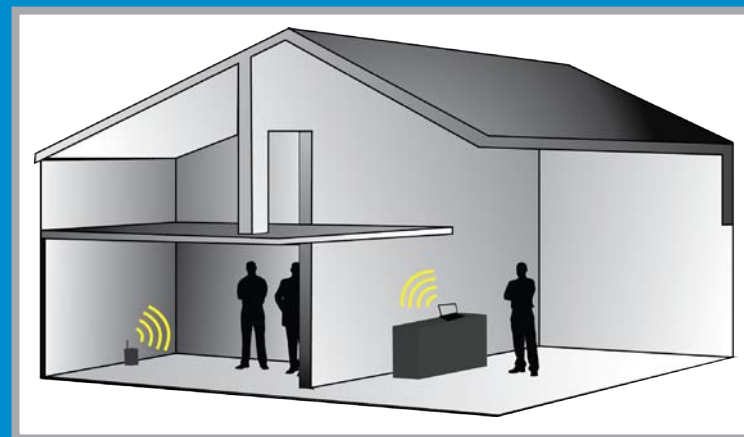
# PATENTS

The Signals Intelligence (SIGINT) field has many devices able to actively monitor areas of interest; however, the disadvantage of active monitoring is its intrusive and detectable nature. This led two innovative minds at SRC, Marty DiStasio and Christopher Bock, to realize a need for a passive, non-detectable method to monitor focal points within a specified area of interest. Their research resulted in the discovery that radio frequency signals can be used to passively monitor human presence within an urban environment (US Patent: 7,940,715).

DiStasio and Bock began experimenting with commonly found devices that emit RF signals to monitor the effect that human presence would have on the strength of the signals being transmitted. Using readily available technologies - a wireless router as a transmitter, and a computer laptop as a receiver - they discovered that you could accurately monitor human presence and even movement in a building. When humans were present, signal strength decreased and signal distortion increased. Monitoring the data over a period of time also allowed for the detection of the approximate number of people within the area.

The ability to use preexisting equipment and RF signals means that no extra equipment is required to actively emit RF signals, a key component to allowing for undetectable monitoring. This provides two unique advantages: the signals can originate from any number of sources ranging in frequency, including cordless phones and wireless routers; and the signals can pass through walls with minimal impact to the accuracy.

This exciting leap in SIGINT data collection has many potential uses, such as monitoring buildings of interest and the movements of subjects under investigation, or gathering intelligence in urban warfare environments or volatile hostage situations.





**For more information:**

800-724-0451

[inquiries@srcinc.com](mailto:inquiries@srcinc.com)

[www.srcinc.com](http://www.srcinc.com)