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From: Commander, Naval Air Warfare Center Weapons Division

Subj: RELEASE OF NAVAIR NEWSLETTER, *SCIENCE AND TECHNOLOGY*

1. Dear Teammates: We hope that you enjoy reading this inaugural edition of the NAVAIR newsletter, *Science and Technology* (Volume 1, Winter 2010).
2. This new publication, which we expect to issue quarterly, provides unclassified technical information that pertains to chemistry, life sciences, physics, and technical communication. This newsletter also intends to inform the NAVAIR science and technology (S&T) community about updates, professional development opportunities, and technology highlights. The contents are not necessarily the official views of nor are they endorsed by the U.S. Government, the Department of Defense or the U.S. Navy.
3. All issues of *Science and Technology* are accessible online for Navy Marine Corps Intranet (NMCI) users. For access, the reader should go to the SciTech website at <https://mynavair.navair.navy.mil/scitech> and select the Communications page. The SciTech community of interest (COI) is an environment designed for the unique needs of NAVAIR Department of Defense professionals who work in the field of S&T.
4. This is your newsletter. We want you to share your input with our community. This is an opportunity for you to gain visibility for your efforts. Please send us your articles, recent publications, announcements, suggestions for interviews, and collaboration opportunities for inclusion in the next issues.
5. Please forward this announcement to others who may also be interested in participating in this endeavor. If you have any questions, please call Dr. Robin Nissan at (760) 939-2246 or via email at robin.nissan@navy.mil. Mailing address is as follows.

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ROBIN NISSAN

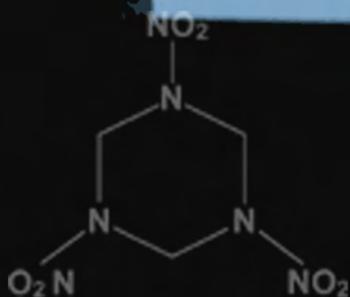
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SCIENCE AND TECHNOLOGY

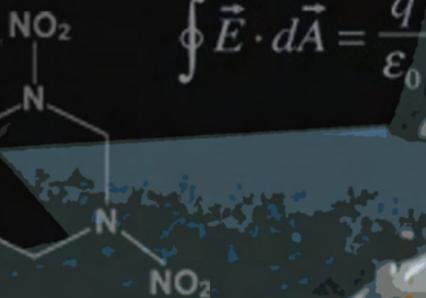
VOLUME 1, WINTER 2010

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Science and Technology Newsletter

Winter 2010

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Research and Intelligence Division Head**

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The portside wing on an F/A-18 assigned to the Blue Blasters of Strike Fighter Squadron Three Four (VFA-34) is loaded with the Navy's latest Satellite Guided Bomb, the GBU-38.

Source: U.S. Navy

NAVAIR Science and Technology Newsletters are published to provide unclassified technical information that pertains to chemistry, life sciences, physics, and technical communication. This newsletter also intends to inform the NAWCWD S&T community about updates, professional development opportunities, and technology highlights.

The contents are not necessarily the official views of or are endorsed by the U.S. Government, the Department of Defense or the United States Navy.

Please direct article submissions and subscription requests to:

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“We are committed to improving the transfer of S&T into Warfighting capabilities.”

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NAWCWD EXPANDS SCIENCE AND TECHNOLOGY COMMUNITY

Science and technology (S&T) are the foundations of research, development, testing, and evaluation work conducted at the Naval Air Warfare Center Weapons Division (NAWCWD), making the team members of the Research & Intelligence Department (Code 4L0000D) indispensable to our mission to support the Warfighter.

In this inaugural edition of the Weapons Division Science and Technology Newsletter, we welcome eight new employees that were hired in 2009.



*Dr. Robin Nissan, Research Director,
Research and Intelligence Division Head
welcomes new hires.*

Source: NAWCWD Photo Lab

WELCOME ABOARD

James Hackney

Hackney is a Program Manager for Code 412000D. He joined the S&T team in July 2009.

Stephen Harlow

Harlow is a student trainee in electronics. He joined Code 412000D in July 2009.

Christopher Maki

Maki is an IT Specialist, Information Security (Code 412000D). He joined the team in February 2009.

Mary Moschitto

Moschitto is a Multimedia Specialist supporting the Technical Communication Office (Code 4L6200D). She joined the team in September 2009. She previously worked as a photographer in the Ridgecrest area.

Patti Parkin

A Ridgecrest native, Parkin is an Office Manager for the F/A-18 and EA-18G Program Office supporting the Integrated Product Team and Chief Financial Officer staff, among others. After spending 20 years raising two daughters, Patti rejoined the workforce in May 2009. "Love the job, love the people, and love playing my part in supporting the Warfighter!" she said.

Jerrienne Schmiedel

Schmiedel is a Technical Writer/Editor supporting the Technical Communication Office (Code 4L6200D). She has a PhD in English and joined the team in October 2009.

David Turbide

Turbide is a retired Navy Officer of 28 years who joined NAWCWD as a Program Analyst for the F/A-18 Advanced Weapons Laboratory Foreign Military Sales in March 2009. He previously worked in the same role for four years as a contractor. Turbide earned a B.S. in technical management from Embry-Riddle Aeronautical University.

Veronica Viner

Viner is a Postdoctoral Fellow with the American Society for Engineering Education who recently joined Code 4L4200D. Prior to relocating from Baton Rouge, Louisiana, she earned a master of science degree and PhD in chemistry from the University of Southern Mississippi.

HONORING INGENUITY, LEADERSHIP, AND DETERMINATION

By Nicolle Walking

As we celebrate the New Year, we should also take a moment to honor the leadership and determination demonstrated by NAVAIR personnel during the last year.

At the 2009 Honorary Award Ceremonies men and women displaying qualities that ranged from ground-breaking creativity to technical acumen and from inspirational leadership to spirited innovation were called up on stage one at a time for recognition and thanks. Their achievements were celebrated across the Naval Air Warfare Center Weapons Division at China Lake and Point Mugu, California.

At the China Lake ceremony, which took place on 11 June, the Executive Director, Scott O'Neil and Weapons Division Commander, Capt. Mark Storch presented five different awards: the Michelson Laboratory Award, the Dr. L.T.E. Thompson Memorial Award, the Dr. William B. McLean Memorial Award, the Dr. Charles C. Lauritzen Memorial Award, and the Equal Employment Opportunity Annual Award.

Michelson Laboratory Award

Recipients of this award exemplify technical excellence in areas of management and leadership, and achievement in overcoming technical difficulty in order to better the levels of ordnance development, testing, and evaluation. There were 15 award recipients this year, which included Kimberly D. Berard, Vicki L. Brady, Timothy Broadley, Daniel A. Carreno, Jr., David R. Ganger, Gene W. Gibson, William E. Gillette, Danny W. Gresham, Ruth E. Hogan, John K. Kandell, Robert A. Koontz, Bettye R. Moody, Anthony M. Parisi, Michael D. Safty, and Jerry D. Taylor.

Dr. L. T. E. Thompson Memorial Award

This award is NAWCWD's highest honor for outstanding individual achievement. The award is based on an individual's contribution to the advancement of ordnance toward the fulfillment of NAWCWD mission as indicated by assumption of personal responsibilities. The 2009 recipients were Donald S. Blake, Dr. Daniel C. Harris, James R. McManigal, Robert D. Pyke, and Scott W. Smith.

Dr. William B. McLean Memorial Award

Howard M. McCauley, Roxanne L. Quintana, and David W. Speer earned the Dr. William B. McLean Memorial Award this year for displaying the kind of creativity that sets them apart from their peers and helps further the mission of NAWCWD, particularly through new inventions.

Dr. Charles C. Lauritzen Award

Recipients of this honor are selected based on their significant contributions to energetics, including leadership/mentorship of the energetics community, technical innovation, the enhancement of the energetics infrastructure, or direct contribution to Warfighter capability. The recipients of the 2009 award were Raymond R. Ash, Bland M. Burchett, Eric D. Erikson, and Loretta A. Lusk.

The Equal Employment Opportunity Award

The final presentation at China Lake was the Equal Employment Opportunity (EEO) Award, the purpose of which is to recognize employees that make significant contributions and improvements to the NAWCWD EEO Program through excellence in their leadership, imagination, and perseverance.

The award contains the sub-categories of Supervisor/Manager and Non-Supervisor in order to differentiate the efforts of various levels of management that contribute to the success of the EEO Program. The Supervisor/Manager EEO Award was given to Linda L. Murray, while the Non-supervisor EEO Award went to Stephanie L. Patterson and Andrew M. Tree.

On 15 June at Point Mugu, California, a similar ceremony took place, honoring recipients of such prestigious awards as the Dr. Manuel Garcia Memorial Award, Memorial Award for Gwendolyn Elliot Hunt, Captain Kenneth A. Walden Memorial Award, and Commander Clifton Evans, Jr. Memorial Award.

Dr. Manuel Garcia Memorial Award

Recipients of this award are civilian employees of NAWCWD who make considerable contributions to the test and evaluation processes of weapon systems through their creativity and application of sound engineering principles. This honor was presented this year to Keith N. Yuen.

Memorial Award for Gwendolyn Elliot Hunt

Diane M. Ghilardi, Barbara A. Lupei, and Kelly R. McDonald were the recipients of this year's award. This particular honor is meant to recognize a NAWCWD military or civilian employee who has made significant strides in personal development, academic achievements, career advancement, and/or mission accomplishment.

Kenneth A. Walden Memorial Award

Individuals who make great strides in personal development, career advancement, or contributions to mission accomplishment in the Division's technical and operational goals within the last three years are eligible for this award. This year's award went to Joni M. Pentony.

Commander Clifton Evans, Jr., Memorial Award

Alex Nguyen and Mark L. Schallheim were the proud winners of this year's award. This particular honor acknowledges individuals who have made significant achievements in the field of information warfare, which includes electronic warfare, countermeasures, and counter-countermeasures.

Congratulations to all award recipients!

WELCOMING LEADERSHIP TO THE FIELD OF RESEARCH

By Nicolle Walkling

Dr. Scott Munro is the newly appointed manager of the In-House Laboratory Independent Research (ILIR) and Independent Applied Research (IAR) programs at the Naval Air Warfare Center Weapons Division, China Lake, California. He is responsible for NAWCWD ILIR and IAR Program documentation, proposal calls, and reporting. ILIR/IAR programs play a very unique role at NAWC. These programs specialize primarily in basic research and operate on a broader scale than most programs, looking to expand scientific knowledge rather than develop applied technology. Munro hopes to maintain the high level of quality for which the ILIR/IAR Program has been known, while expanding the type of work that is performed within the science and technology focus areas.

"I would like to enhance the way in which our basic research is applied to specific technology that will help the Navy," Munro explained, "and because I have experience in an applied field, I feel that I can help improve the process."

Dr. Munro received a doctorate from Georgia Tech after earning bachelor's and master's degrees in aeronautical engineering from Purdue University in Indiana.



Dr. Scott Munro
Source: NAWCWD Photo Lab

DAUGHTERS AND SONS AT WORK: *A Smart Investment for the Future*

By Nicolle Walkling

For the first time since 2005, employees across the Naval Air Weapons Station (NAWS) at China Lake, California, celebrated Take Our Daughters and Sons to Work Day. This nationwide, public education program was designed to help students connect what they learn in the classroom with skills that will be necessary in the workplace.

In 2009, Take Our Daughters and Sons to Work Day was much more than an open house for visitors. Students ranging from 8 to 18 years attended this structured educational event accompanied by their parent or sponsoring adult. Participants began the day by attending a welcome address by Captain Storch, and then split off to guided tours and presentations that portrayed the many facets of the Naval Air Warfare Center Weapons Division (NAWCWD).

“Learning about these different aspects of employment is not only informative for the children but also an important step in fashioning their future. Take Our Daughters and Sons to Work Day is a great way for them to see what their parents are involved in, while building excitement for their futures,” said Deanne Bell, Take Our Daughters and Sons to Work Day Coordinator.

On the tours, students witnessed the kind of work that is done in the Chemistry Laboratory, the China Lake Police Department, the Integrated Battlespace Arena (IBAR), and the Early Operational Capability (EOC) Explosive Ordnance Mobile Unit (BOMB Squad), and saw demonstration of environmental engineering and an exhibit of artifacts from China Lake’s rich history.

Dr. Steve Fallis, a civil service research chemist who has been involved in research for the last 11 years, organized the Chemistry Laboratory demonstration. Three groups of about 10 students each rotated through three different presentations designed to pique an interest in the field of chemistry. The first two presentations were educational and included displays of microscopy, polarized light, and crystal growth, and an exposition of recent biofuel research. The third presentation was a visual experiment that explored the interaction between liquid nitrogen and polymers and

ultimately led to the highly entertaining smashing of a frozen banana. This last activity was devised to show students that chemistry can be fun, challenging, and rewarding.

It is Fallis’ hope that “students who experience these activities will walk away at the end of the day with a newfound interest in chemistry, and a realization that it is not only an important aspect of government and industrial work, but also an ever-present part of the world around us.”

Take Our Daughters and Sons to Work Day was an excellent opportunity to do just that on a large scale. Fallis also hopes the program will enable students to see how adults apply their education at work.

“It lets students see kind of what it’s like in the real world, and how people use their education to do a good, meaningful job that is hopefully very rewarding for them,” said Fallis. “This will encourage them to work hard in school and go on to college.”

Indeed, Take Our Daughters and Sons to Work Day was a smart investment in the future of NAWCWD and a worthwhile venture for our community.

Researchers Seek Collaboration

When physicist Jennifer Flenner (Code 472500D) and several colleagues wanted to attend a lecture of Dr. Lawrence Carin, a William H. Younger professor of engineering at Duke University, they were hindered by high travel costs. Not wanting to miss out on the informative lectures often given by university professors across the country, Flenner set out to bring the lecturers to Naval Air Warfare Center Weapons Division, China Lake, California.

“We had six or seven people that were all going to hear Larry Carin talk...and then there were more than the six or seven that were going that wanted to hear him talk. It costs several thousand dollars per person, so we thought we could just bring him here,” she said.

After making an initial pitch in January 2009 for the series, Flenner began the search for funding and made multiple phone calls before Arun Majumder (Code 4L4100D) volunteered in May 2009 to help. To obtain approval and funding, they also had to prove that they could actually bring in speakers.

“You need a connection,” noted Flenner, who credited Majumder with being well-connected in the academic world.

Distinguished Speakers Lecture at NAWCWD

Majumder and Flenner’s work paid off when the series began in September 2009 with a lecture from the man who inspired it, Dr. Larry Carin. Additional distinguished professors have followed, including Nickolai Kukhtarev of Alabama A&M University and Steven F. Son of Purdue University.

While the original goal of the series was to enable more people to attend the lectures of these great minds, the purpose has expanded to include hiring and collaboration. The graduate students of the lecturing professors are prime candidates for work at NAWCWD and the professors have been good at making the connections. So far, one student has been hired.

Collaboration is Key

Flenner works hard to facilitate collaboration between NAWCWD and universities. After researching and finding speakers, she chooses one person to meet with the speaker for possible collaboration. The hyper-specialized research of the professors and graduate students combined with the application-minded research of the scientists provides new perspectives on tackling technical challenges. It is a great partnership because universities may get funding for pure research while NAWCWD only receives funding for applied research. Essentially, the Weapons Division can find product applications for a university’s pure research and then develop it in a real-world setting, thus benefiting both partners.

Prior to a lecture, Flenner also attempts to identify engineers involved in technology transitions to partner with scientists conducting complementary research and then uses the speaker forum as a platform to bring them together.

“Those scientists who work on fundamental research need contact with experts in current weapon [and] defense products in order to understand where the technology gaps in current equipment exist,” she said.



Jennifer Flenner
Source: NAWCWD TCO

The radar group at NAWCWD is a prime example of internal and external collaboration. Currently, the group is working to apply the information in the paper presented by Dr. Carin on compressed sensing and has partnered with several NAWCWD fundamental researchers.

“That’s exactly what we were hoping would come out of it,” stated Flenner.

Researchers Gain Competitive Edge

The lectures also provide NAWCWD with a competitive edge on new technologies, since research topics are discussed before publication. This approach has led to the issuance of patents in the past.

An unexpected result of the series has been an increase in the Weapons Division’s ability to get outside grants, according to Flenner. To obtain a grant from an organization such as the Office of Naval Research (ONR) usually requires a PhD. If a NAWCWD employee can demonstrate to a visiting speaker that they can contribute to the speaker’s project, the speaker may consider writing a grant that includes salary.

Though the original intended audience for the series was senior research scientists, Flenner has crafted the talks into something appealing and educational for employees in the Engineer and Scientist Development Program (ESDP) as well. Each 40-minute lecture begins with a 20-minute general overview before delving into the more technical aspects of the research. The overview is meant to spark interest and motivate participants to explore the field further. The lectures also enable them to keep abreast of trends in the field as well as provide a “shortcut” because they can take the already completed research and apply it to a specific Navy application. For example, in September, Dr. Carin presented new methods for image processing that would have been used with great results. ESDPs would not have been exposed to this information in college because the paper was published only a couple of months ago.

“It really pushes you to stay up to date,” Flenner said.

Series Command’s Objectives

Pamela Smith, Acting Head of the Employee Development Division (Code 733000D) and the person who helped Flenner coordinate the series, is extremely pleased with the result. Not only does the series meet several strategic Command objectives, such as developing new employees, cross-competency communication, and marketing to potential sponsors of

research activities at NAWCWD, it also complements the other learning opportunities for scientists and engineers.

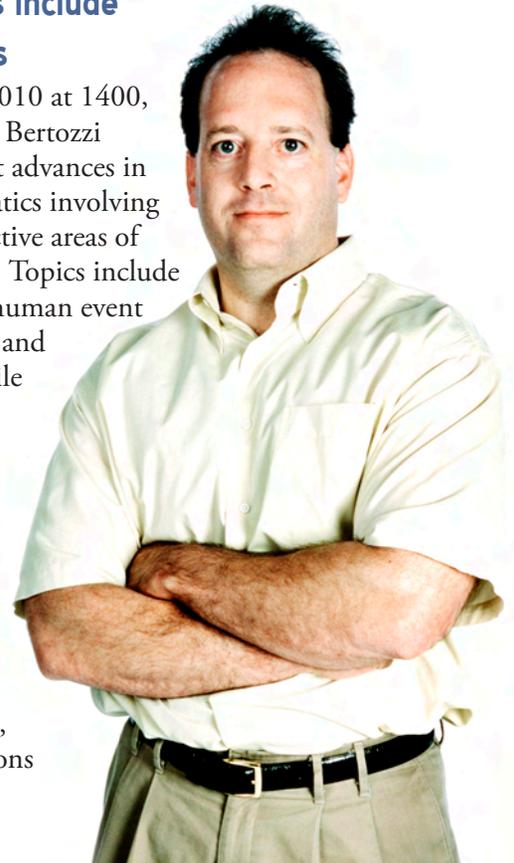
“This forum provides the individuals the opportunity to participate in state-of-the-art knowledge sharing in the most cost-effective way and to form contacts with experts in areas that fill Navy needs,” said Smith. She added, “It provides an application focus to technical developments they learn about through classroom and on-the-job training.”

2010 Lectures Include Diverse Topics

On 2 February 2010 at 1400, Professor Andrea Bertozzi will review recent advances in applied mathematics involving several current active areas of defense research. Topics include remote sensing, human event activity patterns, and cooperative mobile sensing.

This series is made possible by the Training Center Partners in Education Program.

For specific dates, times, and locations of each lecture, please call (760) 939-1758.



Larry Carin

Source: Duke University Photography

REFLECTIONS:

NAVAIR Milestones in Science and Technology

by Michelle Campbell and Kimberly Silver

The Naval Air Warfare Center Weapons Division (NAWCWD) is dedicated to maintaining a center of excellence in weapons development for the Department of Navy. For over 80 years, pioneers in science and technology have worked together in our laboratories to serve the Fleet. Despite the enormity of the challenges ahead, the unique capabilities and rich history of NAWCWD serve as a testimony and promise for future Warfighter success.

The following summary provides some interesting milestones in science and technology at the Weapons Division.

1923: The Naval Experimental and Research Laboratory (now the U.S. Naval Research Laboratory) opened in Washington, D.C. The purpose was to “increase the safety, reliability, and efficiency of the Fleet by the application of scientific research and laboratory experimentation to Naval problems” and did not specifically pertain to weaponry (Van Keuren 1944, 221). In fact, there was not yet any scientific organization funded for a broad range of weapons research.

1942: World War II prompted development of the Navy’s rocket program. In 1942, Cal Tech began work on the Navy’s first modern rocket to be used tactically: a 7.2-inch-diameter antisubmarine rocket.

1943: The Secretary of the Navy signed a document allowing a permanent Research and Development Center—the Naval Ordnance Test Station (NOTS) at China Lake, now NAWCWD. Captain Sherman E. Burroughs served as NOTS’ first Commanding Officer.



*Aerial view of land leveled for lab;
dispensary under construction
(August 1944)*
Source: NAWCWD Photo Lab

1954: The first successful air-to-air missile, Sidewinder, hit its target for the first time. Four years later, it aided in downing Chinese aircraft during the Battle of Formosa.



Sidewinder hits target.
Source: NAWCWD Photo Lab

1962: Researchers invented chemiluminescent light sticks (also known as glow sticks), most often seen commercially as necklaces and emergency safety lights. They were initially created for use as emergency raft lighting, downed



Chemiluminescent light stick.
Source: U.S. Navy photo by Mass Communication Specialist 2nd Class Demetrius Kennon

flyer beacons, map reading, and damage evaluation. Glow sticks became licensed commercially in the 1980s and won the 1993 Federal Laboratory Consortium (FLC) Award for Technology Transfer.

Today they are also used as light sources by military forces and police officers. In 2008, Seabees with Naval Mobile Construction Battalion (NMCB) 1 and NMCB-15, Task Force Sierra, used glow sticks to mark a hole where two 240-mm armored cables were buried.



John F. Kennedy
Source: NAWCWD Photo Lab

1963: President John F. Kennedy visits the Naval Ordnance Test Station (NOTS).

For references see page 13

DEPARTMENT TECHNOLOGY HIGHLIGHTS:

Dr. Andrew Guenther Discusses Science and Technology

By Kimberly Silver

Dr. Andrew (Andy) Guenther formerly led the Polymer Science and Engineering Branch in the Research Department at the Naval Air Warfare Center Weapons Division, China Lake, California. The Branch performs basic and applied research and supports technology demonstration and validation involving polymer materials for the Naval Air Systems Command.

Guenther was also responsible for leading the Power Sources Science and Technology (S&T) Initiative and Corrosion Prevention Science and Technology teams at the Naval Air Warfare Center Weapons Division. He is currently pursuing research efforts at the Air Force Research Laboratory, Edwards Air Force Base.



Dr. Andrew Guenther
Source: NAWCWD Photo Lab

Science and Technology: Thanks for taking the time to discuss your work with me today. What is the Power Science and Technology Initiative?

Guenther: It's a core S&T program at China Lake. The program helps people develop their skills in a particular area. We have tried to make it open and inclusive. We focus on power sources that generate or store energy because we recognize that this type of work will be important to DoD agencies in the future. The program is incentive-based: come up with the research project and we'll provide the resources. Help is provided with proposal writing, networking, and subject matter expert identification, and participants get hands-on experience.

Science and Technology: How do you measure the success of the S&T program?

Guenther: We measure the success of the S&T in terms of building people and careers in paths of power sources. For example, Harvey Hall (Code 477300D) was able to take an older technology, developed in the Chemistry Division a decade ago, and combine it with cathode and anode materials. As a result, he improved the technology of thermal batteries. This illustrates a young individual who was given an opportunity and built a career in the power sources field.

Science and Technology: What are you currently researching?

Guenther:

- Fabrication of structural materials with adaptive multi-functionality
- Development of high-activity electro-optical polymers for integrated optics
- Investigations of low-volatility substitutes for styrene in composite repair applications
- Formulation of thermosetting materials incorporating nanoparticles that actively prevent erosion in low-earth orbit.

Science and Technology: In May 2008, some of your space-survivable composite resin samples were tested aboard the International Space Station. Have you received the results?

Guenther: Not yet. They should have been retrieved. It typically takes about 6 months until samples are returned. I expect samples to be returned soon. At least 8 samples were supplied by the NAWCWD chemistry lab. We are hopeful about the results.

Several institutions were selected by NASA to participate in experiments. Colleagues at Edwards Air Force Base provided an opportunity for China Lake scientists to participate in this study.

Science and Technology: You have an impressive list of publications. What motivates you to publish your work?

Guenther: In the research environment, it is important to publish your papers. I set a publishing target to help me stay on track.

Science and Technology: Why do you feel it is important to publish your efforts?

Guenther: DoD experts conclude that peer-reviewed publications are the number one metric to judge the productivity (valuable return on investment) of a research laboratory.

It is important to release reports that are publicly available and distilled in a format that the majority of readers can understand.

Science and Technology: Why do you feel publishing will add value to the Fleet?

Guenther: If you publish your results and get it in front of a wide audience, it generates a citation link; through a chain of citations, you can draw a link of work and applications in the link. There are many ways that you can show how your work benefits the Fleet. This is how we transition research to the Fleet. Publications in a peer-reviewed journal provide an endorsement that cannot be argued with.

Science and Technology: How can we improve our technical communication skills within NAVAIR?

Guenther: We struggle often with the writing skills of team members who are recent PhDs. I would like for them to practice writing in hard sciences. Everyone could have better writing skills.

It would be nice if the Technical Communication Office (4L6200D) could help us improve the writing skills of our staff. It would be very helpful at all levels. Also, we need a quick turn around on peer reviews. We need some sort of rapid response mechanism in place to improve this. The more that people review proposals, the better the opportunity for funding. In addition to technical reviewers, we need editors to quickly review, edit, and provide feedback that allows documents to stand out from competition.

Science and Technology: What would you like to pursue in the future?

Guenther: I would like to focus and concentrate on delivering our solutions to the Warfighter. For example, in the area of electro-optics, I have tried to hand off some of our work, projects, and information to younger employees. If you document your research in papers over the years, then the information is smoothly transferred. If people can read your papers, then hopefully they can continue the work.

Science and Technology: Do you have any other lessons learned that you would like to share?

Guenther: Researchers should be allowed the freedom to make some mistakes. People learn just as much through experience.

We should learn to tolerate mistakes and use them as an opportunity for learning and mentoring.

Science and Technology: How can we improve our research and development efforts within NAVAIR?

Guenther: It will be important for leadership to understand the value of what we do and to become champions and advocates for our efforts. With good dedicated people who work on projects 3 to 7 years, if they are in a position where they are free to pursue their work, then they will be able to come up with breakthroughs. This will require a two-pronged effort led by champions and advocates.

It will also be important for leaders to provide space and opportunity for breakthroughs to arise.

This goes beyond just providing resources. It would include providing an environment that is conducive for breakthroughs. At times, this would mean providing resources; at other times, it would include ensuring people remain focused.

It's a balancing act. Becoming too stable could result in too narrow of a focus.

Science and Technology: What message do you have for high school students who are considering pursuing either chemistry or engineering degrees?

Guenther: Pursue your dreams. Don't worry about selecting your major now. Just make sure that you can get into a good school and go as far as you can possibly go. Don't give up your education for a short-term gain...satisfaction and lifestyle are improved if you get an advanced degree.

Science and Technology: What message do you have for researchers who are considering employment at NAWCWD?

Guenther: China Lake will challenge you to communicate well and understand the products delivered to customers. There is a variety of workflow. At China Lake, you learn to become very agile and it helps in the long term.

Science and Technology: Thanks for sharing your insight with us.

Guenthner earned a PhD in polymer engineering from the University of Akron in 2000 after receiving a B.S. in chemical engineering from Case Western Reserve University in 1995. He served as a Materials Engineer at NAWCWD for five years before becoming Head of the Polymer Science and Engineering Branch in 2005. Guenthner has published over 20 peer-reviewed journal articles and book chapters, in addition to over 35 conference papers and proceedings articles, on both theoretical and experimental aspects of polymer science.

Guenthner enjoys hiking and exploring Sequoia and Kings Canyon National Park in the southern Sierra Nevada Mountains. He frequents Land of the Giants, a diverse landscape with the world's largest trees, winding canyons, caverns, mountains, and foothills.

LEADERSHIP CORNER

By Kimberly Silver

In this issue of *Science and Technology*, Mr. Scott O'Neil, the Executive Director and Director for Research and Engineering at Naval Air Systems Command (NAVAIR) Naval Air Warfare Center Weapons Division (NAWCWD), China Lake and Point Mugu, California, shares lessons learned from the past, relays best practices for present operations, and speaks about his bright outlook on the future. The Weapons Division is responsible for research, development, acquisition support, test, evaluation, and in-service engineering for U.S. weapons systems.

The Road to Success

Mr. O'Neil's first job began in the early 1960s, washing dishes at the local hospital in his hometown, Bremerton, Washington.

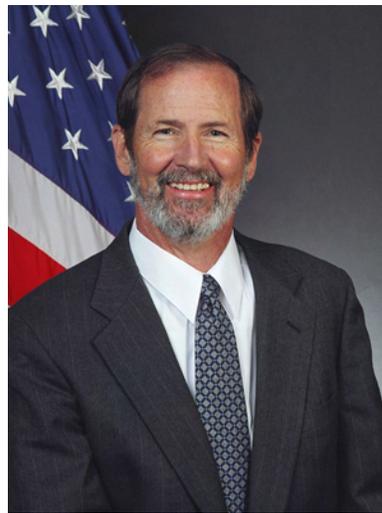
"There's not a lot of elegance in dishwashing" said O'Neil in a sincere tone at the start of our interview.

It was during his first job that O'Neil learned valuable lessons on humility, the importance of hard work, and process improvement that he still finds relevant to his current position.

"There was a human dimension that was good. Many of the employees were hard-working. I was always trying to figure out how to get the same work done faster."

"I am an achiever and I like to get things done," said O'Neil.

Nearly a decade later, in 1972, O'Neil earned his bachelor's degree in mechanical engineering at Seattle University. In 1977, he earned a master's degree in mechanical engineering at the University of Southern



Scott O'Neil
Source: NAWCWD Photo Lab

California, followed by a fellowship that led to an additional M.S. in management from Massachusetts Institute of Technology in 1992.

Mr. O'Neil has dedicated over 34 years of his life to federal service.

His unique career path differs from that of many NAVAIR executives of his caliber because he was never a Branch

or Division Head. Instead, he took a winding road less traveled, gradually accepting several different types of jobs of progressively greater responsibility.

This journey proved valuable—along the way, he sharpened his management skills and added breadth and depth to his leadership abilities.

In 1998, O'Neil was appointed to the Senior Executive Service in the capacity of Head of NAWCWD Weapons and Targets Department. Subsequently, he became the Head of the Naval Air Warfare Center Aircraft Division (NAWCAD), Atlantic Ranges and Facilities Department in Patuxent River, Maryland. In 2006, he was selected as the Executive Director and Director for Research and Engineering of NAWCWD and returned to China Lake.

Mentorship and Professional Development

O'Neil credits the mentors who helped to prepare and guide him toward his current position.

"There were several mentors that were important to my career development. Young people must understand that you need a number of mentors," said O'Neil.

Because mentors will change throughout the development of a career, O'Neil encourages a cadre of professionals. He recommends selecting at least three types of mentors:

- 1. Long term for stability**
- 2. Technical for subject matter expertise**
- 3. Same gender for familiarity**

"A mentor should not just be someone who tells you what you want to hear. A mentor should force you to think. Thinking is hard," said O'Neil.

Looking to the Future

O'Neil's vision for the future of science and technology at NAWCWD is not radically different from that of other NAVAIR executives. He believes that the S&T role that we play is critical to our future and how we provide dominant support to the Warfighter.

"We have been able to see where things are going before many other organizations. This allows us to build skills and capabilities and to be better prepared for the future," he said.

O'Neil offers five recommendations for science and technology personnel as follows:

- 1. Create an effect on the target.**

We broaden our focus from the weapon to encompass the effect on the target. Doing so will help us to ensure that S&T products remain relevant and important to the Warfighter.

- 2. Improve knowledge management strategies.**

We should be aware that the real, underpinning value comes from gaining knowledge by doing research and then transferring it through multiple channels to the proper individuals within our workforce.

- 3. Improve horizontal integration across competencies and campuses.**

We must change our paradigm to be more relationship based so that we can better work

together. This is fundamentally unnatural as we tend to be territorial. Horizontal integration is challenging because social structures act as barriers.

- 4. Allow the freedom to search for new ideas in unrestricted ways.**

We must remain flexible enough to postulate technical solutions.

- 5. Learn how to communicate.**

Technology is easy. Socializing ideas and persuading others is the rather hard part for our science and technology community. We must learn how to communicate: write and speak to convey our ideas.

- 6. Establish a healthy balance.**

We must use a feedback mechanism (e.g., spouse, mentor, co-worker) to keep a healthy balance between personal and professional life.

Knowledge Management

The knowledge management capabilities are quickly evolving within the Navy.

The recent release of Navy Marine Corps Intranet (NMCI)-approved collaborative software and information management tools add to the speed and dexterity of knowledge transfer within the center.

In this increasingly high-tech arena, O'Neil reminds us that "some of the best knowledge transitions will occur interpersonally, through relationships and teams."

The 2009 Empire Challenge, executed by the Joint Forces Command, serves as a prime example of effective knowledge building and management. This event was hosted at China Lake, California, from 6 to 31 July with distributed locations at various domestic and international sites. During the challenge, participants evaluated the effectiveness of emerging technologies in a real-world field environment before deployment to troops. A great deal of knowledge and information was gathered during the event that was rapidly transferred through multiple channels to participants with a legitimate need to know.

The Weapons Division, like many organizations, is now bracing for the reality that many of the senior technical staff are preparing for retirement.

"When I came in 1972, we made some of the same mistakes that our mentors did. It's important for us to allow new hires to have these learning experiences."

Building a Stronger Workforce

Exciting job opportunities are widespread at NAVAIR. Students, college graduates, and experienced graduates are encouraged to explore the possibility of joining the NAWCWD Science and Technology community.

“We support a higher cause: national defense. Our enemies are smart and adaptive. We must be able to meet those challenges and help the Warfighter meet that challenge,” said O’Neil.

Mr. O’Neil hopes to attract candidates with a sense of innovation, an ability to think differently, and a desire to support a higher calling.

Diversity and Innovation

O’Neil urges leaders to value diversity because it helps innovation. He recognizes that it is a challenge, but he believes that we must “have a diverse workforce because it gives us greater power.”

“Our power comes from connecting competencies. As leaders, we must value diversity and put systems in place to make sure accessibility is diverse,” O’Neil said.

Warfighters: We Care

O’Neil offers a final message to the Warfighters, “There’s somebody that cares. Our whole purpose for being here is for you. I want our Warfighters to know that there are people who are trying to innovate and solve their problems.”

The effectiveness of our civil servants aboard requires a good understanding of the Warfighter’s problems and technical needs. O’Neil aims to improve this understanding in the future so that we can more effectively accomplish our mission.

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