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Science and Technology Newsletter

January 2011

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FRONT: Roxanne Quintana gives chemistry demonstrations to James Monroe Middle School AVID program students.

Source: NAWCWD TCO

NAVAIR Science and Technology (S&T) 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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WEB ACCESS

All issues of the Science and Technology Newsletter are accessible online for Navy Marine Corps Intranet (NMCI) users. 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.

REQUEST REPRINTS

To request reprints call 760.939.8729.

EMPLOYEE NEWS

HAPPY NEW YEAR NAWCWD!

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). As such, the team members of the Research & Intelligence Department (Code 4L0000D) are indispensable to our mission to support the Warfighter.

WHAT'S NEW?

The NAWCWD Strategic Plan was released in October 2010. In the plan, the S&T community is urged to continue pursuing key technology-driven emerging capabilities. Read more on page 7. For more information call 760.939.0272.



*Dr. Robin Nissan, Research Director,
Research and Intelligence Department*

Source: NAWCWD Photo Lab

RETIREMENTS



Terry Millett

Source: NAWCWD Technical Communication Office

After over 20 years of dedicated service, Jacobs contractor Terry Millett (4L6200D), retired in October 2010. Millett served as a visual information specialist at the NAWCWD Technical Communication Office, formerly the Technical Information Department (TID) in China Lake, California.

LOCAL RIDGECREST STUDENTS VISIT NAWCWD CHEMISTRY LABORATORY

Roxanne Quintana (4L4200D), NAWCWD research chemist, gave six chemistry demonstrations to 60 Monroe Middle School students on 6 November 2010. The students were eager to tour the chemistry laboratory, learn about safety equipment, and watch various experiments.

“This is a great day and wonderful opportunity to interact with the community and show kids that science is fun,” said Dr. Robin Nissan.

The Advancement Via Individual Determination (AVID) program is an academic support program for grades 6 through 12. This vital program is tailored for middle school students who have a desire to go to college and a willingness to work hard. The program also aims to prepare students for college eligibility and success.

AVID FACTS

- 1 More than 3,386 schools in 48 states and 15 foreign countries offer the AVID program.
- 2 More than 220,000 students have graduated from AVID programs.
- 3 77 percent of AVID students were accepted to a four year college in 2008.

For more information about the AVID program and the California AVID Center, visit www.avid.org/con_caregionalwebsites.html.



Roxanne Quintana gives chemistry demonstrations to James Monroe Middle School AVID program students.



AVID program students learn about chemistry in the NAWCWD laboratory.



James Monroe Middle School Avid Program students watch Roxanne Quintana's chemistry demonstrations.



AVID program students participate in hands-on chemistry lesson.

Source: NAWCWD Technical Communication Office

RECENT ADVANCES IN OPTICAL SIGNAL PROCESSING ARE SHARED AT NAWCWD COLLOQUIUM SERIES



Dr. Peter Delfyett

Source: NAWCWD Technical Communication Office

Today's Warfighter relies on current developments in high-speed optical communication and signal processing fields. Recently, traditional optical communication methods have undergone a transformation as a result of optical frequency and wavelength division multiplexing, in which multiple optical carrier signals can be combined

into one signal on one optical fiber through the use of infrared wavelengths. However, designing optical systems using hundreds of wavelengths is challenging.

Distinguished Colloquium Speaker Dr. Peter Delfyett, a University Trustee Chair Professor of Optics, Electrical, and Computer Engineering, and Physics at the University of Central Florida, has been developing a compact, efficient optical source that can produce many optical frequencies and wavelength channels from a single device.

On 12 August 2010, Dr. Delfyett explained the benefits of a mode-locked semiconductor laser that can generate coherent, phase stabilized optical frequency combs.

Selecting a source laser is an important component of developing an effective communication system. According to Dr. Delfyett, the advantages of using semiconductor lasers instead of solid-state lasers

are numerous. "A conventional, solid-state laser is large and electrically inefficient," he explained. "It operates at a relatively low speed of 100 megahertz.

A semiconductor provides the right wavelength for the Department of Defense DoD, [from] 300 nanometers to greater than 10 microns, via bandgap engineering." Semiconductor lasers are also electrically efficient.

Audience member Philip Land (Code 4L4100D) believes Delfyett's research will greatly benefit the DoD, particularly those serving in the field. "Fs mode-locked semiconductor laser-based optical frequency combs increase the speed of communication and simplify the operation and management of high capacity optical interconnects and links. "Linkups, [such as] Link 16, are not as efficient," said Land. "New technologies make communication more efficient, which decreases the time lag. New technologies could make communication instantaneous."

Dr. Delfyett is an honored faculty member at the School of Optics and the Center for Research and Education in Optics and Lasers (CREOL) at the University of Central Florida. His areas of research include lasers, fiber optics, semiconductor and integrated photonics, and nonlinear and quantum optics.



Dr. Peter Delfyett engages audience during Colloquium
Source: NAWCWD Technical Communication Office

NAWCWD SIGNS BIOJET FUEL CRADA



Dr. Michael Wright

Source: NAWCWD Technical Communication Office

Rear Adm. Mathias W. Winter, NAWCWD Commander, signed a three-year Cooperative Research and Development Agreement (CRADA) on 2 November 2010 with Cobalt Technologies, titled “Conversion of Biobutanol to Biojet/Biodiesel Fuels.”

The focus of the CRADA is to join the technology and research of NAWCWD and Cobalt to discern if a viable route to biojet fuel can be realized without using food feedstock. NAWCWD research chemists Dr. Michael Wright and Dr. Benjamin Harvey have developed proprietary processes for converting the alcohol butanol into jet and diesel fuel. Cobalt Technologies, a San Francisco Bay Area company that is a leader in the emerging area of alternative fuels, has had notable success in efficiently converting lignocellulosic biomass waste (or more specifically, nonfood feedstocks such as beetle-killed trees and fibrous sugar cane residue) into butanol.

It is anticipated that the partnership will ultimately lead to successful development of cost-effective and sustainable domestic fuel sources that will decrease the Navy’s carbon footprint, while reducing dependence on foreign sources of petroleum. The

long-term goal is to implement biojet fuel in the Fleet.

“This is a clear game changer in the world of biofuels,” said Wright. “Typically, bacteria and yeast cannot make fermentation products like biobutanol from cellulose at a production rate that is commercially viable (as Cobalt has done). Take our research chemistry to make jet fuel from biobutanol, and it is a union of technologies that can contribute to solving our dependence on oil.”

Michael Owens, Renewable Energy coordinator for NAWCWD, views the partnership between Cobalt and Naval Air Systems Command (NAVAIR) as just the tip of the iceberg when it comes to the potential of public–private partnerships for renewable energy technology development.

“Whenever our NAVAIR scientists and engineers can work with our private partners to bring Warfighter solutions to fruition through CRADAs and other partnerships, it...ensures that the best minds are addressing the most critical issues for the Warfighter,” said Owens. “Currently, it is the issue of fuel and energy.”

Patuxent River Naval Air Station, the U.S. Air Force, and the Federal Aviation Administration are also key players in this effort, as these organizations will conduct limited chemical testing of the fuels, as well as testing of the new fuel’s performance characteristics and storage capabilities.

Additionally, the fuel developed with Cobalt will help establish American Society for Testing and Materials tests and evaluations that are required for biojet fuel derived from alcohols.

LABORATORY AND OFFICE SAFETY

If you have a power strip with model #P50ES, you must unplug it and dispose of it properly. Power strips with this model number are now banned from use at NAWWS.

NAWCWD 4L personnel may direct laboratory safety questions and concerns to 760.939.0964 or 760.939.215

All other NAWCWD personnel questions may be directed to 760.939.3067 or 760.939.0274



Safety experts express concerns about model# P-50ES S power strips.
Source: Unified Investigations and Sciences



NAWWS personnel are urged to discard model# P-50ES S power strips.
Source: Unified Investigations and Sciences



Model# P-50ES S power strips after failure.
Source: Unified Investigations and Sciences

NEW NAWCWD STRATEGIC PLAN HIGHLIGHTS S&T GOALS



The NAWCWD Strategic Plan was released in October 2010 to “direct our focus as a Command during this time of war and beyond.” The plan, drafted by RMDL Mat Winter, Commander, and Joan Johnson, Executive Director (Acting), concisely communicates the NAWCWD Vision and Mission Statements.

The plan also describes the division’s Enduring Goals, as they pertain to people, the organization, and capabilities.

In the plan, the NAWCWD S&T community is urged to continue to pursue key technology-driven emerging capabilities. Specifically, the NAWCWD Strategic Plan emphasizes S&T goals by stating, “Technology, innovation, research and development constitute the cornerstones of NAWCWD, allowing us to provide our Warfighters [with] the decisive advantage. Ongoing initiatives supporting this goal include NAWCWD technology thrust areas, science and technology networks, the In-house Laboratory Independent Research (ILIR) Program and the Independent Applied Research (IAR) Program.”

All S&T personnel should take the time to read the NAWCWD Strategic Plan in its entirety. It is a tool that we can use to ensure that our goals are aligned in the future. The plan is available online (for Navy Marine Corps Intranet [NMCI] users only) at https://c27ntivpaxr01.navair.navy.mil/NAWCWD/WingSpanWD/command_news/command_communications/downloads/2010/101102_NAWCWD_Strategic_Plan_FINAL.pdf.

“The success of this strategic plan depends on leaders at every level engaging with our workforce to instill a sense of personal ownership and helping each person to see the value of their role in achieving overall mission success through these goals and initiatives.”

--2010 NAWCWD Strategic Plan

FIVE TIPS FOR WRITING STELLAR PROPOSALS

Scientists share a common need: research funding. Thus, the ability to write an effective proposal is a critical weapon in the arsenal of every scientist. You will need to write a compelling government proposal to obtain sponsorship to support your research. These research efforts ultimately help our organization continue to arm our Warfighters with the decisive advantage.

Although the logic for writing proposals seems simple, the actual task of proposal writing can be a daunting task for even most seasoned researchers. Government proposals are often written as a result of a Request for Proposals issued by a procuring program or agency. Here are five tips to help you prepare stellar proposals.

1 Make a Plan. Writing is an iterative process, so plan accordingly. Establish a plan that allows adequate time for research, writing, reviews, editing, and consultation. Find out the due date for your proposal and set milestones to ensure that your writing, editing, and submission goals stay on track. Try setting aside blocks of time (i.e., at least one hour in duration) in your schedule to dedicate to working on your proposal. Use your MS Outlook calendar and set the time as “Busy” to minimize distractions.

2 Be Original. Take the time to diligently research your topic to ensure that your idea is original. Unless you are requesting sponsorship for a continuing project, avoid submitting a proposal for research that is currently in progress or has already been done. Survey the peer reviewed literature, internal reports, and conference proceedings in your field. The NAVAIR Technical Libraries are an excellent starting point for credible information. The Office of Naval Research also maintains S&T

databases to help you with this task. Also consider requesting an appointment with your supervisor or program manager to discuss your proposal topic in advance.

3 Be Clear. Your proposal should include a clear problem statement and proposed solution. Avoid unnecessary words and pompous prose. The simplest, most effective way to present a set of numbers is through graphics. Use well-designed charts, graphs, tables, diagrams, figures, and other technical drawings to communicate complex data and concepts.

4 Pay Attention to the Details. Make a zealous effort to carefully read the directions in the proposal request to ensure that you understand all of the requirements. Always ask for clarification if needed. Pay special attention to the editorial details during the revision stage to ensure that your proposal is grammatically correct and free of typographical errors. Style and formatting guidelines will vary depending upon the organization. Consult a professional editor for assistance with manuscript details as needed.

5 Avoid Weak Science. Strong scientific proposals for research are theoretically sound. Always support each premise in your proposal. This builds credibility in your argument. If you provide equations, be sure they balance. It is also a good practice to provide a description for each variable. Identify at least three colleagues in your field to perform a preliminary peer review before you submit your proposal. Be specific in your request. Ask for constructive criticism and suggestions for improvement on the technical subject matter of your draft.

JANE'S 101: HOW TO USE JANE'S DEFENSE ELECTRONIC LIBRARY

Jane's 101 is a class designed to change the way you work for the rest of the year. This hour of training will demonstrate the kind of information available in Jane's Electronic Library and then show you how to set up alerts that will send filtered, relevant information directly to your inbox. The electronic library includes all of the information and analysis you would find in the Jane's reference books and journals on international defense, security, and terrorism. It is available to all NAWCWD employees from their NMCI desktop computers and is provided by the NAWCWD Scientific and Technical Library.

The representatives from Jane's will be at China Lake 25-27 January 2011. The first training session will be held at the NAWCWD Scientific and Technical Library 25 January at 1400 PST. Another session will be held on 26 January at 0900 PST in Rooms 1116 and 1117 at the McLean Laboratory. Three additional sessions will be held on 26-27 January 2011. If you are interested in hosting a session, please call 760.939.3649.

Jane's Defense Equipment and Technology Intelligence Centers compile references, analysis, images, and news about defense, security, transportation, public safety, and law enforcement into complementary online data banks. These Centers are fast, reliable, comprehensive, and easy to use, and are indispensable sources of information for NAWCWD employees.

For more information, call the Information Desk at 760.939.3389 or visit the NAWCWD Scientific and Technical Library website at www.navair.navy.mil/nacra/library_resources.aspx or Jane's website at www.janes.com.

EVENT CALENDAR

JANUARY 2011

Birthday of Dr. Martin Luther King, Jr.

Date: 17 January 2011

Description: Dr. Martin Luther King, Jr.'s birthday is designated as a Federal holiday.

NAWCWD Fellowship Program - Call for Applications

Date: 14 January 2011

Description: The NAWCWD Fellowship Program is now accepting applications for the FY12 cycle through Friday, 14 January 2011. Employees can apply for either full or part-time fellowships for graduate level course work.

Additional Information: For detailed information, go to the fellowship website <https://mynavair.navair.navy.mil/totalforce>, select "Employees," "Training," and then "Fellowship Program."

China Lake Distinguished Speaker Colloquium Series

Date: 19 January 2011

Description: China Lake Distinguished Speaker, Professor Sukh Sidhu, from the University of Dayton Research Institute, will present a lecture entitled "Evaluation of Algae as a Viable Biofuel/Biomass Feedstock." This lecture will discuss Professor Sidhu's work to evaluate the ability of different algae strains to fix carbon dioxide and clean wastewater by consuming nitrate and phosphates. The results of his studies and the hurdles (i.e., efficient harvesting and lipid extraction) associated with making algae a viable biofuel/biomass feedstock will be presented.

Location: 1000D Michelson Laboratory, China Lake, CA

Jane's 101 Training

Date: 25-27 January 2011

Description: NAWCWD will host Jane's 101: How to Use Jane's Defense Electronic Library. This course is designed to change the way you work for the rest of the year. This hour of training will demonstrate the kind of information available in Jane's Electronic Library and then show you how to set up alerts.

Location: NAWCWD Scientific and Technical Library and Rooms 1116 and 1117 at the McLean Laboratory, China Lake, CA

Additional Information: NAVAIR personnel may call the Information Desk at 760.939.3389 or visit the NAWCWD Scientific and Technical Library website at http://www.navair.navy.mil/nacra/library_resources.aspx or Jane's website at <http://www.janes.com>.

EVENT CALENDAR

FEBRUARY 2011

Washington's Birthday

Date: 21 February 2011

Description: Washington's birthday is designated as a Federal holiday.

2011 Advancing Science, Serving Society (AAAS) Annual Meeting

Date: 17-21 February 2011

Description: Join thousands of leading scientists, engineers, educators, and policy-makers as they interact with one another and with hundreds of members from national and international media.

Location: Washington, D.C.

Additional Information: For detailed information, go to www.aaas.org/meetings/.

Spirit of Hope Award: Call for Nominations

Date: 21 February 2011

Description: The Spirit Hope Award is presented to individuals or organizations that embody the core values of Mr. Bob Hope: duty, honor, courage, loyalty, commitment integrity, and selfless dedication. Award nominees may be members of the regular or reserve components, veterans, civilian Navy employees, or an organization or members of the civilian community who have distinguished themselves in supporting the navy and embodying our core values.

Additional Information: The nomination template, information on past awardees, and more details are available online at www.npc.navy.mil. NAVAIR personnel may call Awards Office at 301.342.6862 for further instructions.

NAVAIR Science and Technology Newsletter: Call for Submissions

Date: 28 February 2011

Description: Jump-start your New Year by submitting an article in the NAVAIR Science and Technology Newsletter. The deadline for our next issue is 28 February 2011. Please submit your newsletter articles, photos, and announcement to the Managing Editor at kimberly.silver@navy.mil. Any submissions received after that will be considered for the summer 2011 issue.

Additional Information: NAVAIR personnel may call 760.939.8729 for further submission instructions.

EVENT CALENDAR

MARCH 2011

Zachary and Elizabeth Fisher Distinguished Civilian Humanitarian Award: Call for Nominations

Date: 1 March 2011

Description: Zachary and Elizabeth Fisher Distinguished Civilian Humanitarian Award was established by the military departments in honor of Zachary and Elizabeth Fisher, who contributed extensively to the support and welfare of members of the Armed Forces. This award is intended to honor and recognize a private sector individual or organization that demonstrated exceptional patriotism and humanitarian concerns for members of the United States Armed Forces and their families. Nominations will be reviewed by a selection committee. The committee recommendations will be endorsed by the Chief of Naval Personnel. An award presentation will be announced at later date.

Nominations should be submitted to the NAVAIR Awards Office electronically by 1 March 2011 in order to meet the sponsor's deadline of 18 March 2011. Please scan in any endorsements with signatures and send nomination packages to katherine.triplett@navy.mil with a copy to virginia.tippett.ctr@navy.mil.

Additional Information: NAVAIR personnel may call the Awards Office at 301.342.6862 for further instructions.

Distinguished Lecture Series

Date: 8 March 2011

Time: 1400-1330 PT

Description: Office of Naval Research Distinguished Speaker, Dr. Peter Warren Singer will be featured. Dr. Singer is a Senior Fellow and the Director of the 21st Century Defense Initiative at the Brookings Institution.

Location: Office of Naval Research Headquarters, Arlington, VA

Additional Information: To register visit <https://secure.onr.navy.mil/events> or watch the live stream at <http://science.dodlive.mil/>. Questions may be directed to 703.696.2924

241st American Chemical Society (ACS) National Meeting & Exposition

Date: 27-31 March 2011

Description: ACS will host the 241st ACS National Meeting & Exposition to showcase recent developments in the chemical sciences.

Location: Anaheim, CA

Additional Information: For detailed information, go to <http://portal.acs.org>.

The
OFFICE OF NAVAL RESEARCH
presents:

Distinguished Lecture Series

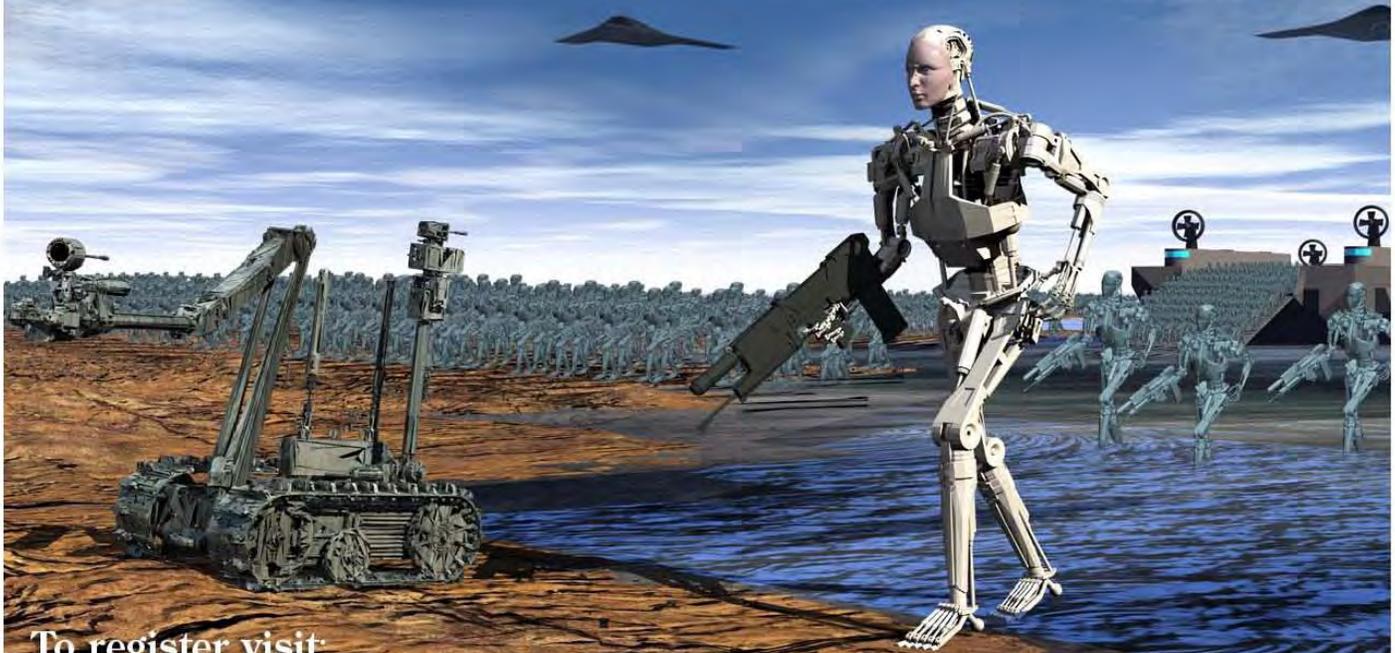
featuring
Global Thinker, Defense Strategist, and Author

Dr. Peter Warren Singer

*"Wired For War: The Science Fiction/Science Reality of Robots, War,
and Politics in the 21st Century"*

Tuesday, March 8, 2011

2:00 - 3:30pm, Office of Naval Research, MIC



To register visit:

<https://secure.onr.navy.mil/events>

Watch the LIVE stream:

<http://science.dodlive.mil/>

For more info contact:

Melody Cook 703-696-2924

melody.cook.ctr@navy.mil



DIRECTOR OF
INNOVATION 

PETER WARREN SINGER, is a Senior Fellow and the Director of the 21st Century Defense Initiative at the Brookings Institution. He is the youngest scholar named Senior Fellow in Brookings's 90-year history. In 2005, CNN named him to their "New Guard" List of the Next Generation of Newsmakers. Singer has also been recognized by the Financial Times as "Guru of the Week" for the thinker who most influenced the world that week and by Slate Magazine for "Quote of the Day." In his personal capacity, Singer served as coordinator of the Obama-08 campaign's defense policy task force. In 2009, Singer was named by Foreign Policy Magazine to the Top 100 Global Thinkers List, of the people whose ideas most influenced the world that year.



Dr. Singer is considered one of the world's leading experts on changes in 21st century warfare. He was named by the President to Joint Forces Command's Transformation Advisory Group. He has written for the full range of major media and journals, including the Boston Globe, L.A. Times, New York Times, Washington Post, Foreign Affairs, Current History, Survival, International Security, Parameters, Weltpolitik, and the World Policy Journal. He has been quoted in every major U.S. newspaper and news magazine and delivered talks at venues ranging from the U.S. Congress to over 40 universities around the world. He has provided commentary on military affairs for nearly every major TV and radio outlet, including ABC-Nightline, Al Jazeera, BBC, CBS-60 Minutes, CNN, FOX, NPR, and the NBC Today Show. He is also a founder and organizer of the U.S.-Islamic World Forum, a global conference that brings together leaders from across the US and the Muslim world.

His first book *Corporate Warriors: The Rise of the Privatized Military Industry*, pioneered the study of the new industry of private companies providing military services for hire, an issue that soon became important with the use and abuse of these companies in Iraq. It was named best book of the year by the American Political Science Association, among the top five international affairs books of the year by the Gelber Prize, and a "top ten summer read" by Businessweek.

Dr. Singer's next book, *Children at War*, explored the rise of another new force in modern warfare, child soldier groups. Dr. Singer's "fascinating" (New York Post) and "landmark" (Newsweek) work was the first book to comprehensively explore the compelling and tragic rise of child soldier groups and was recognized by the 2006 Robert F. Kennedy Memorial Book of the Year Award.

Dr. Singer's most recent book, *Wired for War*, looks at the implications of robotics and other new technologies for war, politics, ethics, and law in the 21st century. Described as: "An exhaustively researched book, enlivened by examples from popular culture" by the Associated Press and "awesome" by Jon Stewart of the Daily Show, *Wired for War* made the New York Times non-fiction bestseller list in its first week of release. It was named a non-fiction Book of the Year by The Financial Times. It has already been featured in the video game "Metal Gear Solid 4: Guns of the Patriot," the CBS "Late Late Show," as well as in over 75 presentations at venues as diverse as all three US military academies, the US Congress, the National Student Leadership Conference, and the royal court of the United Arab Emirates. The book is also been made an official reading with organizations that range from National Defense University, US Air Force, US Navy, to the Royal Australian Navy.

Prior to his current position, Dr. Singer was the founding Director of the Project on U.S. Policy Towards the Islamic World in the Saban Center at Brookings. He has also worked for the Belfer Center for Science and International Affairs at Harvard University, the Balkans Task Force in the U.S. Department of Defense, and the International Peace Academy. Singer received his Ph.D. in Government from Harvard University and a BA from the Woodrow Wilson School of Public and International Affairs at Princeton University.

Approved for public release; distribution is unlimited.

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