

The History of the *Technical Digest*

Helen E. Worth, Erin M. Richardson, and Ariel M. Greenberg



ABSTRACT

Since its inception in 1961, the technical journal of the Johns Hopkins University Applied Physics Laboratory (APL) has undergone many changes, including a name change and several shifts in oversight, content, and design. Nevertheless, the publication has remained true to its core purpose: to record and disseminate the diverse and important work of the Lab—and to do so clearly and compellingly. This article highlights the history of the publication and those who have worked tirelessly to conceive and carry out its vision.

From APL's beginning in 1942, the Laboratory's work has been a wellspring of innovative solutions to national challenges. Cognizant of the importance of archiving and sharing this work, APL's director at the time, Dr. Ralph E. Gibson, recommended in 1961 that the Laboratory publish a bimonthly unclassified journal—and thus was born the *APL Technical Digest*. In the foreword introducing the first edition, Gibson said:

The diversity of the Laboratory's activities and of the vehicles for their publication requires a synthesizing agent to preserve the overall pattern of its activities, not only for the benefit of its own staff, but also for the benefit of scientific and engineering colleagues throughout the world. It is the purpose of the *Technical Digest* to accomplish this synthesis by presenting in one periodical results from many fields, expressed in terms that excite the interest of those who are not specialists in the particular field and at the same time invite the critical examination of those who are.¹

There could be no better champion for such a publication than Gibson, who throughout his 21 years as APL's director (1948–1969) was revered for his brilliant mind and eloquent communications. Gibson chose Dr. Albert M. Stone as the first editor-in-chief and chair

of the *Digest's* editorial board—a dual role each of the *Digest's* eight editors would hold. Stone laid out the publication's purpose:

The need for this new journal springs from the growing necessity of somehow reducing to manageable proportions the relentless, ever-increasing flood of new knowledge. Information-retrieval experts, newly entering the scene, promise eventually to match the flow, if not the content, to the demand. It is a weakness in our culture, however, that insufficient stress has been put on the process of winnowing and assimilating—on the lucid and cogent presentation of the most significant results in a way that stimulates without obscuring. A growing number of attempts at repairing this deficiency are blossoming and, in a modest way, the *APL Technical Digest* is assuming a role in this process.²

Stone, who had held leadership roles in the Plasma Physics Group and the Technical Information Division, as well as served as director of the Laboratory's advanced research projects area, specified that each paper in the *Digest* should

record a significant advance in either basic understanding of physical phenomena or in the application of understanding to broadening our technical resources. We shall strive

that these articles be technically authoritative and scholarly. If the reader of this journal—scientist, engineer, or thoughtful Navy officer—is the serious catholic and eclectic seeker of knowledge we expect him to be, he may well have to read them twice over with care, but he should find them intelligible and thought-provocative. If he is motivated thereafter, by curiosity or by need, to delve further into any topic discussed, we shall have succeeded well in our task.²

The original *APL Technical Digest* was produced from 1961 to 1977 (volumes 1–16). Its first issue featured George F. Pieper’s account of the development and preliminary results of the first of six Navy Injun satellites launched in June 1961 to study ionospheric radiation and magnetism. Other featured articles included one by J. P. Randolph Jr. outlining new trends in telemetry, another by H. Lowell Olsen and H. F. Kirk Jr. describing the new APL hypersonic propulsion research laboratory, and one on tactical analysis by M. C. Waddell. The issue also included briefs, one on the development of welded cord-wood circuits and another on unique microwave switches.

In its first year, nearly 12,000 *Digest* copies were printed,³ with a portion going to APL staff members and the balance to colleges and universities, industrial organizations, and individuals throughout the United States, plus several foreign countries. The early *Digest* issues were sold outside APL for \$2 a year, or \$0.50 an issue, then increased briefly in 1980 to \$10 a year and \$2.50 an issue before the decision was made that same year to distribute copies at no cost. Initially the publication came out bimonthly—with a few exceptions—but in 1973, production schedule constraints, rising publication costs, and the normal demands of acquiring material in a timely manner made it necessary to move to quarterly printings. The *Digest* was not published in 1978 and 1979

while the newly named and significantly redesigned publication, launched in 1980, was being developed.

Stone served as editor-in-chief and editorial board chair until 1963, when he yielded those positions to Dr. Samuel N. Foner, who served for the next 16 years. Foner came to APL in 1945 after working as a physicist on the Manhattan Project while at the Carnegie Institute of Technology. He made APL’s Research Center his home, studying mass spectrometry and free radicals in chemical gas phase reactions. He had been an initial member of the *Digest* editorial board and carried out Stone’s vision for the fledgling publication. When Foner stepped down in 1979, APL Director Alexander Kossiakoff credited him with making the *Digest* “a publication of which the Laboratory is justifiably proud.”⁴

The most significant transformation of the *Digest* came under the leadership of Dr. Walter G. Berl, who was also a member of the founding *Digest* editorial board. Berl joined the APL staff in 1945, pioneered research in high-energy ramjet fuels, was a chemist and fire research expert, and led national and international fire research programs. He served as the *Digest*’s editor-in-chief from 1979 to 1986, transforming the publication, including expanding the *Digest* to cover research outside the APL Research Center. He also renamed the publication the *Johns Hopkins APL Technical Digest*, reflecting the Lab’s important relationship and continuing collaboration with the university.

To improve the breadth and timeliness of research reporting, Berl introduced the guest editor concept. A staff member who was responsible for a technical or other type of subject area would be invited to create an issue around a theme, usually the work of the guest editor’s technical division—which at that time included fleet defense, advanced engineering, space

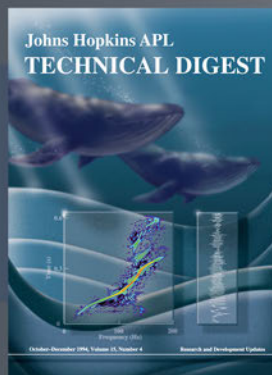
EVOLUTION OF THE *TECHNICAL DIGEST*



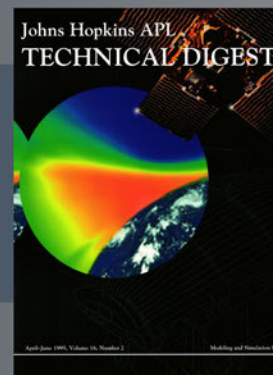
1961



1980



1994



1995

science and satellite technology, and ocean science and technology—or current research and development areas such as energy and safety, biomedical systems, and basic research. Along with delegating primary responsibility for theme issue content, Berl expanded membership on the editorial board to include more technical areas to broaden the board's expertise.

The first newly designed *Johns Hopkins APL Technical Digest* issue was the January–March 1980 edition, with a reset volume designation of Volume 1, No. 1. This issue featured the Milton S. Eisenhower Research Center, which had just been renamed in honor of Johns Hopkins University's eighth president. Subsequent issues focused on the Earth Magnetic Field Satellite (MADSAT), renewable energy, conservation and safety, and other diverse topics. Berl also created the Research and Development Updates section to highlight compelling current research.

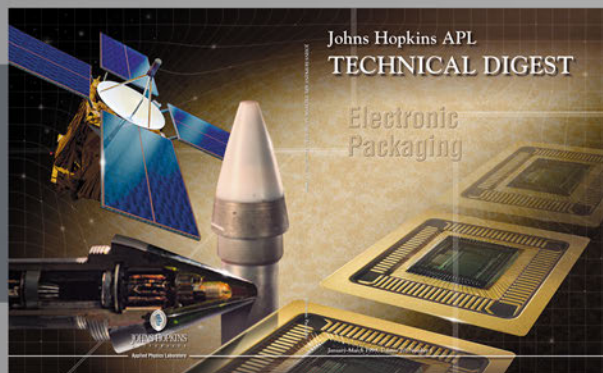
The new publication achieved its intended purpose. A 1995 *Digest* tribute to Berl⁵ noted that his name had become synonymous with the journal and that he had “launched and nurtured the journal that weaves together reports on highly focused technical subjects and articles of much broader interest, both reflecting the diverse creativity of APL scientists and engineers.” It was also during Berl's tenure that several major abstracting services began to cover the *Digest*.⁵ To acknowledge Berl's many contributions to the *Digest*, the annual APL publication award for the most outstanding paper published in the *Digest* was named the Walter G. Berl Award.⁵ This is just one of the many publication awards given annually as part of a competition the *Digest* board launched in 1986 and has judged since its initiation. (See the article by Richardson and Livieratos, in this issue, on the history of APL's awards program.)

During his tenure, Berl also addressed work being done at APL that was too sensitive for public release by creating a new publication—the *APL Technical Review*—a classified counterpart to the *Digest*. Berl, and the next two *Digest* editors, managed both the *Digest* and the *Technical Review* while chairing the editorial board. However, complications of scheduling and maintaining security for such a sensitive publication led to the discontinuation of the *APL Technical Review* in 1993.

When Berl stepped down—becoming a Parsons professor at Johns Hopkins University's Paul H. Nitze School of Advanced International Studies—he entrusted the editorship of the *Digest* and the *Review* to Dr. John R. Apel, a physicist and oceanographer who pioneered the use of satellite remote sensing to study Earth's oceans. Apel had served as director of the National Oceanographic and Atmospheric Administration's Ocean Remote Sensing Laboratory and was chief scientist of APL's Milton S. Eisenhower Research Center when he became the *Digest's* editor.

Apel believed the *Digest's* level of technical discourse should never “dilute the intellectual contributions of the authors” who were drawn to their trade by what Dr. Gibson had called “the challenge of hard thought.”⁶ Apel maintained that standard while allowing for “articles ranging in difficulty from technically entertaining to scientifically solid to theoretically esoteric.”⁶ Apel relinquished his stewardship of the *Digest* in 1989 but remained on the editorial board. Always looking for new ways to disseminate APL's impactful research, Apel contracted with Oxford Press to create *The Johns Hopkins University Applied Physics Laboratory Series in Science and Engineering*, with the first edition appearing in 1992.

In 1990, Dr. Samuel Koslov, assistant to the director for technical assessment and director of the APL Educa-



1999



2013

tion Center, became the *Digest's* editor-in-chief. Before coming to APL in 1978, he was a scientific adviser to the assistant secretary of the Navy for research and development and also worked in the Office of the Secretary of Defense as deputy director for nuclear test detection. Koslov, a physicist specializing in technology-based management and systems and radiation effects, led sensor development for APL's Independent Research and Development Program and had been a member of the *Digest's* editorial board since 1979.

As editor, Koslov respected the transformative changes Berl had made and upheld his high standards. Dr. Kishin Moorjani, who would succeed him, said Koslov “was an activist in the best meaning of the word. He offered sound counsel . . . and guided and goaded authors, guest editors, and editorial staff in putting forth a first-rate technical journal.”⁷ The *Digest* issue commemorating APL's 50th anniversary (Vol. 13, No. 1, 1992) came out under Koslov's tutelage and exemplified his talent and dedication to the publication.

In 1990, reflecting on the 10th anniversary of the *Johns Hopkins APL Technical Digest*, Koslov said the current *Digest*, the original *APL Technical Digest*, and the classified *APL Technical Review* had enhanced both its authors and the Laboratory:

For the author they have engendered a discipline of coherently presenting a project—a basic component of professional methodology; and they have provided the author the satisfaction that comes of seeing one's work in print, where it can receive peer recognition. For the Laboratory, they have served as a window into the widely diversified activities of APL for its sponsors, collaborators, and associates in government, industry, and academe.⁸

Koslov also praised the guest editors as the “unsung heroes” whose “initiative and imagination have often, in far too abbreviated a schedule, pulled together and polished a coherent picture of some phase of technical activity.” And he celebrated the publication's managers, editors, illustrators, compositors, and secretaries, noting that they were “seldom blessed, and often maligned and abused . . . [and] perhaps the hardest working of all.”⁸ He retired in 1993, passing responsibility for the *Digest* to Kishin Moorjani.

Moorjani accepted the task of overseeing the *Digest* and the final two issues of the *APL Technical Review* while also serving as supervisor of the Research Center's Condensed Matter Physics Group. He came to APL in 1967 from the position of visiting scientist at the Centre National de la Recherche Scientifique in France, with special expertise in condensed matter science, magnetism, superconductivity, and disordered solids. Because of the ever-growing mass of communications bombarding staff members, Moorjani was adamant that articles “be succinct and precise and whet the appetite for reading.”⁹ To highlight more examples of ongoing work, he introduced a new Notes section.

The *Digest* also took a big leap forward in visual appeal under Moorjani. Working with Moorjani, Bill Pullin, supervisor of the Technical Communications Group, introduced high-end original cover art by APL artist Ken Moscati and placed a greater emphasis on presentation details to make the *Digest* more readable and navigable. Pullin also incorporated digital integration of text and illustrations that made it possible to produce film negatives for printing—a boon for presentations—and he pushed for electronic availability of the *Digest*. In 1995, soon after the introduction of Adobe Acrobat, the first *Digest* issue was published online, making the content freely available to anyone with an Internet connection.

Moorjani retired in 2002, transitioning the editorship of the *Digest* to Dr. David M. Silver, a theoretical chemist with expertise in atomic and molecular quantum mechanics. After coming to the Laboratory in 1976, Silver became supervisor of chemical physics research in the Research Center. He valued articles that were understandable and promised to “continue to pres-

BOX 1. PRODUCTION PROGRESS

Initially, the *Digest* was a black-and-white publication with a simple cover. In those days, illustrations were drawn by hand, and to create pages, a team of paste-up artists sat in front of light boards, cutting art and type into sections that were then pasted on a board. Before being adhered to the board, some illustrations and pictures required special treatment so that they would photograph properly. When the “page” was completed, it was photographed and the negative was used to make a printing plate.

Since that time, the *Digest* has undergone quite a bit of change. The production team has taken advantage of developments in production and printing technology, incorporating the *Digest's* first digital photographs in the early 1990s and using sophisticated desktop publishing software to create high-resolution digital pages by the late 1990s.¹¹ By 1995, it was fully part of the digital age with issues being posted online, making it possible for readers to open articles on their desktop computers with the tap of a finger.¹¹ The *Digest* has also benefited from aesthetic changes over the years. In 1995, it revealed a complete overhaul, exploding with color graphics and tables and artistic wraparound glossy covers. “We've given more prominence to illustrations, tables, equations, and headings to make it easier for readers to move back and forth between text and related materials,” said then-managing editor Karen Belton. “The pages are more attractive and readable now.”¹² In 2006, it introduced even bolder design elements that complement but do not compete with the content.

The production team has continued to make subtle refinements in recent years, modernizing design elements and always fine-tuning processes to gain efficiency and ensure quality.

ent complicated technical material clearly, accurately, and with visual impact.”¹⁰ By the time he retired in 2014—after 12 years managing the *Digest*—he had overseen the production of nearly three dozen *Digest* issues filled with articles on APL work from every corner of the Laboratory.

Since 2014, the job of editor-in-chief of the *Digest* and chair of the editorial board has been skillfully handled by Dr. Harry K. Charles Jr. An APL electrical engineer for more than 45 years, Charles is an APL Master Inventor with more than 17 patents—his favorite being a miniaturized flexible integrated circuit chip—and over 50 invention disclosures. Charles has broad technical expertise and has served as head of the Technical Services Department, a teacher for Johns Hopkins University’s Whiting School for more than 35 years, program manager for APL’s Education Center, and the author of more than 200 publications. His broad and eclectic background—even his work as a paste-up artist for a printer in Baltimore while he pursued his graduate degree—has been an asset to the *Digest*.

Charles says the excellent management of previous editors has put the *Digest* in a good place and he is not planning any immediate big changes. Undeniably impressive, he says, is the rich archival legacy of the *Digest*. Before he took over as editor, only issues dating from 1995 were available online, with just a contents listing for earlier issues. Charles spearheaded an effort to make all *Digest* content, dating from 1961, available on the web. The process included locating and flipping through old books to find those without pencil markings or tattered pages, sending crates of books to a vendor for scanning, reviewing the resulting PDFs, and configuring the website. After months of work, the production team posted the content in early 2016. Charles notes:

The current *Digest*, its predecessor the *APL Technical Digest*, and the *APL Technical Review* have captured more than 55 years of APL’s historical contributions to science, technology, and the nation, providing excellent background information for our staff and sponsors. And as the Lab pushes past its 75th year, the *Digest* provides a goldmine of important scientific and technical information for our staff members and others.

He points out that by reading the early issues, one can see the development of the Laboratory and the establishment of its fundamental principles of innovation, integrity, independence, and service on which later contributions are based. “These principles continue today and form the backbone of all our efforts,” he says. “As we grow and our tasks become ever more complex, it is important for our staff to understand these founding principles and recognize the roots from which today’s successes came.”

Despite changes in sponsor challenges and priorities, current events, and technology, all of the *Digest*’s eight editors-in-chief have toiled in much the same way. They

BOX 2. THE *DIGEST* BY THE NUMBERS

- Issues
 - Total: 216
 - Organized around a theme (since 1980): 113^a
 - Covering basic R&D (since 1980): 20
 - Celebrating anniversaries: 5^b
 - Multipart: 13
 - Maximum per year: 5
 - Minimum per year: 0^c
- Technical articles
 - Total: 1918
 - Maximum per issue: 43
 - Minimum per issue: 0^d
- Pages of technical content
 - Total: 16,343
 - Maximum per issue: 282
 - Minimum per issue: 14
- Authors
 - Minimum per article: 0^e
 - Maximum per article: 22
- Staff since 1961
 - Editors-in-chief: 8
 - Managing editors: 7
 - Art directors: 5
 - Minimum Editorial Board membership: 4
 - Maximum Editorial Board membership: 16
- Current external recipients
 - Academia: 36%
 - Government/military: 37%
 - Industry: 13%
 - R&D labs/think tanks: 14%

^aWalter Berl introduced theme issues in 1980.

^bThis one makes 6!

^cThe *Digest* did not publish in 1978 and 1979.

^dSome issues include only author and subject indexes.

^eAlthough the hundreds of people who made CEC possible are mentioned in its acknowledgments section, the seminal 1995 article on CEC lists no authors.

have dealt with the task of choosing appropriate content for each issue based on the impact the research could have on a field of knowledge, the work’s special significance to APL, and its interest to the broader technical community. The editors have all had to address budget swings and personnel changes; production and printing schedules; and the challenge of creating publications for anniversaries, like this issue commemorating APL’s 75 years of service to the nation. Other special editions have highlighted extraordinary space missions, defense system advances, and biomedical work. But no matter the time and circumstances, each *Digest* editor has left his own indelibly unique mark on the publication.

BOX 3. RECOGNITION FOR THE DIGEST

In a short 2001 piece celebrating the *Digest's* achievement of several awards, Kishin Moorjani wrote:¹³

In the media manic world of today, the message that one wants to convey can be very easily overwhelmed by excessive noise, or just as easily ignored given the plethora of competing communications. It is therefore essential that the message be presented clearly and framed attractively. We at the *Technical Digest* have been quite aware of these challenges and have endeavored to set high standards of publication and presentation.

This perhaps rings more true today, and to benchmark how well the *Digest* meets the challenge, it continues to compete in prominent national and international competitions. As Moorjani noted in 2001, the *Digest* “has done well in these forums, garnering many awards for its aesthetic appearance, format, and content,”¹³ and 16 years later it continues to score high marks. A judge for a 2016 competition in which the *Digest* took Best of Show remarked, “This a very strong piece, highlighted by excellent graphics, strong writing, and consistent style.”

The *Digest* has earned awards in competitions administered by Graphic Design USA, the International Academy of the Visual Arts, MarCom (International Competition for Marketing and Communication Professionals), the National Association of Government Communicators, Printing & Graphics Association MidAtlantic, the Printing Industry of Maryland Association, the Society for Technical Communications, and the Society of Technical Writers and Publishers.

Since 1961, more than 1900 technical articles have appeared in over 200 issues that have been distributed around the world, indexed by various abstracting services, and cataloged by national and international libraries. For more than five decades, the *Digest* has been the Lab's journal of record, providing an invaluable forum for APL's work that has informed scientists, engineers, sponsors, and the curious. It has chronicled colloquia, staff publications, presentations, patents, and even the pursuit of science-related hobbies,¹⁴ and the publication and its authors and production staff have earned numerous awards for content, editing, illustration, and design.

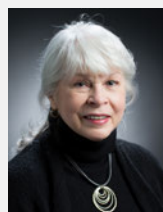
Gibson's vision of an in-house publication that serves as a “corporate memory and as an archival record of novel ideas, new devices and systems, and research results”¹⁵ has been fully realized thanks to the collective efforts of myriad accomplished APL authors and talented reviewers, editorial board members, and production staff throughout the *Digest's* long storied history. And as APL enters its 76th year, the *Digest* remains poised to chronicle many more years of innovative research and significant events.

All *Digest* content is available online at www.techdigest.jhuapl.edu.

ACKNOWLEDGMENTS: It takes quite a team to put together a publication like the *Digest*. Past and current team members have hailed from various parts of the Lab, with titles including author, editor-in-chief, assistant editor-in-chief, editorial board member, managing editor, assistant managing editor, art director, paste-up artist/compositor/page designer, graphic artist, web publisher, photographer, clearance coordinator, and distribution coordinator (to name a few!). Special thanks are extended to past, present, and future contributors to the *Digest*.

REFERENCES

- ¹Gibson, R. E., “Foreword,” *APL Tech. Dig.* **1**(1), 2 (1961).
- ²Stone, A. M., “Editorial,” *APL Tech. Dig.* **1**(1), 2 (1961).
- ³Campbell, P., “1960s: Exploring Space, Simulating Battles and Expanding Civilian Research,” *APLWeb Articles* (23 Mar 2012).
- ⁴“Technical Digest Board Headed by Walter Berl,” *APL News* (Summer 1979).
- ⁵Moorjani, K., “A Tribute to Walter Berl,” *Johns Hopkins APL Tech. Dig.* **16**(1), 2 (1995).
- ⁶Apel, J. R., “Editorial,” *Johns Hopkins APL Tech. Dig.* **10**(4), 292 (1989).
- ⁷Moorjani, K., “A Tribute to Samuel Koslov,” *Johns Hopkins APL Tech. Dig.* **14**(2), 86 (1993).
- ⁸Koslov, S., “Editorial,” *Johns Hopkins APL Tech. Dig.* **11**(1 and 2), 3 (1990).
- ⁹“Moorjani Named New Editor,” *APL News* (June 1993).
- ¹⁰Silver, D. M., “Transitions,” *Johns Hopkins APL Tech. Dig.* **23**(4), 338 (2002).
- ¹¹Pullin, W. T. Jr., Peck, A. D., Sussman, D. W., and Morris, M. K., “Fostering Successful APL Technical Communications,” *Johns Hopkins APL Tech. Dig.* **21**(4), 536–545 (2000).
- ¹²Walker, B., “New Technical Digest Format: Reader Friendly,” *APL News* (Feb 1995).
- ¹³Moorjani, K., “Recognition for the *Digest*,” *Johns Hopkins APL Tech. Dig.* **22**(2), 97 (2001).
- ¹⁴See, for example, Good, W. A., “A Scientist and His Hobby,” *APL Tech. Dig.* **2**(3), 18–23 (1963); Schroader, I. H., “A Scientist and His Hobby: Reflections of a Telescope Maker,” *APL Tech. Dig.* **2**(6), 8–14 (1963); Mowbray, G. H., “A Scientist and His Hobby: The Technology of Wine Making,” *APL Tech. Dig.* **3**(6), 18–23 (1968), 7–13; Apel, J. R., “Ways and Means of Boat Design,” *APL Tech. Dig.* **5**(2), 8–14 (1965), 18–23; and Riblet, H. B., “Orchids and Photography,” *APL Tech. Dig.* **7**(5), 8–14 (1968), 7–13.
- ¹⁵Berl, W. G., “Guest Editors' Introductions: Anniversaries: 50, 30, 10,” *Johns Hopkins APL Tech. Dig.* **11**(1 and 2), 4 (1990).



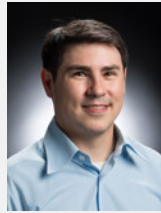
Helen E. Worth, Former Head of the Office of Public Affairs, Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Helen E. Worth is former head of the Office of Public Affairs at APL and former editor of the *APL News*. She served as an APL spokesperson interfacing with media from around the world and led media event planning and public affairs efforts for numerous programs, including the Near Earth Asteroid Rendezvous mission, the Advanced Natural Gas Vehicle program, the Advanced Composition Explorer mission, and the Delta 183 SDI program. She served under, or worked with, the last six APL directors. Retired in 2013 after 27 years of service to the Laboratory, she now provides writing and public affairs services to the Director's Office as requested. Before coming to the Laboratory, she was a reporter for the *Baltimore Sun*, the *Columbia Times*, and various other publications.



Erin M. Richardson, Business and Communication Services Department, Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Erin Richardson is an editor in the Creative Communications Group and managing editor of the *Johns Hopkins APL Technical Digest*. She received a B.A. in English and writing from Loyola College in Maryland (now Loyola University Maryland). She has experience in all facets of editing, publication development, and production management, having worked as a journal production manager, a project manager, and a conference managing editor before joining the Lab. Erin is a member of ACES, the Society for Editing. Her e-mail address is erin.richardson@jhuapl.edu.



Ariel M. Greenberg, Research and Exploratory Development Department, Johns Hopkins University Applied Physics Laboratory, Laurel, MD

Ariel M. Greenberg is a senior research scientist in APL's Intelligent Systems Center; assistant editor-in-chief of the *Johns Hopkins APL Technical Digest*; steering committee co-chair of the International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (<http://sbp-brims.org/>); and an instructor in APL's Strategic Education Program. In the spirit of cells-to-societies transdisciplinary research, his work addresses topics in psychophysiology and computational social science, toward applications in defense, intelligence, and health. Ariel received degrees in biology and electrical engineering from University of Maryland, College Park. His e-mail address is ariel.greenberg@jhuapl.edu.