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**Next-Generation Fuzing for
Next-Generation Weapons Systems**



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The National Defense Industrial Association is the trusted leader in defense and national security associations. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA's membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. For more than 100 years, NDIA and its predecessor organizations have been at the heart of the mission by dedicating their time, expertise, and energy to ensuring our warfighters have the best training, equipment, and support. For more information, visit NDIA.org

SCHEDULE AT A GLANCE

TUESDAY, AUGUST 4

General Session

10:00 – 11:55 am

Networking Chat Lobby

11:55 am – 12:10 pm

General Session

12:10 – 2:15 pm

Networking Chat Lobby

2:15 – 2:45 pm

WEDNESDAY, AUGUST 5

General Session

10:00 am – 12:15 pm

Networking Chat Lobby

12:15 – 12:30 pm

General Session

12:30 – 2:00 pm

Networking Chat Lobby

2:00 – 2:30 pm

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WELCOME TO vFUZE

On behalf of NDIA and the Fuze Conference Steering Committee, I would like to welcome you to NDIA's first-ever virtual fuze conference, called vFuze.

This international conference not only convenes the top fuzing professionals from government, industry, and academia but also enables the exchange of the latest fuzing research and development—all with the common goal of improving safety, capability, and reliability for our warfighters.

We have a thrilling keynote scheduled in addition to the conference's signature science and technology sessions. There

will also be an opportunity to virtually network with your peers.

Through the ongoing passionate work of the presenters, sponsors, and attendees at this conference and across our worldwide defense industry, new challenges will be overcome, resulting in safer and more reliable fuzes being fielded to our warfighters.

Thomas Harward

Chair, Fuze Section, Munitions Technology Division, NDIA
Lead Technologist, Fuzing & Safety Devices, Advanced Systems, Raytheon Missiles & Defense



LEADERSHIP

Thomas Harward
Committee Chair

Nassir Alaboud
Committee Vice Chair

Perry Slayers
Committee Secretary

MUNITIONS TECHNOLOGY FUZE SECTION

WHO WE ARE

The Munitions Technology Division works to maintain the open exchange of technical information among government and industry programs and technical managers. In addition, the Division identifies changes and trends in policy, guidance, and organizational functions that affect the development, production, maintenance, and demilitarization of munitions.

The Fuze Section aims to promote an open exchange of technical information among government and industry personnel, and to identify and address changes in standards, guidance, policy, and organizational functions that impact the development, production, and performance of fuzes.

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AGENDA

TUESDAY, AUGUST 4

10:00 – 10:05 am

INTRODUCTION & ADMIN REMARKS

Thomas Harward

Lead Technologist, Fuzing & Safety Devices, Advanced Systems, Raytheon Missiles & Defense
Chair, Fuze Section, Munitions Technology Division, National Defense Industrial Association (NDIA)

10:05 – 10:15 am

NDIA OPENING REMARKS

MG James Boozer, USA (Ret)

Executive Vice President, NDIA

10:15 – 10:45 am

KEYNOTE SPEAKER

Lt Col Brian A. "Hanzo" Stiles, USAF

Commander, 72d Test and Evaluation Squadron, Whiteman Air Force Base, U.S. Air Force

11:00 – 11:20 am

ARMY S&T STRATEGY

Mike Connolly

Electronics Engineer, Aviation and Missile Center, U.S. Army Combat Capabilities Development Command (CCDC)



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- 11:35 – 11:55 am** **NAVY S&T STRATEGY**
Kevin Cochran
Technical Project Manager, Indian Head Explosive Ordnance Disposal Technology Division, Naval Surface Warfare Center

- 11:55 am – 12:10 pm** **NETWORKING CHAT LOBBY BREAK**

- 12:10 – 12:30 pm** **AIR FORCE S&T STRATEGY**
George Jolly
Technical Advisor, Air Force Research Laboratory.

- 12:45 – 1:05 pm** **MEMS SHOCK ACCELEROMETER CHARACTERIZATION FOR HIGH G APPLICATIONS**
Dr. Adriane Moura, PhD
Staff Mechanical Engineer 2, Applied Research Associates, Inc.

- 1:20 – 1:40 pm** **MODULAR APPROACH TO THE MUNITION FUZE DEVELOPMENT FOR CASE TELESCOPED WEAPON SYSTEMS**
Dr. Isabelle Delagrangre, PhD
Lead Engineer, Ammunition, CTA International

- 1:55 – 2:15 pm** **DEVELOPMENT IN METAL MEMS LATCHING SETBACK SENSING MECHANISM**
Kevin O'Connor, Jr.
Mechanical Engineer, Fuze Division, Armaments Center, U.S. Army CCDC

- 2:15 – 2:45 pm** **NETWORKING CHAT LOBBY**



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The NDIA Policy Team monitors, advocates for, and educates government stakeholders on policy matters of importance to the defense industrial base. Help ensure the continued existence of a viable, competitive national technology and industrial base by keeping up with the latest reforms, rules, and regulations.

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- 10:00 – 10:05 am **INTRODUCTION & ADMIN REMARKS**
Thomas Harward
Lead Technologist, Fuzing & Safety Devices, Advanced Systems, Raytheon Missiles & Defense
Chair, Fuze Section, Munitions Technology Division, NDIA
- 10:05 – 10:25 am **FUZE INCIDENT, SHOALWATER BAY, AUSTRALIA, 2014**
Bernard Smith-Roberts
Manager, Engineering Systems, Explosive Materiel Branch, Joint Systems Division,
Capacity Acquisition and Sustainment Group, Australian Department of Defence
- 10:45 – 11:05 am **ARMY S&T STRATEGY**
Nick Malinoski
Supervisory Engineer, Fuze Division, Armaments Center, U.S. Army CCDC
- 11:20 – 11:40 am **SANDIA NATIONAL LABORATORIES CAPABILITIES AND MISSION**
Shane Curtis
Senior Staff Member, Advanced Fuzing Technology, Sandia National Laboratories

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- 11:55 am – 12:15 pm **DOD JOINT FUZE TECHNOLOGY PROGRAM (JFTP)**
Lawrence Fan
Program Manager, Fuzing Technology & Development, Energetic Technologies Department,
Indian Head Explosive Ordnance Disposal Technology Division, Naval Surface Warfare Center
- 12:15 – 12:30 pm **NETWORKING CHAT LOBBY**
- 12:30 – 12:50 pm **FUZE TECHNOLOGY REFRESH**
Vincent Matrisciano
Program Manager, Research & Development, Joint Program Executive Office Armaments & Ammunition
- 1:05 – 1:25 pm **FULLY RESETTABLE MEMS SAFE/ARM WITH LOCK AND SLIDER POSITION FEEDBACK**
Dr. Daniel Jean
Senior Microsystems Engineer, Army Research Laboratory, U.S. Army CCDC
- 1:40 – 2:00 pm **NEXT-GENERATION LARGE CALIBER SETTER**
Maxim Keyler
Electronic Engineer, Fuze Division, Armaments Center, U.S. Army CCDC
- 2:00 – 2:30 pm **NETWORKING CHAT LOBBY**

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In the past, *National Defense* Magazine e-Books have covered the Defense Industrial Base (DIB), Small Arms, Special Operations Forces (SOF), and Other Transaction Authority (OTA). Moving forward, look out for additional e-Books that cover new and different material.



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BIOGRAPHIES



MG JAMES BOOZER, USA (RET)

Executive Vice President

National Defense Industrial Association

Major General James "Jim" Boozer became executive vice president of

the National Defense Industrial Association (NDIA) December 4, 2017.

Boozer came to NDIA after a 35-year career in the U.S. Army, from which he retired as a two-star general in October 2015. His last assignment was as Commander, U.S. Army Japan at Camp Zama in Japan.

Prior to serving in Japan, Boozer was the Deputy Commanding General of U.S. Army in Europe, the Army component for U.S. European Command in Weisbaden, Germany. Prior to that assignment, Boozer was the Operations Director for the Assistant Chief of Staff for Army Installations at the Pentagon in Washington, DC.

Boozer has served in various operational and staff assignments throughout the Army and commanded at the Brigade and 2 Star level. He served as chief of plans at U.S. Central Command Forward in Baghdad and Qatar.

Boozer has also participated in multiple deployments in support of Operation Iraqi Freedom and Operation Enduring Freedom.

Boozer was a field artilleryman and commanded a brigade in Operation Iraqi Freedom 1 as a part of the Task Force that secured Baghdad.

Boozer graduated from The Citadel in 1980 with a bachelor of arts degree in history. He received a master's degree in strategic studies in 2001 from the U.S. Army War College.



KEVIN COCHRAN

Technical Project Manager

Indian Head Explosive Ordnance Disposal Technology Division, Naval Surface Warfare Center

Kevin Cochran is a Technical Project Manager in the Fuze and Initiation Systems Branch at the Naval Surface Warfare Center, Indian Head Explosive Ordnance Disposal Technology Division. Since 1998, he has focused on developing miniaturized fuze/S&A

systems and has worked on a variety of applications including underwater weapons, mine clearing systems, and guided mortars. He is currently the Project Manager for the High Reliability DPICM Replacement project that is tasked with developing a Cannon-

Delivered Area Effect Munition that meets the requirements of the 2017 DoD Policy on Cluster Munitions. Mr. Cochran received a B.S. and M.S. in Mechanical Engineering from the University of Maryland, College Park, in 1998 and 2003, respectively.



MIKE CONNOLLY

Electronics Engineer

Aviation and Missile Center, U.S. Army Combat Capabilities Development Command

Michael Connolly is an electronics engineer at the U.S. Army Combat Capabilities Development Command, Aviation and Missile Center (CCDC AvMC) at Redstone Arsenal, Alabama. He earned a B.S. in Electrical Engineering with honors from the University of Tennessee, Knoxville, in 1995. Since then, he has worked for the Army in various duties as an engineer specializing in radar systems, missile test sets, air and missile defense

systems, and—since 2001—conventional missile fuzing and rocket motor ignition safety systems. Mr. Connolly is a member of the Technical Steering Committee for the DoD/DOE Joint Munitions Program, the Institute of Electrical and Electronics Engineers (IEEE), the International Council on Systems Engineering (INCOSE), the Tau

Beta Pi National Engineering Honor Society, and the Eta Kappa Nu Electrical Engineering Honor Society.



SHANE CURTIS

Senior Staff Member, Advanced Fuzing Technology
Sandia National Laboratories

Shane Curtis is a senior staff member of the Advanced Fuzing Technology (AFT)

department at Sandia National Laboratories,

which specializes in the research and development of advanced concepts for the DoD and DOE fuzing communities. Shane has a B.S. and M.S. in Mechanical Engineering, and has spent eight years in

the department as the primary mechanical designer and researcher for hard target fuzing and data recorder applications.



DR. ISABELLE DELAGRANGE, PHD

Lead Engineer, Ammunition
CTA International

Dr. Isabelle Delagrange, PhD, is a research and development engineer

with over 20 years experience in the armament industry.

After graduating in engineering in 1995, Isabelle joined Giat Industries as a PhD student in gun barrels dynamics. This work

was the subject of several publications and a presentation on the 10th U.S. Army gun dynamics in 2001.

After being awarded her PhD in 1998, Isabelle continued working in R&D at Nexter as Lead Engineer on several cannons and turrets in medium and large caliber followed by Head of Engineering for weapon systems at Nexter Systems.

Isabelle joined CTAI in 2009 as CT-Cannon Lead Engineer for the end of development and as 40CTA Qualification Technical Lead in charge of the specification, witnessing, analyzing, and reporting of qualification trials for both cannon and ammunition. Since 2014, she worked as Lead Engineer for ammunition development and has been Head of Ammunition Engineering since 2017.



LAWRENCE FAN

Program Manager, Fuzing Technology & Development
Energetic Technologies Department, Indian Head Explosive Ordnance Disposal Technology Division, Naval Surface Warfare Center

Lawrence Fan is a project manager for fuzing technology and development programs in the Energetics Technology Department at the Naval Surface Warfare Center's Indian Head Explosive Ordnance Technology Division. Since entering government service in 1990, he has supported fuzing

development for Navy gun projectile, mine clearance and torpedo applications. He has headed several fuze R&D projects, including the development of the S&A Device for the Navy's Countermeasure Anti-Torpedo Torpedo. Since 2010, Mr. Fan has served as the program manager for the OSD Joint

Fuze Technology Program (JFTP). The JFTP selects, coordinates, and funds the execution of 6.2 and 6.3 fuzing technology projects with a portfolio of \$13M annually. Mr. Fan is also the Navy lead in the DoD Fuze IPT.



THOMAS HARWARD

Lead Technologist, Fuzing & Safety Devices, Advanced Systems
Raytheon Missiles & Defense

Thomas Harward, an Engineering Fellow with 23 years of experience at

Raytheon Missiles & Defense, is the Lead Technologist for Fuzing and Safety Devices. As Lead Technologist, Mr. Harward is the top reviewer for fuze designs, central point of contact for the fuze safety boards, and

approver of estimates and solutions. He guides sourcing selection. Mr. Harward is also very active in the fuze industry as chair of the NDIA Fuze Conference Committee and panel member of the DoD Fuze IPT Advisory Panel. Mr. Harward is also the fuze tech council engineering representative, former Section Head for fuzing, and has held several leadership roles, including several

payload IPT lead roles. He presented a paper at the 2011 NDIA Fuze Conference in Salt Lake City, "Enhanced Weapon Arming Safety by Controlled Accumulation of Arming Energy." Mr. Harward has a B.S. in Electrical Engineering from the University of Arizona and an M.S. in Systems Engineering from Johns Hopkins University.



DR. DANIEL JEAN

Senior Microsystems Engineer

Army Research Laboratory, U.S. Army Combat Capabilities Development Command

Dr. Daniel Jean has worked for the past 20+ years in MEMS and fuzing for the

Naval Surface Warfare Center in Indian Head, Maryland. Areas of research included MEMS design for miniature fuzes and packaging for high-G survivability. Recently, Dr. Jean

moved to the Army Research Lab in Adelphi, Maryland, where he performs research in MEMS and additive manufacturing.



GEORGE JOLLY

Technical Advisor

Air Force Research Laboratory

George Jolly serves as the Technical Advisor

for the Fuzes Branch, Ordnance Division, Munitions Directorate, Air Force Research Laboratory, Eglin Air Force Base, FL. He acts as the subject matter expert for fuzing within the directorate to assist in all weapons development activities. As the Technical Advisor for the Fuzes Branch, he works with the branch personnel to assure the quality of research activities and its products and to set strategic goals. He also assists both the Ordnance Division Chief and the Directorate Chief Scientist in setting internal and external strategic research goals. Such goals include research in fuze system architecture, extreme

environment survivability, end game sensing, initiation sciences, and the characterization and phenomenology of fuzes. In this role, he is responsible for solving the technical gaps for fuzing in the U.S. Air Force for future weapon requirements.

Mr. Jolly has had a broad career for more than 36 years as a technologist having begun as an Air Force officer at the Weapons Laboratory, Kirtland AFB, where he researched radiation hardened microelectronics for space vehicle application. After leaving the Air Force in 1988, Mr. Jolly worked as a support contractor at Eglin AFB focused on fuze technology for various weapon systems that

includes JDAM, PAWWAY, CALCM, and the Sensor Fuzed Weapon. In 2003, he took the position of Director of Engineering for a company that designed and manufactured various avionics systems for both Air Force and Navy aircraft. In this position, he managed personnel in three locations around the country and was responsible for development programs for avionics on the F-15, FA-18, F-22, AC-130, and ACH-130 aircraft. In 2009, Mr. Jolly returned to Eglin AFB and technology development for weapon systems. Mr. Jolly became a Civil Servant and joined AFRL in 2010.

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MAXIM KEYLER

Electronic Engineer

Fuze Division, Armaments Center, U.S. Army Combat Capabilities Development Command

Maxim Keyler is an Electronic Engineer in the U.S. Army CCDC-Armaments Center

Fuze Division, Picatinny Arsenal, NJ, where he has worked since 2004. He obtained a Bachelor of Engineering / Computer

Engineering and Master of Engineering / Electrical Engineering from Stevens Institute of Technology. He has experience in both designing and troubleshooting electronic hardware as well as in software and firmware development. He is part of a team that develops fuze setting technologies

ranging from designing custom single board computers, developing applications for embedded systems, and researching ways to efficiently transfer information to increasingly more complex fuzes.



NICK MALINOSKI

Supervisory Engineer

Fuze Division, Armaments Center, U.S. Army Combat Capabilities Development Command

Nick Malinoski graduated in 2003 from Rutgers University with a B.S.

in Mechanical Engineering and then worked for a couple years for the U.S. Navy at the Naval Surface Warfare Center, Carderock Division (NSWCCD), providing modeling

and simulation work for ship structures and propulsors. Then, he spent a couple of years working for General Dynamics AIS on undersea hardware design, analysis and thermal testing, and the analysis of electronic components and systems. Mr. Malinoski began employment with the U.S. Army at the Armaments Center in 2008 in the Fuze

Division, beginning with hand grenade fuzing before transition to support mortar fuzing and then medium caliber fuzing. He became a Team Lead in 2013, overseeing hand grenade, medium-caliber, shoulder-launched, and artillery fuzing. In 2017, Mr. Malinoski became branch chief and has since been serving in that capacity.



VINCENT MATRISCIANO

Program Manager, Research & Development

Joint Program Executive Office Armaments & Ammunition

During his 30-year career, Vincent Matrisciano has worked many different

weapon system programs from tanks, howitzers, mortars, and small arms to advanced systems like remotely operated weapons and advanced energy systems. Early in his career, he was the U.S. Army's Technical Lead for the M95 Mortar Fire

Control System development program, a very successful program providing never-before-seen position and navigation, weapon pointing, and ballistic calculation capability to the mounted mortar battalion. That system was also used as the baseline for the subsequently developed digital fire control system for towed artillery (M777 and M119). Mr. Matrisciano has spent the past 10 years in JPEO Armaments and Ammunition

(formerly PEO Ammo), overseeing portfolios of technology and development projects. In this role, he is responsible for facilitating the transitions of technology into programs to be fielded to our warfighters. He is also an active representative of the DoD Fuze IPT, where he leads and supports multiple improvement efforts.



DR. ADRIANE MOURA, PHD

Staff Mechanical Engineer 2

Applied Research Associates, Inc.

Dr. Adriane Moura, PhD, is currently a mechanical engineer at Applied Research

Associates, Inc., supporting the Air Force Research Laboratory at Eglin Air Force

Base in Florida. Dr. Moura received her PhD from the Georgia Institute of Technology and her B.S. from Florida State University, both in Mechanical Engineering. Dr. Moura's technical interests include theoretical and experimental structural dynamics, linear/

nonlinear vibration and modal analysis, smart structures, mechanics of materials, and microelectromechanical systems.



KEVIN O'CONNOR, JR.

Mechanical Engineer

Fuze Division, Armaments Center, U.S. Army Combat Capabilities Development Command

Kevin O'Connor, Jr., graduated in 2018 from the New Jersey Institute of Technology with a Bachelor in Mechanical

Engineering. He has been working as a Mechanical Engineer in the U.S. Army CCDC-Armaments Center's Fuze Division for the past two years. Kevin works on the research and development of mechanical

Fuze S&A Technology, using specialized skills in Computer-Aided Design and Finite Element Analysis.



BERNARD SMITH-ROBERTS

Manager, Engineering Systems

Explosive Materiel Branch, Joint Systems Division, Capacity Acquisition and Sustainment Group, Australian Department of Defence

Bernard Smith-Roberts is the Engineering Systems Manager for the Explosive Materiel Branch within the Capability Acquisition and Sustainment Group of the Australian Department of Defence. In this role, he is responsible for the engineering system under which the safe, environmentally

compliant, and effective performance of explosive ordnance is delivered to the Australian Defence Force.

Mr. Smith-Roberts' career over the last 10 years within the Australian Public Service has spanned a number of roles within explosive ordnance and high-risk platform integration, systems safety, and regulatory organizations.

He graduated from the Australian National University with a BEng in Systems Engineering with honors in 2010 and from the University of New South Wales (Australian Defence Force Academy) with an MEng in Systems Engineering in 2013.



LT COL BRIAN A. "HANZO" STILES, USAF

Commander

72d Test and Evaluation Squadron, Whiteman Air Force Base, U.S. Air Force

Lieutenant Colonel Brian A. "Hanzo" Stiles, USAF, is the Commander, 72d Test and Evaluation Squadron, Whiteman AFB in Missouri. The 72d is responsible for the planning and execution of B-2 operational test and evaluation, including force development evaluations, tactics

development and evaluations, and software evaluations. He is an evaluator pilot in both the B-2A and T-38A.

Lt Col Stiles is from Roseville, CA, and received his commission in 2002 from the United States Air Force Academy where he was a distinguished graduate. He has served as an instructor pilot in the T-38A and B-2A. Prior to becoming the Director of Operations of the 72d, he was the Director of Plans

and Programs for the 509th Bomb Wing, planning and executing all major exercises and readiness evaluations. Lt Col Stiles is a senior pilot with more than 2,200 flight hours.

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Defense Electronic Systems (DES), a division of L3Harris, provides precision electronic components, subsystems, and systems for the DOD and international allies. DES specializes in the design and manufacture of fuze solutions, ignition safety devices, proximity sensors, inertial measurement and GPS navigation systems, aerospace indicators, and intelligence management systems. Furthermore, DES is introducing CHIEF (Configurable High-Impact Embedded Fuzing), a key enabler for

tactical flexibility and survivability in extreme target environments.

Headquartered near Cincinnati, Ohio, DES' primary manufacturing facility was specifically designed and constructed for the manufacture of fuzing and ordnance systems and precision electronic components. With additional locations in Anaheim, CA, Budd Lake, NJ, and San Diego, CA, DES has strategically positioned its resources, including program management, engineering, and quality assurance, at each site to ensure complete adherence to programmatic and technical requirements.

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