



# INSENSITIVE MUNITIONS AND ENERGETIC MATERIALS (IMEM) TECHNOLOGY SYMPOSIUM

---

**Enhancing Performance of Insensitive Munitions**

April 7 – 8, 2021 | [NDIA.org/IMEM21](https://NDIA.org/IMEM21)

# TABLE OF CONTENTS

EVENT INFORMATION ..... 3

THANK YOU TO OUR SPONSOR ... 3

AGENDA ..... 4

KEYNOTE BIOGRAPHY ..... 9



## NDIA

### WHO WE ARE

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](http://NDIA.org)

# WELCOME TO THE 2021 VIRTUAL INSENSITIVE MUNITIONS & ENERGETIC MATERIALS TECHNOLOGY SYMPOSIUM

On behalf of the IMEM Committee, I would like to welcome you to the 2021 Virtual Insensitive Munitions and Energetic Materials Technology Symposium. This international gathering of the top chemists, system designers, and engineers from government laboratories, private industry, and academia provides a forum for the exchange and dissemination of cutting-edge research in synthesis, formulation, system design, testing, characterization, and safety—all aimed at both advancing munitions effectiveness and improving safety for the warfighter.

Advancements made by the scientists and engineers presenting at this symposium are directly responsible for the development and fielding of higher-performing, safer munitions; however, challenges remain. It is through the continuing research, development, and collaboration of the members of this community and across our international defense industry that these challenges will be overcome.

**Melissa Hobbs-Hendrickson**

Senior Director, Business Development,  
Elbit Systems of America

Chair, Insensitive Munitions & Energetic  
Materials Committee, Munitions Division, NDIA

# EVENT INFORMATION

## EVENT WEBSITE

NDIA.org/IMEM21

## SURVEY AND PARTICIPANT LIST

You will receive via email a survey and list of participants (name and organization) after the conference. Please complete the survey to make our event even more successful in the future.

## EVENT CONTACTS

**Andrew Peters**  
Meeting Manager  
(703) 247-2572  
apeters@NDIA.org

**George Webster**  
Program Manager, Divisions  
(703) 247-9491  
gwebster@NDIA.org

## SPEAKER GIFTS

In lieu of speaker gifts, a donation is being made to the Fisher House Foundation.

## HARASSMENT STATEMENT

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.



## JOIN THE CONVERSATION

  
 @NDIAToday

  
 @NDIAMembership

  
 NDIA.org/LinkedIn

  
 @NDIAToday

  
 @NDIAToday

# THANK YOU TO OUR SPONSOR

## BAE SYSTEMS

At BAE Systems, we provide some of the world's most advanced, technology-led defense, aerospace and security solutions. We employ a skilled workforce of 87,800 people in more than 40 countries. Working with customers and local partners, we develop, engineer, manufacture, and support products and systems to deliver military capability, protect national security and people, and keep critical information and infrastructure secure.

# AGENDA

WEDNESDAY, APRIL 7

9:00 – 9:15 am

## WELCOME & INTRODUCTION

\*All times are in Eastern Daylight Time (EDT)

Gen Hawk Carlisle, USAF (Ret)

President and Chief Executive Officer, National Defense Industrial Association (NDIA)

9:15 – 10:00 am

## JOINT ENHANCED MUNITIONS TECHNOLOGY PROGRAM UPDATE

Lawrence Fan

Program Manager (Acting), Joint Enhanced Munitions Technology Program, Office of the Under Secretary of Defense for Research & Engineering

10:00 – 10:15 am

## NETWORKING BREAK

ENERGETIC MATERIALS

Session Chair: Steve Nicolich

POLICY

Session Chair: Tom Swierk

10:15 – 10:35 am

### TNT Exudation and Crystal Growth

Dr. Ernest Baker

Technology Specialist Officer, Warheads Technology, Munitions Safety Information Analysis Center (MSIAC), NATO

### NATO AC326 Subgroup B Ammunition Systems Design and Assessment – Insensitive Munitions Test STANAG Updates, Part 2

Ken Tomasello

Program Manager, Insensitive Munition Advanced Development, Naval Ordnance Safety & Security Activity

10:35 – 10:55 am

### Characterization of Nano Octol Formulation

Dr. Daniel Iwaniuk

Chemist, Explosives Development, Armaments Center, U.S. Army Combat Capabilities Development Command

### Revisions and Improvements to the NATO Insensitive Munitions Test Doctrine Portfolio

Daniel Pudlak

Principal Investigator, Armaments Center, U.S. Army Combat Capabilities Development Command

10:55 – 11:10 am

## NETWORKING BREAK

PROCESSING

Session Chair: Dr. Ernest Baker

TESTING

Session Chair: Ken Graham

11:10 – 11:30 am

### Improved Particle Size Reduction & Evaluation Technology for Energetics at HSAAP

Dr. Jacob Morris

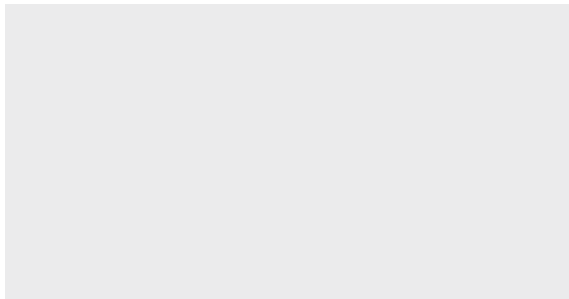
R&D Manager, BAE Systems

### Variability of Munition Response to Operational and Peace Time Threats

Martijn van der Voort

Technical Specialist Officer, Munitions Transport & Storage Safety, MSIAC, NATO

11:30 – 11:50 am



**Influence of Ageing on the IM Signature of an Anti-Aircraft Missile Propulsion Unit**

**Quentin Weisse**

Military Engineer, Expertise Program,  
DGA Missiles Testing (French MoD)

**Hervé Benard**

Head, DGA Missile Testing Expertise Division  
(French MoD); Munition Officer, MMCM Program, OCCAR

11:50 am – 12:05 pm

**NETWORKING BREAK**

<p><b>SYNTHESIS</b> Session Chair: Andrew Wilson</p>	<p><b>POLICY</b> Session Chair: Christelle Collett</p>
--	--

12:05 – 12:25 pm

**Development and Testing of NTFA**

**Dr. Sarah Headrick**

Senior Principal Scientist II, BAE Systems

**Harmonisation of NATO Insensitive Munitions & Hazard Classification Standards and Practices**

**Matthew Ferran**

Technical Specialist Officer, Munitions Systems, MSIAC,  
NATO

12:25 – 12:45 pm

**Continuous Reactors for Energetic Materials Synthesis**

**Dr. Joseph Rheinhardt**

Research Chemist, CS Squared LLC

**Defects Taxonomy & Lexicon**

**Matthew Ferran**

Technical Specialist Officer, Munitions Systems, MSIAC,  
NATO

12:45 – 1:05 pm

**Quantitative Structure-Property Relationship Models for Secondary Explosive Compounds**

**Carson Britt**

Research Chemist, CS Squared LLC

**Risk Associated with Under Classification of Small Arms Ammunition**

**Christelle Collett**

Technical Specialist Officer, Propulsion Technology,  
MSIAC, NATO

1:05 – 1:20 pm

**CLOSING REMARKS**

**Melissa Hobbs-Hendrickson**

Senior Director, Business Development, Elbit Systems of America  
Chair, Insensitive Munitions & Energetic Materials Committee, Munitions Division, NDIA

**THURSDAY, APRIL 8**

9:00 – 9:05 am

**OPENING REMARKS**

**Ron Hollands**

Chief Materials Technologist, BAE Systems

9:05 – 9:20 am

**MSIAC – HIGHLIGHTS AND FUTURE PRIORITIES**

**Charles Denham**

Project Manager, MSIAC, NATO



**NDIA**  
AT THE HEART  
OF THE MISSION

# 64<sup>TH</sup> ANNUAL **FUZE** CONFERENCE

---

## Continued Fuze Advancements amid a Global Pandemic

### Register Today

In 2021, the Fuze Section of NDIA's Munitions Technology Division aims to crack the code of fuze advancements—including their development, production, and performance—in relation to defense and national security within the time of a global pandemic. Accordingly, this event will virtually convene stakeholders from industry, government, and academia to advance the field and art of fuzing for the benefit of our current and future warfighters. Over the course of two days, attendees will network with fellow defense professionals from around the world, participate in engaging sessions, and explore the transformation of the theoretical into the practical. With its packed agenda and focused mission, this event is not to be missed. Secure your virtual spot online today.

May 11 – 12 | [NDIA.org/Fuze21](https://www.ndia.org/Fuze21)

9:20 – 9:30 am

## MUNITION SAFETY AWARDS CEREMONY

**Charles Denham**  
Project Manager, MSIAC, NATO  
*Award Presenter*

### ENERGETIC MATERIALS

Session Chair: Mike Ervin

### MODELING

Session Chair: Wade Babcock

9:30 – 9:50 am

### Evaluation of LX-14 Using FEM HMX

**John Latwinas**  
Chemical Engineer, Armaments Center,  
U.S. Army Combat Capabilities Development Command

### Application of Herd Immunity to Munitions Safety

**Martijn van der Voort**  
Technical Specialist Officer, Munitions Transport &  
Storage Safety, MSIAC, NATO

9:50 – 10:10 am

### Evaluation of PBXN-9 Utilizing FEM HMX

**Dr. Daniel Iwaniuk**  
Chemist, Explosives Development, Armaments Center,  
U.S. Army Combat Capabilities Development Command

### Modeling of the M795 155 mm Artillery Projectile Sympathetic Reaction Test

**Dr. Erik Tolmachoff**  
Senior Engineer, CS Squared LLC

10:10 – 10:25 am

## NETWORKING BREAK

### ENERGETIC MATERIALS

Session Chair: Paul Braithwaite

### TESTING

Session Chair: Ken Graham

10:25 – 10:45 am

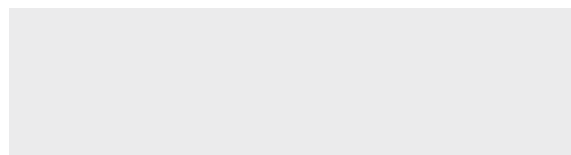
### Novel Recrystallization Procedure to Generate High Bulk Density NQ (HBDNQ) with an Average Particle Size of Less Than 50 $\mu\text{m}$

**Dr. Tomasz Modzelewski**  
R&D Chemist, BAE Systems

### Influence of Mechanical Properties on the Explosiveness of Energetic Materials

**Morgan Bolton**  
Energetic Material Scientist, Defense Ordnance Safety  
Group, ST1

10:45 – 11:05 am



### Advancing Particle Size Characterization Technology: Dynamic Image Analysis

**Dr. Teresa Kirchner**  
Principal Scientist, BAE Systems

11:05 – 11:20 am

## NETWORKING BREAK

### ENERGETIC MATERIALS

Session Chair: Melissa Mileham

### TESTING

Session Chair: Ron Hollands

11:20 – 11:40 am

### An International Review on Green Insensitive Plastic Explosives

**Christelle Collett**  
Technical Specialist Officer, Propulsion Technology,  
MSIAC, NATO

### Re-Development & Manufacture of LX-04 Explosive at HSAAP

**Brian Alexander**  
R&D Senior Principal Chemist and R&D Safety Officer,  
BAE Systems

11:40 am – 12:00 pm	<p><b>Repurposing IMX-101 Risers for Use in the Mining, Oil, and Gas Industries</b>  <b>Radhika Kasabwala</b>  Mechanical Engineer, Explosives Department Branch, Armaments Center, U.S. Army Combat Capabilities Development Command</p>	<p><b>Process Improvement of High Performance Explosive PAX-2A</b>  <b>Virgil Fung</b>  R&amp;D Senior Principal Scientist and Program Manager, BAE Systems</p>				
12:00 – 12:15 pm <b>NETWORKING BREAK</b>						
<table border="0" style="width: 100%; background-color: #cccccc; text-align: center;"> <tr> <td style="width: 50%;"><b>ENERGETIC MATERIALS</b></td> <td style="width: 50%;"><b>PROCESSING</b></td> </tr> <tr> <td>Session Chair: Jamie Neidert</td> <td>Session Chair: Melissa Hobbs-Hendrickson</td> </tr> </table>			<b>ENERGETIC MATERIALS</b>	<b>PROCESSING</b>	Session Chair: Jamie Neidert	Session Chair: Melissa Hobbs-Hendrickson
<b>ENERGETIC MATERIALS</b>	<b>PROCESSING</b>					
Session Chair: Jamie Neidert	Session Chair: Melissa Hobbs-Hendrickson					
12:15 – 12:35 pm	<p><b>Nanomaterials as Energetic Fillers</b>  <b>Christopher Hollands</b>  Technology Specialist Officer, Energetic Materials, MSIAC, NATO</p>	<p><b>Artillery Projectile Prematures Historical Review</b>  <b>Dr. Ernest Baker</b>  Technology Specialist Officer, Warheads Technology, MSIAC, NATO</p>				
12:35 – 12:55 pm	<p><b>Advanced High-Performance Minimum Smoke Propellants</b>  <b>Cameron Lee</b>  Senior Engineer, Energetics and Propellant Development Group, Aerojet Rocketdyne</p>	<p><b>IM Upgrade of the Italian Army’s 155 mm Artillery Projectiles</b>  <b>Dr. James Padfield</b>  Head, Explosives Engineering, RWM Italia SpA</p>				
12:55 – 1:15 pm	<p><b>Advanced Insensitive Munitions &amp; Energetic Materials Concepts Using 1.5-Nanometer Titanates &amp; Zirconates</b>  <b>Salvatore Monte</b>  President, Kenrich Petrochemicals, Inc.</p>	<p><b>Barrel Heating for Hot Gun Cook-Off Thermal Analysis</b>  <b>Dr. Jon Yagla</b>  Bowhead Technical Services</p>				
1:15 – 1:35 pm	<p><b>Allied Ordnance Publication (AOP-7) Revision Status</b>  <b>Ken Tomasello</b>  Program Manager, Insensitive Munition Advanced Development, Naval Ordnance Safety &amp; Security Activity</p>	<p><b>A Review of Mitigation Techniques for Small Calibre Munitions and Flares</b>  <b>Christelle Collett</b>  Technical Specialist Officer, Propulsion Technology, MSIAC, NATO</p>				
1:35 – 1:45 pm	<p><b>CLOSING REMARKS</b>  <b>Gen Hawk Carlisle, USAF (Ret)</b>  President and Chief Executive Officer, NDIA</p>					

NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members: prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.



# KEYNOTE BIOGRAPHY



## LAWRENCE FAN

*Program Manager (Acting), Joint Enhanced Munitions Technology Program  
Office of the Under Secretary of Defense for Research & Engineering*

Mr. Lawrence Fan is a program manager for DoD fuzing and munitions technology and development programs. Mr. Fan is based out of the Energetics Technology Department at the Naval Surface Warfare Center Indian Head Division. Since entering government service in 1990, he has supported fuzing

development for 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 OUSD Research and Engineering (R&E) Joint Fuze Technology Program (JFTP). In 2020, Mr.

Fan assumed the Program Manager (Acting) duties for the OUSD R&E Joint Enhanced Munitions Technology Program (JEMTP). The JFTP and JEMTP invests and executes 6.2 and 6.3 munitions technology projects with a focus on pervasive DoD needs. Mr. Fan is also the Navy lead in the DoD Fuze IPT which supports Department fuzing R&D, acquisition, policy and industrial base issues.



## NDIA Connect

### AN ONLINE COMMUNITY FOR DEFENSE PROFESSIONALS

NDIA Connect is a members-only benefit that's bustling with information, conversation, and activity stimulated by defense professionals from industry, government, and academia. Log in today to explore the platform's various functionalities and contribute to our collective mission in support of the warfighter. From anywhere and at any time, use NDIA Connect to network with colleagues, collaborate on projects, and stay connected.

**Connect.NDIA.org**

