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**NDIA**  
**MDA SBIR Industry Day**  
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**Interceptor Technology Research Area**

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MDA/DV



# Agenda

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- Research Area Objectives
- Research Area Approach
- List of Topics
- Topic Overviews
- Questions



# Interceptor Research Area Scope and Objectives

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- **Scope:** Develop innovative technologies for spiral upgrades to current Ballistic Missile Defense (BMDS) interceptor systems and enable advanced interceptor concepts.
- **Objectives**
  - Increase the capabilities and effectiveness of future or present interceptors for the BMDS
  - Intercept various threats in all phases of flight
  - Help discriminate lethal targets from decoys
  - Defeat asymmetric threats



# Interceptor Research Area Approach

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- **Standardized Program Reviews:** Regularly scheduled reviews to ensure research is being shared with an MDA-wide audience.
- **Help with Transition :**
  - Industrial Partnership Days: Regular events that match SBIR projects with interested Prime Contractors.
  - Institute processes to encourage and maximize transition opportunities (Interceptor Research Area IPT).
  - Proactive support of Technology Applications Program. The TA Program helps MDA funded small businesses to commercialize their technology.



# Interceptor Research Area 2009.3 SBIR/STTR Solicitation

TOPIC	Topic Team Lead	Co-lead
Advanced Synergistic Structures	Joe Ratliffe	
Interceptor Avionics	Teng Ooi	Doug Engle
Interceptor seekers	Mei Mei Tidrow	
Advanced Divert and Attitude Control Systems	Doug Engle	Pashang Esfandiari
Advanced Power Storage Devices	Samuel Stuart	
Innovative Axial Propulsion Technology	Jason Calvert	Paul Zuttarelli
Propulsion Modeling <sup>(STTR)</sup>	Richard Kramer	



# Advanced Synergistic Structures

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- **Objectives:** Develop technology for interceptors that integrates disparate components into the load bearing structure as well as have other functionalities such as shielding.
- **Description:** Desire the development of revolutionary and evolutionary interceptor structure and material technologies that will significantly improve the survivability, reduce the mass, and increase the rigidity of the interceptor structure. The desire is to improve the interceptor structure to allow improvements in key performance parameters (speed, volume, mass, accuracy, agility, etc.) needed to counter present and emerging threats.



# Interceptor Avionics

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- **Objectives:** Development of innovative, high performance avionics systems, subsystems, and components that will enhance the capability of current and future interceptors in a hostile environment.
- **Description:** Desire new GNC modular architecture along with compact, inexpensive, advanced GNC components to support increases in agility, processing power, and accuracy. The focus will be on improving the state-of-the-art in inertial measurement units.



# Interceptor Seekers

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- **Objectives:** Design, develop and demonstrate innovative long range detection, highly integrated, compact, lightweight interceptor seeker technologies of all Ballistic Missile Defense (BMD) endo- and exo-atmospheric targets.
- **Description:** Desire technologies that will support integrated seeker suites for advanced, agile interceptors by reducing mass, increasing sensitivities, using multiple bands, increasing frame rate, and being more cost effective to:
  - Counter maneuvering targets
  - Facilitate discrimination
  - Defeat the asymmetric threats
  - Improve current BMD interceptor capabilities to defeat threat in all phases of flight



# Advanced Divert & Attitude Control Systems

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- **Objectives:** Develop innovative DACS technologies to address cost reduction, insensitive munitions and safety requirements, while maximizing the interceptor divert capability with low mass within restricted geometries.
- **Description:** Desire DACs technologies including structures, propellants, and controls systems that maximize divert capability, maximize efficiency, minimize system latency, increase flexibility of structural designs, minimize mass, and improve safety. The focus will be on DACs which can produce the required performance in a small package to enable development of a lightweight interceptor.



# Advanced Power Storage Devices

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- **Objectives:** MDA is seeking to develop next generation power sources for interceptors including nonrechargeable and rechargeable batteries to accommodate unique, existing and future MDA system, subsystem and component requirements.
- **Description:** Desire battery technologies that can maximize energy density, increase safety, maximize volumetric efficiency by allowing flexible structural designs while retaining long term storage capabilities and maximizing charge /discharge cycles (for rechargeable batteries).



# Innovative Axial Propulsion Technology

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- **Objectives:** Develop innovative booster propellant, component designs, and/or test capabilities that are low cost, highly reliable and cognizant of DoD insensitive munitions (IM) objectives including operational and environmentally friendly formulations.
- **Description:** Desire technologies developed that will provide advanced materials, modeling and simulation, propellants and energy generation methods and/or component design capabilities for various developments within the BMDS.



# Propulsion Modeling<sup>(STTR)</sup>

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- **Objectives:** Develop propulsion system related models, e.g., combustion chamber instability, thermo-mechanical and thermo-chemical models.
- **Description:** Additional understanding is needed in the instability issues associated with liquid propellants operating in low temperature environments and the application of combustion instability methodologies to monopropellant systems. Desire better diagnostic techniques, and improved predictive computational algorithms.



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# QUESTIONS?