



# 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



- **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 with a focus on ascent phase
  - Reduce cost of future interceptors
  - Increase robustness of future interceptors



# Interceptor Research Area Approach



- Assemble world class, multi-service/agency topic team leads and evaluators
- Focus on a manageable set of topics to enhance interceptors that is refined each year
- Provide proactive transition assistance
  - Technology advocate with primes and programs
  - Support the Technology Applications Program
  - Support Industry Days



# Topic Team Leads

TOPIC	LEAD	CO-LEAD
<b>Advanced Synergistic Structures</b>	Mr. Joseph Ratliffe	TBD
<b>Divert, Attitude Control and Axial Propulsion System Technologies</b>	Dr. Jason Calvert	Mr. Doug Engle
<b>Dual-band Passive Interceptor Seekers</b>	Dr. Meimei Tidrow	Ms. Leslie Aitcheson
<b>Active Sensor Technologies for Interceptor Seekers</b>	Dr. Don Snyder	TBD
<b>Radiation Hardened Interceptor Avionics for Ascent Phase Interceptor</b>	Dr. Teng Ooi	Mr. Doug Engle



# Advanced Synergistic Structures



- **Objectives:** Develop technology for interceptors that integrates disparate components into the load bearing structure as well as have other functionalities such as shielding and lethality enhancement.
- **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.



# Divert, Attitude Control and Axial Propulsion System Technologies



- **Objectives:** Develop and demonstrate innovative technologies for advanced solid/liquid propulsion components and systems (DACS and Axial) for Ballistic Missile Interceptors.
- **Description:** Desire technologies including structures, robust materials, propellants, and control systems that maximize divert capability, maximize mass fraction, minimize system latency, increase flexibility of structural designs, minimize mass, reduce costs and improve safety. Physics based reaction and degradation models are also desired.



# Radiation Hardened Interceptor Avionics for Ascent Phase Interceptor



- **Objectives:** The objective of this effort is to develop and demonstrate innovative, high performance avionics systems, subsystems, and components that will enhance the capability of interceptors to achieve early intercept in hostile environments.
- **Description:** Desire cost effective technologies including seeker signal/image processors, flight computer, gyros, accelerometers, IMUs, INUs, IRUs, DACS controllers, secure interceptor communications, innovative antenna technology, internal wiring/wireless interconnectivity, connectors, networks, and interceptor power sources (batteries) and power conditioning that can operate reliably in the hostile, rapid acceleration, high g-load conditions required to overtake and intercept a threat.



# Dual-band Passive Interceptor Seekers



- **Objective:** Develop and demonstrate highly integrated, compact, high performance interceptor infrared seeker technologies, including dual-band infrared sensors, advanced seeker component technologies and forward-thinking architecture and algorithms.
- **Description:** Desire innovative technologies that will allow the development of a two-band, 512x512 to 1024x1024 IR interceptor seeker including but not limited to advanced dual-band IR FPA development, seeker architectures and signal processing electronics design. Focus will be on technologies that can enable development of a real-time, two-band IR seeker with a very large field of view.



# Active Sensor Technologies for Interceptor Seekers



- **Objective:** Develop and demonstrate highly integrated, severe environment, active sensor ranging, velocity and active imaging components for multi-mode seekers to enhance long range target acquisition, track, and intercept.
- **Description:** Desire seeker technologies that provide active ranging and velocity of threats within the size and weight of current seeker footprints to refine the velocity and line of sight angle estimates and derive information regarding target motion. Focus efforts include active-multiple pulse receiver readout integrated circuits , compact laser systems with high peak power, short pulses that can switch to high pulse repetition rates, ultrafast and ultrasensitive laser detectors and arrays (1-5 micrometer) that are inherently radiation hard, and beam steering technologies.



# Questions?

