Missile Defense Agency
Advanced Research Overview
The Increasing Ballistic Missile Threat

- Increasing theater threat capabilities
  - Accuracy & Range
  - North Korea developing new IRBM
- Developing ICBM threat
  - North Korea developing KN-08 ICBM
  - Iran may be technically capable of flight-testing an ICBM by 2015
  - Space Launch Vehicles (SLV) could serve as a test beds for ICBM technologies
- Challenging Missile Defense
  - Maneuver / Salvo firings / Countermeasures

The Increasing Ballistic Missile Threat

- Taepo Dong-1 Launch, August 1998
- North Korean Taepo Dong-2 SLV Launch, December 2012
- North Korean Mobile IRBM on Parade, April 2012
- North Korean KN08 ICBM Launcher on Parade, 2012
- Missile Launches in Iranian Noble Prophet III Exercise 2009
- Iranian Ashura 2-stage solid MRBM launch 2012
- Iranian Safir SLV on launch pad, 2011
Today’s Ballistic Missile Defense System

SENORS
An effective layered defense incorporates a wide range of sensors to detect and track threat missiles through all phases of their trajectory. Satellites and a family of land and sea-based radars provide worldwide sensor coverage.

SATELLITE SURVEILLANCE
FORWARD-BASED RADAR
UPGRADED EARLY WARNING RADAR
AEGIS BMD SPY-1 RADAR
SEA-BASED X-BAND RADAR

BOOST/ASCENT
Defense Segment
Potential New Technologies
SM-3 Standard Missile-3

MIDCOURSE
Defense Segment
EKV Exoatmospheric Kill Vehicle
GBI Ground-Based Interceptor
GMD Ground-Based Midcourse Defense

TERMINAL
Defense Segment
AEGIS Sea-Based Terminal
PAC-3 Patriot Advanced Capability-3
THAAD Terminal High Altitude Area Defense

THE SYSTEM OF ELEMENTS
C2BMC Command and Control, Battle Management, and Communications
NMCC USSTRATCOM USNORTHCOM USPACOM USEUCOM USCENTCOM

The Command and Control, Battle Management, and Communications (C2BMC) program is the hub of the Ballistic Missile Defense System (BMDS). It is a vital operational system that enables the U.S. President, Secretary of Defense and Combatant Commanders at strategic, regional and operational levels to systematically plan ballistic missile defense operations, to collectively see the battle, and to dynamically manage designated networked sensors and weapons systems to achieve global and regional mission objectives.
MDA Small Business Innovation Research (SBIR) / Small Business Technology Transfer Program (STTR) Focus

• Pursue a broad range of high-risk technologies
  - To search out revolutionary technologies
  - Transform new technologies into actual applications for insertion into the BMDS
  - Benefit from commercialization

• Technology insertion into the BMDS is critical

• 4th largest program in the Department of Defense
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Rapid Innovation Fund (RIF) Program

- Established under FY11 Defense Authorization Act (Section 1073)
  - A competitive, merit-based program
  - Accelerate fielding of innovative technologies into military systems
  - Typically, all MDA RIF projects are a SBIR Phase II follow-on
  - Prioritization is given to small business

- Key Requirements:
  - Satisfy an operational or national security need
  - Accelerate or enhance military capability
  - Reduce
    - Technical risk
    - Cost: Development, acquisition, sustainment, or lifecycle
  - Improve timeliness and quality of test and evaluation outcome
  - Provide approach for use by an acquisition program
  - Typical award length 24 months
  - Award values up to $3M

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University Engagement

• Technical Objectives
  - Fund relevant, advanced research and development at domestic universities and academic institutions
  - Exploit breakthroughs in science to offer robust technical improvements to BMDS
  - Build portfolio of revolutionary technology to support and enhance BMDS
  - Develop holistic partnerships
  - Educate future scientists and engineers

Optical Signal Processor Technology
Field Programmable Gate Array Technology
High Energy Laser Technology
Propulsion Technology

Data Fusion and Tracking Algorithms
Advanced Command and Control Algorithms

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BAA Programs

• Missile Defense Science & Technology Advanced Research
  - Open continuously for proposals from universities
    • Broad Agency Announcement (http://www.fbo.gov)
  - Research topics revised annually
  - MDA is seeking strategic alliances with universities
  - Two year base period with one year option
    • Base period $400,000
    • Option year $200,000

• Advanced Technology Innovation Broad Agency Announcement
  - Open continuously to university and commercial vendors
  - Contract value not limited
What is a Broad Agency Announcement (BAA)?

• A competitive research and development contracting approach in the form of a general agency announcement:
  - Identifies areas of research interest
  - Includes criteria for selecting proposals
  - Solicits participation from all offers capable of satisfying the Government need

• Primary objective is to encourage participation by science and technology firms and educational institutions in meeting general research and development goals for innovative ideas and approaches

• Meet full and open competition requirements "The Competition in Contracting Act of 1984"

• Evaluates proposals based on peer or scientific reviews against individual merits rather than against each other
• MDA receives white paper

• Evaluation team evaluates and makes recommendations for award based on a peer or scientific review process IAW with FAR 35.016(d) and (e)

• Technical evaluator(s) uses criteria IAW the BAA to score white paper
  - Technical merit
  - Capabilities
  - Management

• BAA Selection Official makes selections based on the evaluation criteria IAW the BAA, MDA funding and technology priorities
For More Information

www.mda.mil

- Missile Defense News, Images, Videos, Fact Sheets
- BMDS Overview, BMD Basics
- DoD SBIR/STTR website: [https://sbir.defensebusiness.org](https://sbir.defensebusiness.org)
- SBA SBIR/STTR website: [https://www.sbir.gov](https://www.sbir.gov)

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