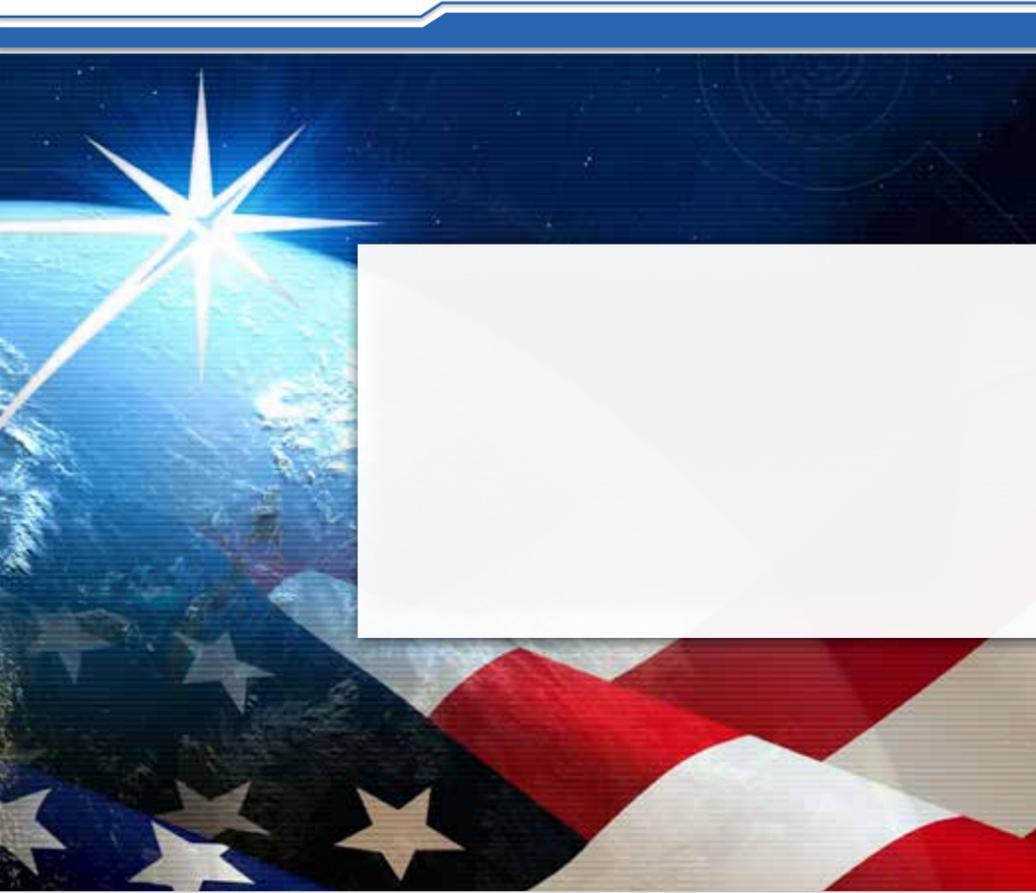
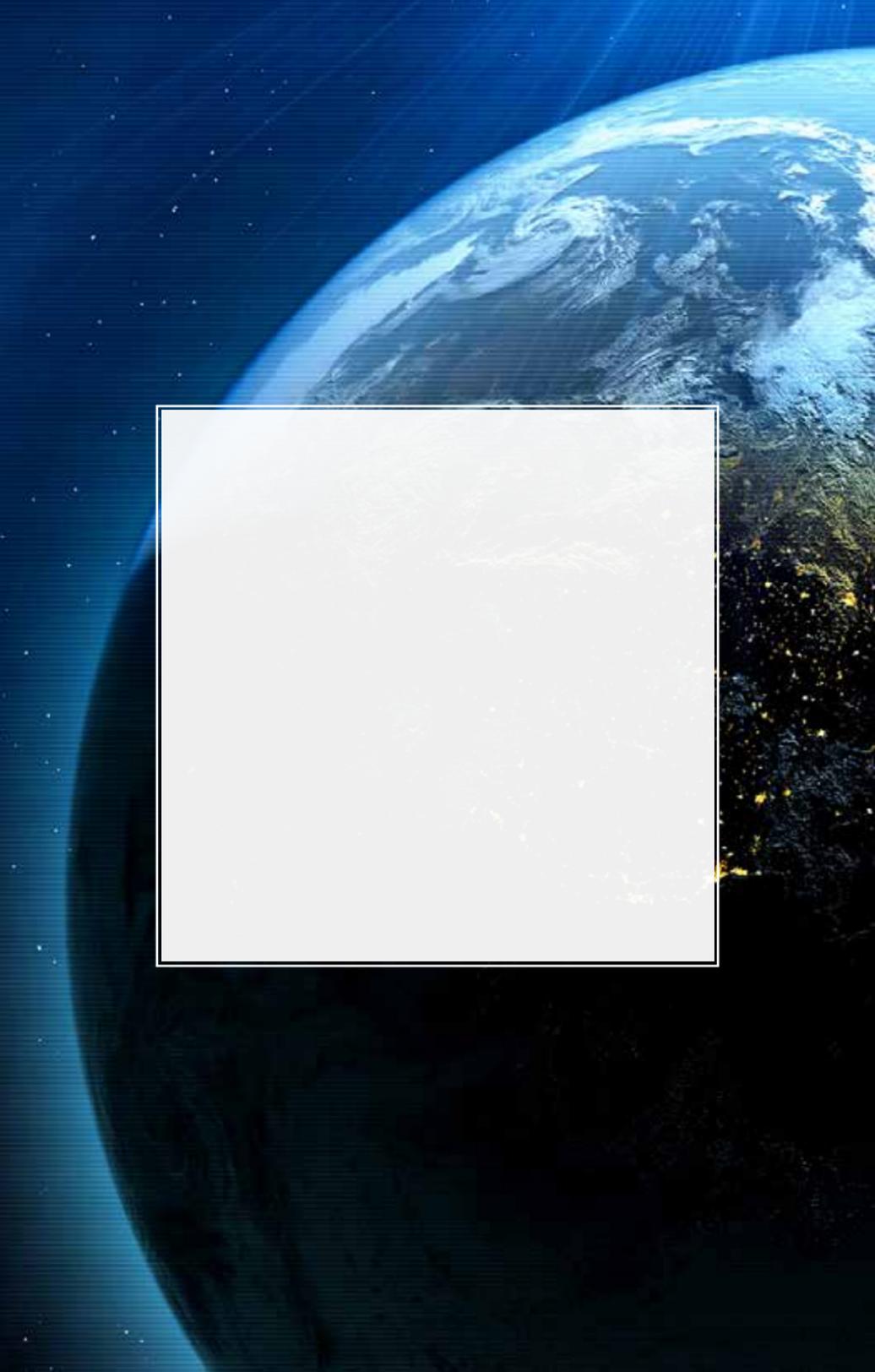


MISSILE DEFENSE AGENCY



PARTNERING TODAY  
DEFENDING TOMORROW



# contents

## UNIVERSITY PROGRAMS PLAYBOOK



### Welcome



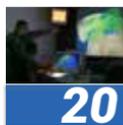
### Who We Are



### The Role of Universities



### Opportunities



### Responsibilities

## QR CODES



Throughout this booklet you will notice these “boxes of black blocks”. These are QR codes. You can take a picture of them with an app on your mobile device to be quickly taken to the websites or resources that are referenced around them. This saves you the time instead of having to enter the website address manually.

There are many applications on your mobile device capable of using these codes, simply search in your devices application store for QR CODE READER, install and enjoy faster access to our Online content.

# PURPOSE

This Missile Defense Agency (MDA) University Programs Playbook is intended to guide universities through the process of submitting proposals for research. MDA generally focuses on awarding contracts for research, rather than grants for research, and it relies largely on broad agency announcements (BAAs) to inform the public about technical areas in which MDA may award research-related contracts.

MDA posts its BAA's at several locations on the internet, including:

[www.fedbizopps.gov](http://www.fedbizopps.gov)

[www.mdatechnology.net](http://www.mdatechnology.net)

This publication also includes information to help universities discover additional collaboration and partnership opportunities with MDA, as well as information on the history, mission, and needs of MDA.

For further information on MDA visit [www.mda.mil](http://www.mda.mil).

[www.mda.mil](http://www.mda.mil)





**JOHN H. JAMES, JR.**  
Executive Director  
Missile Defense Agency

**M**issile defense is perhaps the most technically complex challenge that has ever faced mankind, and it demands the talents of our best and brightest citizens. Today's Ballistic Missile Defense System builds on more than 50 years of research focused on defeating ballistic missiles. Our nation is now facing two challenges: limited funding for developing technology for the next generation of missile defense systems, and a decreasing number of college graduates with science, technology, engineering, and mathematics (STEM) degrees that are qualified for designing these systems. We are aggressively engaging colleges and universities to face both challenges.

Our university engagement vision is to create productive, long-term, and mutually beneficial partnerships with colleges and universities. The purpose of these partnerships is to pursue innovative research, continuously improve the skills of our existing workforce, nurture and shape the development of our future workforce, and strengthen our academic partner institutions.

Partnering with a Federal agency can be challenging. My goal is for this playbook to assist our university partners in learning how to do business with us. There is contact information in every section of this document that can answer questions and help with the next steps.

# WHO WE ARE

The background of the page is a photograph of a sunset or sunrise. The sky is filled with dark, textured clouds, with a bright orange and yellow glow from the sun just below the horizon. Two prominent, bright white streaks of light, resembling meteors or laser beams, cut across the sky. One streak starts in the upper left and points towards the center. The other starts near the horizon and points towards the center, ending in a small, bright, glowing point.





# THE ROLE OF UNIVERSITIES

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Throughout the history of U.S. missile defense, building the tools required to accomplish the mission has presented a host of complex technical challenges.

Developing, maintaining, and improving the BMDS drives a constant need for new:

- Materials for electronics and structural components.
- Computing schemes and data-processing regimes.
- Modeling techniques.
- Manufacturing methods.
- Imaging techniques and sensors.
- Optical components.
- Propellants, fuels, and power technologies.
- Signal-processing tools.
- Actuation/mechanical technologies.

*[Note: These examples represent only some of the areas in which MDA seeks innovation.]*

“*The need of innovation remains, and universities continue to help MDA fill that need.*”

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The missile defense mission touches on a host of major scientific fields, such as electrical engineering, mechanical engineering and robotics, materials engineering, chemistry, software and hardware development, and electro-optics.

The path from idea to technology to product insertion in the BMDS is a long one. That path of innovation often begins at the academic level. Universities across the nation have played a significant role in developing the technology required to address MDA's technical challenges, helping to advance U.S. missile defense.

MDA-funded research-and-development work at universities:

- Results in technologies that can evolve into new products for insertion into the BMDS.
- Provides data and information that can improve BMDS operations.
- Leads to core discoveries and inventions that can further the state-of-the-art and fuel future innovations for missile defense.
- Furthers methods of production that bring greater efficiency to BMDS-related operations.
- Fosters spin-off companies for pursuing commercialization of viable technologies for missile defense and beyond.
- Gives researchers familiarity and experience with missile defense technology challenges—providing useful knowledge for those who ultimately seek a transition into industry or MDA careers.

The need for innovation remains, and universities continue to help MDA fill that need. Over the years, MDA has funded hundreds of university projects to develop technologies that can play a role in missile defense. MDA also funds dozens of new research and development projects to help promising missile defense technologies thrive on a yearly basis.



# OPPORTUNITIES

This section will describe the many partnership paths that your university can take as we work together to defend tomorrow.

# Emphasis on Engagement

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One of our goals is to: "Capitalize on the creativity and innovation of the Nation's universities and small business community to enhance missile defense Science and Technology."

To achieve that goal, MDA instituted a university engagement policy that encompasses a holistic approach involving research; educational opportunities; career development; science, technology, engineering, and mathematics activities; and many other opportunities.

When university partners collaborate with MDA, they can derive benefits such as:

- An awareness of the challenging research topics missile defense offers.
- Access to a source of funding for continuing research strings and student financial assistance.
- Shaping their curricula to better prepare students for careers in missile defense.
- Real world experience through sponsored sabbaticals and summer intern programs.
- A government partner/sponsor for the STEM education outreach.

Thanks to partnership with universities the MDA benefits include:

- Access to cutting-edge research and facilities and a pool of nationally recognized scholars.
- Exposing the Nation's brightest students to the intellectual challenges a missile defense career offers.
- Influencing the engineering curricula to better prepare the future missile defense workforce.
- Refresh the knowledge of the existing workforce through distance learning programs, encouraging professorial sabbatical and guest lecture series.
- Bringing a new perspective to solving some of the most difficult missile defense-related problems.

# OPPORTUNITIES

Major MDA-University Partnership Opportunities: Going Further

Universities interested in working with MDA have several avenues for beginning partnerships. The following pages explain in more detail each of the key MDA programs that extend to collaboration with universities.

## 1 **MSTAR**

### **Missile Defense Science & Technology Advanced Research**

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The Missile Defense Science & Technology Advanced Research (MSTAR) broad agency announcement is open to all accredited domestic universities and colleges. This program funds relevant Advanced Technology research and demonstration work at qualified accredited domestic colleges, universities, or institutions of higher learning, and it supports training of future scientists and engineers in the field of missile defense.

## 2 **ATI**

### **Advanced Technology Innovation**

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MDA's Advanced Technology Innovation (ATI) BAA is open to any university, organization, or individual that does not receive the majority of its funding from the U.S. Government. These efforts identify and develop innovative concepts, stimulate technology innovation, and exploit breakthroughs in science to offer robust technology improvements to all elements of the BMDS.

MDA posts BAA announcements on the Federal Business Opportunities (FedBizOps.gov) website. The specific technical areas of interest in each BAA vary, as do funding and schedule limits. The schedule or window for receiving proposals also varies for each BAA.

MDA bases all contract awards on technical interests at the time and on available funds, making awards on a competitive basis.

For more information, contact the Missile Defense Agency University Research office at (256) 450-3800.

### **IMPORTANT POINTS WHEN PURSUING BAA WORK**

- MDA's ATI research contracts include a clause requiring MDA approval for anything a researcher may want to publish/present about work funded by MDA.
- A second clause requires clearing all proposed foreign nationals before they work on contracts.
- As always, Federal laws on Foreign Disclosure, Export Administration Regulations (EAR) and International Traffic in Arms Regulation (ITAR) apply.



# OPPORTUNITIES

Major MDA-University Partnership Opportunities: Going Further

3

## SBIR & STTR

### SBIR and STTR Programs

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The Department of Defense's SBIR and STTR programs fund early-stage research and development projects at small technology companies. Funded projects must serve a DoD need and have the potential for commercialization in the private sector or military markets. Funded at more



than \$1B in fiscal year 2011, the program stands as part of a larger, Federal SBIR program administered by ten agencies—at a total program funding level greater than \$2B.

The Small Business Technology Transfer program, like SBIR, is a government-wide program, mandated by the Small Business

Research and Development Enhancement Act of 1992 (Public Law 102-564).

While STTR has the same objectives as SBIR regarding the involvement of small businesses in Federal research and development and the commercialization of innovative technologies, the STTR program requires teaming with universities, federally funded research and development centers (FFRDCs), and other non-profit research institutions.

Each team, which includes a small business (as the prime contractor for contracting purposes) and at least one

research institution, can submit an STTR proposal. The small business must perform at least 40 percent of the work and the research institution(s) must perform at least 30 percent of the work. Either team member or a third party may perform the remainder of the work.

For more information on MDA SBIR and STTR opportunities and procedures, please visit the following sites.



[www.dodsbir.net](http://www.dodsbir.net)



[www.mdasbir.com](http://www.mdasbir.com)

## MAKE YOUR OWN OPPORTUNITIES

In addition to conventional MDA-sponsored opportunities, universities often develop their own partnerships organically with companies working on MDA-funded projects. Collaboration might involve anything from student internships to product testing to resource sharing to traditional research and development work. Universities who collaborate with MDA-funded companies—both large and small—play a significant role in advancing technology for potential use in missile defense. Universities often find potential MDA-funded partner companies by navigating traditional networking channels—defense-related exhibitions, technology-specific conferences, and MDA-sponsored events.

Websites such as [www.mdatechnology.net](http://www.mdatechnology.net) and [www.dodsbir.net/Awards/Default.asp](http://www.dodsbir.net/Awards/Default.asp) also provide a starting point for finding MDA-funded companies working in specific fields.



[www.mdatechnology.net](http://www.mdatechnology.net)



[www.dodsbir.net/Awards/Default.asp](http://www.dodsbir.net/Awards/Default.asp)

# OPPORTUNITIES

Major MDA-University Partnership Opportunities: Going Further

## 4 HBCU/MIs

### Historically Black Colleges/Universities and Minority Institutions

Historically black colleges and universities/minority institutions serve as an essential element in MDA's strategy for conducting high-quality research and increasing the number of science, technology, engineering, and mathematics college graduates.

MDA seeks the involvement of HBCU/MIs in missile defense academic programs to shape its research and workforce to improve diversity of thought. HBCU/MI participation across the full spectrum of its academic programs is strongly encouraged. The strategy involves:

- Aggressively encouraging all HBCU/MIs to propose partnerships on MDA university engagement programs.
- Actively participating in the key minority STEM forums, including Black Engineer of the Year Award and Advancing Minorities Interest in Engineering.
- Diligently sponsoring HBCU/MI teaming agreements through Leader/Follower programs. MDA now partners with Howard University to assist HBCU/MIs in learning how to work with the Government on everything from proposing work to closing out contracts. Team arrangements can also help universities gain access to unique test equipment and expertise.

MDA's Office of Small Business Programs historically has worked to coordinate HBCU/MI activities. For background on HBCU/MI opportunities, contact the office by e-mail at:

[MissileDefenseAgencyOutreach@mda.mil](mailto:MissileDefenseAgencyOutreach@mda.mil)



## A Portfolio of Talented People

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To address the MDA's goal of recruiting, developing, and retaining a high-performing and accountable workforce, MDA continues to develop a robust and active "Recruiting portfolio."

This labor force will support the MDA mission while working at MDA, DoD, and other sites - including domestic and foreign partner university facilities. The portfolio also will accommodate university sabbatical work to provide opportunities for faculty to work one on one with Government employees at MDA facilities to learn more about real-world technology applications. University partners meanwhile will have access to a comprehensive and user-friendly Web-based outreach tool provided through the MDA Knowledge Online portal.

The recruiting portfolio plan calls for mission-focused and performance-based career development and cooperative-

education programs. Another element of the portfolio plan addresses the use of career/job fairs and scholarships to fill MDA personnel vacancies and position requirements.

Technology workshops and combination of on-site/off-site and short-term/long-term continuous education opportunities will serve as an integral part of the Recruiting Portfolio. Continuous education provides for challenging work environment that fosters the development of technically competent professionals-professionals who will deliver and sustain national defense capabilities. MDA will encourage interactive distance learning among MDA and partnering universities to strengthen the academic partner institutions while ensuring that the technical competencies of MDA's workforce remain high.



# OPPORTUNITIES

Fostering Future Innovators Through Education



## Future Innovators

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The U.S. Government investment in future innovators happens as early as kindergarten, through programs emphasizing the STEM fields of study. For MDA and the DoD, STEM initiatives focus on making K-12 and college students more aware of the potential, the impact, and the importance of work in the mathematics- and science-based areas—and to show students the excitement and the rewards that await them in these fields.

The approach seeks to build a corps of future U.S. scientists and engineers who can solve missile defense challenges in government, industry, and academia. Developing that body of talent, therefore, means producing students who can go on to advance basic scientific research. Government-sponsored STEM activities help guide young people toward careers in these fields.

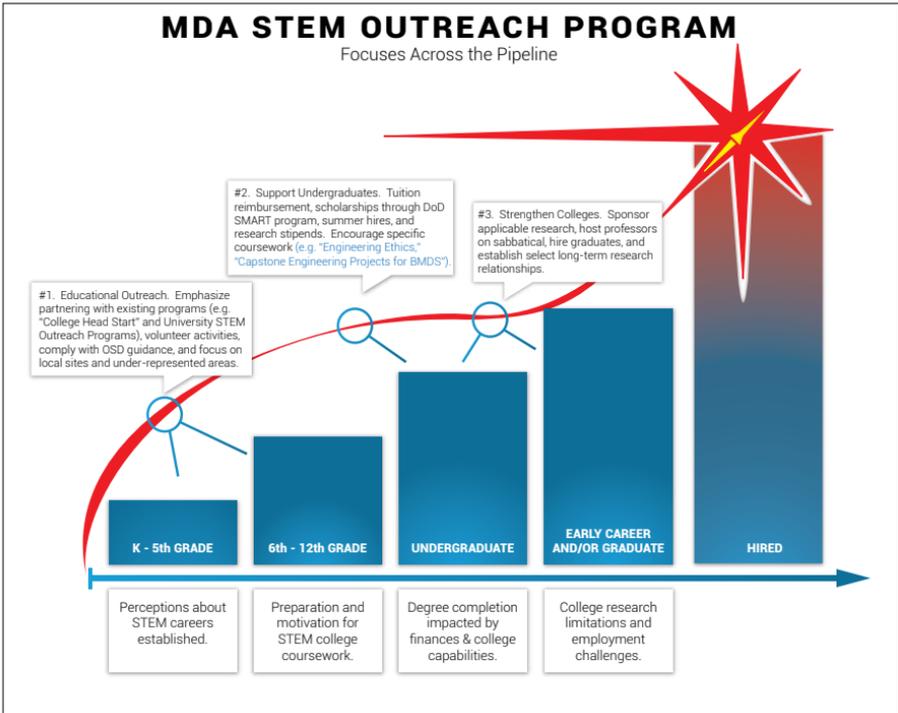
MDA's STEM initiative goals include:

- Increasing the number of high-school graduates capable of declaring a college major in a science, technology, engineering, or mathematics field.
- Inspiring K-12 and college students to follow career paths and the activities of scientists and engineers.
- Investigating real-life, practical uses for applied mathematics and science in K-12 classrooms to further career and life interest in STEM.
- Presenting the importance of STEM career opportunities to school personnel, parents, and supporting institutions.

MDA supports the cooperative development of curriculum materials that engage students in active, in-depth, hands-on STEM learning projects and that stimulate student interests.

Through university outreach programs, MDA continues to enhance its current STEM-related programs and to establish new initiatives to improve participants' STEM competencies.

To share ideas and to learn more about MDA STEM-related programs, please contact [STEMOutreach@mda.mil](mailto:STEMOutreach@mda.mil).



# OPPORTUNITIES

Fostering Future Innovators Through Education

## STUDENT SCHOLARSHIPS



Within the National Defense Education Program (NDEP) initiatives such as the Science, Mathematics and Research for Transformation (SMART) scholarship program help nourish science and engineering careers. The program, a DoD workforce development initiative, emerged to address the growing gap between the United States and the rest of the world in the disciplines of science, technology, engineering, and mathematics.

SMART helps close the gap by recruiting and retaining some of the best and brightest STEM candidates in the nation. Like other NDEP programs, SMART—a DoD civilian “scholarship-for-service” program—gets funding through the Office of the Secretary of Defense, with administration carried out by the American Society of Engineering Education.

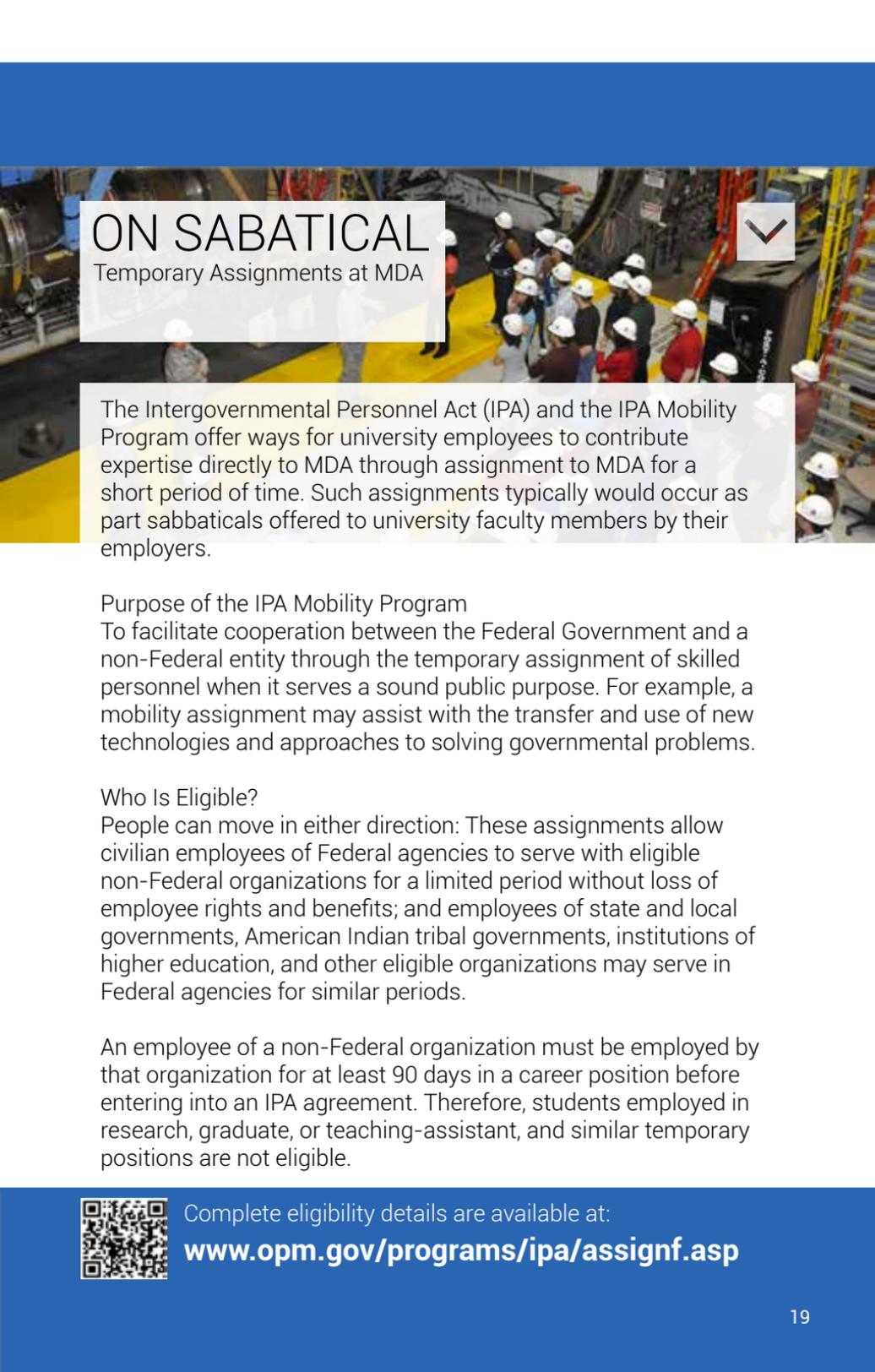
Financially assisting college students in completing technical degrees in a STEM discipline and ensuring students gain practical experience are key to closing the technology gap. The NDEP SMART scholarship program assists by:

- Providing scholarships and fellowships in defense STEM-critical skill-shortfall disciplines.
- Connecting students to DoD laboratories and providing mentoring by DoD science and engineering professionals.
- Mandating a one-to-one employment “payback” obligation.

SMART sponsoring organizations throughout the United States stand ready to support the development of careers in the science and engineering fields, and MDA continues to work toward becoming a sponsoring agency for SMART scholarship participants.



Find more information on NDEP SMART opportunities at:  
<http://smart.asee.org>



# ON SABBATICAL

Temporary Assignments at MDA



The Intergovernmental Personnel Act (IPA) and the IPA Mobility Program offer ways for university employees to contribute expertise directly to MDA through assignment to MDA for a short period of time. Such assignments typically would occur as part sabbaticals offered to university faculty members by their employers.

## Purpose of the IPA Mobility Program

To facilitate cooperation between the Federal Government and a non-Federal entity through the temporary assignment of skilled personnel when it serves a sound public purpose. For example, a mobility assignment may assist with the transfer and use of new technologies and approaches to solving governmental problems.

## Who Is Eligible?

People can move in either direction: These assignments allow civilian employees of Federal agencies to serve with eligible non-Federal organizations for a limited period without loss of employee rights and benefits; and employees of state and local governments, American Indian tribal governments, institutions of higher education, and other eligible organizations may serve in Federal agencies for similar periods.

An employee of a non-Federal organization must be employed by that organization for at least 90 days in a career position before entering into an IPA agreement. Therefore, students employed in research, graduate, or teaching-assistant, and similar temporary positions are not eligible.



Complete eligibility details are available at:

[www.opm.gov/programs/ipa/assignf.asp](http://www.opm.gov/programs/ipa/assignf.asp)



# RESPONSIBILITIES

Receiving a contract from the Missile Defense Agency brings with it administrative responsibilities. The following pages offer details on how to win a contract, your responsibilities upon receiving an MDA contract, and the role of MDA personnel in guiding researches through the process.

# Broad Agency Announcements

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MDA primarily uses BAAs to solicit white paper ideas from interested colleges, universities, or institutions of higher learning. The BAA as well as other actions are published on the Federal Business Opportunities, commonly referred to as FedBizOpps, located on the web at <https://fbo.gov>.

Individuals may search, monitor, and review any of MDA's posted opportunities on this site. Users may search in several ways—by type, by agency name, by location, by keyword, or by solicitation number.

MDA commonly has two individual BAAs posted. The first is the Advanced Technology Initiative BAA which remains continuously open for a two-year period from the time posted. MDA makes this first BAA available to both industry and universities. Those interested in pursuing BAA-related work can submit white papers to begin MDA contract funding. For white papers submitted under this BAA, MDA sets no limit on the dollar value or length of period of performance.

The second BAA is the Missile Defense Agency Science and Technology Advanced Research BAA which invites only university participation. Calls for submittals under the MSTAR BAA occur at least once a year, and sometimes more frequently. White papers submitted under this BAA must conform to an associated maximum budget amount (on both a yearly and total basis), as well as an associated period of performance.

# RESPONSIBILITIES

Administrative responsibilities and processes

## BROAD AGENCY ANNOUNCEMENT REQUIREMENTS

Interested parties should follow the BAA announcement and proposal preparation instructions (PPI) for detailed submission requirements, evaluation factors, and formats to develop a white paper/proposal. Some important items to note include:

- A university must be an accredited domestic college, university, or institution of higher learning registered by the U.S. Department of Education.
- Topics, unless stated otherwise, and any resulting white papers/proposals submitted under the BAAs should cover advanced research.
- Any contract awarded from the BAA must comply with International Traffic in Arms Regulation.
- MDA requires review and approval of all public information materials on any resulting contract prior to release.
- No foreign persons are allowed to work on any effort under contract unless approved in writing by the contracting officer.
- The contractor shall submit all payment requests (invoicing) electronically using Wide Area Work Flow – Receipt and Acceptance (WAWF-RA).

# Procurement Instruments

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If your white paper is selected for award, there are two types of procurement instruments that MDA uses with academic partners: a contract or a grant/cooperative agreement.

## A Contract:

- Serves as a binding agreement between two or more parties and creates an obligation to do (or not do) a specific activity (acquire property, service, construction, or research and development).
- Is governed by the Federal Acquisition Regulations (FAR).
- Requires an agreement, acceptance, and consideration.

## A Grant /Cooperative Agreement:

- Acts as a financial-assistance mechanism to provide money, property, or both to an eligible entity to carry out a project or activity for a public purpose.
- Is not governed by the FAR but is covered by the DoD Grant and Agreement Regulations (DoDGARs).
- Differs from a contract, with one key difference: limited Government involvement regarding performance.

Both types of procurement instruments contain the following elements:

- Period of Performance: the length of the agreement; may have a base (or funded) portion and option(s), which may be funded in the future at the Government's discretion.
- Contract Type: typically cost or fixed-price, depending on the type of work to be performed by the university.
- Total Ceiling Amount: covers both the base and option (if any); the maximum amount of money that can be spent under the agreement.
- Funded Amount: the amount of money allocated for the activity.
- Terms and conditions: additional requirements, laws, or regulations that must be followed or met to officially complete the effort.

# RESPONSIBILITIES

Administrative responsibilities and processes

## Presenting Research to MDA

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a helpful checklist.

How can you work with MDA? Specific instructions are in each of our Broad Agency Announcements presented earlier. The steps and time line below are general guidance for going from an interest to a proposal.

- Call MDA's University Research Point of Contact (POC) using the information listed in the front section of the BAA. The BAAs are located at: [http://www.mda.mil/business/research\\_opportunities.html](http://www.mda.mil/business/research_opportunities.html)
- Discuss university research interests, and collaborate with the POC to discuss how the research maps to MDA needs.
- Narrow to top 2-3 research areas.
- Develop a plan for a research activity, and investigate the current state- of- the- art, desired goal of the research, and resources/facilities.
- Send a draft paragraph on a research idea to the MDA POC.
- Call Agency POC to discuss.
- Draft a white-paper (2-3 pages) that captures the proposed research and the application to missile defense, and then submit following the guidelines in the BAA.
- MDA will review the white-paper, and then contact you to discuss the details of the proposed work.
- Upon approval from the MDA POC, submit a formal proposal that includes a cost estimate as defined in the BAA.
- Participate in cost/technical fact-finding reviews with MDA.
- Contract award follows the fact finding, based on available funding and negotiations.

From start to finish, the process usually takes around six months. Questions? Please contact us at: [universityresearch@mda.mil](mailto:universityresearch@mda.mil)

# DEFENDING TOMORROW

MDA encourages you to learn more about the Agency and to consider collaborating on projects that can lead to better tools for missile defense and technologies to benefit the Nation.

MDA leadership understands that university engagement can generate important innovations, produce fresh ideas, and develop technology talent for future workforces.

We encourage you to contact our contracting and outreach personnel to learn more about opportunities with MDA. (You can find that contact information listed throughout this publication and on official opportunity announcements such as broad agency announcements.)

To find out even more about MDA's history, vision, people, activities, and needs, please visit [www.mda.mil](http://www.mda.mil).

For additional information on the basics  
of contracting, be sure to visit:  
[www.mda.mil/faqs.html#BizOpsFAQ](http://www.mda.mil/faqs.html#BizOpsFAQ)



For an expanded history of U.S. missile  
defense and the Missile Defense Agency, visit:  
[www.mda.mil/news/history\\_resources.html](http://www.mda.mil/news/history_resources.html)



# MISSILE DEFENSE AGENCY



## PARTNERING TODAY DEFENDING TOMORROW

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