BIGST BAA (HM047623BAA0001)

Topic # 06 – Magnifying University Science Expertise (MUSE) 2

Document Change History

Date	Description

Table 1: Document Change History

Expected Awards

The Government intends to issue one or more awards per subject area described below in Sections 3.1 and 3.2. The Government reserves the right to cancel and/or issue no awards. All awards are subject to the availability of funds.

Award Type: GRANT, Cost Only (No Fee)

Budget

The total budget for the MUSE 2 is $25.0M across all awards. The maximum amounts for each Funding Period for the multiple awards are as follows:

Funding Period 1 (24 months):	$1.0M
Funding Period 2 (12 months):	$0.5M
Funding Period 3 (12 months):	$0.5M
Funding Period 4 (12 months):	$0.5M

Note: Proposed Travel costs cannot exceed 4% of the Applicant's overall proposed price.

Topic Technology Readiness Level (TRL):

This BAA Topic is limited to projects that meet Technology Readiness Level (TRL) definitions in the TRL range 1–6. Definitions can be found in the BIGST BAA General Solicitation (HM047623BAA0001).

Dates

Topic Posting	25 February 2026
Questions Due	09 March 2026 @ 10:00am ET
Q&A Posting	16 March 2026
Abstracts Due	26 March 2026 @ 10:00am ET
Abstract Feedback	2 April 2026
Proposals Due	4 May 2026 @ 10:00am ET
Estimated Period of Performance Start:	12 August 2026

Table 2*:* Dates

Submission Instructions

For instructions on submission of abstracts and proposals and evaluation of proposals, please review BIGST BAA General Solicitation (HM047623BAA0001), all associated Revision documents, and specifically Appendix 1 – Abstract Template, Appendix 2 – Proposal Template, and Appendix 5 - Grants and Cooperative Agreements Proposal Preparation & Submission Instructions.

Please send a courtesy email to the Grants Officer, Viphalac Chanthaphone at Viphalac.chanthaphone@nga.mil and to the Grants Specialist, Nathalie Nlate at Nathalie.nlate@nga.mil, to ensure NGA is aware of the application submitted in Grants.gov. Upon successful download of the application package from Grants.gov, NGA will provide the Applicant confirmation status.

All questions shall be submitted directly to the Grants Officer, Viphalac Chanthaphone at Viphalac.chanthaphone@nga.mil and to the Grants Specialist, Nathalie Nlate at Nathalie.nlate@nga.mil using the Q&A template located in Appendix 1 of this Topic Call.

1. Topic Research Opportunity Description

The National Geospatial-Intelligence Agency (NGA) GEOINT Innovation and Research (GEOINT I&R) Directorate (formerly Research & Development (R&D) Directorate) seeks to increase the breadth and depth of knowledge to key science and technology areas of need to the geospatial intelligence (GEOINT) community and advance the state of practice in:

- Geodesy
- Geomatics

Approaches developed under this topic shall:

- Provide coursework in geodesy and geomatics.
- Increase the numbers of students who are highly educated in geodesy and geomatics.

- Provide opportunities for students under the proposed curriculums to develop skills in geodetic and/or geomatics work.
- Support students doing substantive research and coursework relating to the subjects of interest identified in this Topic Call.
- Prepare students for careers in geodesy/geomatics.

2. Background

The geodesy mission of the NGA's Mapping, Charting and Geodesy (MC&G) domain is to better understand the earth to improve navigation, mapping, charting, tides, and geodetic products as called out in U.S. Code Title 10, Subtitle A, Part 1, Chapter 22. To address this mission, NGA created the World Geodetic System (WGS). NGA's WGS is a system of geodetic systems; at its heart is the terrestrial reference frame (TRF). The Earth Gravitational Model 2008 (EGM2008), and World Magnetic Model (WMM) are two geodetic models within WGS. Future WGS iterations could contain new models of plate motion and tides (both solid earth and ocean).

Geodesy is the science that studies the size, shape, and orientation of the earth in space, its gravity field, and how its shape and orientation, in relation to the stars, and the earth's gravity field are changing over time. The earth's orientation and motion through space is defined relative to the stars that are in the celestial sphere. Location in this celestial sphere is defined in terms of its coordinates in the Celestial Reference Frame (CRF), similar to the earth's latitude and longitude system used to plot positions within the Terrestrial Reference Frame (TRF) for points residing on a reference ellipsoid.

While geodetic science is very old, dating back to the ancient Greeks trying to understand the size and shape of the Earth, it is a very important and highly relevant science today, especially considering that over 4 billion users rely on the Global Positioning System (GPS) each day to determine their position on Earth. It is because of the desire to accurately determine one's position, and understand our planet and its temporal evolution, that geodesy is one of the few science disciplines that cares about accuracies at parts per billion.

Geomatics is a complimentary branch of the science to geodesy that is associated with the collection, analysis, and interpretation of spatial data related to the Earth's surface. It encompasses a number of technologies and techniques, including the fields of surveying, mapping, remote sensing, photogrammetry, hydrology, GPS, and Geographical Information Systems (GIS) to gain understanding and solve problems related to the Earth's surface.

Although the relative importance of geodetic sciences and geomatics to modern society has been on the increase over the past couple of decades, the research conducted, and the number of students being trained in these sciences has greatly declined in U.S. colleges and universities. This shift jeopardizes future advancements and the future geodetic sciences workforce in the United States. U.S. Government agencies involved in geodetic research and development are finding it harder to recruit highly educated personnel skilled in geodetic and/or geomatics work.

3. Project Structure/Scope

Grantees have considerable latitude to focus on geodetic and/or geomatic topics of interest, provided they:

- Achieve the goals set out for each subject area (sections 3.1 and 3.2 below).
- Advance the state of practice in geodesy and/or geomatic research.
- Increase student involvement and exposure to geodetic and/or geomatic principles.

Each subject area, geodesy and geomatics, requires the separate submission of an abstract and proposal:

- Any proposal which attempts to address more than one subject area in a single submission will not be considered.
- An institution and a principal investigator are permitted to make a submission for more than one subject area.
- Abstracts and proposals shall clearly identify which one of the two subject areas they are addressing.

Proposals shall endeavor to create interest in the students they reach, not only for the scientific advancement, but also for careers and applications in this science. This applies to both direct student involvement and curriculum development.

Grantees shall construct their project in accordance with the Funding Periods of Performance outlined above.

Proposals shall provide a clear breakdown of what the Grantee intends to accomplish within each Funding Period, along with a schedule and detailed milestones for these activities.

3.1 Geodesy Subject Area

The goals of this subject area are to increase exposure and understanding of geodetic science through research efforts with direct student involvement and course work; and to create a broad foundation that will allow students to move into geodesy related work or research roles.

Geodetic science is built upon fundamental principles: “Geometric Geodesy” including terrestrial reference frame (TRF) and Earth orientation parameters (EOP), and “Physical Geodesy and Geophysics” including potential field observations and modeling (gravitational and magnetic fields). Fulfillment of the goals for this subject area requires student exposure to these fundamental principles in their coursework and research into:

- Gravity Field and Geoid Modeling.
- Crustal and Core Magnetic Field Observations and Modeling.
- Marine geodetic data collection techniques and sensors.

As a minimum, proposals shall address how they will expose students to the fundamental geodetic science principals and one of these three focus areas of research as described in paragraphs 3.1.1, 3.1.2, and 3.1.3.

Colleges and universities with strong applied mathematics, geophysics and/or aerospace engineering (orbital mechanics) programs, but little to no prior research in geodesy, are encouraged to apply, as well as institutions with prior geodetic science experience.

Direct Student Involvement: All proposals shall articulate the number of undergraduate and graduate students involved in every activity. Students do not need to be involved in every activity; however, Grantees are expected to include substantial student involvement; specifically, involvement of undergraduate students and mentorship of students in geodesy and its application. Proposals under this subject area shall demonstrate how they will address broadening the exposure of individuals to geodesy.

Curriculum Development: Academic course development in one or more of the three focus areas listed below is strongly recommended but not required. If included, the proposal shall provide specific details on the content of the course, the length of time the course is likely to be in use, course type (i.e., major, minor, or general elective), and the students the course is expected to reach (i.e., undergraduate, graduate, etc.). The proposal should also indicate whether the course being developed will support in class, remote learning, or both.

3.1.1 Gravity Field and Geoid Modeling

Inclusion of this focus area in curriculum development will support an understanding of the type, quality, and quantity of gravitational data needed, and how to determine what data and models should be used to improve our understanding of Earth's gravitational fields.

Additional, modeling of the earth's gravitational fields requires use of a large number of observations from different sources, with differing accuracies, and collected at different distances from the Earth's surface. These data sources, include terrestrial, marine, airborne, and space-based observations including both space gravity missions and satellite altimetry missions. In addition, satellite gravity missions like Gravity Recovery and Climate Experiment (GRACE) and Gravity Field and Steady State Ocean Circulation Explorer (GOCE), which form the long wavelength basis of gravitational models, suffer from aliasing and noise, and require careful treatment of solutions and associated error properties. This leads to several challenges in the modeling of these potential fields, to include the problem of downward continuation. In addition, significant areas of our planet are void of the data required to develop high accuracy and high-resolution gravitational models. This necessitates use of forward gravity modeling techniques, employing other data sources (e.g., elevations).

For this area, proposals shall focus on addressing the several challenges in modeling gravitational fields and geoid modeling, including the accuracies of different data types,

and how each proposed solution contributes to mitigating the uncertainties of the resulting model.

3.1.2 Crustal and Core Magnetic Field Observations and Modeling

Inclusion of this focus area in curriculum development will support an understanding of investigate approaches used to collect, process, and use magnetic data in the modeling of the Earth's crustal field or core field. Further, it will explain what data and models should be used to improve our ability to map crustal magnetic field anomalies and their associated uncertainties and the preferred data and models used to improve our understanding of Earth's core magnetic field.

Modeling of the Earth's crustal and core magnetic fields requires large amounts of observations from different sources, with differing accuracies, and collected at different distances from the Earth's surface over decades. This leads to several challenges in the modeling of these potential fields, to include the problem of downward continuation. Furthermore, significant areas of our planet are void of the data required to develop high accuracy and resolution crustal magnetic models. This necessitates use of forward modeling techniques, employing other data sources (e.g., elevations). In addition, satellite missions like SWARM and Challenging Minisatellite Payload (CHAMP), which form the long wavelength basis of magnetic field models, suffer from aliasing and noise, and require careful treatment of solutions and associated error properties.

For this area, proposals shall focus on addressing the several challenges in modeling gravitational and magnetic fields, including the accuracies of different data types, and how each proposed solution contributes to mitigating the uncertainties of the resulting model.

3.1.3 Marine Geodetic Data Collection Techniques and Sensors

Over 70% of the earth's surface is covered by water, inclusion of this focus area in curriculum development will provide insights into investigate approaches and sensors for the collection and processing of geodetic data in these maritime environments. Further, it will provide an understanding of the error sources and uncertainties within these instruments and systems, and how to address them at the observation level or post-processing level.

For this area, proposals shall focus on maritime geodetic data collection and processing and gaining an improved understanding of error sources and uncertainties within maritime geodetic observation techniques and sensors, and examine how measurements from one technique could be used to improve corrections for another geodetic technique. Proposals can also examine approaches for improved corrections for different geodetic observation techniques, using geophysical and non-geophysical modeling.

3.2 Geomatics Subject Area

The goals of this subject area are to increase exposure and understanding of geomatics, through research efforts with direct student involvement and course work and creating a broad foundation that will allow students to move into geomatics related work or research roles.

Fulfillment of the goals for this subject area requires student exposure to three topics in geomatics research:

- 3D geospatial and photogrammetry.
- Multimodal multiscale 3D scene reconstruction.
- Interferometric synthetic aperture radar (InSAR) Applications.

As a minimum, proposals shall address how they will expose students to these geomatics research topics as described in paragraphs 3.2.1, 3.2.2, and 3.2.3.

Colleges and universities with strong applied mathematics, geosciences and/or civil engineering programs, but little to no prior research in geomatics, are encouraged to apply, as well as institutions with prior geomatics science and photogrammetry experience.

Direct Student Involvement: All proposals shall articulate the number of undergraduate and graduate students involved in every activity. Students do not need to be involved in every activity; however, Grantees are expected to include substantial student involvement; specifically, involvement of undergraduate students and mentorship of students in geodesy and its application. Proposals under this subject area shall demonstrate how they will address broadening the exposure of individuals to geomatics.

Curriculum Development: Academic course development in one or more of the three focus areas listed below is strongly recommended but not required. If included, the proposal shall provide specific details on the content of the course, the length of time the course is likely to be in use, course type (i.e., major, minor, or general elective), and the students the course is expected to reach (i.e., undergraduate and/or graduate). The proposal should also indicate whether the course being developed will support in class, remote learning, or both.

3.2.1 3D geospatial and photogrammetry

Inclusion of this focus area in curriculum development will support the explanation of multi-view satellite photogrammetry in 3D geospatial research to:

- Enhance Digital Surface Model (DSM) generation.
- Achieve feature-based detection and extraction (such as windows on a building/ light pole on the roads, etc.) in 3D.
- Conduct feature-based change detection and modeling in 3D to inform battle damage assessment.

In addition, the intent is to allow Grantees to focus on topics of interest to them and advance the state of practice in 3D photogrammetry research while also increasing student involvement.

3.2.2 Multimodal multiscale 3D scene reconstruction

Inclusion of this focus area in curriculum development is to promote an increased understanding of 3D scene reconstruction to:

- Perform joint 3D scene reconstruction from different modalities (such as satellite, drone, ground-based images, etc.).
- Understand uncertainties in multimodal/ multiscale datasets through photogrammetric methods.
- Establish sensor agnostic framework to achieve generalizable and efficient 3D scene reconstruction.

In addition, the intent is to allow Grantees to focus on topics of interest to them and advance the state of practice in 3D scene reconstruction research while also increasing student involvement

3.2.3 Interferometric synthetic aperture radar (InSAR) Applications

Inclusion of this focus area in curriculum development will increase exposure and understanding of using InSAR time series to:

- Establish seasonal and annual baselines of terrain.
- Understand uncertainties in the data.
- Employ these observations and trends to validate models that infer subsurface processes (such as bio/geochemical, hydrological, etc.) to inform mobility and infrastructure risk assessments.

In addition, the intent is to allow Grantees to focus on topics of interest to them and advance the state of practice in InSAR research while also increasing student involvement.

3.3 Outside the Scope of this Topic

Any subject not explicitly described within Section 3.1 and 3.2 is considered outside the scope.

4. Reporting Requirements and Oversight Activities

#	ITEM	DESCRIPTION	DUE DATE	SUBMIT TO
1	Kick-off Meeting – Technical Assistance.	Briefing in support of a project kick off meeting that details the plan for the work, as well as any additional details since the proposal was submitted. Meeting will be in person at Grantee or NGA location, or virtual at the discretion of the Government. This is an opportunity for two-way communication between the grantor and the award recipient to ensure both parties understanding of the work to be performed.	45 days after start of initial performance	*Information will be provided at award*
2	Quarterly Research Performance Progress Report (RPPR)- Oversight	RPPR status report. Subject Area 1 & 2 shall address the following as part of the report: • Description of activities conducted that quarter and accomplishments (block 25) Students doing substantive work relating to this Topic Call (Include level, i.e., freshman, sophomore, junior, senior, graduate as well as percentage of time) (block 33) • Student involved with the program who obtained jobs in the field, including company and position where possible (block 40) • Other students exposed to or trained in Topic Call Subject Areas through classes or other activities (block 36) • Status of academic papers (block 29, conference talks (block 29), patents or similar resulting from this work (block 31) • Any other materials Grantee wants to provide the Government (block 32) • Others items of interest pertaining to the award or student training (block 26) If the RPRR does not provide sufficient space to submit the information above, Grantees shall submit an addendum with the information as part of the RPRR.	No later than 5 business days after the end of each quarter of work The quarterly report for the last quarter of the 12-month reporting period is replaced by the annual report.	*Information will be provided at award*
3	Financial Execution - Oversight	Via Form SF-425 reports charges made during the quarter (include labor hours charges and rate, by labor category), cumulative totals, and remaining funds.	Due with quarterly RPPR; no later than 5 business days after the end of each quarter of work.	*Information will be provided at award*

4	Quarterly Status Discussion – Technical Assistance/Site Visits	A discussion on status and progress in addition to the written quarterly RPRR. The first and third quarterly discussion will be approximately one hour, held virtually, and focus on only the metrics and RPPR content. The second and fourth quarterly discussions will be in person (assume one each year at the Government's location and one at the Grantees for costing purposes), half a day to a day in length, and provide more detailed presentations / discussions of the work undertaken in the grant.	Quarterly, NLT 10 days following receipt of the quarterly RPRR.	*Information will be provided at award*
5	Annual RPPR-Oversight		90 days after the end of the reporting period	*Information will be provided at award*
6	Annual Common Disclosure Forms-Oversight	Update, re-certify, and resubmit Common Disclosure Forms for all covered individuals (Biographical Sketch Common Form and Current and Pending Support Common Form)	45 days prior to end of reporting period.	*Information will be provided at award*
6	Final RPPR-Oversight		90 days after the end of the expiration or termination of the award	*Information will be provided at award*
7	Audits-Oversight	The audit aims to ensure compliance with government regulations and evaluate financial information, including expenses paid for with federal award funds.	The Single Audit Act (amended in 1996) states that grant recipients may be subject to an audit once a year.	*Information will be provided at award*

Table 3*:* Reporting Requirements and Oversight Activities

5. Government Furnished Information/Data/Property

No Government furnished data or hardware will be provided in this topic call.

6. Security Considerations

Work under this effort will be at the **unclassified** level.

7.1. Unclassified Work Performance Security Requirements

Uncleared Contractor personnel are authorized to work on this contract at the **unclassified** level only without the requirement of a security clearance

7.2. Uncleared Personnel Security Requirements

Should NGA identify the use of unauthorized personnel, the Grants Officer (GO) may direct the Contractor, at its own expense, to remove and replace any unauthorized Contractors, Subcontractors, or other personnel performing on the contract. Such action may be taken at the NGA's discretion without prejudice to its rights under any other contract provision, e.g., termination for default.

Uncleared Contractor personnel visiting NGA facilities or other sites may receive the appropriate visitor badge and be escorted, as appropriate. The Contractor will return the visitor badge at the end of each visit day.

7.3. Physical Security Requirements

Contractor personnel are forbidden from bringing prohibited or unauthorized items into any NGA installation or other secure facility covered under this contract. These items include weapons, cell phones, cameras, two-way pagers, laptops, recording devices of any kind, flash drives, or any other removable media. Exceptions may be granted by NGA Security upon the Contractor's request. If granted, Contractor personnel must bring documentation showing approval prior to entering with the item(s). Violations may subject the Contractor and its offending personnel to civil and/or criminal liability IAW applicable laws and regulations governing access to secure Government facilities.

7.4. Information Security Requirements

There are no information security requirements for this Topic Call.

7.5. Due Diligence Requirements

NGA conducts due diligence reviews in accordance with the DoD Policy for Risk-Based Security Reviews of Fundamental Research. Please see the following link for more information on disclosure and review requirements: https://basicresearch.defense.gov/Programs/Academic-Research-Security/

7. Performance

8.1. Place of Performance:

The Applicant shall list place or places of performance in the proposal. If the Applicant wants to collect data outside the United States and its Territories and their surrounding coastal waters, the performer should notify NGA of this collection 45 days prior to the start of collection.

8.2. Period of Performance:

The resultant Grant will be established with a 24-month Base Funding Period with three (3) 12-month Funding Periods, not to exceed a total of five (5) years. After funding the initial 24-month period, additional funding increments will be provided at the sole discretion of the Government. Applicants shall submit proposals that cover the entire proposed performance period; additional funding increments which were not included in the original proposal cannot be added later.

Appendix 1 Questions & Answers (Q&A)

#	Topic 06 Reference	Contractor Question	Government Response
1			