SYNOPSIS

NASA Goddard Space Flight Center is hereby soliciting information from potential sources for flight Tandem Stereographic Cameras for potential future AtmOS acquisition.

The National Aeronautics and Space Administration (NASA) GSFC is seeking capability statements from all interested parties, including all socioeconomic categories of Small Businesses and Historically Black Colleges and Universities (HBCU)/Minority Institutions (MI), for the purposes of determining the appropriate level of competition and/or small business subcontracting goals for flight Tandem Stereographic Cameras for potential future AtmOS acquisition.
The Government reserves the right to consider a Small, 8(a), Women-owned (WOSB), Service Disabled Veteran (SD-VOSB), Economically Disadvantaged Women-owned Small Business (EDWOSB) or HUBZone business set-aside based on responses received.

No solicitation exists; therefore, do not request a copy of the solicitation. If a solicitation is released, it will be synopsized on SAM.gov. Interested firms are responsible for monitoring this website for the release of any solicitation or synopsis.

Interested firms having the required capabilities necessary to meet the requirements described herein should submit a capability statement of no more than 25 pages indicating the ability to perform all aspects of the effort.

Please advise if the requirement is considered to be a commercial or commercial-type product. A commercial item is defined in FAR 2.101.

This synopsis is for information and planning purposes only and is not to be construed as a commitment by the Government nor will the Government pay for information solicited. Respondents will not be notified of the results of the evaluation.

The National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC) is seeking capability information from all interested parties, including Small, Small Disadvantaged (SDB), 8(a), Woman-owned (WOSB), Veteran Owned (VOSB), Service Disabled Veteran Owned (SD-VOSB), Historically Underutilized Business Zone (HUBZone) businesses, and Historically Black Colleges and Universities (HBCU)/Minority Institutions (MI) for the purposes of understanding the market availability and capabilities of flight Tandem Stereographic Cameras for potential future AtmOS acquisition.

AtmOS BACKGROUND

The Atmosphere Observing System (AtmOS) was established by the NASA Science Mission Directorate Earth Science Division to fulfill the science needs proffered in the 2017 Earth Science Decadal Survey for the combined Designated Observables: Aerosols and Clouds, Convection and Precipitation (ACCP). The AtmOS Constellation Architecture is the result of a 2.5 year ACCP Architecture Study. The ACCP Architecture Study concluded in February 2021 and the mission was authorized to move into Pre-Phase A on May 23, 2021. The respondent may find information on the study results including the Science and Applications Traceability Matrix at the ACCP Architecture Study website: https://vac.gsfc.nasa.gov.

The AtmOS Constellation will make measurements of the aerosol and cloud microphysical properties as well as the measurements of the vertical velocity of convection, aerosol redistribution and precipitation to understand the processes which drive the Earth's atmosphere. By employing a multi-satellite architecture, AtmOS will be able to cover the relevant temporal and spatial scales, thereby transforming our understanding of this critical part of the Earth System. As part of pre-formulation and formulation activities, the AtmOS team is performing trade studies to determine options to make measurements and achieve sampling to meet as many of the AtmOS science objectives as possible within cost and schedule constraints. Through this RFI, the AtmOS team seeks information on Tandem Stereographic Cameras approaches to further refine the payload assignments, spacecraft needs, and mission concept of operations necessary to meet the science objectives.

The selected AtmOS architecture is illustrated in Figure 1**Error! Reference source not found.**. This architecture encompasses flight assets in two orbit planes: (1) Polar: Sun-Synchronous Orbit, 450 km, and 1330 Ascending Node and (2) Inclined: Nominally 50 to 65 Degree Inclination, 407 km. Within the AtmOS Constellation, Inclined Plane assets will be launched first to achieve earliest possible science with instruments that will make advancements in the understanding aerosol and cloud properties and target the **dynamics** of the cloud processes and precipitation on sub-daily to sub-minute time scales. The polar plane will follow a year or two later with more advanced measurements targeting the seasonal, global scale microphysical properties of clouds and aerosol and their linkage to atmospheric radiation and longer-term climate **change**. The constellation targets understanding the dynamics of the Earth's Atmosphere and the processes that drive change over time.

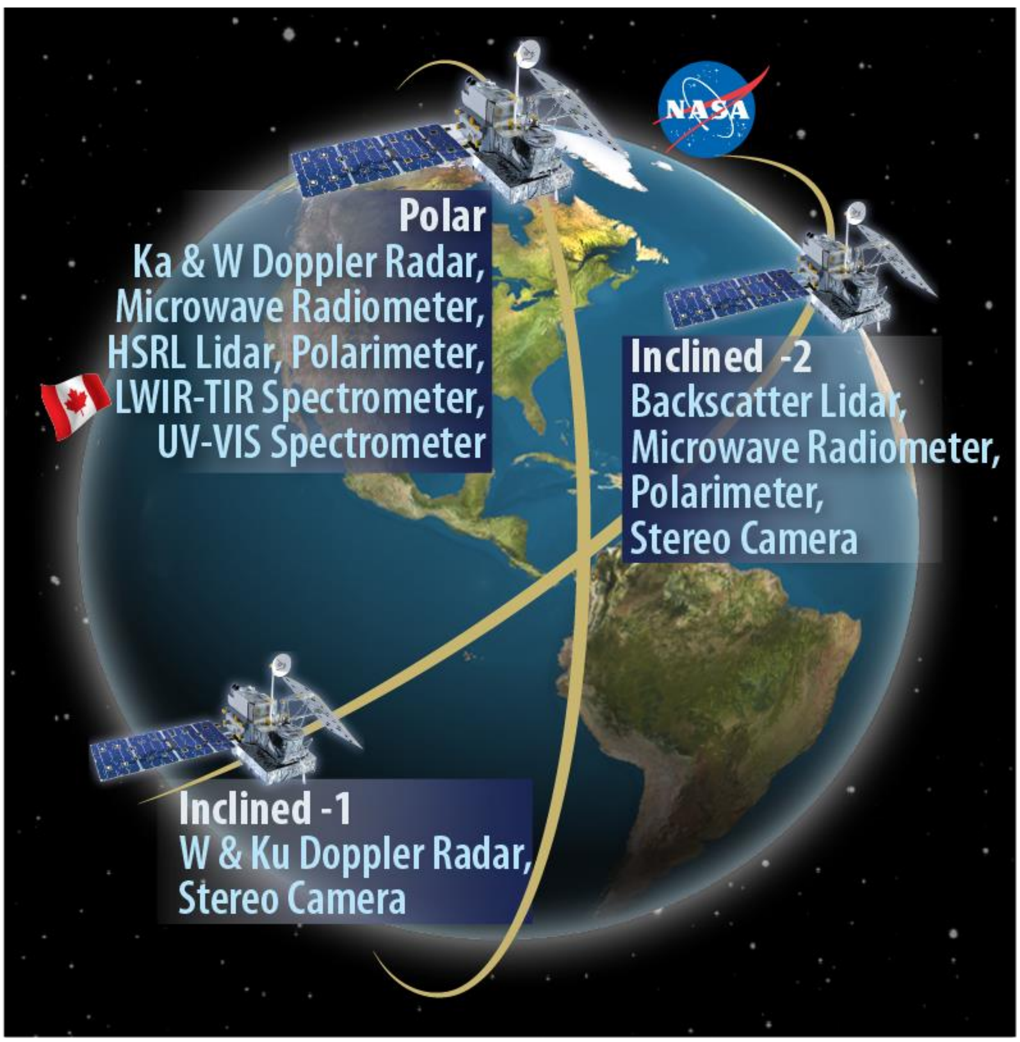

Figure 1 Preferred AtmOS Architecture Concept

While the concept illustrated in Figure 1**Error! Reference source not found.** accurately reflects the AtmOS intent, the number of spacecraft in the two orbit planes and the specific instrumentation assignment on the spacecraft remains under study during the pre-Phase A period.

The anticipated instrumentation suite for the AtmOS Constellation as assigned to the Inclined Orbit and the Polar Orbit is shown in Table 1. Note that some passive instrumentation/sensors (i.e. Polarimeter, Microwave Radiometer) are found in both orbit planes but their performance and spacecraft allocation needs may differ depending upon the assigned orbit plane.

Table 1 Anticipated AtmOS Science Instrumentation

Polar Orbit Plane Instrumentation	Inclined Orbit Plane Instrumentation	Acquisition Comment for Passive Instruments
---	W/Ku Band Doppler Radar	---
W/Ka Band Doppler Radar	---	---
---	Backscatter Lidar	---
High Spectral Resolution Lidar	---	---
LWIR-TIR Spectrometer	---	Proposed CSA Contribution
Microwave Radiometer	Microwave Radiometer	Subject of a separate AtmOS RFI
Polarimeter	Polarimeter	Subject of a separate AtmOS RFI
UV-VIS Spectrometer	---	Subject of a separate AtmOS RFI
---	Stereo Camera (Tandem Stereographic Cameras)	Subject of this AtmOS RFI

TANDEM STEREOGRAPHIC CAMERAS PERFORMANCE

The main purpose of the Tandem Stereographic Cameras is to provide information on low cloud dynamics. The related observing concept envisioned by AtmOS consists of two multi-angle instruments onboard two spacecrafts flying in close formation flight as illustrated in Figure 2**Error! Reference source not found.** (one instrument per spacecraft). Each of the two instruments consists of two or more high-resolution cameras, one pointed at nadir and the others at an off-nadir angle intersecting the nadir pointing view of the high-resolution camera on the other spacecraft (see Figure 3**Error! Reference source not found.**). Each of the resulting sets of simultaneous stereographic images enable an instantaneous geometric measure of the height of cloud/aerosol plume-tops or surface features. The time-laps between the two simultaneous stereographic images, given by the distance between the two spacecrafts, allows to derive cloud or plume-top motion vector and vertical and horizontal wind velocity information through tracking of image feature displacements.

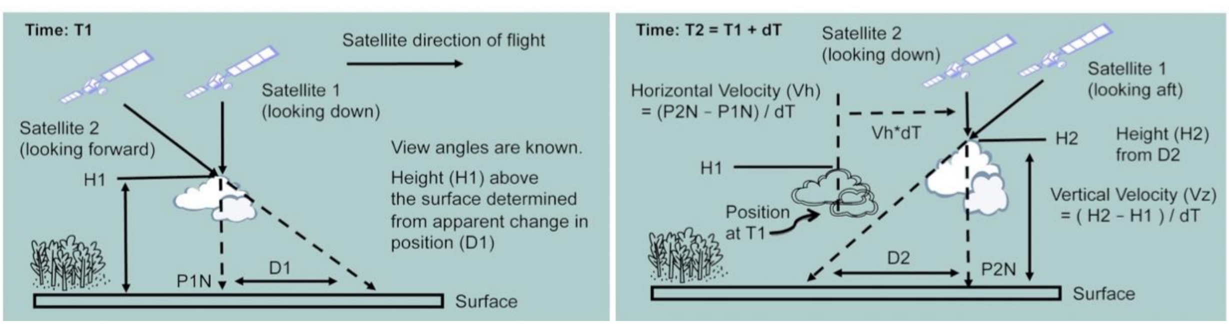

Figure 2 Illustration of how two view angles (one at nadir) from tandem spacecraft provide stereographic and time-lapse imagery for retrieval of cloud-top heights horizontal winds, and vertical winds.

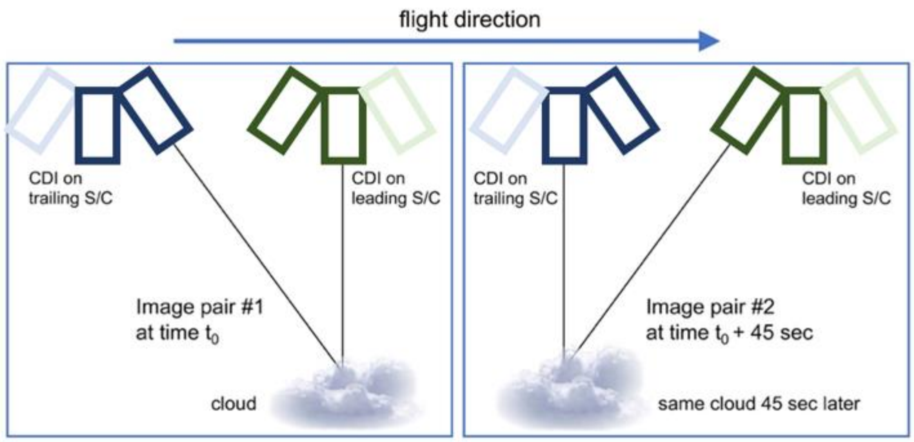

Figure 3 Tandem Stereographic Cameras concept of operations with instruments on tandem spacecraft (S/C). The nadir and backward-viewing cameras on the leading S/C (green) and the nadir and forward-viewing cameras on the trailing S/C (blue) acquire images continuously along the dayside flight track. An optional third camera is shown in fainter hues for each instrument as one possible solution to enabling S/C yaw flips without interruption to Tandem Stereographic Cameras measurements, and if available power and data rate resources permit simultaneous operation with the other two cameras, could provide additional information about the observed scenes. The responder may offer alternative approaches.

Tandem Stereographic Cameras should be able to accommodate yaw maneuvers, in which the satellite is rotated 180 degrees such that forward facing cameras now face aftward and vice versa (see Table 5), and enable the acquisition of two instantaneous stereo image pairs independent of the spacecraft orientation along its velocity (x) vector (see Figure 5). An along-track symmetric design of three cameras, one pointed forward, one nadir, and one backward is one possible solution, as illustrated in Figure 3**Error! Reference source not found.**, where the optional third camera is depicted more faintly than the other two. The RFI response can choose to provide alternative designs as long as science data of equal quality can be acquired when the two spacecraft undergo periodic 180º yaw flips.

The time separation between the two spacecraft is expected to range between 30 and 60 seconds. The off-nadir camera's view angle (defined as the along-track off-nadir angle of the camera boresight measured at the instrument) target is nominally set to -38° and +38° (if three cameras are used to allow for the yaw-flip maneuver as described above) to enable co-registration optimal (at the center of the focal plane array in along-track direction) at the average time separation of 45 seconds.

A notional instrument design uses a focal plane detector area array with rapid readout of a single detector row and on-board summing of multiple reads enables the use of time delay and integration to achieve pushbroom images with an along-track ground sample distance (along-track GSD, spacing of successive images determined by the integration time and the number of summed readouts, not dependent on along-track view angle) and ground instantaneous field of view (GIFOV, cross-track pixel footprint projected onto ground, dependent on view angle across the swath) that meets the instrument performance targets. A benefit of using an area array with a windowing option is that the row to be read out, and the corresponding along-track angle within the field of view is selectable in-flight to assure image co-registration between the two spacecraft to compensate for static assembly errors in instrument pointing, offsets in spacecraft pointing, and possible changes in orbit separation ranging between 30 to 60 seconds (see Figure 4**Error! Reference source not found.**). Responders may choose this or other approaches to meet the specified instrument performance targets.

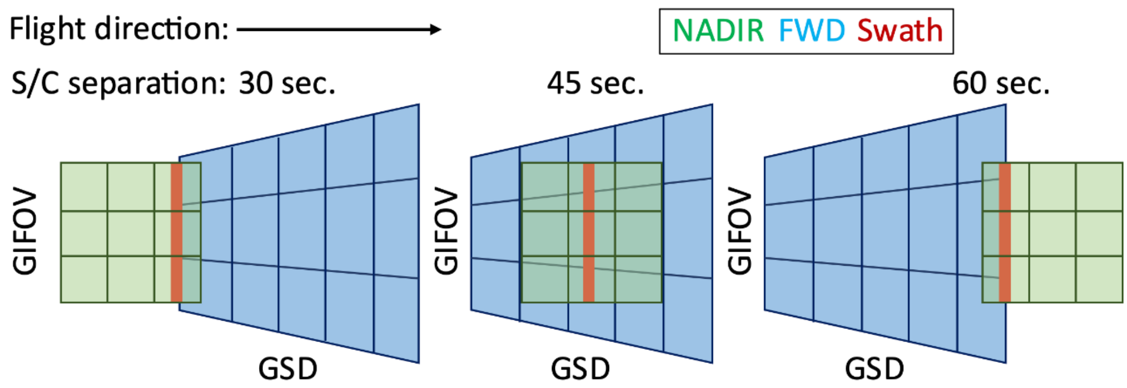

Figure 4 Simplified depiction of the nadir (green) and forward off-nadir (blue) area array projected onto the ground. The lines illustrate the along-track ground sample distance (GSD) and cross-track ground instantaneous field of view (GIFOV). The red line indicates the instrument swath and the array readout locations providing co-registration between the nadir and off-nadir views in the case of fixed boresight angles (0° and 38°) and varying spacecraft (S/C) separation of 45±15 seconds. In this case, the GSDs of the nadir and off-nadir views are matched and the larger off-nadir GIFOV would reduce image contrast, which would impact the geophysical retrievals.

The GSD and GIFOV are driving instrument performance factors to achieve the desired science data accuracy for cloud-top height and horizontal and vertical cloud-top velocity. The smallest possible GSD and GIFOV are therefore desirable while maintaining a swath near the target value of 100 km. For geophysical retrievals, it is desired for the nadir GSD and GIFOV to be 40 m or finer. It is also desired for both, the nadir and off-nadir GSD to be matched by using the same integration time and summed readout. If resource and cost savings can be achieved by using identical nadir and off-nadir camera (optical) designs, the off-nadir GIFOV can grow up to 60 m. We welcome responders to also provide alternative optical designs, for example to enable an off-nadir GIFOV of ≤40 m, or at least estimate related impacts on mass, volume, cost, pointing and jitter requirements, etc.

Another driving instrument performance factor is the ability to provide high contrast of clouds above ocean and land surfaces (free of snow and ice). Wavelengths dominated by either Rayleigh scattering, highly reflective vegetation (NIR), or strong atmospheric absorption would be less favorable. A solution centered around 620 nm was used in previous scientific assessments. Imagery of bright clouds and snow shall not saturate up to 1.3 equivalent reflectance; defined as the product of π times the spectral band-averaged radiance, divided by the band-averaged solar irradiance). Besides the signal to noise ratio (SNR) target values listed in Table 2 **Error! Reference source not found.**, the bit depth of the digital data output should be adequate (≥11 bit). If the instrument concept makes use of time-delay integration (TDI), the response should describe the TDI concept of operation and how it achieves the required SNR targets while preserving spatial resolution of the imagery.

Table 2 Overview of signal to noise ratio (SNR) target values. Equivalent reflectance is defined as the product of pi times the spectral band-averaged radiance, divided by the band-averaged solar irradiance. The assumed top-of-atmosphere solar irradiance (at 620 nm) is 1610 W/m2/µm. The noise-equivalent delta radiance is the ratio between the upwelling radiance at the sensor level and the instrument SNR.

Equivalent Reflectance	Reflected Radiance [W/m^2/µm/steradian]	NedL [W/m^2/µm/steradian]	SNR target values
0.01	5.124	0.059	87
0.05	25.62	0.128	201
0.10	51.24	0.180	285
0.50	256.2	0.401	639
1.00	512.4	0.567	904
1.30	666.1	0.646	1031

Notionally, the proposed instrument should be pre-flight calibrated for linearization, flat-fielding, spectral response characterization, and geometry. On-orbit, absolute radiometric calibration is not required. However, relative radiometric stability is desired to maintain approximate radiometry between cross-calibration events using an imaging polarimeter which will be on the same platform. It can be assumed that regular on-orbit geometric calibration will be performed regularly using ground control points to ensure image co-registration.

Summary of key instrument performance targets:

Spatial resolution	See text for definitions. Nadir GSD: ≤ 40 m Nadir GIFOV: ≤ 40 m Off-nadir GSD: ≤ 40 m Off-nadir GIFOV: ≤ 60 m / ≤ 40 m (desired, see text)
View angles	Defined as the along-track off-nadir angle of the camera boresight measured at the instrument. Nadir: 0° Off-nadir: -38° and +38°
Swath	≥ 100 km
Wavelength	1 band in the visible part of the solar spectrum is required. The wavelength for stereo imaging shall be chosen to provide high contrast between clouds or aerosol plumes, their surroundings, and the underlying surface. Additional bands can be considered as a variant to enhance geophysical retrieval capabilities. Impacts on instrument cost and resource needs should be provided.
Bandwidth	< 200 nm, and chosen to meet the SNR requirements without saturation over bright clouds or snow at 1.3 equivalent reflectance (see text for definition) while keeping the full bandpass for stereo imaging shortward of the surface vegetation "red edge".
SNR	≥ 120 at 0.02 equivalent reflectance; ≥ 1000 at 1.3 equivalent reflectance. See **Error! Reference source not found.** for additional values.

TANDEM STEREOGRAPHIC CAMERAS RESOURCE ALLOCATION TARGETS

The AtmOS team has developed target spacecraft resource allocations for the Tandem Stereographic Cameras based on information gathered during the ACCP Architecture Study Phase, including information gathered from an instrumentation Request for Information submitted during that period. From this information the mission systems team developed spacecraft concepts commensurate with allocations as found in Table 3. The respondent should provide both their Current Best Estimate and Maximum Expected Value resource needs in the attached spreadsheet under tab labeled 'Spacecraft Accommodation.' Note: The values in the table below are not requirements but rather for informational purposes to provide the respondent with the notional resources needs currently envisioned by the AtmOS team. Exceedance of these values are acceptable and expected, especially in the event of enhanced performance capability.

Table 3 Tandem Stereographic Cameras Target Resource Allocations

Tandem Stereographic Camera allocations are given for <u>each</u> of the two identical instruments (per S/C).		
Resource	**Units**	**Target Allocation (Current Best Estimate)****
Mass	kg	10
Operational Power (Orbit Average)	W	20
Envelope Dimensions (LxWxH) in Operational Configuration	cm	75 x 20 x 35

Data Rate (Peak*)	bits/second	$1.0x10^7$ (with lossless compression)
*Peak data rate is the nominal rate while the instrument is in its acquisition mode.		**Please provide both the Current Best Estimate (CBE) and the Maximum Expected Value (MEV) for these resources. MEV = [(100 + XX)/100] CBE where XX is contingency in percent.

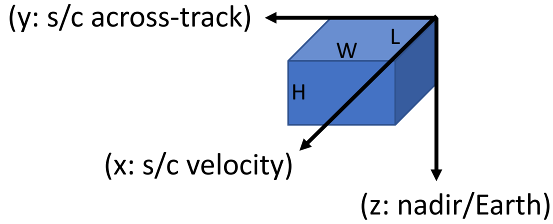

Figure 5 Instrument reference coordinate system.

INSTRUMENT MATURITY

The respondent is encouraged to use the narrative section of the response to describe the technical maturity and supporting basis for the instrument use in spaceflight. In addition to the narrative, the respondent should address the itemized requests within the spreadsheet on technology readiness assessment.

Suitable instrument candidates must be no less than Technology Readiness Level (TRL) 6 by the Tandem Stereographic Cameras Preliminary Design Review (PDR), see Table 4. TRL definitions can be found in the NASA Systems Engineering Handbook, and they apply to the relevant, intended environment (e.g. airborne instrument demonstrated in that environment would be considered TRL 6, but would not be considered TRL 6 if they were intended for a spaceflight environment for AtmOS).

If the candidate instrument is not currently at TRL 6 for the intended environment, the response should include the following:

a) An estimate of current TRL, using the TRL definitions in Appendix G of the NASA Systems Engineering Handbook (NASA SP-2016-6105 Rev. 2, 2016).
b) A technology maturation plan that outlines the approach and timeline to achieve TRL 6
c) Identification of the external funding source(s) supporting the effort to achieve TRL 6 and qualify the hardware for the intended environment

COST ESTIMATE

The AtmOS Constellation is cost-constrained. The AtmOS team requests a rough-order-of-magnitude estimate on the total cost in 2021 dollars for the Tandem Stereographic Cameras. For purposes of cost estimation and planning, the respondent should consider award of the instrument Phase A contract NET March 2022. Award of an instrument delivery contract should occur sometime in Phase B for Phase C-E. Phase B is expected to start NET March 2023. The respondent should assume that the instrument is delivered to a spacecraft provider for integration and testing at observatory-level and for delivery to the launch site for launch and a follow-on period of on-orbit checkout. For purposes of developing the Cost Estimate, the respondent should assume the following draft AtmOS milestone schedule found in Table 4.

Table 4 Draft AtmOS Milestone Schedule

Milestone	Date

Mission Concept Review	2/1/22
Tandem Stereographic Cameras System Requirements Review	10/1/22
Mission Systems Requirements Review	12/1/22
Tandem Stereographic Cameras Preliminary Design Review	4/1/24
Mission Preliminary Design Review	6/1/24
Tandem Stereographic Cameras Critical Design Review	4/1/25
Mission Critical Design Review	6/1/25
Inclined Orbit Plane Systems Integration Review	6/1/26
Polar Orbit Plane Integration Review	6/1/27
Inclined Systems Integration Review	6/1/26
Polar Systems Integration Review	6/1/27
Inclined Launch	3/1/28
Inclined On-Obit Checkout Complete/Operations Commence	6/1/28
Polar Launch	3/1/29
Polar On-Obit Checkout Complete/Operations Commence	6/1/29

MISSION ASSUMPTIONS AND SPACECRAFT INTERFACE ASSUMPTIONS

When developing their response, the respondent should consider the following Mission and Spacecraft Interface assumptions detailed in Table 5.

Table 5 Mission and Spacecraft (MSC) Interface Assumptions

Identifier	Category	Polar, Inclined, or Common	Mission Parameters and Spacecraft Interface: Driving/Key Assumptions
MSC1	Orbit	Polar	450 km +/-10 km altitude, Sun Synchronous Polar Orbit, Ascending Node: 1330
MSC2	Orbit	Inclined	407 km +/- 10 km altitude, 50 to 65 degree inclination
MSC3	Orbit and Thermal Interface	Inclined	For thermal purposes, the Inclined Spacecraft will perform approximately 9 to 12 180-degree yaw maneuvers per year to maintain a consistent 'cold side' to the spacecraft. The responder should note any instrument performance or functional concerns with this inclined ConOps assumption.
MSC4	Launch Date	Inclined	See Table
MSC5	Launch Date	Polar	See Table
MSC6	Instrument Design Life	Polar	Minimum 3 Years, accommodate 5 years for any consumable.
MSC7	Instrument Design Life	Inclined	Minimum 3 Years, accommodate 5 years for any consumable.
MSC8	Instrument Risk Classification	Common	Risk Class C per NASA 8705.4A
MSC9	Launch Vehide	Common	Assume environment envelope of the following launch vehides: Falcon 9, Blue Origin New Glenn, and ULA Vulcan Centaur.

Identifier	Category	Polar, Inclined, or Common	Mission Parameters and Spacecraft Interface: Driving/Key Assumptions
MSC10	Deployments	Common	Deployments for initial instrument configuration are acceptable. and should be noted by the vendor. For example, this might include protective aperture covers or release mechanisms for a system locked during launch.
MSC11	Orbital Debris Reduction	Common	The instrument should retain with the instrument any deployed hardware. No hardware is to be released into orbit.
MSC12	Thermal Interface	Common	Instrument is responsible for its own thermal management, including any cryocoolers, operational heaters, thermal radiators, thermal straps, and heat pipes. Assume that spacecraft will accommodate field of view for instrument radiators with view to a 'cold side' of the spacecraft. Conductive heat transfer between instrument and mounting interface will be restricted.
MSC13	Survival Power	Common	Spacecraft will provide dedicated power feed for survival heaters from nominal 28 V DC power service. Instrument is responsible for its own survival heaters and control (e.g. thermostats).
MSC14	Operational Power Service	Common	Assume nominal 28 V DC power service from spacecraft battery system, notionally 23 V to 32 V DC range of variation.
MSC15	Spacecraft Attitude Control System	Common	The spacecraft will maintain a fixed nadir-pointing attitude during operations.
MSC16	Science Data Management	Common	Instrument need not provide its own data storage system. Assume spacecraft will provide adequately sized data recorder to store instrument science, telemetry, housekeeping for periodic spacecraft downlinking.
MSC17	Science Data Management	Common	Data Rate values provided in the targeted resource allocation are for uncompressed data. Assume that the spacecraft will not implement any data compression on the instrument science data. The instruments may wish to implement data compression (lossy or lossless) algorithms prior to transfer to the spacecraft.

SOLICITATION

The AtmOS team will conduct a Pre-Acquisition Strategy Meeting with NASA Headquarters and Earth Science Division (ESD) in late Summer 2021 and a final Acquisition Strategy Meeting during Phase A. The purpose of this solicitation is to help inform the AtmOS team in preparation for those Acquisition Strategy meetings. NASA Headquarters Earth Science Division (ESD) will make the final determination as to the acquisition approach including a determination if the Tandem Stereographic Cameras will be commercially competed.

The Key Decision Point (KDP) A for AtmOS is expected to be no earlier than 3/2022. If solicited, the Tandem Stereographic Cameras solicitation will be posted no earlier than first quarter CY 2022.

DATA SECURITY

The information provided will be maintained on GSFC-maintained secure servers, and accessed only by civil servants, or contractors that have signed Non-Disclosure Agreements (NDAs) that preserve vendor proprietary and competition sensitive data.

It is not NASA's intent to publicly disclose vendor proprietary information obtained during this solicitation, including any cost estimates provided. To the full extent that it is protected pursuant to the Freedom of Information Act and other laws and regulations, information identified by a respondent as "Proprietary or Confidential" will be kept confidential.

The North American Industry Classification System (NAICS) code for this procurement is 336419, Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing, with a size standard of 1,000 employees.

RESPONSE CONTENT REQUIREMENTS

This RFI is to solicit specific capability information from any experienced source and promote collaboration and competition. The RFI seeks responses that provide the technical resource footprint, science performance, and vendor capability statements for Tandem Stereographic Cameras. The description of the Tandem Stereographic Cameras should include any relevant laboratory, sub-orbital, or spaceflight information regarding the hardware configuration as previously demonstrated and the science returned, as well as the instrument calibration and data validation methods.

Interested offerors/vendors having the required specialized capabilities to meet the intended application should submit a capability statement indicating the ability to perform all aspects of the effort described herein. Responders are invited to submit a narrative and to fill out the attached Tandem Stereographic Cameras spreadsheet. The narrative should not exceed 25 pages. Science publications and other relevant information can be referenced in the narrative to provide examples of the source's expertise, facilities, and prior work, especially regarding hardware and/or test results for the Tandem Stereographic Cameras. The respondent should include within the narrative a description of the Tandem Stereographic Cameras operating principles within the larger AtmOS operational concept including any measurement synergies enabled by the instrument. The respondent is encouraged to use the narrative to include an instrument functional block diagram, technology readiness assessment basis, identification of any long-lead components or subsystems, and any potential risks (cost, technology, or schedule) envisioned for the Tandem Stereographic Cameras based on the AtmOS schedule and flight architecture.

The attached AtmOS Tandem Stereographic Cameras spreadsheet offers a convenient and concise means of addressing the anticipated Tandem Stereographic Cameras performance, spacecraft resource, and mission operational concept needs. The spreadsheet includes the technical information necessary to support Mission Concept development/pre-formulation. The spreadsheet includes separate tabs for General Information, Tandem Stereographic Cameras Performance, Supplemental Information, Spacecraft Accommodation, Orbit and Attitude, and TRL. Please complete one spreadsheet for each candidate instrument submitted.

Responses must also include the following: name and address of firm, size of business; average annual revenue for past 3 years and number of employees; ownership; whether they are large, small, small disadvantaged, 8(a), Woman-owned, Veteran Owned, Service Disabled Veteran Owned, Historically Underutilized Business Zone and Historically Black Colleges and Universities)/Minority Institutions and number of years in business. Also include affiliate information: parent company, joint venture partners, potential teaming partners, prime contractor (if potential sub) or subcontractors (if potential prime), list of customers covering the past five years (highlight relevant work performed, contract numbers, contract type, dollar value of each procurement; and point of contact - address and phone number).

This synopsis is for information and planning purposes and is not to be construed as a commitment by the Government nor will the Government pay for information solicited. Respondents will not be notified of the results of the evaluation.

Technical questions should be directed to: Vickie Moran at Vickie.E.Moran@nasa.gov.

Procurement related questions should be directed to: Craig Keish at craig.f.keish@nasa.gov.

Interested offerors should respond to this RFI in written format as described in the previous paragraphs by electronic mail to: Vickie Moran at Vickie.E.Moran@nasa.gov by July 21, 2021. Responses can be submitted via email. The subject line of the submission should be "RFI for AtmOS Tandem Stereographic Cameras," and attachments should be in Microsoft WORD, POWERPOINT, EXCEL or PDF format. The email text must give a point-of-contact and provide his/her name, address, telephone/fax numbers, and email address.

Contracting Office Address:
NASA/Goddard Space Flight Center
Greenbelt, Maryland 20771

Primary Point of Contact:
Craig Keish
craig.f.keish@nasa.gov
Phone: 240-285-0839