DARPA-PA-24-04-03 NIMBUS
Frequently Asked Questions (FAQs)
as of 12/13/2024

22Q: Will all NIMBUS program reviews and PI meetings be virtual, and no travel budget needs to be allocated for PI meetings? Would you please confirm?

22A: At this point all meetings are planned to be virtual. However, the program is very "demo" based, so if multiple teams have exciting results to share or present the challenges they overcame to achieve results, DARPA may change to an in-person 6month meeting. If so, teams can adjust their budgets to arrange for travel. If that is not possible, DARPA team may visit the team at their site

21Q: Would it be allowed to budget trips for PI and student/postdoc to visit Co-PI's lab for collaborative experiments, or vice versa?

21A: Yes

20Q: NIST Demo Questions:

- What testing will be performed at NIST/Polytec?
- Will it be in vacuum?
- What data will be provided about our devices in post?
- Will we get the devices back after the NIST demo?
- Will we have access to data/results from other performers?

20A: DARPA will evaluate performance under conditions and at locations that align with the team's experimental requirement. Specific details about vacuum conditions can be clarified based on individual testing plans. Data rights will be strictly protected for all performers. Data will be loaded to the government VAULT system and accessible to government team members. No action or use of the data will be made without team knowledge and consent.

19Q: In phase 1 are we constrained by the fatigue limit of polysilicon, even if we are not using polysilicon as our material for phase 1 devices?

19A: The mission of NIMBUS is not about imposing constrains. It's about exploring the ultimate limits of a MEMS material resonator and its mode of vibration. If the polysilicon fracture limit is not applicable to your chosen material and MEMS system, please provide alternate equivalent number supported by detailed calculations and clear justification.

----------⬆⬆⬆**New Q/A**⬆⬆⬆----------

18Q: Clarification on the Price Volume – should we include the "Schedule of Milestones and Payments" excel file to satisfy the requirement for the Volume 2, Price Volume? Or should we provide the Schedule of Milestones and Payment file in addition to the Volume 2: Price document and the DARPA Standard Cost Proposal Spreadsheet referenced in the main solicitation (DARPA-PA-24-04)?

18A: Format instruction is stated in DARPA PA-24-04 Section 5. The "Schedule of Milestones and Payments" spreadsheet is a separate document from the Volume 2: Price. All proposals must use the spreadsheet template as an attachment to DARPA-PA-24-04.

17Q: Can this funding be used to support students on student visas (non-U.S. citizens)?

17A: Similar answer to question#15 below

16Q: For the IV&V testing, do you expect potential performers to have a chip-scale/board-level actuation scheme? The DO has no limits on SWaP and we want to know how/if off-the-shelf actuation equipment is within the scope of the proposal.

16A: DARPA is aware of several commercial and university domestic opportunities for LDV rental. We encourage reaching out to get quotes etc.

15Q: Can non-US persons work on your Disruptioneering programs?

15A: Per DARPA PA-24-04 Section 7.1.2, "Non-U.S. Organizations Non-U.S. organizations and/or individuals may participate to the extent that such participants comply with any necessary nondisclosure agreements, security regulations, export control laws, and other governing statutes applicable under the circumstances."

14Q: With the change from BASIC RESEARCH to APPLIED RESEARCH per the solicitation amendment is it still be possible for university performers to claim Fundamental Research as prime and/or subcontractor?

14A: Both Basic and Applied Research fall under the umbrella of Fundamental Research, so this change in the amendment should not impact publication restrictions.

13Q: If we don't use single crystal silicon for our material, do we recalculate the Phase 2 metric of 200 m/s for our chosen material?

13A: Yes. As stated in the Disruption Opportunity (DO), DARPA-PA-24-04-03, "the velocity goal is for single-crystal silicon, and performers should state the calculated material limit of their chosen MEMS technology".

12Q: Would it be acceptable to use a commercial MEMS foundry in Europe or Canada for prototype fabrication and include the cost of such services in the budget?

12A: Using a commercial MEMS foundry located in Europe or Canada may be permissible, provided that all export control, Controlled Unclassified Information (CUI), and Controlled Technical Information (CTI) regulations are rigorously observed. To mitigate risks associated with foreign access to sensitive technology, a robust CUI/CTI management plan is advisable, which may include measures such as restricted data flow and secure handling protocols for sensitive information. For further clarification on including foundry services in the budget, please refer to the VOLUME 3 ADMINISTRATIVE & NATIONAL POLICY REQUIREMENTS attachment to the Disruptioneering Program Announcement (PA), DARPA-PA-24-04, which details guidelines on cost allocation for international services.

11Q: What is the payment schedule for DO projects. Are the payments upfront for the whole Phase? Or are they upfront for each task? Or upon satisfactory completion of each task/Phase?

11A: Payments will be made in accordance with the Schedule of Milestones and Payments document that becomes part of any resulting OT, after review and approval of the deliverable in accordance with the terms of the agreement. Please review the

Schedule of Milestones and Payments that is an attachment to DARPA-PA-24-04-03 for a general sense of timing of said payments.

10Q: Is there a budget limit for equipment? To increase velocity, I propose increasing the operating frequency from the current 1-10 MHz range to 10-100 MHz range. However, the vibrometer in my lab is limited to a maximum of 20 MHz, so an upgrade would be necessary to cover the higher frequency range. High-frequency vibrometers can be quite expensive, with costs potentially reaching hundreds of thousands of dollars. If such a significant expense is not allowable, I will explore other options, such as cost-sharing, equipment rental, or other alternatives. Could you provide guidance on this?

10A: See question 9Q. It is our understanding that access to service testing and facilities is available within the U.S. and elsewhere. While such equipment would be beneficial, DARPA does not believe that purchasing a completely new system is necessary.

9Q: I'm currently exploring various solutions for purchasing equipment. If my NIMBUS proposal is selected, would you be able to support my DURIP proposal to acquire the high-frequency vibrometer?

9A: The total award value for Phase 1 and Phase 2 combined is capped at $2,000,000, inclusive of both Government funding and any performer cost-sharing. This implies that all budget elements - including equipment purchases - must be allocated within this limit. For any high-cost items, such as specialized vibrometers, we may need to explore alternative funding sources (e.g., DURIP) or consider options like cost-sharing or equipment rentals to stay within budgetary confines.

8Q: I could not find explicitly what contract types would be accepted under this solicitation. I could only find reference to Cost Sharing in Paragraph 1, and Fixed Milestone Payments in Paragraph 1.E. Should I assume that DARPA is only accepting proposals utilizing a FFP type contract for this solicitation? Will a proposal that is submitted using a Cost Reimbursement Contract Type be disqualified from award, or will it still be considered?

8A: All awards resulting from the NIMBUS DO will be Other Transaction (OT) for Prototype agreements.

7Q: Is there any wafer size requirement for demonstration of devices?

7A: The DO doesn't explicitly state a required wafer size for demonstrating the devices.

6Q: Are the target velocities of 65m/s and 200m/s for the oscillating element the peak speed (i.e. 2*pi*amplitude*frequency)? or the average speed that would be pi/2 times smaller than the peak velocity?

6A: The DO emphasized achieving high velocities, aiming to put the limits of micro-mechanical systems, therefore maximum velocity attained by the oscillating element, correspond to the peak velocity.

5Q: No requirement for the amount of mass to be moved at target speeds is mentioned in the BAA. Would it still satisfy the requirements if only a tiny mass (e.g. under 10 microns in dimensions) actuated by a much larger transducer (e.g. 1-2 mm in chip surface area) is accelerated to the target velocities?

5A: The program aims to demonstrate tethered resonant systems that operate near the material fracture velocity limit. This suggests that achieving the target velocity, regardless of the mass involved, might satisfy the core requirement.

4Q: Is this proposal-call focused only on developing MEMS gyroscopes? or MEMS oscillators (clocks) that can achieve the required criteria (200m/s velocity) are also considered?

4A: The NIMBUS program is not limited to developing only MEMS gyroscopes.

3Q: Should the focus of the proposal be on proof-massed resonators or continuous-shaped resonators (disks, BAW...) are also acceptable?

3A: If you believe continuous-shaped resonators provide unique advantages or represent a promising pathway to achieve the program's goals, clearly articulating these benefits and their alignment with program objectives in your proposal will be important.

2Q: Could you please provide references for desired fracture velocity of 200m/s and the current state of the art oscillators that achieved the maximum velocity of 5m/s?

2A: The solicitation does not directly cite specific references for the fracture velocity for single-crystal silicon or limit of current state-of-the-art oscillators. Therefore, it may be necessary to conduct independent research to identify relevant references and data to support these values.

1Q: Should the deliverable microsystems be an inertial sensor or an oscillator? I understand the primary goal of NIMBUS is to achieve targeted velocity in tethered microsystems for inertial sensors. However, reading the solicitation, I am still confused about whether the tethered micro-resonators can be just a resonator (e.g., doubly-clamped beam) or need to be an inertial sensor (accelerometer or gyroscope).

1A: While the DO does not explicitly mandate that deliverable microsystems be fully functional inertial sensors (e.g., accelerometers or gyroscopes), proposals should demonstrate how the chosen approach aligns with and advances the program’s overarching objectives. Proposers should provide a clear rationale for how this work contributes to the development of high-velocity microsystems.