DARPA-BAA-16-13 (MOABB) - Frequently Asked Questions Update

1) **Question:** Where can MOABB proposals be submitted?
   Answer: Please refer to DARPA-BAA-16-13, pages 21-23, "Proposal Submission Information." Proposers must submit proposal via DARPA's BAA Website (https://baa.darpa.mil).

2) **Question:** Where should the Proposal Summary Slide be in regards to the order of the proposal, and is it included in the page limit?
   Answer: There is no specific order in which the Proposal Summary Slide should be included in a proposal and it is not included in the official page count.

3) **Question:** Is it acceptable to include the Award Administration Information as an Appendix? Would this affect the page limit?
   Answer: It is acceptable to include the Award Administration Information as an Appendix. It will not be included in the page limit.

4) **Question:** The BAA specifies that "wafer-scale processing" is highly desirable, and also references heterogeneous integration. Does "wafer-scale processing" require that any integration or bonding process must be performed between entire wafers? Or does it include situations in which one or more dies in bonded to a substrate wafer?
   Answer: There is no preferred wafer-scale processing approach; proposers are encouraged to provide unique technical approaches and architectures to meet the performance objectives for all phases of the program, as specified in DARPA-BAA-16-13.

5) **Question:** For proposals that address both Technical Area 1 and Technical Area 2, will the two areas be evaluated separately or as a whole? In other words, does such a proposal need to clearly distinguish in the SOW, costing, and other sections, which parts of the proposal addresses each Technical Area?
   Answer: Yes, proposers must clearly identify the Technical Area(s) they are proposing to. Proposals should include well-defined technical approaches, a SOW, key tasks, cost estimates, and schedule to meet all performance objectives for each Technical Area.

6) **Question:** The BAA appears to suggest that the system needs to include integrated amplifiers in each unit cell. With the exception of directed energy applications where the power scalability of distributed light generation is beneficial, for other (ranging, communication) applications the benefit of integrated light generation and amplification is debatable and could be a significant liability in terms of yield, power density and cost in comparison to, for example, approaches where the light source is treated as a power supply to a LIDAR system-on-chip. If we propose a system that meets the system specifications without using integrated amplifiers, will our proposal be seriously considered? Or, is development of integrated amplification technology a key goal of the program?
   Answer: For Technical Area 1 and depending on the proposed architecture, co-integrated photonic devices may not be necessarily required as long as all performance objectives are met.

Updated as of 2 February 2016

7) **Question:** In Table 2 of Technical Area 2, the target weight is 0.01 lb., and target power is 40 W. One can assume that this is for the data processing chip, and not for the packaged system. In addition, 40 W appears to be the power budgeted for the data processing chip alone, since optical power is already 100 W and is presumably excluded as well. What are the specific inputs/outputs for the packaged LIDAR system?
Answer: The inputs to the operational LIDAR system will include regulated DC power and direction information, while the outputs will include target range and target velocity. The proposed LIDAR system needs to package all necessary system components and meet all required size, weight, and power consumption objectives listed in Table 2 as stated in DARPA-BAA-16-13. Note that 100 W will NOT be radiated from the Technical Area 2 final demonstrator, this specification is the objective of the Technical Area 1 final demonstrator.

8) **Question:** The BAA states (below Table 1): "Aperture Fill Factor is defined as the total area of the radiating surface divided by the aperture size. Non-radiating devices can be arrayed around the aperture area and not contribute to fill factor." This is very clear in case of a single 1 x 1 mm cell (Phase 1): the radiating surface must be 1 x 1 mm, and the non-radiating devices can be placed outside this 1 x 1 mm radiating surface. However, if this cell is tiled to achieve a larger aperture (1 cm x 1 cm in phase 2 and 10 cm x 10 cm in Phase 3), these non-radiating devices will end up being inside this larger aperture. Do these non-radiating devices contribute to the aperture fill factor? The question can also be formulated in a different way. The objective of Phase 3 is to have a 10 cm x 10 cm aperture with 95% fill factor. Does it mean that 95% of the 10 cm x 10 cm, i.e. 95 cm^2 area, needs to be radiating?
Answer: Yes, the radiating surface in Phase 3 for Technical Area 1 should be 95% of the total aperture area, and proposers also must meet all performance objectives in Table 1 of DARPA-BAA-16-13. Please note that non-radiating devices can be arrayed around the aperture area and not contribute to fill factor.

9) **Question:** In the BAA, it states for Technical Area 2: "Each phase will employ the output optical system from the previous phase of Technical Area 1." This would indicate that the Technical Area 1 Phase 1 chip will be used in Technical Area 2 Phase 2, and the Technical Area 1 Phase 2 chip will be used in Technical Area 2 Phase 3. However, when will the Technical Area 1 Phase 3 (i.e. 10 cm x 10 cm) chip be employed in Technical Area 2, if ever? If it is not to be employed, do you want a design developed for said chip in Phase 3 of Technical Area 2?
Answer: Technical Area 2 will follow the progress of Technical Area 1, although they are allowed to develop alternative technologies capable of meeting the Technical Area 2 objectives. The Phase 3 output of Technical Area 1 will not be incorporated into a LIDAR system within the scope of the MOABB Program.

10) **Question:** Will smaller proposals (seedling-like) be considered? They will be complete and include all the requested sections. We have a couple of very innovative concepts but higher risk and the focus would be on risk reduction and/or proof of concept for the desired end objectives.
Answer: DARPA is seeking complete solutions to the technical areas described in DARPA-BAA-16-13. Solutions that do not address the complete technical area to which they are proposing will be

considered incomplete. The appropriate avenue for seedlings and other concepts not specifically addressed by DARPA-BAA-16-13 is through the open-office BAA.

11) **Question:** What is the desired angular resolution for the stated field of regard?
Answer: The angular resolution is unspecified. Proposers are encouraged to provide additional performance metrics of their unique architectures, as long as they meet program metrics and objectives outlined in DARPA-BAA-16-13.

12) **Question:** Within the BAA, Part II, IV(B)(4)(a), Section II. Detailed Proposal Information, Part I states "I. Cost schedules and measurable milestones for the proposed research…" Normally, this section is written, "Cost, Schedules, and Measurable milestones…." The commas indicate that Schedules (e.g. Gantt Charts) as opposed to just Cost Schedules are part of the section. Can you clarify?
Answer: There typically is a comma between "Cost" and "Schedules." Proposers should provide a summary (very high-level) of costs, along with the schedule and milestones within Volume I.

13) **Question:** For the MOABB scan rate of 100Hz, how many interrogation points does this refer to? If it is the entire field of regard, I assume we can't hit every diffraction limited point, because for the 70 deg x 12 deg Field of Regard (FOR) there are 1e5 points (each diffraction limited spot is 1.55 mrad), so if we hit every one of these points at 100 Hz, that only leaves 0.1 µs per point.
Answer: The number of points will depend on the unique architecture proposed, which must also meet all the performance objectives specified in DARPA-BAA-16-13. It is not intended for the performer to interrogate every diffraction limited angle in the field of regard (for the reasons stated in the question), and it is not anticipated that the performer will form an ideal diffraction-limited beam. It is anticipated that the performer will interrogate the entire field of regard with some combination of non-diffraction limited beams and minimal holes in coverage.