ASSOCIATION OF UNIVERSITIES FOR RESEARCH IN ASTRONOMY, INC.

AMENDMENT NO. 01 **DATE: 08/07/2025**

TO

RFP N00051392C

THIS AMENDMENT NO. 01 TO RFP N00051392C hereby incorporates the following changes:

1. Question: Is there a target price, price-range, or maximum budget/price to which we should try to constrain the scope of work proposed?

   Answer: Please submit a cost estimate with your proposal that will cover the effort necessary to complete the work detailed in the Statement of Work. While cost will factor in the ranking of proposals, there are other factors that hold significant weight. We will not provide our internal cost estimates as part of the RfP process. If the successful bidder's cost is over our budget limitations, we may discuss limiting the scope of work to reduce the overall cost.

2. Question: In the Tender documents, several article numbers are missing: such as Articles 15-17 (page 11-12); and SOW 6.3: 4)-6). Can we assume these were intentionally left out and there is no missing text?

   Answer: There is no missing text in those sections, it appears to be a numbering error.

3. Question: In the Study Specification, the deliverable design is referred to as the "Initial Design." We interpret this deliverable to be a relatively mature preliminary design, subject to potential risk reduction activities such as breadboarding, and maturation to a final design in a follow-on phase. Is that correct?

   Answer: That is a correct interpretation. The purpose of this design study is to progress the design to what would be considered a relatively mature preliminary design.

4. Question: The contract refers to the law of Arizona. Would it be acceptable to agree on the law of New York as a somewhat neutral option?

   Answer: AURA is able to operate under New York law so that change would be acceptable.

5. Question: For Requirements 0105 and 0110, by "bias voltage" do you mean a power-off condition, or can this be an open-loop nominal flattening voltage (or current)?

   Answer: For those two requirements, "bias voltage" should be considered to mean that the drive electronics are powered on and their internal startup functions have been completed but no commands have been sent from the DKIST AO system. This would allow a nominal flattening voltage or current to be applied, provided it doesn't require feedback from the DKIST wavefront sensors or other systems external to the DM Assembly.

6. Question: For Requirement 0125, does the reference to >2.5micron deflection refer to the stroke available to flatten the mirror, or the stroke available after the actuator is in the "calibrated position for making the mirror flat."?

   Answer: The 2.5 microns deflection refers to the stroke available to the actuators after the actuators have been driven to flatten the mirror. Another way to phrase this would be the "working stroke" of the actuator, that is, the total stroke minus the stroke needed to flatten the mirror.

7. Question: Requirements 0200 and 0205 require mirror qualities (roughness, scratch/dig) outside of the clear aperture. In light Req. 0005 allowing extended shapes (hex, circular), there could be a significant area outside the aperture. Why do these requirements apply to areas outside of the clear aperture? (this could eventually be price driving).

   Answer: Upon further review of the beam dimensions on this mirror, we are amending the requirements 0200 and 0205 to apply only within the clear aperture of the mirror.

8. Question: Requirement 300 seems to require verification of the coating by "Test" in this phase which does not include any hardware. Are you looking for more general/historic coating qualifications tests, and not a new test to be performed within the project?

   Answer: The test required for the coating could be satisfied by providing historical data from previous coating runs done on similar substrates and under similar conditions.

   If one of the three coatings called out in the requirement is chosen, then only the reflectance data for that coating needs to be provided as AURA/NSO has already validated those specific coatings.

   If the bidder wishes to validate an alternative "equivalent" coating then more data (ellipsometry, adhesion, durability, etc) will be needed to properly evaluate the coating. More information on the DKIST coating validation process can be provided if necessary.

9. Question: Requirement 400 refers to "Starfire Optical Range SOR-422 16-bit LVDS digital interface". Can you provide documentation regarding this interface or point us in the direction of documentation? Is this proprietary or open source? If proprietary, will AURA be handling the licensing to the successful bidder?

   Answer: The SOR-422 interface is a unidirectional serial RS-422 interface to transfer actuator commands at high-speeds and low latency. It can be realized with TI DS90LV048A receivers.

   There are 16 data lines (bits), three control lines and one clock line. Each clock cycle (e.g. 20 MHz) is the 16-bit command for one actuator, and all actuators are transmitted in a frame, that is there is no separate addressing. The interface is unidirectional and has no feedback from the DM drive electronics. Any non-actuator data communication with the DM driver needs to be accomplished with an additional interface at the vendors choice.

   The exact specification (e.g. connectors, pinout, voltage levels and timing) will be made available to the successful bidder at no cost.

10. The due date for this RFP has been extended to 31 October 2025 by 3:00PM MST.