

Technology Collaboration Center Collaboration Request

REQUEST SUMMARY

Collaboration Request ID: IAD

Collaboration Request Title: Innovative Air Drying Via Lightweight Structure Coating

Requesting Organization: NASA Johnson Space Center

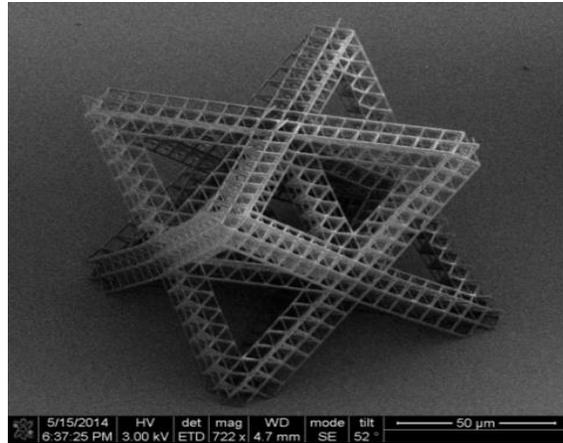
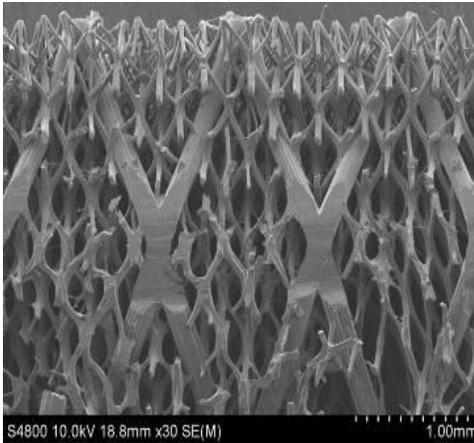
All questions on this request are to be:

- Submitted via e-mail to Collaborations@techcollaboration.center

Any organization interested in participating in this collaboration are to submit a proposal using the Collaboration Response form from techcollaboration.center, the Technology Collaboration Center's (TCC) website. Responses will be forwarded to the Requesting Organization for consideration.

OVERVIEW – NON-CONFIDENTIAL**1. Brief explanation of the problem(s) to be solved with the Collaboration:**

As NASA ventures from Low Earth Orbit into deep space, longevity and air scrubbing concerns for astronauts increase. Lightweight structures have been developed that can support thin films of coatings for increased air drying. The challenge arises in developing and testing surface coating materials with dehumidifying capabilities for various lightweight structures.

**2. What is the time frame for the collaboration (when will it start, deadline for results, ...)?**

Responses will be reviewed as they're received and collaborations can begin at any time.

3. When reviewing responses, are there any key elements that will factor into the decision process?

The key elements are: (1) The capacity of adsorbing water vapor and/or carbon dioxide expressed in terms of moles of H₂O/CO₂ per unit volume of coated sorbent, (2) energy needed to drive off the H₂O/CO₂, (3) pressure drop of the system, (4) non-recurring costs to manufacture.

4. Brief summary of the progress made so far to address the problem(s):

Limited progress has been made in analyzing film-forming surface coating materials. Previous attempts at developing coated structures proved to be significantly less effective than granular packed beds of pelletized sorbents.

5. What has already been tried or considered to solve the problem?

Traditional structures similar to lightweight heat exchangers have been coated. The resulting technology can be heated to regeneration temperatures approximately 10 times faster than pelletized sorbents, but the capacity of the coated structures is 100 times less. An order of magnitude improvement is needed in the amount of surface area for a given thermal mass.

6. What is the technology readiness level (TRL) of the current technology, and briefly explain the technology is at this level?

TRL of existing coated structures is 2 – lab scale.

7. Are there similar implementations of the solution you are seeking in other fields? If so, what are they, and how might they apply to your problem? How much would have to be changed to have it meet your needs?

NASA has limited insight into implementations or solutions from other fields and would be interested in learning about potential solutions from other industries or applications.

8. Types of collaborations being sought (such as a joint project or contracted project):

NASA seeks unique surface coating ideas and capabilities, knowledge sharing opportunities, or potential partnership arrangements (if applicable). This technology may be of interest to other research such as thin film applications as well as office air conditioning and climate control.

9. Do you have any resources to help with this project (specialized equipment, labs, materials, ...)?

Depending on the nature of the partnership agreement, NASA may be able to provide access to one or more of the following resources:

- 1) Standard sorbent characterization capabilities
- 2) Standard microscopy / materials analysis

10. How will this collaboration be funded (will funds be provided for this project, or should a proposal for funding be part of the response)?

No funds will be available for this project. This announcement is solely for information, planning and collaborative discussion purposes and does not constitute a Request for Proposal (RFP).

11. What are the potential benefits for collaboration partners (i.e., why should they want to work on this project)? Is there an opportunity for partners to commercialize this technology for the primary and/or secondary applications?

Partners can potentially benefit from NASA's unique capabilities, technology advancements, and expertise. In addition, new Intellectual Property (IP) may be created through a collaboration that would enable the partner to commercialize the technology for other applications such as office air conditioning and climate control products. In previous projects, the NASA work fully characterizing a research grade material (as part of the flight hardware qualification process) helped mature the technology of the commercial product being developed.

12. Will there be any opportunities for sharing the created Intellectual Property from the collaboration?

Joint collaboration projects may produce new Intellectual Property (IP) that could jointly be owned by NASA and the Partner. Specific IP terms will be determined on a case-by-case basis depending on the legal mechanism selected for the collaboration and the circumstances related to the development of the new IP. Proprietary information shared with the government will be protected in accordance with federal law.

13. Beyond the primary application for this technology, what are other potential applications of this technology, which may be of benefit to collaboration partners?

Other potential applications could include using this technology in office air conditioning and climate control products.

14. Are there any restrictions or constraints on potential collaborations?

No restrictions are being placed on responses or the type of organization responding. NASA collaborations / partnerships are subject to limitations that relate to safety, security, appropriations, and non-interference with other NASA operations. Partnerships are non-exclusive and NASA cannot provide services through a partnership that would compete with private industry. NASA's participation may be further restricted by law, regulation, or policy.

15. Identify any other sources of supporting information to help organizations prepare a response:

None.

16. Please provide any additional information that potential responders should be aware of when preparing their responses:

This announcement is solely for information, planning and collaborative discussion purposes and does not constitute a Request for Proposal (RFP). Since this is a general announcement, no evaluation letters or results will be issued to the respondents. The purpose of this Announcement is to engage prospective partners in dialogue leading to research and development (R&D) knowledge sharing or joint collaboration projects. In selecting potential partners, JSC will assess the best-fit use of its resources consistent with the NASA mission.

DETAILS – NON-CONFIDENTIAL

As NASA ventures from Low Earth Orbit into deep space, longevity and air scrubbing concerns for astronauts increase. Lightweight structures have been developed that can support thin films of coatings for increased air drying. The challenge arises in developing and testing surface coating materials with dehumidifying capabilities for various lightweight structures.

The goal is to collaborate on technologies pertaining to surface coatings for lightweight, unobtrusive mobility structures for air separation and scrubbing systems. These technologies could be applied to systems for astronauts venturing into deep space as well as for innovative air conditioning and climate control systems for office buildings.