NanoRacks

Announcement of Opportunity-1

"Building a NanoLab Community for Space Station Users"

NanoRacks, the leading company in low-earth orbit research and educational utilization, seeks to further stimulate the market for International Space Station usage by offering to designate and promote up to five (5) companies that can offer for retail sale NanoLabs for use in NanoRacks hardware now on the space station and on suborbital platforms.

The purpose of this AO is to help create a robust, standardized ecosystem that makes use of the NanoRacks research platforms now permanently onboard the U.S. National Lab on International Space Station as well as for possible use in other environments, such as onboard the Virgin Galactic suborbital SpaceShipTwo research racks.

We believe that hardware that can be used on the space station that is low-cost and standardized allows researchers to focus their budget and time on the payload itself. It is our hope that this further lowers the barriers to microgravity utilization.

For those companies whose NanoLab design is selected by NanoRacks:

--We will award $2,000 as an honorarium for each chosen NanoLab;

--Promotion of your NanoLab to NanoRacks' customers, providing your product favored status among students, educators and researchers for space station and suborbital utilization.

Background

In 2010, NanoRacks self-funded the installation onboard International Space Station of two research platform (NR-1 and NR-2) that each can support up to 16 1U NanoLabs for utilization inside the space station.

The following video shows the NanoLabs and our NanoRacks Platform-1 being handled by astronaut Scott Kelley: http://www.youtube.com/watch?v=tLax1va1w3w&feature=plcp.

To date, customers using NanoLabs have had to build the hardware each time from scratch. We have considered creating our own family of NanoLabs, but have come to believe it is better for the community to have a marketplace with differing NanoLab vendors for researchers and students.

Several companies have announced hardware compatible for NanoRacks Research Platforms, but we want to stimulate the market further with this AO.

NanoLabs

Each NanoLab is a standardized sized module in the CubeSat form factor, measuring 4 inches by 4 inches by 4 inches. (Also referred to as 1U) Each NanoLab is carried up to the space station in simple cargo bags, though certain future NanoLabs may require greater temperature control. Each NanoLab has at least a single microcontroller circuit board that controls the operation of an experiment and a USB 2.0 female Type B connector that provides data connectivity and power (5 VDC at approximately 2 Watts) to the NanoRacks Frame. They are utilized inside the space station pressurized environment.

Announcement of Opportunity

NanoRacks is seeking to select

a) One (1) NanoLab that is specific for botany (plant) projects that will germinate seeds and is either a 1U or 2U unit and includes a microcontroller circuit board and USB port (as described above) and includes the following:

    a. Still electronic camera

    b. Flash memory capable of holding 4 weeks' worth of still images

    c. Plant watering system

    d. Plant temperature and hydration sensor system

    e. Plant growth chamber

    f. Comprehensive users guide

    g. Explanation of how you will manufacture and distribute your NanoLab and any marketing concepts you may have

b) One (1) NanoLab that is 1U in size and specific for measuring environmental conditions with a number of sensors that can be customer supplied or supplied by the chosen vendor and includes a microcontroller circuit board and USB port (as described above) and includes the following:

a. A non-metallic enclosure

b. Flash memory capable of holding 4 weeks' worth of data

c. Accommodate 5 analog sensor inputs with an A/D converter that can accommodate a variety of sensor sampling frequencies

d. Accommodate 5 analog outputs with associated high (0.5 A) current drivers.

e. Accommodate 5 discrete inputs

f. Accommodate 5 discrete outputs.

g. Comprehensive users guide

h. Explanation of how you will manufacture and distribute your NanoLab and any marketing concepts you may have

c) One (1) NanoLab that is 2U in size and can support the mixing of up to 24 biological compounds automatically and includes a microcontroller circuit board and USB port (as described above) and includes the following:

a. A maximum of 24 "vial set" each that have a central volume that will hold 1 ml of any fluid, a second volume that will hold 0.5 ml of any fluid, and a third volume that will hold 0.5 ml of any fluid.

b. The second and third volumes will be separated by some form of electrically actuated barriers from the first volume. The barriers can be one way in operation (e.g. frangible) and will not need to recluse once actuated. The barriers must be controlled by the microcontroller circuit for programmed operation.

c. The unit must be triply contained.

d. The unit must be returnable in a Soyuz or Dragon spacecraft.

e. Comprehensive users guide

f. Explanation of how you will manufacture and distribute your NanoLab and any marketing concepts you may have

d) One (1) NanoLab that is either 1U or 2U in size that can support the growth of bacteria with sample return and includes a microcontroller circuit board and USB port (as described above) and includes the following:

   a. A bacteria growth chamber.

   b. A nutrient chamber that communicates with the growth chamber via a reclosable separation means.

   c. The unit must be capable of being frozen

   d. The unit must be triply contained.

   e. The unit must be returnable in a Soyuz spacecraft in a cooler.

   f. Comprehensive users guide

   g. Explanation of how you will manufacture and distribute your NanoLab and any marketing concepts you may have

e) One (1) NanoLab that is dedicated to a specific function that is none of the above and has a function chosen by you.

We are seeking creativity and robustness. Your designs will be judged on the quality of the design, ease of use and cost. We are looking to you to supply the hardware for the NanoRacks' customer. We take that role very seriously.

Ideally, the same NanoLab could be used both by a high-school student and a commercial researcher; the only difference would be the project objectives.

Though the size of the market is difficult to judge, we have a backlog of several dozen payload slots and anticipate growth in 2013. In most cases, a NanoLab is used only once, hence allowing a customer base of repeat business to develop.

Resources

See the following background documents located at:

http://nanoracks.com/resources/documents/

----"Learn How to Make a Great NanoLab Payload"
And,
----"Get an Understanding of the NanoRacks Platform"

For the Interface Control Document relating to NanoLabs and our Platforms please see:

http://www.conradfoundation.org/wp-content/uploads/NR-ICD-2-2-copy.pdf

Our channel of videos can be seen on www.youtube.com/nanoracks and pictures at www.flickr.com/nanoracks

AO Terms and Conditions:

1) Designs are due to NanoRacks by October 1st, 2012.
2) Announcement of selected NanoLabs, if any, will be made by October 14th, 2012;
3) If less than five are chosen than the AO may remain open;
4) We expect that by December the chosen NanoLabs will be available commercially at a retail price of no more than $2,999. per 1U.
5) The NanoLab remains the property of the developer; the NanoLab must be open-sourced allowing the eco-system to further develop.
6) Care must be taken to use only off-the-shelf electronics to assure no concerns towards transfer of technology;

Our Support

1) Your NanoLab selected as officially approved research hardware for the NanoRacks' Research Platforms;
2) Your NanoLab present at conferences, symposiums and workshops;
3) Your NanoLab included as part of our official hardware list;
4) We will work with you to assure that your product meets the NASA safety standards;
5) You become part of the new revolution in open-source, standardized hardware for suborbital and space station utilization

6) NanoRacks will look to you for next generation hardware on space station…and beyond.

7) Of course, if your NanoLab is not selected by us, you are free to market the product on your own.

Anyone interested in taking part in an upcoming Q&A please send your name to: info@nanoracks.com and we will contact you with further information.