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The ISS US National Lab, NanoRacks and Users

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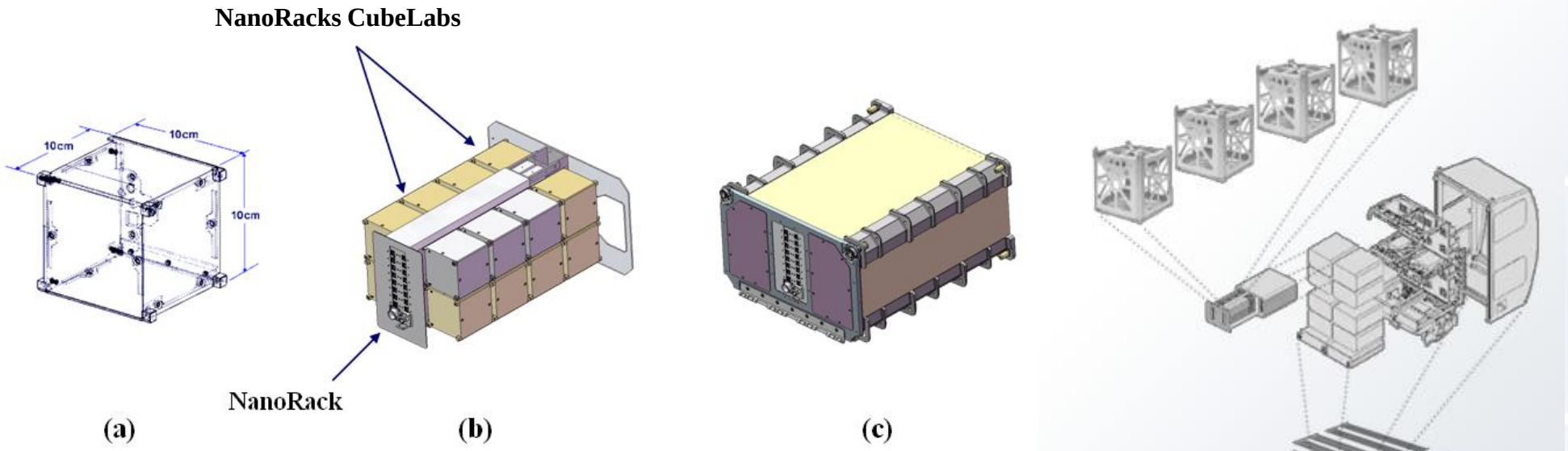
ISS US National Lab

- **NASA transitioning ISS to operational mode**
- **Extension of ISS to 2020 is key**
- **National Lab is an elegant solution to broad access for research**
- **Extended time in microgravity is a key feature of the ISS US National Lab**

NanoRacks on the ISS



- **2 NanoRacks on the ISS in the US National Lab – Now!**
- **16 CubeLabs™ slots per NanoRack per mission**
- **Multiple missions per year**

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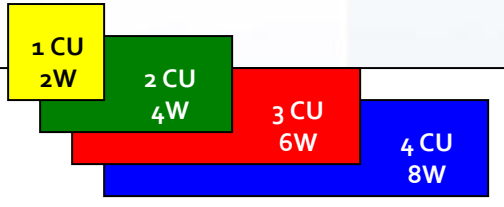
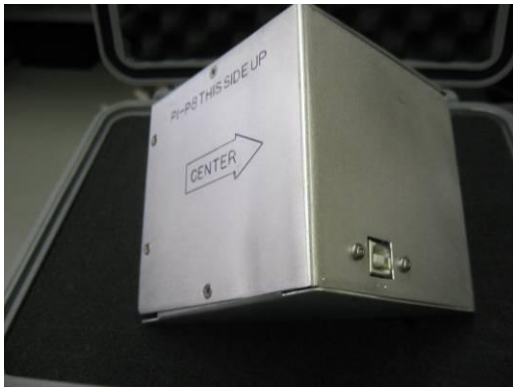
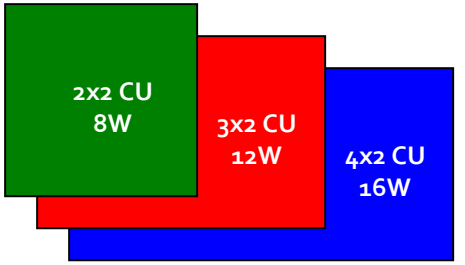
NanoRacks Modules may be configured as follows:



Ratings per NanoRacks (CubeLab Module)Unit

Maximum Mass per CU:	1000g
Maximum Power per CU:	2 Watts
Maximum Voltage:	5 VDC
Maximum Current per CU:	400 mA
Maximum Cooling per CU:	2 Watts
Data:	Intermittent USB Connectivity
Crew Time:	Negotiated as needed
Delivery Timeframe:	L-6 to Late Access
Return Mass:	Soyuz limit to 1 kg
Transport Method	Cargo Transfer Bags



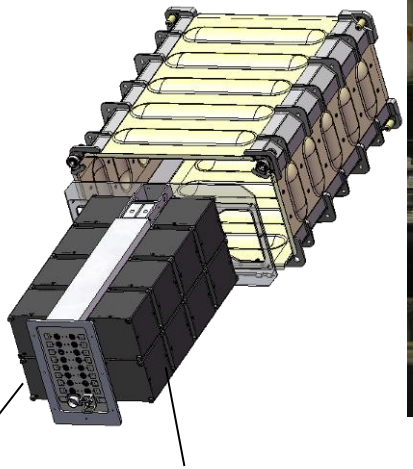


NanoRack Modules

NanoRacks is an ISS National Laboratories Payload
Two NanoRacks Platforms were installed on 19A and ULF4
Modules can be flown on any ISS transportation vehicle

Payloads can fly on any launch vehicle
NanoRack Modules can work in or out of the frame

NanoRacks Platform



NanoRacks Platform w/ CubeLabs™

NanoRacks Platform In ISS Locker

ISS ExPRESS Rack 4, Lockers 3 and 7

NanoRacks Facilities

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National Lab Users?

- The ISS U. S. National Lab isn't an outgrowth of a pure or applied science research organization.
- It has grown out of an engineering organization smart enough to recognize its strengths and weaknesses
- No organic following for the Lab - Yet
  - Its young
  - No student group or alumni groups
  - No massive trail of papers citing work in the Lab
- Need to jump start a following

How to Jump Start a Market

- Let users know about the Opportunity
- Lower Barriers - Make it easy to join in
- Generate innovation by allowing for contained Chaos

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Bottoms Up Innovation

"In a world where so many people now have access to education and cheap tools of innovation, ***innovation that happens from the bottom up tends to be chaotic but smart.*** *Innovation that happens from the top down tends to be orderly but dumb." As a result, says Carlson, "On balance, the sweet spot for innovation today is moving down, not up."*

- Curtis Carlson, the C.E.O. of SRI International,

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How to Jump Start a Market

- Let users know about the Opportunity
- Lower Barriers - Make it easy to join
- Generate innovation by allowing for contained Chaos
  - Simple Interfaces
  - Open Standards
  - Utilities
  - Clear, Limited Guidelines
  - Quick lifecycles
- Start young

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Applying the Jumper Cables

- **Economical Space Research**
  - Stability
  - Access
  - Repeatability
  - Un-refereed
- **Growing the customer base**
  - CubeSat form factor, $25K for schools, $50K for others
  - standardized, simple, quick, and inexpensive

NanoRacks Platform

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Making It Simple

NanoRacks provides full service integration

•Our team has 20 years of payload integration experience

•Seamlessly works with team-member Kentucky Space who efficiently processes many payloads

•Full service NASA safety system

•Extensive Interaction/Experience with
- ► NASA Payloads Office
- ► NASA Safety
- ► NASA MOD

•Interface Control Document Generation

•Full Service Verification Capabilities

•Experts at minimizing verification waste

Stowage for Flight

Final Verification

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NanoRacks Is Delivering

- Multiple University and Secondary School Customers
- 2 BioPharma Customers
- Utility Payloads
- In house research (with Kentucky Space)
- Much more to come

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NanoRacks Info

NanoRacks' goal is to create products, price points and support system that allows more and more customers to tap into all sorts of space research.

NanoRacks achieves this goal through its use of **standardized,** small form factor CubeLabs™

We believe that the U.S. National Lab can be marketed to new players both government and commercial, both research and students

We have built a full spectrum of capabilities to market to and support our customers all in the last year.

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