National Aeronautics and Space Administration

# Hypergravity Research Facilities for Model Organisms

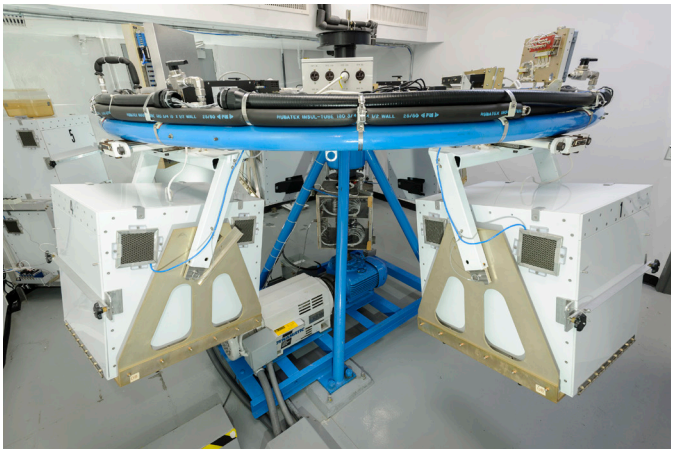
## NASA Ames Research Center, Moffett Field, CA

NASAfacts

The **1.22-Meter and 1-Meter Radius Centrifuges** are located in the Life Science Acceleration Research Facilities at NASA Ames Research Center, Moffett Field, CA. They are uniquely built for hypergravity studies evaluating the effects of high g-forces on small model organisms ranging from microbes to plants and small animals. Supporting residential staff expertise and resources allow researchers to conduct hypergravity studies at NASA Ames Research Center that cannot be performed in any other NASA facility.

### 1.22-Meter Radius Centrifuge

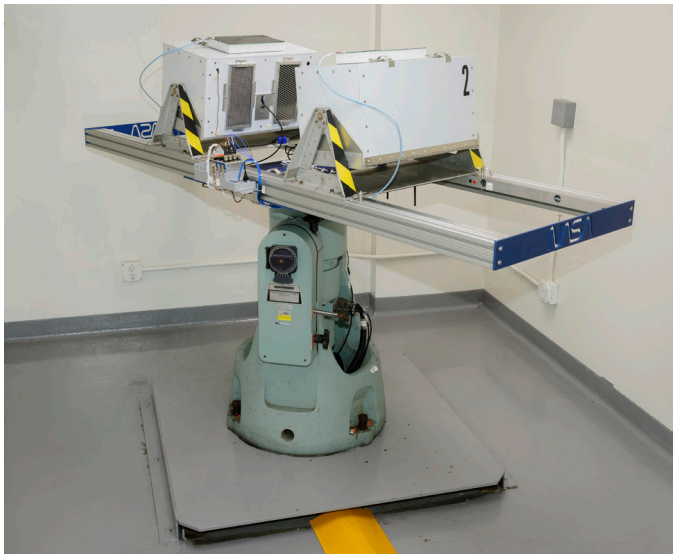
The 1.22-Meter Radius Centrifuge supports four specimen cabs, each adaptable to accommodate different types of experiments. Each of the specimen cabs can accommodate a variety of model organisms at various acceleration levels during a single experiment. Powered habitat enclosures include continuous data, video, and temperature monitoring. The four ground control cabs, in addition to the four specimen cabs attached to the centrifuge, are located within the centrifuge room, while experiment operations are monitored and performed from an adjacent room.



*1.22-Meter Radius Centrifuge*

### 1-Meter Radius Centrifuge

The 1-Meter Radius Centrifuge supports one to four specimen cabs, configured with one or two rotating arms to accommodate different types of experiments. Powered habitat enclosures include continuous data, video, and temperature monitoring. Experiment operations and ground controls are performed from an adjacent room with a PI monitoring station.



*1-Meter Radius Centrifuge*

# HyperGravity Research Facilities for Model Organisms

| Parameters | 1.22-Meter Radius Centrifuge | 1-Meter Radius Centrifuge |
|---|---|---|
| RPM Range at 1-Meter Radius Configuration | 10-45 RPM | 0-60 RPM |
| RPM Range at < 0.5-Meter Radius Configuration | | 0-90 RPM |
| Acceleration Level | 1-3G (Capable of 4G*)<br>*Centrifuge can support 4G loads using extensions which modify the original radius for 2 out of 4 arms. | 1-3G |
| Primary Outboard Enclosures | 1-4 | 1-4 |
| Radial Position Range of Primary Enclosures | 93-162 cm | 50-100 cm |
| On-center Enclosures | 1 MAX | 1 MAX |
| On-center Enclosures Volume | $0.03m^3 – 0.06m^3$ | $0.03m^3 – 0.06m^3$ |
| PI Payload Capacity per Enclosure | 113 kg | 5 kg |
| Primary Enclosure Dimensions | 51 cm x 64 cm x 61 cm | 29 cm x 29 cm x 54 cm |
| Primary Enclosure Volume | 0.20 $m^3$ | 0.05 $m^3$ |
| Enclosure Parameters Monitored | HD & IR Wireless Video<br>Temperature<br>Lights (on/off) | HD & IR Wireless Video<br>Temperature<br>Lights (on/off) |
| Room Parameters and Monitoring | Temperature Control: 16-28ºC<br>Humidity <75%<br>Lighting On/Off Timer<br>Video HD/IR<br>Operator Notification for Off-nominal Conditions | Temperature Control: 16-32ºC<br>Humidity <75%<br>Lighting On/Off Time<br>Video HD/IR<br>Operator Notification for Off-nominal Conditions |
| PI Payload Available Capabilities on Centrifuge | Multiple Data Collection Lines + 10 BNC<br>Power at 28 VDC / 110 VAC<br>Light Timing | 3 Data Collection Lines (Digital/Analog)<br>Power 28 VDC<br>Light Timing |

*RPM = Revolutions Per Minute

**For more information, visit:**

https://www.nasa.gov/ames/research/space-biosciences/ground-research-facilities

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