



# Combustion Integrated Rack (CIR)



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## Objective:

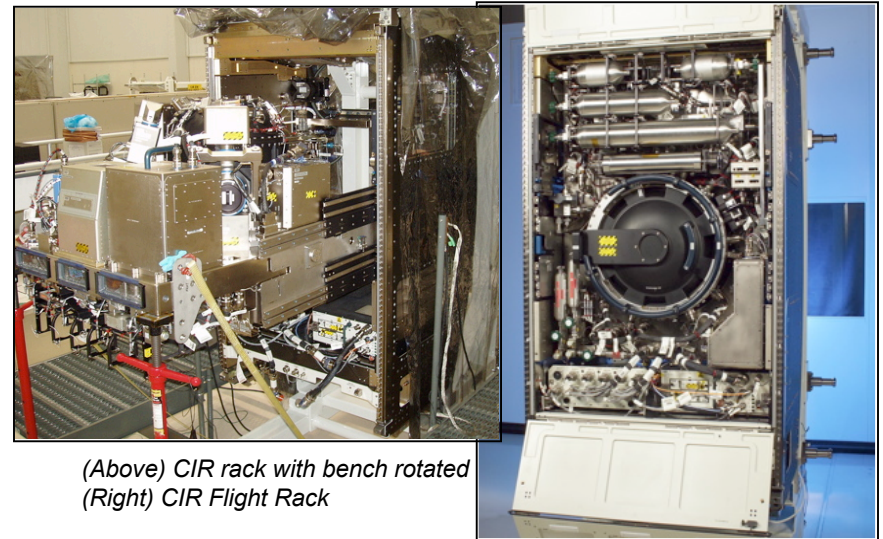
- ◆ The Combustion Integrated Rack is a facility designed to support sustained systematic combustion research and technology experiments on the International Space Station.

## Relevance/Impact:

- ◆ The CIR will accommodate experiments that address critical needs in the areas of spacecraft fire safety (i.e., fire prevention, detection and suppression), incineration of solid wastes, power generation, flame spread, soot and polycyclic aromatic hydrocarbons, in-situ resource utilization, environmental monitoring and materials synthesis.

## Development/Operations Approach:

- ◆ The CIR is part of the Fluids & Combustion Facility (FCF).
- ◆ The FCF system consists of a Flight Segment (flight rack & payload hw/sw) and a Ground Segment (integration/spares).
- ◆ All avionics and diagnostics are contained in orbital replacement units with simple interfaces that allow for easy change-out/reconfiguration.
- ◆ FCF operates together with payload experiment equipment, ground-based operations facilities and the FCF ground segment.
- ◆ The CIR is designed for remote/autonomous operations performed from GRC's Telescience Support Center.



(Above) CIR rack with bench rotated  
 (Right) CIR Flight Rack

## ISS Resource Requirements

<b>Accommodation (carrier)</b>	ISS US Laboratory
<b>Upmass (kg)</b> (w/o packing factor)	881
<b>Volume (m<sup>3</sup>)</b> (w/o packing factor)	0.4 (stowed hardware)
<b>Power (kw)</b> (peak)	1.9 Kw
<b>Crew Time (hrs)</b> (initial installation & setup)	25
<b>Launch/Increment</b>	ULF-2/Increment 18 ->

## Project Life Cycle Schedule and Documentation

Milestones	SCR	HCR	PDR	CDR	VRR	Safety	FHA	Launch	Ops	Return	Final Report
<b>Actual/ Baseline</b>	N/A	6/1998	2/2001	5/2002	2/2003	7/2005	6/2007	11/2008	Inc. 18 ->	N/A	N/A
<b>Documentation</b>	Website: eRoom:				SRD: EDMP:			Project Plan: SEMP:			