



# Multi-User Droplet Combustion Apparatus (MDCA)/ Flame Extinguishment Experiment (FLEX)



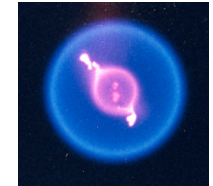
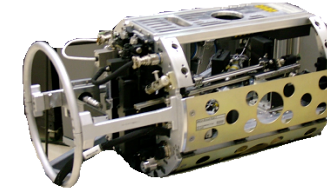
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(Left) The Combustion Integrated Rack. (Top Right) FLEX Chamber Insert Assembly Apparatus. (Bottom Right) Color image of a burning droplet.

## Objective:

- ◆ Modular apparatus designed for fire suppression/flame extinguishment investigations.
  - Assess the effectiveness of suppressants in microgravity.
  - Quantify the effect of candidate exploration atmospheres on fire suppression characteristics.
  - Provide data to develop of simplified combustion models.

## Relevance/Impact:

- ◆ Direct the definition and development of large-scale fire suppression tests.
- ◆ Provide the direction for the selection of fire suppressant for CEV and LSAM.
- ◆ Allow the development of rational design rules for fire suppression in exploration vehicles and habitats.

## Development Approach:

- ◆ Flight design leverages off previous flight design heritage (STS-83/94).
- ◆ Multi-user, re-usable apparatus minimizing up-mass/volume, costs, and crew involvement.

## ISS Resource Requirements

<b>Accommodation (carrier)</b>	Combustion Integrated Rack
<b>Upmass (kg)</b> (w/o packing factor)	254 kg
<b>Volume (m<sup>3</sup>)</b> (w/o packing factor)	0.48 m <sup>3</sup>
<b>Power (kw)</b> (peak)	0.73 Kw
<b>Crew Time (hrs)</b> - Initial configuration of CIR Rack - Change-outs during experiment	8.5 hrs 8.3 hrs
<b>Autonomous Ops (hrs)</b>	300 hrs
<b>Launch/Increment</b>	ULF-2/Increment 18/19

## Project Life Cycle Schedule

Milestones	FY95 NRA Process	HCR/RDR	CDR	VRR	Safety (PH-3)	PSR-2	Ship	Launch	Ops	Return	Final Report
<b>Actual/ Baseline</b>	Nov 1998	Aug 2001	July 2003	March 2004	Oct 2005	May 2007	Feb 2008	Nov 2008	Jan 2009	Dec 2009	Dec 2010
<b>Documentation</b>	Website: eRoom:				SRD: EDMP:			Project Plan: SEMP:			