



1
00:00:00,476 --> 00:00:03,626
>> Speaker 1: The Microgravity
Science Glovebox located

2
00:00:03,626 --> 00:00:06,766
in the Destiny Laboratory
provides 9 cubic feet

3
00:00:06,766 --> 00:00:10,066
of enclosed workspace for
conducting a wide variety

4
00:00:10,066 --> 00:00:12,866
of experiments that
require liquids, combustion

5
00:00:13,046 --> 00:00:14,666
or hazardous materials.

6
00:00:15,576 --> 00:00:19,346
ISS crewmembers can safely
use its rugged gloves to work

7
00:00:19,346 --> 00:00:21,626
in a sealed environment
without the risk

8
00:00:21,626 --> 00:00:25,186
of releasing any small parts,
particles, fluids or gases

9
00:00:25,416 --> 00:00:27,766
into the rest of the laboratory.

10
00:00:28,056 --> 00:00:30,776
The structure and liftoff
in combustion experiment,

11
00:00:30,956 --> 00:00:34,646

or a SLICE, utilizes the
MSG to study and work

12

00:00:34,646 --> 00:00:36,236
with fire in microgravity.

13

00:00:37,156 --> 00:00:40,376
SLICE allows astronauts to
photograph and measure the shape

14

00:00:40,376 --> 00:00:43,756
in temperature of flames
produced by various fuels

15

00:00:43,756 --> 00:00:45,606
and sizes of burner nozzles.

16

00:00:46,656 --> 00:00:49,946
These assorted flame shapes
and sizes are then modeled

17

00:00:49,946 --> 00:00:52,526
to help scientists develop
more efficient engines

18

00:00:52,526 --> 00:00:54,536
and furnaces here on earth.

19

00:00:55,526 --> 00:00:58,816
The MSG is also used to
conduct the BASS experiment,

20

00:00:59,086 --> 00:01:02,046
which stands for burning
suppression of solids.

21

00:01:02,636 --> 00:01:05,696
Instead of measuring
flames from burner nozzles,

22

00:01:05,696 --> 00:01:09,996

the BASS experiment observes and models the geometry of flames

23

00:01:10,156 --> 00:01:13,626

on solid spheres and flat surfaces.

24

00:01:13,626 --> 00:01:17,206

These control fires are then extinguish in a variety of ways

25

00:01:17,206 --> 00:01:19,746

to look for the best strategy to use

26

00:01:19,746 --> 00:01:22,846

for suppressing flames in microgravity.

27

00:01:22,846 --> 00:01:25,766

Improved fire detection and suppression systems for use

28

00:01:25,766 --> 00:01:31,156

on earth and the ISS can then be designed from this information.

29

00:01:31,156 --> 00:01:33,546

The MSG is also used to accommodate tests

30

00:01:33,546 --> 00:01:37,426

for heating liquids in the boiling experiment facility.

31

00:01:37,426 --> 00:01:40,516

A small container that includes 2 types of heating arrays,

32

00:01:40,786 --> 00:01:43,176

high-speed video
cameras, and a variety

33

00:01:43,176 --> 00:01:44,416

of tools for measurement.

34

00:01:44,786 --> 00:01:47,156

Experiments in the [inaudible],

35

00:01:47,536 --> 00:01:49,756

try to determine
critical heat flux,

36

00:01:50,066 --> 00:01:52,816

the point at which a heat
source becomes so hopped

37

00:01:53,106 --> 00:01:55,206

that the liquid can't
actually touch it.

38

00:01:55,316 --> 00:01:58,006

Interestingly the information

39

00:01:58,006 --> 00:02:00,676

from the critical
heat flux is used

40

00:02:00,676 --> 00:02:03,106

to design enhanced
cooling systems.

41

00:02:03,106 --> 00:02:07,726

The [inaudible] heating arrays
are also used to study the shape

42

00:02:07,726 --> 00:02:09,576

and buoyancy of bubbles.

43

00:02:09,616 --> 00:02:13,796

The high-speed cameras in the
[inaudible] capture the growth,

44

00:02:14,016 --> 00:02:17,396

detachment, and motion of
2 types of vapor bubbles-

45

00:02:17,846 --> 00:02:21,006

small individual bubbles
and larger bubbles

46

00:02:21,006 --> 00:02:22,216

that have merged together.

47

00:02:23,636 --> 00:02:26,736

Without the Microgravity
Science Glovebox aboard the ISS,

48

00:02:26,736 --> 00:02:30,566

there wouldn't be a safe way to
work with dangerous materials