
STS-51D
PE PHASE SYSTEMS AT LOW S

1
00:00:00,000 --> 00:00:25,750
foreign

2
00:00:29,589 --> 00:00:27,670
the beauty of these crystals goes far

3
00:00:31,750 --> 00:00:29,599
beyond the vivid colors and rich

4
00:00:34,150 --> 00:00:31,760
patterns that you are seeing here

5
00:00:36,229 --> 00:00:34,160
these are protein crystals and they may

6
00:00:38,869 --> 00:00:36,239
prove to be to drug researchers what

7
00:00:40,790 --> 00:00:38,879
blueprints are to architects

8
00:00:42,310 --> 00:00:40,800
building on this technology these and

9
00:00:45,430 --> 00:00:42,320
other scientists hope to discover new

10
00:00:47,590 --> 00:00:45,440
ways of fighting cancer aids diabetes

11
00:00:48,709 --> 00:00:47,600
high blood pressure and their list goes

12
00:00:50,470 --> 00:00:48,719
on

13
00:00:52,549 --> 00:00:50,480

what makes this research more promising

14
00:00:55,270 --> 00:00:52,559
than ever before is the fact that these

15
00:00:56,950 --> 00:00:55,280
crystals were grown in space

16
00:00:58,790 --> 00:00:56,960
dr charlie bug with the university of

17
00:01:01,270 --> 00:00:58,800
alabama at birmingham is the principal

18
00:01:03,189 --> 00:01:01,280
investigator gravity affects the crystal

19
00:01:06,230 --> 00:01:03,199
growth processes and by eliminating

20
00:01:08,149 --> 00:01:06,240
gravity we can control these processes

21
00:01:10,710 --> 00:01:08,159
in a way that's totally impossible on

22
00:01:12,630 --> 00:01:10,720
earth protein crystal growth is just one

23
00:01:14,149 --> 00:01:12,640
of 11 experiments that the astronauts

24
00:01:16,550 --> 00:01:14,159
will perform aboard the next flight of

25
00:01:18,469 --> 00:01:16,560
the space shuttle the experiments are to

26
00:01:20,950 --> 00:01:18,479
be performed in the mid-deck or living

27
00:01:22,870 --> 00:01:20,960
area of the shuttle the project names

28
00:01:25,030 --> 00:01:22,880
may sound foreign to most phased

29
00:01:27,990 --> 00:01:25,040
partitioning experiment aggregation of

30
00:01:30,149 --> 00:01:28,000
red blood cells isoelectric focusing but

31
00:01:31,830 --> 00:01:30,159
they translate into new understanding

32
00:01:34,469 --> 00:01:31,840
and new answers in the fields of life

33
00:01:36,310 --> 00:01:34,479
science and basic physics

34
00:01:38,390 --> 00:01:36,320
six of the mid-deck experiments are

35
00:01:40,789 --> 00:01:38,400
being managed by nasa's marshall space

36
00:01:42,789 --> 00:01:40,799
flight center in huntsville alabama

37
00:01:45,270 --> 00:01:42,799
here pilot dick covey and mission

38
00:01:47,510 --> 00:01:45,280

specialist george pinky nelson and mike

39
00:01:49,429 --> 00:01:47,520
lounge get hands-on experience at

40
00:01:51,190 --> 00:01:49,439
marshall with the actual hardware

41
00:01:52,870 --> 00:01:51,200
they'll operate in space

42
00:01:54,870 --> 00:01:52,880
two of these experiments will seek new

43
00:01:56,389 --> 00:01:54,880
ways of separating cells

44
00:01:58,789 --> 00:01:56,399
the phase partitioning experiment

45
00:02:00,789 --> 00:01:58,799
separates materials by keying in on the

46
00:02:03,109 --> 00:02:00,799
physical behavior of fluids

47
00:02:04,870 --> 00:02:03,119
while isoelectric focusing explores ways

48
00:02:05,910 --> 00:02:04,880
to separate cells with electrical

49
00:02:08,070 --> 00:02:05,920
currents

50
00:02:09,990 --> 00:02:08,080
yet another experiment measures how

51
00:02:11,190 --> 00:02:10,000
cells come together in this case red

52
00:02:12,869 --> 00:02:11,200
blood cells

53
00:02:14,869 --> 00:02:12,879
samples have been taken from donors with

54
00:02:17,110 --> 00:02:14,879
heart disease cancer diabetes and

55
00:02:18,869 --> 00:02:17,120
hypertension scientists will study how

56
00:02:21,270 --> 00:02:18,879
the organization of these cells affect

57
00:02:22,949 --> 00:02:21,280
blood flow in space the payback here on

58
00:02:25,910 --> 00:02:22,959
earth could be improved clinical

59
00:02:27,910 --> 00:02:25,920
research and diagnostic testing

60
00:02:29,350 --> 00:02:27,920
a basic component in everything from

61
00:02:31,589 --> 00:02:29,360
airliners

62
00:02:34,309 --> 00:02:31,599
to surgical instruments

63
00:02:36,309 --> 00:02:34,319

to home appliances is the magnet

64
00:02:38,390 --> 00:02:36,319
this special space furnace will meld

65
00:02:40,150 --> 00:02:38,400
techniques for making magnets that are

66
00:02:42,470 --> 00:02:40,160
stronger and more lightweight

67
00:02:44,630 --> 00:02:42,480
gravity weakens magnets manufactured on

68
00:02:46,390 --> 00:02:44,640
the earth could space-based studies

69
00:02:47,589 --> 00:02:46,400
overcome some of the problems presented

70
00:02:49,589 --> 00:02:47,599
by gravity

71
00:02:51,750 --> 00:02:49,599
nasa engineers hope the automated

72
00:02:53,670 --> 00:02:51,760
directional solidification furnace will

73
00:02:55,589 --> 00:02:53,680
answer that question it's called

74
00:02:57,910 --> 00:02:55,599
automated by the way because all the

75
00:03:00,309 --> 00:02:57,920
astronauts have to do is throw these two

76
00:03:02,149 --> 00:03:00,319
switches to perform this 10 hour

77
00:03:06,070 --> 00:03:02,159
experiment

78
00:03:08,390 --> 00:03:06,080
that everybody talks about the weather

79
00:03:10,710 --> 00:03:08,400
but nobody does anything about it

80
00:03:12,550 --> 00:03:10,720
the mesoscale or large-scale lightning

81
00:03:15,030 --> 00:03:12,560
experiment will put astronauts on the

82
00:03:16,949 --> 00:03:15,040
lookout for large storm systems at night

83
00:03:18,949 --> 00:03:16,959
which they hope to capture with existing

84
00:03:20,470 --> 00:03:18,959
on-board cameras

85
00:03:22,630 --> 00:03:20,480
the space shuttle mid-deck was not

86
00:03:24,390 --> 00:03:22,640
originally meant to be a lab but ever

87
00:03:26,070 --> 00:03:24,400
since the third shuttle flight it's been

88
00:03:28,470 --> 00:03:26,080

proving to be an excellent science

89
00:03:29,830 --> 00:03:28,480
facility the science community's demand

90
00:03:32,309 --> 00:03:29,840
for space on the mid-deck has

91
00:03:34,470 --> 00:03:32,319
accelerated since then and for many good

92
00:03:36,550 --> 00:03:34,480
reasons you can fly very low-cost

93
00:03:38,229 --> 00:03:36,560
experiments in the mid-deck you don't

94
00:03:40,630 --> 00:03:38,239
have a lot of resources but they're a

95
00:03:42,550 --> 00:03:40,640
lot it's amazing how much science can be

96
00:03:44,470 --> 00:03:42,560
done with little resources

97
00:03:46,390 --> 00:03:44,480
mission manager ed valentine with the

98
00:03:48,550 --> 00:03:46,400
marshall center points out another

99
00:03:50,789 --> 00:03:48,560
advantage of the middeck perishable

100
00:03:53,270 --> 00:03:50,799
samples like proteins from this lab can

101
00:03:54,949 --> 00:03:53,280
be loaded just hours before launch

102
00:03:57,190 --> 00:03:54,959
now when the space shuttle returns to

103
00:03:59,670 --> 00:03:57,200
space once more it will take us all a