



1
00:00:00,506 --> 00:00:06,546
[Music]

2
00:00:07,046 --> 00:00:09,206
>> [Background Music] Hi.

3
00:00:09,596 --> 00:00:11,536
I'm Andrew Trunek
and I'm a researcher.

4
00:00:12,366 --> 00:00:15,376
Here at the NASA Glenn Research
Center in Cleveland, Ohio,

5
00:00:15,676 --> 00:00:17,026
we have a long history

6
00:00:17,026 --> 00:00:19,106
of developing innovative
aeronautics

7
00:00:19,236 --> 00:00:20,616
and space technologies.

8
00:00:21,716 --> 00:00:24,586
NASA Glenn would like
students to join our efforts

9
00:00:24,726 --> 00:00:28,656
by participating in the Center's
University Student Design

10
00:00:28,656 --> 00:00:29,676
Space Challenge.

11
00:00:30,286 --> 00:00:35,106
The scenario, imagine that it's
2050, the Earth is in trouble,

12
00:00:35,626 --> 00:00:36,826
rising sea levels

13
00:00:36,826 --> 00:00:39,326
and increasingly
severe storms are posing

14
00:00:39,326 --> 00:00:40,766
insurmountable challenges.

15
00:00:41,696 --> 00:00:42,836
Governments are anxious

16
00:00:42,836 --> 00:00:45,366
to establish permanent
settlements elsewhere

17
00:00:45,366 --> 00:00:46,376
in the solar system.

18
00:00:47,356 --> 00:00:50,556
The future is bleak, but
human kind is resourceful

19
00:00:50,796 --> 00:00:51,516
and observant.

20
00:00:52,176 --> 00:00:54,446
Scientists have seen
how elegantly

21
00:00:54,446 --> 00:00:58,496
and efficiently the biological
world sustains life on Earth.

22
00:00:59,076 --> 00:01:01,956
Engineers and other
technologists begin mimicking

23

00:01:01,956 --> 00:01:05,916

nature as they design
systems of resource extraction

24

00:01:06,166 --> 00:01:09,136

and allocation to support
permanent independent

25

00:01:09,256 --> 00:01:12,046

settlements on interplanetary
bodies.

26

00:01:12,936 --> 00:01:14,096

They need your help.

27

00:01:15,146 --> 00:01:19,886

NASA's University Student Design
Space Challenge gives teams

28

00:01:19,886 --> 00:01:24,116

of full-time junior and senior
undergraduate students the

29

00:01:24,116 --> 00:01:26,536

opportunity to work
with top NASA experts

30

00:01:26,746 --> 00:01:30,946

in designing a bio-inspired
system to extract resources

31

00:01:30,946 --> 00:01:32,426

from extraterrestrial bodies.

32

00:01:33,586 --> 00:01:37,136

Your team will use environmental
conditions on Mars or the moon

33

00:01:37,586 --> 00:01:40,466

to determine what
resources could be contained

34

00:01:40,466 --> 00:01:42,266
in regolith or fluids.

35

00:01:43,286 --> 00:01:46,846
You will also need to specify
the power required to extract

36

00:01:46,846 --> 00:01:48,436
and process those resources.

37

00:01:49,256 --> 00:01:52,046
Your team should look
at natural models, bugs,

38

00:01:52,446 --> 00:01:55,906
plants and biomechanisms
for fluid transport

39

00:01:56,366 --> 00:01:59,486
such as tree roots then
translate those models

40

00:01:59,486 --> 00:02:00,846
into mechanical systems.

41

00:02:01,706 --> 00:02:03,386
Chemicals for example
could be moved

42

00:02:03,386 --> 00:02:07,166
through the mycelial networks
of fungi that also serve

43

00:02:07,166 --> 00:02:09,756
as building material,
food sources

44

00:02:10,006 --> 00:02:11,616
and radiation shielding
material.

45

00:02:12,956 --> 00:02:15,666
The Martian atmospheric
chemistry simulator,

46

00:02:16,276 --> 00:02:19,346
a small vacuum chamber that
approximates the temperature

47

00:02:19,346 --> 00:02:22,806
and atmospheric conditions
on Mars can be used

48

00:02:22,806 --> 00:02:24,326
to gather data on your system.

49

00:02:25,126 --> 00:02:26,926
We invite you to
broaden the scope

50

00:02:26,926 --> 00:02:30,466
of your resource extraction
system by integrating it

51

00:02:30,466 --> 00:02:34,486
into other systems required for
humans to live away from Earth.

52

00:02:35,506 --> 00:02:38,686
People on your team will come
from science, technology,

53

00:02:39,186 --> 00:02:41,926
engineering and mathematics
backgrounds,

54

00:02:42,346 --> 00:02:45,736

but incorporating majors
from economics, marketing,

55

00:02:46,136 --> 00:02:49,276

graphic arts and other areas
can strengthen your concepts

56

00:02:49,516 --> 00:02:52,166

and may result in a
better more creative design

57

00:02:52,766 --> 00:02:55,506

that benefits a sustainable
future America.

58

00:02:56,566 --> 00:02:59,306

Your team will compete
against other college teams

59

00:02:59,446 --> 00:03:01,946

under the supervision
of a college adviser.

60

00:03:03,166 --> 00:03:07,056

An expert from NASA Glenn
Research Center will mentor your

61

00:03:07,056 --> 00:03:11,266

team as it immerses itself
in NASA-related research

62

00:03:11,266 --> 00:03:15,236

from space scientists,
physicists, chemists,

63

00:03:15,906 --> 00:03:18,666

engineers and systems experts.

64

00:03:19,246 --> 00:03:21,376

For a complete list of
project requirements,

65

00:03:21,906 --> 00:03:24,966

be sure to attend the
mandatory virtual space project

66

00:03:24,966 --> 00:03:25,836

kickoff meetings.

67

00:03:26,606 --> 00:03:28,116

You can also visit
us on the web.

68

00:03:29,426 --> 00:03:32,776

I look forward to seeing your
team's bio-inspired resource

69

00:03:32,776 --> 00:03:33,776

extraction system.