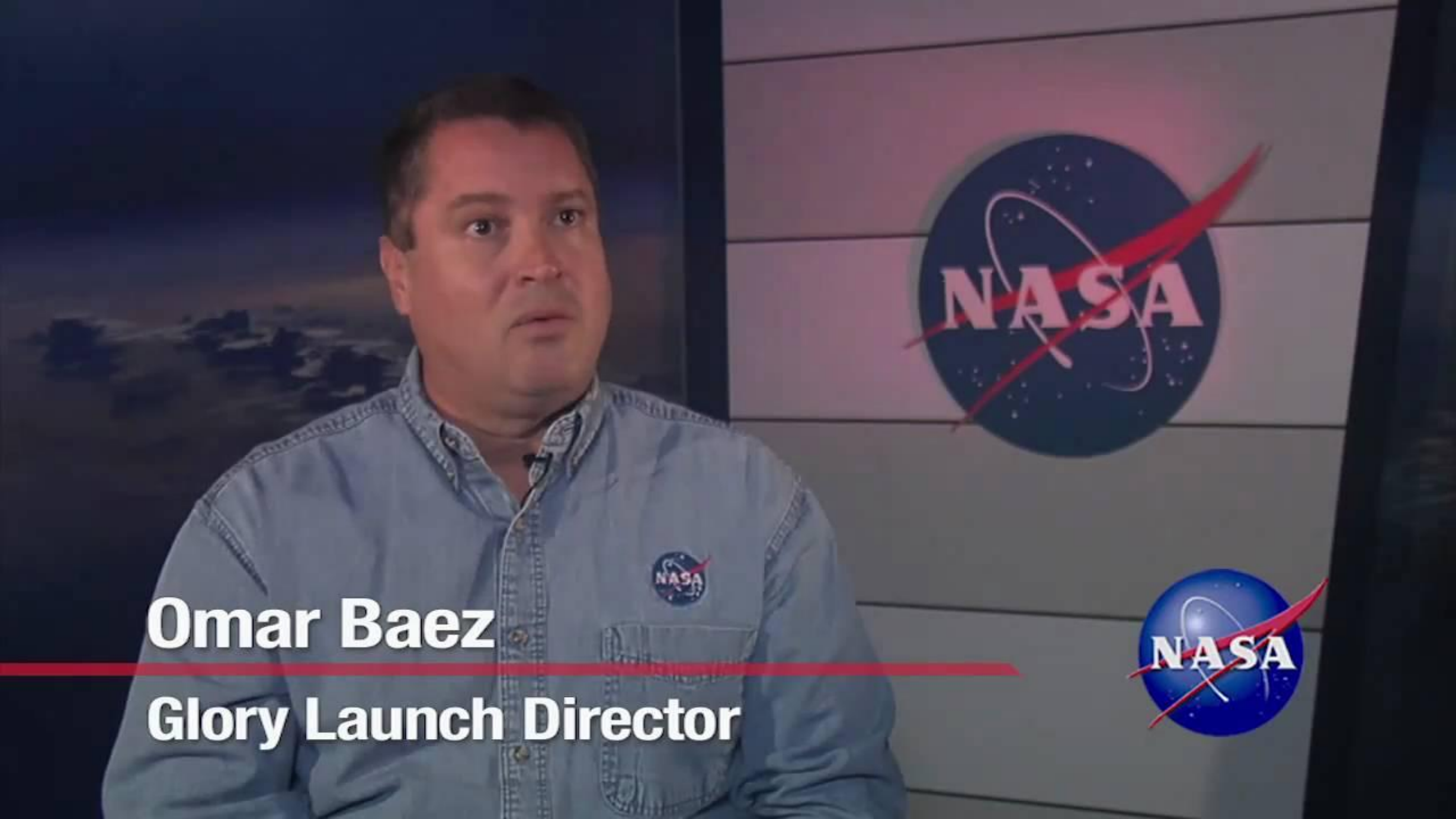
Omar Baez
Glory Launch Director

1
00:00:00,510 --> 00:00:00,620
\h

2
00:00:01,400 --> 00:00:02,400
Music

3
00:00:05,500 --> 00:00:07,440
NARRATOR: NASA's Glory mission offers the potential to dazzle us with discoveries of our home

4
00:00:09,760 --> 00:00:10,076
planet's climate. With specialized sensors and orbiting on a path that covers all of Earth,

5
00:00:15,510 --> 00:00:16,540
the Glory satellite is to tell researchers how much of the sun's energy the planet absorbs or

6
00:00:20,680 --> 00:00:24,213
uses and how much gets reflected back out into space.

7
00:00:25,240 --> 00:00:26,283
About the size of a refrigerator, the Glory spacecraft will look for those answers in the

8
00:00:30,130 --> 00:00:30,336
form of aerosols in the Earth's atmosphere. Particles of solids and liquids that float high

9
00:00:35,990 --> 00:00:36,726
in the air, some reaching the stratosphere, are what Glory will detect and map. The sensors

10
00:00:41,320 --> 00:00:46,253
also are expected to reveal how long the particles stay in the atmosphere.

11
00:00:46,360 --> 00:00:52,093
NGUYEN: Glory will fly two instruments that will help us understand, first of all, the

12
00:00:52,860 --> 00:00:54,070
aerosols interaction between the Earth's atmosphere and then the second instrument, called

13
00:00:57,650 --> 00:00:57,756

TIM, Total Irradiance Monitor, will help us understand the sun's interaction with our upper

14
00:01:03,610 --> 00:01:04,610
atmosphere.

15
00:01:06,870 --> 00:01:08,043
NARRATOR: The answers are expected to be a key piece of the puzzle to figuring out the

16
00:01:11,430 --> 00:01:14,830
world's prospects for climate change in the future.

17
00:01:14,920 --> 00:01:15,976
BAEZ: What they're trying to do is define the size of it, where it resides, what are its

18
00:01:19,730 --> 00:01:21,076
peculiarities, is it something that man is doing, is it something that the Earth does

19
00:01:24,050 --> 00:01:29,916
naturally, is it something that the sun interacts and causes, umm, those kind of things.

20
00:01:30,370 --> 00:01:31,273
NARRATOR: Glory also marks the return to flight for the Taurus XL rocket, a relatively small

21
00:01:35,600 --> 00:01:36,106
booster NASA would like to use to launch future satellites, too.

22
00:01:39,360 --> 00:01:39,613
Based on existing launchers, Orbital Sciences designed the Taurus XL to meet the needs of

23
00:01:45,040 --> 00:01:45,183
small satellites heading into Earth orbit. It has four stages and burns a solid fuel similar

24
00:01:51,030 --> 00:01:51,986
to the propellants used by the space shuttle's solid rocket boosters. The Stage Zero of the

25
00:01:56,140 --> 00:01:56,403
Taurus XL traces its heritage back to the Peacekeeper missile. The other three stages are

26
00:02:01,810 --> 00:02:06,943
taken from the design of the Pegasus booster, but without the signature wing.

27
00:02:07,010 --> 00:02:13,010
BAEZ: The vehicle is very similar to the Pegasus XL vehicle, minus the stage zero, and the

28
00:02:13,660 --> 00:02:15,793
first stage doesn't have a wing.

29
00:02:16,470 --> 00:02:22,603
NARRATOR: A Taurus XL was launched in February 2009 to lift the Orbiting Carbon Observatory,

30
00:02:22,610 --> 00:02:24,340
but the payload fairing protecting the spacecraft during the first part of the launch did not

31
00:02:27,080 --> 00:02:31,546
separate as it was supposed to. The spacecraft did not reach orbit.

32
00:02:31,970 --> 00:02:37,970
BAEZ: Glory's going to do some fantastic stuff as far as mapping out, umm, aerosols in the

33
00:02:38,670 --> 00:02:39,170
atmosphere. It's also a groundbreaker in that this is the first flight after a failure of the

34
00:02:44,370 --> 00:02:50,570
Taurus XL vehicle and so we're excited to be doing this. Glory just happens to be the science

35
00:02:52,110 --> 00:02:54,710
that we're taking up with us this time.

36
00:02:55,920 --> 00:02:57,176
NARRATOR: When the Orbiting Carbon Observatory mission did not achieve orbit, the launch

37
00:03:00,530 --> 00:03:03,040
teams set out to determine what happened, a task made more difficult by the fact that they

38
00:03:04,020 --> 00:03:04,443

did not have the failed pieces to examine. Instead, they had to use the extensive data or

39
00:03:09,530 --> 00:03:10,733
telemetry they received during the climb into space along with extensive fault trees to best

40
00:03:14,460 --> 00:03:20,526
figure out the likely cause. The redesign work, from finding a probable cause to fixing it,

41
00:03:20,730 --> 00:03:21,863
has been intense.

42
00:03:22,330 --> 00:03:23,236
NASA's Launch Services Program, based at Kennedy Space Center in Florida, operates launches

43
00:03:27,490 --> 00:03:28,423
from several parts of the world so spacecraft can go into different kinds of orbits. This

44
00:03:32,490 --> 00:03:38,623
time, Glory required what's called a polar, or sun-synchronous, orbit to fulfill its studies

45
00:03:38,660 --> 00:03:40,126
of Earth's atmosphere.

46
00:03:40,330 --> 00:03:41,983
Reaching that orbit means using the Vandenberg Air Force Base, Calif., launch site on the

47
00:03:44,610 --> 00:03:45,610
West Coast.

48
00:03:46,610 --> 00:03:52,476
NGUYEN: Glory was designed to join what's called the A-train or afternoon train of Earth

49
00:03:52,940 --> 00:03:58,873
observing satellites. It is necessary to launch from Vandenberg to be able to go into the

50
00:03:59,860 --> 00:04:01,050
sun-synchronous orbit. That orbit cannot be achieved efficiently by launching out of the east

51
00:04:04,870 --> 00:04:06,136
coast, for example.

52
00:04:06,490 --> 00:04:08,383
NARRATOR: The Glory spacecraft is to become the fifth satellite of the eight planned to make

53
00:04:10,730 --> 00:04:11,603
up the "A-train" constellation. Taking readings at the same time on different aspects of the

54
00:04:15,990 --> 00:04:16,610
atmosphere, Glory's observations are expected to add more information to the growing database

55
00:04:21,570 --> 00:04:27,503
of knowledge about our own planet and how it is affected by the sun and other influences.