

Spaceflight SSO-A: SmallSat Express Mission

MISSION OVERVIEW

SpaceX is targeting launch of the Spaceflight SSO-A: SmallSat Express mission to low Earth orbit on Sunday, December 2 from Space Launch Complex 4E (SLC-4E) Vandenberg Air Force Base in California. The primary launch window opens at 10:32 a.m. PST, or 18:32 UTC, and closes at 11:00 a.m. PST, or 19:00 UTC. A series of six deployments will occur approximately 13-43 minutes after liftoff, after which Spaceflight will begin to command its own deployment sequences. Spaceflight's deployments are expected to occur over a period of six hours.

A backup launch window opens on Monday, December 3 at 10:32 a.m. PST, or 18:32 UTC, and closes at 11:00 a.m. PST, or 19:00 UTC.

Falcon 9's first stage for the Spaceflight SSO-A: SmallSat Express mission previously supported the Bangabandhu Satellite-1 mission in May 2018 and the Merah Putih mission in August 2018. Following stage separation, SpaceX will attempt to land Falcon 9's first stage on the "Just Read the Instructions" droneship, which will be stationed in the Pacific Ocean.



Official SpaceX Spaceflight SSO-A: SmallSat Express Mission Patch

PAYLOAD

A total of 64 spacecraft from 34 organizations will be launched as part of the Spaceflight SSO-A: SmallSat Express mission. The mission signifies Spaceflight's first dedicated rideshare mission to a sun-synchronous low Earth orbit and represents the company's effort to accommodate the growing number of domestic, international, government, and commercial customers seeking affordable rideshare options to launch their spacecraft into orbit. Spaceflight SSO-A: SmallSat Express is the largest single rideshare mission from a U.S.-based launch vehicle to-date.

The mission includes 15 microsats and 49 cubesats from commercial and government entities, like universities, startups, and even a middle school. The payloads, which vary from technology demonstrations and imaging satellites to educational research endeavors, are from 17 countries, including the U.S., Australia, Italy, Netherlands, Finland, South Korea, Spain, Switzerland, U.K., Germany, Jordan, Kazakhstan, Thailand, Poland, Canada, Brazil, and India.

Spaceflight also constructed a unique payload stack, which is one of the most complex and intricate endeavors that Spaceflight has undertaken. The smallsats will be integrated with a variety of dispensers and avionics to an upper free flyer and lower free flyer.

MISSION TIMELINE (ALL TIMES APPROXIMATE)

COUNTDOWN

Hour/Min/Sec	Events
- 00:38:00	SpaceX Launch Director verifies go for propellant load
- 00:35:00	RP-1 (rocket grade kerosene) loading underway
- 00:35:00	1st stage LOX (liquid oxygen) loading underway
- 00:16:00	2nd stage LOX loading underway
- 00:07:00	Falcon 9 begins engine chill prior to launch
- 00:01:00	Command flight computer to begin final prelaunch checks
- 00:01:00	Propellant tank pressurization to flight pressure begins
- 00:00:45	SpaceX Launch Director verifies go for launch
- 00:00:03	Engine controller commands engine ignition sequence to start
00:00:00	Falcon 9 liftoff

LAUNCH, LANDING, AND SATELLITE DEPLOYMENTS

Hour/Min/Sec	Events
00:00:59	Max Q (moment of peak mechanical stress on the rocket)
00:02:21	1st stage main engine cutoff (MECO)
00:02:24	1st and 2nd stages separate
00:02:32	2nd stage engine starts
00:02:38	Boostback burn
00:02:43	Fairing deployment
00:05:58	1st stage entry burn
00:07:45	1st stage landing
00:10:01	2nd stage engine cutoff (SECO-1)
00:13:47	Spaceflight SSO-A:SmallSat Express deployment begins
00:43:11	Spaceflight SSO-A:SmallSat Express final deployment

LAUNCH FACILITY

Space Launch Complex 4E at Vandenberg Air Force Base, California

SpaceX's Space Launch Complex 4E at Vandenberg Air Force Base has a long history dating back to the early 1960s. Originally an Atlas launch pad activated in 1962, SLC-4E was in active use until its last Titan IV launch in 2005. SpaceX's groundbreaking was in July 2011, and extensive modifications and reconstruction of the launch pad were completed just 17 months later.

SLC-4E consists of a concrete launch pad/apron and a flame exhaust duct. Surrounding the pad are RP-1 and liquid oxygen storage tanks and an integration hangar. Before launch, Falcon 9's stages, fairing and the mission payload are housed inside the hangar. A crane/lift system moves Falcon 9 into a transporter erector system and the fairing and its payload are mated to the rocket. The vehicle is rolled from the hangar to the launch pad shortly before launch to minimize exposure to the elements.

RESOURCES

SpaceX Contact | Eva Behrend, Sr. Communications Manager, 310-363-6247, media@spacex.com.

Photos | High-resolution photos will be posted at [flickr.com/spacex](https://www.flickr.com/photos/spacex/).

Webcast | Launch webcast will go live about 15 minutes before liftoff at [spacex.com/webcast](https://www.spacex.com/webcast).