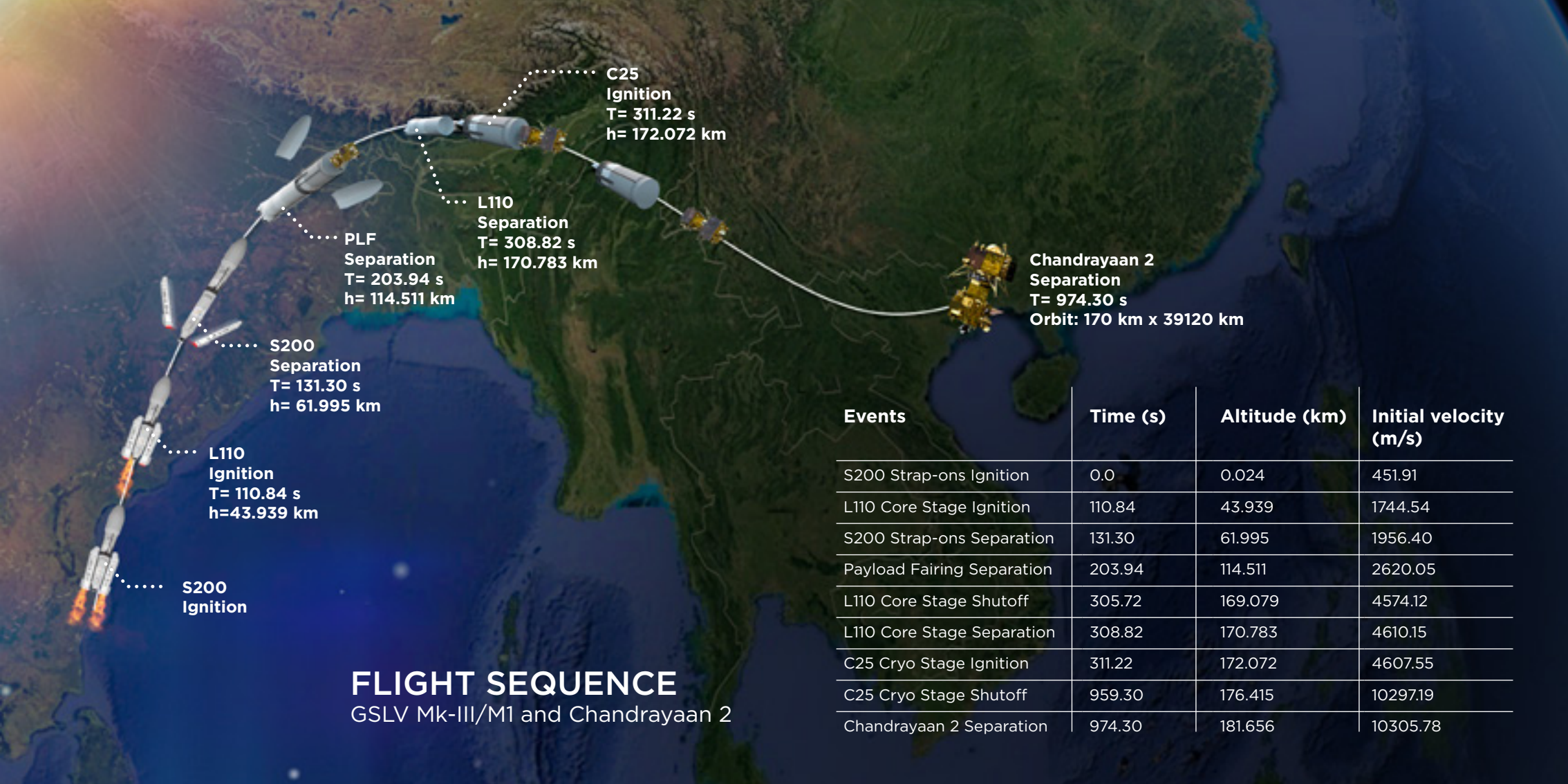

इसरो ISRO
CHANDRAYAAN 2
Exploring the Unknown
22 JULY, 2019

INTRODUCTION

Chandrayaan 2 is an Indian lunar mission that will boldly go where no country has ever gone before — the Moon's south polar region. We aim to improve our understanding of the Moon, which could lead to discoveries that will benefit India and humanity as a whole. These insights and experiences will cause a paradigm shift in how lunar expeditions are approached for years to come, propelling further voyages into the farthest frontiers.

WHY ARE WE GOING TO THE MOON?

The Moon is the closest cosmic body on which space discovery can be attempted and documented. **It is also a promising test bed to demonstrate technologies required for deep-space missions.** Chandrayaan 2 attempts to foster a new age of discovery, increase our understanding of space, stimulate the advancement of technology, promote global alliances, and inspire a future generation of explorers and scientists.



FLIGHT SEQUENCE

GSLV Mk-III/M1 and Chandrayaan 2

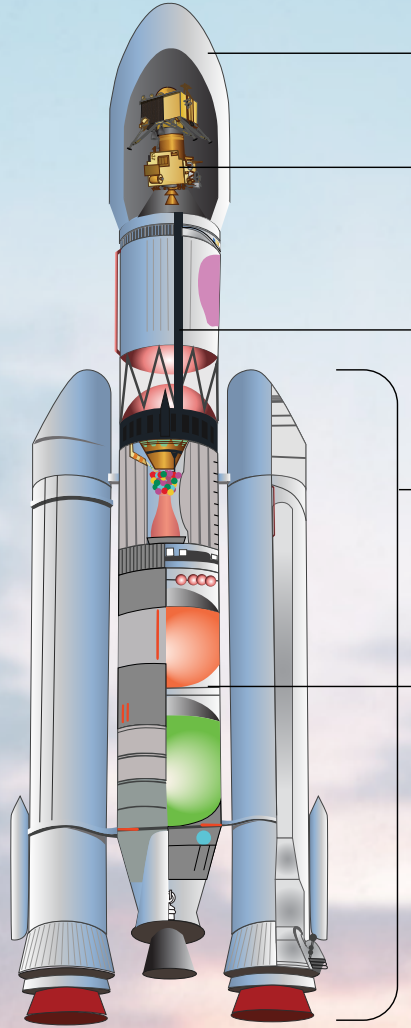
Events	Time (s)	Altitude (km)	Initial velocity (m/s)
S200 Strap-ons Ignition	0.0	0.024	451.91
L110 Core Stage Ignition	110.84	43.939	1744.54
S200 Strap-ons Separation	131.30	61.995	1956.40
Payload Fairing Separation	203.94	114.511	2620.05
L110 Core Stage Shutoff	305.72	169.079	4574.12
L110 Core Stage Separation	308.82	170.783	4610.15
C25 Cryo Stage Ignition	311.22	172.072	4607.55
C25 Cryo Stage Shutoff	959.30	176.415	10297.19
Chandrayaan 2 Separation	974.30	181.656	10305.78

GEOSYNCHRONOUS SATELLITE LAUNCH VEHICLE MARK-III (GSLV Mk-III)

The GSLV Mk-III will carry Chandrayaan 2 to its designated orbit. **This three-stage vehicle is India's most powerful launcher to date**, and is capable of launching 4-tonne class of satellites to the Geosynchronous Transfer Orbit (GTO).

Height:
43.43 m

Lift Off Mass:
640 tonnes



Payload Fairing (PLF)

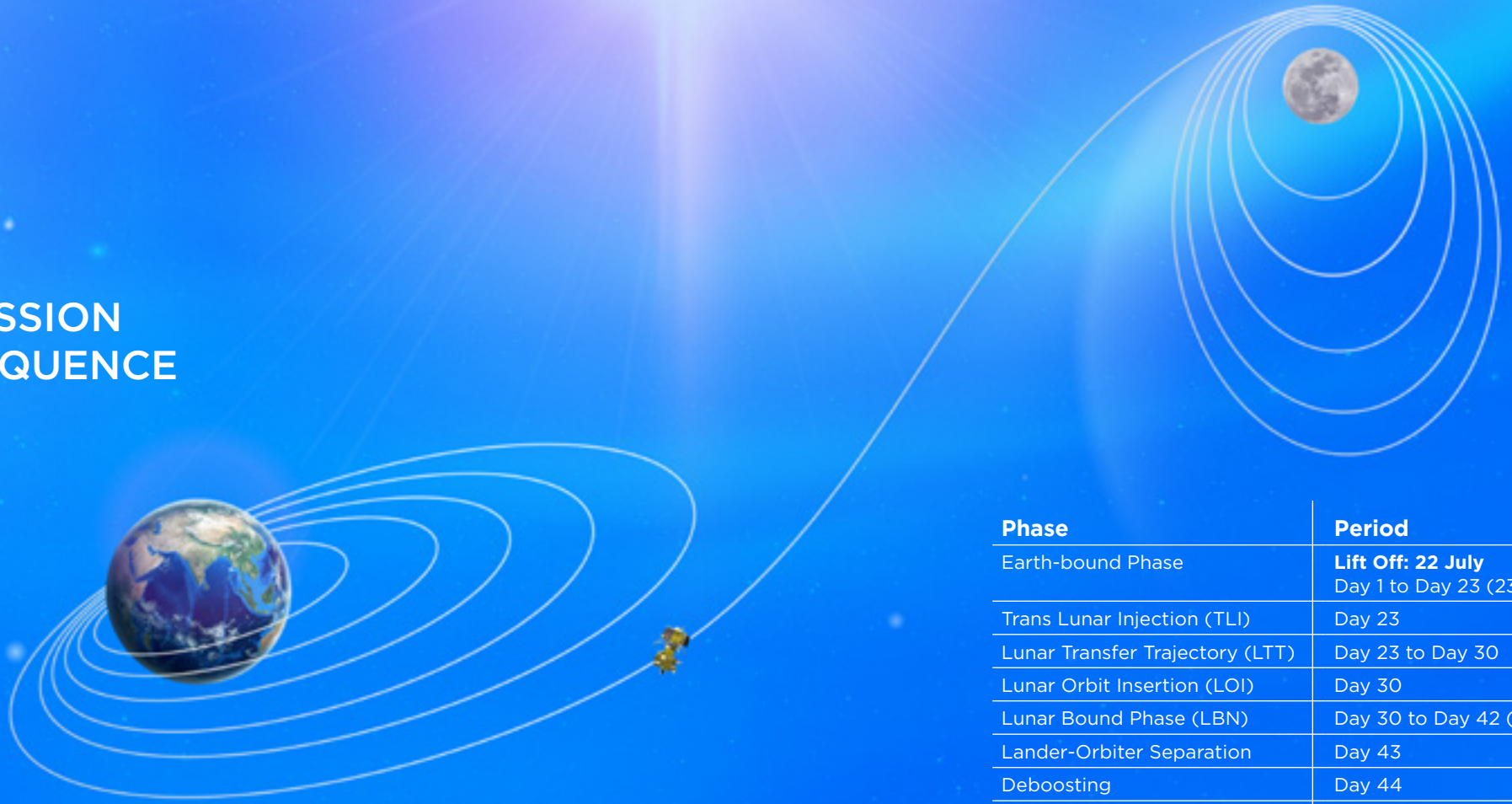
Chandrayaan 2 Composite Module

C25 Cryogenic Stage

S200 Solid Rocket Boosters

L110 Liquid Stage

MISSION SEQUENCE



Phase	Period
Earth-bound Phase	**Lift Off: 22 July** Day 1 to Day 23 (23 days)
Trans Lunar Injection (TLI)	Day 23
Lunar Transfer Trajectory (LTT)	Day 23 to Day 30
Lunar Orbit Insertion (LOI)	Day 30
Lunar Bound Phase (LBN)	Day 30 to Day 42 (13 days)
Lander-Orbiter Separation	Day 43
Deboosting	Day 44
Powered Descent Starts	Day 48
Landing	Day 48

CHANDRAYAAN 2
Composite Module

Chandrayaan 2 will be aided in achieving its mission by some of India's most advanced engineering marvels. Its composite module, which comprises technology and software developed across the country, includes a wholly indigenous rover and our first lander capable of executing a 'soft landing'.

Dimensions
3.1 x 3.1 x 5.8 m

Weight
3,850 kg

ORBITER

Weight
2,379 kg

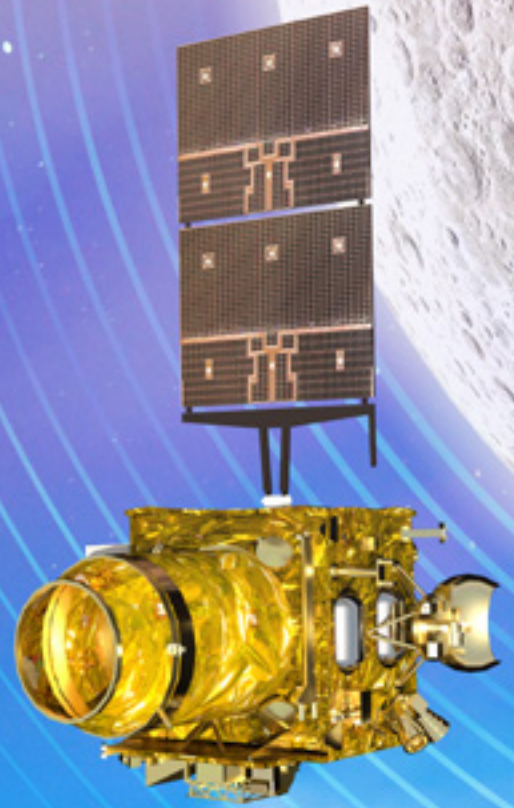
Dimensions
3.2 x 5.8 x 2.1 m

Power
1,000 W

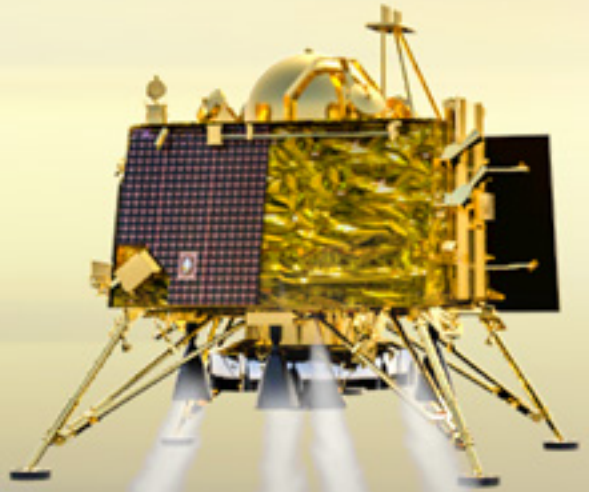
Payloads
8

Mission Life
1 year in lunar orbit

At the time of launch, the Chandrayaan 2 **Orbiter will be capable of communicating with the Indian Deep Space Network (IDSN) at Byalalu, as well as with the Vikram lander.** The mission life of the Orbiter is one year, during which it will be placed in a 100 x 100 km lunar polar orbit.



VIKRAM LANDER



Weight
1,471 kg

Power
650 W

Payloads
3
1 passive experiment

Dimensions
2.54 x 2 x 1.2 m

Mission Life
1 lunar day

Chandrayaan 2's lander is named Vikram after Dr Vikram A Sarabhai, the Father of the Indian Space Programme. **It is designed to function for one lunar day, which is equivalent to about 14 Earth days.** Vikram has the capability to communicate with IDSN at Byalalu near Bangalore, as well as with the Orbiter and Pragyan rover. The lander is designed to execute a soft landing on the lunar surface at a touchdown velocity of 2 metres per second.

Landing Site: High plain between two craters, Manzinus C and Simpelius N, at a latitude of about 70.9° South 22.7° East
Alternate Site: 67.7 ° South 18.4° West

PRAGYAN ROVER

Weight
27 kg

Power
50 W

Payloads
2

Dimensions
0.9 x 0.75 x 0.85 m

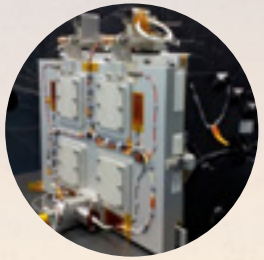
Mission Life
1 lunar day

Chandrayaan 2's rover is a 6-wheeled robotic vehicle named Pragyan, which translates to 'wisdom' in Sanskrit. **It can travel up to 500 m (0.5 km) at a speed of 1 centimetre per second, and leverages solar energy for its functioning.** It can communicate with the lander.

MISSION PAYLOADS

Orbiter Payloads

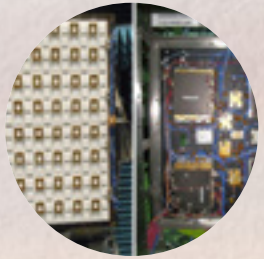
- **Terrain Mapping Camera - 2:** Will generate a Digital Elevation Model (DEM) of the entire Moon



- **Chandrayaan 2 Large Area Soft X-ray Spectrometer (CLASS):** Will derive the elemental composition of the Moon's surface

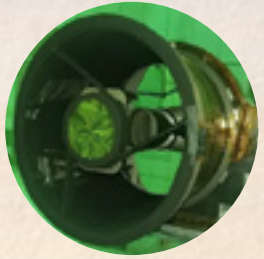
- **Solar X-Ray Monitor:** Will provide solar X-ray spectrum inputs for CLASS

- **Imaging IR Spectrometer:** Will map the Moon's mineralogy and confirm the presence of water on the lunar surface



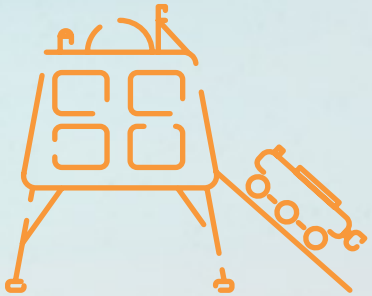
- **Dual Frequency Synthetic Aperture Radar:** Will map the polar regions and search for water-ice at the sub-surface level

- **Chandra's Atmospheric Composition Explorer - 2:** Will examine the Moon's neutral exosphere



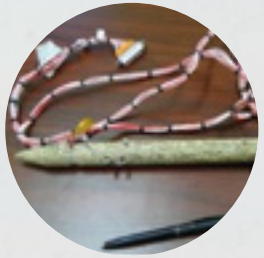
- **Orbiter High Resolution Camera:** Will conduct high-res topography mapping

- **Dual Frequency Radio Science Experiment:** Will study the lunar ionosphere



Vikram Payloads

- **Instrument for Lunar Seismic Activity:** Will characterise the seismicity around the landing site



- **Chandra's Surface Thermo-physical Experiment:** Will examine the Moon's thermal conductivity and temperature gradient

- **Langmuir Probe:** Will conduct ionosphere studies on the lunar surface

Pragyan Payloads

- **Alpha Particle X-ray Spectrometer:** Will determine the elemental composition near the landing site

- **Laser Induced Breakdown Spectroscope:** Will derive elemental abundance in the vicinity of the landing site

Passive Experiment (on Vikram lander)

- **Laser Retroreflector Array (LRA):** For lunar laser ranging studies

BEHIND THE SCENES

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