

Update for MVEDA Meeting


Jonathan Firth, Executive Vice President VG

Las Cruces, NM – Star Date: April 3rd 2018





Virgin Galactic's business aim is to transform access to space for the benefit of life on Earth



More frequent
More responsive
More affordable
More reliable
Most Safe

Virgin Galactic's business aim
is to transform access to space
for the benefit of life on Earth

Virgin aims to transform access to space in two markets



Suborbital: SpaceShipTwo



**Personal
Spaceflight
Research
Flights**



Orbital: LauncherOne



**Small Satellite
Launch**

Virgin's Space Portfolio at a Glance

- Virgin Galactic was set up in 2004 to be world's first commercial spaceline
- Three business areas now – separate companies:
 - Virgin Galactic: Suborbital spaceflight for people & research
 - Virgin Orbit: Orbital satellite launch (SSO / LEO)
 - The Spaceship Company: Vehicle manufacture and flight test



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 - The Spaceship Company: Vehicle manufacture and test
- Each company carries out its own: design, engineering, manufacturing, testing and flight operations

Aims: frequent flights, responsive, lower cost, high safety/reliability

Virgin Galactic will operate from
the 'Gateway to Space' facility
at Spaceport America in New Mexico



VG's Economic Impact in New Mexico to date

33 + 85 + local hires / 5 years



VG's Economic Impact in New Mexico to date

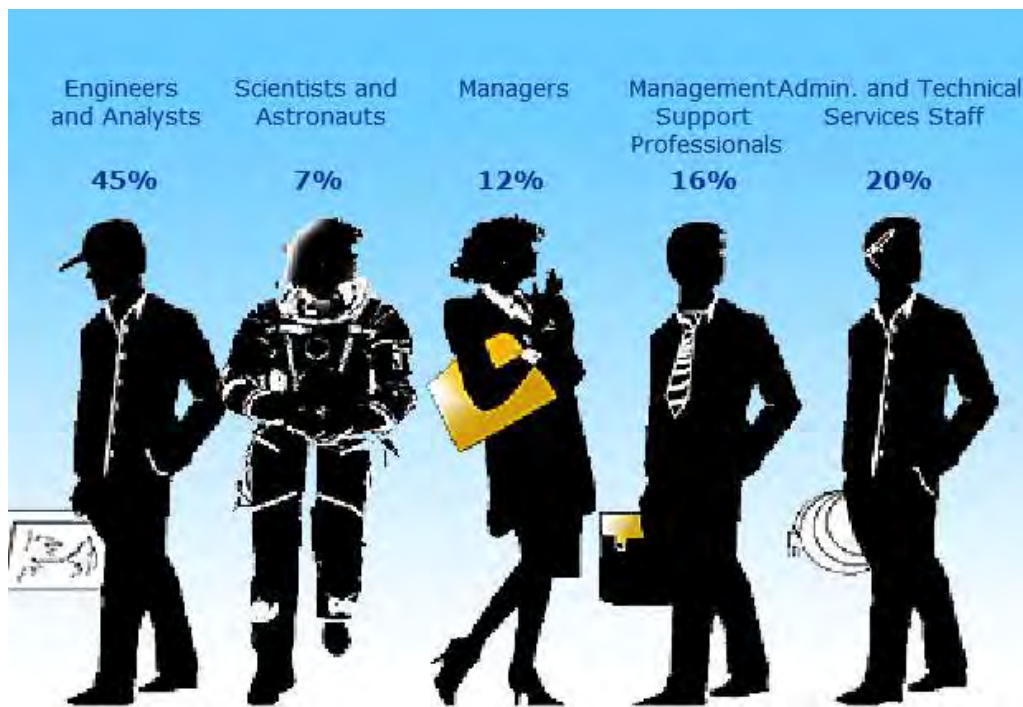
VG now has 33 full time employees permanently based at its Las Cruces, NM office, with various other employees cycling through from our Mojave, CA facility on a regular basis, and a plan to transition at least 85 employees permanently from Mojave to New Mexico before the start of operations.

A large number of VG's employees in Las Cruces are from New Mexico or the Borderlands. In preparation for operations, VG expects to make a number of local hires to support the development of the business.

VG has recently signed a new five-year lease on office space in Las Cruces.



Space Agency ≠ Spaceline





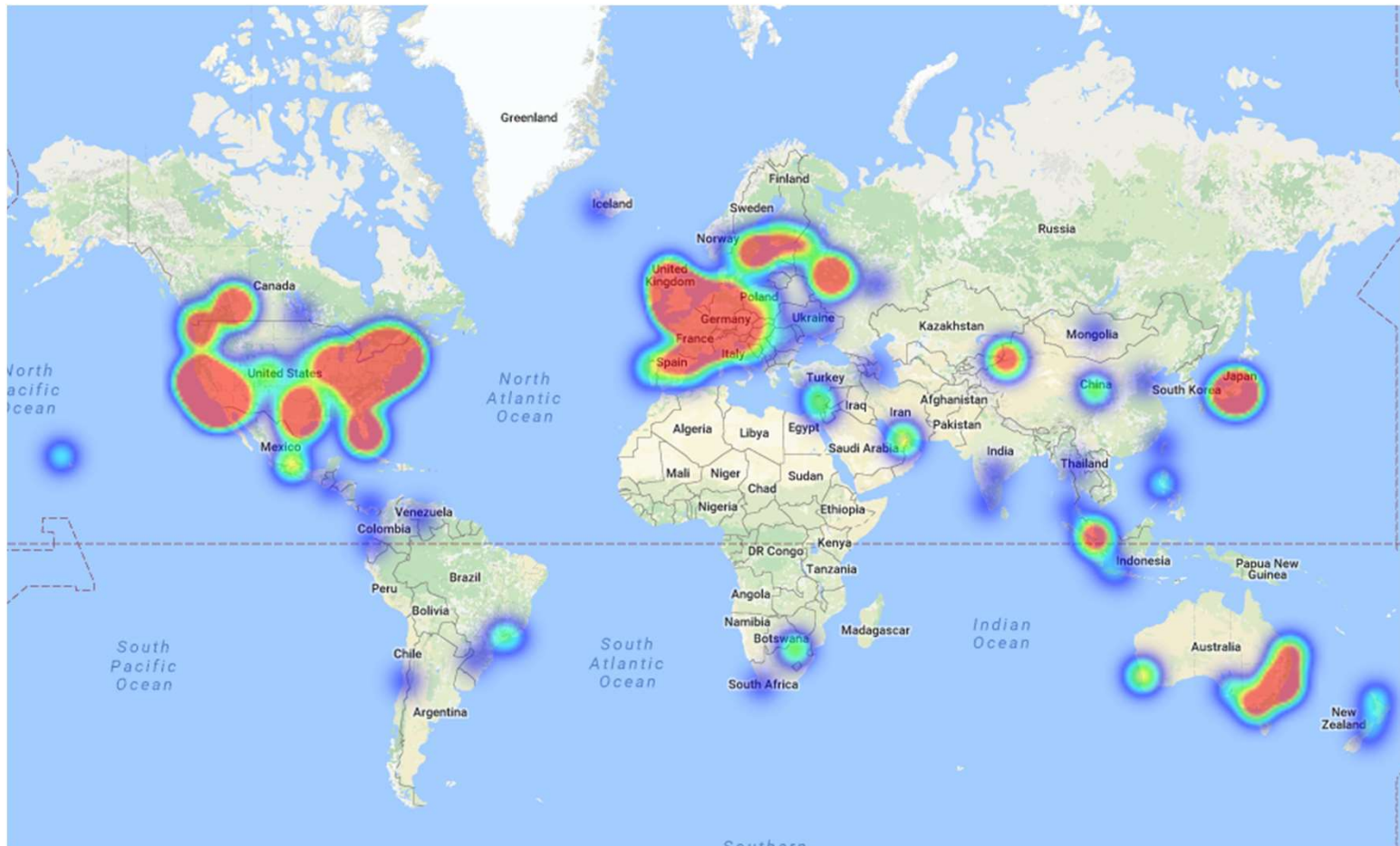
More than
600 people
from over 50
nations have
made a
reservation
to fly on one
of our
Suborbital
flights





Future Astronauts: a global community

More than 50 nations and a global spread, as shown by this 'heat map'



VG's Economic Impact in New Mexico to date

Anchor tenant / 20 yrs / \$9+m



Virgin Galactic (VG) is Spaceport America's anchor tenant, and supports the Spaceport's efforts to reach its full, sustainable potential with many tenants. VG plans to operate from Spaceport America and signed a 20 year lease with the State for the "Galactic Gateway to Space". VG started paying monthly rent and associated fees in January 2013. VG has paid the State of New Mexico more than \$9.2 million in rent and associated fees to date.



VG's Economic Impact in New Mexico to date

\$10.5+m / 42 in 2017 / ~\$20m



Since 2010, VG has also paid more than \$10.5 million to various New Mexico suppliers, including: Hotel Encanto de Las Cruces, Dickerson's Catering, World Class Gourmet, HB Construction, Ultramain Systems, Progressive Construction Management, RMKM Architecture, Elegant View Office Properties and New Mexico Office Furniture.

In 2017, VG placed orders with 42 unique New Mexico suppliers (26 so far in 2018)

Total spend in-state is more than \$19.7 million to date, *not* including the salaries paid to VG's New Mexico based staff.

In addition to that, VG has customer-related hospitality agreements valued at \$2.5-3 million agreed with New Mexico firms.



Service offering - transformed access to space

**Suborbital
Spaceflight**

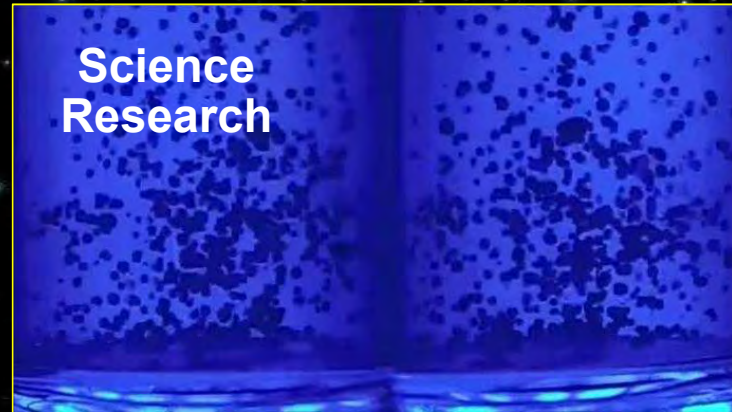


SpaceShipTwo



**Personal
Spaceflight**

**Science
Research**





Science Research Payload Applications

NASA Flight Opportunities Program is expected to grow

Technology demonstration:

- 3D Printing
- On-orbit Propellant Storage
- ADS-B
- Micro-sat attitude control systems

Science:

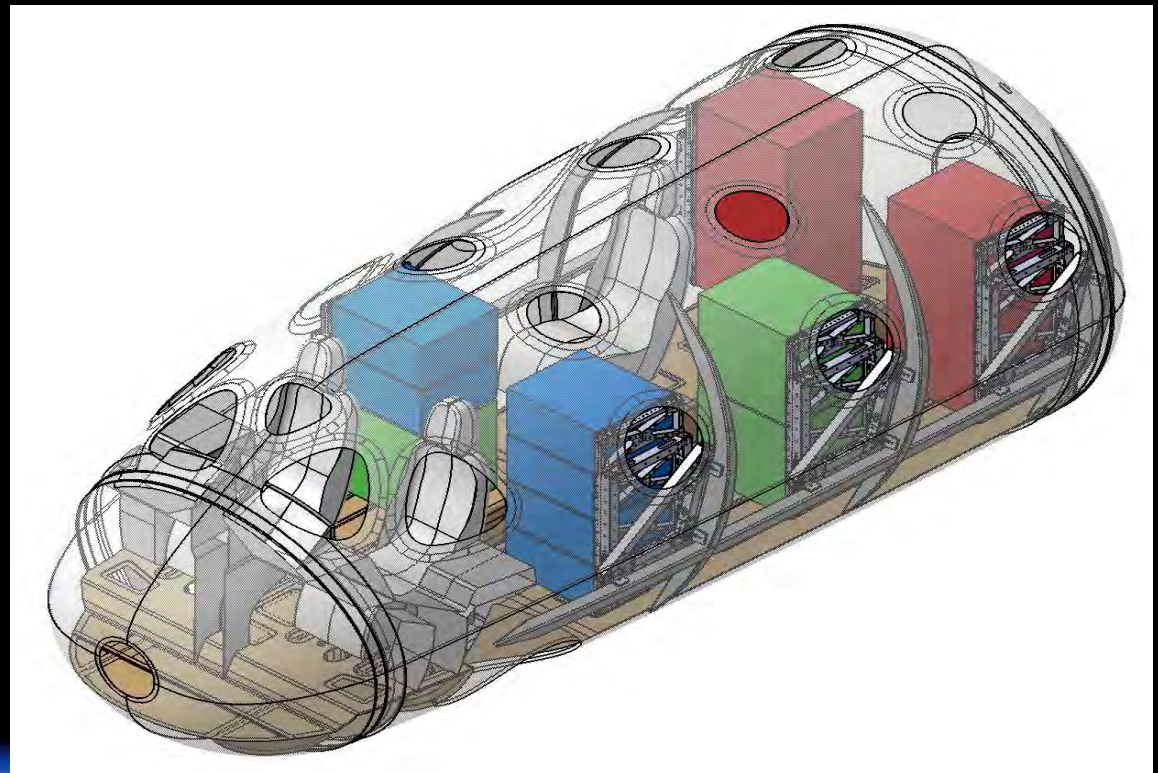
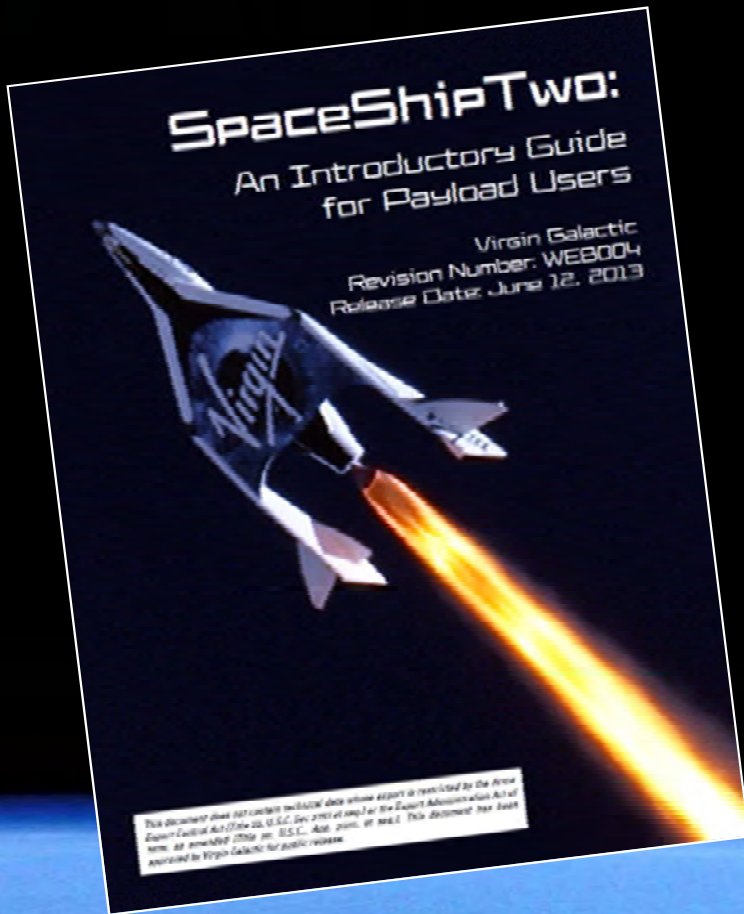
- Collision behavior of submillimeter sized dust
- Gene expression of biological samples during spaceflight
- Capillary flow in microgravity



* ADS-B = Automatic dependent surveillance–broadcast, a technology in which an aircraft determines its position via satellite navigation



Science Research on SpaceShipTwo





An Inspiration for the next generation



Ron Rosano
@ronrosano

#GalacticUnite is reaching classrooms worldwide via @Google Hangouts goo.gl/tBJRRo



VG's NM Outreach Program Goals



- Return to New Mexico, particularly Dona Ana & Sierra Counties, for development of and support to the Spaceport
- Community Relations / maintain dialog re: VG transition to NM
- Inspiration to Students and Community
- Make VG's mission relatable for students, and others, and communicate the wide range of future space careers (VG and industry in general)
- Engagement with potential future employees / Retain graduates
- Channel for Future Astronaut engagement - before and while in NM
- Local Community Grants awarded to support specific needs



VG Outreach in New Mexico



- **Local Education**
 - Las Cruces Public Schools
 - Las Cruces Challenger Center
 - Tombaugh Elementary School
 - Las Cruces Academy
 - Truth or Consequences Schools
 - Pecos Valley Schools
 - NMSU
- **Local Community**
 - Big Brothers Big Sisters (Mountain Region)
 - ISPCS
 - NM Space Grant Consortium
 - EAA Chapter 51
 - Girl Scouts
 - Boy Scouts
 - YPO NM / West Texas Chapters
 - Other local stakeholders
- **NM State**
 - NM Tourism Department
 - Albuquerque Chamber of Commerce
 - NM Society of Professional Engineers
 - Spaceport America / Spaceport Authority support
- **VG Gateway to Space**
 - Open House
 - Pilot Fly In support
 - Tour support
 - Movie shoots
- **National/International**
 - Galactic Unite Grants Program
 - School Video Hangouts
 - Future Travel Experience
 - JLR 4x4 Schools Competition
 - Google Science Fair

SpaceShipTwo “Unity” flight testing in progress





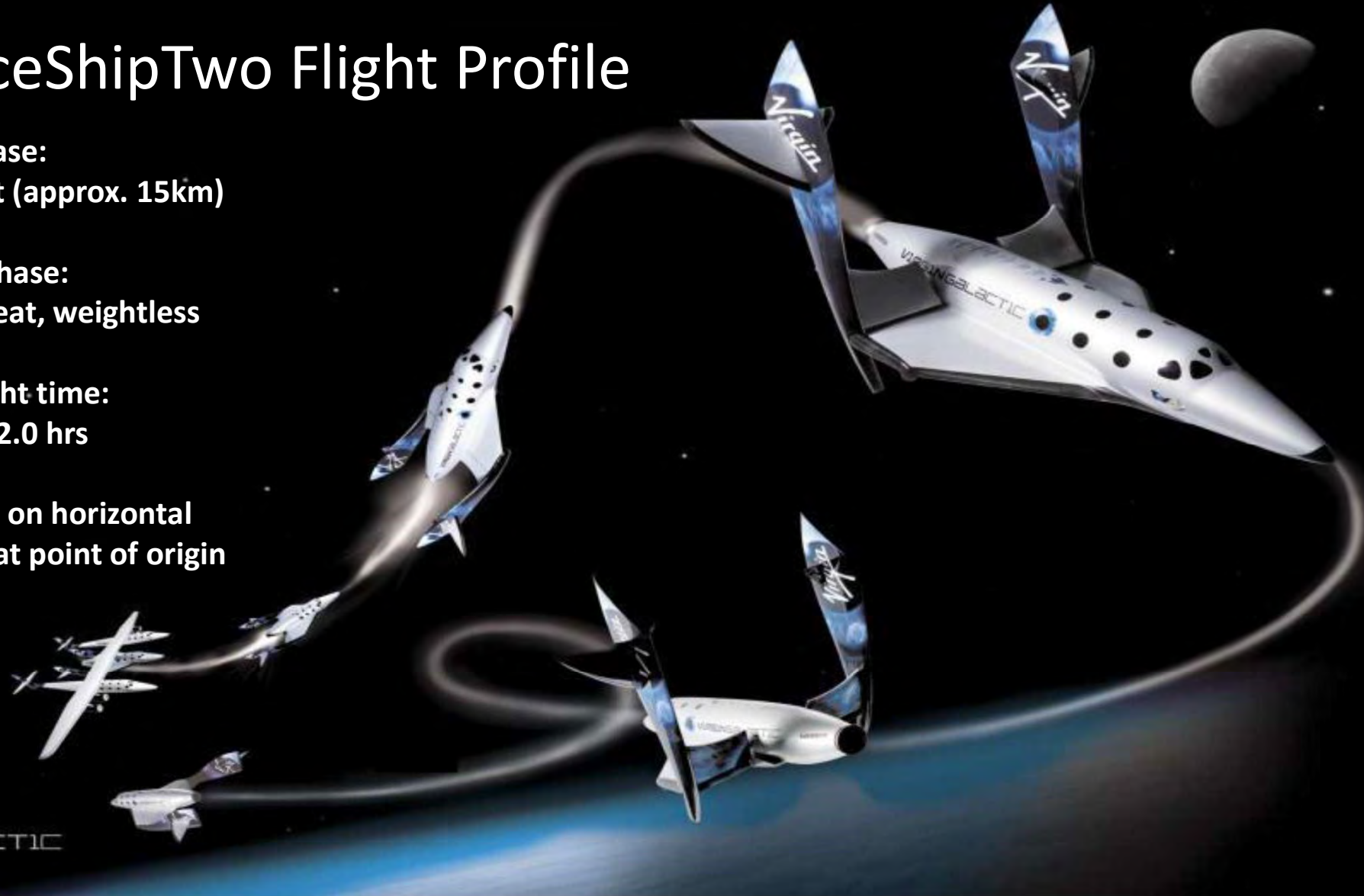
SpaceShipTwo Flight Profile

SS2 release:
50,000 ft (approx. 15km)

Zero-g phase:
out-of-seat, weightless

Total flight time:
approx. 2.0 hrs

Landing: on horizontal
runway at point of origin



Flight testing of VG's spaceship "Unity" started in September 2016, with good progress since then – glide flight testing is complete, leading to the start of powered flight testing.

Flight testing is being conducted from Mojave, CA and commercial spaceline operations are set to start at Spaceport America in New Mexico upon completion of that test program.



Powered Flight Testing

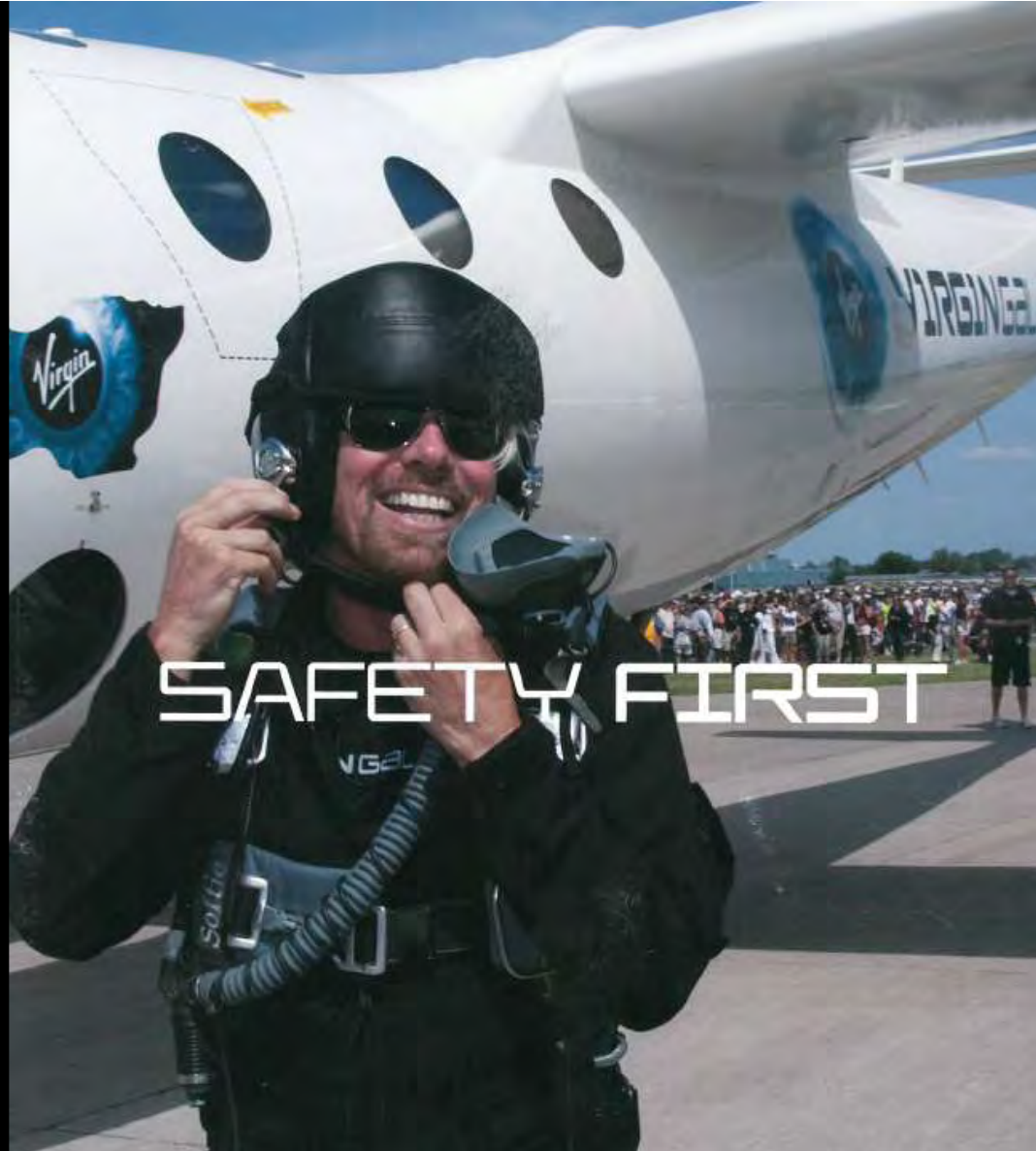
Completion will lead to Start of Operations

Many test flights to be
completed in 2018





GALACTIC



SAFETY FIRST

A satellite image of the state of New Mexico, showing its geographical features and the border with Texas to the south. The state is highlighted in a light tan color against the darker terrain of the surrounding region. The image is taken from a high altitude, showing the curvature of the Earth and the blue atmosphere. The text "New Mexico from the Edge of Space" is overlaid in the top right corner.

**New Mexico
from the Edge
of Space**

Our Space Heritage



First Photos of Earth from Space