



Path to the First Launch of the SL-OMV

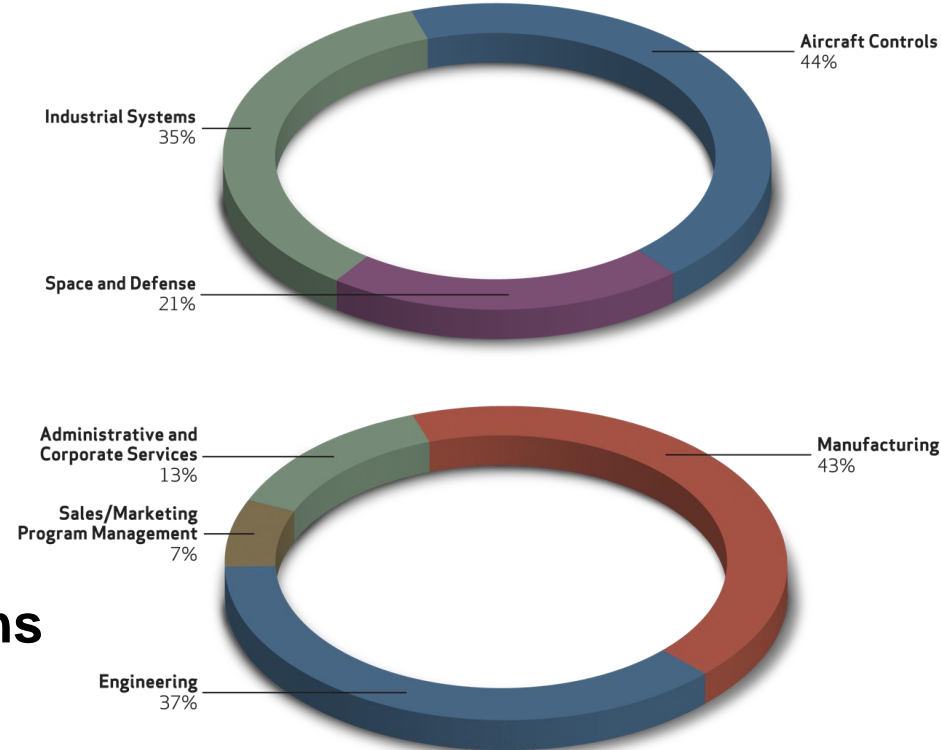
16th Annual CubeSat Developers Workshop

Christopher Loghry

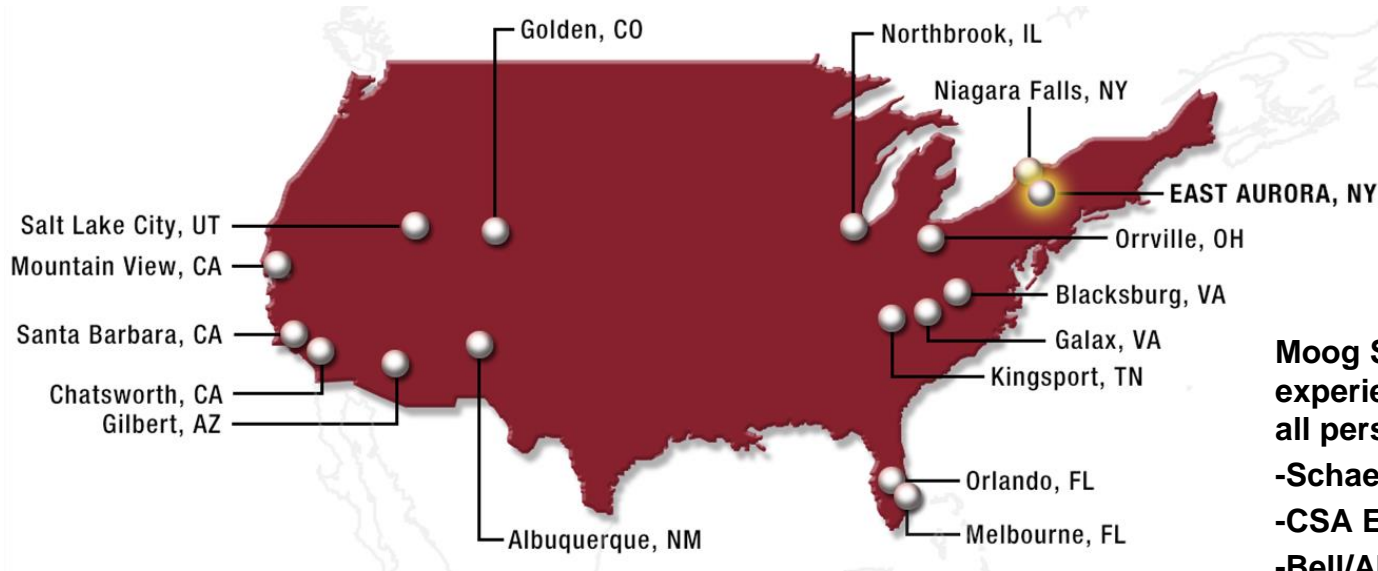
April 24, 2019

Company Background Information

- **Founded in 1951 by Bill Moog**
- **Headquarters in East Aurora, NY**
 - Over 300 Acre Facility
- **Global Company**
 - 25 Countries
- **Over 11,800 Employees Worldwide**
- **\$2.70 Billion in Revenue (FY 2018)**
- **Aerospace, Defense, Industrial**
- **Precision Control Systems Solutions and Component Provider**



Moog Space and Defense Group



Moog Space leverages the unique experience from acquisitions to include all perspectives in the Space market

- Schaeffer Magnetics
- CSA Engineering
- Bell/ARC/AMPAC In-Space Propulsion
- Broad Reach Engineering

2018 Sales
\$581M



Solutions for Every Stage of a Space Mission



REVOLUTIONIZING THE WAY TO SPACE

Propulsion

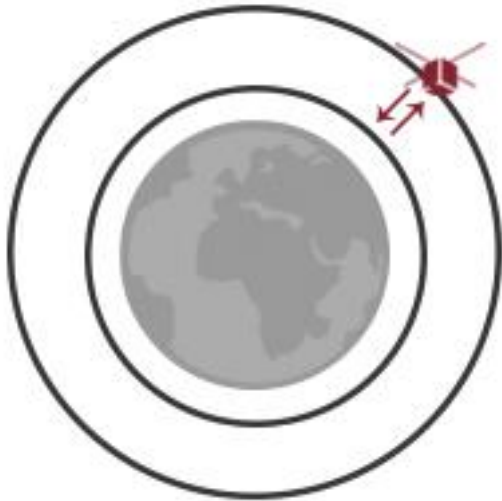
Actuation

Avionics

Structures

Power

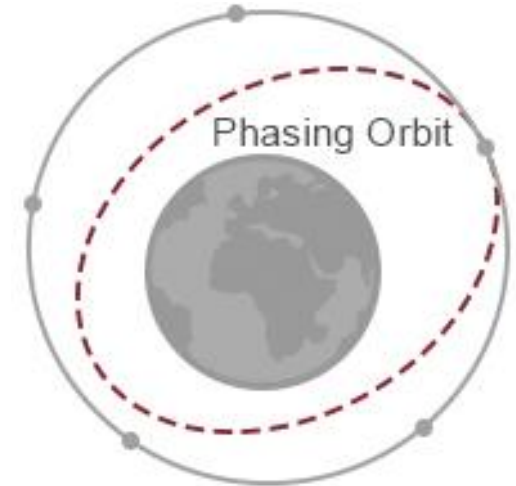
OMV Family Use Cases



Change Altitude



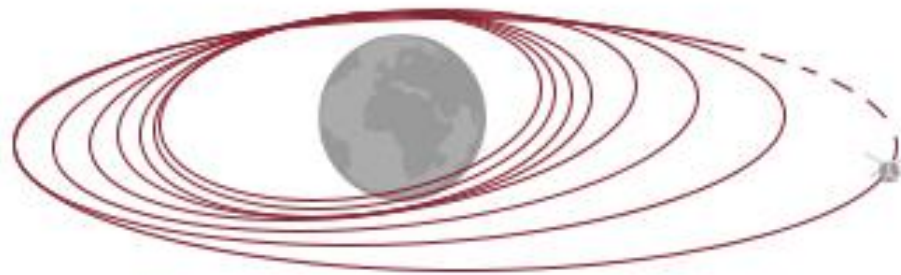
Change Inclination



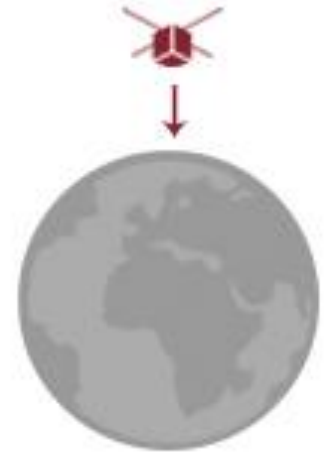
In-Plane Phasing



Multi-Plane Deployment



Liquid Insertion Stage



Hosted Payload

July 16, 2018 – A Big Day for the SL-OMV

Lockheed Martin, Orbex to launch from new British spaceport

by Jeff Foust — July 16, 2018



An illustration of a Lockheed Martin-provided launch vehicle being launched from the U.K.'s proposed spaceport in Sutherland, Scotland. Credit: Lockheed Martin

Courtesy of SpaceNews



Courtesy of NASA

Lockheed Martin To Help UK Space Agency Build First Commercial Spaceport; Launch First Orbital Rocket

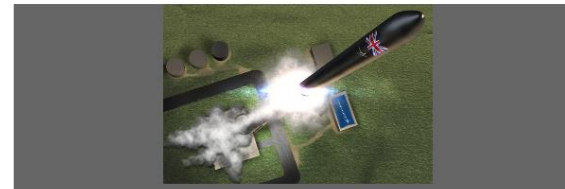
First vertical launch from Scotland planned for the early 2020s.



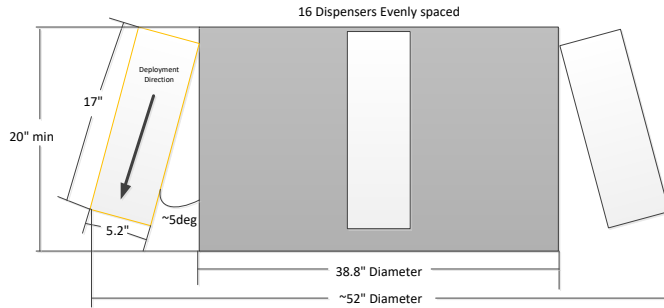
FARNBOROUGH, England, July 16, 2018 /PRNewswire/ -- The UK Space Agency has selected Lockheed Martin (NYSE: LMT) to help implement its vision for the UK Spaceflight Programme, an innovative initiative to create a world-leading commercial launch market that grows the UK economy through regular, reliable and responsible access to space.

"The countdown to the first orbital rocket launch from UK soil has officially begun," said Patrick Wood, Lockheed Martin's UK Country Executive for Space. "The UK Government has stated its desire to grow the UK's space sector to ten percent of the global space economy by 2030. We are proud to be selected to help them achieve this goal. This initiative will not only spark advancements in science and innovation, it will create new opportunities for current and future UK-based suppliers to become part of the next space age."

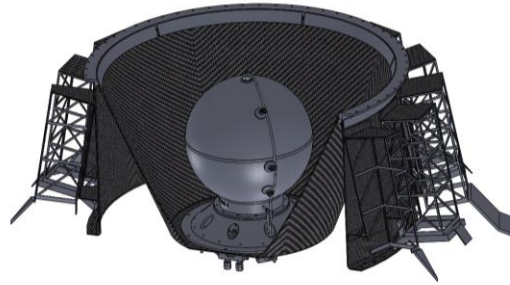
Courtesy of Lockheed Martin



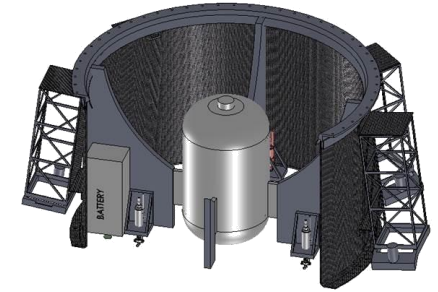
SL-OMV Progression



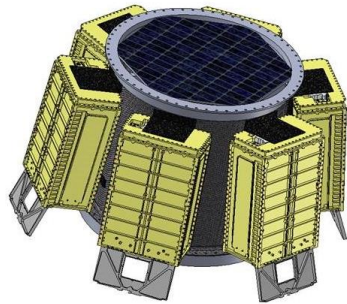
November 2015



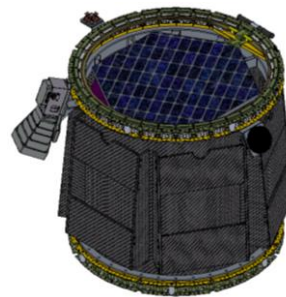
January 2016



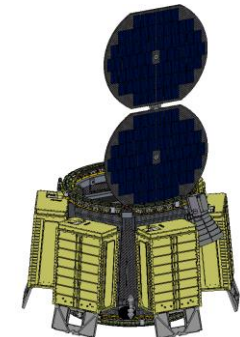
Summer 2016



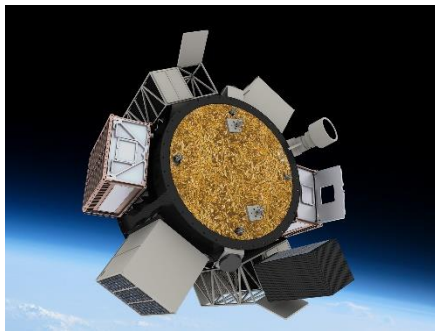
Winter 2016



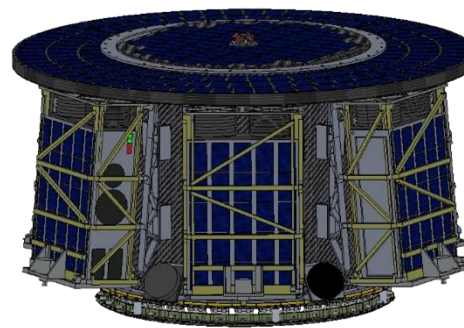
Spring 2017



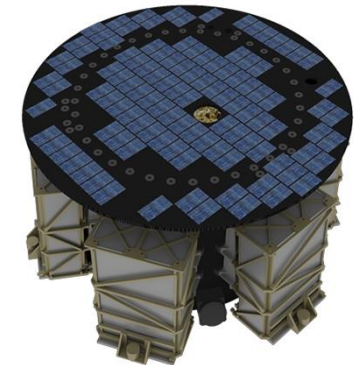
Winter 2017



Spring 2018

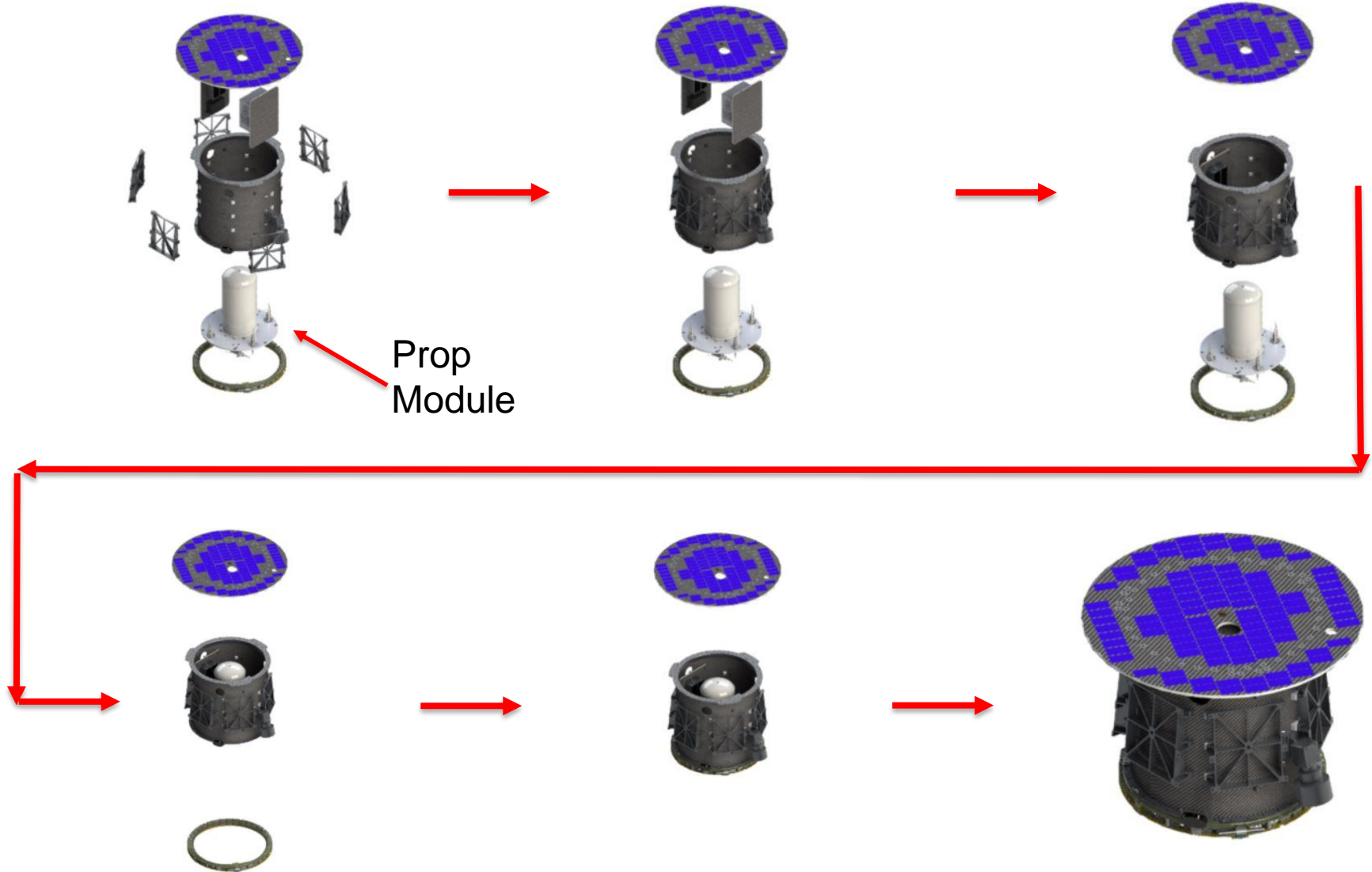


Fall/Winter 2018

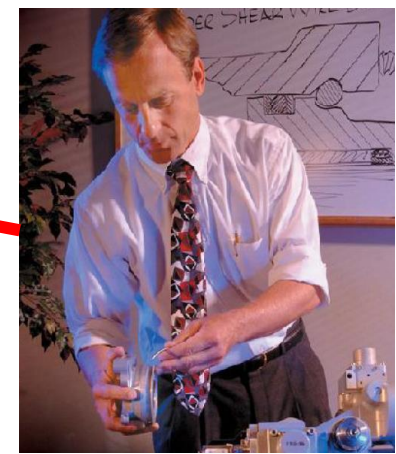
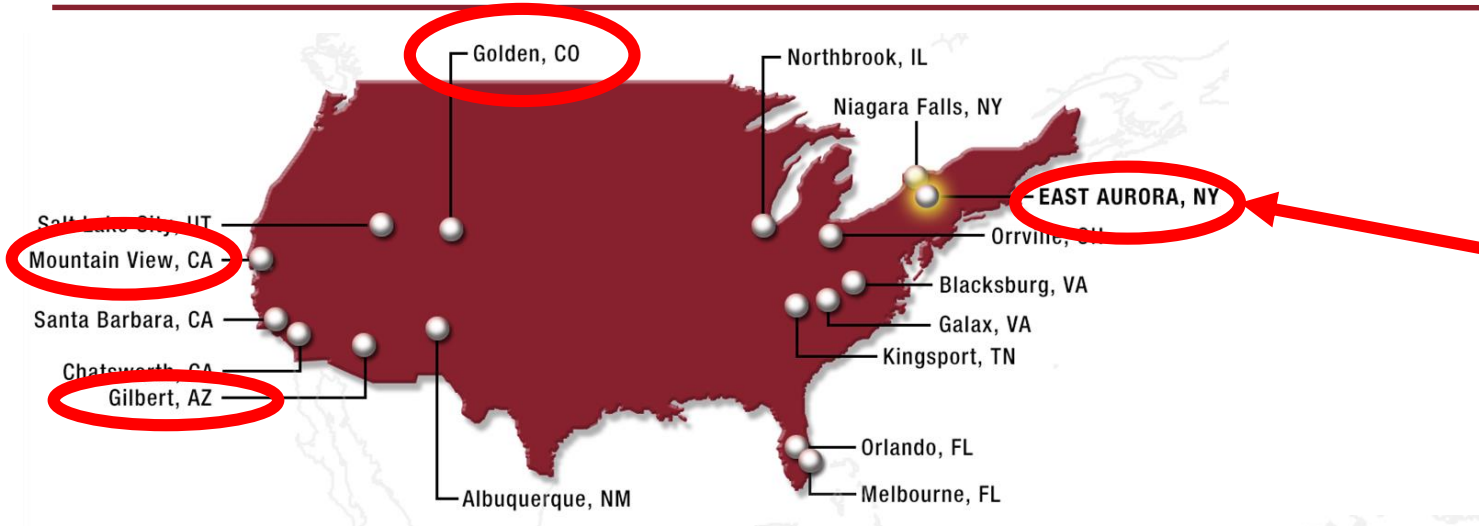


Spring 2019

SL-OMV Integration Planning



SL-OMV Program: Both Sides of the Pond



Large UK Foot Print



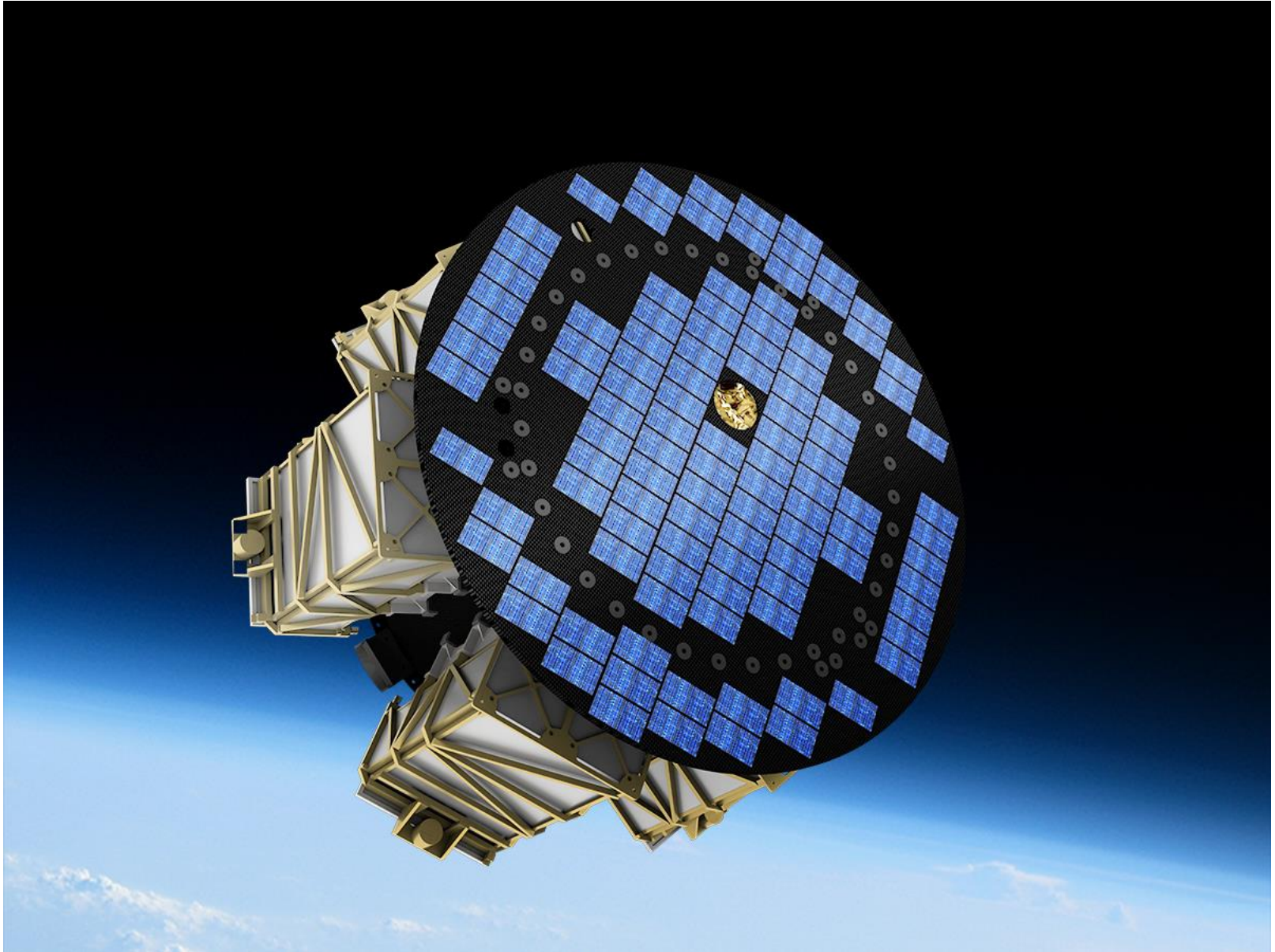
Note: Final hardware selections in work but several additional UK locations will support this program

SL-OMV Schedule

| Q3 2018 | Q4 2018 | Q1 2019 | Q2 2019 | Q3 2019 | Q4 2019 | Q1 2020 | Q2 2020 | Q3+ 2020 |
|------------|------------|-----------------|------------|------------|------------|------------|-------------------|-------------|
| ATP | | | | | | | | |
| | SRR | PDR | | | | | | |
| | | Industry Day | | | | | | |
| | | | MIR #1 | | | | | |
| | | | | CDR | | | | |
| | | | | | MIR #2 | | | |
| | | | | | PRR | | | |
| | | | | | | I&T | | |
| | | | | | | | Build Complete | |
| | | | | | | | | SIL |

Current Status

Obligatory Pretty Space Graphic



Contact Information

Please contact us with any questions or potential applications you would like to discuss

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