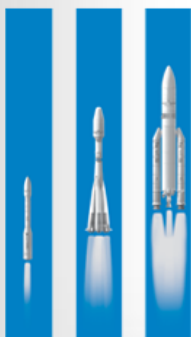


Determination Meets Innovation

ISPCS
Las Cruces, New Mexico
18 October 2012



Power³



Vega

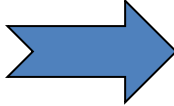
- **Developed by ESA, Vega is a light launcher adapted to LEO (1.5 tons at 700 km SSO) for:**
 - Scientific missions
 - Earth observation satellites
 - Small satellite constellation deployments
- **Maiden launch in February 13, 2012 carried two 2 main satellites (LARES/ALMASat 1) & 8 Picosats**
- **Arianespace has engaged the Vega production phase and ordered five launch vehicles**
- **Arianespace has already signed the first four commercial Vega launch contracts**
- **Next flight in second quarter 2013**



Evolving Market For Small Payloads

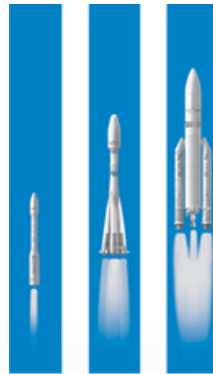
- **Multiple Markets and Business Plans**
 - Enhanced Weather Forecasting
 - Real Time Earth Observation
 - Mobile Communications
 - Geo-Location Applications
- **Global Constellations & Consumer Applications**
 - 8 to 36 satellite constellations
- **Venture Financing Is The Big Challenge**
 - Export Credit Financing

Five Burning Questions

- **Define Small? 3U Cubesat  250 kg.**
- **What orbit do you want to go to?**
- **Primary or Secondary Status?**
- **Optical? Dawn-Dusk? LTAN?**
- **Flexibility – Are you ready to wait?**

Regulatory Aspects of SmallSat Launches

- **Respecting 25 year de-orbit commitment for upperstage**
- **FCC licensing requirements for transmission and de-orbit**
- **Do optical small satellites need NOAA licenses?**
- **FAA rules for smallsat or cubesat launches?**
- **Objective is not to create orbital debris**
- **Meet customer requirements for injection & lifetime**



Power³

arianespace.com

