

# Space Investment Summit 8

26 May 2010

## Summary Presentation



# Overview

Paul Eckert, PhD

International & Commercial Strategist  
The Boeing Company



# Hosts



Space Investment Summit 8

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# Supporting Organizations



# An Overview of Commercial Space Markets

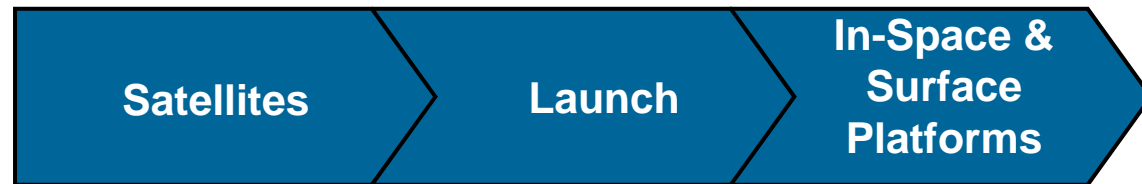
**Max Grimard**, Vice President/Deputy Head, Strategy & Business Development, EADS Astrium

**Amaresh Kollipara**, Managing Partner, Earth2Orbit LLC

**Michael Leventhal**, Attorney/Consultant, mc<sup>2</sup> The Law Firm

**-Commercial Space Market Segments-  
Space is an enabler: it enhances existing market verticals.**

**Infrastructure**



**Applications**

Healthcare	Earth Observation	Science Research
Media and Entertainment	Navigation and Communications	Governance
Energy and Mining	Defense	Transport Operations

# Today's Case Studies



- **Commercial space companies can loosely be defined as Infrastructure Providers, Operators, and Service/Application Providers.**
- **The new NASA direction will potentially help commercial space development**
- **Governments can be key catalysts in commercial space development**

# Conclusions

- **With the new NASA direction and other catalysts, the scope of government involvement has become more broad.**
- **Commercial space companies are creating an ecosystem of businesses, accelerating growth in the industry.**
- **There are different ways to become a commercial space success.**
  - **Billionaire-backed**
  - **Government backed**
  - **University/space agency backed**
  - **Traditional start-up**

# Keynote Presentations

**Bruce Pittman**, Director of Flight Projects  
and Chief System Engineer,  
NASA Space Portal at Ames Research Center



# Keynote Presentation

## Success Story: Commercial Opportunities for Space Enabled Markets

Joshua Raffaelli, Associate & Kauffman Fellow,  
Draper Fisher Jurvetson





# What do VCs look for?

## Key attributes

- Passionate Entrepreneurs
- Unique ideas
- Companies that change the world
  - Enormous markets
  - Capital efficiency
  - New industries and markets, early mover
  - Disruptive technology



## SpaceX case study – what did we love

### Pros

- Leader and innovator in an industry on the cusp of dramatic transformation
- No low cost alternatives
- Fixed price contracts with low fixed cost
- This is a ‘change the world’ opportunity. Launch costs are the critical barrier to the growth of an entirely new industry



## SpaceX case study – what gave us pause

### Cons

- Satellite business is lumpy
- Heavy government exposure with COTS and COTS-D to business model
- Substantial non-market risk from entrenched providers. Not a level playing field

# Keynote Presentation

## Insights: Assessment of Market Development and Business Segments

**Richard Garriott**, Chairman, Space Adventures Ltd; Space Explorer,  
Entrepreneur & Adventure Traveler



# Entrepreneurial Space Race

- “Orphans” began 20 years ago
- Organizing next generation of aerospace
- Tech leaders return to aerospace



# Push beyond L.E.O.

- **Public vs. Private?**
  - Private = a procurement method change
- **Today NASA already buys non HSF launches**
  - Example Mars Rovers launched commercially
    - (pic of mars rovers)
  - Only Shuttle remains an internal launch
- **Non-NASA businesses can buy HSF launches now too**
  - Same companies that build Shuttle will bid for next gen commercial, just as in old plan
  - Now they face competition from entrepreneurs
- **Ultimately this: decreases costs, increases safety, increases frequency, democratizes access**

# Business Plan Presentations

**Amaresh Kollipara**, Managing Partner, Earth2Orbit LLC (*Moderator*)



# Business Plan Presentations

**Linear Signal** – Helps satellite antenna OEMs and system integrators deliver economical Phased Arrays and Phased Array Feeds to their markets, leveraging our low cost/high performance beamformer chips, array tiles and full, private-labeled antenna assemblies

**Orbital Technologies** – Commercialization growth and spin-offs in propulsion and space resources, human support, emergency response, bio-products and interactive 3D

**Skycorp Incorporated** – Patented On Orbit Assembly process for large spacecraft on the International Space Station



# Business Plan Presentations

**Janet's Planet** – Launch pad for tomorrow's scientists and space explorers designed to inspire students to use the scientific process

**Packer Engineering Inc** – Drop, load, start – Robotic ISRU factory produces many times its own weight in oxygen, silicon, aluminum, iron, and refractory bricks.

**The Elwing Company** – Proprietary breakthrough technology opening up a new segment of the satellite propulsion market

# Panel Session

## Government-Industry Synergy in Expanding Commercial Space Opportunities

**Douglas Comstock**, Director, Innovative Partnerships Program,  
NASA Office of the Chief Technologist

**Bruce Pittman**, Director of Flight Projects and Chief System Engineer,  
NASA Space Portal at Ames Research Center

**Chris Cummins**, Chief Financial Officer/Chief Operating Officer, NanoRacks LLC

**Tim Pickens**, Chief Propulsion Engineer, Dynetics Inc

# Commercial Space and NASA

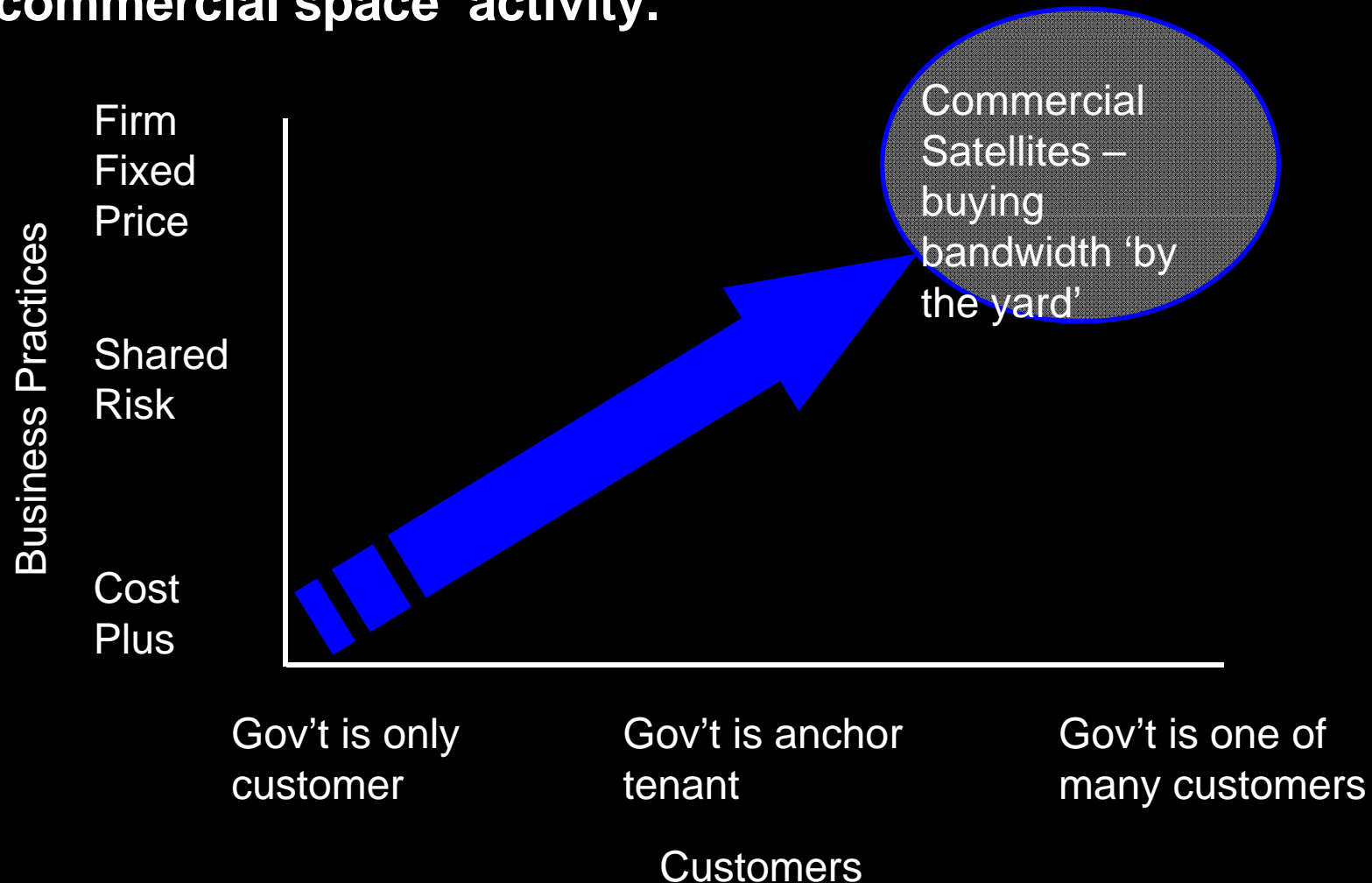
- There are three key themes that underscore some of the changes underway in how NASA is engaging the commercial space community:
  - Private sector role as partner rather than contractor.
  - Government purchase of services instead of hardware.
  - Creating broader opportunities for innovation.



IPP's recent edition of Technology Innovation focused on NASA's activities related to Commercial Space.

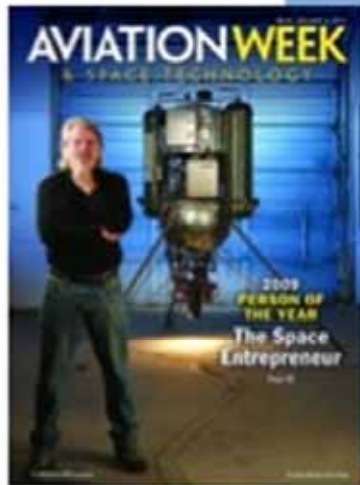
# What is Commercial Space?

- No single discrete definition, but rather a context for understanding different aspects of what makes something a 'commercial space' activity.



# Centennial Challenges

## 2009 WINNERS



Masten Space Systems and Armadillo Aerospace win Lunar Lander Challenge and as Space Entrepreneurs are honored as the "Persons of the Year"

Paul's Robotics, a student team beats 22 others to win \$500,000 in the Regolith Excavation Challenge



Ted Sothern and Peter Homer display their prize winning Astronaut Gloves



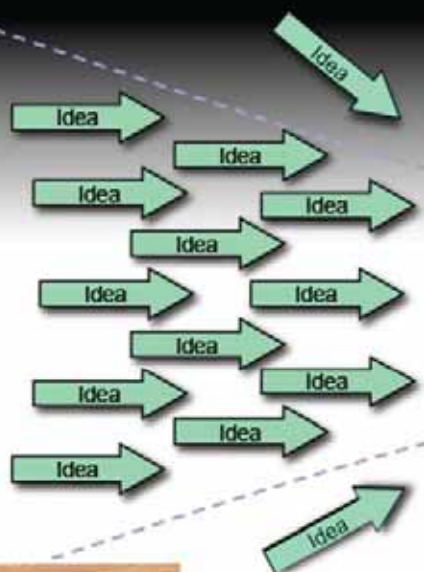
LaserMotive climbs to one kilometer with beamed power to win \$900,000



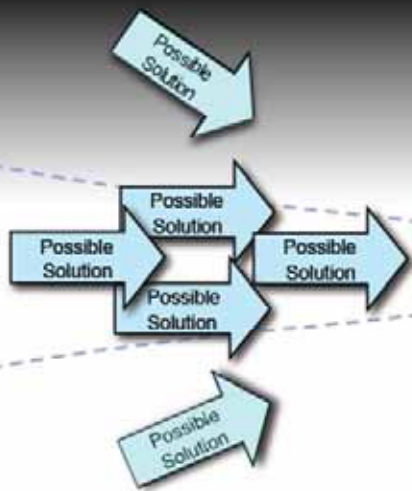


# NASA Space Technology Program

Visions of the Future



Does it WORK?



Is it Flight Ready?

Infusion Opportunities for NASA Mission Directorates, Other Govt. Agencies, and Industry

**Early Stage Innovation**

Creative ideas regarding future NASA systems and/or solutions to national needs.

**Game Changing Technology**

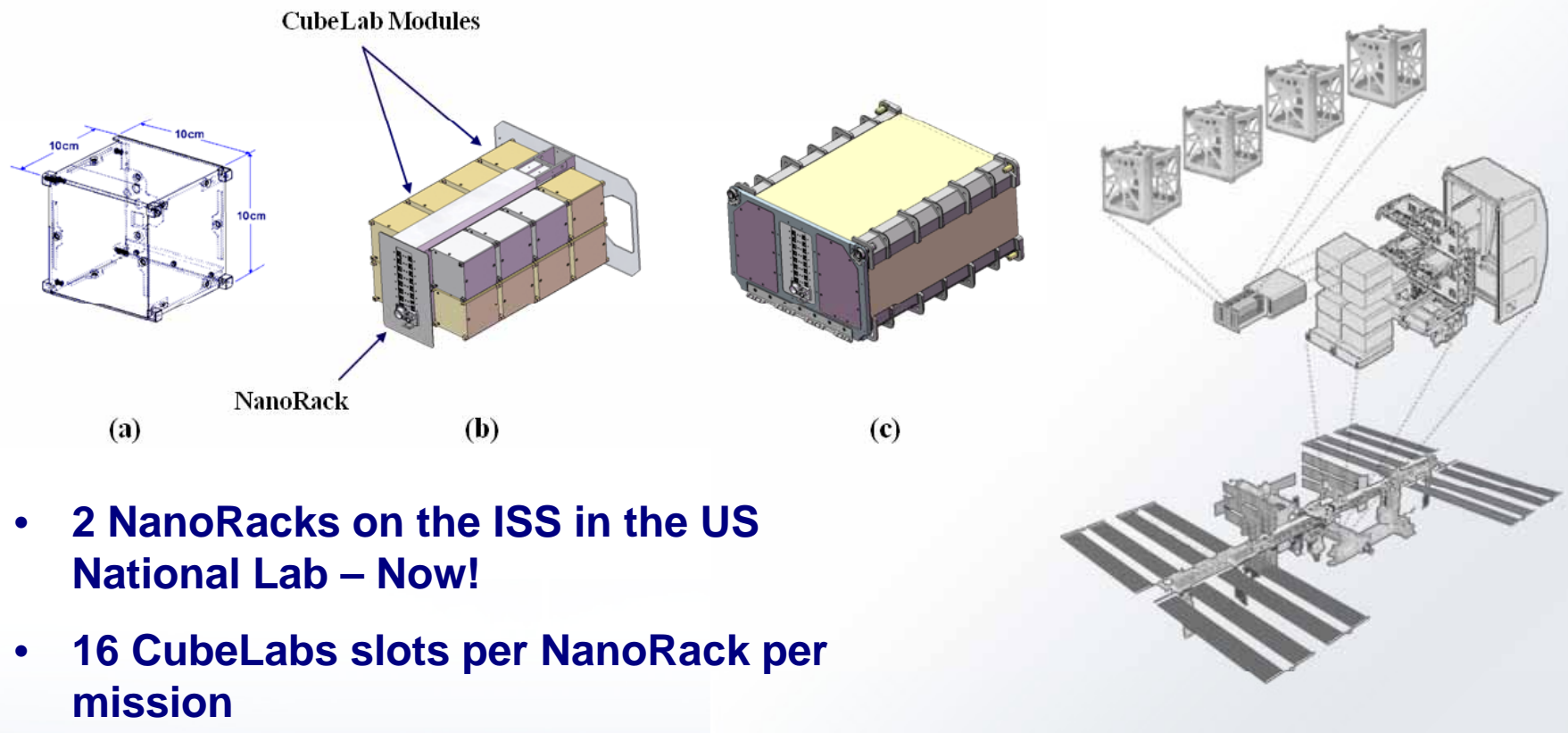
Prove feasibility of novel, early-stage ideas with potential to revolutionize a future NASA mission and/or fulfill national need.

**Crosscutting Capability Demonstrations**

Mature crosscutting capabilities that advance multiple future space missions to flight readiness status



# NanoRacks on the ISS



- **2 NanoRacks on the ISS in the US National Lab – Now!**
- **16 CubeLabs slots per NanoRack per mission**
- **Multiple missions per year**

**NANORACKS**



# Panel Session

## Meeting Customer Needs: Space-Related Business Opportunities

**Petter Kleppan**, Managing Partner, NORROC Venture Partners LLC

**Robert Jacobson**, Partner, Desert Sky Holdings LLC

**Michael Lindenmayer**, Managing Partner, Lindenmayer, Piquet & Company

**Jorge Rufat-Latre**, Director, Innovaro Strategos

# Key Points

- Recognizing the potential role of high net worth investors
- Protecting and applying Intellectual property
- Addressing both Earth and space markets
- Maximizing differentiation for competitive advantage

## Question

What are some important recent achievements in the field of commercial space?

## Question

What are the most important factors affecting private investment in space commerce?

# Question

How do investors compare space and non-space investment opportunities?



# Closing Presentation

Paul Eckert, PhD

International & Commercial Strategist  
The Boeing Company



# Space Investment Summit Planner



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