



Jet Propulsion Laboratory and the Bayh-Dole Act

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Jet Propulsion Laboratory

- A federally funded research and development center (FFRDC)
- Owned by NASA
- Operated by the California Institute of Technology
- Caltech has the first right to elect intellectual property through the Bayh-Dole Act
- Significant intellectual synergy with Caltech



Bayh-Dole Act

- University may elect to retain title to inventions developed under federally-funded research programs (1980)
- University grants royalty-free nonexclusive license to government to make, use, and have made
- Exclusive licensee must substantially manufacture in the U.S. (can be waived if cannot find a U.S. mfr)
- University must give preference to small businesses
- University must share with the inventor(s) a portion of any revenue received from licensing



Drivers for Caltech/JPL IP Strategy

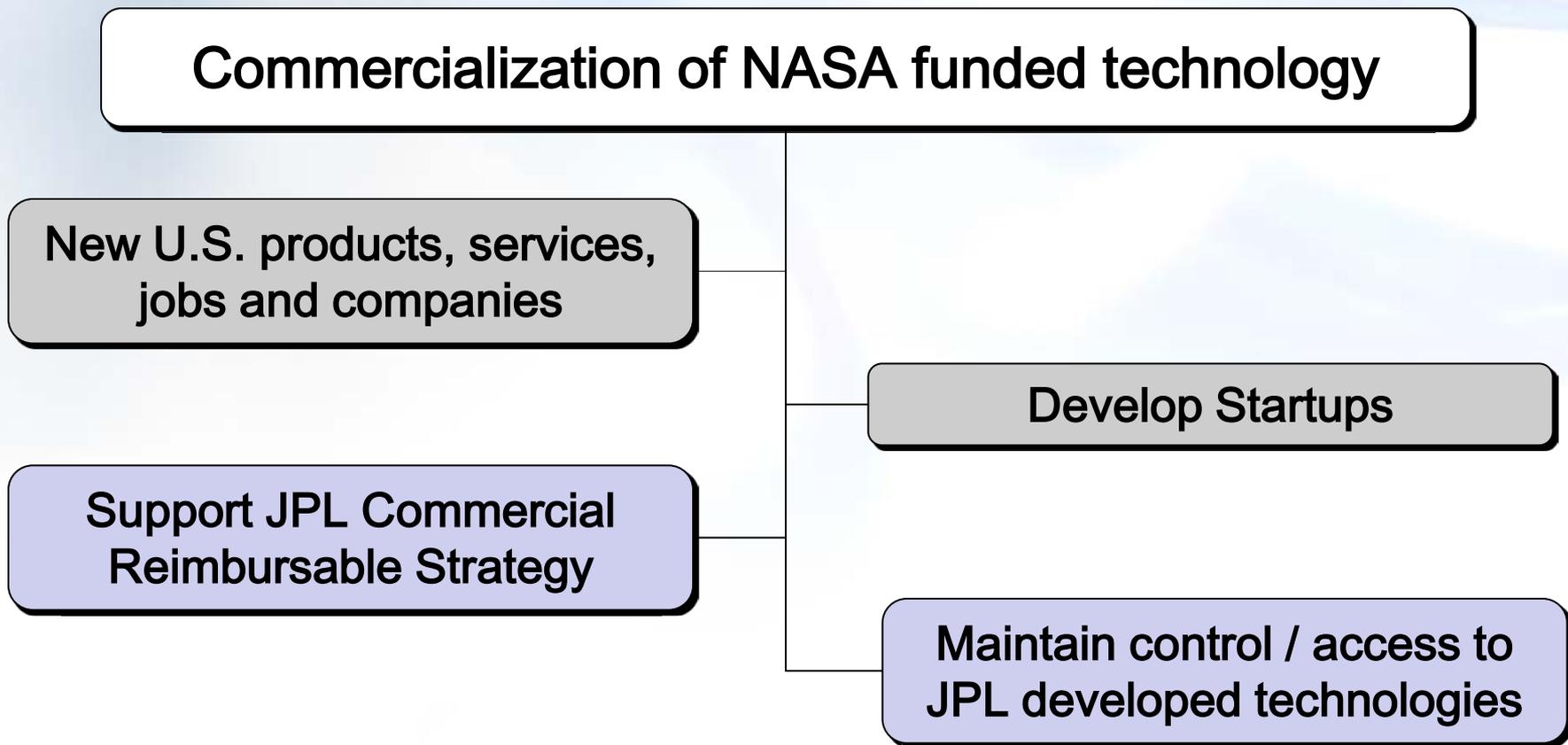
Commercialization of NASA funded technology

**New U.S. products, services,
jobs and companies**

**Support JPL Commercial
Reimbursable Strategy**

Develop Startups

**Maintain control / access to
JPL developed technologies**





The Caltech Commercialization Model is Based on Start-Ups and Small Companies

- Startup de-risks technology and market
 - Must focus on developing the technology
 - Typical goal is to exit (acquired or IPO) or partner with larger company
 - Under intense pressure to achieve technical and commercial milestones
- Generally, Large Companies
 - License working, documented, and/or “supported” software
 - License patents for freedom to operate
 - Tend to not be interested in licensing embryonic technology
 - May not have the means or motivation to develop products starting with embryonic technology



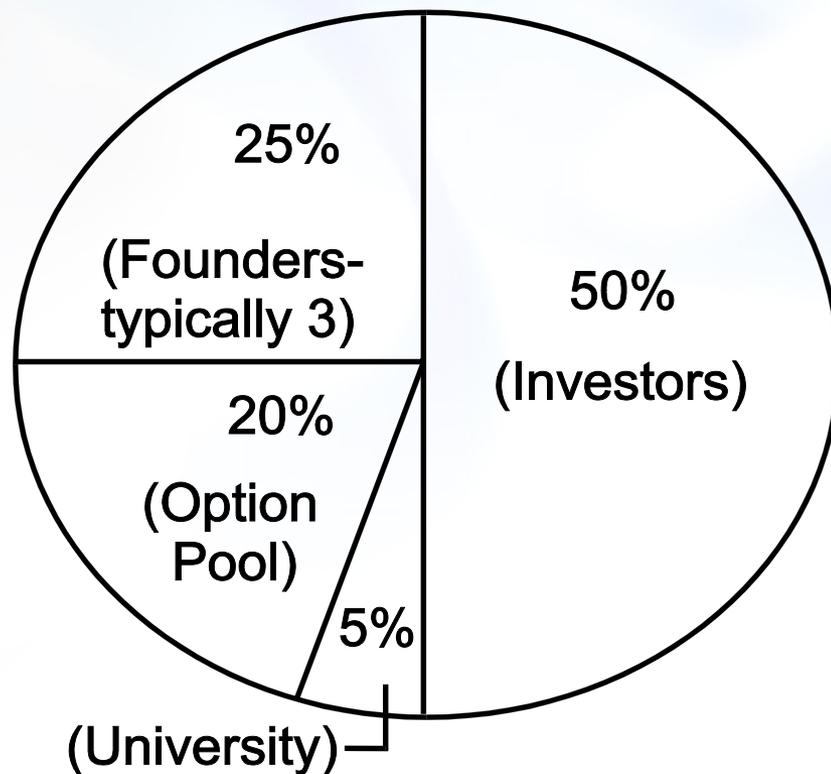
Benefits of Equity

- Why equity?
 - In exchange for a small equity share Caltech:
 - Is a partner
 - Defers patent expense payment until threshold investment is raised
 - Defers minimum payments
 - May reduce royalty rates
 - Takes no up front payments
 - Money raised is focused on product development
 - Equity provides an undivided interest in the company as a whole (including unlicensed products)
 - Equity provides a quicker (possibly greater) return



Fund Raising

Typical VC series A pie-chart





GlassiMetal Technologies



- Amorphous alloys represent the first enabling materials technology since the creation of thermoplastics
- Applications
 - Amorphous metal alloys possess an atomic structure, unprecedented for structural metals, and lend themselves to process technology similar to that possessed by plastics



Contour Energy Systems

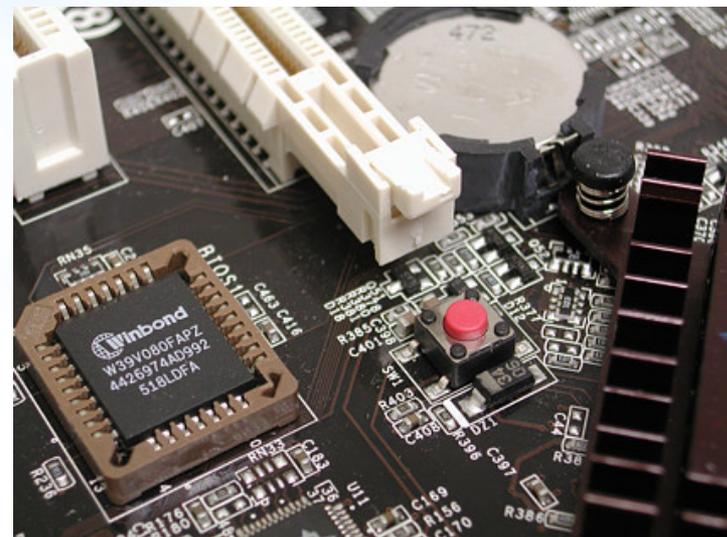
- Founders
 - Dr. Robert Grubbs , Nobel laureate
 - Dr. Rachid Yazami, CNRS
- Purpose
 - Contour is developing advanced primary and next-generation rechargeable battery systems optimized to meet the most demanding power and energy density, reliability and safety requirements.





Forza Silicon Corporation

- Technology
 - Complementary metal-oxide-semiconductor (CMOS)
- Applications
 - Image Sensor applications, mixed signal applications, high-speed solutions for optoelectronic, copper, and FR4-based
 - Products can be found in physician offices, cell phones, cars, and even space.





Medical Technologies International

- ArterioVision software accurately measures the thickness of the inner two layers of the carotid artery
- Exposes the earliest evidence of atherosclerosis, which can lead to heart disease and stroke.





Sirona Dental Systems

- CMOS-based dental imaging
- No film
- Low x-ray dose
- High resolution
- No development time
- Images easily transmitted





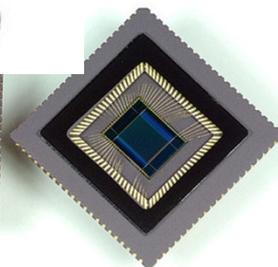
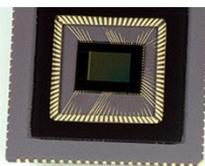
iRobot PacBot

- iRobot has shipped 3,000th PackBot robot
- PackBot rides on tank treads and has an articulating arm with a camera attached (Pathfinder mission)
- PackBot missions include military bomb disposal and hazardous environment operations





Photobit (acquired by Micron, now Aptina) - CMOS Imaging





Major New JPL Technologies on the Radar

- Global Positioning Systems (GPS)
- New amorphous metals
- Gecko grippers
- III-V infrared detectors
- THz imaging
- Very high temperature electronics (>500 °C)
- Extreme environment, highly reliable batteries





Major New JPL Technologies on the Radar

- Thermoelectrics
- Low Density Parity Checking
- High technology drilling
- Advanced robotics
- Autonomous navigation
- Atomic clock





Metrics Snapshot

- Approximate annual numbers for JPL:
 - 400 to 550 NTRs
 - 85 new provisional applications per year
 - About 35 nonprovisonal (full) applications
- 8-15 commercial licenses per year
- 1-3 startups per year
- Most licensed patents are in startups or small companies



Revision of New Venture Process

- Recognition that technology commercialization often requires the startups that involve of JPL researchers
- More innovator friendly
- Encourage commercialization
- More OTT involvement in the process
- Entrepreneurism rewarded



Open Source

- An Open Source strategy is in the process of formulation and implementation
- Open Source Benefits
 - High value with inherently collaborative software
 - More freedom to operate
 - Access to improvements and outside resources
 - May be an advantage to winning bids
- ITAR issues



Fast Track Patent Application

- Email is sent to researchers informing them of “fast-track” as part of the NTR process
- Researcher notifies JPL Office of Technology Transfer when they need a patent application filed immediately
- Application is filed, bypassing normal process
- “Win without fighting” - odds of a derivation proceeding fight is reduced on our side