

National Aeronautics and  
Space Administration



# Software for Start-Ups

## *Introducing the NASA in Silicon Valley*

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A large, semi-transparent silhouette of an astronaut in a space suit, reaching out with one hand. The background is a dark space scene with a bright, glowing nebula or galaxy in shades of blue and purple, and several stars.

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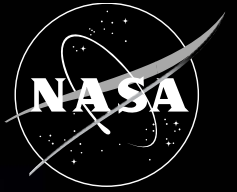
# Software for Start-Ups

Ames is in the unique position to cater to tech companies and start-ups in the Silicon Valley. The majority of Ames' technology transfer is software, which is very attractive to newly developing companies in the Valley as they create their business plans and develop their technology portfolio structures. Ames is collaborating with several "accelerators", "incubators" and academic technology transfer programs to connect start-ups with the space agency's technologies and software. The ultimate goal is to help enable successful businesses by harnessing the unique resources of the Silicon Valley entrepreneurial ecosystem, AND beyond!



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# Ames Technology Transfer and Partnerships



## PURPOSES / BENEFITS:

- Support and Enable NASA missions
- Create New Products
- Create New Jobs
- Improve the Quality of Life on Earth



## There are Many Ways to Partner with NASA

- Space Act Agreements
  - Non-Reimbursable
  - Reimbursable
  - Memorandum of Agreement/Understanding
  - Interagency
  - International
- Licensing Agreements
  - Exclusive
  - Nonexclusive
  - Limited Exclusive
- Software Usage Agreements



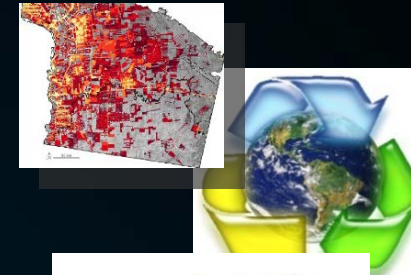
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# Key Partnerships, Silicon Valley and Beyond



## Planetary Skin Initiative and Rainforest Skin Layer

1. Quantum Computing
2. Planetary Content
3. Disaster Response
4. Autonomous Vehicles



## Robotics Technologies for Autonomous Vehicles



## Robotic and Spacecraft Technology Research

1. Commercial Crew Dev
2. Risk Analysis
3. TPS Design and Analysis
4. High-End Computing



## NASA Earth Exchange Services on the Amazon Cloud

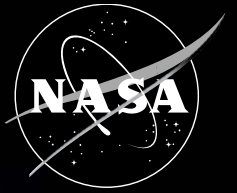


## Carbon Nanofiber Electrodes for Deep Brain Stimulation and Neural Prosthesis

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# 40 Years of NASA Spinoffs

Some of the best of over 2,000 recorded Spinoffs



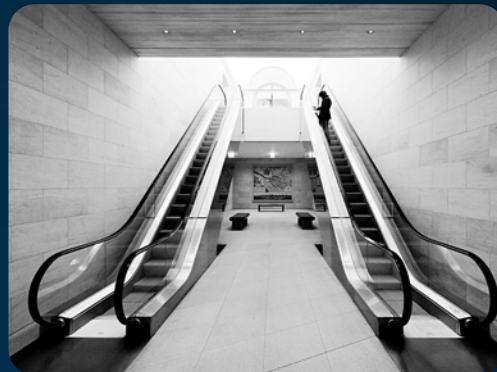
CMOS camera-on-a-chip technology used in nearly all digital cameras, including smartphones



International search-and-rescue system has saved 40k lives worldwide since 1982



Ubiquitous aerodynamic innovations in airplanes and trucks



Voltage controller saves energy in nearly all load-bearing electrical machines

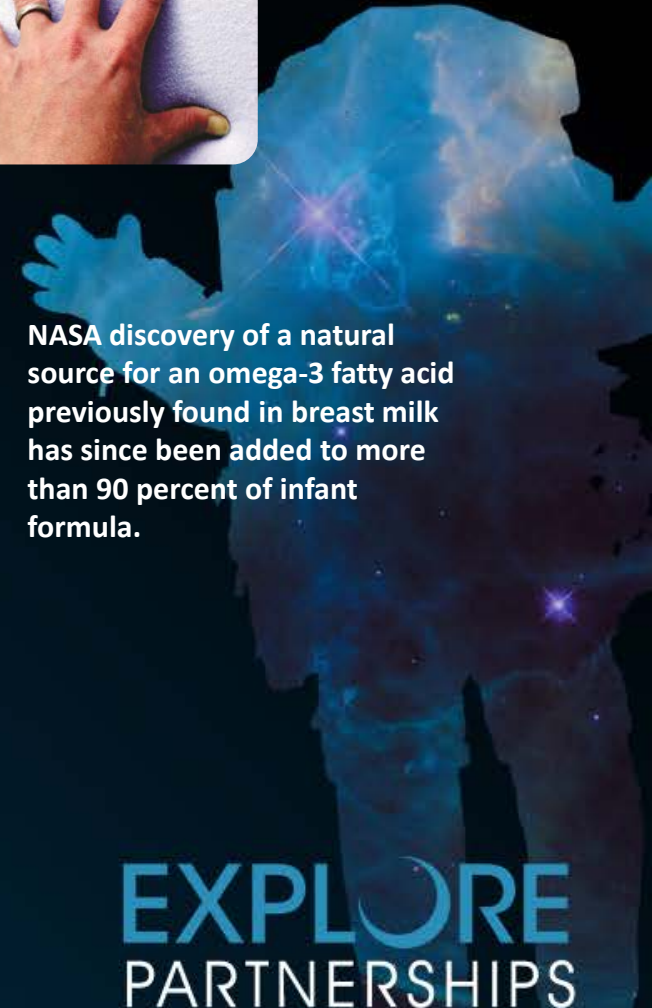


Precision GPS enabled self-driving tractors that are now used to work the majority of the world's farmland.

Temper foam has branched out far from its original applications to absorb shock and provide safety; From racecars, motorcycle and horseback saddles, to amusement park rides and aircraft.



NASA discovery of a natural source for an omega-3 fatty acid previously found in breast milk has since been added to more than 90 percent of infant formula.



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# Ames Spinoffs



## Self-Driving Tractors

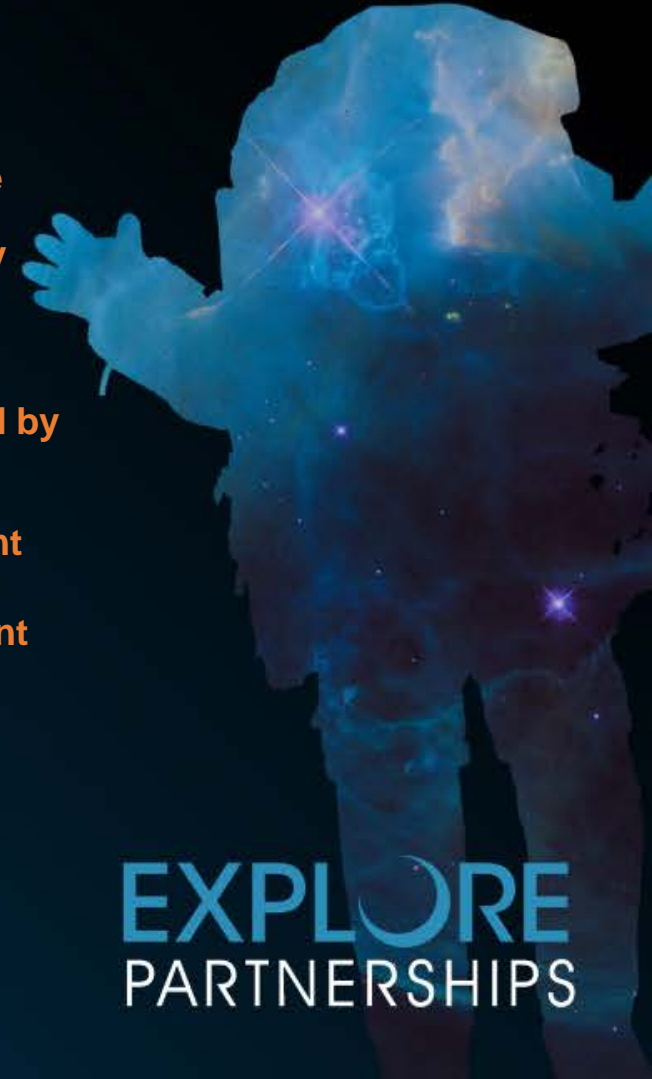


- First commercially viable self-driving tractors developed by John Deere using NASA license

- Precise GPS brought accuracy within centimeters, versus meters

- Estimates for farmland worked by self-driving tractors in 2016:

- North America: 70 percent
- Europe: 50 percent
- South America: 50 percent
- Australia: 90 percent



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# Ames Spinoffs, cont...



## CMOS Image Sensor



- CMOS image sensors are in virtually every digital camera
- Phones, amateur to professional DSLRs, Video cameras, dental imagers, car backup cameras
- Enabled social media as we know it through image- and video-sharing



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# Ames Spinoffs, cont...



## Truck Design



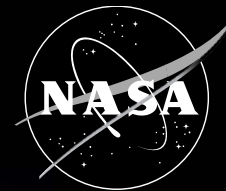
- Modern truck aerodynamic design was invented at NASA
- Curves and shape reduce drag and save on fuel and carbon emissions
- Tens of billions of dollars saved, estimates are nearly 7,000 gallons of fuel per average vehicle per year



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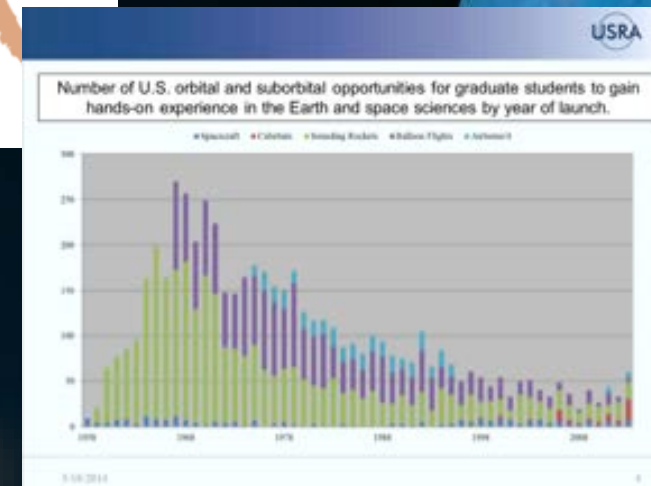
# Space Technology – An Investment for the Future



- Enables a **new class of NASA missions** beyond low Earth Orbit.
- **Delivers innovative solutions** that dramatically improve technological capabilities for NASA and the Nation.
- Develops technologies and capabilities that make NASA's missions **more affordable and more reliable**.
- Invests in the economy by **creating markets and spurring innovation** for traditional and emerging aerospace business.
- **Engages the brightest minds** from academia in solving NASA's tough technological challenges.

## Addresses National Needs

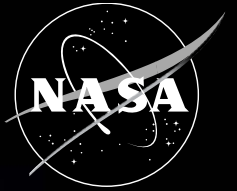
A generation of studies and reports (40+ since 1980) document the need for regular investment in new, transformative space technologies.



Value to NASA

Value to the Nation

# NASA's Technology Transfer Portal



Searchable databases help identify technologies of interest:

NASA Technology Transfer Portal:

<http://technology.nasa.gov/>

NASA Game Changing Technology:

<http://nasa.gov/spacetech>

NASA Software Catalog:

<http://software.nasa.gov>

NASA Spinoff:

<http://spinoff.nasa.gov>



# Partnerships Points of Contact at NASA Ames



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