

# Joseph E. Palaia, IV

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## Qualifications Summary

**SEASONED ENTREPRENEUR:** 5+ years startup experience, including writing business plans and pro-forma financials, presenting to investors, preparing proposals, negotiating contracts, administering contracts and hiring & managing over 100 staff, consultants and interns.

**R&D AND TECHNOLOGY EXPERT:** 10+ years research & development and technical & business consulting experience, including high voltage RF engineering, electric vehicles, plasma fuel reformers, thermoionic energy converters, space systems materials research, Earth-orbiting hotel concepts and Mars exploration and settlement infrastructure concepts. BS Electrical Engineering & MS Nuclear Engineering.

**NEWSPACE NETWORKER:** Connected with the key players in the emerging NewSpace industry, having unique knowledge of the individuals, technologies and markets.

**ARTICULATE & PROFESSIONAL:** Well spoken, with extensive experience presenting to large and small audiences at conferences, industry events and symposia worldwide.

## Experience

### MANAGER

May 2008 – Present

**NewSpace Center, LLC** - New Port Richey, FL

- Co-founded space-themed entertainment venture, as a spin-off of the 4Frontiers Corporation.
- Company is developing INTERSPACE, a tourism and R&D facility showcasing the latest developments by the NewSpace industry and a full-scale mockup of a Mars settlement.

### VP OF OPERATIONS AND R&D

June 2005 – Present

**4Frontiers Corporation** - Cambridge, MA & New Port Richey, FL

- Co-founded company focused on Mars settlement and related technology development.
- Pursuing business opportunities in research & development, informative entertainment / education, and consultancy, and spinning off additional companies as appropriate.
- Heavily involved in business development, contract negotiation, grant and proposal writing, technical research and consulting, presentations, marketing, business and financial plan preparation, program management and more.
- Routinely manage diverse groups of technical consultants and interns (interns provided during the summers of 2008, 2009 and 2010 by NASA ESMD and the Florida Space Grant Consortium).
- Website: [www.4FrontiersCorp.com](http://www.4FrontiersCorp.com)

Served as a **PRINCIPAL INVESTIGATOR** on the following 3 research grants via 4Frontiers:

“Greenhouse Resources on Other Worlds (GROW)” – \$70,000

2009-2010

- Generated content and managed interns and consultants to develop interactive educational modules for 4Frontiers’ Crazy4Mars.org website. Modules consist of simulated Mars greenhouse environments that students can explore. Coordinated with the University of Florida, Dept. of Agricultural and Biological Engineering.
- Grant awarded under NASA Announcement NNH09ZNE001C: Ralph Steckler / Space Grant Space Colonization Research and Technology Development Opportunity Phase I.

“Education & Outreach with Florida Students Through Direct Interaction with the Crew of a Simulated Mars Mission.” – \$6,000

2009

- Conducted two interactive video conference sessions via satellite with student groups in the state of Florida, while participating in the July 2009 Flashline Mars Arctic Research Station expedition in the Mars analog environment of Devon Island in the Canadian Arctic (see below under “Leadership” for additional information).
- Grant from Florida Space Grant Consortium, awarded in response to an unsolicited proposal.

“Heat Transfer and Stress Investigations of Transparent Material Subjected to Internal Greenhouse Conditions in a Simulated Mars Surface Environment.” – \$25,000 2008-2009

- Tested various materials proposed for use in future transparent Mars greenhouses under simulated Mars conditions.
- Coordinated research efforts conducted by consultants at the Space Life Sciences Lab at Kennedy Space Center and co-investigators at the University of Florida, Dept. of Agricultural and Biological Engineering.
- Grant awarded under the 2008 Florida Space Research & Education Grant Program, funded by NASA and administered by the Florida Space Grant Consortium.

Served as a **CONSULTANT** on the following 5 contracts via 4Frontiers:

Black Bay Technologies – Singapore 2009

- Lead a team that performed the first two electric vehicle (EV) conversions ever performed in Singapore, converting a Renault Kangoo and a BMW 5 Series sedan to electric drive.
- Developed training materials and conducted lectures for client on electric vehicle topics, certifying client staff as EV conversion specialists, and helped client establish the first electric vehicle conversion facility in Singapore.

Atlantis Research – Tampa, FL 2008

- Developed and conducted two custom tour package programs for New Delhi based Atlantis Research. Tour participants were Indian high school students, and tours included visits to US cultural destinations, space and science centers, and behind the scenes at space facilities.

Galactic Suite, Ltd. – Barcelona, Spain 2007-2008

- Performed business plan development and provided technical advice related to the development of an Earth-orbiting hotel resort.

Thermocon, Inc. – Daytona Beach, FL 2007

- Performed technical review, component specification development and component provider evaluation for ThermoCon, Inc., a company developing a novel thermionic energy converter.

MKS Instruments, Inc. – Reading, MA 2006

- Assisted in the design and testing of a radio frequency (RF) generator for use in semiconductor processing applications.

**PRIVATE TUTOR** September 2009 – Present

**Tutoring by Joe** - Holiday, FL

- Conduct private tutoring for 20+ students, totaling over 400 hours of instruction to date.
- Subjects include Algebra I, Algebra II, Trigonometry, Geometry, Precalculus, Calculus I, Calculus II, Calculus III, SAT Preparation, Chemistry and Physics at all high school and college levels.
- Student reviews are available at [www.TutoringbyJoe.com](http://www.TutoringbyJoe.com).

**RESEARCH ASSISTANT** 2002-2006

**Massachusetts Institute of Technology – Cambridge, MA**

**MIT Space Propulsion Laboratory** 2005-2006

- Assisted in design and construction of an experimental thruster apparatus (Mini-Helicon Plasma Thruster). Manufactured thruster and test stand mechanical systems.
- Installed and troubleshot RF power delivery and chamber grounding systems.

**MIT Plasma Science & Fusion Center** 2002-2004

- Helped to develop and improve plasma fuel reformers for just-in-time hydrogen generation.
- Constructed and maintained high voltage (~20kV) RF switching power supplies, circuit design, and installation of experimental setup instrumentation.
- Performed NI LabVIEW and PIC microcontroller programming.

## **ELECTRICAL ENGINEER IN TRAINING**

- Advanced Energy Industries, Inc.** – Voorhees, NJ 2000-2002
- Performed circuit design, simulation and prototyping of RF power supplies/amplifiers.
  - Efforts included circuit analysis, testing and modification to meet required specs, CAD design of printed circuit boards, and prototype circuit construction and testing.

- Education** MASSACHUSETTS INSTITUTE OF TECHNOLOGY – Cambridge, MA June 2006  
**Master of Science in Nuclear Science & Engineering**
- NEW JERSEY INSTITUTE OF TECHNOLOGY – Mt. Laurel, NJ June 2002  
**Bachelor of Science with Honors in Electrical Engineering**

- Certifications & Training** BLACK BAY TECHNICAL INSTITUTE – Tarpon Springs, FL November 2009  
**Electric Vehicle Technician Certification Course**
- PRIORIA ROBOTICS – Gainesville, FL June 2009  
**Maveric Unmanned Aerial Vehicle (UAV) Flight Training Course**
- HARVARD BUSINESS SCHOOL – Boston, MA January 2009  
**Executive Education Intensive Course – Launching New Ventures**

- Leadership** **2011 FIELD SEASON DIRECTOR & CREW COMMANDER** Nov 2010 – Present  
**Mars Society – Flashline Mars Arctic Research Station (FMARS)**
- Appointed for the upcoming FMARS expedition, located in the Mars analog environment of Devon Island in the Canadian Arctic.
  - Responsible for selecting crew members to participate in the expedition, securing necessary funding (through donations, grants, scholarships and contracts), coordinating research activities, and obtaining experiments and hardware to be tested during the mission.
  - Will lead the crew in conducting the mission during the month of July, 2011.
  - More information available at <http://arctic.marssociety.org/>

As part of this effort, named as **Principal Investigator** on the following grant:

**“Education & Outreach with Florida Students Through Direct Interaction with the Crew of a Simulated Mars Mission.”** – \$12,500 2010-2011

- Will conduct interactive video conference sessions via satellite with student groups in the state of Florida while participating in the 2011 FMARS expedition.
- Grant awarded under the 2010 Florida Space Research Grant Program, funded by NASA and administered by the Florida Space Grant Consortium.

- FOUNDING MEMBER, SECRETARY OF THE CORPORATION & DIRECTOR** April 2010 – Present  
**Astronauts for Hire, Inc.** – Holiday, FL

- Co-founded this Florida non-profit whose mission is to increase the competitiveness of commercial astronaut candidates by providing skills training, facilitating forums for candidate communication, engaging with potential employers, and inspiring the next generation.
- Selected as an initial commercial astronaut candidate by the organization.
- Duties include business and financial planning, management of the documentation for the organization and fundraising.
- More information available at [www.astronauts4hire.org](http://www.astronauts4hire.org)

- TEAM MEMBER, ADVISOR & DIRECTOR** Jan 2010 – Present  
**Earthrise Space, Inc. / Omega Envoy Project** – Orlando, FL

- Providing advice and guidance to this Florida non-profit company, a competitor in the \$30M Google Lunar X PRIZE Competition (a private sector competition to land a rover on the moon).
- Duties include reviewing technical plans, assisting in preparation of proposals, providing input on staffing and assisting in the preparation of business and financial plans.
- Also currently assisting in the administration of the NASA Innovative Lunar Demonstrations Data Contract No. NNJ11TA08B.
- More information available at [www.omegaenvoy.org](http://www.omegaenvoy.org)

**EXECUTIVE OFFICER / ENGINEER FOR CREW XII**

July 2009

**Mars Society – Flashline Mars Arctic Research Station (FMARS)**

- One of six crew members who conducted a one month simulated Mars mission to the Flashline Mars Arctic Research Station, located on Devon Island in the Canadian Arctic.
- Solicited donations of equipment and financial support from multiple entities.
- Secured an Unmanned Aerial Vehicle (UAV) for expedition use from Prioria (Gainesville, FL).
- Conducted UAV flights on Devon Island while wearing a simulated Mars spacesuit (**first person in history to operate a UAV while wearing a space suit**).
- Obtained donations from AUVSI, Florida Space Grant Consortium & the Space Coast Office of Tourism. Conducted live Q&A sessions with Florida, Georgia and Texas students during expedition for outreach purposes.
- Partnered with Omega Envoy, a team competing in the Google Lunar X PRIZE, to test their lunar rover prototype during the expedition.
- More information available at <http://arctic.marssociety.org>

**CORE MANAGEMENT TEAM MEMBER**

2004-2005

**Mars Foundation / Mars Homestead Project - Cambridge, MA**

- Coordinated fundraising, outreach, publication, and performed some project management.
- Served as Nuclear and Electrical discipline leads for Mars settlement feasibility study.

**TEAM MENTOR**

1999-2002

**FIRST National Robotics Competition Team #204 - Voorhees, NJ**

- Assisted a team of ~40 high school students through the design, construction and testing of robots during four competition seasons.
- Provided instruction in mechanical design, use of 3D-CAD software, robot programming, machining, mechanism assembly, and group / project management.

**FOUNDER & 1ST CAPTAIN**

1998

**FIRST National Robotics Competition Team #204 - Voorhees, NJ**

- Organized and led a group of high school physics students to begin the first ever Eastern High School robotics team.
- Solicited funding for entry fee, material and travel costs from local area businesses.
- Served as liaison between corporate sponsors, school management and competition officials.
- Led students during robot design, construction & testing.

**Computer Skills**

Proficient in MS Office, Adobe Photoshop, 2D Autocad, 3D Autodesk Inventor, HTML for web design, online collaboration tools (Skype, Google Docs, social networks). Some knowledge of programming in 68000 & PIC microcontroller assembly languages, Mathworks Matlab, National Instruments LabVIEW, and Adobe Flash for web design.

**Awards & Honors**

- Selected for and attended Space Generation Congress (2007 – Hyderabad, India; 2006 – Valencia, Spain; 2005 – Fukuoka, Japan);
- Young Professionals Entrepreneurship Prize, Awarded by the Luigi Gerardo Napolitano Society and the International Astronautical Federation (2007);
- Peter Diamandis Leadership Award (2005);
- NJIT Albert Dorman Honors College Full 4 Year Undergraduate Scholarship (1998 - 2002);
- New Jersey Institute of Chemists Distinguished Award (1999);
- Edward J. Bloustein Distinguished Scholarship (1998);
- Selected for and attended American Legion New Jersey Boys State (1997);
- Eagle Scout, Boy Scouts of America (1997);
- BSA Troop 48 Walter Kowelewski Memorial Award (1997)

**Professional Committees & Boards**

- 4Frontiers Corporation – Board of Directors
- Astronauts for Hire, Inc. – Board of Directors
- Earthrise Space, Inc. – Board of Directors

- Mars Society – Steering Committee
- AIAA - Space Colonization Technical Committee
- National Space Society - Space Settlement Committee
- Students for the Exploration & Development of Space – Board of Alumni

#### Affiliations

- American Institute of Aeronautics and Astronautics (AIAA)
- Association for Unmanned Vehicle Systems International (AUVSI)
- Association of Mars Explorers
- Mars Society
- National Space Society (NSS)
- Planetary Society

#### Publications

S. J. Smith, J. A. Townley, A. D. Martin-Ryals, J. Truett, **J. E. Palaia, IV**, A. E. Schuerger, R. A. Bucklin, M. J. Correll (2011). "Materials Testing For Space Environments" Applied Engineering in Agriculture.

K. Ferrone, S. Cusack, C. Garvin, V.W. Kramer, **J. Palaia**, B. Shiro (2010). "Flashline Mars Arctic Research Station (FMARS) 2009 Crew Perspectives." AIAA SpaceOps 2010 Conf. Huntsville, AL. Session 65-ME-18

Shiro, B., **J. Palaia**, and K. Ferrone (2009), "Use of Web 2.0 Technologies for Public Outreach on a Simulated Mars Mission", Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract ED11A-0565

**Palaia J**, Homnick M, Crossman F, Stimpson A, Truett J. (2009) Economics of Energy on Mars. In: Badescu V. Mars: Prospective Energy and Material Resources. New York: Springer. Ch 13 p369-400.

Sylvan R, Komerath N, Woellert K, Homnick M, **Palaia J**. (2009) The Emerging Inner Solar System Economy. World Future Review, Vol.1 No.1, April-May

Som S, Manyapu K, **Palaia J**, Beaumont M, Garcia-Oviedo L, Jordan N. (2008) "A Global Imperative: We Must Go!" 59th International Astronautical Congress, Paper IAC-08-B3.1.10, Glasgow, Scotland.

**Palaia J**, (2006) Empirical Aspects of a Mini-Helicon Plasma Thruster Experiment (mHTX@MIT). M.S. thesis, Massachusetts Institute of Technology

Pucci JM, Sinenian N, **Palaia J**, LaBry Z, Shabshelowitz A, Celik M, Batishchev O, and Martinez-Sanchez M. (2006) mHTX@MIT: Characterization of a Mini Helicon Plasma Thruster. MIT

Ellender DJ, **Palaia J**, Mackenzie B. (2005) Requirements for Establishment of Site Data for a Permanent Mars Settlement. The 2nd Mars Expedition Planning Workshop, Vancouver BC, August

Petrov G, Homnick M, Mackenzie B, **Palaia J** (2005) A Permanent Settlement on Mars: The Architecture of the MarsHomestead Project. Published by the 35th International Conference on Environmental Systems (ICES), Rome, Italy, 05ICES-466, July

Dostal V, Gezelius K, Horng J, Koser J, **Palaia J**, Shwageraus E, Yarsky P, Kadak AC. (2004) Mission to Mars: How to Get People There and Back with Nuclear Energy. Published by the MIT CANES (Center for Advanced Nuclear Studies), Cambridge MA, MIT-NSA-TR-1, September

#### Conferences & Workshops Attended

- 2011, February 27-March 2 – Next Generation Suborbital Researchers Conference – Orlando, FL
- 2010, August 5-8<sup>th</sup> – 13<sup>th</sup> International Mars Society Convention – Dayton, Ohio (Speaker)
- 2010, June 27<sup>th</sup> – Next Generation Suborbital Opportunities Workshop – Kennedy Space Center, FL
- 2010, January 5 – 48th AIAA Aerospace Sciences Meeting – Orlando, FL (Astrosociology Session Chair)
- 2009, July 30-Aug 2 – 12<sup>th</sup> Annual Intl. Mars Society Convention – University of Maryland, College Park, MD (Speaker)
- 2009, May 28-31 – 28<sup>th</sup> International Space Development Conference (ISDC) – Kissimmee, FL (Speaker)
- 2009, May 27 – Space Investment Summit 6 – Kissimmee, FL (Speaker)
- 2008, Oct 2-3 – State of Space Based Solar Power Technology Conference – Lake Buena Vista, FL
- 2008, July 26-28 – International Space Settlement Design Competition Finals – Houston, TX (Team mentor)
- 2008, Apr 11 – Spring Space Forum – Purdue University, West Lafayette, IN (Speaker)

- 2007 – NASA’s Next Generation Exploration Conference 2 – NASA Ames Research Center, Mountain View, California.
- 2007 – Florida Association of Science Supervisors & Teachers, Meeting and Conference – Orlando, FL (Speaker)
- 2007 – International Astronautical Congress – Hyderabad, India
- 2007, Sept 24-28 – Space Generation Congress - Hyderabad, India (Speaker)
- 2007, Sept 14-16 – Wired NextFest – Los Angeles, California
- 2007, April 16-17 – Space Investment Summit 2 (SIS2) – New York City, NY
- 2007 – 26<sup>th</sup> International Space Development Conference (ISDC) – Dallas, Texas (Speaker)
- 2006 – AIAA Space 2006 Conference – San Jose, California
- 2006, Oct 2-6 – International Astronautical Congress – Valencia, Spain
- 2006 Sept 30-Oct 1 – Space Generation Congress - Valencia, Spain
- 2006, Aug 3-6 – 9<sup>th</sup> International Mars Society Convention – Washington, DC (Speaker)
- 2006 – 25<sup>th</sup> International Space Development Conference (ISDC) – Los Angeles, California (Speaker)
- 2006, July 30-Aug3 – Siggraph 2006 Conference – Boston, Massachusetts
- 2006, June 6 – Planetary & Terrestrial Mining Science Symposium (PTMSS) – Sudbury, Ontario, Canada (Speaker)
- 2006, Mar 5-8 – ASCE Earth & Space 2006 Conference – League City, Texas (Speaker)
- 2006 – Arisia Science Fiction Convention – Boston, Massachusetts (Speaker)
- 2005 – Space Frontier Foundation Conference (SFC 14) – Los Angeles, California (Speaker)
- 2005, Oct 17-21 – International Astronautical Congress – Fukuoka, Japan
- 2005, Oct 14-16 – Space Generation Congress – Fukuoka, Japan
- 2005, Aug 11-14 – 8<sup>th</sup> International Mars Society Convention – Boulder, Colorado (Speaker)
- 2005, May 19-22 – 24<sup>th</sup> International Space Development Conference (ISDC) – Washington, DC (Speaker)
- 2004, Nov 11-14 – SpaceVision2004 Conference – Cambridge, Massachusetts
- 2004, Aug 19-22 – 7<sup>th</sup> International Mars Society Convention – Chicago, Illinois
- 2004 – MIT Mars Week Conference – Cambridge, Massachusetts
- 2002, Oct 4-6 – MIT Mars Week Conference – Cambridge, Massachusetts
- 2002 – Apr 19-21 – FIRST Robotics Competition National Championship – Orlando, Florida (with Team #204)
- 2001 - FIRST Robotics Competition National Championship – Orlando, Florida (with Team #204)
- 2000, Oct 20-22 – MIT Mars Week Conference – Cambridge, Massachusetts
- 2000, Apr 6-8 – FIRST Robotics Competition National Championship – Orlando, Florida (with Team #204)
- 1999 - FIRST Robotics Competition National Championship – Orlando, Florida (with Team #204)
- 1999, June 5-6 – NASA Jet Propulsion Laboratory Open House – Pasadena, California
- 1998 – FIRST Robotics Competition National Championship – Orlando, Florida (as captain of Team #204)
- 1997 – American Legion New Jersey Boys State
- 1991 – US Space Camp – Huntsville, Alabama