Ralph Ewig, PhD

launch vehicle development • space systems engineering • engineering management

ralph@holderaerospace.com
www.linkedin.com/in/ralphewig
Office : (888) 705-4477
Mobile: (425) 761-8969

EDUCATION

Aeronautical & Astronautical Engineering, University of Washington

Bachelor of Science	08/95
Master of Science	12/97
Doctor of Philosophy	12/06

EXPERIENCE

Holder Aerospace: Partner / Chief Engineer — *01/'05 - present*

Partner / Consultant one of three equal partners focusing on technical engineering project / proposal support. Worked with a wide variety of clients (NASA, DOD, DOE, and commercial).

Chief Engineer lead for all in-house engineering development projects / proposals including launch vehicle design, propulsion technology, energy storage, and thermal protection systems. Responsible for engineering testing and data analysis, including full scale liquid rocket engine development program, and full-scale crew capsule landing test program.

AirLaunch LLC: Senior Engineer — *01/'06 – 10/'08*

Senior Engineer / Project Manager for large launch vehicle development contract under proprietary customer, managing a team of 12 companies including Northrop Grumman, ULA/Lockheed Martin, and Raytheon.

Senior Engineer / Performance Analyst for QuickReach small launch vehicle development. Responsible for vehicle performance budgeting, analysis, and development. Vehicle design & analysis for new concepts / proposal work.

Senior Engineer / Propulsion Analyst for self-pressurized (VaPak) propulsion system, responsible for feed system / engine / tank integration, full-scale system test definition / implementation and test-data reduction on 30,000 lbf class liquid bi-prop rocket engine.

Andrews Space: Project Manager / Principal Investigator — *06/'03 - 01/'05*

Project Manager / Chief Architect for exploration architecture and technology development contract under NASA Concept Exploration & Refinement (CE&R) Program; creator of the Versatile Integrated Space Transportation Architecture (VISTA).

Project Manager / Principal Investigator for Mini-MagOrion program, investigating small-scale pulsed nuclear propulsion using electrodynamic compression of solid materials (in partnership with Sandia National Laboratories, funded by NASA / DOE). Hardware experiments performed at SNL Z-Pinch and Saturn machines.

Project Manager / Principal Investigator of IRAD study on a water launched, HTHL TSTO RLV; using rocket powered horizontal water take-off and wing-in-ground-effect aerodynamics for return flight.

Project Manager / Systems Engineer for Future Space Transportation Study (FSTS-1, NRA8-27), investigating non-aerospace industries in future commercial space markets. Developed customer requirements framework and derived system requirements.

Andrews Space: Space Systems Engineer — *10/'00 -05/'03*

Systems Engineer / Software Developer lead development and implementation of company wide system engineering processes and tools. Responsible for procurement, development, and integration. Created web-based Document Management System tool (PHP,MySQL).

Aerodynamics Analyst lead CFD tool procurement (NASCART-GT, APAS, CFD++); developed GUI parallelization for NASCART-GT, executed analyses of launch / reentry vehicles.

Performance Analyst developed GUI for Optimal Trajectories by Implicit Simulation (OTIS) code; trajectory & performance analysis / optimization of vehicles for IRAD, NASA SLI 2nd Gen RLV (with Northrop Grumman), Beal Aerospace, DARPA RASCAL, and NASA NGLT.

Space Power Analyst designed power subsystem on the Commercial Science and Logistics Vehicle (CSLV) under NASA Marshall Alternate Access to Station (AAS) contract.

Propulsion Analyst created analysis model for nuclear thermal interplanetary transportation; partnered with SAIC under NASA's Integrated Technology Assessment Contract (ITAC).

Safety / Reliability Analyst performed launch vehicle S/R analysis, participated in AIAA/FAA working group on RLV safety; contributor to Working Group AIAA publication of "Guidelines to the Identification of Safety Critical RLV Items".

UW Department of Aeronautics & Astronautics: Student Projects *01/'95 -10/'00*

Project Manager / System Engineer for AFRL funded UW nano-satellite project scheduled for Shuttle launch in 2002. Responsible for systems integration, requirements management, project schedule and management.

Web Developer designed, coded, and maintained departmental web-site.

Teaching Assistant for undergraduate space system design class (nanosat design focus), and orbital mechanics class; taught several lectures on Systems Engineering.

Project Lead for student team project to design evolved version of the Kistler Aerospace K1 RLV (K2X); team was awarded first place in international competition.

Research Assistant for the development / construction and operation of the Helicity Injected Tokamak II (HIT-II) Experiment; designed and machined power electronics assemblies.

Student Participant in group project to develop robotic Mars sample return mission *Project Ares Acquire*, incorporating ISRU; presentations / design-reviews at NASA JPL and KSC.

UW Office of Development: Manager *09/'92 - 08/'95*

Manager of automated call-center (Student Telepledge Program), responsible for system efficiency, hiring, training, supervising nightly calling operations.

COMPUTING

Operating Systems	MS-Windows, Apple MacOS, Linux, Unix, VAX
Office Productivity	MS Office, Open Office, MS Project, OpenProj(ect)
Programming	FORTRAN, BASIC, ADA, HTML, C/C++, JavaScript, PHP, SQL, Python
Infrastructure	Network / Web / Database Administration
Mathematics	Matlab, Scilab, Maple V, Mathematica, IDL
CAD/Visualization	AutoCAD, SolidWorks, 3dStudio, Blender, Photoshop, GIMP, SketchUp
Aerospace Tools	STK, SOAP, OTIS, POST, APAS, DATCOM, CFD++, NASCART-GT, TDK, CET, Tecplot, FieldView, Cradle

ACHIEVEMENTS

NASA "Turning Goals into Reality" Award *09/'04*

For outstanding contributions to the NGLT Systems Analysis Project Team and exceptional progress toward Mission Risk Analysis.

AIAA Pacific Northwest Region Graduate Student Achievement Award *06/'00*

For outstanding contributions and leadership at the University of Washington in the area of space systems engineering.

NASA Breakthrough Propulsion Physics Workshop *08/'97*

Invitation only workshop at NASA Lewis for physicists, researchers and select innovators to assess prospects of emerging physics that may lead to space propulsion breakthroughs.

Machine Shop Certification, University of Washington *04/'96*

Certification for 100+ hours of experience in machine shop operation.

Reichel Memorial Award, Department of Aeronautics and Astronautics *05/'95*

Awarded for academic excellence / demonstrated leadership.

I. Hanan Scholarship, UW Office of Student Affairs *09/'93 & 02/'95*

Awarded for outstanding academic achievements.

Dean's List Student *09/'92 & 03/'95*

Awarded for academic achievement.

1st place, Spirit Week Essay Contest, University of Washington *05/92*

Awarded for a science fiction short story on the theme of freedom.

Certificate of Appreciation, Department of Defense (DOD) *06/'91*

Awarded for volunteer community services.

LANGUAGES

German	native, college level proficiency
English	native, college level proficiency
Japanese	1st year - college level classes

PUBLICATIONS

	Open Space Architecture and Online Collaboration Environment AIAA Space 2009 Conference & Exposition, 14-17 September 2009, Pasadena CA Paper introducing the Open-Aerospae.Org website and non-profit organization.	*09/'09*
Holder Aerospace	**Water Horizontal Take-off and Landing (HTHL) Reusable Launch Vehicle (RLV) Concept** Holder Aerospace white paper developing the concept of an HTHL rocket-powered reusable booster for a TSTO RLV.	*08/'09*
Holder Aerospace	**Platelet based Active Thermal Protection System (ATPS)** Holder Aerospace white paper developing the use of platelet manufacturing for the construction of low-cost, metallic, transpiration cooled Thermal Protection Systems (TPS).	*05/`09*
Holder Aerospace	**Vapor Pressurization (VaPak) Systems: History, Concepts, and Applications** Holder Aerospace white paper providing an introduction to vapor-pressurized propulsion systems and their potential applications in launch vehicle and in-space propulsion design.	*04/'09*
Holder Aerospace	**Active Control of Vapor Pressurization (VaPak) Systems** Holder Aerospace white paper on the topic of controlling bi-propellant VaPak systems for improved stability and performance in launch vehicle and in-space applications.	*03/'09*
Holder Aerospace	**Reverse Technology Transfer; a Case Study: Use of Automotive OF sensors in Rocket Applications** Holder Aerospace white paper on leveraging technology developed for other industries in aerospace applications. Uses the case study of using automotive OF sensors for rocket applications.	*03/'09*
AIAA Space 2008	**Testing and Analysis of the AirLaunch QuickReach Stage 2 Engine** AIAA conference paper summarizing the test program and findings of the AirLaunch QuickReach Stage LOX/Propane engine test program.	*07/'08*
SSC08-IX-5	**Results of QuickReach Small Launch Vehicle Propulsion Testing and Next Steps to Demonstration Flights** 22nd Annual Conference on Small Satellites, Logan Utah – paper on development testing of the QuickReach propulsion system and performance analysis.	*07/'08*
JANNAF-2007	**Performance Modeling and Validation of Vapor Pressurization (VaPak) Based Propulsion Systems** Joint Army Navy NASA Air Force (JANNAF) Interagency Propulsion Committee presentation / paper, detailing the VaPak technology development and testing activities at AirLaunch.	*05/'07*
TL507 Th56641	**Identification of a physically idealized human rated rocket based interplanetary transportation system (PhD Dissertation)** PhD Dissertation at the University of Washington (Seattle).	*12/'06*
	Using Physical Idealization to remove Technology Bias from Conceptual Trade Studies Summary paper of the method of physical idealization and its application to identifying a human capable interplanetary transportation system.	*10/'06*
AIAA-2006-7257	**Performance Modeling of Launch Vehicles utilizing Vapor Pressurization (VaPak) based Propulsion Systems** AIAA Space 2006 conference paper on analysis activities in conjunction with work on the AirLaunch QuickReach launch vehicle development program.	*09/'06*
IDCF-CSER-150	**Low Cost Distributed Computing Framework for Large Option Space Trade Studies** Conference paper at the INCOSE sponsored Conference on Systems Engineering Research (CSER) summarizing the computational setup developed to support the authors dissertation work.	*10/'06*
	Polynomial Initial Guess Algorithm for Trajectory Solvers / Optimizers Paper describing the use of a novel, polynomial based, initial guess generator for trajectory optimization programs.	*08/'06*
AIAA Publication	**Guide to the Identification of Safety-Critical Hardware Items for Reusable Launch Vehicle (RLV) Developers** Editor Craig Day (AIAA Standards Program Manager) This document provides guidelines for the identification of potentially safety-critical hardware items in RLV designs. Possible risk-mitigating design strategies that may be incorporated into designs are also included.	*05/'05*
NASA Report	**Versatile Integrated Space Transportation Architecture (VISTA)** NASA technical report on the Versatile Integrated Space Transportation Architecture developed at Andrews Space for the NASA Concept Exploration and Refinement (CEnR) program.	*02/'05*

AIAA-2004-3907	**Optimization of ETO launch systems for airplane-like safety and reliability** Together with Andrews,D. et all. 40th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit; Fort Lauderdale, FL; July 2004.	*07/'04*
AIAA-2003-4525	**Mini-MagOrion: A Pulsed Fission Rocket for Crewed Solar System Exploration** Together with Andrews,D. et all, 11th International Conference on Emerging Nuclear Systems (ICENES) 2002, Albuquerque, NM.	*07/'03*
NASA Report	**Mini-MagOrion Program Document: Final Report** Final report of the Mini-MagOrion pulsed nuclear fission propulsion concept study and experiment conducted by Andrews Space for NASA Marshall Space Flight Center.	*01/'03*
NASA-ASPW	**Mini-MagOrion: Micro Fission Powered Orion Rocket** Together with Andrews, D., NASA JPL Advanced Space Propulsion Workshop, 2002, CA.	*07/'02*
NASA Publication	**Future Space Transportation Study-1 (Final Report)** Final Report of the Andrews Space & Technology Future Space Transportation Study, investigating future commercial space opportunities for non-aerospace companies (available at www.andrews-space.com).	*01/'01*
AIAA-2000-3827	**The K2X: Design of a 2nd Generation Reusable Launch Vehicle** Together with Sandhu,J., Shell,C.A., Schneider,M.A., Bloom,J.B., Ohno,S., 36th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Huntsville, Alabama, 17-19 July 2000.	*10/'99*
SSC9-111-4	**UW Dawgstar: One Third of ION-F** With Prof. Mark Campbell et all, 13th AIAA/USU conference on small satellites.	*7/'99*
Fusion Technology Journal, Vl.35, Pt.1	**Simulation of a Non-Ideal Saddle Coil on Toroidally Symmetric Magnetic Confinement Experiments** Simulation of magnetic confinement experiments under the UW / Princeton Plasma Physics Laboratory Coaxial Helicity Injection (CHI) collaboration.	*5/'99*
APS, DPP98, Q7Q.05	**Time Varying Magnetic Flux Simulations of the NSTX and HIT-II Experiments** APS conference poster presenting the results of magnetic flux simulations of CHI driven plasmas in the HIT-II and NSTX fusion experiments.	*11/'98*
APS, DPP98, Q7Q.43	**Diagnostics for the HIT--II Experiment** APS conference poster session describing design and results of diagnostic devices implemented on the HIT plasma confinement experiment at the UW.	*11/'98*
APS, DPP98, Q7Q.40	**The Helicity Injected Torus--II Experiment** APS Conference poster session presenting recent results of experiments of the HIT plasma confinement experiment at the UW.	*11/'98*
10.1109/PLASMA.1998.677904	**Results from the HIT-II coaxial helicity injection spherical tokamak** Together with Nelson, B.A.; Jarboe, T.R.; Hoffman, C.S.; Holcomb, C.T.; McCollam, K.J.; Shumlak, U.; Plasma Science, 1998. 25th Anniversary. IEEE Conference.	*06/'98*
TL507 Th46500	**Magnetic diagnostic devices on the Helicity injected Tokamak II experiment** Master Thesis at University of Washington (Seattle).	*12/'97*
10.1109/PLASMA.1997.605167	**Results from the HIT-II coaxial helicity injection spherical tokamak** Together with Nelson, B.A.; Jarboe, T.R.; Hoffman, C.; Martin, A.K.; McCollam, K.; Orvis, D.J.; Shumlak, U.; Udrea, B.;1997 IEEE International Conference on Plasma Science.	*05/97*
Seattle Times 10/29/96, p. A10	**Seattle Times, "Footprints on Mars?"** Article on Mars exploration by Diedtra Henderson (Seattle Times), Graphics / CAD illustrations by Ralph Ewig (University of Washington).	*10/29/96*

WEBSITES

http://ralph.open-aerospace.org
http://www.linkedin.com/in/ralphewig