

Leslie Wickman, Ph.D.

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Highlights of

- Excellent technical, communications, & interpersonal skills.

Qualifications:

- Extensive international/intercultural teaching & training experience.
- Strong experimental & analytical R&D background.
- Proven success in multiple disciplines.
- Trained EVA/IVA astronaut, pilot, athlete, minister & musician.

Education

Doctor of Philosophy, Human Factors & Biomechanics, Stanford University.

Master of Science, Aeronautical/Astronautical Engineering, Stanford University.

Bachelor of Arts, Political Science, Willamette University; concentration in international relations, math & science;

Graduated magna cum laude.

Professional Experience:

Azusa Pacific University (APU), College of Liberal Arts & Sciences

Director, Center for Research in Science (CRIS), July 2000 to present

Faculty member, January 1999 to present (Full Professor as of April 2008)

Promote & support faculty & student research, science education, & the dialog between science & theology. Integrate scientific research into the educational process. Pursue & enable development of on-campus research programs. Perform research in life & space sciences. Provide research services, such as literature searches, links to funding sources, grant-writing, & technical consultation. Develop physical & life science course materials & teach math & science courses to undergraduate students. Prepare & present demonstrations of physical phenomena. Evaluate student performance. Provide academic & career counseling & mentoring.

Wickman Enterprises

Consultant, April 1996 to present

Human factors, biomechanics, & systems engineering research & analysis for aerospace, entertainment, & forestry industries. Recent projects include pilot training analyses, simulation software development, spacesuit design development & evaluation, spaceflight training curriculum development, extreme environmentally controlled life support systems research, reduced-gravity energetics studies, crew cabin design layouts & anthropometric analyses. VP of Engineering for aerospace start-up. Technical writing for NASA & Air Force projects.

The Aerospace Corporation

Sr. Engineering Specialist, January 2008 to present

Analyze technical, cost, schedule & risk aspects of military & civil space projects. Evaluate impacts of various climate change parameters on national security issues as PI on IRAD project. Perform rocket trajectory & sensor look angle calculations. Assess technology readiness levels, costs & risks for projected space missions. Participate in review of NASA's Constellation Program for the Augustine Congressional Commission.

The RAND Corporation

Research Scientist, February 1999 to December 2007

Evaluate Air Force C3I objectives & examine resource allocations for cost-effectivity. Develop decision-making methodology to identify candidate activities for commercialization. Using Satellite Tool Kit & other analytical methods, investigate satellite launch & orbital operations for potential ground or in-situ intervention opportunities to mitigate anomalies & failures. Analyze post-Cold War security threats & determine new intelligence-gathering schemes & priorities. Compare robotic, biological, & biotechnology capabilities for military operations. Model USAF fighter pilot skill requirements versus training activities & resources to enhance pilot proficiency levels as well as flight training program efficiency & cost-effectiveness.

WET Labs, division of WET Enterprises, Universal City, CA
Chief Research Scientist/Director of Technology Development,
April 1996 to September 1998

Responsible for directing R&D & Product Design Departments. Introduce innovative applications of new technologies for use in high technology hydrodynamic systems. Develop fluid dynamics & particle system computer models for use as design, analytical, & programming tools. Emulate & analyze various dynamic water effects. Develop state-of-the-art electro-mechanical control & remote monitoring systems. Incorporate new manufacturing technologies. Identify & resolve systemic problems. Manage product development work, from research through test phases. Direct value-engineering efforts. Schedule, budget, & track priorities & milestones. Recruit engineering & scientific talent. Support project technology requirements & troubleshoot technical challenges. Study materials properties & chemical reactions; formulate engineering solutions to associated problems. Investigate water chemistry & treatment issues. Instrumental in development & programming of the *Fountains of Bellagio* in Las Vegas, Nevada.

Lockheed Martin Missiles & Space, Sunnyvale, CA
Senior Staff Engineer/Engineering Manager, October 1990 to April 1996

International Space Station (ISS) Program

Support programs as Lockheed Corporate Astronaut. Responsible for technical management, crew & systems engineering. Perform requirements management, design, analysis, test, & verification of space systems & support equipment. Direct hardware design efforts for extravehicular activity (EVA) compatibility. Evaluate feasibility & efficiency of proposed tasks & procedures. Perform fault tolerance/maintainability analyses. Conduct simulations & analyses of orbital EVA scenarios to ensure operability, safety, & optimization of human-machine interfaces. Develop new EVA technologies. Train simulation personnel. Develop working relationships with international participants in ISS Program.

Senior Crew Systems Engineer/Engineering Specialist, August 1983 to May 1989

ISS & Hubble Space Telescope (HST) Programs

Crew trainer for HST deployment & repair activities. EVA test crewmember for Lockheed, McDonnell-Douglas & Air Force neutral buoyancy & one-g simulations. Astronaut interface engineer for HST program. Evaluate flight hardware designs for on-orbit maintainability. Developed procedures & timelines for crew operations. Participate in crew tools/aids development process. Responsible engineer for new-generation EVA astronaut portable foot restraint. Contribute to the development of EVA helmet-mounted display. Perform orbital mechanics calculations for on-orbit visual capabilities & satellite repair opportunities. Identify potential satellite servicing missions. Participate in design & mockup development of ISS crew quarters. Spokesperson for space project media events.

Stanford University, Stanford, CA
NASA Ames Research Center, Moffett Field, CA
Research Assistant, May 1989 to August 1994

Dissertation Topic: The Influence of Reduced Gravity on Human Load-Carrying Capability & Preferred Load Placement. Investigate reduced gravity human load-carrying biomechanics, energetics, & design issues; performed human life sciences experiments in the Neutral Buoyancy Test Facility at NASA ARC, & aboard the KC-135 Research Aircraft out of Ellington Field, TX; develop prediction models, operations scenarios, & spacesuit design recommendations. Analyze spacesuit & EVA equipment design problems to enhance EVA operations in zero-gravity & planetary environments. Perform research on the physiological effects of extended weightlessness, with special attention to bone demineralization. Conduct analysis of the effects of implementing progressive levels of automation into orbital operations on the characteristics of work in space. Participate in design of smart end-effector for NASA's Flight Telerobotic Servicer.

SRI International, Foreign Technology Center, Menlo Park, CA
Research Assistant, September 1981 to December 1982

Research the development of tactical & strategic foreign defense technologies. Investigate the role of various academic & governmental institutions, as well as significant individuals, in important technological achievements.

Honors & Awards

Aerospace Medical Association (AsMA) presentation award, 1995; named AsMA Associate Fellow, 2010.
Aerospace Corporation Internal Research & Development grant awards, 2008, 2009, 2010.
Aerospace Corporation Team Award for Review of US Human Space Flight Plans Committee, 2009.
Alpha Kappa Nu Honor Society, election to membership, 1980.
Alpha Lambda Delta Honor Society recognition, 1980.
American Association of University Women's Award, 1980.
Astronauts 4 Hire (A4H) Senior Technical Advisory Board Member, 2011.
Azusa Pacific University Transformational Scholarship Champion Award, 2004.
Board of Fellows, Azusa Pacific University Center for Research in Science (CRIS), 1999.
California Quake Football Team Spirit Award, 2003.
California Quake Football Team Head Coach's & Spirit Awards, 2004.
California Quake Women's Professional Football World Championship, 2002.
California Space Grant awards for Aerospace Workforce Development, 2008-2011.
Christian Scholars Foundation Grants, 2003-2006.
Co-host for CRIS Space & Time Workshop, 1999.
Coach & Athlete Magazine Prep Track & Field "Athlete of the Year" Award, 1976.
Designated as Lockheed Corporate Astronaut, 1988.
Faculty Research Council Grant, 2004.
Fulbright Senior Specialist Candidate, 2007-2012.
Jet Propulsion Laboratory Mars Science Lander Review Panel, 2004.
Local Societies Initiative Metanexus Grant, 2006, 2007, 2008.
Lockheed Director's & Manager's Commendations for Space Station Program, 1986.
Mark O. Hatfield Prize in Political Science, 1980.
Mars Desert Research Station Crew Biologist, 2006.
McDonnell Douglas Commendation for Space Station EVA Simulations, 1986.
NASA-ARC Joint Research Grant with Stanford University, 1990-94.
NASA & Lockheed Commendations for Hubble Space Telescope Program, 1990.
National Science Foundation Guest Lecturer at Whitworth College on "Life in Space", 2003.
Nominated to Technical Advisory Committee for the US Secretary of Defense, 1990.
Omicron Delta Kappa Honor Society induction, 1978.
Sigma Rho Phi Science & Theology Honor Society membership, 1999.
Seaside High School Hall of Fame inductee, 2003.
Society of Automotive Engineers' Arch T. Colwell Merit Award, 1997.
Stanford Honors Cooperative Graduate Program Scholarship, 1981-83; 1988-1990.
"Stanford on the Moon" Project Advisory Board Member.
Teaching Learning Technology Roundtable Grant, 2001.
US Volleyball Association Women's 30's Grass Doubles National Championship, 1994.
Willamette University Distinguished Alumni Award, 2000.
Willamette University Pentathlon All-Time Record Holder, 1980.
Women's Affiliated Football Conference All-Star Team, 2002.
Women's Conference of Independent Colleges All-Star Track & Field Team, 1980.
Who's Who in America, 2006, 2007, 2008, 2009, 2010, 2011.

Specialized Training

Extensive space simulation experience (300+ hours).
100+ hours of test time in Space Shuttle Extravehicular Mobility Unit (spacesuit).
FAA Private Pilot.
Ordained Minister, National Association of Christian Ministers.
Other: T-33 jet training, KC-135 reduced-gravity, High Altitude Physiology, Parachute, SCUBA, Water Safety, Forestry Operations, California Basic Educational Skills certificate, California Motorcycle Safety Course, CPR, First Aid, CAD, STK, office & statistics software, & more.

Selected Publications & Presentations - Aerospace Topics:

- "Feasibility of Space-Based Monitoring for Governance of Solar Radiation Management Activities,"* co-authored with P. Smith, I. Min, & S. Beck, presented/published for AIAA Space 2010 Conference, Anaheim, CA.
- "Future Space System Support to US Military Operations in an Ice-Free Arctic: Broadband Satellite Communications Considerations,"* co-authored with P. Smith & I. Min, presented/published for AIAA Space 2009 Conference, Pasadena, CA.
- "Activity-Based Habitable Volume Estimating for Human Spaceflight Vehicles,"* co-authored with G. Anderson, presented/published for 2009 IEEE Aerospace Conference, Big Sky, Montana.
- "Orion Crew Exploration Vehicle Reusability Parametric Study,"* co-authored with M. Lobbia, T. Radcliffe, D. Bucher, J. Aguilar & D. Judnick, for NASA. The Aerospace Corporation, El Segundo, CA, 2008.
- "Unmanned aerial vehicle (UAV) ground station study,"* co-authored with G. Buchan, M. Nixon, L. Stephenson, L. Sidor, R. Firpo, H. Iwata, A. Unell, & J. Arcos, for the Department of Defense. The Aerospace Corporation, Washington, D.C., 2008.
- "Isolation & Confinement Issues in Long Duration Spaceflight,"* paper co-authored with A. Tsai & R. Walters, presented/published for 2008 IEEE Aerospace Conference, Big Sky, Montana.
- "Eight Days in Inner Space: My Experience at the Moon Desert Research Station,"* paper presented/published for 2007 IEEE Aerospace Conference, Big Sky, Montana.
- "Absorbing & Developing Qualified Fighter Pilots: The Role of the Advanced Simulator,"* RAND research report number MG-597, co-authored with R. Marken, W. Taylor, J. Ausink, L. Hanser, & C. Anderegg for USAF, 2007.
- "Inside NASA: A Female Engineer's Perspective on Humans in Space,"* presented at LA County Forum of Legal Secretaries & Whittier Chapter of AAUW, Whittier, CA, 2007.
- "Human Performance Considerations for a Mars Mission,"* paper presented/published for 2006 IEEE Aerospace Conference, Big Sky, Montana.
- "An Activity-Based Methodology & Tool for Determining Required Habitable Volume for Spacecraft,"* co-authored with G. Anderson, poster presented/published for Habitation 2006 Conference, Orlando, FL.
- "Lunar Life Support System Study: Metabolic Energy & Water Considerations,"* co-authored with B. Nota & S. Keates, paper presented/published for AIAA Space 2004 Conference, San Diego, CA.
- "Mars: Mission Possible?"* article published in APU Life Magazine, Summer 2004.
- "Absorbing Air Force Fighter Pilots: Parameters, Problems, & Policy Options,"* RAND research report number MR-1550-AF, co-authored with W. Taylor, J. Bigelow, C. Moore, B. Thomas, & R. Marken for USAF, 2002.
- "Crew Volume Estimating,"* Lockheed-Paragon research report number 092600-002NC, co-authored with G. Anderson for NASA, 2000.
- "Intervention & Correction of Launch Anomalies,"* RAND research briefing for USAF, 2000.
- "Comparing Animal & Robot Capabilities for Military Missions,"* RAND research report co-authored with J. Brower, P. Bromley, & S. Resetar for DARPA, 1999.
- "Space Technology Transfer to Earth Health & Medical Applications,"* paper presented/published for 1996 *Space of Service to Humanity Symposium* at International Space University, Strasbourg, France.
- "Load-Carrying in Reduced Gravities: Operational Considerations,"* co-authored with B. Luna, paper presented/published for 1995 International Conference on Environmental Systems, San Diego, CA.
- "Locomotion while Load-Carrying in Reduced Gravities,"* co-authored with B. Luna, paper presented/published for 1995 Aerospace Medical Association Annual Scientific Meeting, Anaheim, CA.
- "The Influence of Reduced Gravity on Human Load-Carrying & Preferred Load Placement,"* dissertation submitted to Stanford University, 1994.
- "Zero-Gravity Induced Osteoporosis,"* paper presented/published for 1990 International Astronautical Federation (IAF) Congress, Dresden, Germany.
- "The Effects of Automation on Work in Space,"* paper presented/published for 1989 IAF Congress, Malaga, Spain; 1990 Society of Logistics Engineers Conference, Colorado Springs, CO; & 1990 Satellite Servicing Workshop, Sunnyvale, CA.
- "Hubble Space Telescope - Dawn of the Era of Serviceable Spacecraft,"* paper presented/published for 1986 IAF Congress, Innsbruck, Austria, & 1987 Space Commercialization Conference, Taipei, Taiwan.
- "Space-Based Servicing,"* paper presented/published for 1985 IAF Congress, Stockholm, Sweden.

Environmental Topics:

- "Water Reclamation for Remote Environments: An Ecologically Sound Approach,"* paper presented/published for 45th AIAA Aerospace Sciences Meeting, Reno, NV, & OC AIAA Aerospace Science & Technology Meeting, Santa Ana, CA, 2007.
- "Cultivating a Personal Environmental Ethic,"* presented at American Scientific Affiliation Conference, Baylor University, Waco, TX, & Oral Roberts University School of Engineering, Tulsa, OK, 2009.
- Organizer and co-chair, *Climate Change Briefing Day*, The Aerospace Corporation, El Segundo, CA, 21 July 2010.

Selected Publications & Presentations (continued) - Science & Theology Topics:

Book review (*Living at the Crossroads: An Introduction to Christian Worldview* by M.W. Goheen & C.G. Bartholomew), published in Religious Studies Review, 36 (3), 212-213, September, 2010.

"*Science & Faith: A Spectrum of Views on Origins*," presented at Glendora Community Church, Glendora, CA, & Ocean View Baptist Church, San Pedro, CA 2010.

"*Does God Exist?*" presented at Reasons to Believe *Cosmic Fingerprints* conference at St. Andrew's Mt. Pleasant Church in South Carolina, 2006, and Ocean View Baptist Church, San Pedro, CA, 2010.

"*What does it mean to be Human? Contemporary Issues in Bioethics & Science Policy*," panel moderator with Joni Eareckson Tada & Dr. Nigel Cameron, Common Day of Learning Conference, Azusa Pacific University, Azusa, CA, 2009.

"*Faith Integration in the Science Classroom*," presented at American Scientific Affiliation Conference, George Fox College, Newberg, OR, 2008.

"*Planet Earth: Lucky Accident or Anthropic Purpose?*" presented at Reasons to Believe *Cosmic Fingerprints* conferences at Kauai Community Church in Hawaii, 2005; St. Andrew's Mt. Pleasant Church in South Carolina, 2006; Ocean View Baptist Church, San Pedro, CA, 2007; California Baptist University, Riverside, CA, 2009; Southern California American Association of Physics Teachers conference at Azusa Pacific University, 2010.

"*The Scientific Method & Christian Apologetics*," co-authored with J. Eriksen & presented at Common Day of Learning 2004, APU.

"*Are We Alone in the Universe? What about UFOs & ETs?*" co-authored with H. Ross & presented at Common Day of Learning 2003, APU; Ocean View Baptist Church, San Pedro, CA, 2008.

Interviews

"40th Anniversary of Apollo Moon Landing Show," interviewed by Christy Pepper, with author Lee Strobel & astronaut Rick Husband, Moody Radio South, 7/31/09.

"Conversations with Masterful Women," interviewed by Portia Cohen, Manhattan Beach Women in Business, 4/17/10.

"The Astronaut Show," interviewed by Christopher Neiswonger, KKLA Radio, www.apologetics.com, 9/27/08.

"Philosophy of Science: How to Think About Science," interviewed by Lindsay Brooks, KKLA Radio, 7/10/10.

"Evangelicals Go Green – Will Conservative Candidates Follow Suit?" by C. Caron, ABCNews.com, 8/23/07.

"Wickman Takes on Sports & Space," by N. Chin, APU Clause newspaper, 2/23/07.

"APU Weighs in on the Pluto Debate," by L. Croft, APU Clause newspaper, 9/15/06.

"Why Mars?" Reasons to Believe Webcast, www.reasons.org, June 2004.

"Professor Researches Life Support Systems for Astronauts," by B. Ott, APU Clause newspaper, 2/27/04.

"Mission to Mars: Beyond Jet Lag," by T. Webster, San Gabriel Valley Tribune, 2/10/04.

"Women of Space: Cool Careers on the Final Frontier," by Laura Woodmansee, Apogee Books, 2003.

"Science Meets Faith at University," by L. Hight, Highlander San Gabriel Valley Newspapers, 1/23/03.

"Gender Equity in the Sciences," by B. Mallay, Willamette Scene magazine, Winter 2002.

"Renaissance Woman," by L. Carson, Azusa Pacific University Art Show, "Profiles," February 2002.

"A Focused Force for Faith," by T. Trost, Facts for Faith magazine, Quarter 1-2002, Issue 8.

"Hit woman: APU professor to knock heads in women's league," by G. Lacques, San Gabriel Trib., 10/26/01.

"New CRIS Director Named," APU Life staff writer, APU Life magazine, Fall 2000.

"Unlocking the Mystery of Mars," by M. Moisan, Willamette Scene magazine, Winter 1997.

Courses Taught

Astronomy, Department of Math & Physics, APU

Biosphere Science, AuSable Institute of Environmental Studies

Contemporary Mathematics, Department of Math & Physics, APU

Earth Science, Department of Math & Physics, APU

Extravehicular Activity Tutorial, Department of Life & Materials Sciences, ISU

History of Spaceflight, Department of Life & Materials Sciences, ISU

Human Factors in Design, Department of Life & Materials Sciences, ISU

Humans & Computation, School of Education & Behavioral Studies, APU

Humans & Scientific Inquiry, School of Education & Behavioral Studies, APU

Living & Working in Space, Department of Life & Materials Sciences, ISU

Physical Science, Department of Math & Physics, APU; Department of Math & Sciences, Marymount College

Science & Faith Seminar, Department of Biology & Chemistry, APU

Senior Seminar in Bioethics, Department of Biology & Chemistry, APU

Space Physiology, Department of Biology & Chemistry, APU

Spacesuit Technologies, Department of Life & Materials Sciences, ISU

Activities & Affiliations

Aerospace Medical Association (AsMA)
American Institute for Aeronautics & Astronautics (AIAA)
American Scientific Affiliation (ASA)
Athletes in Action Volleyball
AuSable Institute of Environmental Studies Faculty Member
Azusa Pacific University President's Circle Member
Azusa Pacific University Faith Integration Advisory Council & Faculty Mentor
Azusa Pacific University Executive Advisory Committee for Research
Azusa Pacific University Faculty Research Council Chairperson
Azusa Pacific University Administrative Search Committee
Azusa Pacific University Science Building Planning Committee
"APU Life" Magazine Advisory Committee
California Beach Volleyball Association AAA Rating
California Space Grant Affiliate Campus Director
Founder, Starry Nights Café, Los Angeles County
Founding Member & Advisory Council, Academy of Evangelical Scientists & Ethicists, 2005.
Founding Member & Chairperson, Science & Religion Association of Azusa, 2006.
Human Factors & Ergonomics Society (HFES)
International Space University Visiting Faculty
Los Angeles Adventurers Club "Night of High Adventure" Speaker
Mexico Inland Missions
National Association of Christian Ministers
Noah Alliance for the protection of endangered species & biological diversity
Science Consortium of California Christian Universities Executive Committee
Sigma Rho Phi Honor Society Faculty Advisor
Stanford University International Mars Mission Project
Vocalist, "Prepare the Way," Sunday Night Music, Brentwood Presbyterian Church
Western Science Education Consortium Curriculum Committee
Willamette University Alumni Admissions Counselor
Willamette University Letterwinners
Witness Ministry Team
Young Astronauts

Internships

Oregon State Legislative Committee on Trade & Economic Development

(January to May 1979)

Research potential for industries in Oregon to develop trade relations with the People's Republic of China.

United States Department of State, Office of Soviet Affairs

(September to December 1979)

Investigate visa requests for Soviet dignitaries; research Soviet defections; participate in international policy discussions.

Willamette University, Computer Center

(January to May 1980)

Assistant Operations Manager; help students with programming & operational problems.

Marin Covenant Church

(June 1980 to June 1981)

Youth Director; organize & lead youth activities, programs, & Bible studies.

San Marin High School

(January to June 1981)

Boys & Girls Assistant Track Coach, jump & hurdle events.

McClellan Logging & Construction

(June to September 1981)

Safety officer/engineering aide on forestry crew: survey sites, operate logging/construction machines, enforce OTJ safety.