Anthony Phillip Ewing

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Objective: Systems Engineer / Research and Development Engineer

Education:

- **Ph.D. Mechanical Engineering** - Vanderbilt University, TN.
- **M.S. Physics** – South Dakota School of Mines & Tech., SD.
- **B.S. Mathematics** – South Dakota School of Mines & Tech., SD.

Qualification Highlights:

- Formed own business: Ewing Research – consulting in the engineering & applied sciences.
- 3+ years systems engineering support of NASA solar sail propulsion program.
- 4+ years as Senior Research and Development Engineer leading engineering design team in developing custom-built magnetic imaging systems.
- Project manager for contracts with NASA, AFOSR, and NIH.
- 15+ years experience in applied physics/engineering research and development.

Professional Experience:

2004-present **Engineering Consultant –** Ewing Research, TN www.ewingresearch.com
2005-present **Engineer/Scientist** (part-time) – Qualis Corporation, AL www.qualis-corp.com

Profile: Provides engineering and science support in research, development, analysis, systems engineering and technical management.

- Liquid-propulsion performance analyses on Marshall Enriched Storable Oxidizer (MESO) using NASA Lewis Research Center's Chemical Equilibrium with Applications (CEA) program. Conducted launch-vehicle trade studies including mass estimation comparisons and performance optimization as a function of MESO mix ratio.
- Systems engineering support of NASA In-Space Propulsion Technologies solar sail program and as a member of the NASA Space Technology-9 study report core team supporting solar sail modeling, attitude control trade studies, validation requirements definition, and solar sail model and test measurement correspondence.

1998-2004 **Senior R&D Engineer -** Tristan Technologies, CA,

Profile: Tristan Technologies designs, develops, and manufactures electromagnetic sensing/imaging and cryogenic components and systems for applications including biomagnetics, geomagnetics, non-destructive inspection, medical imaging and laboratory research. www.tristantech.com

- Senior Engineer leading in the design, development, and fabrication of magnetic measurement systems utilizing superconducting quantum interference devices (SQUIDs).
- Extensive experience in cryogenic system development including thermal modeling, structural analysis, AutoCAD drawing, electrical design, testing and documentation procedures, and safety analysis.

1989-1998**: Post Doc/Graduate Researcher** - Vanderbilt University, TN.

Profile: The Living State Physics Group at Vanderbilt University specializes in the development of new instrumentation using high-resolution scanning superconducting magnetometers. www.vanderbilt.edu/lsp

- *AFOSR Grant Fellow* - Dissertation research focused on the application of SQUIDs to non-destructive evaluation of fatigue cracking in aircraft structures. Developed mathematical simulations and analyses using boundary integral equations, magnetic field calculations, probability of detection models, and statistical simulations. Conducted measurements to validate mathematical models.
- *NASA Space Grant Fellow* - Research in solar sail spacecraft design and trajectory analysis. Collaboration with Tennessee State University on development of educational software to learn about solar sails. Space engineering coursework at the University of Tennessee Space Institute involved satellite attitude control systems and sensor design.

***1984-1989*: Physics Dept. Faculty/Graduate Researcher** - S.D. School of Mines & Tech., SD

- Research in surface physics and instruction of undergraduate E&M lecture and laboratory.

***1982-1984*: Mathematician DP-1** - Naval Weapons Center, CA

- Mathematical simulation and analysis of missile designs.

Selected Works:

Recent Advances in Gossamer Spacecraft: Chapter 5 Solar Sail Propulsion Technology Development, G. Garbe, B. Wie, D. Murphy, **A.P. Ewing**, L. Lichodziejewksi, B. Derbes, B. Campbell, J. Wang, B. Taleghani, S. Canfield, J. Beard, Progress in Astronautics and Aeronautics Vol. 212. Edited by Christopher Jenkins. Published by AIAA (2006).

"Solar Sail Propulsion Sensitivity to Membrane Shape and Optical Properties Using the Solar Vectoring Evaluation Tool (SVET)", **A.P. Ewing**, 53rd JANAAF Propulsion Meeting, December 5-8, 2005.

"Solar Sail Models and Test Measurements Correspondence for Validation Requirements Definition", **A.P. Ewing**, C. Adams, 1st Solar Sail Technology and Applications Conference, September 28-29, 2004.

"A SQUID NDE Measurement Model using BEM", **A.P. Ewing**, T.A. Cruse, J.P. Wikswo, Jr., Review of Progress in QNDE, Vol. 17A, pgs. 1083-1090, ed. D.O. Thompson, D.E. Chimenti, Plenum Press 1998.

"Probability of Detection (POD) in SQUID NDE", **A.P. Ewing**, T.A. Cruse, J.P. Wikswo, Jr., Proceedings of The First Joint DoD/FAA/NASA Conference on Aging Aircraft, July 8-10, 1997 pgs. 817-833.

"The Apollo's Cup Race to the Moon – A Computer-Based Simulation System for Cooperative Learning Groups", C. Dickens, D. Hartmann, **A. Ewing**. 44th Congress of the International Astronautical Federation (IAF-93-P.1.350) October, 1993.

"Solar Sail Spacecraft Design using Dimensional Analysis", **A.P. Ewing**. 43rd Congress of the International Astronautical Federation – World Space Congress (IAA-92-0239) September 1992.

"Small Recoverable Satellites for In-Orbit Experimentation and Demonstration", **A.P. Ewing**, F. Shahrokhi, 41st Congress of the International Astronautical Federation (IAF-90-009) October, 1990.

Patent:

"High-Resolution Magnetoencephalography System and Method", D. Paulson, T. Starr, **A. Ewing**, Y. Okada; submitted July, 2003. Provisional patent 60/393,045.