Robert H. Frisbee, Ph.D.

Experience

1979 - Present **Propulsion Systems Engineer**
Jet Propulsion Laboratory, Pasadena, CA
Propulsion Systems Section

1981 - Present: Advanced Propulsion Technology Group. Tasks included:

- Task Manager of the Advanced Propulsion Concepts Study Activity (1982 - Present)
- Modeling and analysis of advanced propulsion concepts including:
  - Advanced chemical (atomic hydrogen, metastable helium)
  - Nuclear fission, fusion, and antimatter propulsion
  - Solar-electric and nuclear-electric propulsion (kW to MMW)
  - Beamed-energy (solar/laser/microwave thermal) propulsion
  - Beamed-momentum (solar/laser/microwave/plasma sail) propulsion
  - Advanced launch-assist catapult systems (chemical and EM "guns," MagLev)
  - Space station propulsion systems options
  - Extraterrestrial resource (Moon, Mars, asteroids, etc.) utilization for propellant production
- Propulsion representative for several mission studies:
  - Robotic Mars and comet sample returns
  - Robotic solar probes, outer planet orbiters, and interstellar precursors
  - Robotic interstellar flyby/rendezvous missions
  - Robotic Jupiter icy moon orbiter
  - Piloted Moon and Mars missions
- Coordinator/Technical Chair for Annual Advanced Space Propulsion Workshop
- Analyses of flow decay (nitrogen-tetroxide/stainless-steel corrosion product formation) in the Galileo and Mars Observer spacecraft bipropellant propulsion systems
- Technical contract manager/monitor for University, Industrial, and SBIR research contracts in advanced propulsion
- Advisor to the NASA Center for the Utilization of Local Planetary Resources at the University of Arizona
- Advisor to the NASA University Space Research Association Design Team at the University of Wisconsin (Madison)

1979 - 1981: Solid Propulsion Technology Group. Tasks included:

- Research on heat transfer in solid propellant insulation
- Propellant formulation (mixing and test-firing) for heat-sterilizable and coal-based solid propellants

1978 - 1979 **General Chemistry Lecturer**
California State Polytechnic University, San Luis Obispo, CA

1977 - 1978 **General Chemistry Lecturer (Part-Time)**
Oxnard Community College, Oxnard, CA

Education

1972 - 1978 University of California, Santa Barbara, CA

- Ph.D. in Physical Chemistry.
- Thesis: Gas-phase intermolecular vibrational energy transfer kinetics. Built and operated a CO infrared laser.
- Graduate Teaching Assistant.

1970 - 1972 California State University, Long Beach, CA

- M. S. in Physical Chemistry.
- Thesis: Thermodynamics of europium and ytterbium ammoniates.
- Graduate Teaching Assistant.

1968 - 1970 California State University, Long Beach, CA

- B. S. in Chemistry.
- Senior Project: Differential refractive index of aqueous nitromethane solutions.

Publications/Presentations

- Numerous JPL reports and AIAA/JANNAF/IECEC conference papers
- Three refereed journal articles, two NASA Tech Briefs
- "Popular" descriptions of advanced propulsion including two magazine articles, World Book Encyclopedia article, and web site, as well as technical advisor/consultant to other writers
- Instructor in the "Nuclear and Future Flight Propulsion" Professional Development Classes given at the AIAA Joint Propulsion Conference (1997 on)
- Public lectures at schools (high school and college/university level) and various clubs/organizations
- Appearances on several Cable TV (Discovery and Learning Channel, etc.) documentaries on advanced propulsion, space science, advanced physics, Star Trek, Science of Christmas (Thermodynamics of Cooking a Turkey), and Tech TV (Tethers)

Professional Societies

- American Institute of Aeronautics and Astronautics
- American Chemical Society
- Phi Kappa Phi