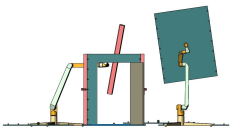
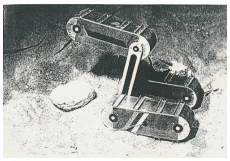
Statement of Research Interests

Prof. Dr. V. David Sánchez A., Ph.D., IEEE Fellow, AAAS Member
Ph.D.(CS), M.S.(ECE), M.S. (Telecom.Eng.), B.S.(Math), B.S. (Electronic Eng.)
Huntsville, AL 35801 • Phone (650) 630-2746, (256) 361-6244
Email: vdsanchez@hotmail.com • URL: http://ProfDrVDSAPhD.funpic.de/



dedicated to their eternal memories …



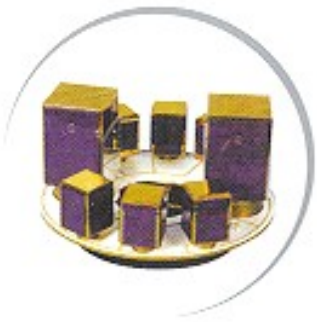
Based on previous world-leading research and development work on interplanetary missions, spacecraft, space robotics, intelligence and autonomy, real-time perception, understanding and building of computational brains, among others, focused research and development will be continued that provides further scientific accomplishments in the areas mentioned above and affine to deliver research and development results for terrestrial utilization and lead to space technology that allows faster goal achievement for the space exploration and human colonization programs.

As pointers to previous work, Figure 1 shows some of the main components of a design of a series of micro-missions to Mars and the spacecraft avionics common bus for different configurations, I was honored as NASA national award winner for this work with my consortium. Figure 2 shows some key components of the design and realization of an orbit infrastructural mission flown on-board of the Spaceshuttle Columbia / Spacelab including the demonstration of shared intelligence between humans and machines (teleoperators/astronauts, robotic brains) as well as full autonomous robotic operation to execute prototypical activities: build grid structures, open doors, recovery of lost tools, ... I supervised/led this historical spaceflight experiment with NASA-ESA-DLR cooperative participation.

Challenging areas of current and future interest include manned missions to the Moon and Mars, Figure 3, spacecraft to fly to Mars, Jupiter moons, Pluto, and beyond the solar system, Figure 4, and sophisticated unmanned exploration, e.g., of Mars and Jupiter moons, Figure 5. I was an integral part of the NASA team building the most advanced spacecraft ever, a precursor to the current NASA's JIMO mission.

More specifically, efficient and economic manned and unmanned space missions and space systems, associated computational schemes and architectures, mechanical structures, sensors and instrumentation, as well as robotic payloads for exploring (navigating, flying) and building (manipulating, constructing) infrastructure on other planets and moons will be researched, designed, and developed. A high level of collaboration is expected. World leading academic publication material I have compiled including my own contributions in recent book publications shown in Figure 6 and Figure 7.

Figure 1
NASA Mars Micromissions



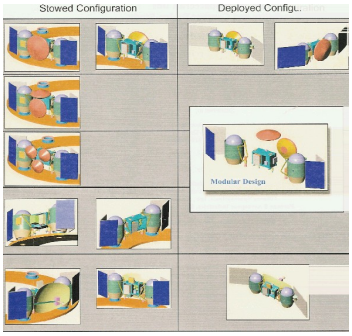
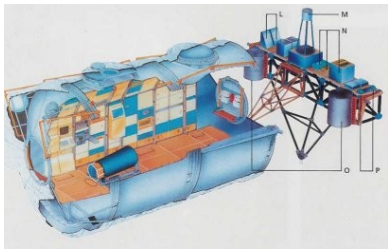
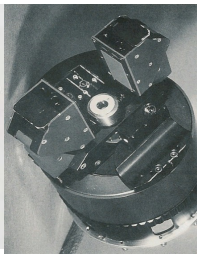
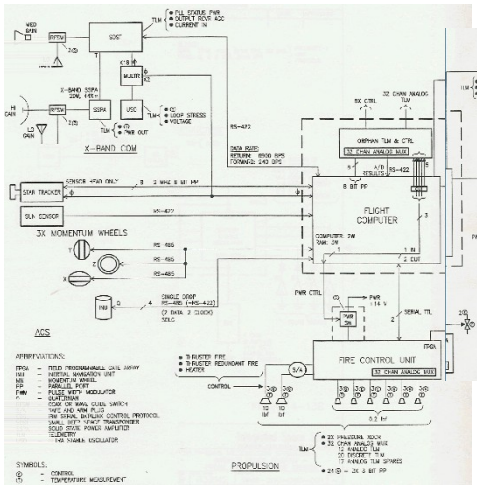
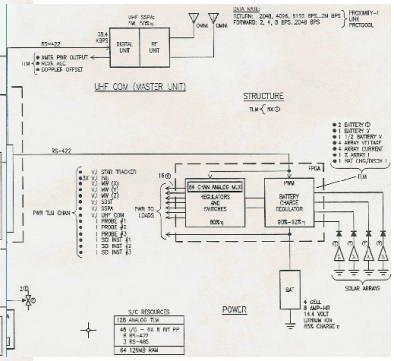


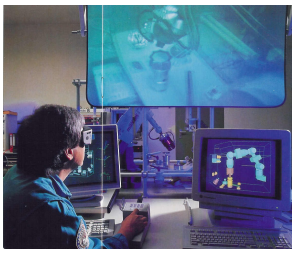
Figure 2
DLR Spaceshuttle Mission

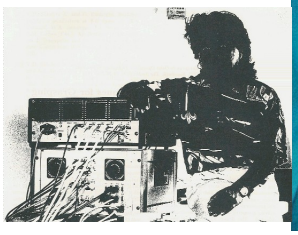












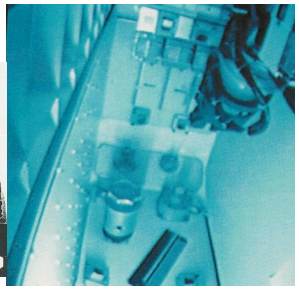
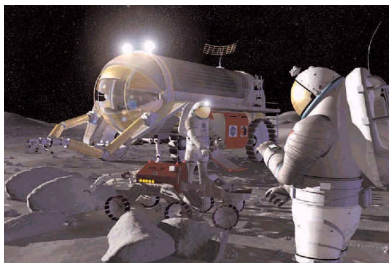


Figure 3
Manned Missions to the Moon & Mars



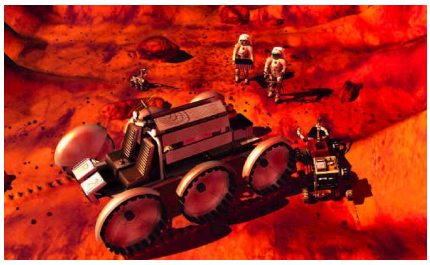
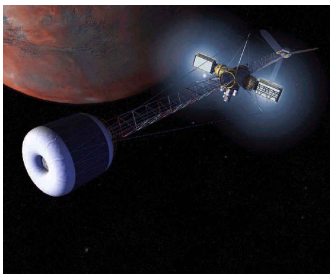


Figure 4
Spacecraft – Earth, Mars, Jupiter, & Beyond



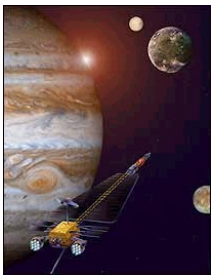


Figure 5
Unmanned Exploration

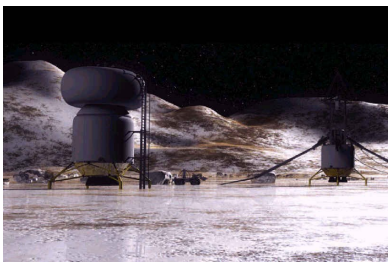


Figure 6
Book: ‘Advanced Unmanned, Manned, and Robotic Space Systems and Space Missions’

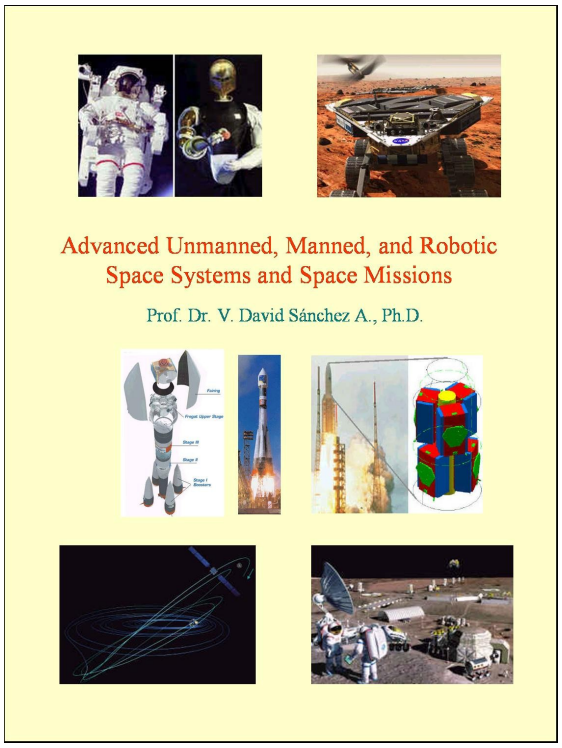


Figure 7
Book: ‘The Present and the Future of the Intelligent Machines’