

Preparing the Next Generation: Implementing Instructional Microscopy Technology Developed by NASA Kennedy Space Center

T.M. Schroeder*

*Education Programs Division, NASA, Mailstop: XA-D1, Kennedy Space Center, FL 32899

To Mars and beyond. A simplistic summation of NASA's strategic goals to be sure, but a catch phrase to simplify the challenge given to NASA two years ago by the President in the Vision for Space Exploration. NASA's director has stated: "The Vision commits our Nation to a new journey of exploration of the solar system, beginning with the return of humans to the Moon by the end of the next decade, and leading to subsequent landings on Mars and other destinations, such as near-Earth asteroids." In the words of our President, the fundamental goal of the directive is "to advance U.S. scientific, security, and economic interests through a robust space exploration program." Space exploration requires and resolves five critical problems – water, waste, propulsion, radiation, energy. It is that same technology which helps us back on earth. An essential component of reaching these strategic goals is education.

The Education department at NASA feeds directly into the overarching strategic goals by contributing to the scientific workforce in disciplines needed to achieve those goals. Inspire, Engage, Educate, Employ. Four simple words that guide our actions and programs within Education in support of our strategic goals. As an integral part of our evolving electronic world, a portion of NASA's approved learning materials are required to be delivered using technology-enabled learning systems. It is within this scope that Virtual Lab was funded. It was initiated out of a community defined need for access to expensive equipment which is inaccessible to the majority of the educational field. These high fidelity simulations of a suite of microscopes, developed by Beckman Institute for Advanced Science and Technology, brings extremely expensive hardware directly into the classroom. Distributed as open source software, and downloadable from the internet, it is easily accessible at no charge. Defined in XML code, it can be easily expanded by the developer community as well.

For these e-products to flourish beyond NASA funding, however, there is a need for partnerships with education and with the user/developer community. In support of this goal, NASA has initiated partnerships with universities, medical centers, and museums. Virtual Lab is being used to share rare specimens of a new species of echinoderm with scientists worldwide, it is being considered for use with a series of children's books, it is being considered for use by various non-profit education curriculum developers, and will be used for the study of the 3.5 billion year old Australian Pilbara structures by students worldwide through a Virtual Field Trip. The study of these ancient structures ties directly into the study for life on other planets, as they are also billions of years old. The use of Virtual Lab is virtually unlimited. Continued goals that must be considered are (1) increasing the library of electronic specimens (2) increasing the library of microscopes (3) increasing the exposure of Virtual Lab to the medical and educational user community. Accomplishment of these goals feeds directly back into our strategic goal: To Mars and beyond.



Fig. 1 - Artist's rendering of NASA's Crew Exploration Vehicle launching, docking at International Space Station, and on to Mars.

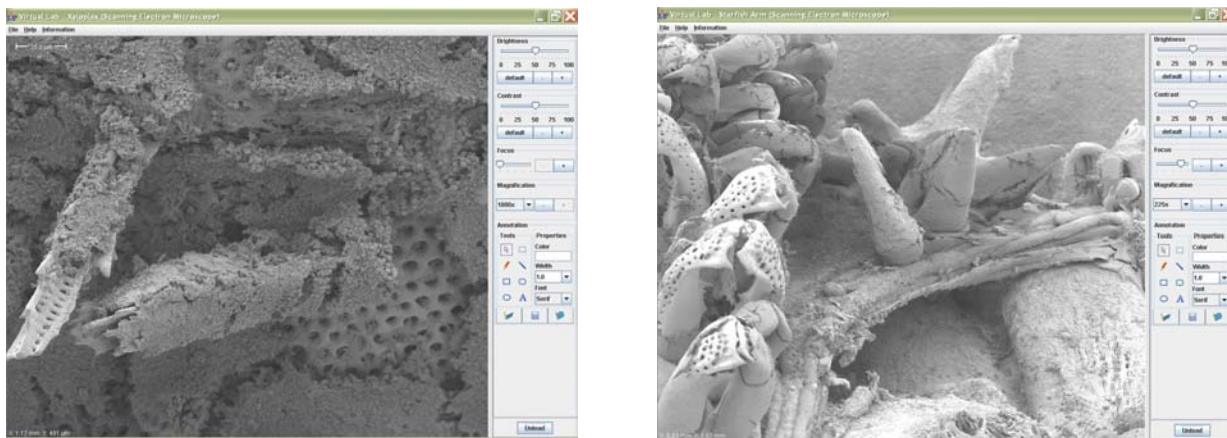


Fig. 2 - Rare xyloplax echinoderm specimen and potentially related starfish



Fig. 3 – Screen captures for the Virtual Field Trip to the ancient Australian Pilbara structures