A Statement in Support of the James Webb Space Telescope

This statement is written by the Scientific Organizing Committee of the "Frontier Science Opportunities with JWST" meeting, held at the Space Telescope Science Institute on June 6-8th, 2011.

The "Frontier Science Opportunities with *JWST*" meeting brought together nearly 200 astronomers from around the world, including many students and postdoctoral researchers. The goal of the meeting was to critically review the science potential of *JWST*, through a mix of invited and contributed talks and poster presentations.

The range of science presented at the Frontiers meeting provided dramatic illustrations of the unique role that *JWST* will play across the frontiers of astronomy, from studies of our Solar-System neighbors to probing the distant beginnings of time. The characteristics of the telescope, with unprecedented sensitivity, high resolution, and large fields of view will offer a new leap forward on the toughest questions that face us today. JWST will be sensitive enough to capture the light curves of the first cosmic explosions in the Universe, measure ages, abundances, and morphologies for the first galaxies, and explore dark energy research by characterizing departures from a flat Universe through measurements of the Hubble constant with ~1% accuracy.

JWST will also provide our strongest constraints to date on the theories of galaxy formation and evolution by studying the constituent components of galaxies with unprecedented clarity across the cosmic timeline. The multiple modes of operation, including near- and mid-infrared imaging and spectroscopy, will provide synergistic examinations of the interplay of gas, dust, stars, and dark matter in galaxies. JWST will also measure galactic structure, test density profiles, and disentangle contributions from active galactic nuclei and star formation.

In the Milky Way, JWST's high resolution at infrared wavelengths is optimally suited to complete the Galactic mass budget by uncovering and characterizing the lowest mass stellar and sub-stellar stars. The initial mass function of stars will be mapped across different environments, down to below the hydrogen-burning limit. One of the core science themes of JWST is to study nearby exoplanets and to search for the presence of chemical ingredients that are essential for life to exist. The Frontiers meeting highlighted that spectroscopy with JWST is sensitive enough to characterize water features in the atmospheres of "ocean" planets.

The science goals of JWST were given top priority in the 2000 Astronomy Decadal Survey and have become stronger since then. JWST is the cornerstone of the 2010 Astronomy Decadal Survey. The project has come a long way and the most important parts, such as the primary mirror array and the science instruments are nearing completion. We fully support the mission and encourage its complete funding. JWST will open a new window on the Universe and carry forward the amazing legacy of NASA's Great Observatories.

The Scientific Organizing Committee
Wendy Freedman (Chair), Alan Boss, Mark Dickinson, Dan Eisenstein, Therese Encrenaz, Lisa Kewley, Sara Seager, Alicia Soderberg, Xander Tielens, Christine Wilson