Attn.: Dr. John P. Holdren
Director - Office of Science and Technology Policy
The White House
1600 Pennsylvania Ave. NW
Washington, DC 20500

RE: The James Webb Space Telescope

Dear Dr. Holdren,

The James Webb Space Telescope (JWST) is in danger of cancellation. We are writing as members of the astronomical community to express our strongest support for JWST science.

JWST is planned as the next major space observatory because it will revolutionize fundamental astrophysics. Fifteen years after its selection, the science case is even stronger. No other facility, existing, planned, or in construction, will match JWST's capabilities. It will have 7 times the light grasp of Hubble, and 50 to 100 times the sensitivity of the Spitzer infrared space telescope. With sky background levels lower than any terrestrial observatory, JWST will outperform even future 30-meter class ground-based telescopes by orders of magnitude at near- and mid-infrared wavelengths.

Every ten years since 1960, the US astronomical community has collectively assessed its priorities for the coming decade. JWST was the highest priority recommendation of the 2000 Survey, *Astronomy and Astrophysics in the New Millenium*; and its observations will be essential to the Astro2010 themes, *Cosmic Dawn: Searching for the First Stars, Galaxies and Black Holes*, and *New Worlds: Finding and Preparing to Characterize Nearby Planets like Earth*.

JWST will provide breakthrough observations of the first stages of galaxy formation. In 20 years, Hubble has detected no more than a handful of galaxies at redshifts $z>8$. A single deep field on JWST will likely resolve 30-50 galaxies at $z=10$, when the universe was 500 million years old. JWST has the potential to reach redshifts $z\sim20$, pushing to within 200 Myrs of the Big Bang.

JWST will provide crucial insight into the complex processes of star and planet formation. Coronagraphic imaging of individual protostars at mid-infrared wavelengths will reach contrast ratios from 10^{-5} to 10^{-8} at separations from 1 to ~4 arcseconds, factors of 10 to 10,000 times better than even future 30-meter ground-based telescopes. As a result, JWST will resolve detailed structure in protoplanetary disks, and obtain spectra of jovian-mass gas giants around young stars within ~100 pc of the Sun.

JWST will be a unique asset for characterizing the atmospheric properties of transiting planets. Indeed, JWST offers the only foreseeable prospect of probing the atmospheres of earth-like planets. Hubble and Spitzer played a pioneering role, detecting

atomic and molecular species in a few systems. JWST will probe many more systems, expanding coverage to smaller planets around smaller stars.

Like Hubble, Chandra and Spitzer, JWST will be a general-purpose observatory, with broad and even transformative impact in almost every branch of astronomy. Its versatility will allow it to exploit emergent new scientific areas, whether in dark energy, cosmology, stellar, exoplanet or solar system research. Its extraordinary capabilities will ensure that US scientists remain at the forefront of astrophysical research in the coming decade.

Space-based astronomy is a key player in bringing science to the American public. Hubble, Chandra and Spitzer have transformed the way that we view the universe, and brought images of complex astrophysics phenomena into the daily lives of non-scientists. Like those observatories, JWST will not only inspire a new generation of students and scientists, but astound and excite the public at large.

Amherst, September 13th, 2011

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