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**“A MOONBASE OF OBSERVATORIES”  
A Robust Space Exploration and Enterprise Strategy,  
including Private and International Participation to implement the President’s  
Space Vision.**

In response to the President’s Space Exploration Initiative announcement of January 14, 2004 and to give substance and focus to the President’s explicit statement of January 14<sup>th</sup>, 2004 to NASA and the nation, High Frontier proposes to outline a robust strategy toward the establish a first sustained human presence in Space starting in 2015 and fully operational by 2020 to operate through 2030 and beyond.

Key to an assessment of the various options is a Baseline of realistic Exploration activities, including uses of the Moon as a Testbed for various Space Exploration technologies for sustained Human Missions to the Moon, Mars and beyond.

In addition to the many issues already identified by NASA are

- identification of one (or more) **unifying “themes” of science and human exploration missions** around which the various constituent interest groups can coalesce;
- answers to several **serious challenges to prolonged Human Space** flight – often assumed away or denied; and
- an early and realistic definition and assessment of **private sector participation** in the various technology areas.

One principal mission around which such agreement might be reached may be the deployment of a **CONDOMINIUM OF LARGE OBSERVATORIES**, for Astronomy, Earth and Sun Observations, including vast distributed aperture instruments and "on board" data processing, management, servicing, repairs and updating of facilities. Such initial observatories should include HUBBLE/CHANDRA/COMPTON CLASS FACILITIES by 2020 and LARGE DISTRIBUTED APERTURE SYSTEMS of 1 KM – 2020, 100 KM – 2025, 1,000 KM + 2030.

Adjoined with such a mission can be a variety of key technology areas in need for RDT&E for a sustained human Space exploration and Development such as:

- **A Testbed for HUMAN HEALTH issues of sustained long term Space flight, including TELE-MEDICINE**, in a 1/6<sup>th</sup> g environment to destinations beyond of two years or more duration to assess ‘in situ’ the myriad of issues raised in the Jay M. McDonald report of 2001. To such purpose a two year baseline “on station” rotation schedule is proposed for the astronauts in the 2020 to 2030 decade.
- **A Testbed for “in situ” RESOURCES PRODUCTION AND PROCESSING**, including **TELE-OPERATIONS**, with the objective to maximize lunar production capabilities / minimizing the need for terrestrial supplies and ‘on site manpower through automation, robotics and tele-operations to tap the myriad resources of the Moon and later use on other planets.

- **A Testbed for “in situ” ENERGY PRODUCTION TECHNOLOGIES**, including ‘conventional’ **NUCLEAR** and **SOLAR POWER** plants up to entirely novel processes such as **<sup>3</sup>HE CLEAN FUSION**.
- **A Testbed for (CLOSED) ECOLOGICAL/BIOLOGICAL LIFE SUPPORT SYSTEMS (ELSS - CELSS)** for sustaining the twelve astronaut base to decrease the outside (terrestrial) support needed, leading ultimately to resource autonomy and independence.
- **A Testbed for novel SPACE TRANSPORTATION technologies**, including “in situ” **FUELS PRODUCTION** and storage, “**FUEL-LESS**” **TRANSPORTATION** concepts such as Electromagnetic Propulsion, Lunar Elevator concepts, microwave and laser assisted propulsion.
- Establishment of a **DIGITAL HUMAN KNOWLEDGE ARCHIVE AND LIBRARY “ALEXANDRIA”** to safeguard mankind’s historic, cultural and knowledge base against catastrophic loss such as occurred with the destruction of the Library of Alexandria first by the Romans in the turmoil of establishing the Augustan Empire and later in the seventh century AD with the Muslim conquests.
- Decadal Technology Goals can be defined for each of the Technology/Applications areas listed herein or to be added.

In preparation for such deployment the following precursor missions can be defined such as:

- **2008 Remote Sensing missions for site exploration and evaluation** with, amongst others, sub-meter stereo panchromatic and multispectral resolution for topographic mapping of potential Base sites;
- **2012 - Precursor Robotic Site preparation and pre-deployment missions;**
- **2012 + Deployment of 'global' seismic detectors on the Moon** to determine internal geologic structure of the Moon making use of the periodic impact of meteorites and/or sounding experiments using explosives (analogous to oil and gas industry reservoir evaluations).
- **2015 - First Human Lunar Return mission** to the prospective Base Site of **seven days** duration, with site evaluation, prospecting and preparation tasks, including deployment and checkout of robotic systems;
- **2018 - a 90 day extended stay mission at the Base site** with detailed site evaluation, preparation and Base predeployment tasks for the 2020 initial operation of a permanent Base.

With such a robust Baseline Strategy the further exploration of systems beyond will be assured – at dramatically reduced costs and risks – while assuring “immediate” benefits to taxpayers and the public at large over the next two decades from Cis-Lunar applications.