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Centrifugal Force for Artificial Gravity

My Contribution to *America at the Threshold:*
The President's Space Exploration Initiative

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BRIEF DESCRIPTION: "Centrifugal" force (the equal but opposite force to the "centripetal" force that acts on a body to keep it in circular motion and that is directed to the center of rotation) can be produced by a cylindrical design of space vehicle, to supply medically beneficial artificial gravity on the inside wall of the vehicle.

PAYOFF OR VALUE: Providing artificial gravity, via centrifugal force, will prove invaluable in alleviating the crew of the physiological disorders and psychological disorientations that commonly develop during long periods of weightlessness.

Additionally, in order to produce centrifugal force, the ship will rotate around its longitudinal axis as it travels forward: Gyroscopic effects, akin to the effects of gun-barrel rifling on bullets, may help flight stability.

PERFORMANCE CHARACTERISTICS: The basic design of the ship, or at least of the crew's living quarters, will need to be cylindrical; and side thrusters will need to be provided, in order to produce and, as need be, correct the uniform rate of rotation and, thus, centrifugal force.

As an example, if the cylindrical ship had an internal radius of 25 meters, it would need to rotate around its axis once every 10 seconds in order to create a centripetal force on the crew that would be felt as a centrifugal force on the wall under their feet equal to the force of gravity on their mass (regardless of what it is) upon the surface of the Earth.

Although the inside wall of the ship will, thus, serve as an artificial landscape, the central "core" of the ship will remain in a low-gravity condition, facilitating the "weightless" storage and lifting of massive items.

RELATION TO MAJOR MISSION OBJECTIVES: Overcoming the deleterious physiological and psychological effects of weightlessness can better make long journeys into space by human beings feasible.