CLAIMS

What is claimed is:

1. A cryogenic storage system, comprising:

a storage container comprising a spherical radially outer surface defining at least a portion of a sphere, wherein all points on the spherical radially outer surface defining the at least the portion of the sphere are equidistant from a center of the storage container; and

an enclosure assembly configured to house the storage container, the enclosure assembly comprising:

an outer dome comprising a spherical cavity and a spherical radially inner surface that is a spherical surface of the spherical cavity, wherein all points of the spherical radially outer surface are always radially inward of the spherical radially inner surface of the spherical cavity; and

wherein the storage container has a center of gravity or mass within a bottom portion of the storage container that passively stabilizes the storage container when the storage container is tilted, angled or rotated within the enclosure assembly, wherein the spherical radially outer surface of the storage container is supported by the spherical radially inner surface of the spherical cavity inwardly of the spherical radially inner surface.

2. The cryogenic storage system of claim 1, wherein the enclosure assembly further comprises an enclosure and a padding component, wherein the padding component is disposed between the enclosure and the outer dome.

3. The cryogenic storage system of claim 2, wherein the padding component is a gasket disposed in a recess of the enclosure.

4. The cryogenic storage system of claim 2, further comprising a plurality of padding components, the plurality of padding components including the padding component, the plurality of padding components disposed around an outer dome radially outer surface of the outer dome.

5. The cryogenic storage system of claim 4, wherein the padding component comprises a first padding portion coupled to the enclosure and a second padding portion disposed between the first padding portion and the radially outer surface of the outer dome, the first padding

portion including a first stiffness that is greater than a second stiffness of the second padding portion.

6. The cryogenic storage system of claim 1, wherein the storage container is a spherical dewar that rotates in three-dimensions and only contacts the plurality of ball elements.

7. The cryogenic storage system of claim 1, wherein the storage container is a temperature-controlled spherical storage container with a temperature below an ambient temperature that is positioned within the spherical cavity of the enclosure assembly and having a payload area that is configured to passively stabilize in an upright position.

8. The cryogenic storage system of claim 7, wherein the temperature-controlled spherical storage container has a center of mass or gravity that is located at or near a bottom of the temperature-controlled spherical storage container and that returns the temperature-controlled spherical storage container to an upright or vertical position or maintains the temperature-controlled spherical storage container in the upright or vertical position when the enclosure assembly is tilted or rotated.

9. The cryogenic storage system of claim 8, wherein the temperature-controlled spherical storage container is suspended within the cavity and remains upright within the enclosure assembly regardless of an orientation of the enclosure assembly.

10. The cryogenic storage system of claim 9, wherein the temperature-controlled suspended spherical storage container freely rotates within the spherical cavity.

11. The cryogenic storage system of claim 7, wherein the temperature-controlled spherical storage container rotates or moves about within the spherical cavity of the enclosure assembly without impacting inner sides of the enclosure assembly.

12. The cryogenic storage system of claim 7, wherein the enclosure assembly has an outer frame and an inner frame.

13. The cryogenic storage system of claim 6, wherein the plurality of ball elements are evenly distributed across a top hemisphere of the outer dome and a bottom hemisphere of the outer dome.

14. The cryogenic storage system of claim 6, wherein a spring is connected to one or more of the plurality of ball elements.