CLAIMS

What is claimed is:

1. An enclosure assembly for a cryogenic storage system, the enclosure assembly comprising:

a first enclosure;

a first padding component coupled to the first enclosure;

a second enclosure disposed opposite the first enclosure, the second enclosure configured to couple to the first enclosure;

a second padding component coupled to the first enclosure,

wherein the first enclosure and the second enclosure are configured to receive a dewar therein.

2. The enclosure assembly of claim 1, further comprising an outer dome configured to be fully enclosed within the first enclosure and the second enclosure.

~~3. The enclosure assembly of claim 2, further comprising a plurality of ball elements disposed within the outer dome.~~

~~4. The cryogenic storage system, comprising:~~

~~the enclosure assembly of claim 3; and~~

~~the dewar disposed in the outer dome, wherein the dewar is in contact with the plurality of ball elements only.~~

~~5.~~3. The enclosure assembly of claim 2, wherein the first padding component is a gasket, and wherein the first enclosure comprises a recess, the gasket disposed in the recess.

~~6.~~4. The enclosure assembly of claim ~~5~~3, wherein the first padding component comprises an aperture disposed proximate a distal end of the first enclosure, wherein the outer dome is configured to be press fit into the aperture.

~~7.~~5. The enclosure assembly of claim 2, further comprising a plurality of padding components, the plurality of padding components including the first padding component and

the second padding component, the plurality of padding components disposed around the outer dome, each padding component in the plurality of padding components being substantially perpendicular to a radially outer surface of the outer dome.

~~8.~~6. The enclosure assembly of claim 1, wherein the first enclosure and the second enclosure each comprise a radially inner ring and a radially outer ring, the enclosure assembly further comprising:

a first support tube coupled to the first enclosure between the radially outer ring and the radially inner ring of the first enclosure, the first support tube filled with nitrogen gas;

a second support tube coupled to the second enclosure between the radially outer ring and the radially inner ring of the first enclosure, the second support tube filled with nitrogen gas;

a first plurality of pad assemblies disposed around the radially inner ring of the first enclosure, each pad assembly in the first plurality of pad assemblies including the first padding component; and

a second plurality of pad assemblies disposed around the radially inner ring of the second enclosure, each pad assembly in the second plurality of pad assemblies including the second padding component.

~~9.~~7. The enclosure assembly of claim ~~8~~6, each pad assembly in the first plurality of pad assemblies and the second plurality of pad assemblies includes a pad housing coupled to a respective radially inner ring of the first enclosure or the second enclosure.

~~10.~~8. The enclosure assembly of claim 1, further comprising:

a first plurality of ball transfer devices disposed around a first radially inner surface of the first padding component; and

a second plurality of ball transfer devices disposed around a second radially inner surface of the second padding component,

wherein each ball transfer device in the first plurality of ball transfer devices and the second plurality of ball transfer devices comprises a spring, a cup and a ball bearing,

wherein the spring is coupled to a respective enclosure and the cup,

wherein the ball bearing is disposed within the cup, and

wherein the ball bearing is configured to contact the dewar.

~~11.~~9. A cryogenic storage system, comprising:

a dewar comprising a radially outer surface; and

an enclosure assembly configured to house the dewar, the enclosure assembly comprising:

an outer dome comprising a substantially spherical cavity and a radially inner surface; and

~~a plurality of ball elements disposed between the radially inner surface of the outer dome and the radially outer surface of the dewar~~

wherein the dewar is shaped as a sphere and has a center of gravity or mass within a bottom portion of the dewar that passively stabilizes the dewar when the dewar is tilted, angled or rotated within the enclosure assembly.

~~12. The cryogenic storage system of claim 11, wherein the dewar is shaped as a sphere and has a center of gravity or mass within a bottom portion of the dewar that passively stabilizes the dewar when the dewar is tilted, angled or rotated within the enclosure assembly.~~

~~13.~~10. The cryogenic storage system of claim ~~11~~9, 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.

~~14.~~11. The cryogenic storage system of claim ~~13~~10, wherein the padding component is a gasket disposed in a recess of the enclosure.

~~15.~~12. The cryogenic storage system of claim ~~13~~10, 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.

~~16.~~13. The cryogenic storage system of claim ~~15~~12, 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.

~~17.~~14. The cryogenic storage system of claim ~~11~~9, wherein the dewar is a spherical dewar that rotates in three-dimensions ~~and only contacts the plurality of ball elements~~.

~~18. A method of assembling a cryogenic storage system, the method comprising:~~

~~filling a first portion of an outer dome with a plurality of ball elements;~~

~~disposing a spherical dewar in the first portion of the outer dome, the spherical dewar in contact with the plurality of ball elements; and~~

~~coupling a second portion of the outer dome to the first portion of the outer dome.~~

~~19. The method of claim 18, further comprising:~~

~~disposing the outer dome on a first padding component coupled to a first enclosure; and~~

~~coupling a second enclosure to the first enclosure and fully enclosing the outer dome between the first enclosure and the second enclosure, wherein a second padding component is disposed between the second enclosure and the outer dome.~~

~~20. The method of claim 18, further comprising:~~

~~disposing the outer dome between a first enclosure and a second enclosure, wherein a plurality of padding components are disposed around a radially outer surface of the outer dome between the first enclosure and the radially outer surface and between the second enclosure and the radially outer surface, wherein each padding component is substantially perpendicular to the radially outer surface of the outer dome.~~

15. A storage system, comprising:

an enclosure having a cavity; and

a temperature-controlled spherical storage container with a temperature below an ambient temperature that is positioned within the cavity of the enclosure and having a payload area that is configured to passively stabilize in an upright position.