CLAIMS

What is claimed is:

1. A substrate support assembly, comprising:

a ceramic bottom plate having heater elements therein;

a ceramic top plate having an electrode therein; and

a metal layer between the ceramic top plate and the ceramic bottom plate, the ceramic top plate in direct contact with the metal layer, and the metal layer in direct contact with the ceramic bottom plate.

2. The substrate support assembly of claim 1, wherein the metal layer is an aluminum foil.

3. The substrate support assembly of claim 2, wherein the aluminum foil comprises silicon having an atomic concentration in the range of 2% – 20% of the aluminum foil.

4. The substrate support assembly of claim 2, wherein the aluminum foil has a thickness in the range of 50 – 500 microns.

5. The substrate support assembly of claim 1, further comprising:

a ceramic shaft coupled to the ceramic bottom plate at a side of the ceramic bottom plate opposite the metal layer.

6. The substrate support assembly of claim 1, further comprising:

a gas pathway through the ceramic shaft, through the ceramic bottom plate, through the metal layer, and through the ceramic top plate.

7. The substrate support assembly of claim 5, wherein the ceramic shaft is coupled to the ceramic bottom plate by a diffusion bond.

8. The substrate support assembly of claim 5, wherein the ceramic shaft is coupled to the ceramic bottom plate by a second metal layer, the ceramic bottom plate in direct contact with the

~~second metal layer, and the second metal layer in direct contact with the ceramic shaft.~~

~~9. The substrate support assembly of claim 1, wherein the ceramic bottom plate comprises a first aluminum nitride material, and the ceramic top plate comprises a second aluminum nitride material.~~

~~10.~~1. A method of fabricating a substrate support assembly, the method comprising:

forming a ceramic bottom plate having heater elements therein;

forming a ceramic top plate having an electrode therein; and

bonding the ceramic top plate to the ceramic bottom plate with a metal layer between the ceramic top plate and the ceramic bottom plate, the ceramic top plate in direct contact with the metal layer, and the metal layer in direct contact with the ceramic bottom plate~~.~~

~~11. The method of claim 10~~, wherein bonding the ceramic top plate to the ceramic bottom plate with the metal layer comprises heating the ceramic bottom plate, the metal layer, and the ceramic top plate to a temperature less than 600 degrees Celsius.

~~12.~~ 2. The method of claim ~~10~~1, wherein the metal layer is an aluminum foil, and the method comprises cleaning a surface of the aluminum foil to remove a passivation layer of the aluminum foil prior to bonding the ceramic top plate to the ceramic bottom plate with the metal layer.

~~13.~~ 3. The method of claim ~~10~~1, further comprising:

prior to bonding the ceramic top plate to the ceramic bottom plate with the metal layer, bonding a ceramic shaft to the ceramic bottom plate at a side of the ceramic bottom plate opposite the metal layer.

~~14. 4.~~ The substrate support assembly of claim ~~13~~3, wherein bonding the ceramic shaft to the ceramic bottom plate comprises heating the ceramic shaft and the ceramic bottom plate to a temperature above 1400 degrees Celsius to form a diffusion bond between the ceramic shaft and the ceramic bottom plate.

~~15. 5.~~ The substrate support assembly of claim ~~13~~3, wherein bonding the ceramic shaft to the ceramic bottom plate comprises coupling the ceramic shaft to the ceramic bottom plate by a second metal layer, the ceramic bottom plate in direct contact with the second metal layer, and the second metal layer in direct contact with the ceramic shaft.

~~16. A system for deposition, comprising:~~

~~a chamber;~~

~~a plasma source within or coupled to the chamber; and~~

~~an electrostatic chuck within the chamber, the electrostatic chuck comprising:~~

~~a ceramic bottom plate having heater elements therein;~~

~~a ceramic top plate having an electrode therein; and~~

~~a metal layer between the ceramic top plate and the ceramic bottom plate, the ceramic top plate in direct contact with the metal layer, and the metal layer in direct contact with the ceramic bottom plate.~~

~~17. The system for deposition of claim 16, wherein the metal layer is an aluminum foil.~~

~~18. The system for deposition of claim 16, wherein the electrostatic chuck further comprises:~~

~~a ceramic shaft coupled to the ceramic bottom plate at a side of the ceramic bottom plate opposite the metal layer.~~

~~19. The system for deposition of claim 18, wherein the ceramic shaft is coupled to the ceramic~~

~~bottom plate by a diffusion bond.~~

~~20. The system for deposition of claim 18, wherein the ceramic shaft is coupled to the ceramic bottom plate by a second metal layer, the ceramic bottom plate in direct contact with the second metal layer, and the second metal layer in direct contact with the ceramic shaft.~~