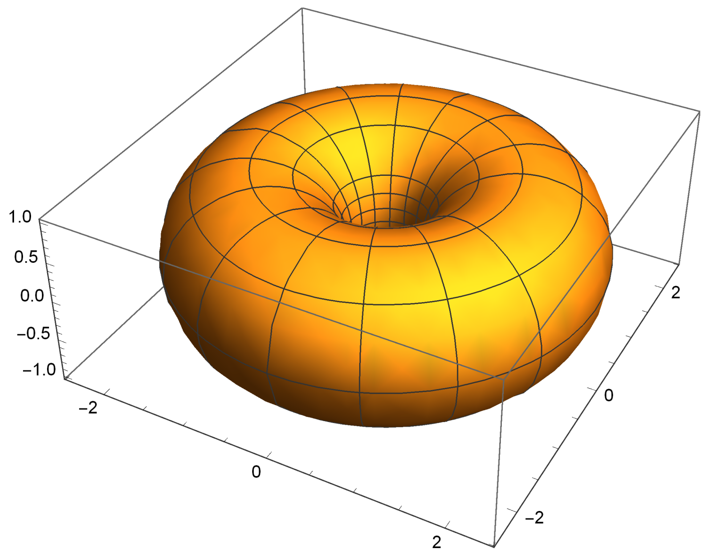
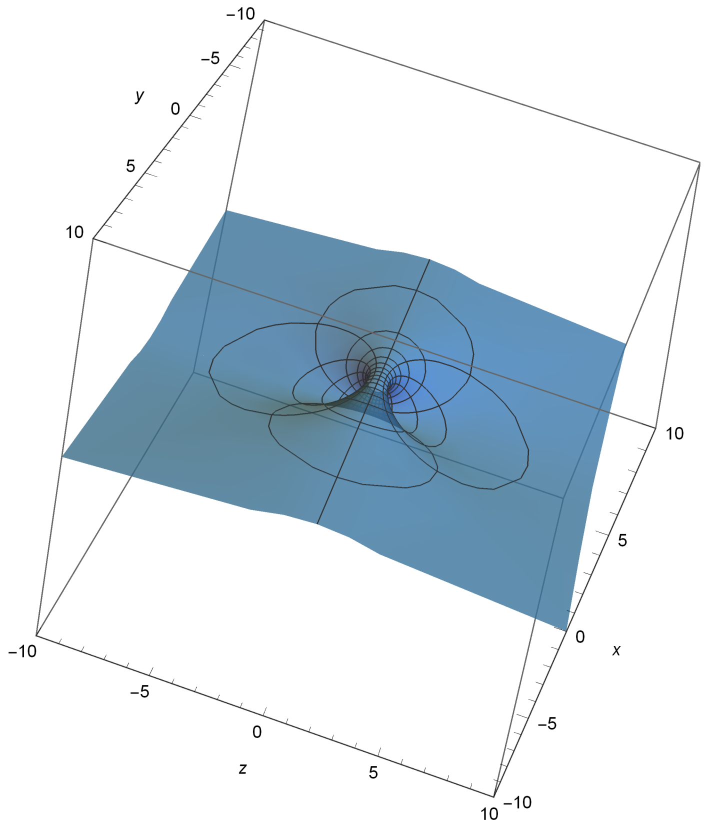
```
(* Define Stereographic projection from the north pole of S3, as well as its inverse*)

StereoN[x_] := {x[[1]]/(1 - x[[4]]), x[[2]]/(1 - x[[4]]), x[[3]]/(1 - x[[4]])};

IStereoN[x_] := {2 x[[1]]/(Norm[x]^2 + 1), 2 x[[2]]/(Norm[x]^2 + 1), 2 x[[3]]/(Norm[x]^2 + 1), (Norm[x]^2 - 1)/(Norm[x]^2 + 1)};

(*Here is our torus, stereographically projected from the north pole of S3*)

tor[th1_, th2_] := {Cos[2 Pi th1]/Sqrt[2], Sin[2 Pi th1]/Sqrt[2], Cos[2 Pi th2]/Sqrt[2], Sin[2 Pi th2]/Sqrt[2]};
ParametricPlot3D[StereoN[tor[th1, th2]], {th1, 0, 1}, {th2, 0, 1}]
```




```
(* The point {1+Sqrt[2],0,0} is on the surface of this torus. I intend
 to do a stereographic projection from the corresponding point in S3*)

projpoint = IStereoN[{1 + Sqrt[2], 0, 0}];

(* Define rotation matrices for stereographic projections. R
 is a rotation matrix sending projpoint to the north pole of S3*)

Rot[th_] := {{Cos[th], 0, 0, -Sin[th]}, {0, 1, 0, 0}, {0, 0, 1, 0}, {Sin[th], 0, 0, Cos[th]}}
R = {Rot[Pi / 2].projpoint, {0, 1, 0, 0}, {0, 0, 1, 0}, projpoint};

(* Plot the resulting projection of the torus*)
```

```
ParametricPlot3D[StereoN[R.tor[th1, th2]], {th1, 0, 1}, {th2, 0, 1}, PlotRange → {-10, 10},
 PlotStyle → {{Opacity[0.8], FaceForm[Hue[0.59, 0.73, 0.79], Hue[0.11, 0.73, 0.88]]}},
 AxesLabel → {x, y, z},
 ViewPoint → {1.721792493400969`, -0.8671937374601687`, 2.78090014768203`},
 ViewVertical → {-0.4669018501380959`, 0.2603456483843665`, -0.9471894444621316`}]
```




```
(* This is a picture of the torus going through the point at infinity. The
 fourth order symmetry is a rotation Pi/2 radians CCW about the x axis,
followed by a reflection in the xy plane.
```