Cool toroidal segment figure for the book. toroidFig1.eps

```
<< peeters` ;
peeters`setGitDir[ "../project/figures/GAelectrodynamics" ]
```

```
/Users/pjoot/project/figures/GAelectrodynamics
```

```
<< GA30`;
```

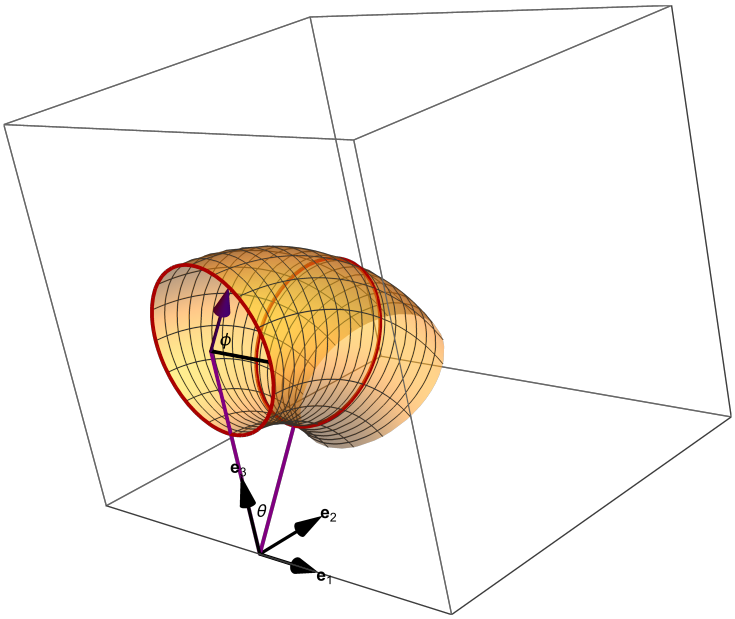
```
j = Bivector[1, 3, 2] ;
i = Bivector[1, 1, 3];
e1 = Vector[1, 1] ;
e2 = Vector[1, 2];
e3 = Vector[1, 3];

cis[t_, i_] := Cos[t] + i Sin[t];
(cis[-t / 2, j] ** (rho e1 ** cis[phi, i] + r e3) ** cis[t / 2, j]
)
```

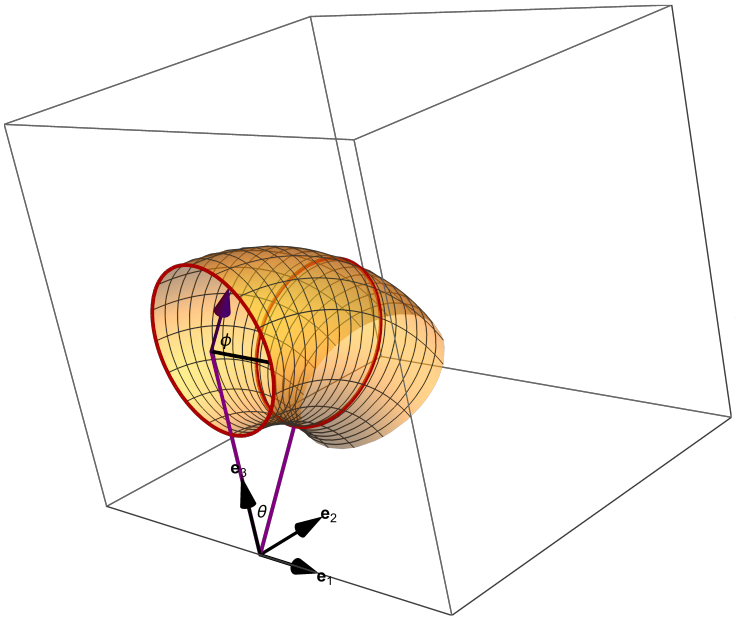
$$\text{rho}\,\text{Cos}[\text{phi}]\,\mathbf{e}_1 + (r + \text{rho}\,\text{Sin}[\text{phi}])\,\text{Sin}[t]\,\mathbf{e}_2 + \text{Cos}[t]\,(r + \text{rho}\,\text{Sin}[\text{phi}])\,\mathbf{e}_3$$

```
{u1, u2, u3} = UnitVector[3, #] & /@ Range[3];
toroid[t_, phi_, r_, rho_] :=
  rho Cos[phi] u1 + (r + rho Sin[phi]) Sin[t] u2 + Cos[t] (r + rho Sin[phi]) u3;


Module[{o, r, rho, tt, pp, pt},
 r = 2.5;
 rho = 1;
 o = {0, 0, 0};
 tt = Pi / 5;
 pp = 1.2 Pi / 4;
 pt[x_, l_] := (l) (u3 Cos[x] + u2 Sin[x]);
 Show[
  ParametricPlot3D[toroid[u, v, r, rho], {u, 0, 2 Pi / 6}, {v, 0, 2 Pi}, Ticks → None,
   PlotStyle → Directive[Opacity[0.5]], PlotRange → {{-3, 3}, {0, 5}, {0, 5}}],
  ParametricPlot3D[toroid[0, v, r, rho], {v, 0, 2 Pi}, PlotStyle → {Red // Darker}],
  ParametricPlot3D[toroid[tt, v, r, rho], {v, 0, 2 Pi}, PlotStyle → {Red // Darker}],
  Graphics3D[{
    Black,
    Arrow[Tube[{o, u1}]],
    Arrow[Tube[{o, u2}]],
    Arrow[Tube[{o, u3}]],
    Text[Subscript["e" // bold, 1], 1.1 u1],
    Text[Subscript["e" // bold, 2], 1.1 u2],
    Text[Subscript["e" // bold, 3], 1.1 u3],
    Green // Darker,
    Thick,
    Purple,
    Line[{o, (r) u3}],
    Line[{o, pt[tt, r - rho]}],
    Arrow[Tube[{r u3, (r) u3 + rho (u1 Cos[pp] + u3 Sin[pp])}]],
    Black,
    Text["θ", pt[tt / 2, (r - rho) / 3]],
    Line[{r u3, (r) u3 + u1 rho}],
    Text["ϕ", (r) u3 + (rho / 3) (u1 Cos[pp / 2] + u3 Sin[pp / 2])]
   }]
 ]
]
```



p1 =



;

```
peeters`exportForLatex["toroidFig1", p1]
```

{toroidFig1.eps, toroidFig1pn.png}