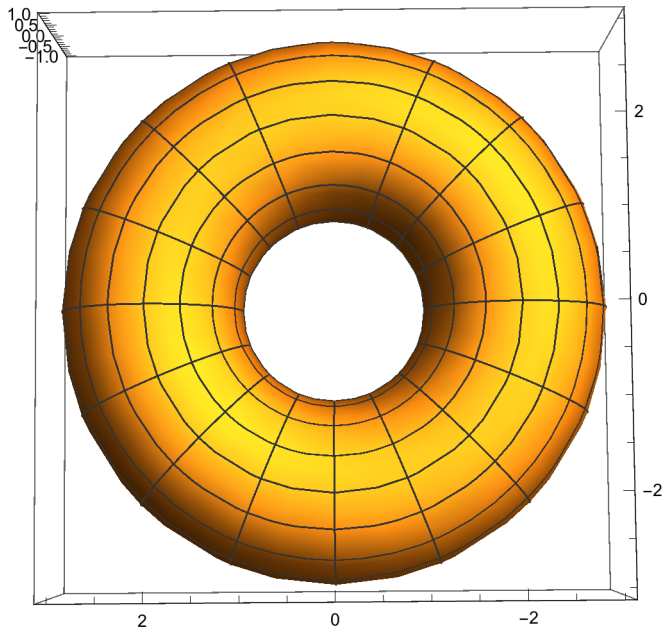
Tessellating torus

In[12]:=
```
torusxy[u_, v_] := {(2 + Cos[v]) Cos[u], (2 + Cos[v]) Sin[u], Sin[v]}
```

In[13]:=
```
ParametricPlot3D[torusxy[t, θ], {t, 0, 2 π}, {θ, 0, 2 π}]
```

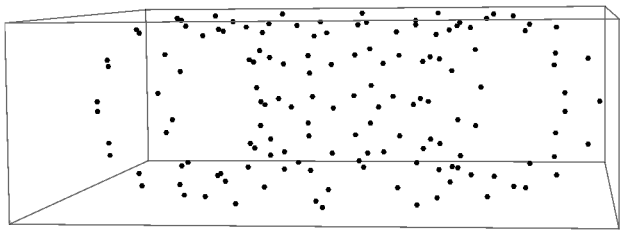
Out[13]=



In[15]:=
```
pts = Table[torusxy[u, v], {u, 0, 2 π, π / 6}, {v, 0, 2 π, π / 6}]
```

In[19]:=
```
Graphics3D[Point[Flatten[pts, 1]]]
```

Out[19]=



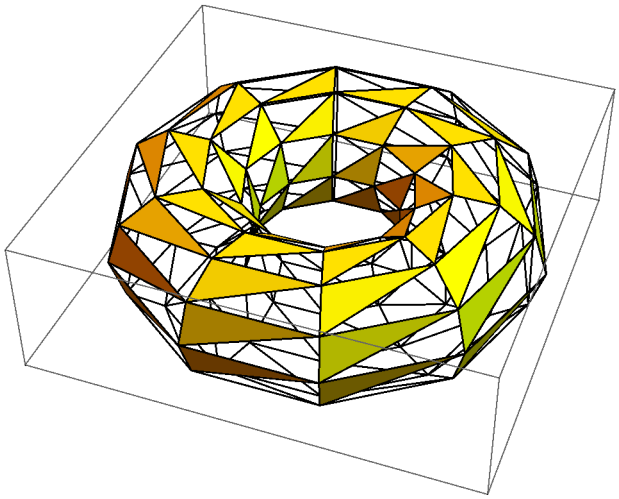
In[32]:=
```
torusPt[n_]:=Table[{(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},{i,1,n},{j,1,n}
```

In[312]:=
```
torus1[n_]:={FaceForm[Yellow,Transparent],
    Table[Polygon[{
    {(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
```

```
    {{(2+Cos[(i-1)/n 2π]) Cos[j/n 2π], (2+Cos[(i-1)/n 2π]) Sin[j/n 2π], Sin[(i-1)/n 2π]},
    {(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]}}],
    {i,1,n},{j,1,n}]}

tesseTorus1[n_]:=Table[{{{(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
            {(2+Cos[(i-1)/n 2π]) Cos[j/n 2π], (2+Cos[(i-1)/n 2π]) Sin[j/n 2π], Sin[(i-1)/n 2π]},
            {(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]}},
    {i,1,n},{j,1,n}]

tesseTorus2[n_]:=Table[{{{(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
{(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]},
{(2+Cos[(i+1)/n 2π]) Cos[(j+1)/n 2π], (2+Cos[(i+1)/n 2π]) Sin[(j+1)/n 2π], Sin[(i+1)/n 2π]}},
    {i,1,n},{j,1,n}]
torus2[n_]:={FaceForm[Yellow,Transparent],
    Table[Polygon[{{{(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
{(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]},
{(2+Cos[(i+1)/n 2π]) Cos[(j+1)/n 2π], (2+Cos[(i+1)/n 2π]) Sin[(j+1)/n 2π], Sin[(i+1)/n 2π]}}],
    {i,1,n},{j,1,n}]}

torus[n_]:=
{FaceForm[Yellow,Transparent],
Table[Polygon[{
    {(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
    {(2+Cos[(i-1)/n 2π]) Cos[j/n 2π], (2+Cos[(i-1)/n 2π]) Sin[j/n 2π], Sin[(i-1)/n 2π]},
    {(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]}}],
    {i,1,n},{j,1,n}],
Table[Polygon[{{{(2+Cos[i/n 2π]) Cos[j/n 2π], (2+Cos[i/n 2π]) Sin[j/n 2π], Sin[i/n 2π]},
{(2+Cos[i/n 2π]) Cos[(j+1)/n 2π], (2+Cos[i/n 2π]) Sin[(j+1)/n 2π], Sin[i/n 2π]},
{(2+Cos[(i+1)/n 2π]) Cos[(j+1)/n 2π], (2+Cos[(i+1)/n 2π]) Sin[(j+1)/n 2π], Sin[(i+1)/n 2π]}}],
    {i,1,n},{j,1,n}]}
```

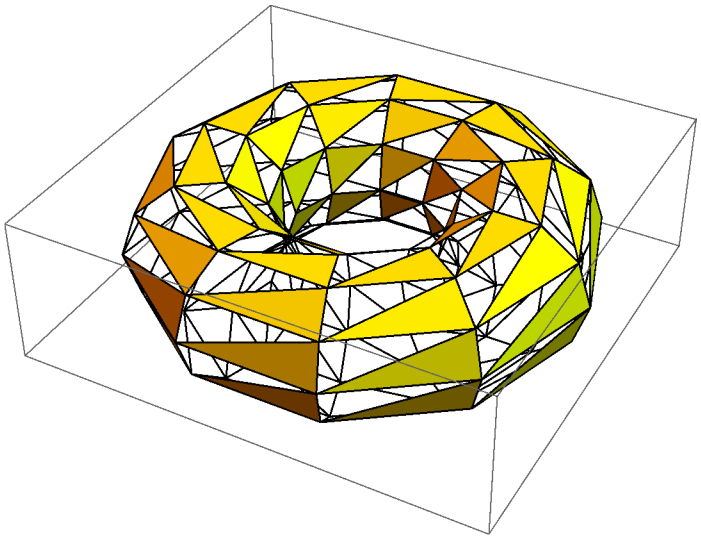
In[276]:= **Graphics3D[torus1[10]]**

Out[276]=



In[311]:= **Graphics3D[torus2[10]]**

Out[311]=



In[319]:=
```
Graphics3D[torus[20]]
```

Out[319]=