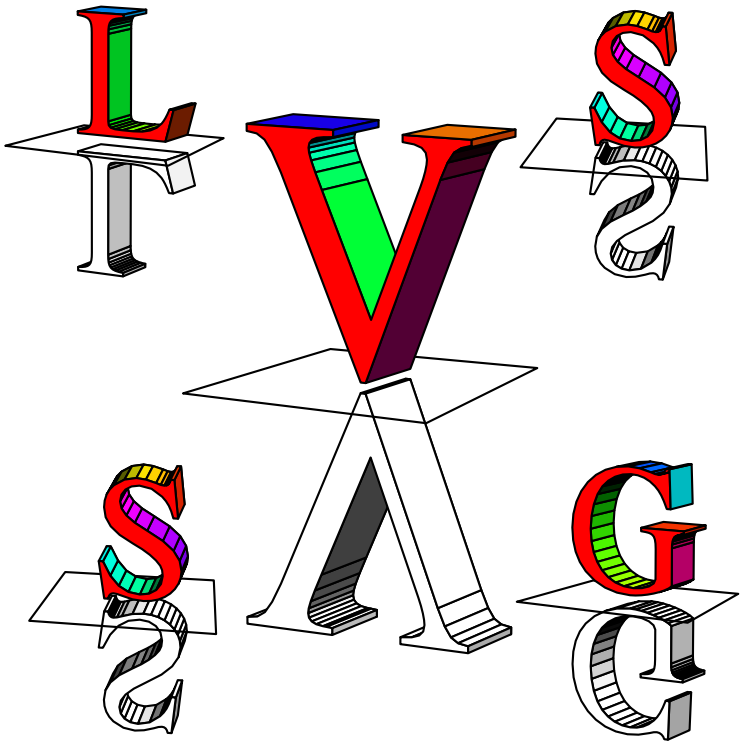
pst-solides3d :
Exemples d'utilisation

v. 3.0 (2007/12/21)



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21 décembre 2 007

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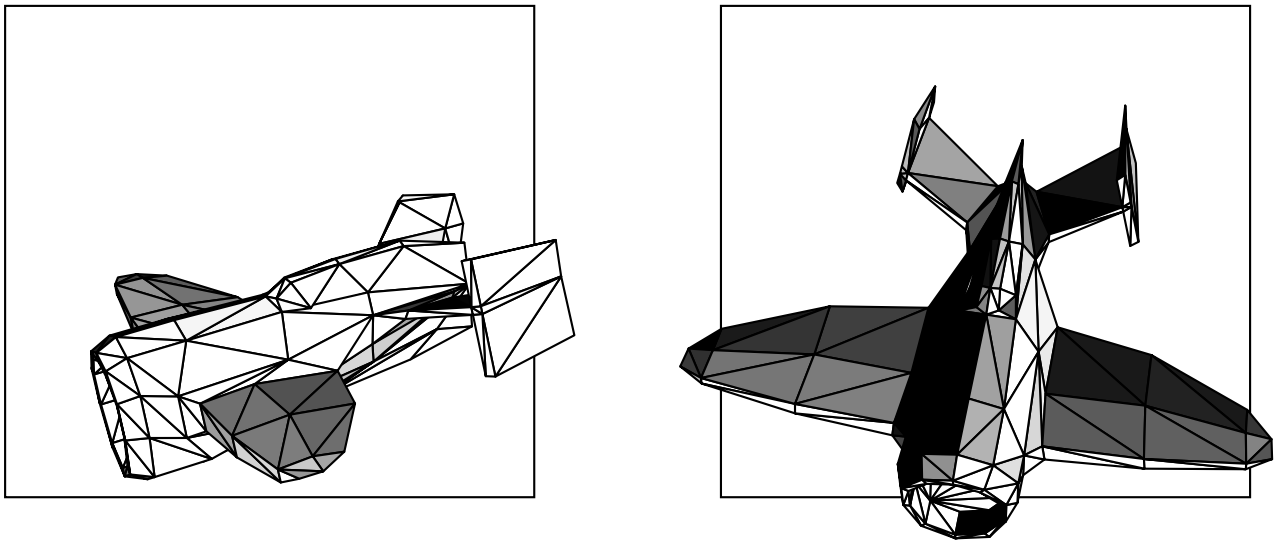
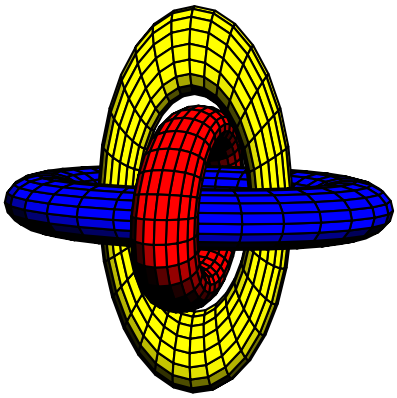
*Avec la collaboration de : Jürgen GILG<gilg@acrotex.net>, Jean-Michel SARLAT<jm.sarlat@gmail.com>.

1 Un avion

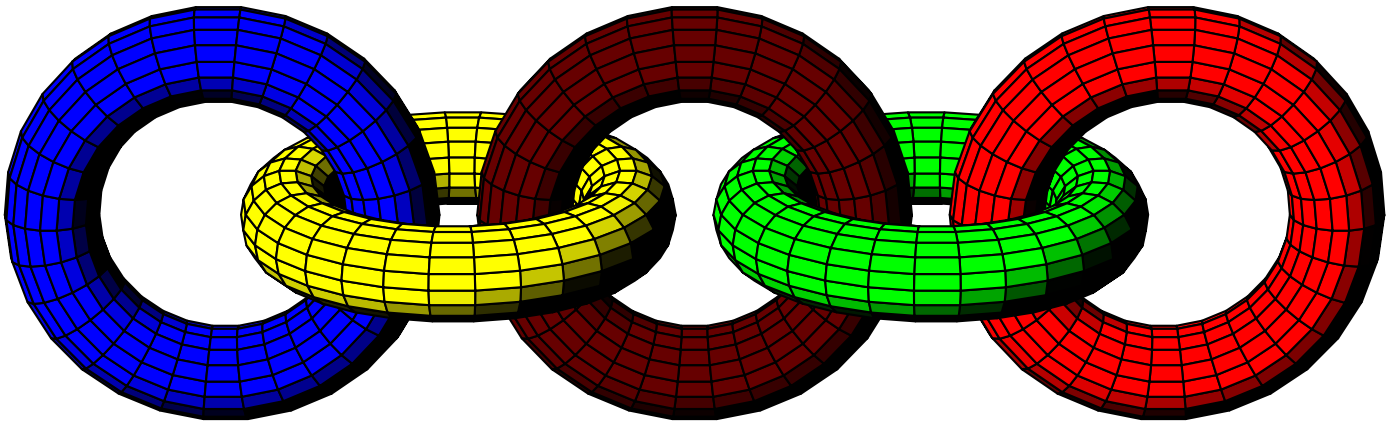


2 Anneaux De Borromée



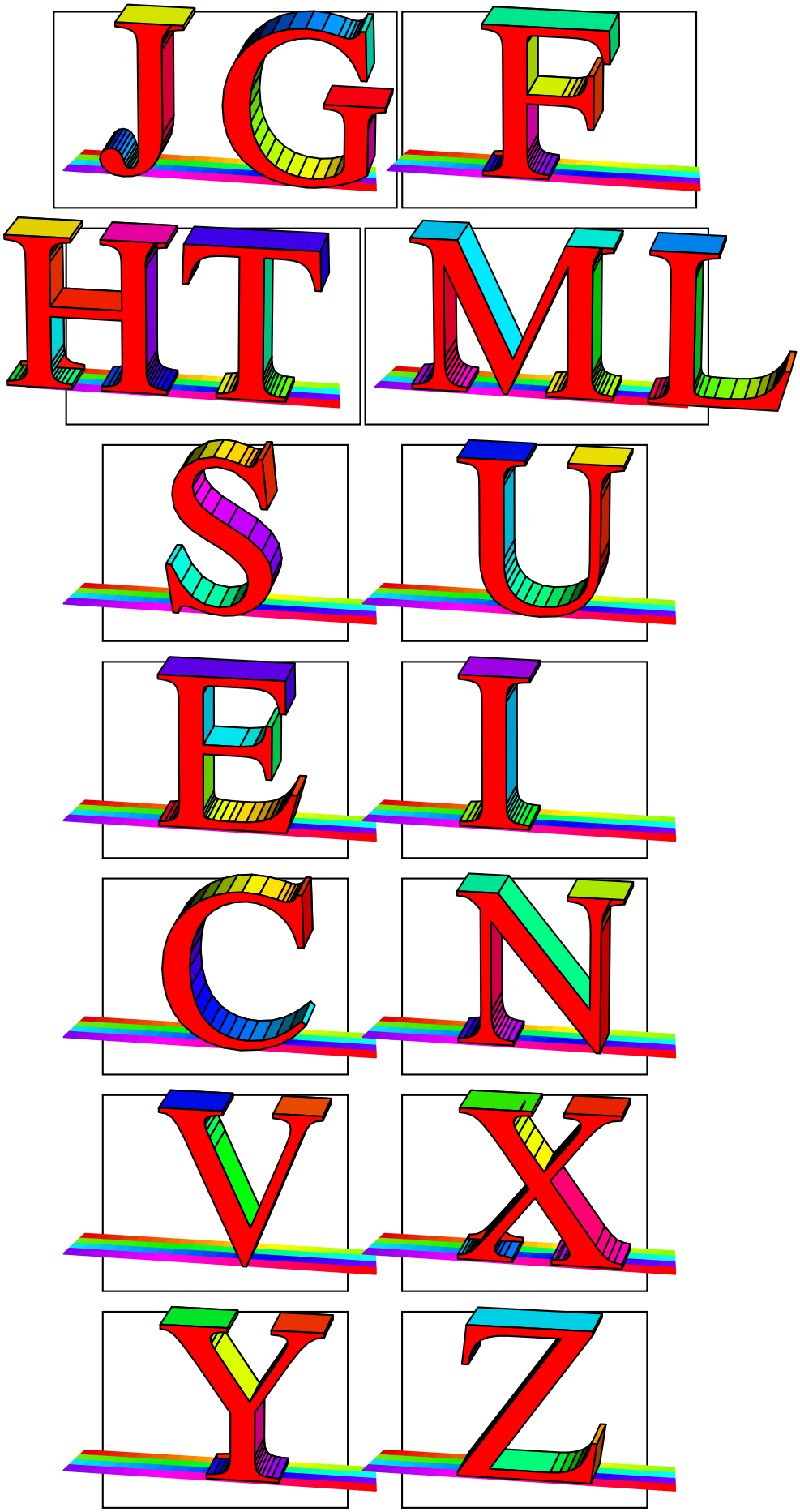
```
\begin{pspicture}(-4,-6)(4,6)
\codejps{
 /ORing1 {
    0.25 0.9 [18 30] newtore
    {0.75 1.5 1 scaleOpoint3d} solidtransform
    {0 0 0 rotateOpoint3d} solidtransform
    dup (Blue) outputcolors} def
/ORing2 {
    0.25 0.9 [18 30] newtore
    {0.75 1.5 1 scaleOpoint3d} solidtransform
    {90 0 90 rotateOpoint3d} solidtransform
    dup (Yellow) outputcolors} def
/ORing3 {
    0.25 0.9 [18 30] newtore
    {0.75 1.5 1 scaleOpoint3d} solidtransform
    {0 90 90 rotateOpoint3d} solidtransform
    dup (Red) outputcolors} def
/un {ORing1 ORing2 solidfuz} def
/deux {ORing3 un solidfuz} def
deux drawsolid**}
\end{pspicture}
```

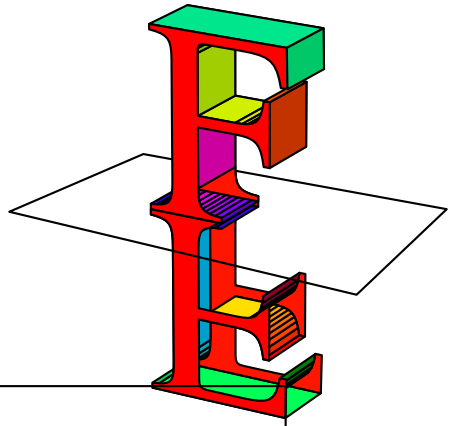
3 Chaîne olympique



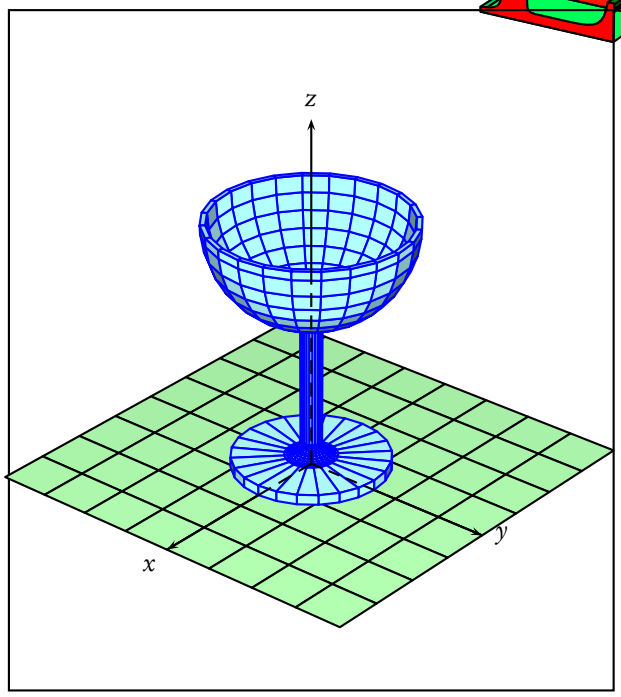
```
\begin{pspicture}(-6,-5)(6,6)
\psset{lightsrc=50 -50 50,viewpoint=40 0 20,SphericalCoor,Decran=100,ngrid=18 30,r0=0.25,r1=0.9}
\psSolid[object=tore,solidmemory=true,
   RotY=90,
   fillcolor=blue,
   action=none,
   name=anneau1](0,-2.5,0)
\psSolid[object=tore,solidmemory=true,
   RotY=90,
   fillcolor=Brown,
    action=none,
   name=anneau2](0,0,0)
\psSolid[object=tore,solidmemory=true,
   RotY=90,
   fillcolor=red,
    action=none,
   name=anneau3](0,2.5,0)
\psSolid[object=tore,solidmemory=true,
   fillcolor=yellow,
    action=none,
   name=anneau4](0,-1.25,0)
\psSolid[object=tore,solidmemory=true,
   fillcolor=green,
    action=none,
   name=anneau5](0,1.25,0)
\psSolid[object=fusion,
   base=anneau1 anneau2 anneau3 anneau4 anneau5,
   name=anneaux,
   action=draw**]%
\composeSolid
\end{pspicture}
```

4 Un abécédaire



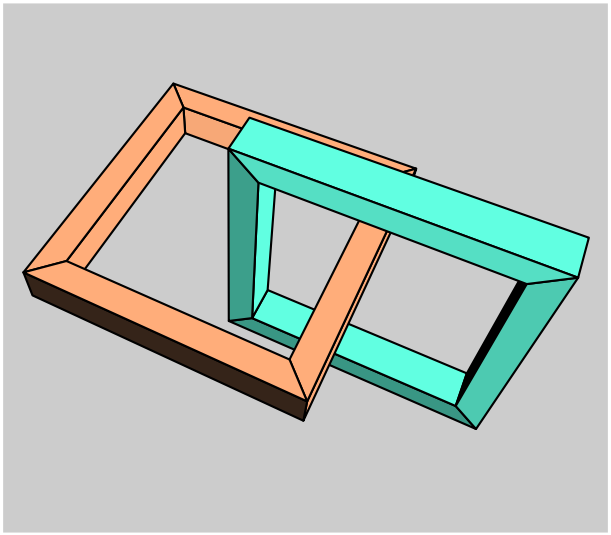


5 Une coupe



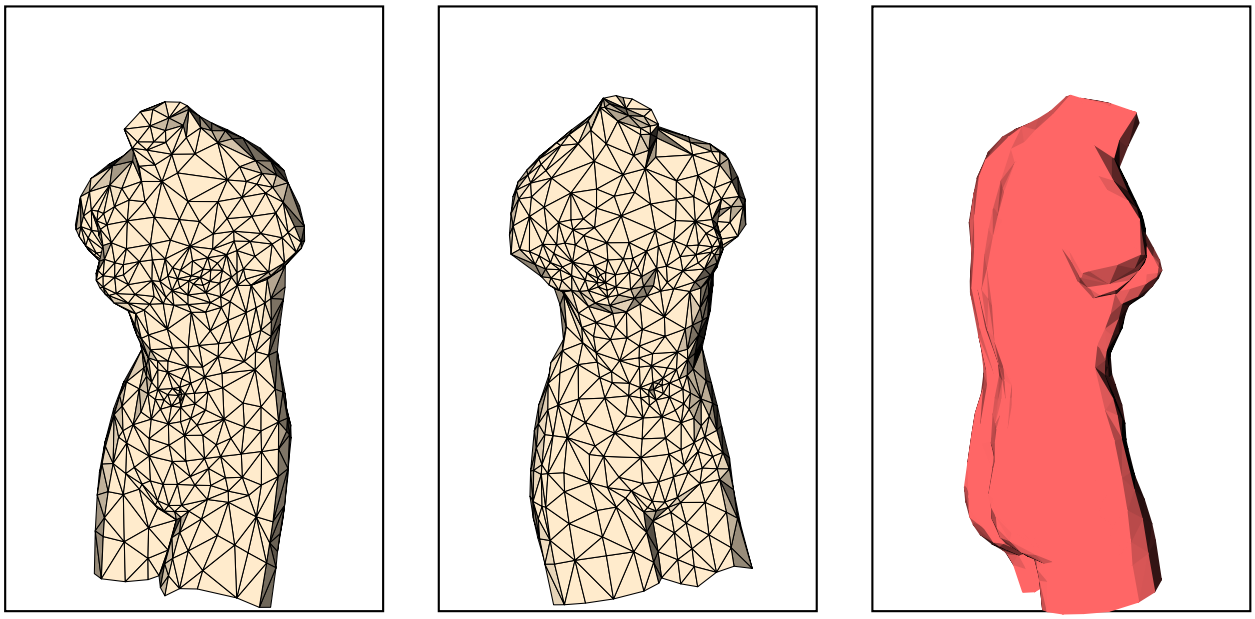

```
\begin{pspicture}(-4,-3)(4,6)
\psframe(-4,-3)(4,6)
\psset[pst-solides3d]{SphericalCoor,
   viewpoint=70 40 30,Decran=50,lightsrc
   =50 40 35}
\psSolid[object=grille,base=-4 4 -4 4,
   fillcolor=green!30]%
\psSolid[object=anneau,section=\
   SectionCoupe,fillcolor=cyan!30,
   linecolor=blue]%
\axesIIID(1.5,1.5,4)(4,4,7)
\end{pspicture}
```

6 Anneaux carrés

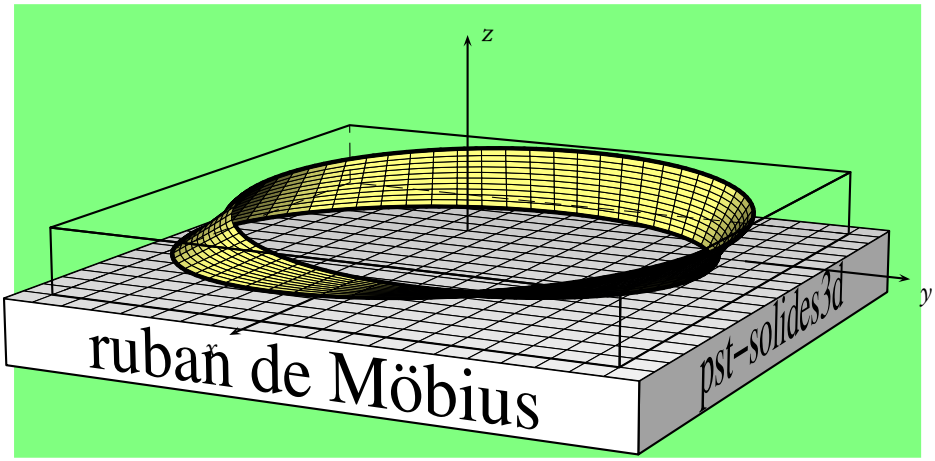


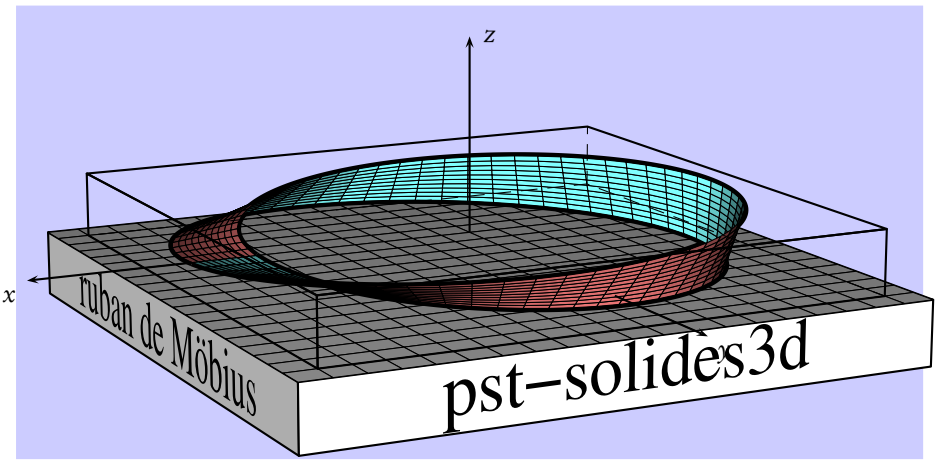
```
\psset{viewpoint=20 10 30,Decran=10,lightsrc=10 20 20}
\begin{pspicture}(-3,-4)(5,3)
\psframe*[linecolor=gray!40](-3,-4)(5,3)
\codejps{
 /SquareRing {
    [10 -1 10 1 8 1 8 -1] 4 newanneau
    {0 0 45 rotateOpoint3d} solidtransform
    } def
SquareRing dup (Apricot) outputcolors
SquareRing
        {0 90 0 rotateOpoint3d} solidtransform
        {0 7.5 0 translatepoint3d} solidtransform
        dup (SkyBlue) outputcolors
     solidfuz
    drawsolid**}
\end{pspicture}
```

7 La vénus de Milo

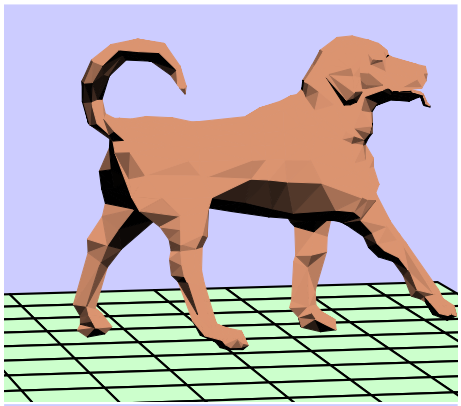
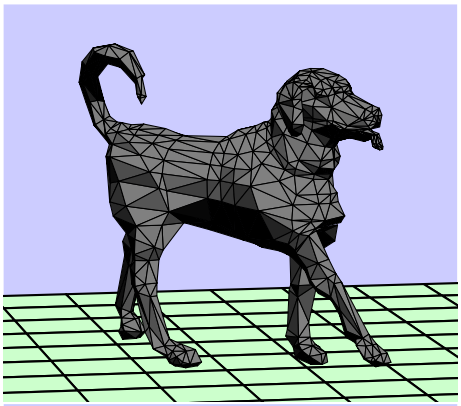
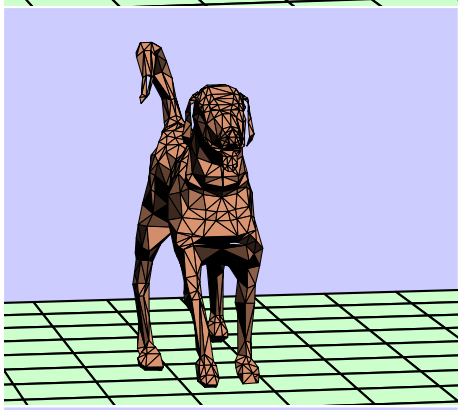
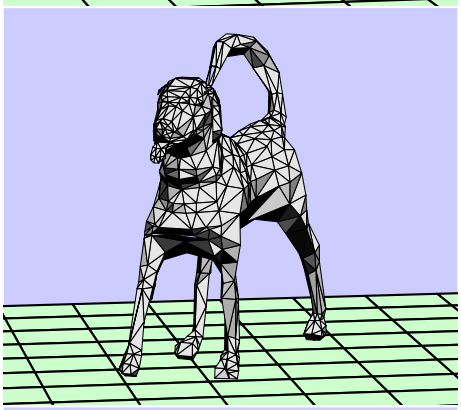
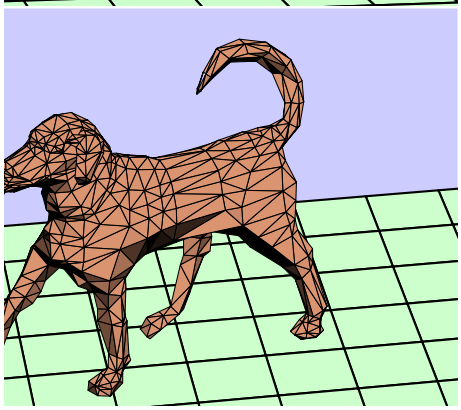
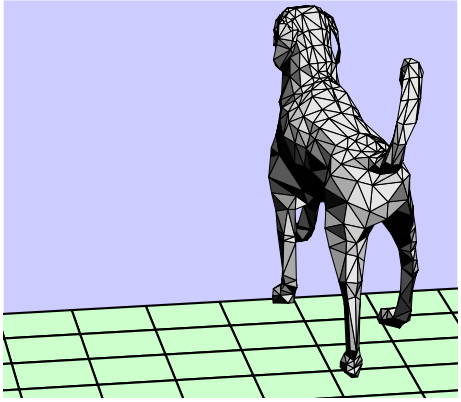


8 Ruban de Möbius

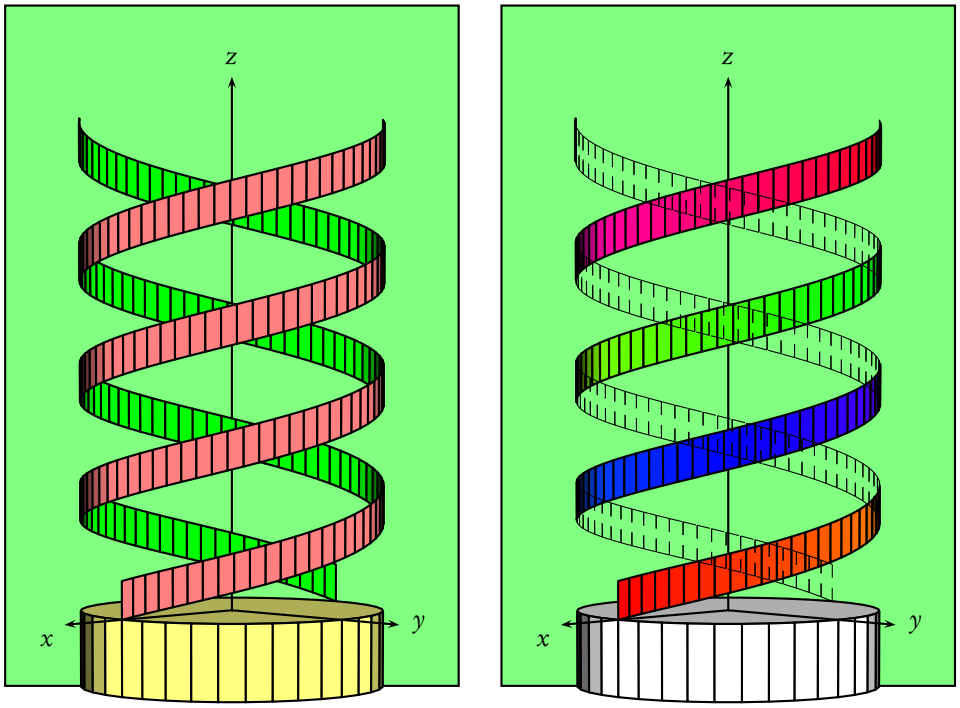




9 Labrador

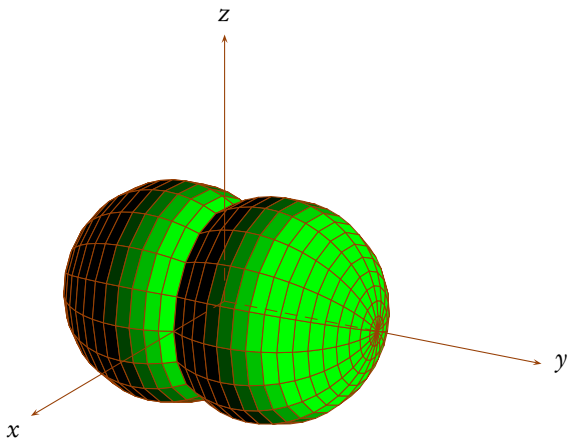







10 La double hélice de l'ADN



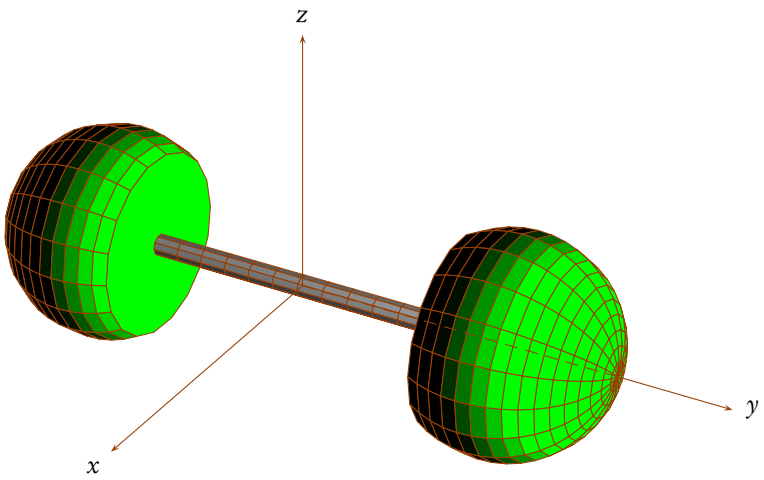
11 Modèles moléculaires compact et éclaté

11.1 Cl_2 : modèle compact



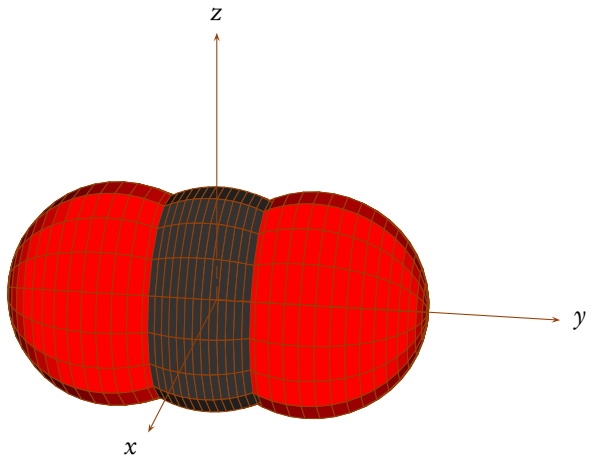

```
\begin{pspicture}(-4,-3)(4,5)
\psset{lightsrc=10 50 10,lightintensity=2,
       viewpoint=100 30 20,Decran=30,SphericalCoor}
\psset{linecolor={[cmyk]{0 0.72 1 0.45}},
       linewidth=0.5\pslinewidth}
\codejps{
% r phi theta [ngrid] newcalottesphere
  /Chlore1 {
  5 -30 90 [16 18] newcalottesphere
  {90 0 0 rotateOpoint3d} solidtransform
  {0 -2.5 0 translatepoint3d} solidtransform
  dup videsolid
  dup (Green) outputcolors
  } def
  /Chlore2 {
  5 -30 90 [16 18] newcalottesphere
  {-90 0 0 rotateOpoint3d} solidtransform
  {0 2.5 0 translatepoint3d} solidtransform
  dup (Green) outputcolors
  } def
  /dichlore{
  Chlore1 Chlore2 solidfuz
  } def
  dichlore drawsolid**}
\axesIIID(2.5,7.5,2.5)(15,15,12)
\end{pspicture}
```

11.2 Cl_2 : modèle éclaté



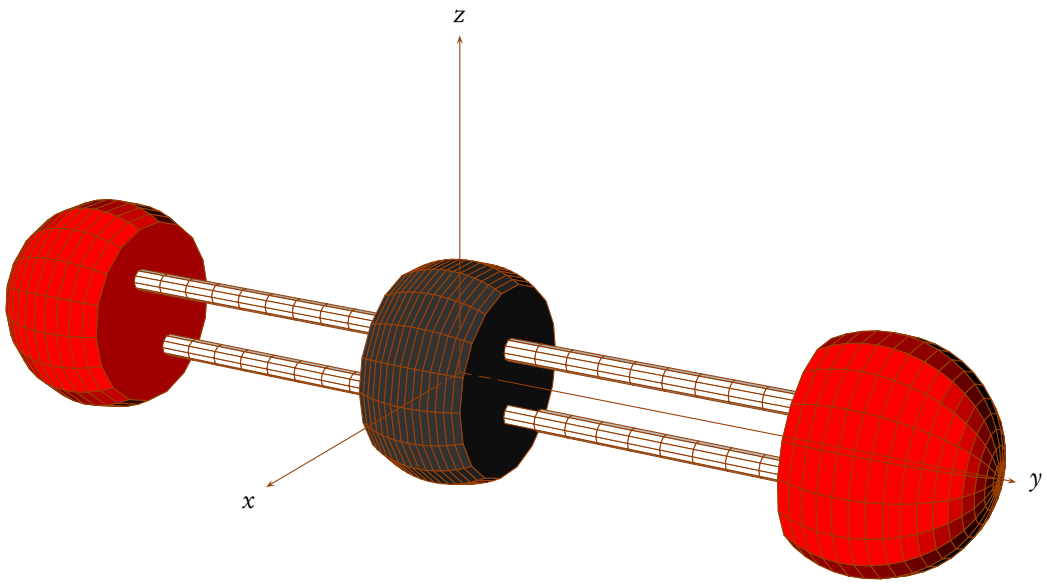

```
\begin{pspicture}(-5,-5)(5,5)
\psset{lightsrc=10 50 10,lightintensity=2,viewpoint=100 30 30,Decran=30,SphericalCoor}
\psset{linecolor={[cmyk]{0 0.72 1 0.45}},linewidth=0.5\pslinewidth}
\codejps{
 /Chlore1 {5 -30 90 [16 18] newcalottesphere
  {90 0 0 rotateOpoint3d} solidtransform
    {0 -10 0 translatepoint3d} solidtransform
    dup (Green) outputcolors } def
/Chlore2 {5 -30 90 [16 18] newcalottesphere
 {-90 0 0 rotateOpoint3d} solidtransform
  {0 10 0 translatepoint3d} solidtransform
  dup (Green) outputcolors } def
/Liaison {
     0 0.5 15 [12 10] newcylindre
     {-90 0 0 rotateOpoint3d} solidtransform
  {0 -7.5 0 translatepoint3d} solidtransform
      dup (White) outputcolors
   } def
/Cl2{Chlore1 Chlore2 solidfuz} def
/dichlore{Cl2 Liaison solidfuz} def
  dichlore drawsolid**}
\axesIIID(1,15,1)(15,20,12)
\end{pspicture}
```

11.3 CO_2 : modèle compact



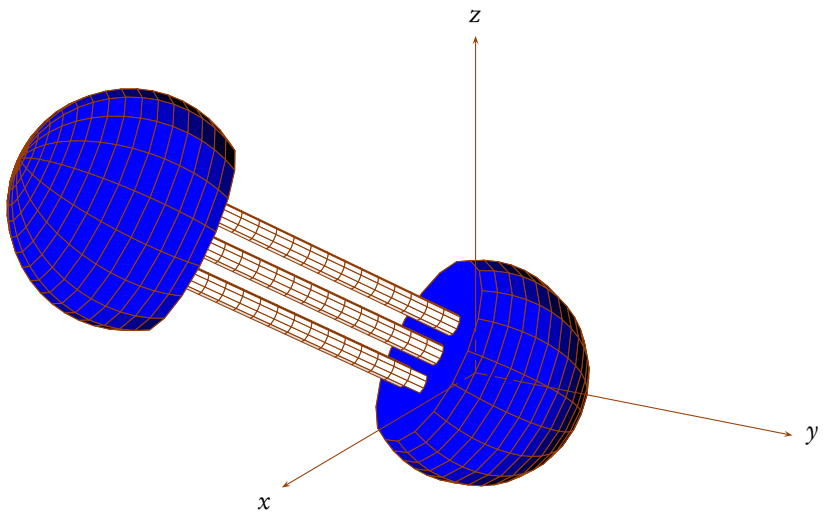

```
\begin{pspicture}(-4,-3)(4,3)
\pstVerb{/DarkGray {0.2 setgray} def}%
\psset{lightsrc=92 16 35,lightintensity=2,
       viewpoint=100 10 20,Decran=30,SphericalCoor}
\psset{linecolor={[cmyk]{0 0.72 1 0.45}},
       linewidth=0.5\pslinewidth}
\codejps{
% r phi theta [ngrid] newcalottesphere
  /Oxygen {
  5 -30 90 [16 18] newcalottesphere
  dup videsolid
  dup (rouge) outputcolors
  } def
  /Carbon {
  5 -30 30 [16 18] newcalottesphere
  {90 0 0 rotateOpoint3d} solidtransform
  dup (DarkGray) outputcolors
  } def
  /Oxygen1 {
    Oxygen {90 0 0 rotateOpoint3d} solidtransform
       {0 -4.33 0 translatepoint3d} solidtransform } def
  /Oxygen2 {
    Oxygen {-90 0 0 rotateOpoint3d} solidtransform
        {0 4.33 0 translatepoint3d} solidtransform } def
  /CO{Oxygen1 Carbon solidfuz} def
  /CO2 {CO Oxygen2 solidfuz} def
  CO2 drawsolid**}
\axesIIID(2.5,7.5,2.5)(15,15,12)
\end{pspicture}
```

11.4 CO_2 : modèle éclaté



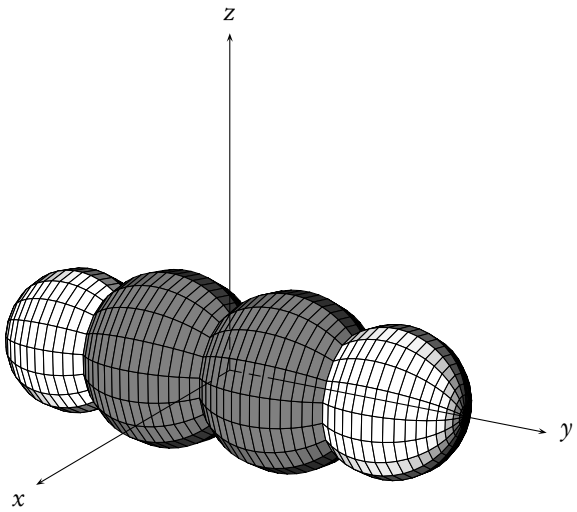

```
\begin{pspicture}(-7,-3)(7,6)
\pstVerb{/DarkGray {0.2 setgray} def}%
\psset{lightsrc=92 16 35,lightintensity=2,
       viewpoint=100 30 20,Decran=30,SphericalCoor}
\psset{linecolor={[cmyk]{0 0.72 1 0.45}},
       linewidth=0.5\pslinewidth}
\codejps{
% r phi theta [ngrid] newcalottesphere
  /Oxygen {
  5 -30 90 [16 18] newcalottesphere
  dup videsolid
  dup (rouge) outputcolors
  } def
  /Carbon {
  5 -30 30 [16 18] newcalottesphere
  {90 0 0 rotateOpoint3d} solidtransform
  dup (DarkGray) outputcolors
  } def
/Liaison {
     0 0.5 15 [10 10] newcylindre
     {-90 0 0 rotateOpoint3d} solidtransform
      dup (White) outputcolors
   } def
/L1 { Liaison {0 -17.5 1.5 translatepoint3d} solidtransform } def
/L2 { Liaison {0 -17.5 -1.5 translatepoint3d} solidtransform } def
/L3 { Liaison {0 2.5 1.5 translatepoint3d} solidtransform } def
/L4 { Liaison {0 2.5 -1.5 translatepoint3d} solidtransform } def
/Oxygen1 {Oxygen {90 0 0 rotateOpoint3d} solidtransform
                 {0 -19.33 0 translatepoint3d} solidtransform } def
/Oxygen2 {Oxygen {-90 0 0 rotateOpoint3d} solidtransform
                 {0 19.33 0 translatepoint3d} solidtransform } def
/Oxygen1L1 {Oxygen1 L1 solidfuz} def
/Oxygen1L12 {Oxygen1L1 L2 solidfuz} def
/CO1L12{Oxygen1L12 Carbon solidfuz} def
/Oxygen2L3 {Oxygen2 L3 solidfuz} def
/Oxygen2L34 {Oxygen2L3 L4 solidfuz} def
/CO2 {CO1L12 Oxygen2L34 solidfuz} def
  CO2 drawsolid**}
%/L1234 {L12 L34 solidfuz} def
%L1234 drawsolid**}
\axesIIID(2.5,2.5,2.5)(15,25,15)
\end{pspicture}
```

11.5 Modèle éclaté du N_2



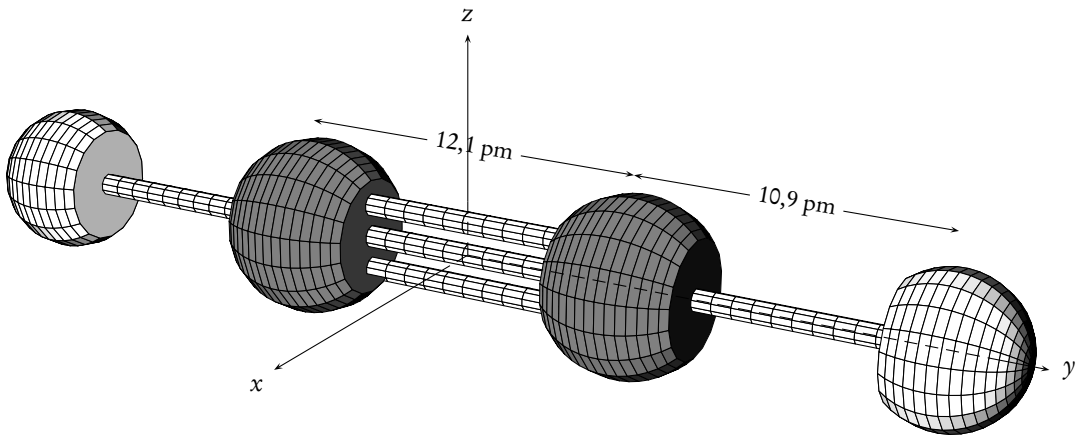

```
\begin{pspicture}(-7,-2)(7,5)
\psset{lightsrc=92 16 35,lightintensity=2,
       viewpoint=100 30 20,Decran=30,SphericalCoor}
\psset{linecolor={[cmyk]{0 0.72 1 0.45}},
       linewidth=0.5\pslinewidth}
\codejps{
% r phi theta [ngrid] newcalottesphere
  /Nitrogen {
  5 -30 90 [16 18] newcalottesphere
  {0 180 0 rotateOpoint3d} solidtransform
  dup videsolid
  dup (bleu) outputcolors
  } def
/Liaison {
     0 0.5 15 [18 10] newcylindre
      dup (White) outputcolors
   } def
/L1 {Liaison {0 -1.5 2 translatepoint3d} solidtransform } def
/L2 {Liaison {0 1.5 2 translatepoint3d} solidtransform } def
/L3 {Liaison {0 0 2 translatepoint3d} solidtransform } def
/NitrogenL1 {Nitrogen L1 solidfuz} def
/NitrogenL12 {NitrogenL1 L2 solidfuz} def
/NitrogenL123 {NitrogenL12 L3 solidfuz} def
/N2{NitrogenL123 Nitrogen {0 180 0 rotateOpoint3d} solidtransform {0 0 17 translatepoint3d} solidtransform
   solidfuz} def
N2 {60 0 0 rotateOpoint3d} solidtransform {0 0 45 rotateOpoint3d} solidtransform drawsolid**}
\axesIIID(2.5,2.5,2.5)(15,15,15)
\end{pspicture}
```

11.6 Modèle compact de l'acétylène



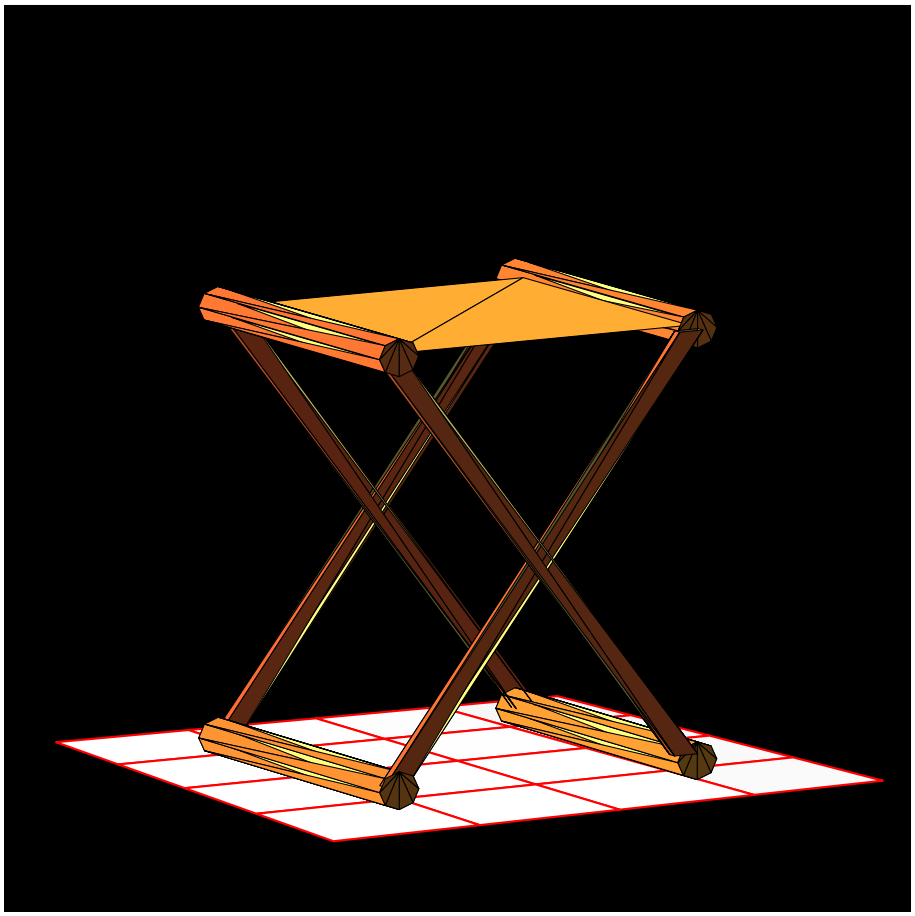

```
\begin{pspicture}(-7,-2)(7,5)
\psset{lightsrc=92 16 35,lightintensity=2,linewidth=0.5\pslinewidth,
       viewpoint=100 30 20,Decran=30,SphericalCoor}
\pstVerb{/DarkGray {0.5 setgray} def}%
\codejps{
% r phi theta [ngrid] newcalottesphere
  /Carbon {
  4 -48.6 48.6 [16 18] newcalottesphere
  {0 90 0 rotateOpoint3d} solidtransform
  dup (DarkGray) outputcolors
  } def
  /Hydrogen {
  3.317 -37.1 90 [16 18] newcalottesphere
  dup videsolid
  dup (White) outputcolors
  } def
/C2H2 {Hydrogen {0 -90 0 rotateOpoint3d} solidtransform
               {-8 0 0 translatepoint3d} solidtransform
      Carbon   {-3 0 0 translatepoint3d} solidtransform
        solidfuz
      Carbon   {3 0 0 translatepoint3d} solidtransform
        solidfuz
      Hydrogen {0 90 0 rotateOpoint3d} solidtransform
              {8 0 0 translatepoint3d} solidtransform
        solidfuz} def
C2H2 {0 0 90 rotateOpoint3d} solidtransform drawsolid**}
\axesIIID(2.5,2.5,2.5)(15,15,15)
\end{pspicture}
```

11.7 Modèle éclaté de l'acétylène

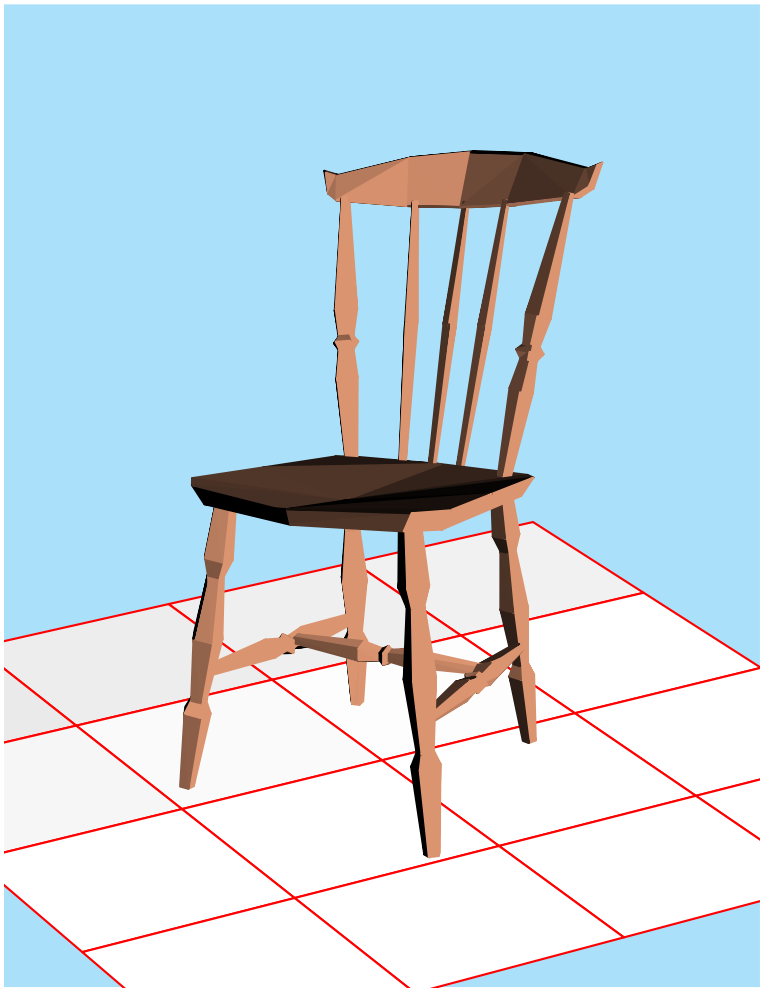



```
\begin{pspicture}(-7,-2.5)(7,3)
\psset{lightsrc=92 16 35,lightintensity=2,linewidth=0.5\pslinewidth,
       viewpoint=100 30 20,Decran=30,SphericalCoor}
\pstVerb{/DarkGray {0.5 setgray} def}%
\codejps{
  /Carbon {
  4 -48.6 48.6 [16 18] newcalottesphere
  {0 90 0 rotateOpoint3d} solidtransform
  dup (DarkGray) outputcolors
  } def
  /Hydrogen {
  3.317 -37.1 90 [16 18] newcalottesphere
  dup videsolid dup (White) outputcolors
  } def
/LiaisonCH {
     0 0.5 9 [10 10] newcylindre
      dup (White) outputcolors
   } def
/LiaisonCC {
     0 0.5 10 [10 10] newcylindre
      dup (White) outputcolors
   } def
/C2H2 {Carbon {-8 0 0 translatepoint3d} solidtransform
     Carbon {8 0 0 translatepoint3d} solidtransform
        solidfuz
     LiaisonCC {0 -90 0 rotateOpoint3d} solidtransform
               {5 0 0 translatepoint3d} solidtransform
       solidfuz
     LiaisonCC {0 -90 0 rotateOpoint3d} solidtransform
               {5 0 1.5 translatepoint3d} solidtransform
       solidfuz
     LiaisonCC {0 -90 0 rotateOpoint3d} solidtransform
               {5 0 -1.5 translatepoint3d} solidtransform
       solidfuz
     LiaisonCH {0 -90 0 rotateOpoint3d} solidtransform
               {-11 0 0 translatepoint3d} solidtransform
      solidfuz
      Hydrogen {0 90 0 rotateOpoint3d} solidtransform
               {22 0 0 translatepoint3d} solidtransform
        solidfuz
      LiaisonCH {0 90 0 rotateOpoint3d} solidtransform
               {11 0 0 translatepoint3d} solidtransform
      solidfuz
      Hydrogen {0 -90 0 rotateOpoint3d} solidtransform
               {-22 0 0 translatepoint3d} solidtransform
        solidfuz } def
C2H2 {0 0 90 rotateOpoint3d} solidtransform drawsolid**}
\psPoint(0,8,5){C2}\psPoint(0,22,5){H2}
\psPoint(0,-8,5){C1}\pcline{<->}(C1)(C2)
\lput*{:U}{\small 12,1 pm}
\pcline{<->}(C2)(H2)\lput*{:U}{\small 10,9 pm}
\axesIIID(2.5,24,2.5)(15,26,10)
\end{pspicture}
```

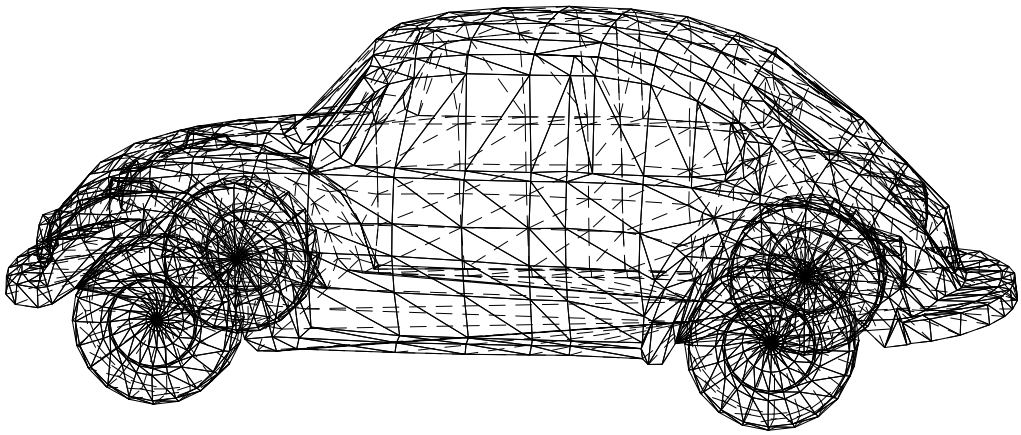
12 Un pliant



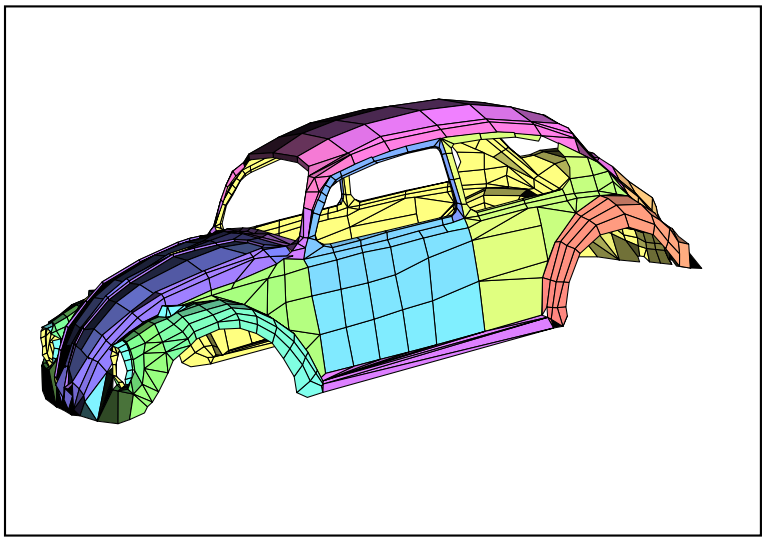
13 Une chaise



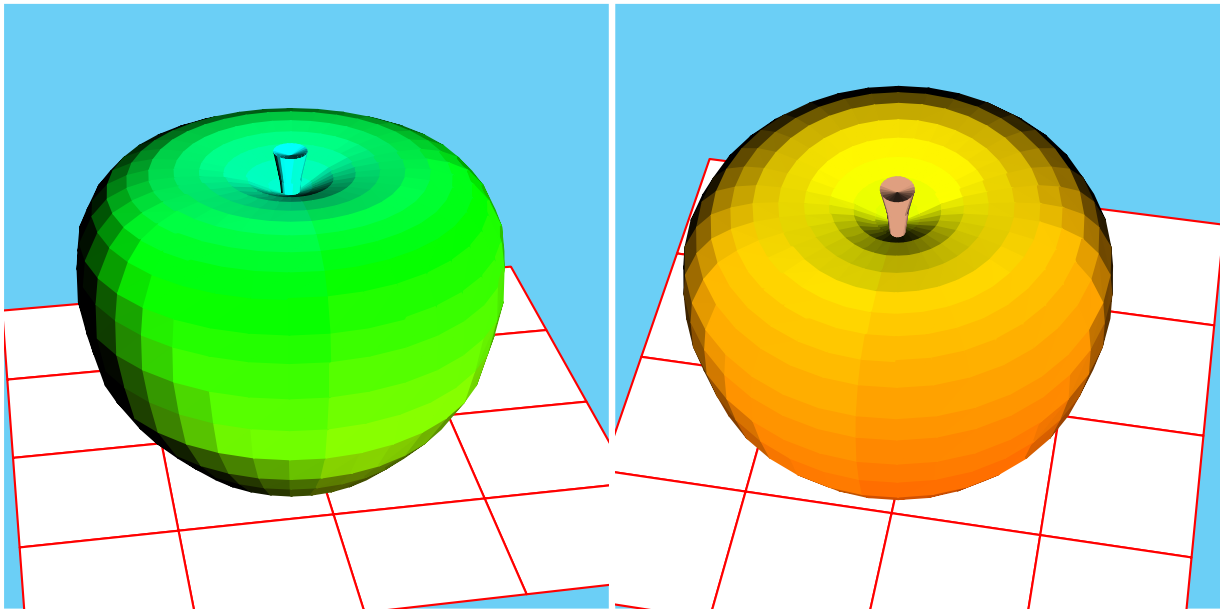
14 Une coccinelle VW



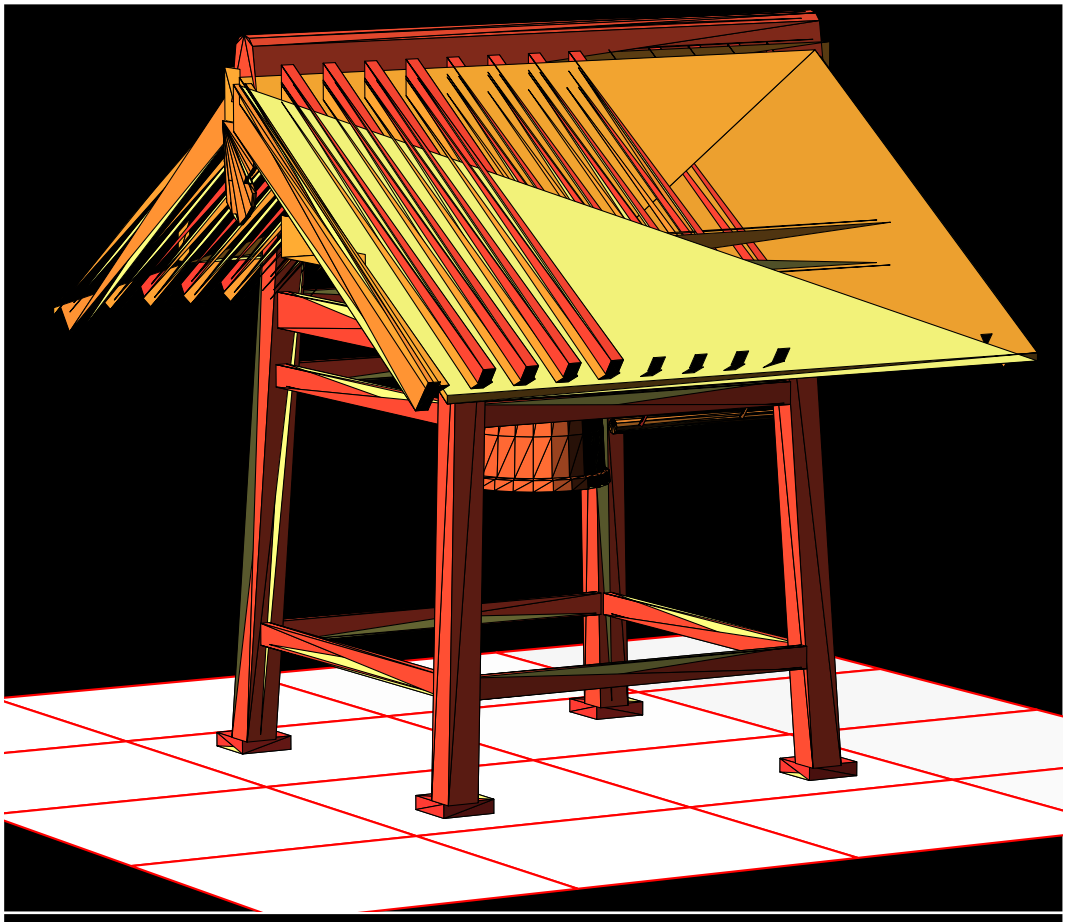
15 Une VW multicolore

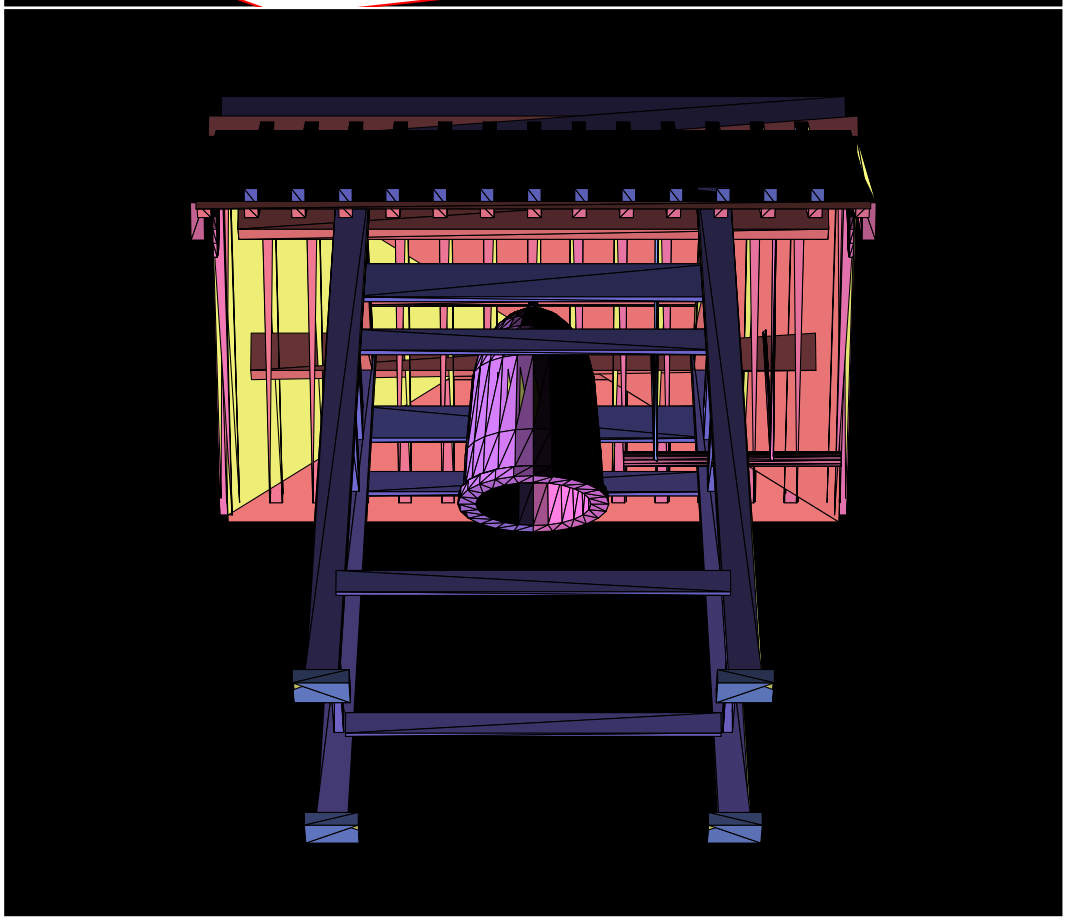


16 Une pomme

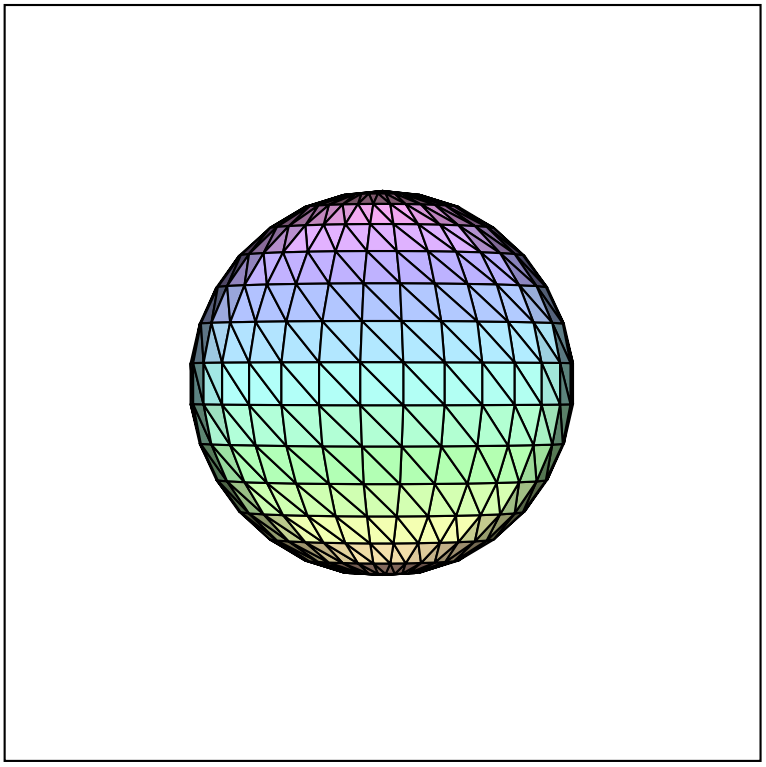


17 Un shu

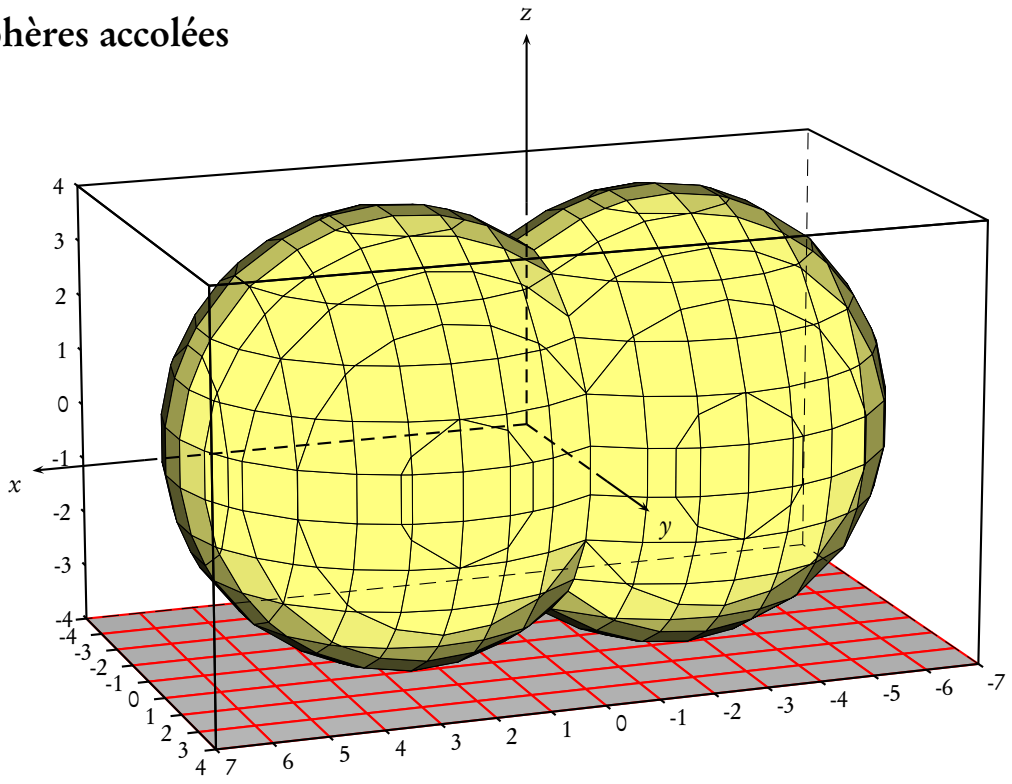




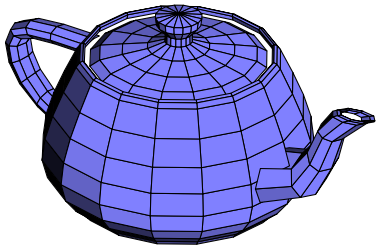
18 Une sphère



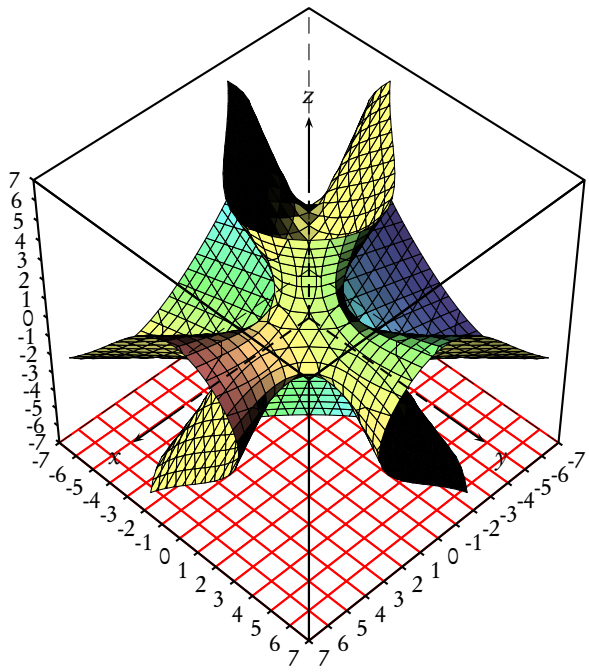
19 Sphères accolées

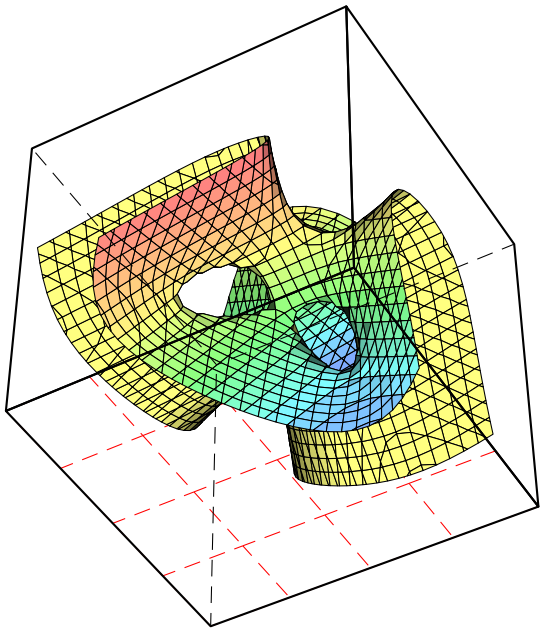


20 Une théière

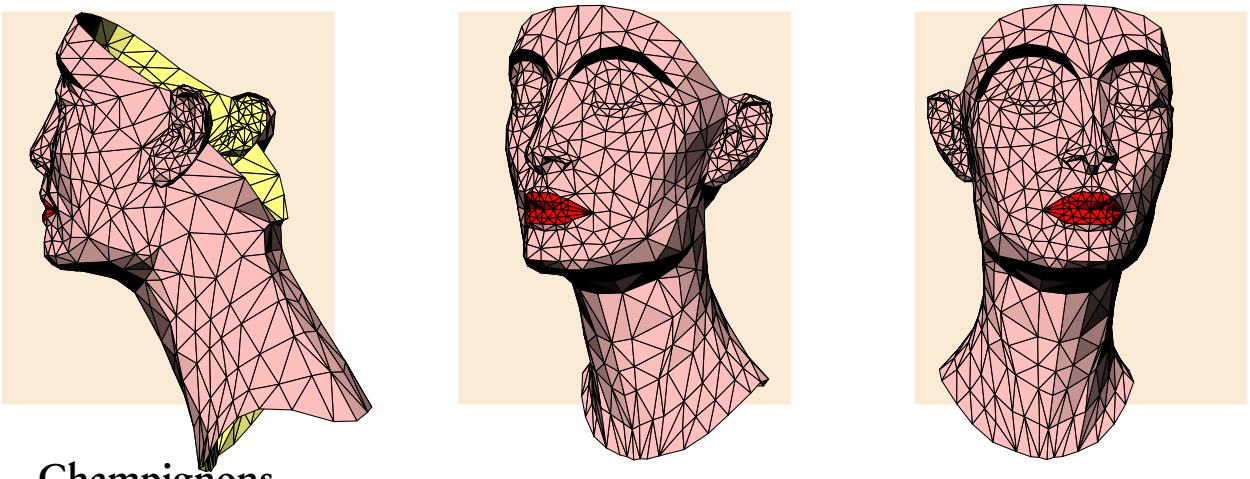


21 Surface de Clebsch

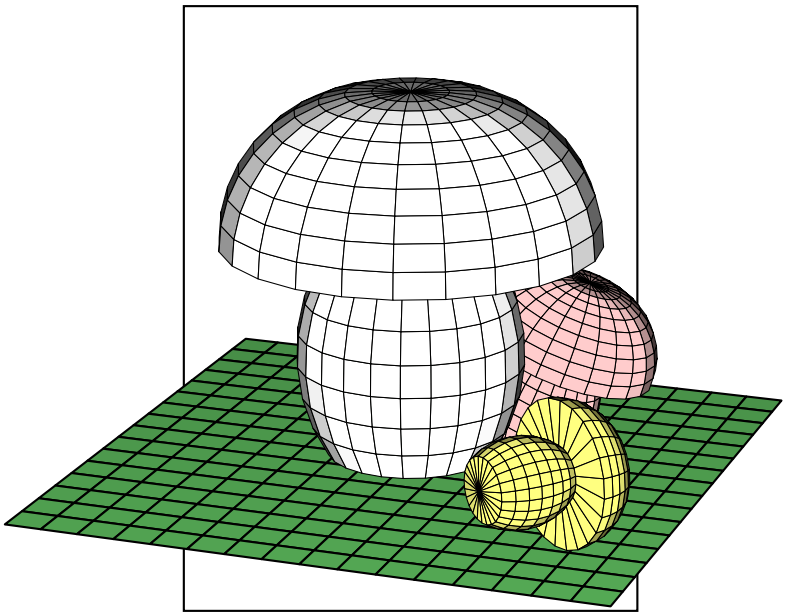




22 Nefertiti



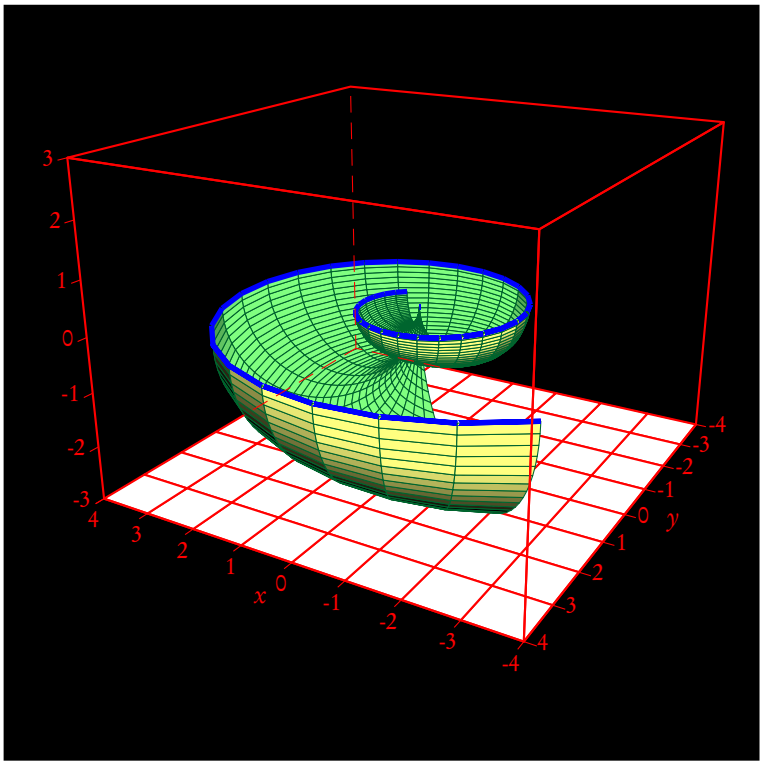
23 Champignons



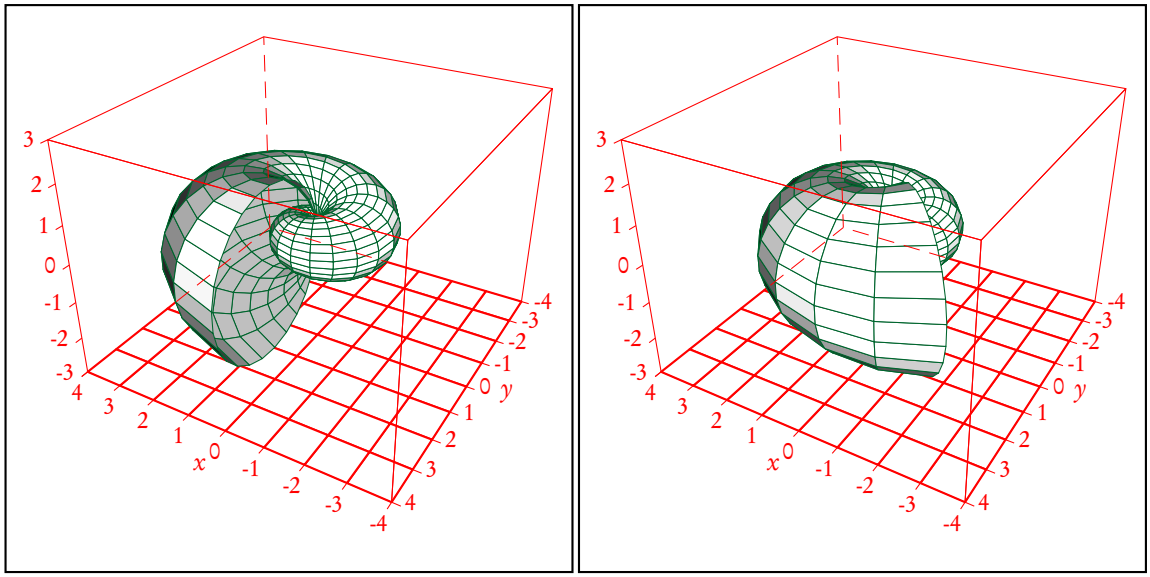
```
\newcommand\SectionChampignon{
 /r3 0.2 R mul def
 0 0 %1
% 0 r1 0 % 2
 -33 10 43 { /Angle ED
    Angle cos 0.5 h mul mul 0.2 h mul sub
      Angle sin 0.5 h mul mul 0.3 h mul add
      } for
 0 10 90 {
    /Angle ED
    0.8 R mul Angle cos mul r3 add 0.8 R mul Angle sin mul 0.6 h mul add
    } for
 0 h
}
\begin{pspicture}(-3,-6)(3,6)
\psframe(-3,-2)(3,6)
\psset[pst-solides3d]{SphericalCoor=true,viewpoint=100 20 20,Decran=50,lightsrc=90 30 30}
\psSolid[object=grille,base=-8 8 -8 8,action=draw**,fillcolor=green!50]%
\psSolid[object=anneau,section=\SectionChampignon,fillcolor=red!20,h=10,R=5,r=0,unit=0.5,RotX=-20,linewidth
   =0.5\pslinewidth](-4,5,0)
\psSolid[object=anneau,section=\SectionChampignon,fillcolor=white,h=10,R=5,r=0,linewidth=0.5\pslinewidth]%
\psSolid[object=anneau,section=\SectionChampignon,fillcolor=yellow!50,h=10,R=5,r=0,unit=0.4,RotY=-90,RotZ=-40,
   linewidth=0.5\pslinewidth](4,6,0)
\end{pspicture}
```

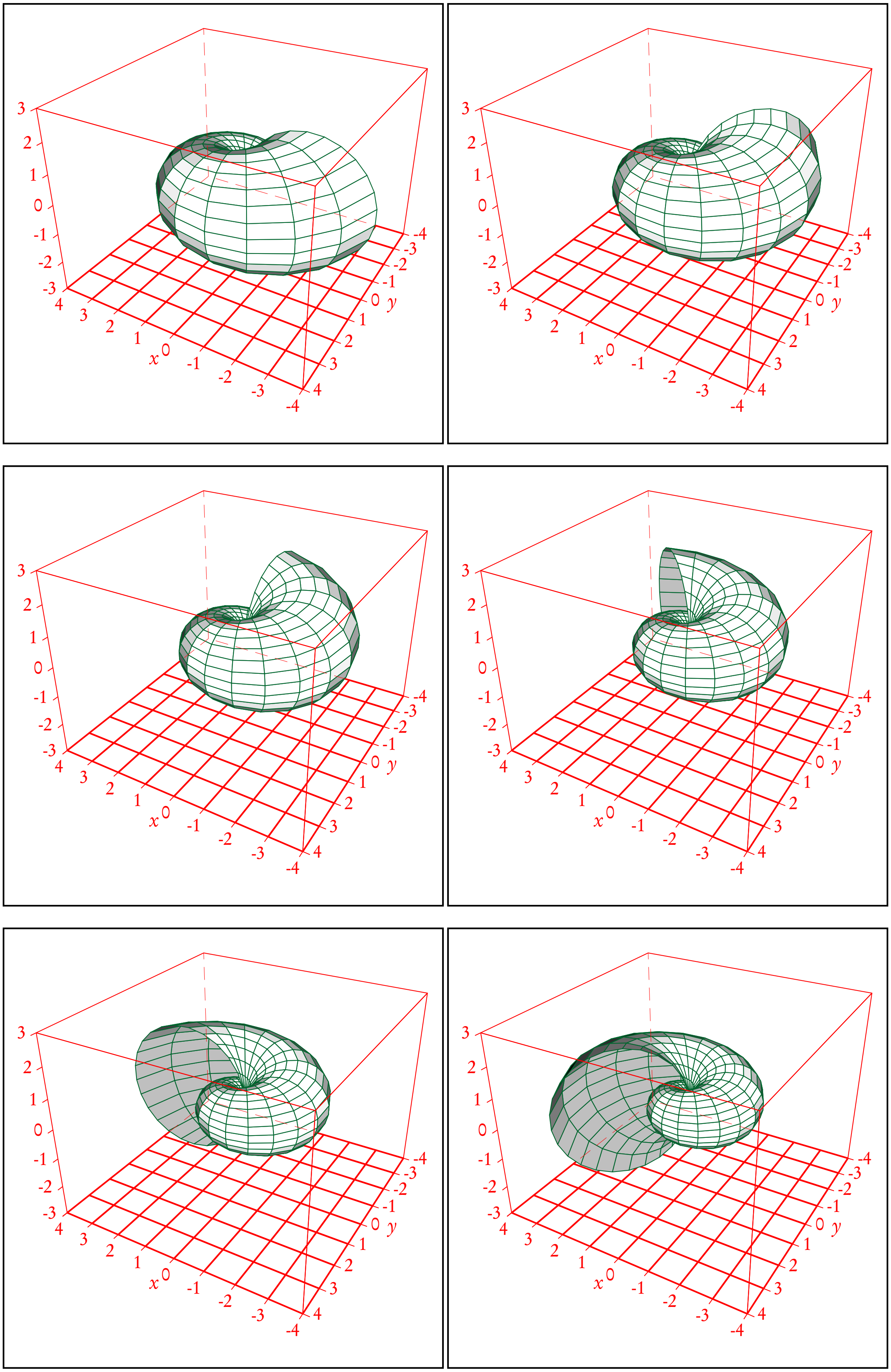
```
\newcommand\SectionAmanite{
 /radius1 h 8 div 1.52 mul def
 /xC1 h 8 div 0.25 mul def
 /yC1 h 8 div 1.5 mul def
 /radius2 h 8 div 4.5 mul dup mul h 8 div 2 mul dup mul add sqrt 4 div 4.5 mul def
 /xC2 0 def
 /yC2 h 8 div 2.46 mul def
-110 10 70 { /Angle ED
            Angle cos radius1 mul xC1 add
              Angle sin radius1 mul yC1 add
            } for
h 8 div 0.5 mul h 8 div 6 mul
40 10 90 {/Angle ED
            Angle cos radius2 mul xC2 add
              Angle sin radius2 mul yC2 add
            } for
 0 h
}
\begin{pspicture}(-3,-6)(3,6)
\psframe*(-3,-2)(3,6)
\psset[pst-solides3d]{SphericalCoor,viewpoint=100 20 20,Decran=50,lightsrc=90 30 30}
\psSolid[object=grille,base=-8 8 -8 8,action=draw**,hue=0.2 0.5 0.5 1,grid](0,0,0)
\psSolid[object=anneau,section=\SectionAmanite,h=8,R=5,r=0,hue=0 1 0.5 1,unit=0.5,grid,RotX=-20](-4,5,0)
\psSolid[object=anneau,section=\SectionAmanite,h=8,R=5,r=0,hue=0 1 0.5 1,grid](0,0,0)
\psSolid[object=anneau,section=\SectionAmanite,h=8,R=5,r=0,hue=0 1 0.5 1,grid,unit=0.4,RotY=-90,RotZ
  =-50](4,6,0)
\end{pspicture}
```

24 Un demi-coquillage

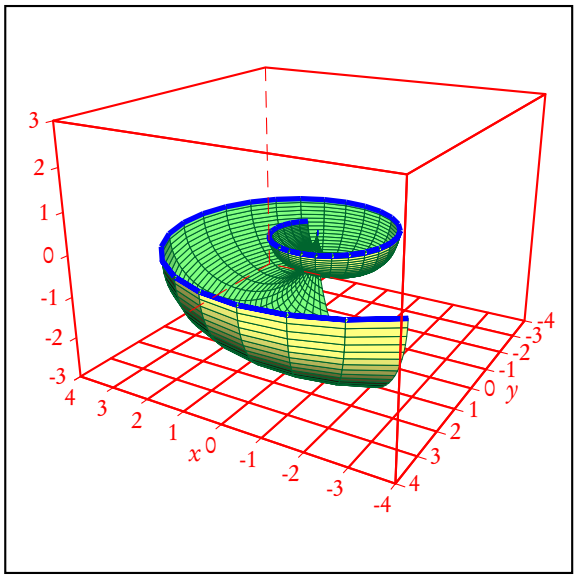


25 Un coquillage qui tourne

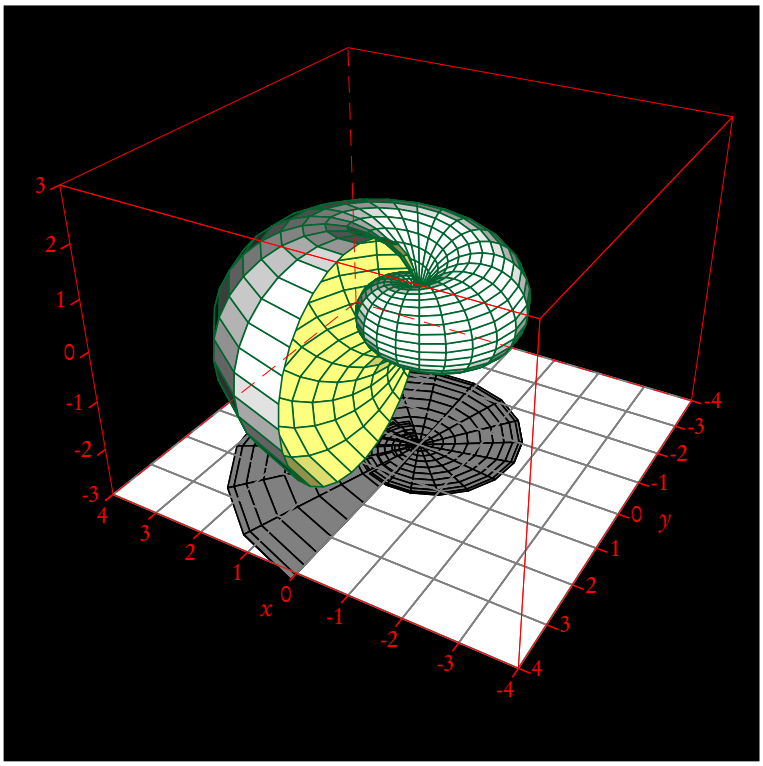




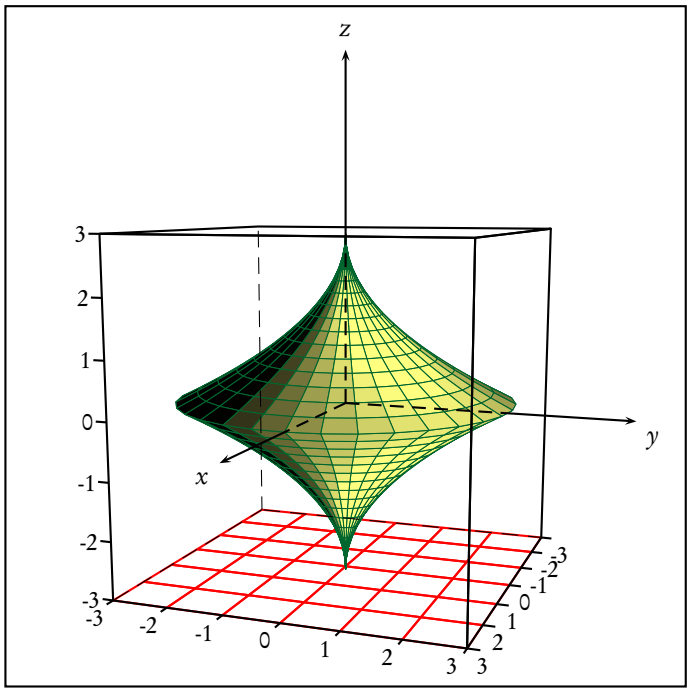
x
y



26 Un coquillage et son ombre

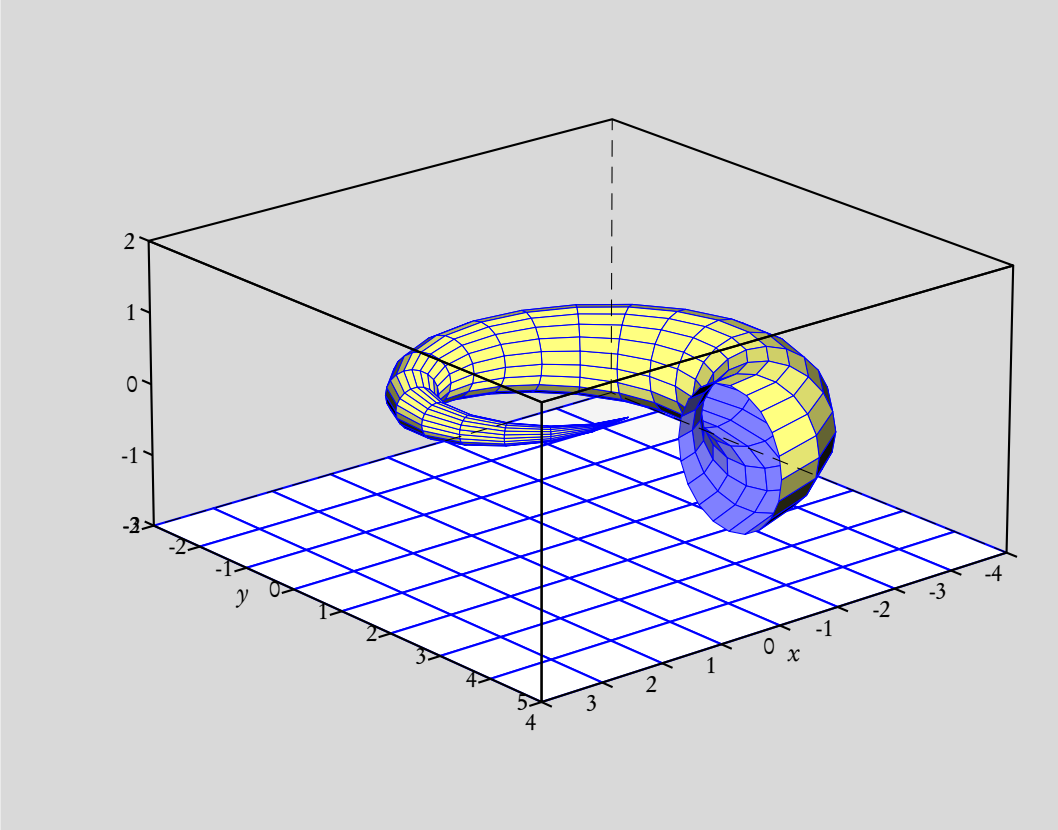


27 Une toupie



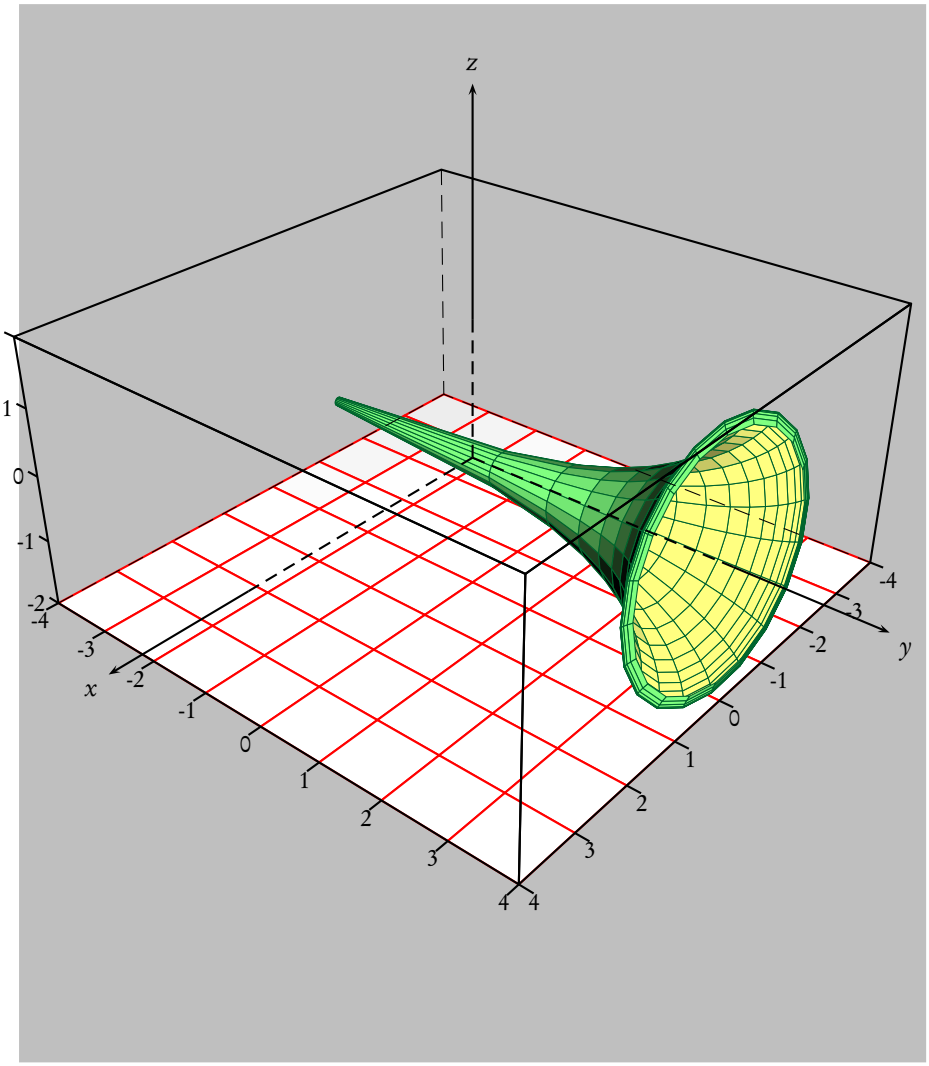

```
\psset{unit=0.75}
\begin{pspicture}(-6,-5)(6,7)
\psframe(-6,-5)(6,7)
\psset[pst-solides3d]{viewpoint=20 20 10,SphericalCoor,Decran=20,lightsrc=10 15 0}
% Parametric Surfaces
\psSolid[object=grille,base=-3 3 -3 3,action=draw,linecolor=red](0,0,-3)
\defFunction[algebraic]{toupie}(u,v){(abs(u)-1)^2 * cos(v)}{(abs(u)-1)^2 * sin(v)}{u}
\psSolid[object=surfaceparametree,linecolor={[cmyk]{1,0,1,0.5}},
   base=1 -1 0 2 pi mul,incolor=green!50,fillcolor=yellow!50,
   function=toupie,linewidth=0.5\pslinewidth,unit=3,
   ngrid=30]%
\gridIIID[Zmin=-3,Zmax=3](-3,3)(-3,3)
\end{pspicture}
```

28 Corne



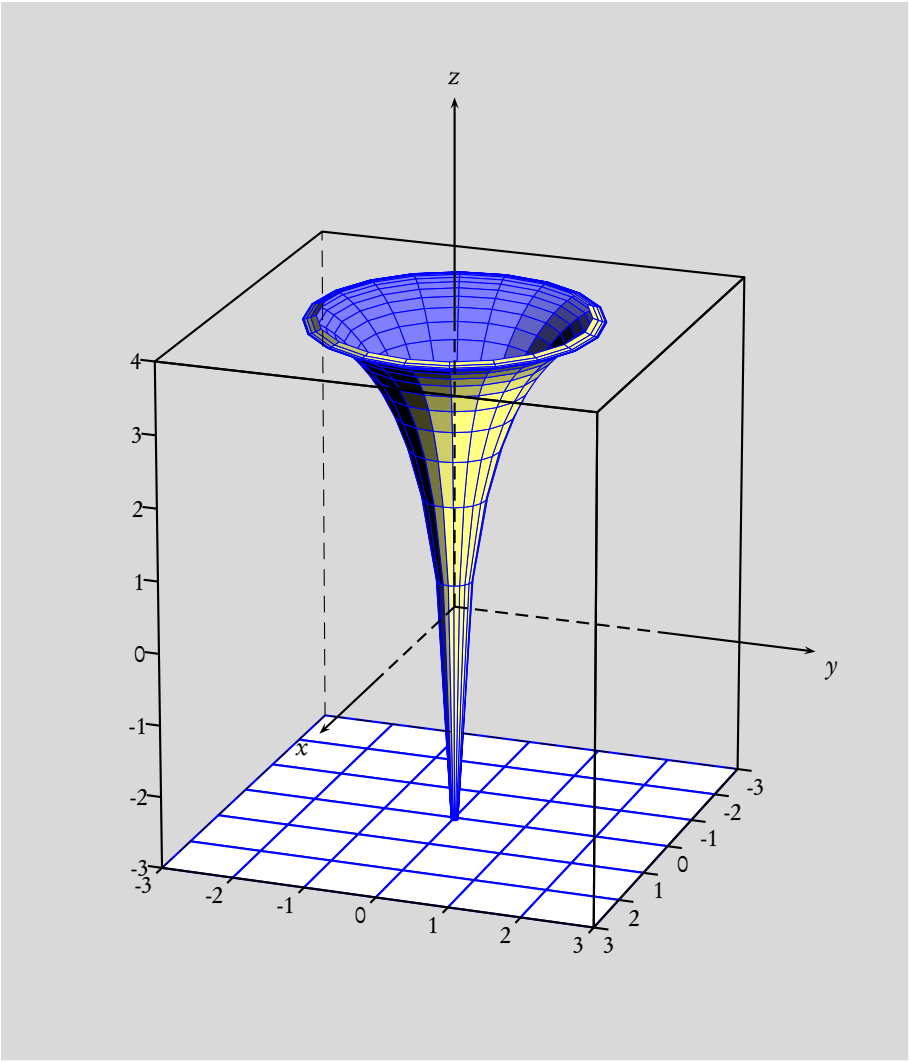

```
\begin{pspicture}(-7,-6)(7,5)
\psframe*[linecolor=gray!30](-7,-6)(7,5)
\psset[pst-solides3d]{viewpoint=100 50 20,SphericalCoor,Decran=100,lightsrc=10 15 10}
\defFunction[algebraic]{corne}(u,v){(2 + u*cos(v))*sin(2*pi*u)}{(2 + u*cos(v))*cos(2*pi*u) + 2*u}{u *sin(v)}
\psSolid[object=grille,base=-4 4 -3 5,action=draw*,linecolor=blue](0,0,-2)
\psSolid[object=surfaceparametree,linecolor=blue,
   base=0 1 0 2 pi mul,fillcolor=blue!50,incolor=yellow!50,
   function=corne,linewidth=0.5\pslinewidth,
   ngrid=20]%
\quadrillage
\end{pspicture}
```

29 Trompette, version 1



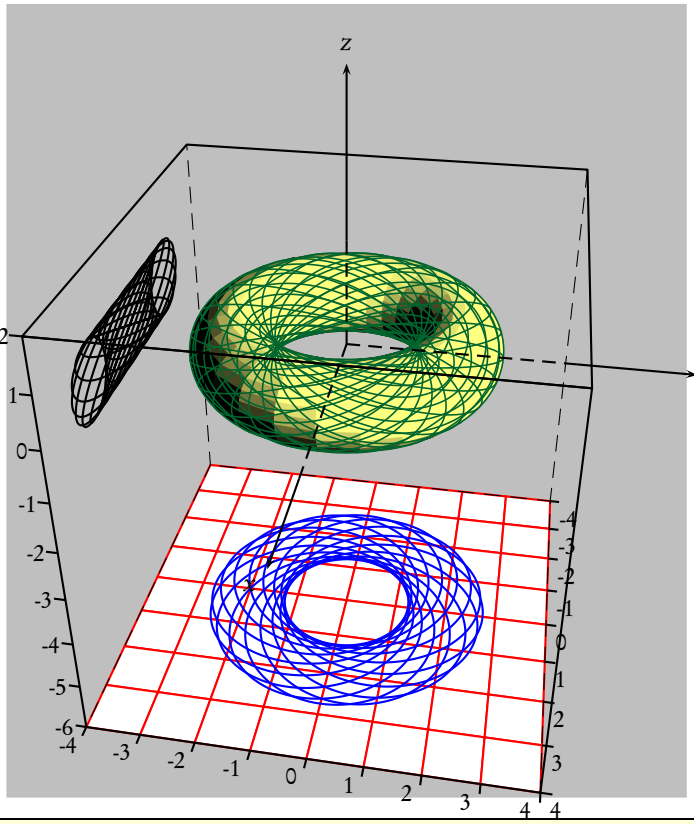

```
\begin{pspicture}(-6,-8)(6,6)
\psframe*[linecolor=gray!50](-6,-8)(6,6)
\psset[pst-solides3d]{viewpoint=20 40 30,SphericalCoor,Decran=20,lightsrc=10 15 10}
\defFunction[algebraic]{trompette}(u,v){cos(u)*sin(v)}{cos(v)+ln(tan(1/2*v))+2}{sin(u)*sin(v)}
% en notation RPN
%\defFunction{trompette}(u,v){u Cos v Sin mul}{v Cos 0.5 v mul Tan log 2.3 mul add}{u Sin v Sin mul}
\psSolid[object=grille,base=-4 4 -4 4,action=draw*,linecolor=red](0,0,-2)
\psSolid[object=surfaceparametree,linecolor={[cmyk]{1,0,1,0.5}},
   base=0 2 pi mul 0.03 2,fillcolor=yellow!50,incolor=green!50,
   function=trompette,linewidth=0.5\pslinewidth,unit=2,
   ngrid=20]%
\gridIIID[Zmin=-2,Zmax=2](-4,4)(-4,4)
\end{pspicture}
```

30 Trompette, version 2



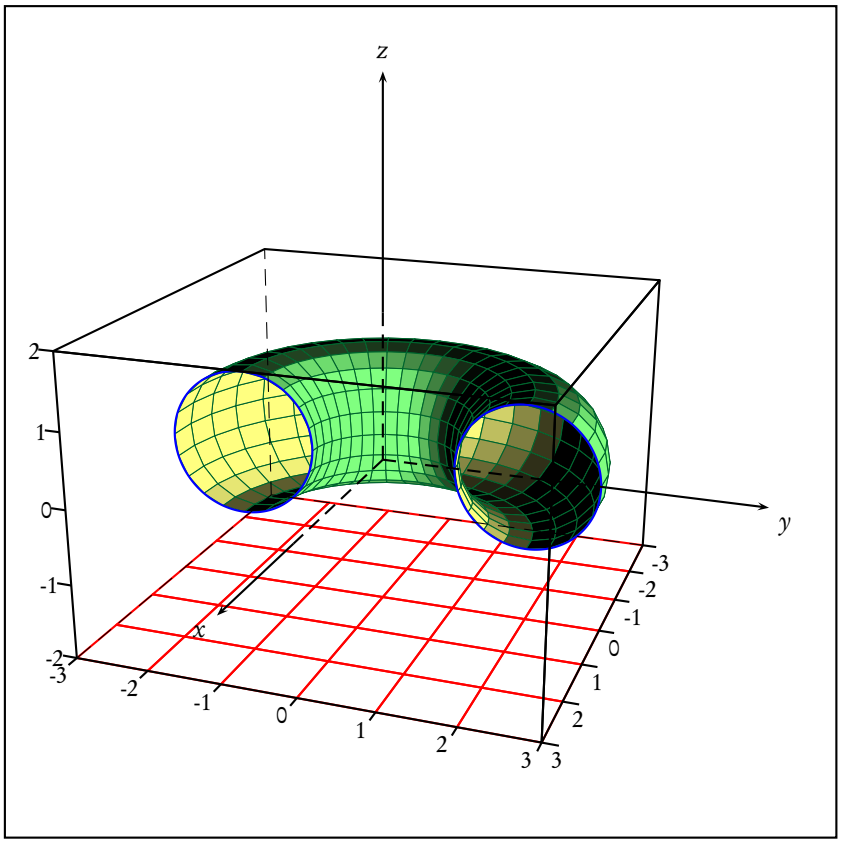

```
\begin{pspicture}(-6,-6)(6,8)
\psframe*[linecolor=gray!30](-6,-6)(6,8)
\psset[pst-solides3d]{viewpoint=100 20 20,SphericalCoor,Decran=100,lightsrc=10 15 10}
\defFunction[algebraic]{trompette}(u,v){cos(u)*sin(v)}{sin(u)*sin(v)}{cos(v)+ln(tan(1/2*v))+2}
\psSolid[object=grille,base=-3 3 -3 3,action=draw*,linecolor=blue](0,0,-3)
\psSolid[object=surfaceparametree,linecolor=blue,
   base=0 2 pi mul 0.0221 2,fillcolor=yellow!50,incolor=blue!50,
   function=trompette,linewidth=0.5\pslinewidth,unit=2,
   ngrid=20]%
\gridIIID[Zmin=-3,Zmax=4,QZ=0.5](-3,3)(-3,3)
\end{pspicture}
```

31 Les cercles de Villarceau



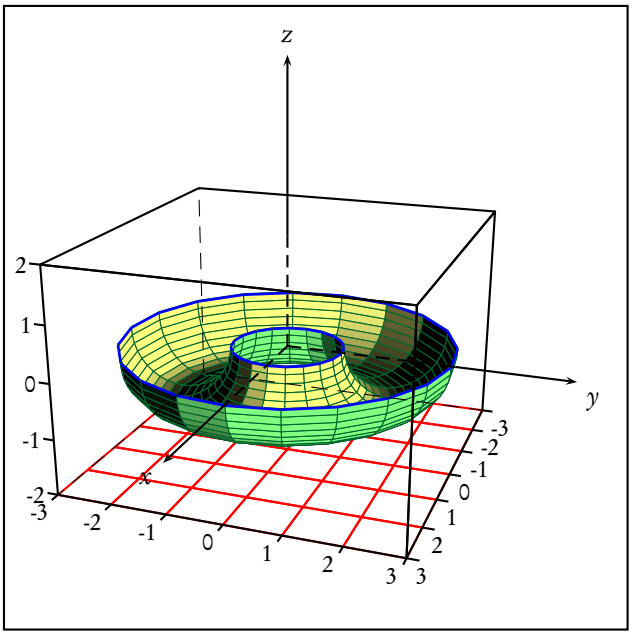

```
\psset{unit=0.75}
\begin{pspicture}(-6,-8)(6,6)
\psframe*[linecolor=gray!50](-6,-8)(6,6)
\psset[pst-solides3d]{viewpoint=20 10 30,SphericalCoor,Decran=20,lightsrc=10 15 10}
\psSolid[object=grille,base=-4 4 -4 4,action=draw*,linecolor=red](0,0,-6)
\defFunction[algebraic]{torus}(u,v){(\Radius+ \radius*cos(u))*cos(v)}{(\Radius+ \radius*cos(u))*sin(v)}{\
   radius*sin(u)}
\psSolid[object=surfaceparametree,
   base=0 2 pi mul 0 2 pi mul ,action=draw**,fillcolor=yellow!50,linecolor=yellow,incolor=yellow!50,grid,
   function=torus,linewidth=0.5\pslinewidth,grid,
   ngrid=25]%
\multido{\r=0+0.3927}{16}{%
\defFunction[algebraic]{villarceauxy}(t){sqrt(\Radius^2-\radius^2)*cos(\r)*sin(t)-(\radius+\Radius*cos(t))*sin
   (\r)}{sqrt(\Radius^2-\radius^2)*sin(\r)*sin(t)+(\radius+\Radius*cos(t))*cos(\r)}{-6}
\psSolid[object=courbe,
    range=0 2 pi mul,linecolor=blue,
    resolution=360,function=villarceauxy]%
\defFunction[algebraic]{villarceau}(t){sqrt(\Radius^2-\radius^2)*cos(\r)*sin(t)-(\radius+\Radius*cos(t))*sin(\
   r)}{sqrt(\Radius^2-\radius^2)*sin(\r)*sin(t)+(\radius+\Radius*cos(t))*cos(\r)}{\radius*sin(t)}
\psSolid[object=courbe,
    range=0 2 pi mul,
    linecolor={[cmyk]{1,0,1,0.5}},linewidth=0.75\pslinewidth,
    resolution=360,
    function=villarceau]%
\defFunction[algebraic]{villarceau}(t){sqrt(\Radius^2-\radius^2)*cos(\r)*sin(t)+(\radius+\Radius*cos(t))*sin(\
   r)}{sqrt(\Radius^2-\radius^2)*sin(\r)*sin(t)-(\radius+\Radius*cos(t))*cos(\r)}{\radius*sin(t)}
\psSolid[object=courbe,
    range=0 2 pi mul,
    linecolor={[cmyk]{1,0,1,0.5}},linewidth=0.75\pslinewidth,
    resolution=360,
    function=villarceau]%
\defFunction[algebraic]{villarceauyz}(t){sqrt(\Radius^2-\radius^2)*cos(\r)*sin(t)-(\radius+\Radius*cos(t))*sin
   (\r)}{-4}{\radius*sin(t)}
\psSolid[object=courbe,
    range=0 2 pi mul,
    resolution=360,
    function=villarceauyz]}
\gridIIID[Zmin=-6,Zmax=2,QZ=-2](-4,4)(-4,4)
\end{pspicture}
```

32 Un tore coupé par un plan méridien




```
\begin{pspicture}(-5,-5)(6,6)
\psframe(-5,-5)(6,6)
\psset[pst-solides3d]{viewpoint=20 20 20,SphericalCoor,Decran=20,lightsrc=10 15 0}
% Parametric Surfaces
\psSolid[object=grille,base=-3 3 -3 3,action=draw,linecolor=red](0,0,-2)
\defFunction[algebraic]{torus}(u,v){(1+ 0.5*cos(u))*cos(v)}{(1+ 0.5*cos(u))*sin(v)}{0.5*sin(u)}
\psSolid[object=surfaceparametree,linecolor={[cmyk]{1,0,1,0.5}},
   base=0 2 pi mul pi 2 div neg pi 2 div,fillcolor=yellow!50,incolor=green!50,
   function=torus,linewidth=0.5\pslinewidth,unit=2,RotZ=180,
   ngrid=20]%
\defFunction[algebraic]{cercleA}(t){0}{0.5*cos(t)+1}{0.5*sin(t)}
\psSolid[object=courbe,
    range=0 2 pi mul,unit=2,
    linecolor=blue,
    resolution=360,
    function=cercleA]%
\defFunction[algebraic]{cercleB}(t){0}{0.5*cos(t)-1}{0.5*sin(t)}
\psSolid[object=courbe,
    range=0 2 pi mul,unit=2,
    linecolor=blue,
    resolution=360,
    function=cercleB]%
\gridIIID[Zmin=-2,Zmax=2](-3,3)(-3,3)
\end{pspicture}
```

33 Un tore coupé par l'équateur




```
\psset{unit=0.75}
\begin{pspicture}(-5,-5)(6,6)
\psframe(-5,-5)(6,6)
\psset[pst-solides3d]{viewpoint=20 20 20,SphericalCoor,Decran=20,lightsrc=10 15 0}
% Parametric Surfaces
\psSolid[object=grille,base=-3 3 -3 3,action=draw,linecolor=red](0,0,-2)
\defFunction[algebraic]{torus}(u,v){(1+ 0.5*cos(u))*cos(v)}{(1+ 0.5*cos(u))*sin(v)}{0.5*sin(u)}
\psSolid[object=surfaceparametree,linecolor={[cmyk]{1,0,1,0.5}},
   base=pi neg 0 0 2 pi mul ,fillcolor=yellow!50,incolor=green!50,
   function=torus,linewidth=0.5\pslinewidth,unit=2,
   tracelignedeniveau=true,
   hauteurlignedeniveau=-.01,
   linewidthlignedeniveau=1,
   couleurlignedeniveau=blue,
   ngrid=20]%
\gridIIID[Zmin=-2,Zmax=2](-3,3)(-3,3)
\end{pspicture}
```