

```

0001 // ++++++
0002 funcprot(0);
0003 // ++++++
0004
0005 function [x, y, z]=fSphereData()
0006     u=linspace(-%pi/2, %pi/2, 100);
0007     v=linspace(0, 2*%pi, 100);
0008
0009     x=cos(u)'*cos(v);
0010     y=cos(u)'*sin(v);
0011     z=sin(u)'*ones(v);
0012 endfunction
0013
0014 // ++++++
0015
0016 // defines the color index for each facet, considering dot product
0017 // of each direction of the light (cosang)
0018
0019 function [col]=setSphereColor(cosang, icol)
0020     c1=-0.03; // -88.3°
0021     c2= 0.03; // +88.3°
0022     c3=1;
0023
0024     col=zeros(cosang);
0025
0026     I=find(cosang<=c1);
0027     col(I)=icol(1);
0028     // dark zone
0029
0030     I=find(cosang>c1 & cosang<c2);
0031     col(I)=icol(1)+round(((cosang(I)-c1)/(c2-c1))*(icol(2)-icol(1)));
0032     // small middle zone, uses interpolation
0033
0034     I=find(cosang>=c2);
0035     col(I)=icol(2)+round(((cosang(I)-c2)/(c3-c2))*(icol(3)-icol(2)));
0036     // yellow zone, uses interpolation
0037
0038 endfunction
0039
0040 // ++++++
0041
0042 // Defines 63 colors
0043
0044 function [Cmap0, Cmap1, Cmap2]=setSphereColorMap()
0045     c0=0.3*[1,1,1]; // dark grey
0046     c1=[1,0.85,0.1]; // dark yellow
0047     c2=[1,1,0.5]; // light yellow
0048
0049     Cmap0=[1,1,1]; // 1 color
0050
0051     p=(0:30)'/30; // 31 values
0052
0053     Cmap1=CL_dMult(1-p, c0)+CL_dMult(p, c1);
0054     // grey .. dark yellow, 31 colors
0055

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0056     Cmap2=CL_dMult(1-p, c1)+CL_dMult(p, c2);
0057     // dark yellow .. light yellow, 31 colors
0058 endfunction
0059
0060 // ++++++
0061
0062 // Test
0063
0064 [x,y,z]=fSphereData();
0065
0066 [Cmap0,Cmap1,Cmap2]=setSphereColorMap();
0067
0068 tic();
0069
0070 f=scf();
0071 clf(f);
0072
0073 f.visible="off";
0074 f.immediate_drawing="off";
0075
0076 f.color_map=[Cmap0;Cmap1;Cmap2];
0077 icol=1+[1,31,62]; // Color indices
0078
0079 plot3d2(x,y,z);
0080
0081 e=gce();
0082 fcData=e.data;
0083
0084 // The light comes from +z
0085 // d.z is the scalar product of the vector with the direction
0086 // of the light => color
0087
0088 icol=1+[1,31,62];
0089 sphereCol=setSphereColor(fcData.z,icol);
0090
0091 TL=tlist(["3d" "x" "y" "z" "color"],...
0092         fcData.x,fcData.y,fcData.z,sphereCol);
0093
0094 e.data=TL;
0095 e.color_flag=3; // 'interpolated' shading
0096 e.color_mode=-1; // no edges
0097
0098 // graphic settings
0099 a=gca();
0100 a.axes_visible=["off","off","off"];
0101 a.box="off";
0102 a.x_label.text="";
0103 a.y_label.text="";
0104 a.z_label.text="";
0105 a.isoview="on";
0106
0107 f.immediate_drawing="on";
0108 f.visible="on";
0109
0110 dt=(0.8-toc())*1000;

```

```
0111  sleep(max(dt,1)); // sleeps at most 0.8 s
```