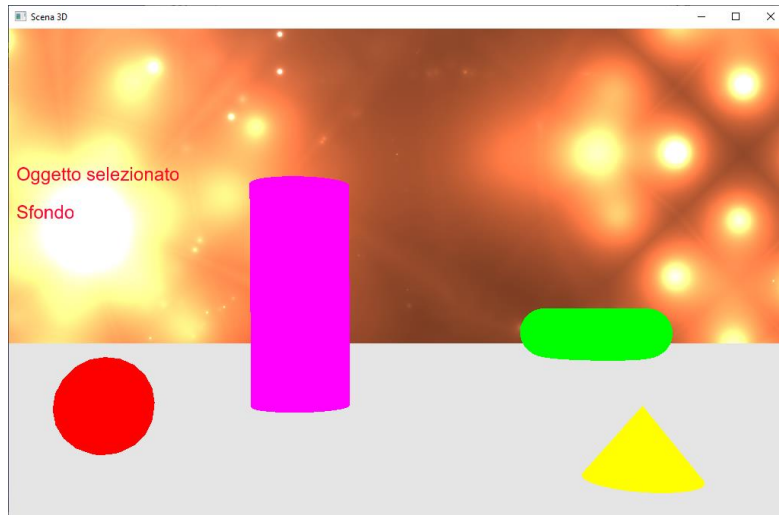


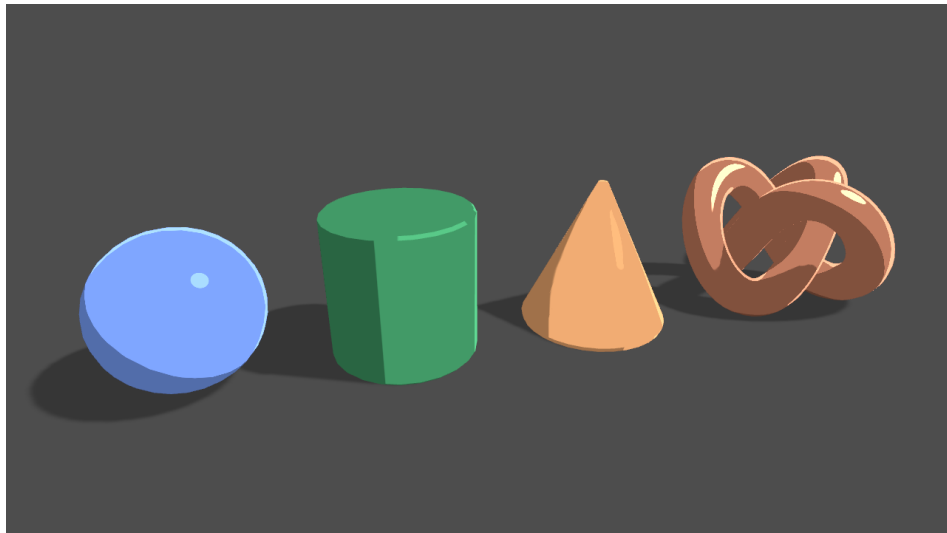
## Laboratory Exercises 9

Download the zip file Laboratorio9\_Studenti\_lab.zip from virtual



- 1) Implement Phong lighting model and interpolative shading model.
- 2) Implement the Blinn-Phong lighting model with interpolative shading model.
- 3) Implement the lighting model of Phon and Blinn-Phong with the shading model of Phong.
- 4) Implement toon shading: in the fragment shader, give the fragment a color based on the cosine of the angle formed between the normal direction and the light direction:

```
intensity= normalize(dot(L,N))  
  
if (intensity > 0.95)  
    FragColor = vec4(1.0,0.5,0.5,1.0);  
else if (intensity > 0.5)  
    FragColor = vec4(0.6,0.3,0.3,1.0);  
else if (intensity > 0.25)  
    FragColor = vec4(0.4,0.2,0.2,1.0);  
else  
    FragColor = vec4(0.2,0.1,0.1,1.0);
```



Example of the effect of toon-shading

5) Add another light in the scene.

6) Allow the user to select the 3D model with the mouse and to modify the type of shaders, materials.