



Modelowanie i wizualizowanie 3W-grafiki Ray tracing. Techniki zaawansowane

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ul. Żołnierska 14

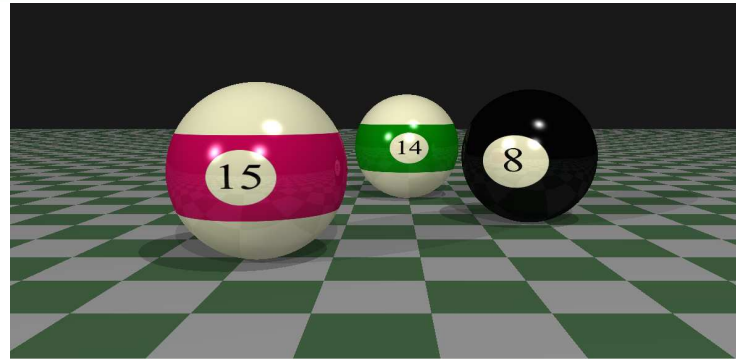
10-561 Olsztyn

Ray tracing. Techniki zaawansowane

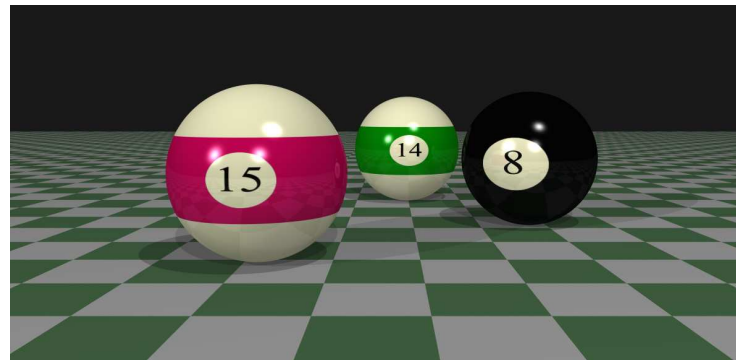
Najnowsza wersja tego dokumentu dostępna jest pod adresem

<http://matman.uwm.edu.pl/~denisjuk/>

Supersampling i Antialiasing



(a) No supersampling.



(b) Supersampling with jittered subpixel centers.

Figure IX.9: An example of anti-aliasing using jittered subpixel centers. (a) shows the scene rendered without supersampling; note the “jaggies” on the silhouettes of the balls, for instance. (b) is the scene with pixels selectively supersampled up to a maximum of 40 times. See color plate C.9.

Supersampling i Antialiasing



(a) No supersampling.



(b) Supersampling with jittered subpixel centers.

Figure IX.10: Close up views of the images in figure IX.9. See color plate C.10.

Głębina ostrości (depth of field)

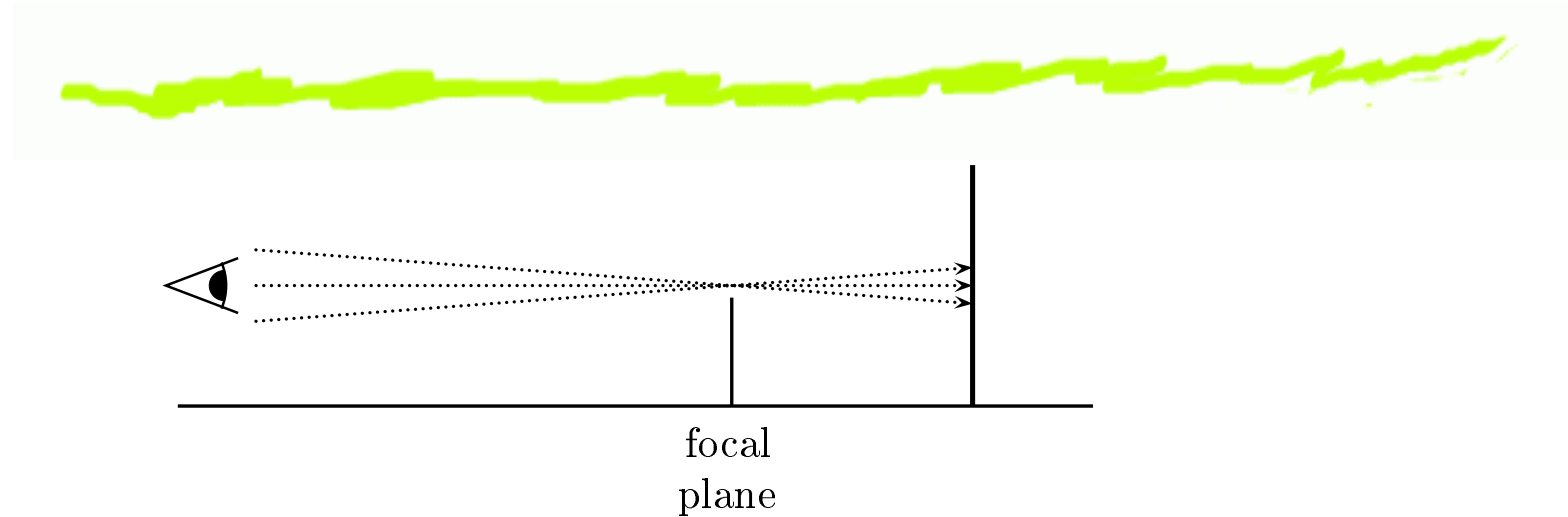


Figure IX.11: The rays from the jittered viewpoints converge at the focal plane, but not at the back plane.

Głębia ostrości

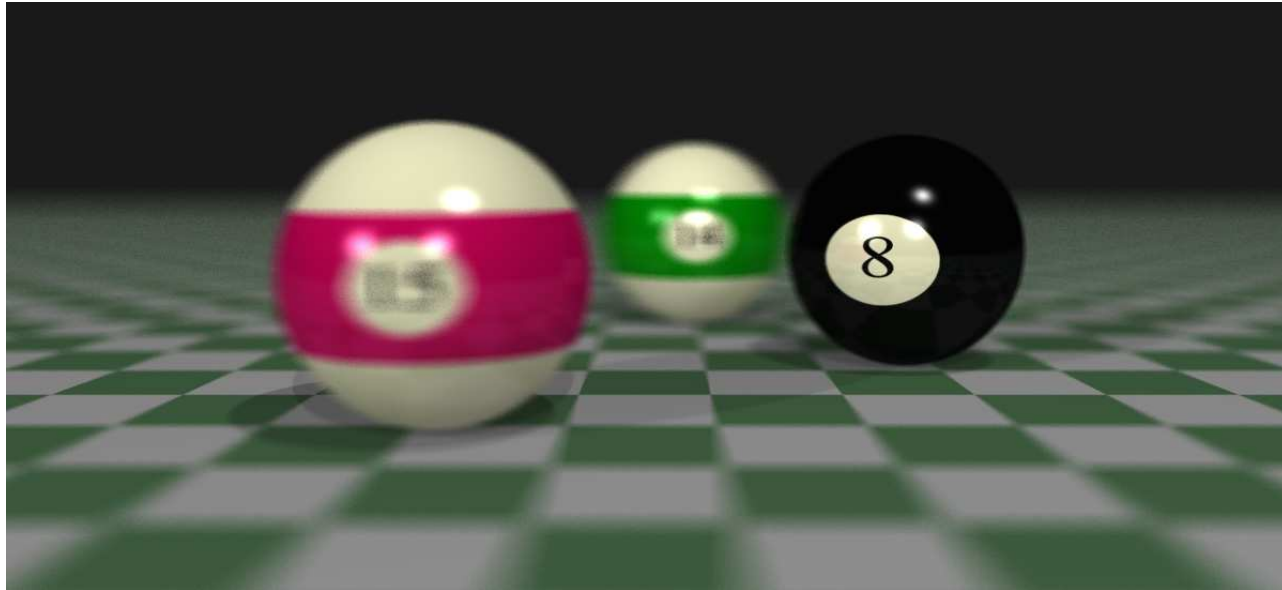


Figure IX.12: An example of depth of field. The front of the eight ball is the focal plane. Note also the blurring of the checkerboard plane. In this image, each pixel is selectively supersampled up to 40 times. The eye positions and the subpixel positions were independently jittered as described on page 315. See color plate C.11.

Rozmazywanie ruchu (motion blur)

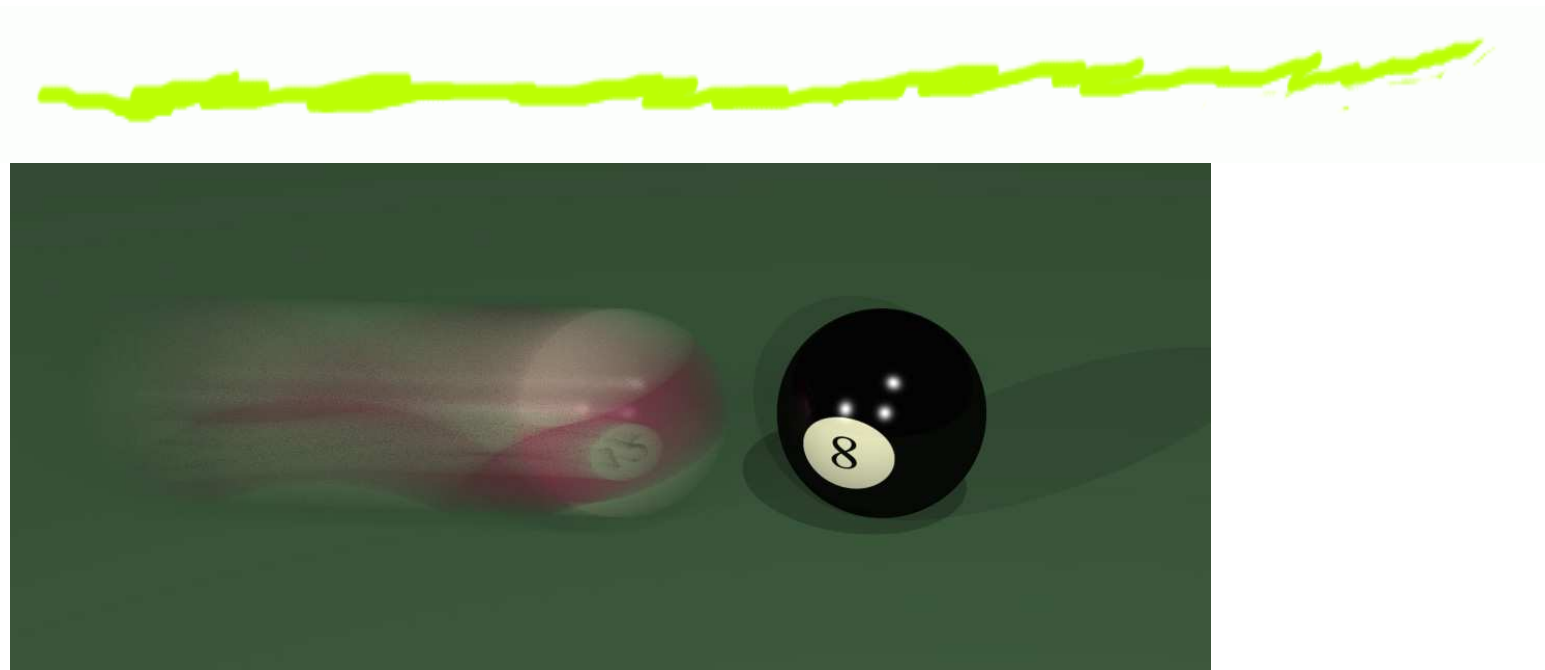


Figure IX.13: An example of motion blur. Pixels were selectively supersampled up to 40 times. Both motion supersampling and subpixel supersampling were used. See color plate C.12.

Miękie cienie

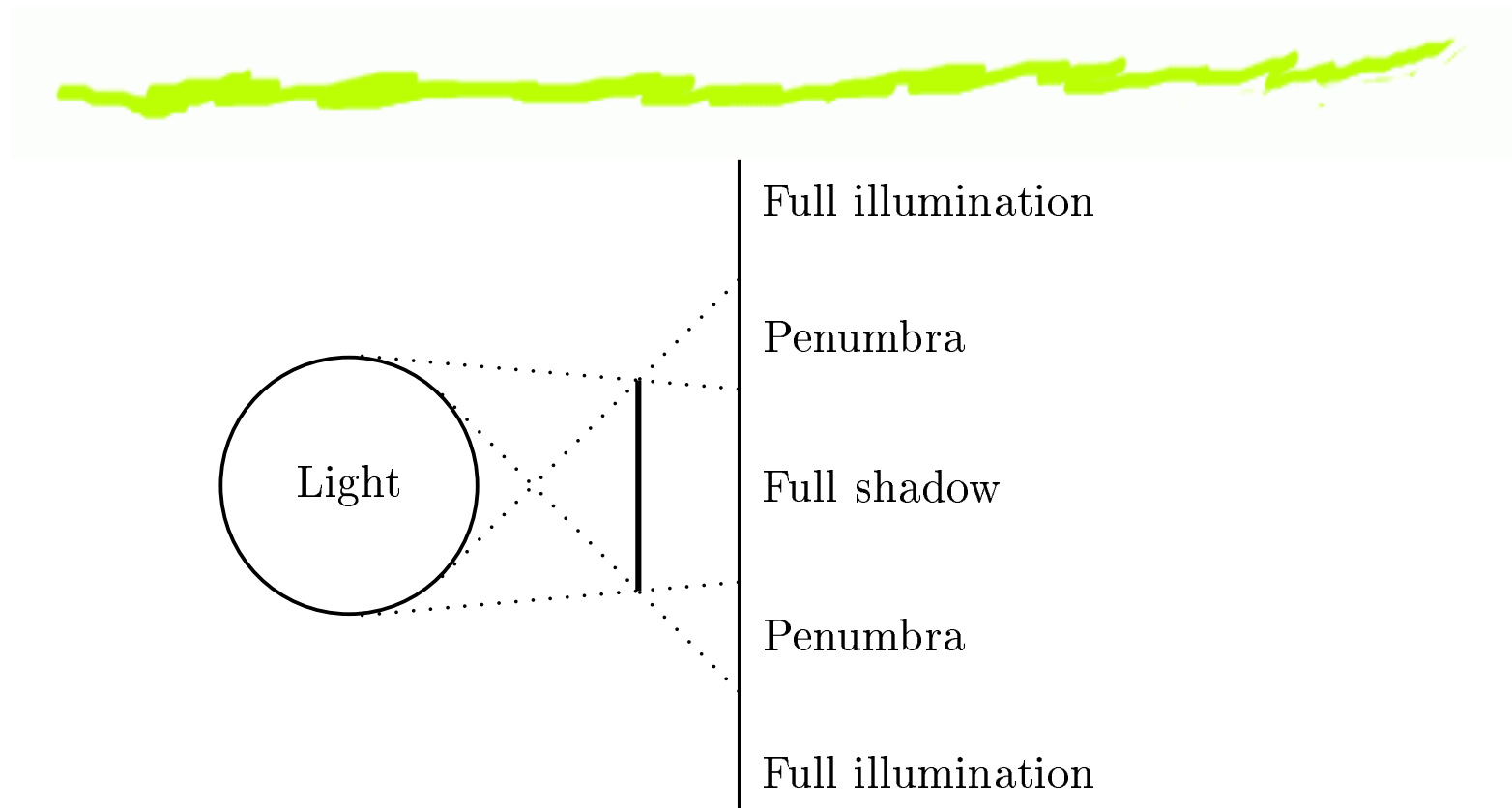


Figure IX.14: The penumbra is the area where the light is only partly blocked.

Wiele technik na raz



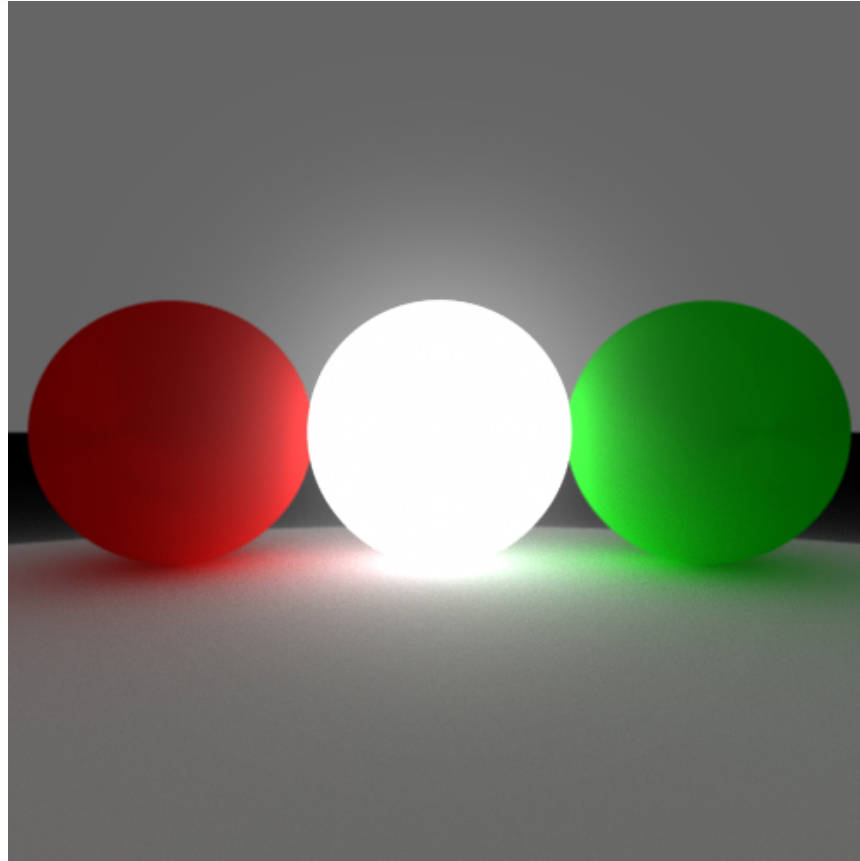
- ⑥ Antialiasing i głęboka ostrości,
- ⑥ Wystarczy każdy z dziewięciu pikseli połączyć z jednym,
- ⑥ Piksele wybierać niezależnie

Wiele kolorów

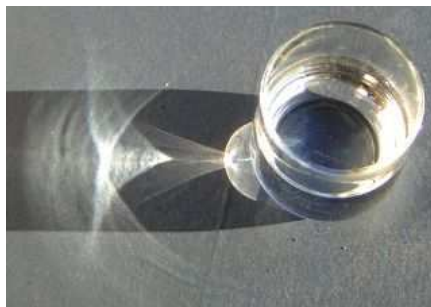


- ⑥ Nie tylko RGB,
- ⑥ odbicie i załamanie zależy od barwy (częstotliwości f_{ai}).

Path tracing



Odwrotny (backwards) Ray Tracing

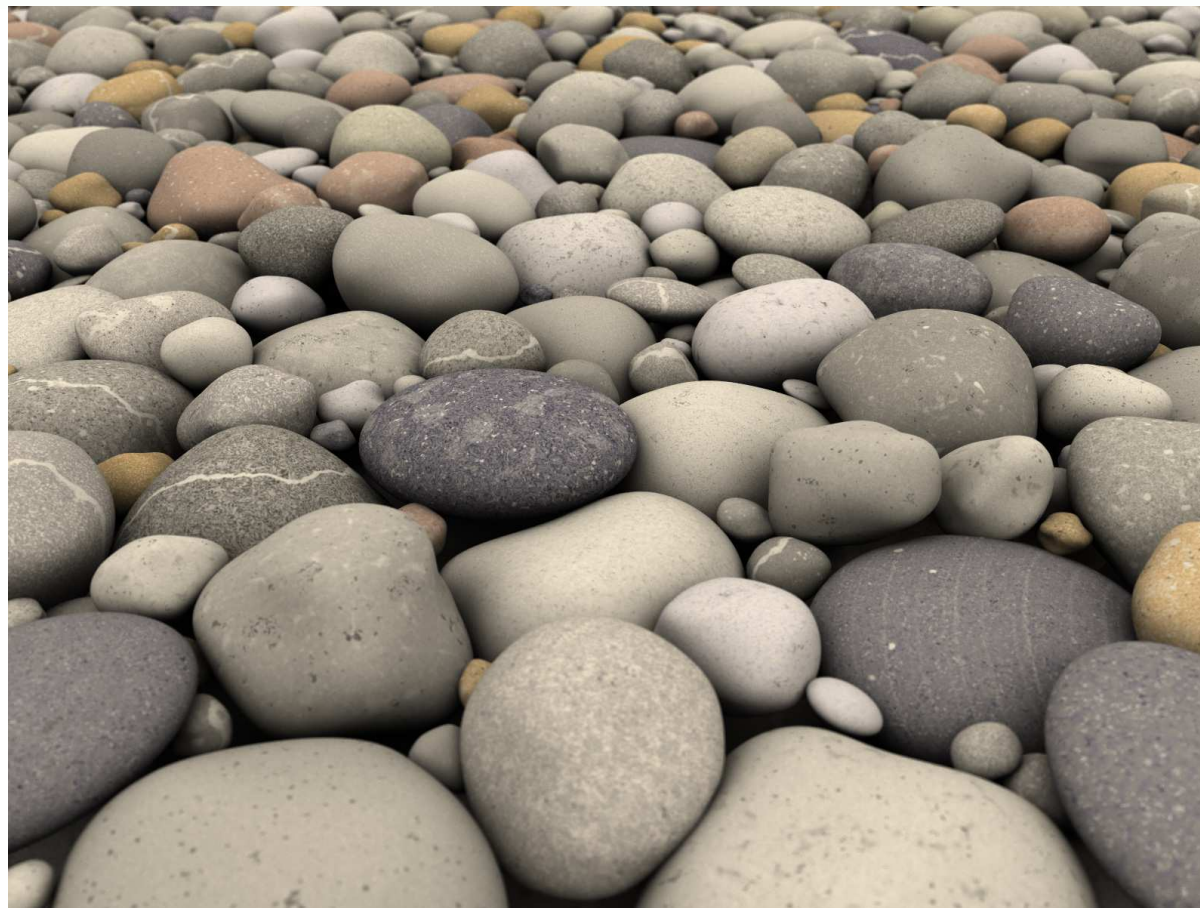


Rysunek 1: Kaustyk



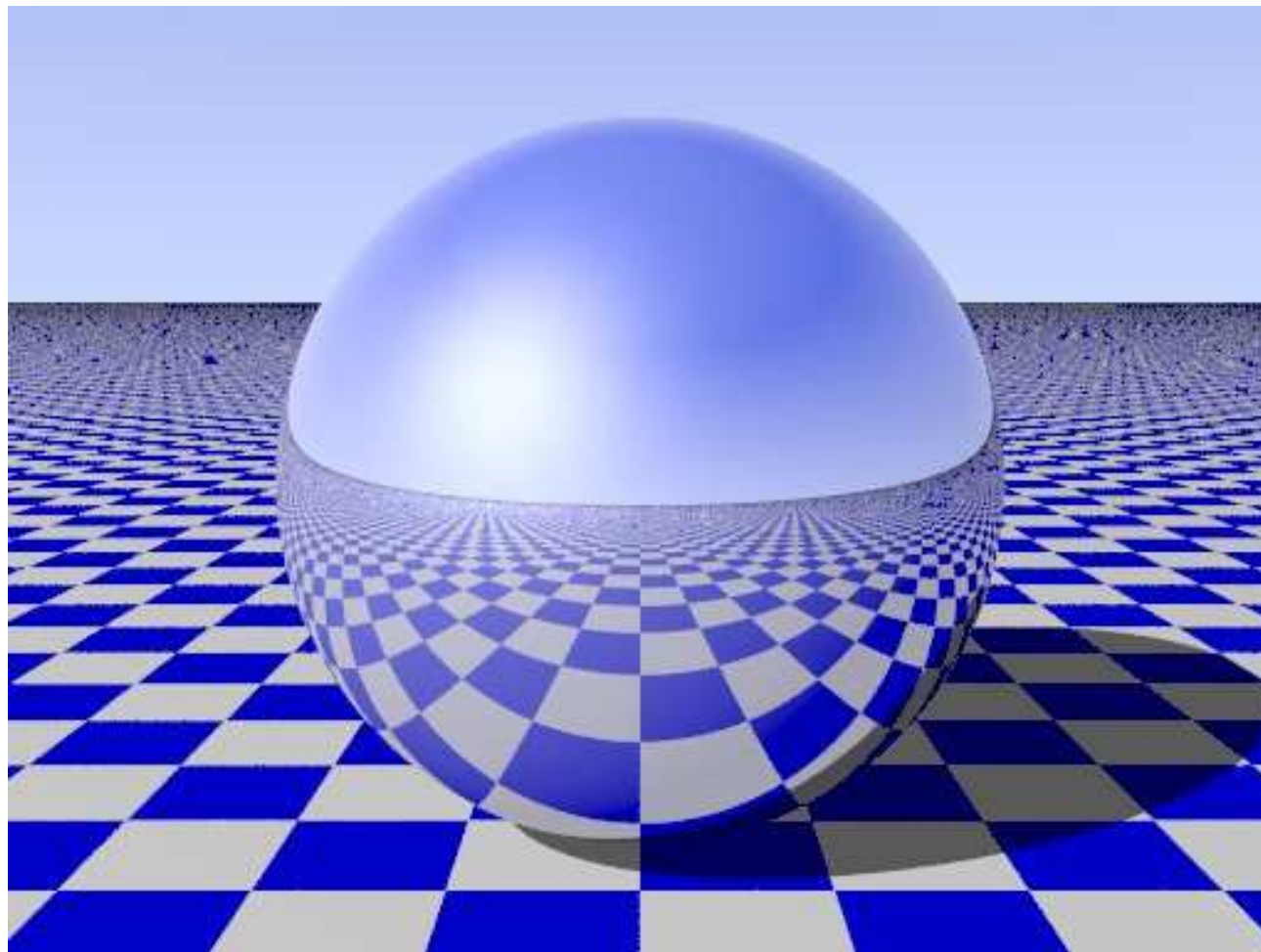
- ⑥ Persistence of Vision Ray-Tracer
- ⑥ <http://www.povray.org/>
- ⑥ Język skryptowy
- ⑥ Biblioteka gotowych obiektów, scen, tekstur
- ⑥ Zjawiska atmosferyczne (mgła, dym, chmury)
- ⑥ Caustics
- ⑥ Tekstutowanie nierówności (bump mapping)
- ⑥ Radiosity
- ⑥ Dokumentacja, podręczniki, społeczność
- ⑥ Wolna licencja

Pov-Ray. Przykłady obrazów



6 Galeria: <http://hof.povray.org/>

Pov-Ray. Przykładowy skrypt



Ogólne parametry

```
#include "colors.inc"
```

```
global_settings {  
    assumed_gamma 1.0  
    max_trace_level 5  
}
```

Umieszczanie kamery



```
camera {  
    location    <0.0, 0.5, -4.0>  
    direction  1.5*z  
    right      x*image_width/image_height  
    look_at    <0.0, 0.0, 0.0>  
}
```

Niebo



```
sky_sphere {  
  pigment {  
    gradient y  
    color_map {  
      [0.0 rgb <0.6,0.7,1.0>]  
      [0.7 rgb <0.0,0.1,0.8>]  
    }  
  }  
}
```

Światło



```
light_source {  
    <0, 0, 0>  
    color rgb <1, 1, 1>  
    translate <-30, 30, -30>  
}
```

Podłoga



```
plane {  
  y, -1  
  texture  
  {  
    pigment {  
      checker  
      color rgb 1  
      color blue 1  
      scale 0.5  
    }  
    finish{  
      diffuse 0.8  
      ambient 0.1  
    }  
  }  
}
```

Błyszcząca kulka



```
sphere {  
  0.0, 1  
  texture {  
    pigment {  
      color rgb <0.8,0.8,1.0>  
    }  
    finish{  
      diffuse 0.3  
      ambient 0.0  
      specular 0.6  
      reflection {  
        0.8  
        metallic  
      }  
      conserve_energy  
    }  
  }  
}
```

Blender

