Simple Special Effects

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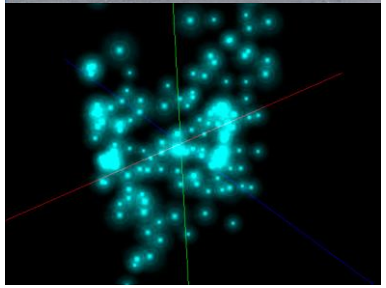
Particle Systems

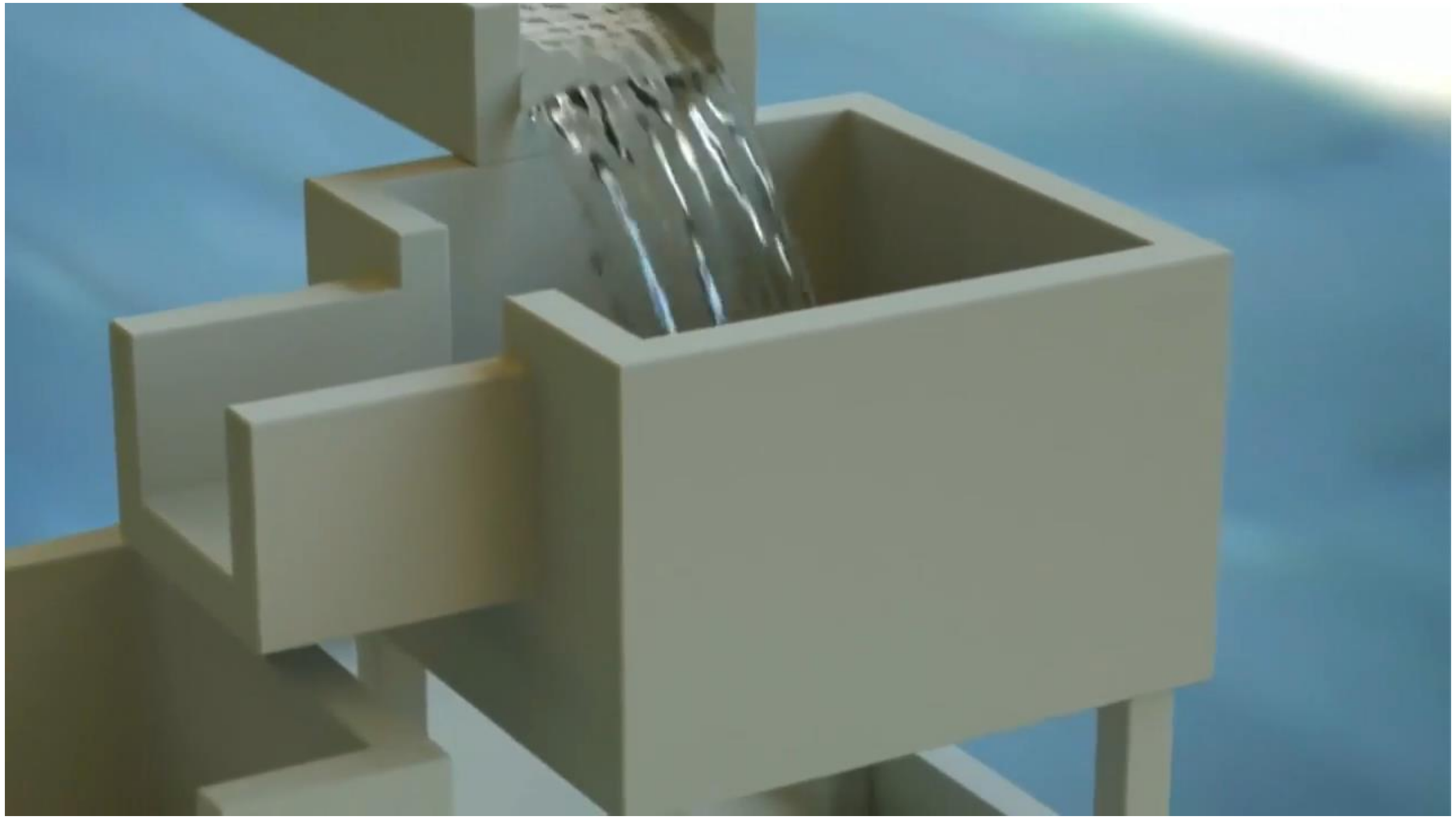
- The algorithm to simulate effects that involve a lot of particles
  - Snow
  - Fireworks
  - Liquid droplets



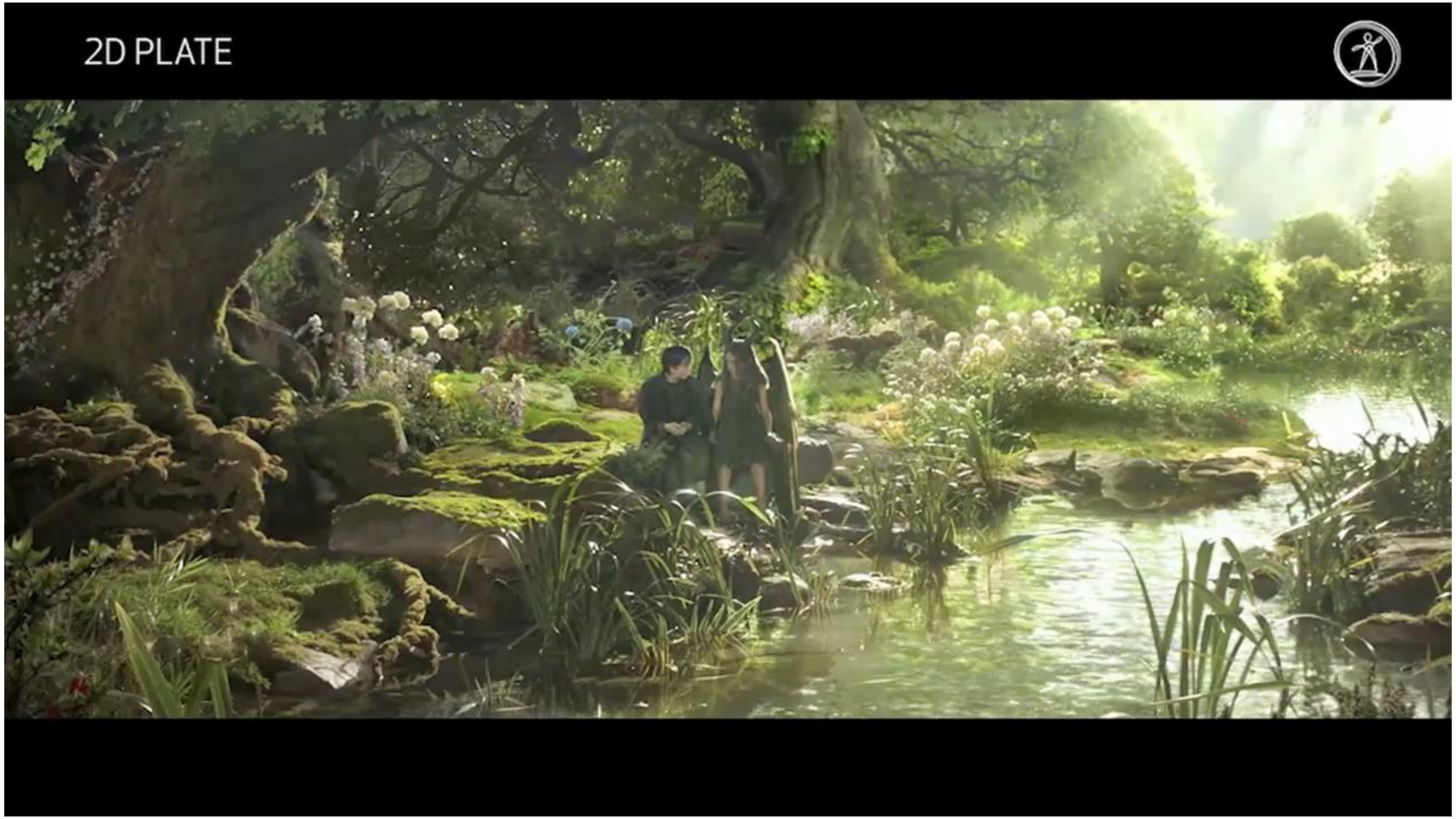
Particle Systems

Fluid Simulations

- The process to simulate liquid



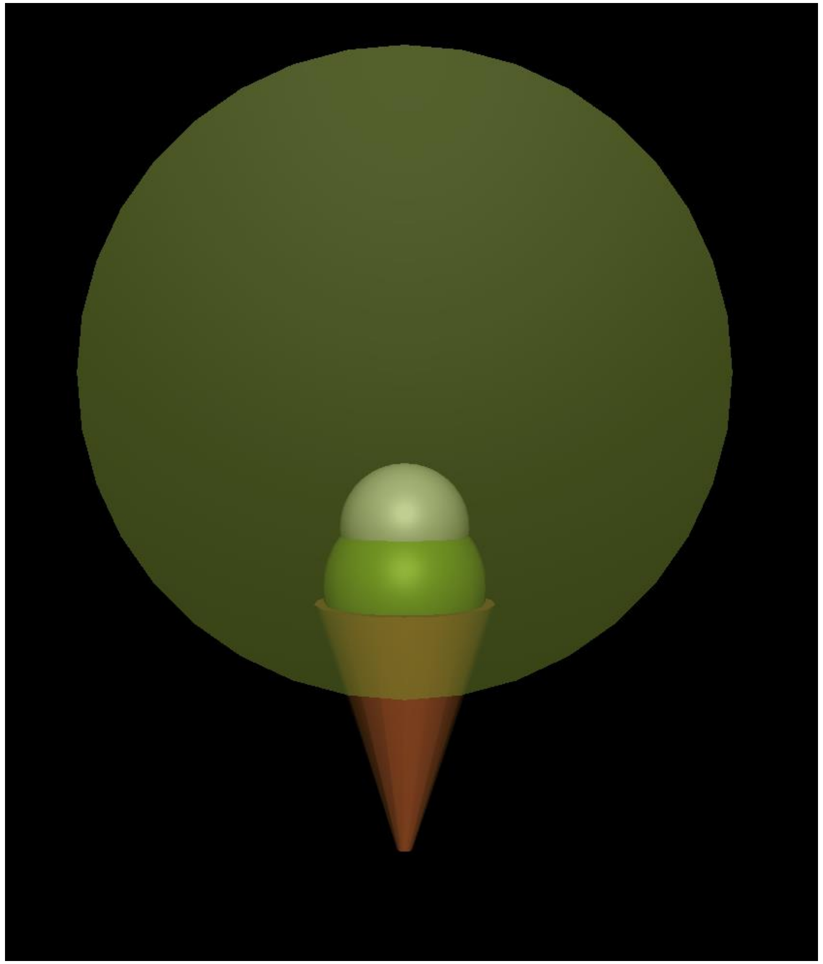
Special Effects using 3D Information



3D Particle Systems

Semi-Transparent

```
// A circle
var g = new THREE.CircleGeometry(1, 36);
var m = new THREE.MeshPhongMaterial({ color: 0x88AA22,
transparent: true, opacity: 0.3});
var meshCircle = new THREE.Mesh(g, m);
meshCircle.position.z = 5.0;
scene.add(meshCircle);
```



Array of Meshes - Creating

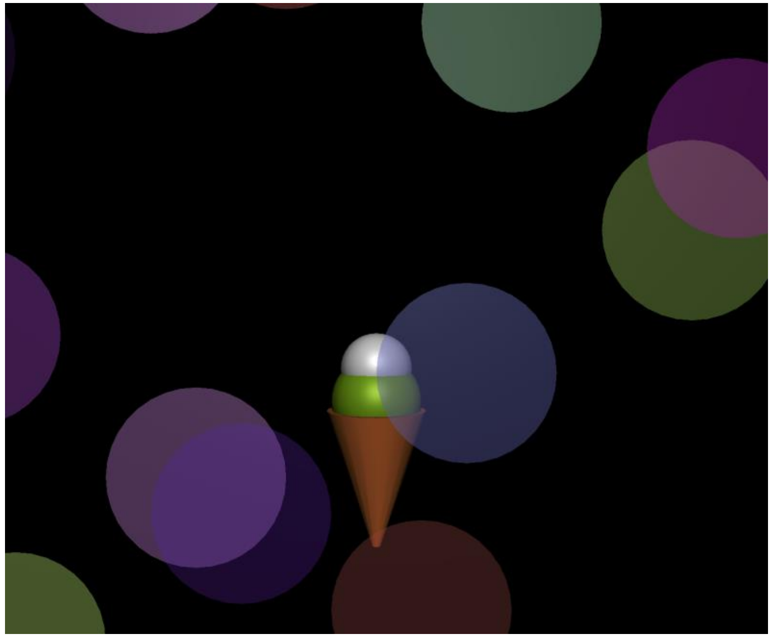
```
var geoCircleArray = [];
var matCircleArray = [];
var meshCircleArray = [];
var iCircleNumber = 5;
for (var i =0; i<iCircleNumber; i++)
{
    geoCircleArray.push( new THREE.CircleGeometry(1, 36) );
    matCircleArray.push( new THREE.MeshPhongMaterial({ color: 0x88AA22, transparent: true, opacity: 0.5 }) );
    meshCircleArray.push( new THREE.Mesh(geoCircleArray[i], matCircleArray[i]));
    meshCircleArray[i].position.z = 5.0;
    meshCircleArray[i].position.x = i;
    scene.add(meshCircleArray[i]);
}
```

Array of Meshes – Moving

```
function animate()
{
    requestAnimationFrame(animate);
    for (var i =0; i<iCircleNumber; i++)
    {
        meshCircleArray[i].position.y = Math.sin(iFrame/200 + i*10) * 6;
    }
     iFrame ++;
    renderer.render(scene, camera);
}
```

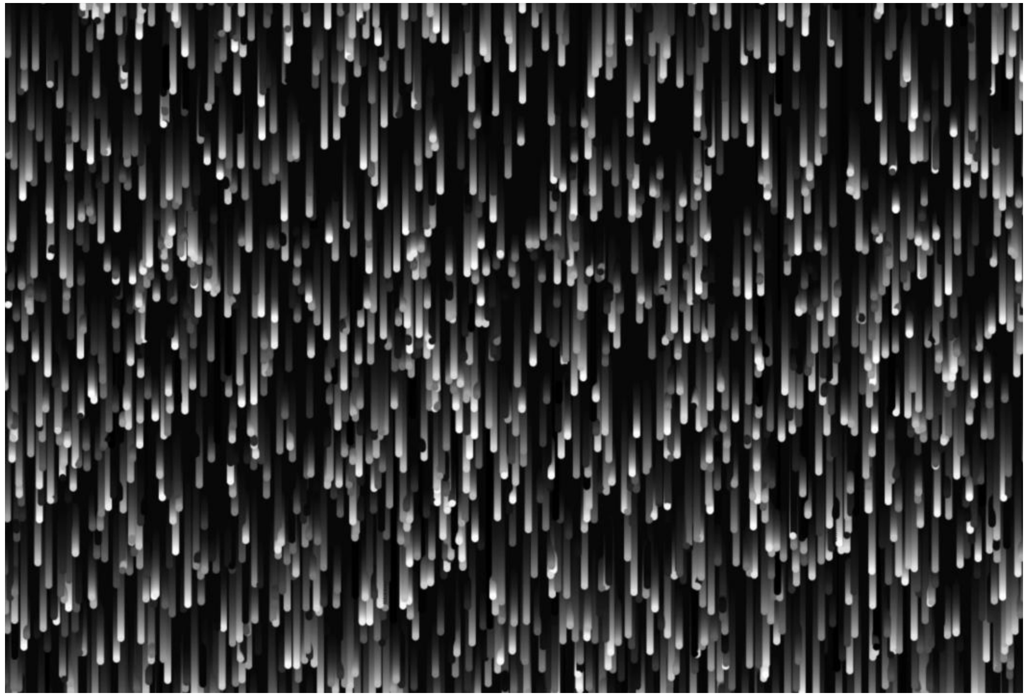
Random Function

- Math.random()
  - Returns a value between 0 and 1
  - 10 * Math.random() returns a value between 0 and 10
  - 10 * Math.random() – 5 returns a value between -5 and 5
- e.g. Randomize the color of the circles
  - color: Math.random() * 0xFFFFFF
- e.g. Randomize the opacity
  - opacity: Math.random() * 0.2 + 0.3



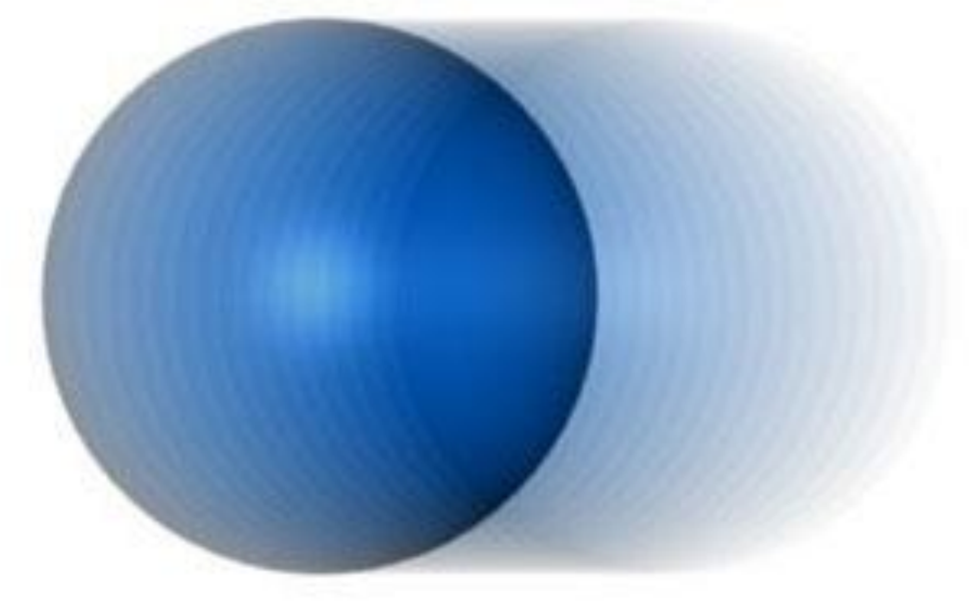
Rain

- Multiple semi-transparent cylinders moving to the bottom (and once they reach the bottom, their position is reset to the top)



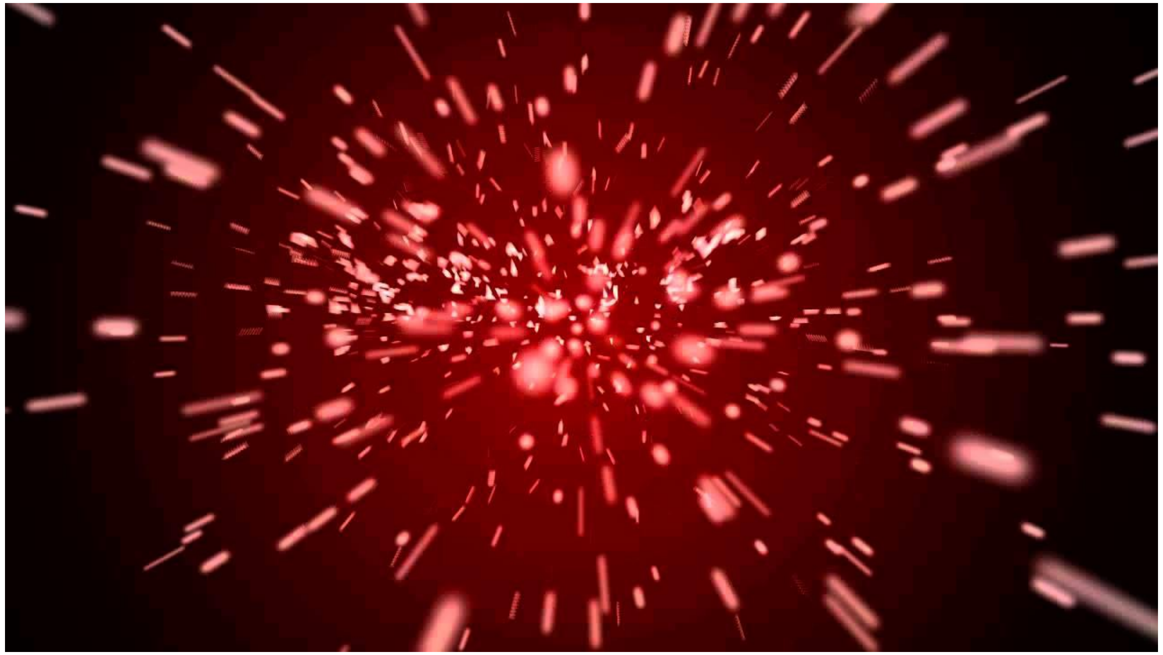
Motion Blur

- Multiple instances of the same object with decreasing opacity



Explosion

- Multiple semi-transparent spheres moving away from a position



The End

Any Questions?