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# Introduction[edit | edit source]

Particle systems are used to simulate large amounts of small moving objects, creating phenomena of higher order like fire, dust, clouds, smoke, or fur, grass and other strand based objects. You may also use other objects as a visualization of particles.

Before you start with the tutorials, you should at least take a brief overview about the very extensive documentation pages of the particle system. You will find every single parameter explained in the manual if you have the desire to delve deeper ...

Don't forget: particles alone don't do any magic. They are only a placeholder for something nice to view. You have to take care of the visualization also, and that is usually the harder part than to create the particle system.

# The very first particle system

### Creating a particle system



Image 1a: Where to create a new particle system

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Image 1b: The very first particle system

To create a particle system:

- Create a mesh object to be the "parent" (source) of the particles (only mesh objects can emit particles). Let's use a simple plane to start with.
- select the object
- change to the Particles tab in the Object Properties window
- click on the "+" button (Image. 1a)

Voila, your first particle system (**Image. 1b**)! It doesn't do anything useful now, but we're going to change that on the following pages.

- To see the particles, you must start the animation running by pressing ALT + A. You will see particles appear and fall from the plane. Press ESC to stop the animation; you return to frame 1. The particle movement is cached (stored), so if you play your animation again it will go faster (well, you won't notice any difference in this simple case).
- If you want to stop the animation in the current frame, press **ALT** + **A** while it is running instead of **ESC**.
- The shortcut for returning to the first frame is **SHIFT** +  $\leftarrow$  )
- To see the particles even better change to wireframe mode (Z),

If you change anything in your particle system you always have to return to frame 1, to recalculate the system from the start.

Use the *timeline* window along the bottom of the screen to change easily between frames.

#### **Ultra Physics Coolness:**

While the animation is running, you can move the objects in the 3D window and the particle system is updated in realtime. The system is not cached then.

## Changing properties of the system



**Image 2a:** Particles emitted in the direction of the face normal of the plane Some important settings, from the "Emission" panel:

- *Number:* the total number of particles; increase this to 5000
- Start: and End: the start and end frame of the emission
- Lifetime: the lifetime in frames of the particles

And in the "Velocity" panel are settings that combine to determine the initial velocity of the particles:

- Normal: a velocity component in the direction of the face normal (if emitted from faces)
- Tangent: a velocity component parallel to the face
- Rotation: controls the direction of the tangent velocity component
- *Emitter Object X/Y/Z*: a velocity component oriented in the object's coordinate system
- *Object:* a multiplier that imparts some proportion of the object velocity to the particles (try moving the object around with a nonzero value for this field to see its effect)
- *Random:* a random contribution to the object velocity

Initially, the plane has its face normal oriented upwards. However, it probably looks like the particles are emitted downwards. This is because the initial normal velocity of 1.0 is quite small compared to the force of gravity (which is on by default). Try increasing it to something like 10.0, and when you rerun the animation, you should see the particles rise quite high above the plane before falling down again.

If you render a frame with particles showing, you will see the particles appear as white blobs. This is the default *Halo* rendering of the particles.

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### Changing the material of the particles

**Image 3a:** The first simple *Halo* material.

• Switch the Properties window to the Materials 🙆 tab and create a new material for the plane.

• Change the material type to *Halo*. (see also the Manual on Halos). Halos are a post rendering effect, that is applied after the scene is finished. So halos can't shed any lights on other objects, they are not rendered behind *RayTransp* materials (like glass).



**Image 3b:** Our first particle system rendered in frame 68