



Particle Systems

Month 2, Lecture 7

What we will learn today:

- ◉ Where particle systems are used
- ◉ How to make particle systems
- ◉ The particle view dialog box
- ◉ Particle foliage
- ◉ Other particle examples
- ◉ Altering particles with forces

PARTICLE USAGE – SUPER SPRAY



Water Fountains

PARTICLE USAGE – SUPER SPRAY



Waterfalls

PARTICLE USAGE - BLIZZARD



Snow (not tigers)

PARTICLE USAGE - BLIZZARD



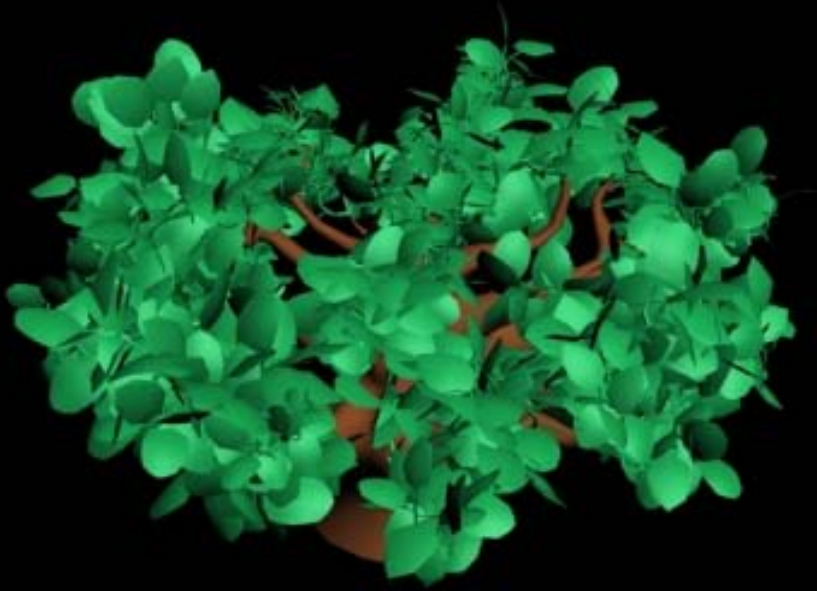
Snow / Blizzard

PARTICLE USAGE - P ARRAY



Explosions

PARTICLE USAGE - P ARRAY



Shrubs

PARTICLE USAGE - P ARRAY



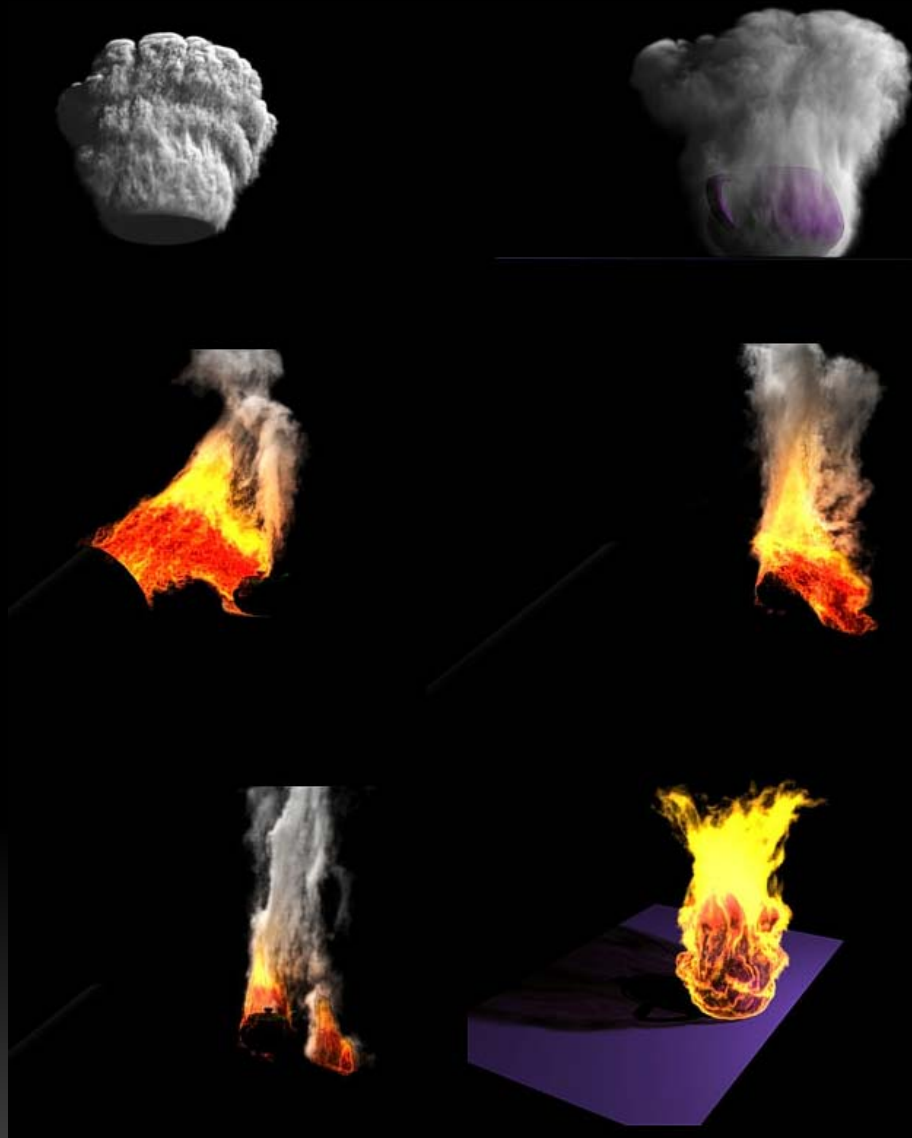
Custom Trees

PARTICLE USAGE - P CLOUD



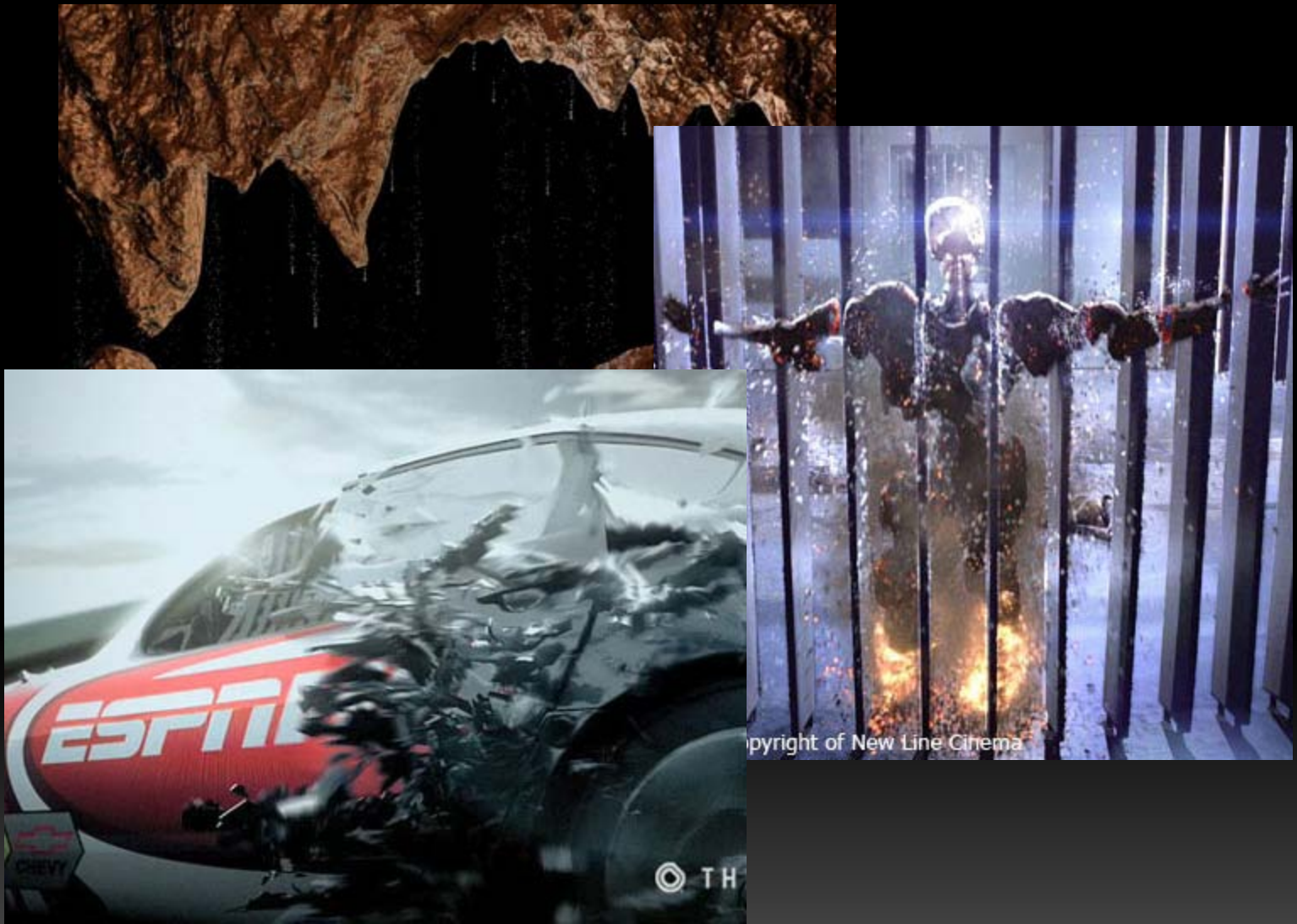
Bubbles in Soda

PARTICLE USAGE - COMBINATION



Smoke and Fire

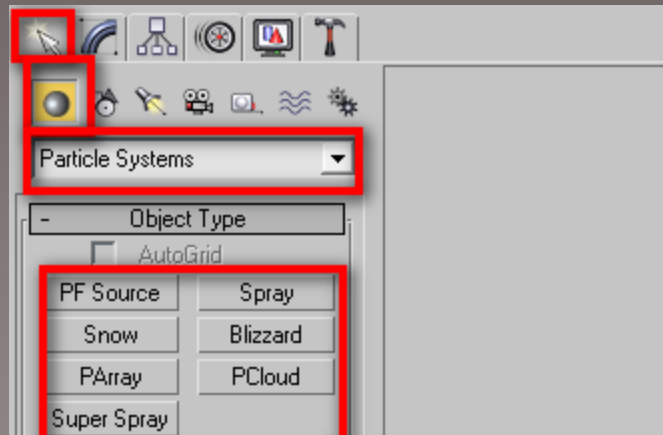
PARTICLE USAGE



Anything you can imagine.

Particle Systems

- Particle system- an object that generates non-editable sub-objects, called *particles*, for the purpose of simulating snow, rain, dust, foliage, smoke, etc...
- Create Tab > Geometry > Particle Systems



Emitter Types

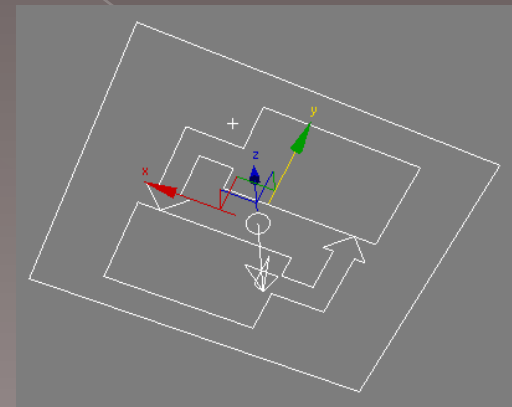
The first step to achieving the look you want

Particle Emitter Types

- ◉ PF Source
- ◉ Snow
- ◉ PArray
- ◉ Super Spray
- ◉ Spray
- ◉ Blizzard
- ◉ PCloud

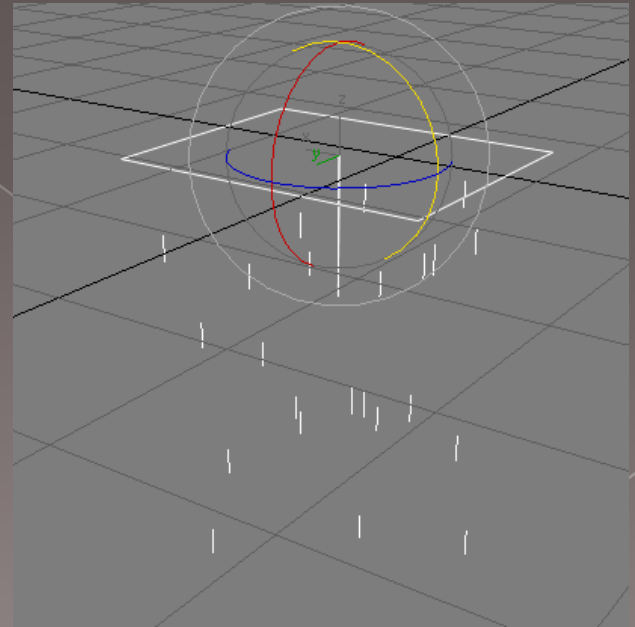
PFSource

- Default icon designating where particles are emitting from
- Doorway to the Particle View Editor
- Used for a huge variety of things



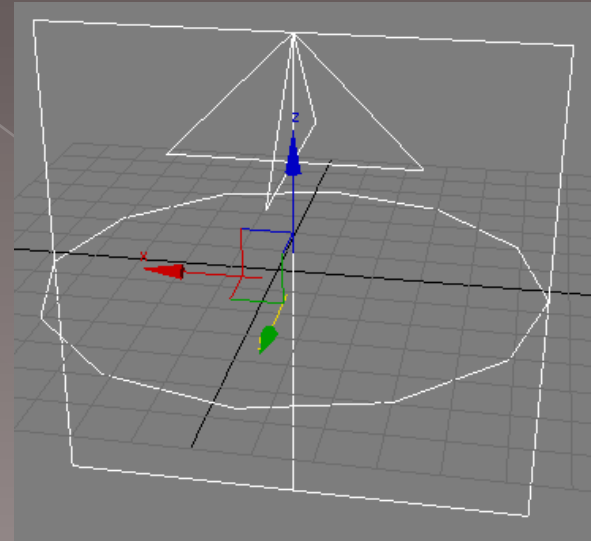
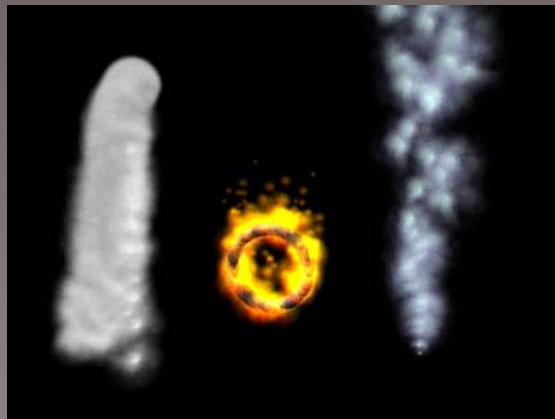
Spray

- Simulates water drops such as rain, fountains, and garden hoses
- Less advanced than Super Spray



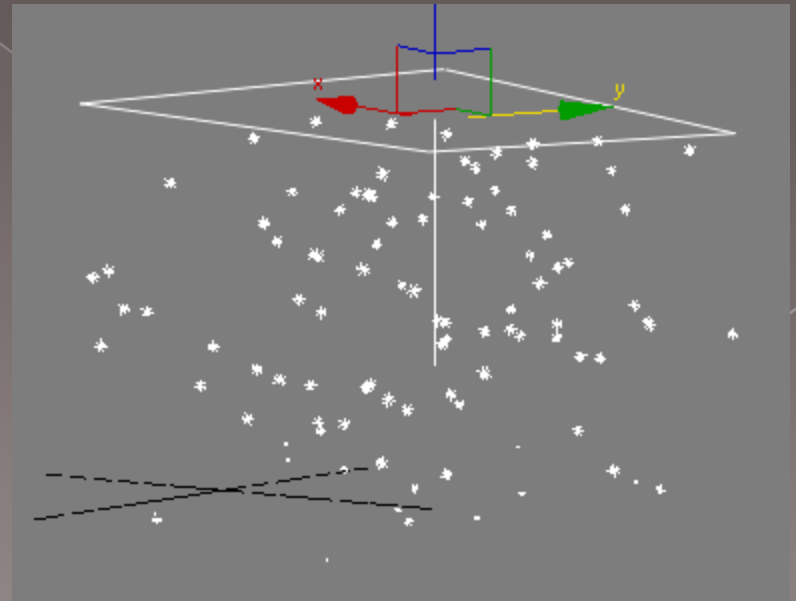
Super Spray

- Emits a controlled spray of particles.
- Similar to Spray with extra functionality provided by all the newer particle systems.
- Used for water fountains, bubbles, smoke trails, flowing water, crowds



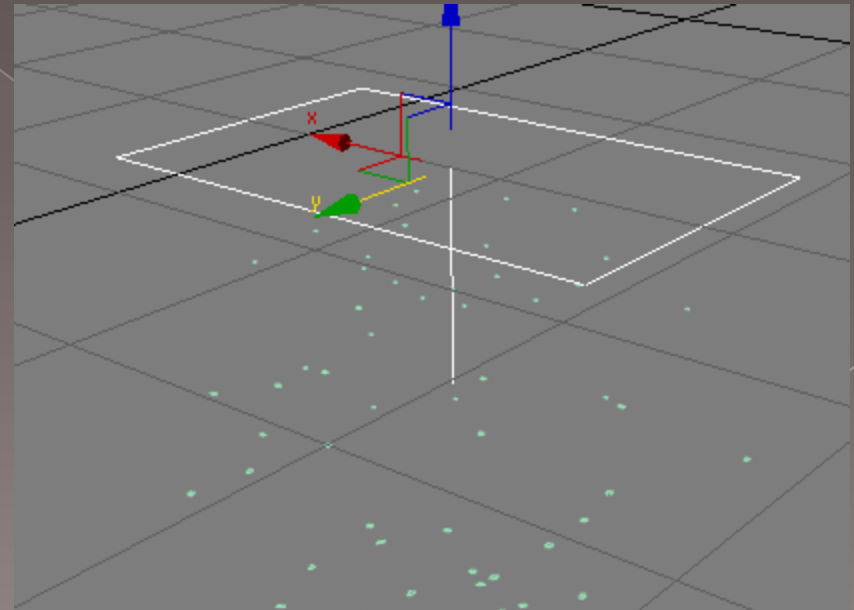
Snow

- Simulates falling snow or confetti. Similar to Spray, but with additional parameters to generate tumbling snowflakes
- Simpler Version of Blizzard



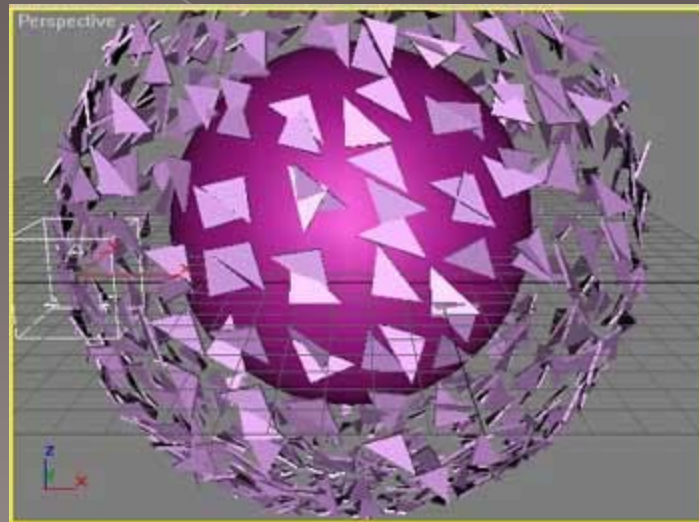
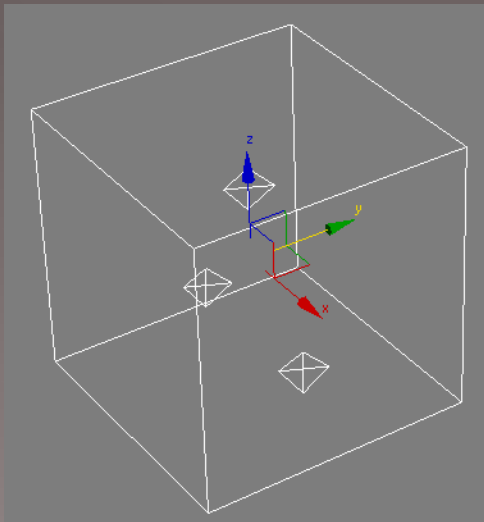
Blizzard

- Advanced Version of Snow
- Can be used for: snow, rain, crowds



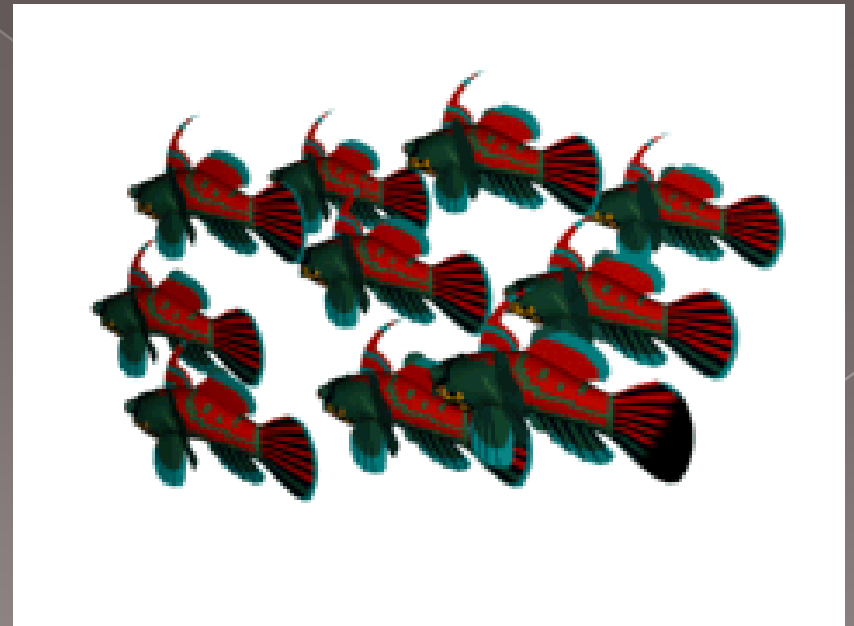
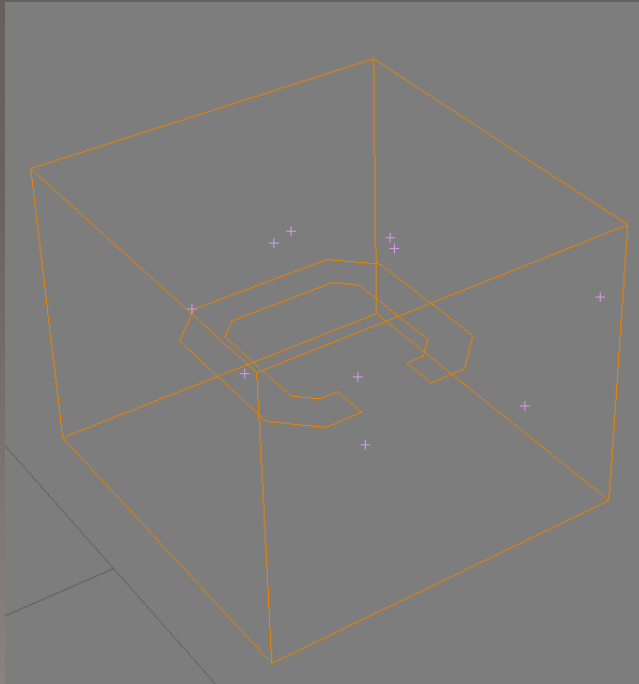
PArray

- Uses another object as its emitter
- Used for: Blowing things up (usually teapots), Crowds (ants, birds, bees)



PCloud

- Constrains particles within a specified volume
- Used for: Bubbles in soda, Crowds (bugs in a jar, birds in a cage)

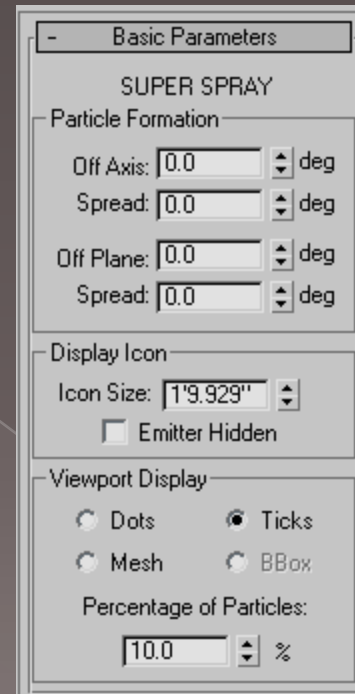


Controlling Particles

What do all those
parameters mean?

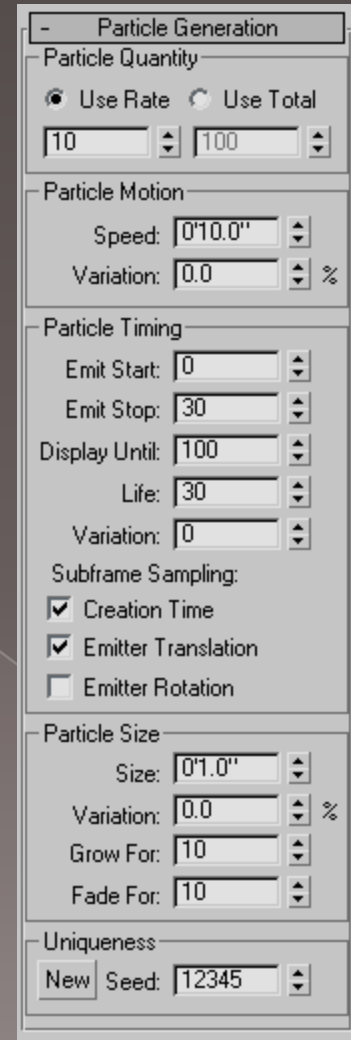
Basic Parameters

- Controls how the particles leave the emitter and how you see them



Particle Generation

- Controls the amount, timing and size of the particles



A screenshot of a software interface for particle generation settings. The panel is titled 'Particle Generation' and contains several sections with adjustable parameters.

Particle Quantity

- ☒ Use Rate ☐ Use Total
- Value 1: 10
- Value 2: 100

Particle Motion

- Speed: 0.10.0"
- Variation: 0.0 %

Particle Timing

- Emit Start: 0
- Emit Stop: 30
- Display Until: 100
- Life: 30
- Variation: 0
- Subframe Sampling:
 - ☒ Creation Time
 - ☒ Emitter Translation
 - ☐ Emitter Rotation

Particle Size

- Size: 0.1.0"
- Variation: 0.0 %
- Grow For: 10
- Fade For: 10

Uniqueness

- Seed: 12345

Particle Type

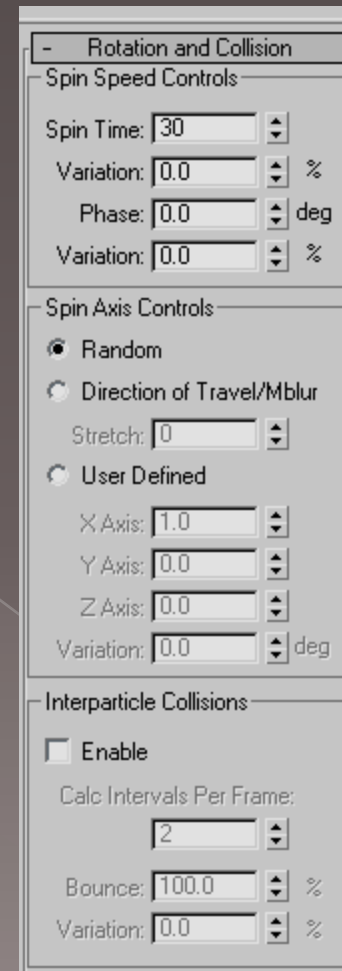
- Controls the type of particles and the geometry they are made of

The screenshot shows a 'Particle Type' settings panel with the following sections:

- Particle Types:** Radio buttons for ☒ Standard Particles, ☐ MetaParticles, and ☐ Instanced Geometry.
- Standard Particles:** Radio buttons for ☒ Triangle, ☐ Cube, ☐ Special, ☐ Facing, ☐ Constant, ☐ Tetra, ☐ SixPoint, and ☐ Sphere.
- MetaParticle Parameters:**
 - Tension:
 - Variation: %
 - Evaluation Coarseness:
 - Render:
 - Viewport:
 - ☒ Automatic Coarseness
 - ☐ One Connected Blob
- Instancing Parameters:**
 - Object: <None>
 -
 - ☐ Use Subtree Also
 - Animation Offset Keying:
 - ☒ None
 - ☐ Birth
 - ☐ Random
 - Frame Offset:
- Mat'l Mapping and Source:**
 - ☒ Time ☐ Distance
 -
 -
 - ☒ Icon ☐ Instanced Geometry

Rotation and Collision

- Controls how / if the particles rotate and inter-collide



The image shows a software control panel titled "Rotation and Collision". It is divided into three main sections: "Spin Speed Controls", "Spin Axis Controls", and "Interparticle Collisions".

Spin Speed Controls:

- Spin Time: 30
- Variation: 0.0 %
- Phase: 0.0 deg
- Variation: 0.0 %

Spin Axis Controls:

- ☒ Random
- ☐ Direction of Travel/Mblur
- Stretch: 0
- ☐ User Defined
- X Axis: 1.0
- Y Axis: 0.0
- Z Axis: 0.0
- Variation: 0.0 deg

Interparticle Collisions:

- ☐ Enable
- Calc Intervals Per Frame: 2
- Bounce: 100.0 %
- Variation: 0.0 %

Bubble Motion

- Used to create bubble effects

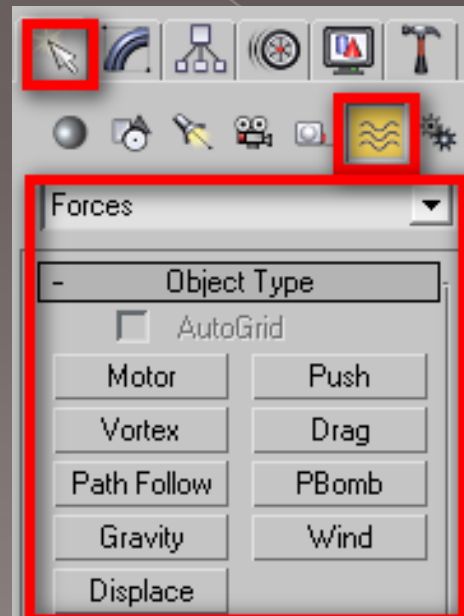


Controlling Particles Externally

Forces and Spacwarps

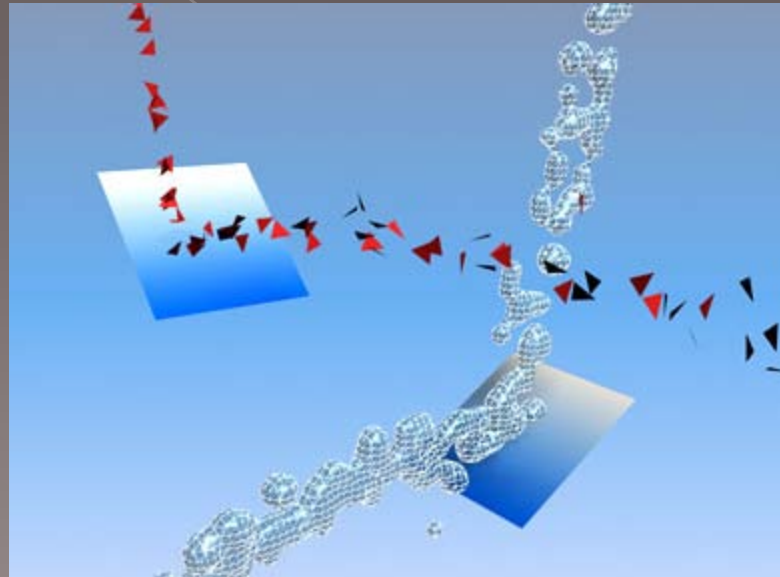
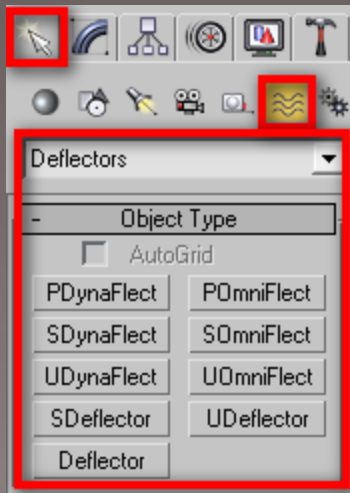
Forces

- Let you influence particles externally
- Simulates wind, gravity, etc.



Deflectors

- Acts as a shield to deflect particles off of an object
- 2 Main options:
 - Deflector – for planar objects
 - Udeflector – to use an object as a deflector



Bind to Space Warp

- Used to attach a selected object (usually a particle system) to a Force or Deflector
- Click and drag, a slight screen flash will let you know you are successful



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- ◉ How to make particle systems
- ◉ The particle view dialog box
- ◉ Particle foliage
- ◉ Other particle examples
- ◉ Altering particles with forces

What we learned this month:

- ◉ Modeling architectural objects
- ◉ Setting up templates
- ◉ Organization
- ◉ Materials (Arch & Design and Standard)
- ◉ Photometric Lighting
- ◉ HDRI Lighting
- ◉ Particle Systems

Next Month

- ◉ Animation
- ◉ Wire Parameters
- ◉ Physics (Reactor)
- ◉ Character Animation
- ◉ Cameras
- ◉ Compositing