

KNOX

# Particle Systems

Knox Game Design

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Levi D. Smith

DESIGN

# What are Particle Systems?

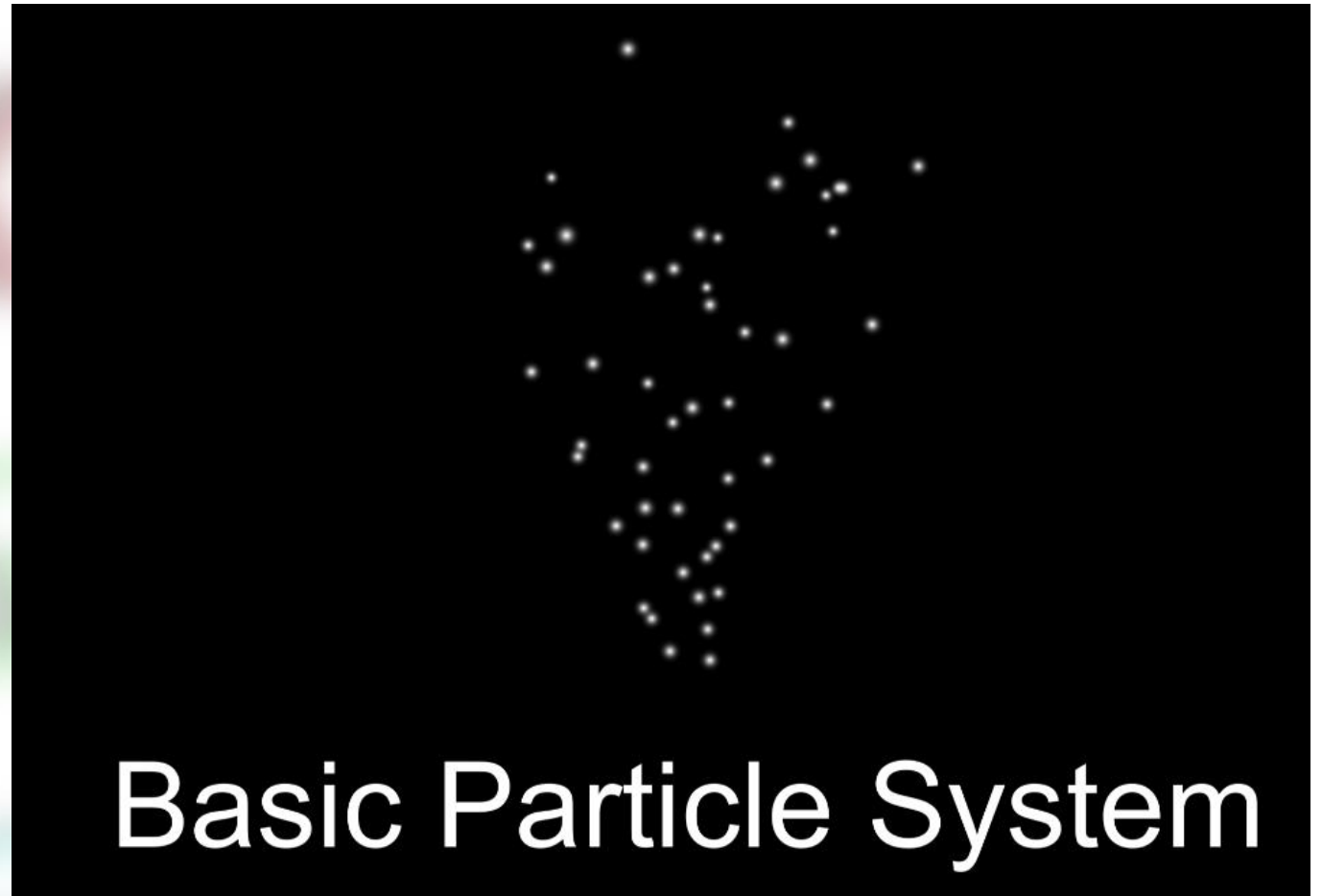
- Numerous images to give appearance of fluid object
- Altered over time
- Billboarding
  - Image on flat plane
  - Always facing the camera

# Why Use Particle Systems?

- Things that can't be easily modeled
  - Clouds
  - Streaming liquids
  - Gases / Vapors
  - Fire / Flames
  - Explosions
  - Fireworks

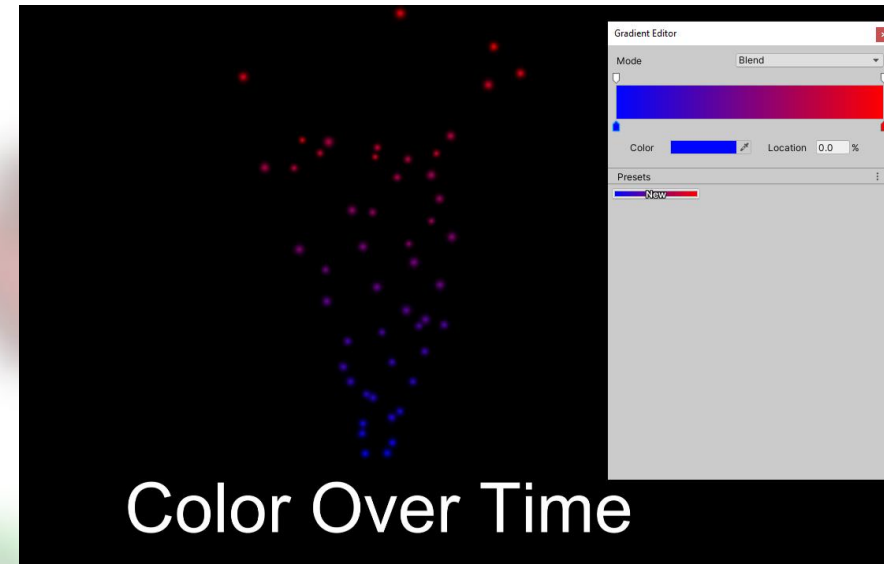
# Unity

- Has a basic "ready to go" particle system object
  - GameObject > Effects > Particle System

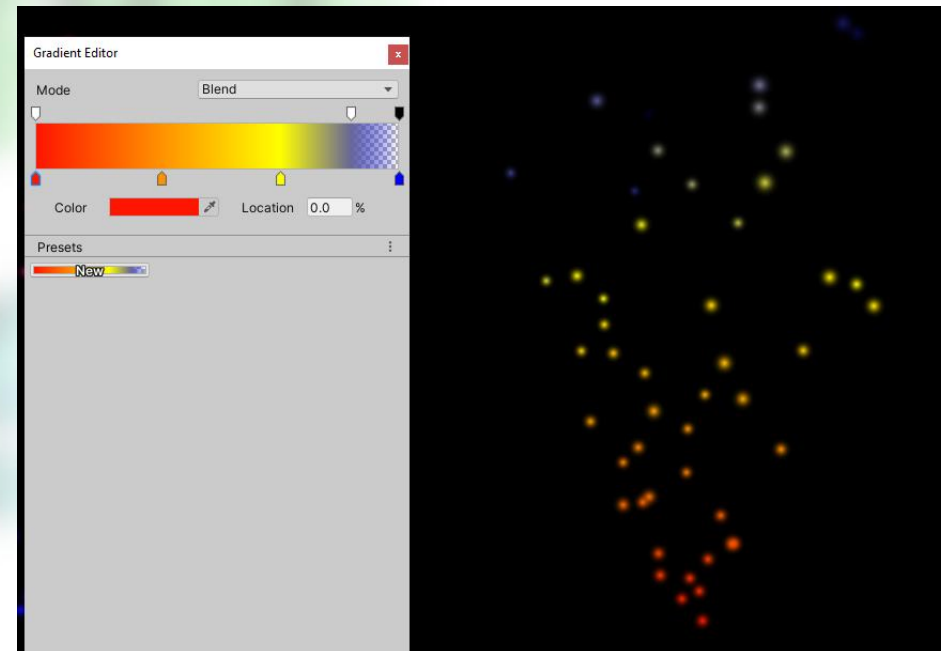


# Color Over Time

- Can specify color gradient
- Can add multiple "stops"
  - Color on bottom
  - Transparency on top
- Can add transparency



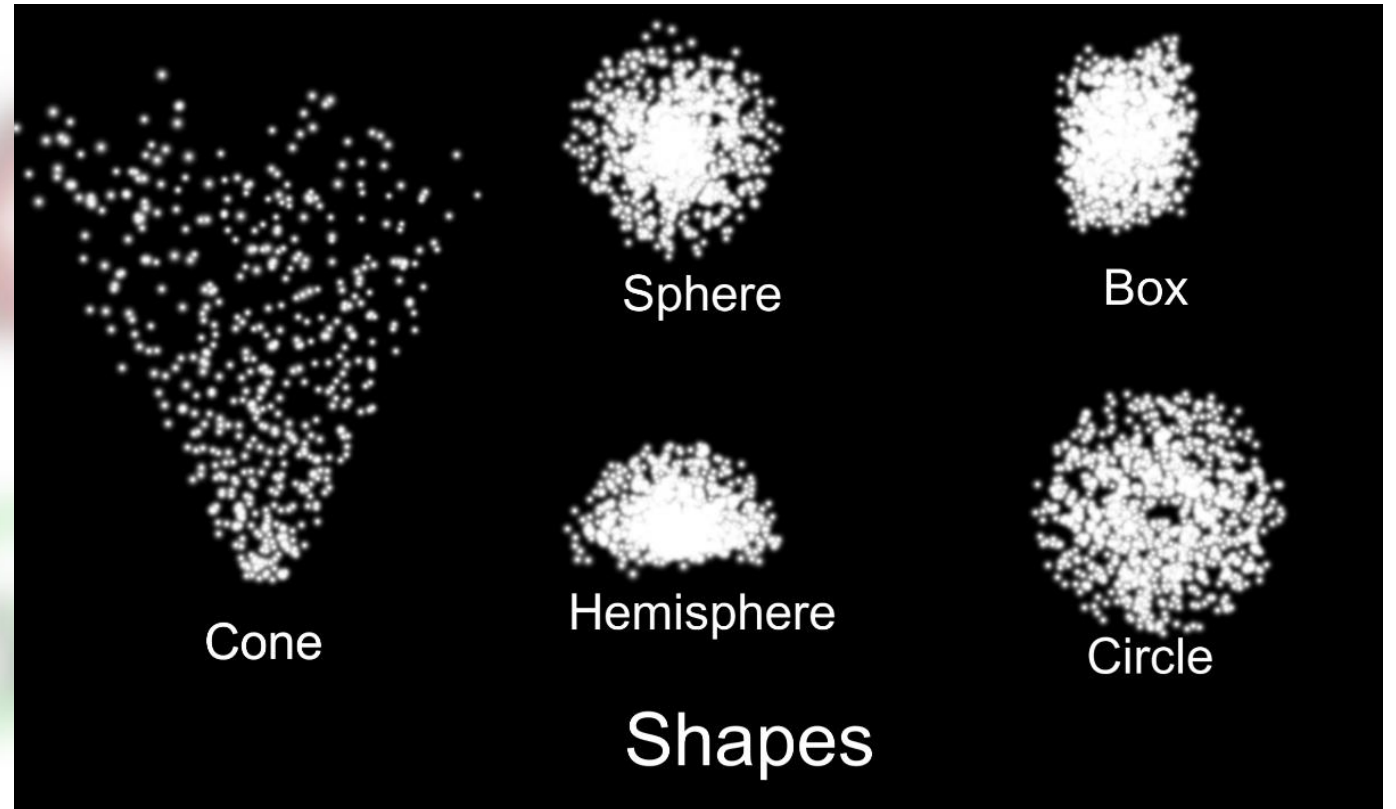
Color Over Time



Four color stops, with transparency

# Shapes

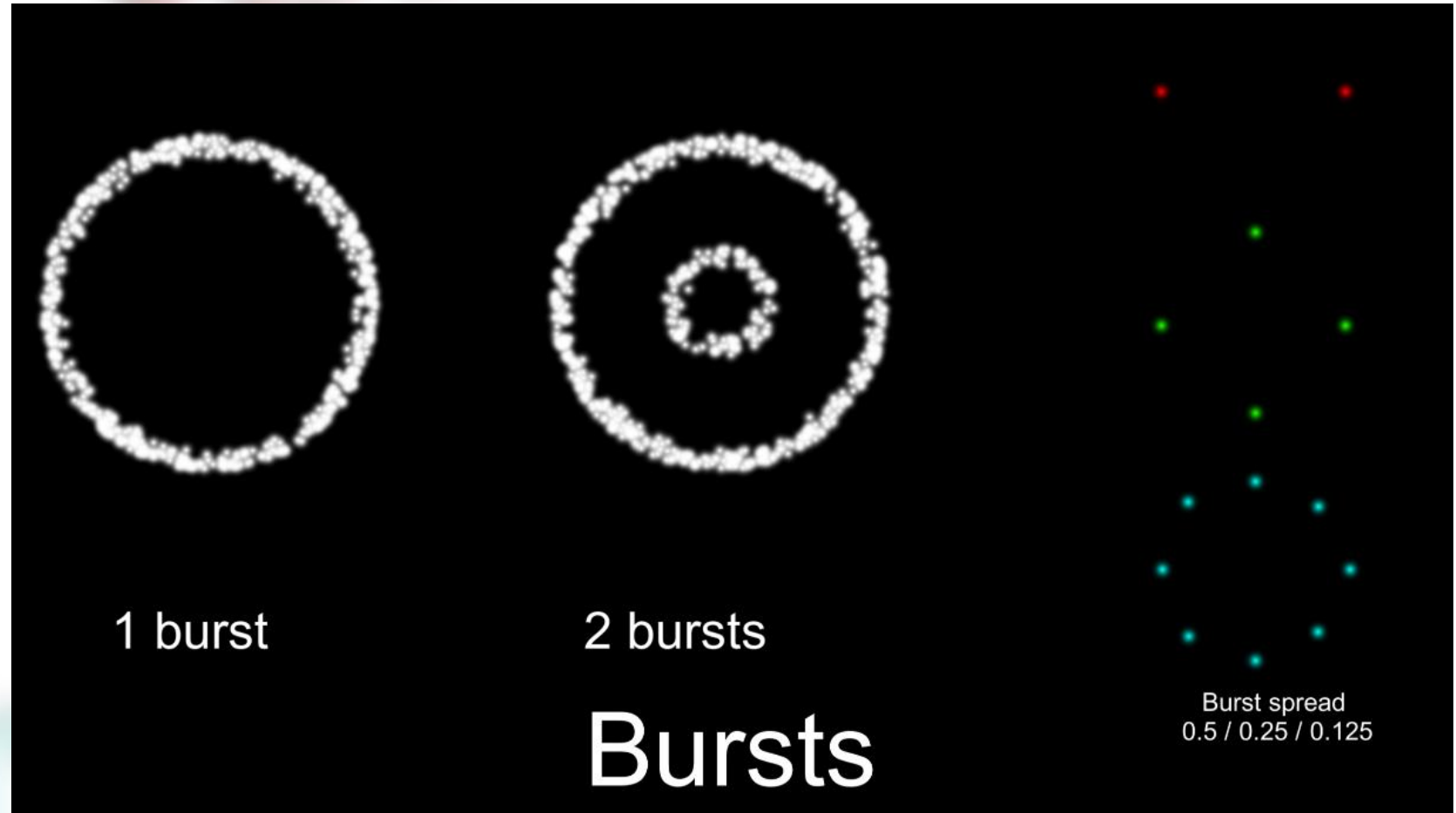
- Emission Shapes
- Can set position/rotation/scale
  - Example - Rotate Box to make waterfall



Emission Rate over Time = 1000

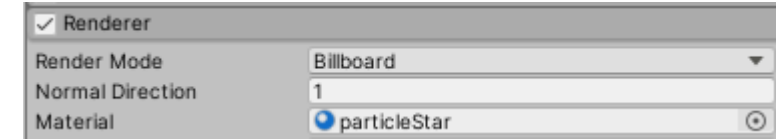
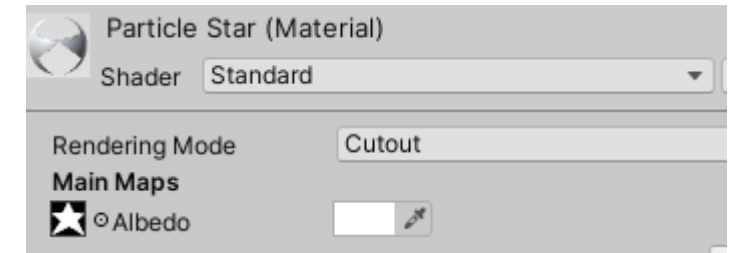
# Bursts

- Can set the burst frequency under *Emission*
- How many particles are in each burst
- Set burst spread under *Shape* (Divide 1 by number of divisions)



# Custom Textures

- Create and export transparent image
  - Image editor such as Gimp
  - Format such as PNG
- Create new Material in Unity
- Set *Albedo* to your image
- Set *Rendering Mode* to *Cutout* (otherwise transparency won't work)
- Select the new material under *Render* section
- *Important* - Set particle material shader to *Sprites/Default* if using *Start Color* or *Color over Lifetime*



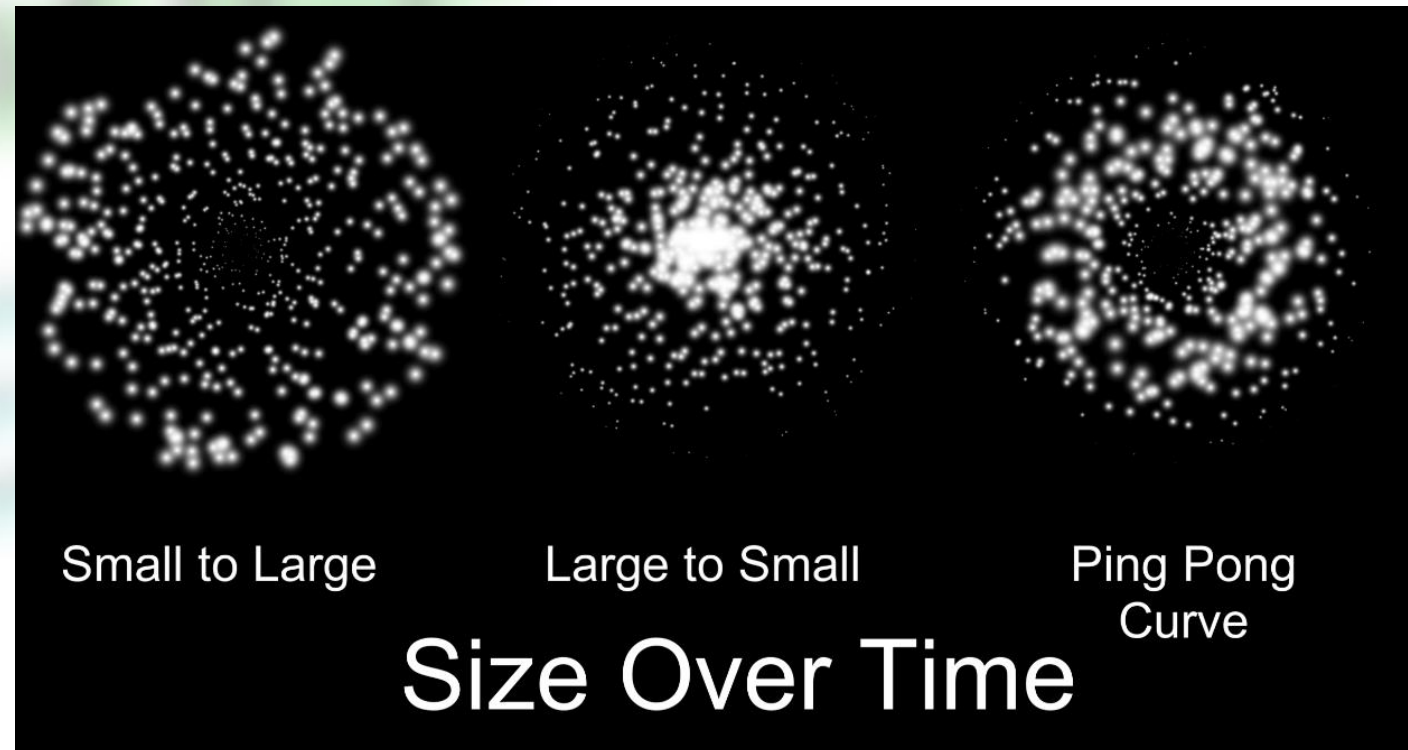
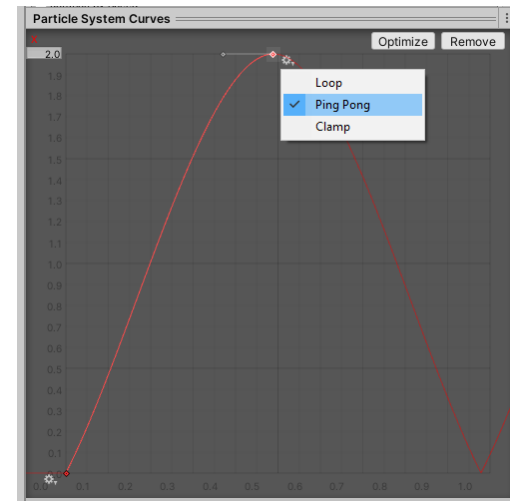
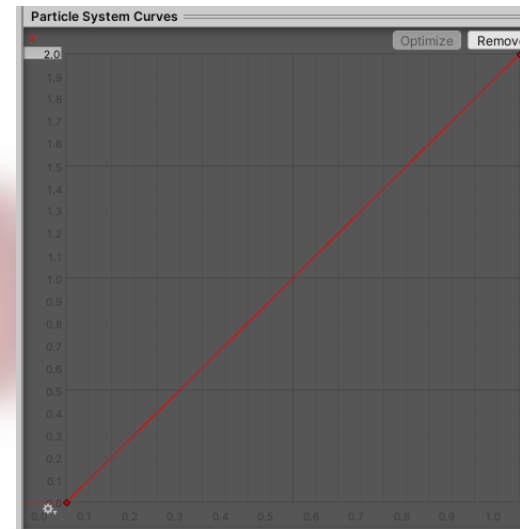
Custom Textures

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# Size Over Time

- Curve editor
- Preset curves
- Can separate axes
- Loop/Ping Pong options to repeat curve
- Note - can increase the upper limit on curve editor



# Other options

- Prewarm - when the particle system is created, it starts as if it has ran a full loop
- Looping - whether to keep looping
- Start Size - size of the particles
  - Ignored if using *Size over Lifetime*
- Start Color - starting color of particles
  - *Important* - Leave white if using *Color over time*