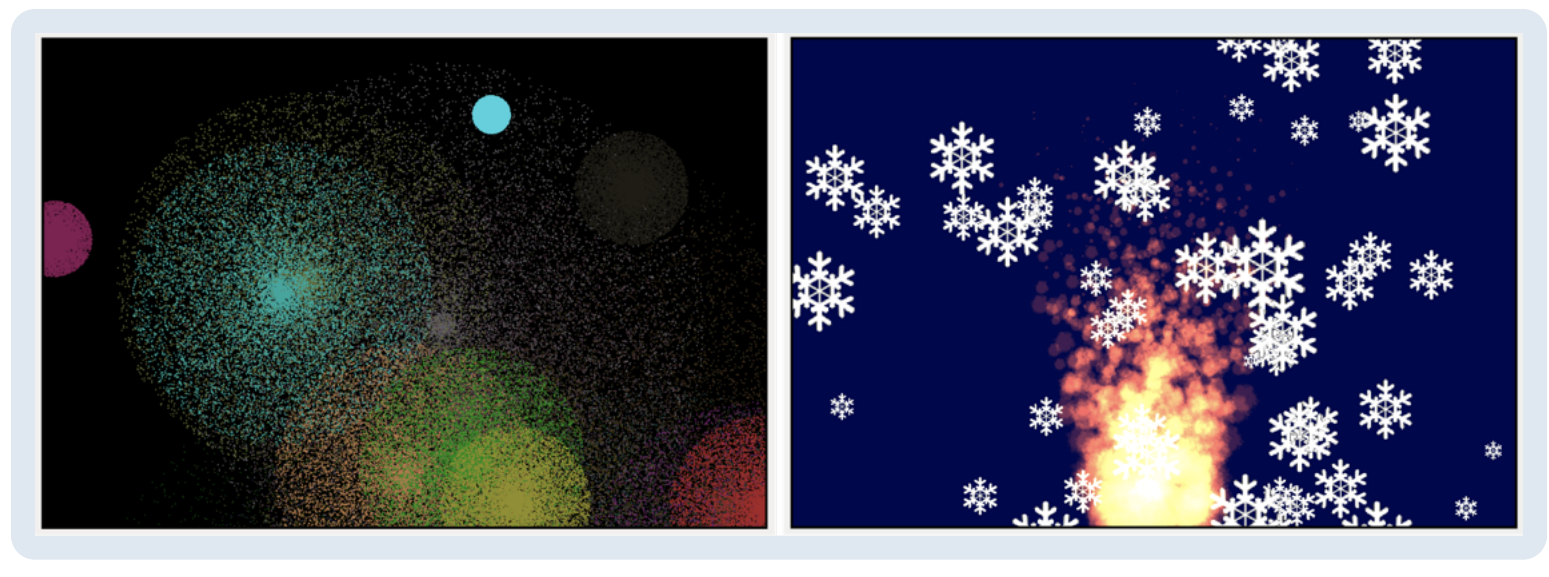
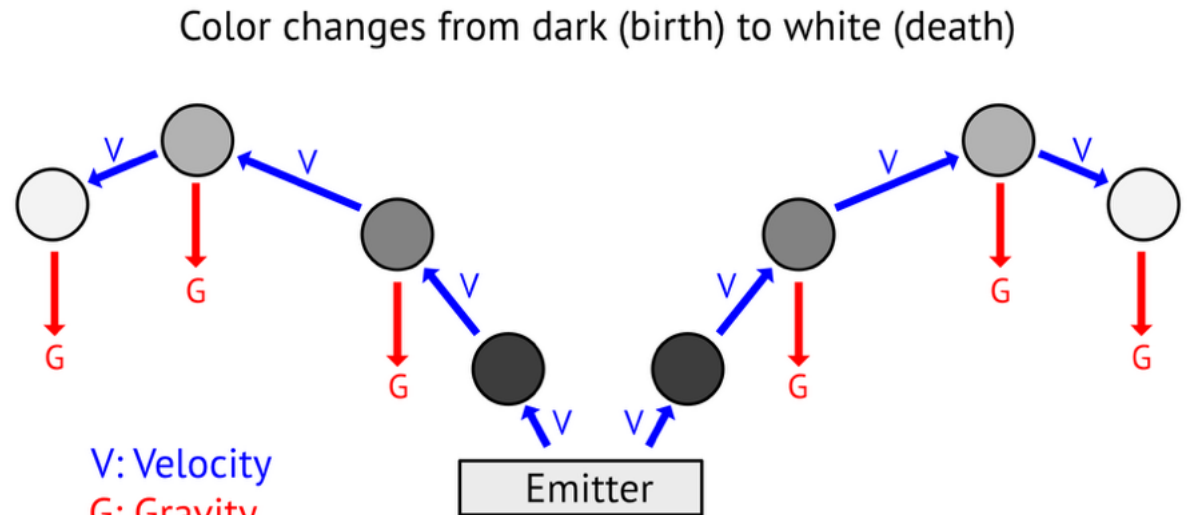


17 Particle Systems



Particle systems

Particle



Particle life

Emitter

The Starter Project



The starter project

Creating a Particle and Emitter

The Compute Pipeline State Object

The Fireworks Pass

Clearing the Screen



Drawable cleared to black

Dispatching the Particle Buffer

Particle Dynamics

$$x_2 = x_1 + v_1 t + \frac{1}{2} a t^2$$

Law of motion

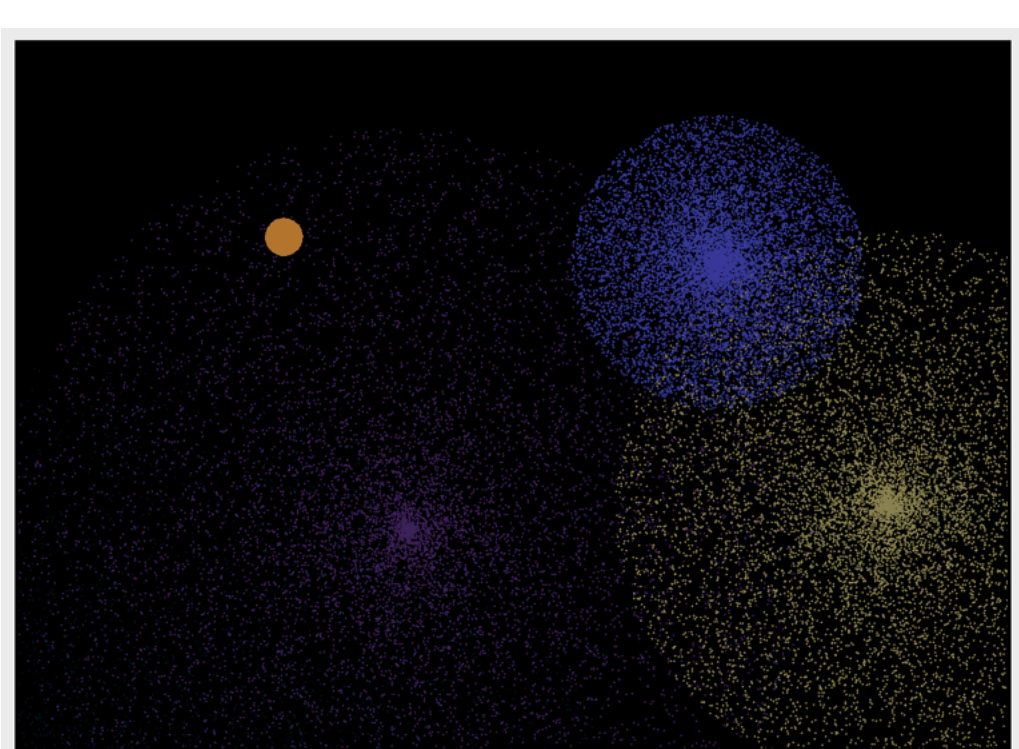
$$v_2 = v_1 + a t$$

Law of motion

$$\begin{aligned} x &= a + r \cos t \\ y &= b + r \sin t \end{aligned}$$

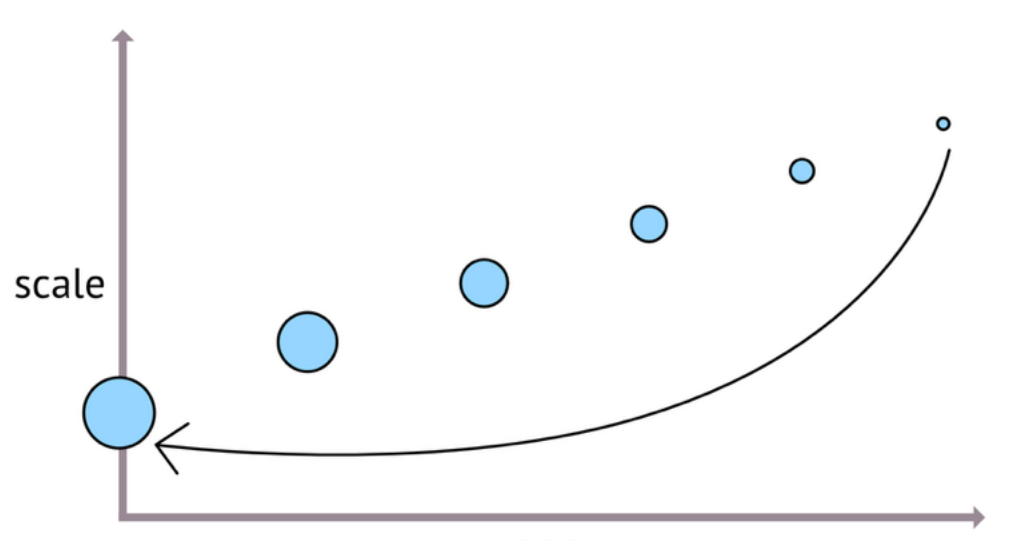
Equation of a circle

Implementing Particle Physics



Fireworks!

Particle Systems



Scaling over time

Resetting the Scene



Reset project

Updating the Particle Structure

Rendering a Particle System

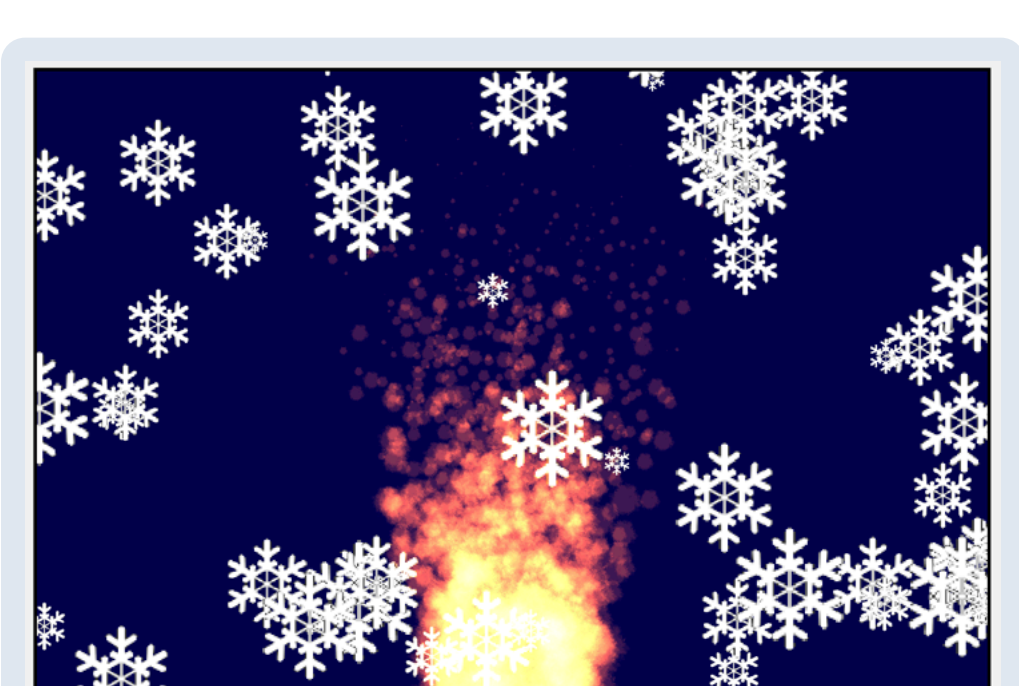
The Vertex and Fragment Functions

Configuring Particle Effects



A snow particle system

Fire



Fire and snow