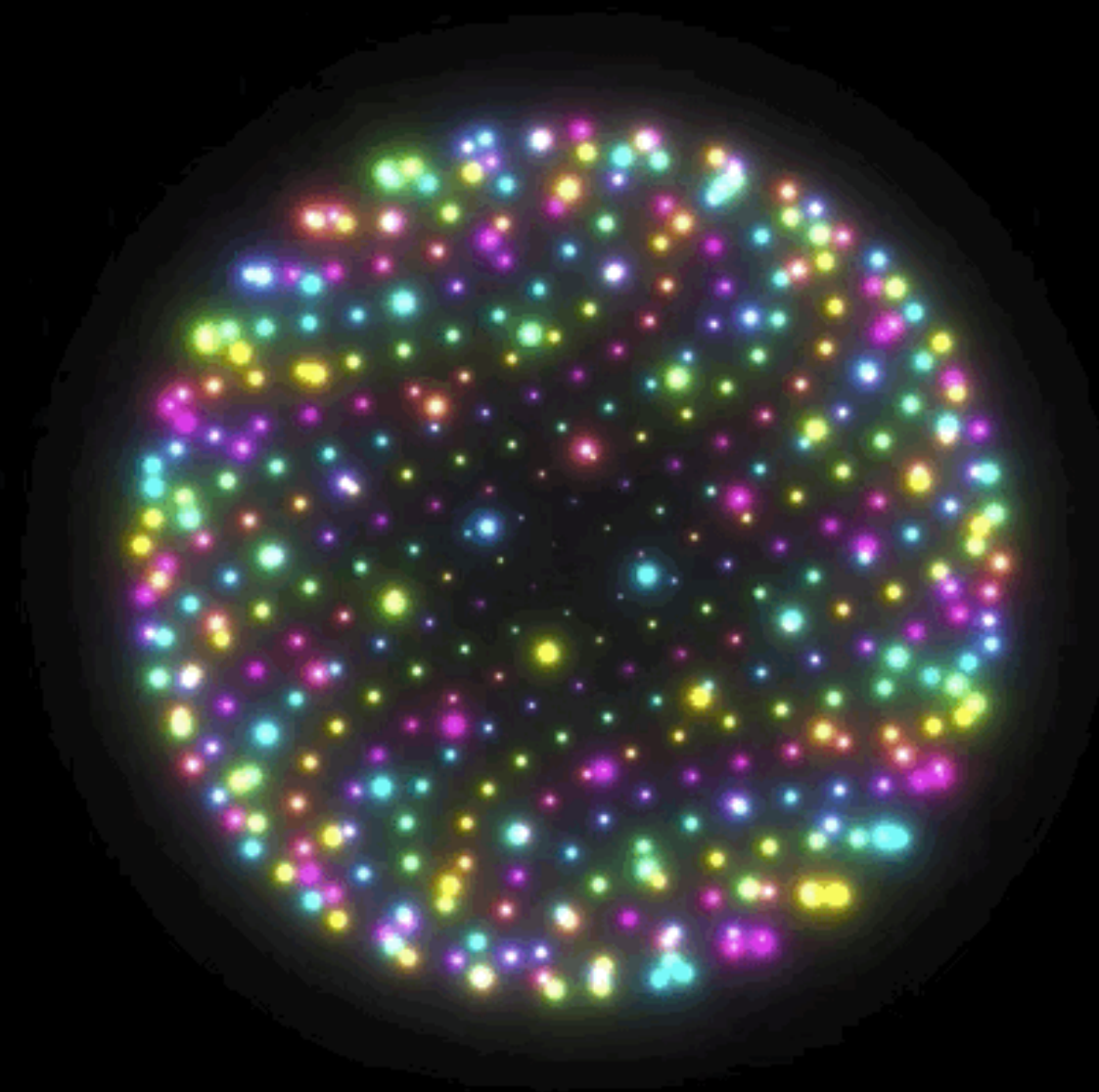


# On Android

- < Android 13 can use only pre-built shaders: **BitmapShader**, **LinearGradient**, etc
- with Android 13 can use programmable **RuntimeShaders** written in AGSL
- GPU level effects without direct OpenGL
- pass shaders as ***string*** into a **RuntimeShader** object!

```
val shader = RuntimeShader("""  
    // Shader code here in AGSL  
    """)  
  
// Make a Brush  
val brush = ShaderBrush(shader)  
  
// Canvas() / DrawScope  
onDraw = { value →  
    // Use it to paint anything!  
    drawRect(brush)  
}
```



GLSL - [shadertoy.com](https://shadertoy.com)

SKSL (~AGSL) - [shaders.skia.org](https://shaders.skia.org)

#### Shader Inputs

```
uniform vec3 iResolution; // viewport resolution (in pixels)
uniform float iTime; // shader playback time (in seconds)
uniform float iTimeDelta; // render time (in seconds)
uniform int iFrame; // shader playback frame
uniform float iChannelTime[4]; // channel playback time (in seconds)
uniform vec3 iChannelResolution[4]; // channel resolution (in pixels)
uniform vec4 iMouse; // mouse pixel coords. xy: current (if MLB do
uniform samplerXX iChannel0..3; // input channel. XX = 2D/Cube
uniform vec4 iDate; // (year, month, day, time in seconds)
uniform float iSampleRate; // sound sample rate (i.e., 44100)
```

```
1 //https://twitter.com/XorDev/status/1475524322785640455
2 void mainImage( out vec4 fragColor, in vec2 fragCoord ) {
3   vec4 o = vec4(0.0);
4   vec2 p = vec2(0.0), c=p, u=fragCoord.xy*2.-iResolution.xy;
5   float a;
6   for (float i=0.0; i<4e2; i++) {
7     a = i/2e2-1.;
8     p = cos(i*2.4+iTime+vec2(0.0,11.0))*sqrt(1.-a*a);
9     c = u/iResolution.y+vec2(p.x,a)/(p.y+2.);
10    o += (cos(i+vec4(0.0,2.0,4.0,0.0))+1.)/dot(c,c)*(1.-p.y)/3e4;
11  }
12  fragColor = o;
13 }
14
```

#### Shader Inputs

```
uniform float3 iResolution; // Viewport resolution (pixels)
uniform float iTime; // Shader playback time (s)
uniform float4 iMouse; // Mouse drag pos=xy Click pos=zw (pixels)
uniform float3 iImageResolution; // iImage1 resolution (pixels)
uniform shader iImage1; // An input image.
```

```
1 // Source: @XorDev https://twitter.com/XorDev/status/1475524322785
2 vec4 main(vec2 fragCoord) {
3   vec4 o = vec4(0.0);
4   vec2 p = vec2(0.0), c=p, u=fragCoord.xy*2.-iResolution.xy;
5   float a;
6   for (float i=0; i<4e2; i++) {
7     a = i/2e2-1.;
8     p = cos(i*2.4+iTime+vec2(0.0,11.0))*sqrt(1.-a*a);
9     c = u/iResolution.y+vec2(p.x,a)/(p.y+2.);
10    o += (cos(i+vec4(0.0,2.0,4.0,0.0))+1.)/dot(c,c)*(1.-p.y)/3e4;
11  }
12  return o;
13 }
14
```