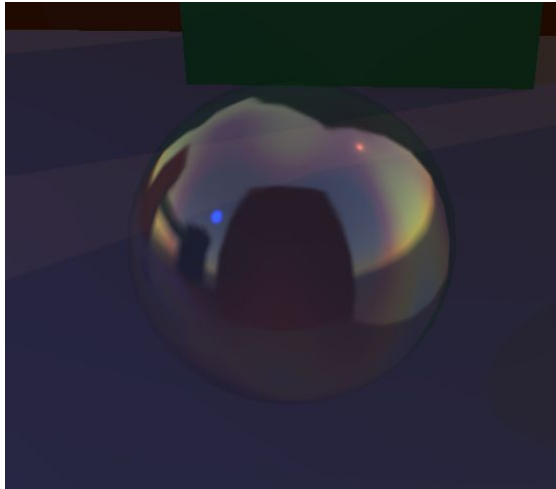# BubbleR

BubbleR is an Unity shader that simulates a bubble. You just have to set a material and assign it to a sphere or a particle system, and your soap bubble is ready.


It features most of the things you would expect from an Unity standard shader as a base, like shadows, reflections, smoothness/metallic, etc. In addition it adds vertex animation and color shifting.

You can also achieve several other effects by tweaking parameters, like for example barriers or other spells.

It comes with a custom material inspector, that looks like this:
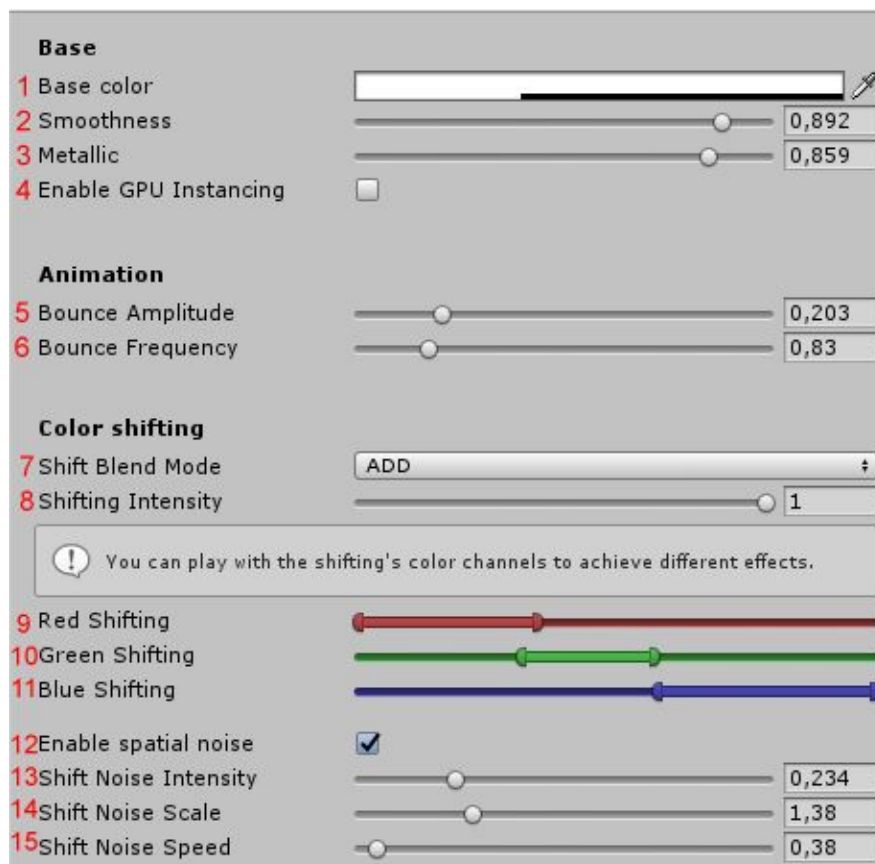
1. **Base color:** The base tint of the material, alpha is transparency. If you are using the textured shader, this row also includes a texture field, which is used to tint (RGB) and transparency (A).
2. **Smoothness**: How reflective you want this material to be.
3. **Metallic**: Changes the metallic value of the material, changing the way light is reflected.
4. **Enable GPU instancing**: Enable/disable instancing for this material.
5. **Bounce Amplitude**: How strong the bubble bounce animation will be (set it to 0 if you don't need animation).
6. **Bounce Frequency**: How fast the bubble animation will be.
7. **Shift blend mode**: What operation should be performed with the color shifting value
   a. **ADD**: Adds the color shifting value to the base color
   b. **MUL**: Multiplicates the color shifting to the base color
   c. **SUB**: Subtracts the color shifting to the base color
8. **Shifting intensity**: How strong will the color shifting be.
9. **Red Shifting**: You can set the range on which the red color will be more prevalent (more info [below](#))
10. **Green Shifting**: Same as the other color ranges, but for green.
11. **Blue Shifting**: Same as the other color ranges, but for blue.
12. **Enable Spatial Noise**: Should this material have color noise based on world position? *I suggest to enable this if you are using a mesh with "flat" normals (a plane, a cube, etc.)*
    a. **Off**: The surface noise will be a function of the vertex normals.
    b. **On**: The surface noise will be a function of the normals and the position of the vertex.
13. **Shift Noise Intensity**: How strong the effect of the noise on the color shifting will be *(picture below for a visual comparison)*.
14. **Shift Noise Scale**: How "tiled" the noise pattern will be.
15. **Shift Noise Animation**: How fast the noise animation will be.
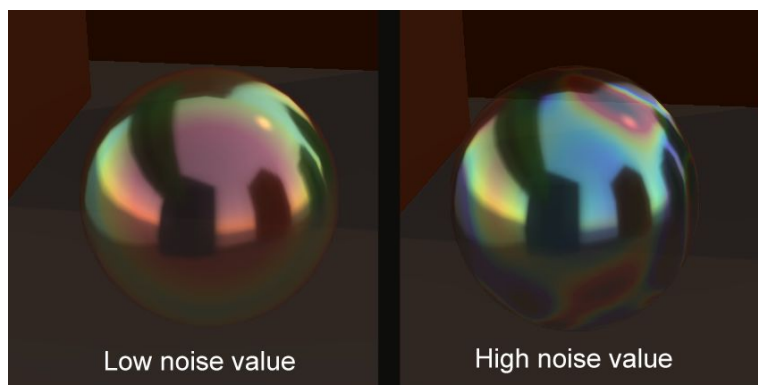
Example of low vs high Shift Noise Intensity

Color shifting (Thin-film interference effect)

This is supposed to simulate the rainbow effect you can often see on the surface of soap bubbles, or other thin surfaces, like oil spills. Note that this effect is not physically accurate, but rather it is just an approximation. You can vary intensity, blend mode, and even add some animated noise. Most parameters are really straightforward, except for the color shifting bars.

The general rules when setting the color shifting ranges (Red, Green, Blue) are:
- The bigger the range, the more that specific color will be prevalent on the bubble.
- Colors on the left end will be more likely to appear on the center of the bubble, color on the right will be more likely to appear on the outer (shift noise affect this rule).
- You can mix color by overlapping ranges.

Suggestions

- For the best visual effect, in case you are using it for bubbles, it's suggested to use it in combination of reflection probes, with high smoothness and metallic values.
- If you are using non spheric meshes, I recommend to enable the Spatial Noise option.
- If you are using it with a particle system, you can enable "Custom Vertex Streams" in the Renderer tab of the particle system, and assign **AgePercent** on **TEXCOORD0.z**, if you want the bubble animation to reduce over the particle lifetime.
- If instancing is enabled, the shader code will introduce a phase shift on the vertex animation, to make every bubble look unique. However, due to how it's implemented, it might slightly vary when bubbles instances are reordered or changed.

Contacts

If you encounter any issue with BubbleR, you can contact me via email and I will try my best to help you.

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