



Displacement Textures



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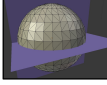


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DisplacementTextures.pptx mpb - January 3, 2022

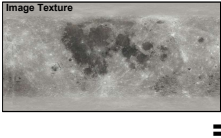
Displacement Textures as a Special Way to Model 3D Ge

Vertex-described Object




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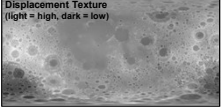
Image Texture




=



Displacement Texture (light = high, dark = low)



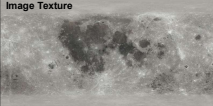


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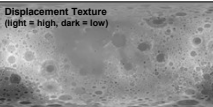
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Displacement Textures as a Special Way to Model 3D Geometry


Image Texture



Displacement Texture (light = high, dark = low)







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Displacement Textures as a Special Way to Model 3D Geometry

```

moondisp.vert
uniform float          uScale;
uniform sampler2D      uDispUnit;

out vec2              vST;
out vec3              vNormal;


void main()
{
    vec2 st = gl_MultiTexCoord0.st;
    vST = st; // to send to fragment shader

    vec3 norm = normalize( gl_Normal );
    vNormal = normalize( gl_NormalMatrix * gl_Normal );

    float disp = texture( uDispUnit, st ).r;
    // in half-meters, relative to a radius of 1,727,400 meters
    disp *= uScale;

    vec3 vert = gl_Vertex.xyz;
    vert += norm * disp;

    gl_Position = gl_ModelViewProjectionMatrix * vec4( vert, 1. );
}
    
```



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Displacement Textures as a Special Way to Model 3D Geometry


```

moondisp.frag
#version 330 compatibility

uniform float          uLightX, uLightY, uLightZ;
uniform float          uKd;
uniform sampler2D      uColorUnit;

in vec2                vST;
in vec3                vNormal;

void main()
{
    vec3 light = normalize( vec3( uLightX, uLightY, uLightZ ) );
    float intensity = uKd * abs( dot( vNormal, light ) );
    intensity += (1.-uKd); // ambient
    vec3 newcolor = texture( uColorUnit, vST ).rgb;
    gl_FragColor = vec4( newcolor*intensity, 1. );
}
    
```



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