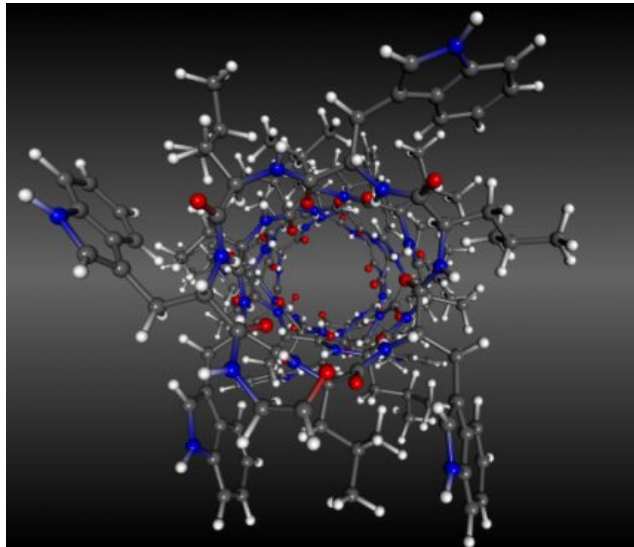


Accumulation Buffer

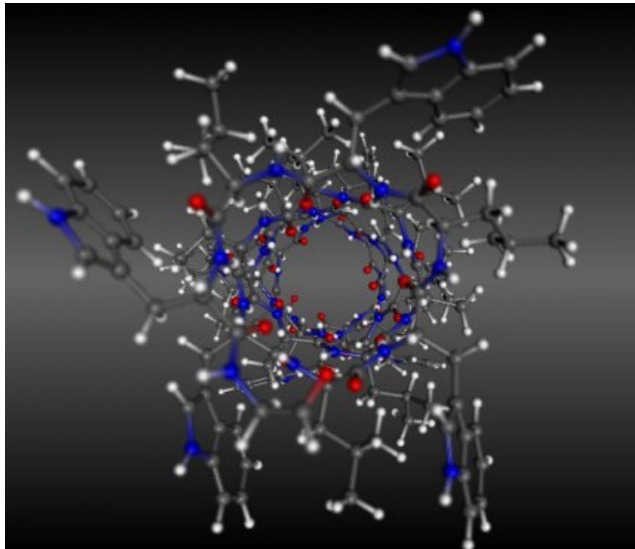
The accumulation buffer can be used to accumulate a series of images generated in the color buffer. Finally, the result is copied back into the color buffer for viewing. Because a scene has to be rendered several times it takes longer to create an image, but the quality of the output is improved significantly.

A) Depth of Field

I

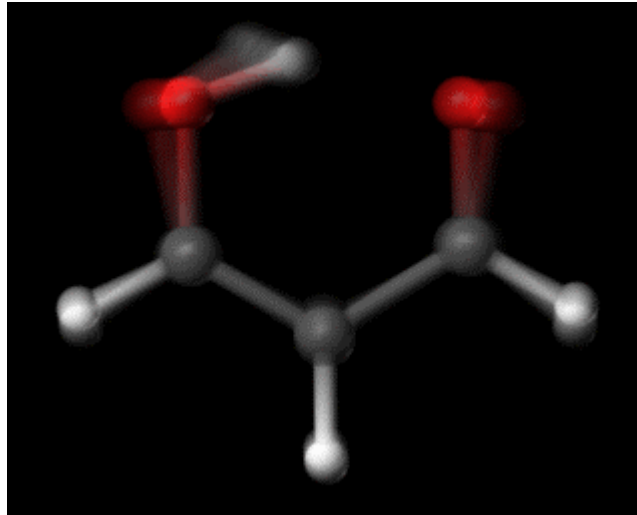


II



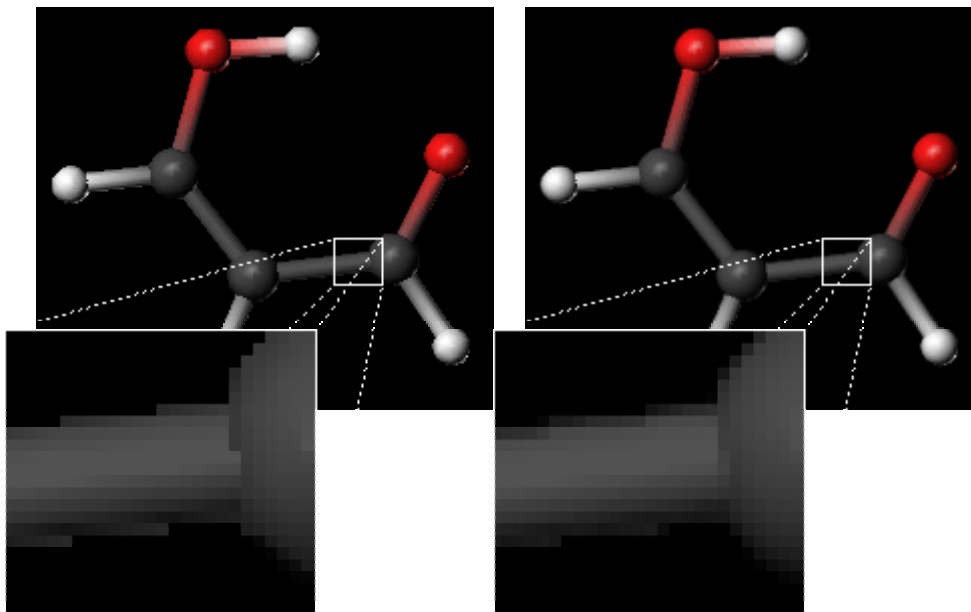
The first image (I) above shows the Ball-And-Stick model of gramicidin A rendered once with a perspective projection. The second image (II) shows the same model. This time, the scene is rendered 24 times each with a slightly different point of view and a different viewing direction. All images are averaged using the accumulation buffer. The viewing parameters were chosen so that all scenes have only one common plane, the plane of perfect focus. Objects far away from this plane get blurred (II). This is the Depth-Of-Field effect you would see in a photograph. The shadows were simulated using texture mapping with shadow maps.

B) Motion Blur



The picture shows the vibration of malondialdehyde (only 2 normal modes are activated). The scene is rendered continuously. Between each rendering step the positions of the atoms are changed. After the image of a scene is added to the accumulation buffer the contents of the accumulation buffer is normalized and copied to the color buffer for viewing. The rendering speed is only reduced by a factor of 2 or less for scenes with more details, because for each frame only one image is stored and one image is loaded.

C) Antialiasing



The left picture shows the Ball-And-Stick model of malondialdehyde rendered once in the normal color buffer. The edges of the model appear jagged. The right picture was created by accumulating 24 images as described in the Depth-Of-Field section. This time, the position of the eye is held fixed and the model is moved in fractions of a pixel around the original position. (This method is obsolete on graphics systems with multisampling buffers, like the Reality Engine 2 from SGI).