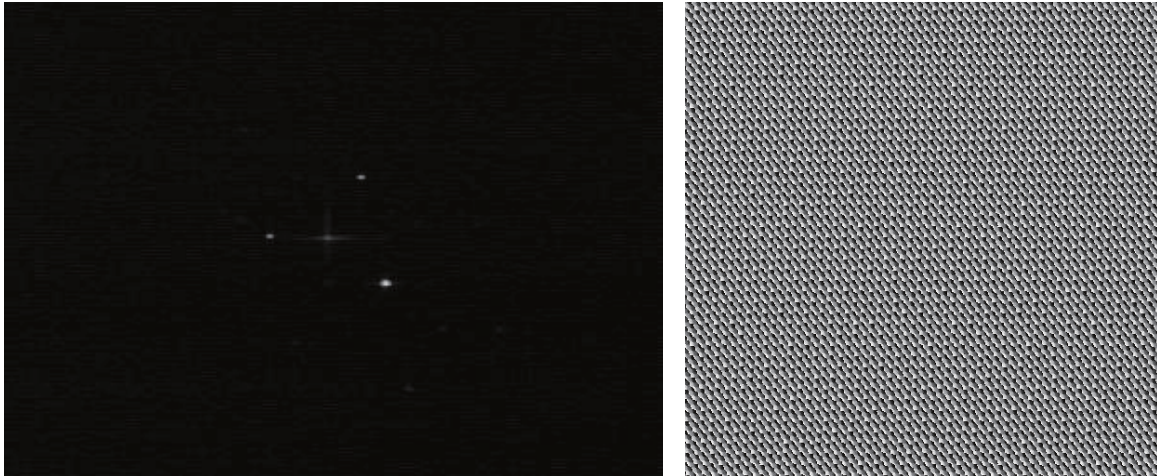


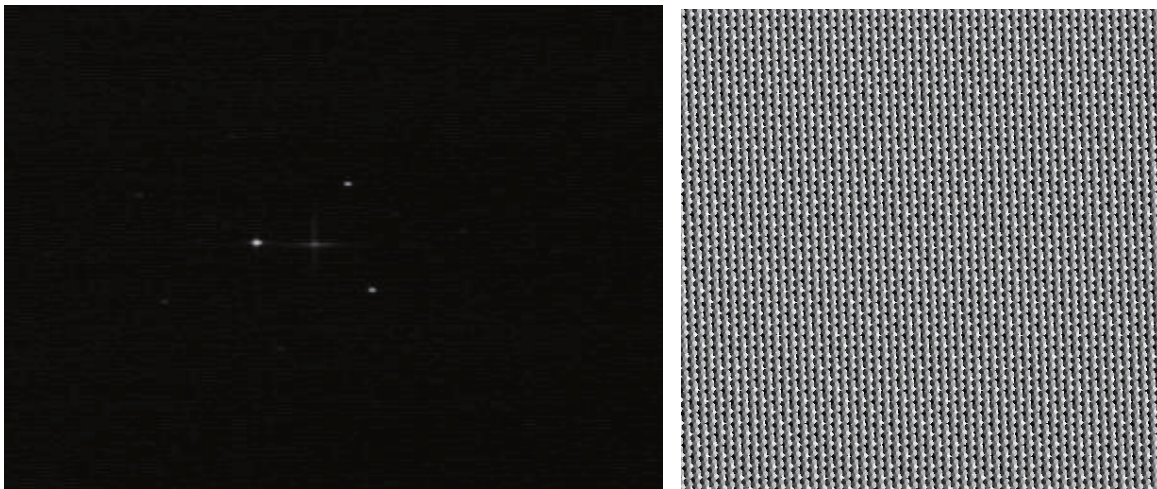
Multispot Beamsteering

The following images illustrate three simple examples of use of the weighted Gerchberg Saxton. In the three holograms, three focal points are produced. In each hologram the intensity of one point was increased with respect to the other two points. In the middle of the triangle of diffracted focal points the 0th order can be seen.

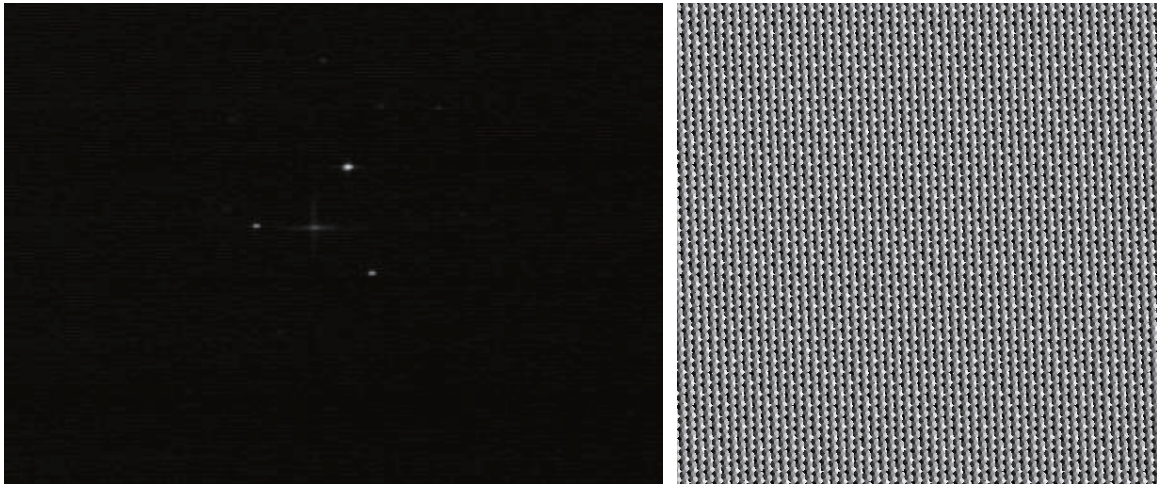
Spot 1 and 2 have an intensity of 1, and spot 3 has an intensity of 10



Spot 1 and 3 have an intensity of 1, and spot 2 has an intensity of 10



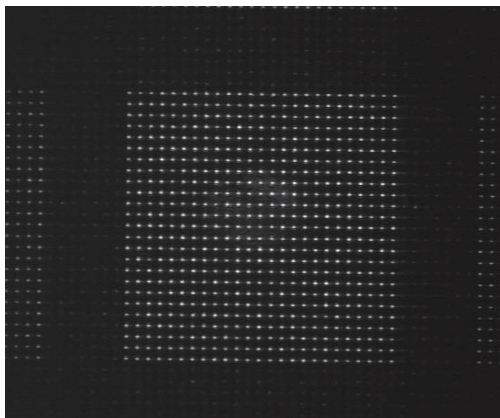
Spot 2 and 3 have an intensity of 1, and spot 1 has an intensity of 10



Complex Holograms to Create Hundreds of Focal Points

The images thus far are useful for understanding the SLM operation from a simplistic perspective. However, in most applications it is desirable to use far more complex holograms. The images below illustrate beamsteering with grids of hundreds of focal points. While grids were selected for the sake of simplicity, it is possible selectively direct illuminate to any location within the 3D volume. Furthermore, it is possible to create images in the Fourier plane. This is potentially useful for exciting an entire cell body as opposed to exciting with individual focal points. However, the problem with creating images in the Fourier plane is that, when combined with a coherent light source, interference occurs at the focal plane which causes speckle in the excitation. This has been a topic of extensive research. A variety of methods can be exploited to minimize this problem, but not entirely eliminate it.

625 Focal Points



1024 Focal Points

