

## Bi 1X, Spring 2011

### Assignment 2: Powers of Ten Project

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#### Goal:

Your mission is to investigate, like the scientists in the Powers of Ten video, what is happening in the Caltech ponds at each power of 10 from  $10^{-8}$  meters to  $10^{-1}$  meters. Turn in a gallery of photos with descriptions, one for each order of magnitude, in those cases where it is possible, using the pictures you took with microscopes in class. For orders of magnitude outside the capabilities of your microscope, you may add pictures you take or find using outside resources (remember to always cite sources). Be sure to discuss the biology of what's happening at each length scale in the pond and how it relates to the world at large in a short paragraph with each picture. In addition, use Matlab to convert pixels to microns on the graticules for each magnification and add scale bars to each picture. Concatenate images taken using different fluorescence channels using Matlab with a caption on the false colors and scale bars.

#### List of things to turn in:

- A gallery of photos for each order of magnitude with a scale bar and description in a short paragraph with each picture. Note that for large scale features you photograph at the ponds, you may use macroscopic objects such as rulers to provide a scale bar.
- Images of graticules at different magnifications with scale bars and captions.
- Concatenated fluorescent image from the fluorescently labeled cells you took pictures of during class. Make sure your image has both a scale bar and caption.
- Your own Matlab codes