Initial Assignments
Flow Visualization: The Physics and Art of Fluid Flow
Spring 2009

1) **Email list:** Due Weds 1/21. To subscribe, send email from your favorite email account to listproc@lists.colorado.edu. In the body of the message include

Subscribe flowvis Firstname Lastname (with appropriate substitution).

2) **Entry Survey:** Also due Weds 1/21. Turn in a hardcopy. Document can be downloaded from the course website: www.colorado.edu/MCEN/flowvis. Typed is appreciated

3) **Image Assignment 1:Get Wet**. Due Monday 2/2.

The purpose of this assignment is to "get your feet wet", Make a picture of fluids (air or water, gas and/or liquid, any fluid, any combination of fluids) that both (1) demonstrates the phenomenon being observed and (2) is a good picture. Use any imaging technique you are familiar with, analog or digital, still or video, black and white or color, positive or negative, flash or available light, etc.. Make the clearest, cleanest, most interesting picture possible.

This means you will probably need to set up a situation, control your variables, do it once, observe the results and do it again once you know what works and what doesn't.. Keep notes on what you've done.

You are welcome to work in teams to create the image you want, but you are individually responsible for your own final image. Formal teams and more elaborate projects will be set up for the next assignment.

Everyone's images will be displayed and critiqued in class on Mondy 2/2.

All images must be accompanied by a short report. See Report Guidelines document for info.

To speed posting your image on the website, please provide the following, electronically:

a) The best resolution file you have of your final image or clip, for future large format prints and presentations. TIFF or Photoshop formats preferred; jpg is ok. Use the best resolution setting that you can. If your camera only takes jpgs, use the large file, fine jpg setting.
b) A copy of the original file, pre-Photoshop.
c) Word document of your report. Pdf is fine too.
d) A completed image assessment form, either electronic or hardcopy.

Assignments are due in Hertzberg's email or CULearn at NOON of the specified day, so we have time to put the slideshow together before class.

Please include your last name as part of each file name. You can email the files, submit on CULearn, or drop off a CD or a USB memory key (will be returned in class at 2 pm). If you are submitting prints, we will arrange for scanning.

Technical Notes:

If you are working in the bathtub or kitchen sink you may find it useful to view the flow through a "boat." A clear plastic disposable food container works like a glass bottom boat used

on Caribbean tours to observe fish. If you use a fish tank or other glass enclosure, be careful about where the flash reflects off the glass (to become a distracting white hole in your photo).

If you are using a digital camera, you may need to set a white balance. Almost any deficiency in color balance, contrast, etc., can be adjusted in Photoshop, but requires a working familiarity and access to the program. The Quickstart Photoshop book is the easiest entry point if you don't know the program.

4) **The Photography of Clouds.** There will be two Clouds Assignments, with the first due Weds 2/25 in class, the second image later in the semester. This is to give plenty of opportunity to observe a variety of atmospheric conditions. Images made before January 12 2009will not be acceptable for the first assignment, and images made before February 25 2009 will not be acceptable for the second assignment. Exceptional images made prior to this course can be submittted in addition to new images for discussion and posting, please document them as best you can.

Photograph a cloud. In fact, photograph clouds as often as possible, and start as soon as possible. You will soon discover that it is not easy to do but that it is a very pleasant diversion from everything else that you do. Do keep track of where, when, and how the image was made. A report is still required. Engineering students (and interested photo students) must include atmospheric sounding data (see website for links) and discuss the physics revealed. See the website for links to old weather data. There will be a series of lectures on cloud physics to help you interpret your images.

The most famous "cloud" photographs were made in black and white by the legendary early twentieth century New York art dealer, photographer, and husband of Georgia O'Keefe, Alfred Steiglitz. He called them "equivalents" and considered them to be music.

Sunrise and sunset are sometimes quite colorful or even extraordinary, but difficult to picture in a satisfying way. During the day, individual clouds can be extremely interesting. In the course of this assignment you will discover what the English writer and amateur photographer George Bernard Shaw once said about the photographer: "The photographer is like the cod (fish) who lays a million eggs so that one may hatch." So, keep looking up and keep pressing the button. And, if you have access to an extreme wide angle lens as well as a telephoto lens, use them as needed and as often as possible. Also consider making a short time lapse video instead of or in addition to a single image. Some digital cameras have software to automate this process.

Clouds require that you think outside the box.

Technical Note:
No doubt you have seen the absolute black skies of Ansel Adams, with brilliant picturesque white clouds. This trick is accomplished using a red or orange filter with black and white film. A circular polarizing filter can be used to heighten contrast in color images, but they are pricey and may cause color shifts.