

# Great (Focal) Lengths

Project 2. Due 11:59PM on Friday, March 1, 2013.

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## I. Planning, setup, and photographs (75 points)

Some of the rewarding photographs to be taken during this course will require intricate planning, careful setup, and maybe even a bit of luck. Devoting significant time in an effort to perfect a photograph is not an uncommon occurrence. This approach may require money, manpower, and time; however, since most of the photographs you will be taking will not be professionally sponsored, money and manpower are often limited. Being faced with these limited resources can stir the additional creativity necessary to create a truly fantastic result.

That is precisely the idea behind this project. During the 18 days that this project is released, you are asked to plan, setup, and execute a specific type of photograph, and to continue working on it to strive for perfection while documenting your steps towards its completion. An ambitious idea is vital.

Please consider the following examples of possible scenarios that will require careful planning and setup. You may choose **one** of these ideas and execute it or create one of your own. Feel free to email the staff with your idea if you are not sure whether or not it will be of sufficient scope for this project. It should not be necessary to purchase anything to complete this project since many ideas can be executed by being creative with the materials you already have at your disposal.

- **Do-it-yourself lens (4-5 photos).** Modern lenses contain elements that are rigidly positioned in a plastic or metallic barrel. View cameras, lenses with bellows, and tilt-shift lenses allow manipulation of the lens elements in a less familiar manner. In particular, the lens can be tilted with respect to the film plane to drastically alter the behavior of the depth of field. For instance, photographs of real scenes may appear miniaturized because of the surprisingly narrow focus! View cameras and tilt-shift lenses have a high cost, and less expensive alternatives (such as LensBaby products) lose many of the advantages of the more expensive equipment. You might want to experiment with this sort of photography; here is your chance to try!

There are a number of "DIY" lens tutorials, but you might start your research with this version:  
<http://cow.mooh.org/projects/tiltshift/diyexamples.html>

- **High-speed flash photography (3-4 photos).** If you do not already have an external flash unit, please obtain access (perhaps by renting) to one and ensure that it allows for full manual control over its power. Generally, high-speed flash photography is best achieved with the use of a circuit that will trigger the flash unit when some event occurs, such as a loud sound. You might use this as an opportunity to take a photograph of a balloon popping, a water droplet hitting a surface, or some other high-speed event. Be sure to experiment with interesting compositions, angles, and colors. For example, you might try to add food coloring to some water if your photograph calls for it or add color gels to the front of the flash unit to add some color to the photograph.

The following links might be useful to get started:

Images by Dr. Harold Edgerton: <http://edgerton-digital-collections.org/galleries/iconic>

Circuit design from NCSSM: <http://courses.ncssm.edu/hsi/pacsci/fpaper.html>

- **High(?)-altitude photography (4-5 photos).** High-altitude photography is becoming increasingly popular as the materials needed to send cameras to the upper layers of the atmosphere become less expensive and more accessible. This sort of photography poses particularly interesting challenges as you must ensure that your balloon is legally able to fly (check the Federal Aviation Administration's website), your equipment must survive the extreme changes of atmospheric pressure and temperature, and you must have a means to recover your equipment after it lands. For this reason, high-altitude photography is probably difficult to achieve in the limited time provided for this project, but safely strapping your camera to a device that can provide as large an increase in altitude as possible is the goal. The aircraft keeping your equipment airborne need not be a balloon; it could be a model airplane or, if you're exceptionally brave, a model rocket. Please be sure to take **all** necessary precautions if you decide to pursue this idea.

For some inspiration, you might take a look at: <http://vimeo.com/24390348>

- **Extremely long exposure (2-3 photos).** Capturing star trails or aurorae requires patience, good geographical position, exceptional technical skill, and a bit of luck with the weather. A typical star trail exposure can last hours so be sure to plan ahead. Batteries exhaust more quickly in the cold so be sure that your camera stays relatively warm when the temperature dips at night, especially since you will likely need to be outside the comfort of the city to be able to take an effective star trail photograph. Please also provide some context for your photograph by capturing a fixed object on the ground in your photograph. In other words, a photograph of just a trail of stars with no fixed reference point may be disorienting and less successful. Since you will most likely be photographing a star trail in the northern hemisphere, we suggest you pay attention to the location of Polaris. This star is a reasonable approximation of the direction of the north celestial pole and will provide some circular star trails. Like this:

[http://philhart.com/gallery/Astrophotography/Phenomena/Biolumiscence\\_Star\\_Trail\\_sm.jpg.html](http://philhart.com/gallery/Astrophotography/Phenomena/Biolumiscence_Star_Trail_sm.jpg.html)

As with many of the rules in photography, however, sometimes breaking conventions can result in some equally great results; for example, consider the following:

<http://blogs.discovermagazine.com/badastronomy/2010/06/24/the-lines-in-the-sky-are-stars/>

- **Fun with Ferrofluids (4-5 photos).** Ferrofluids are liquids that contain magnetic particles suspended at a specific ratio. Placing a ferrofluid near a magnet will result in fascinating patterns as the fluid reacts to the magnetic field. This makes for captivating photos, and combined with some creative compositions could make some interesting abstract art.

More information on ferrofluids: <http://en.wikipedia.org/wiki/Ferrofluid>

DIY: <http://chemistry.about.com/od/demonstrationsexperiments/ss/liquidmagnet.htm>

Again, these are just a few of many possible ideas that would satisfy the requirements for this project! Feel free to implement an idea that is not listed above if you would like, but we strongly suggest that you email us to ensure it is of sufficient scope.

The number of photographs you submit depends on the type of project you do. We have defined an approximate but reasonable number of photos for each of the above ideas. Note that some types of projects (*e.g.*, DIY Lens, Ferrofluid, or Altitude) are more likely than others to produce numerous photos that are interesting and unique for the amount of work that is necessary. If you decide to implement your own idea, use these numbers of photographs as a guideline or ask the staff for some guidance.

The technical requirements for these photographs are as follows:

- Please submit **no fewer than two** and **no more than five** images. The final number depends on the type of project you select.
- Name the image files in whatever way you think is appropriate.
- The low number of images being required means that the submitted images are expected to be as near to perfection as possible.
- Each submitted photograph must be **unique**. In other words, if your project calls for two photographs, please do not simply submit two versions of the same photograph with only slight variations in composition, exposure, or quality.
- Please use an **advanced metering mode** such as aperture priority, shutter priority, manual mode, bulb mode, or program mode when taking the photographs. If you think that your project would require some alternate form of exposure mode (for example, it might be unreasonably difficult to use anything other than fully automatic mode for a project based on medium-altitude photography) then please be sure to first seek approval from the staff.
- The **EXIF data** associated with your photographs must remain wholly intact. If you are unsure if your modifications will result in the erasure of this metadata, please submit the photographs directly from the camera.
- The photos **must not be resized**. We should be able to view the photos at their full resolution. Crops for composition are acceptable. Again, if you are in doubt, use the photographs directly from the camera.
- Small modifications to the image such as color tweaks, contrast enhancement, *etc.*, are acceptable. However, please be sure that your image still meets all of the other requirements; notably, the EXIF data must be preserved and the image must be submitted at its original size.
- All submissions should be **original photographs** taken by you after the release of these project specifications for the purposes of satisfying the requirements of this project.
- Be sure to submit the photographs in the **JPEG** file format; note that this should be the default for many, if not all, cameras. If you prefer to take photographs in RAW format, note that your camera may have a "RAW+JPEG" setting which will save a photograph in both formats. You may also submit a photograph that was taken in RAW and processed to JPEG, but you must ensure the preservation of the EXIF data. There is no need to be concerned if you are unfamiliar with RAW because we will be discussing it later in the course. If you would like to know more about it in the meantime, please search Wikipedia and Google for some preliminary information.

- To submit these photos by the due date, simply place them in the appropriate project dropbox in the submission tool. Please be sure to place them in the directory sufficiently in advance of the due date to allow enough time for them to upload to the servers before the project is due. You are welcome to submit early and modify the images as many times as you wish before the due date. However, take special care not to modify any of the files in this directory after the due date because doing so will cause your entire submission to be considered as late.

## II. Documentation (25 points)

As you work on this project, please be sure to document what you are doing in order to achieve the end result. The goal of this documentation is to provide a "behind-the-scenes" look at the work you have done to create the resulting images, not merely to have progress reports or status updates. Please include photographs of your setup (these documentation photographs do not count towards or against your final image limitations) and a document (Microsoft Word, PDF, or text documents are acceptable) to explain and show off your effort for this project.

The requirements for the documentation are:

- In addition to the final photos, you must also submit a **one page** Microsoft Word (.doc, .docx), Text (.txt, .rtf), or PDF document that describes, "behind-the-scenes" how the final images were captured.
- The document should be named, *e.g.*, **BehindTheScenes.doc**
- You must also include three or more images that are much less formal than the final photographs and are used simply to document how your project was executed. In other words, technical perfection is not necessary for these documentation photos; indeed, using a fully automatic cameraphone would be acceptable, just as long as the photos clearly show your setup. These documentation images will be counted separately from the final images that you take as part of this project.
- You may either embed the images within your document or include them separately. If they are separate, the photographs should be named **BTS1.jpg**, **BTS2.jpg**, etc.
- Please submit the documentation by placing it into the appropriate folder in the submission tool.