



### **Trifid Nebula (by Jacob Gunnarson)**

The Trifid Nebula is so-called because of the dark dust lanes that divide its main section into three. The red portion is an active star-forming region, glowing crimson due to the presence of ionized hydrogen. In the upper left, tiny dust grains reflect the light of nearby stars. The same basic scattering mechanism that creates earth's blue skies give such reflection nebulae their characteristic blue color. (Taken with Small Hall's observatory)



### **The Butte-y of Physics (by Danya AbdelHameid)**

The image above is of a butte (pronounced *byoot*) in Golden, Colorado seen from the Colorado School of Mines campus. A butte is a tall, flat topped, steep sided tower of rock that forms as a result of differences in the cohesive forces of varying rock types. The top layer or surface layer of a butte or the caprock, is generally composed of a very hard rock material that is capable of resisting erosion, as the cohesive forces of the caprock exceed the aerodynamic or fluid forces imposed by water or wind driven erosion. As result, the caprock functions as a shield for the softer rock material beneath it and as water and wind forces begin to erode away the softer, less cohesive rock material, the portion of material shielded by the caprock remains, producing the characteristic butte landform.



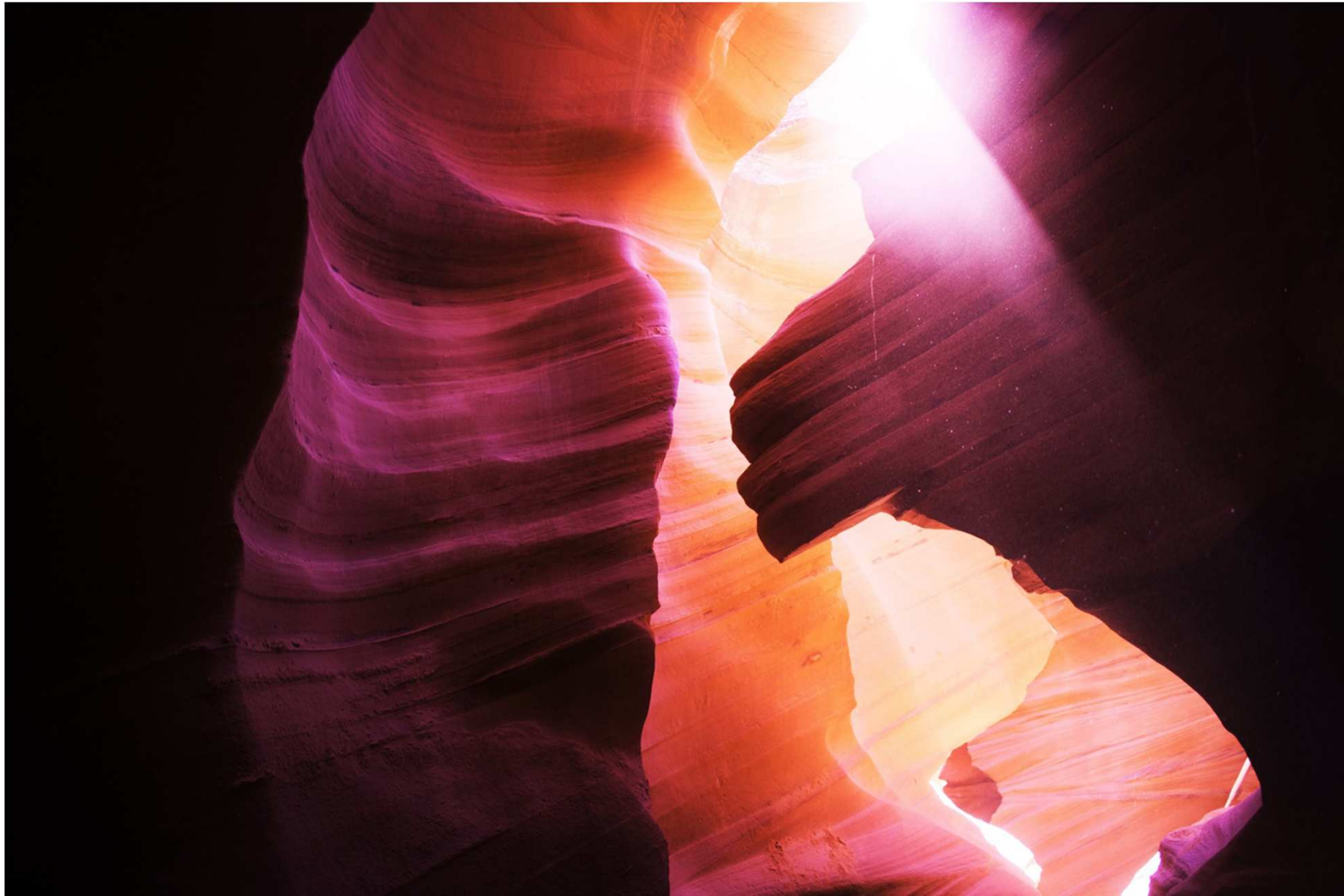
### **A Night at the Movies (by Joseph Payson)**

Movie projectors use converging lenses to display images. The film has to be put in upside down in order to create the correct image. The light rays are refracted by the lens, and then converge creating a real image. Light shines through the filmstrip to project each individual frame of film onto the screen. As a person whose life revolves around film, the process is truly fascinating.



### **Beautiful gravity (by Irina Novikova)**

The fountains of Peterhof new St. Petersburg, Russia, amazed and inspire people for almost 300 years. It makes it all more awe-inspiring when one realizes that none of the fountains uses any pump, but just the natural change in elevation and manipulation with the pipe sizes.



**Chasing Light (by Deepak Krishnankutty)**

Finally, defeated light in a race to the depths of Antelope Canyon. Light couldn't make it.



### **Lunar Mosaic (by Jacob Gunnarson )**

The near side of the moon is dominated by dark plains of basalt, which formed after the heavy bombardment of asteroids that pockmarked the older highlands. This photo was by combining three separate photos, each made by combining hundreds of video frames into a single image. This minimizes the effect of atmospheric turbulence which can significantly distort images. (Taken with Small Hall's observatory).



### **Arizona from the Air (by Stephanie Wang)**

This is an aerial view of Lake Mead, the largest reservoir in the US. At first, it may seem unnatural for such a large body of water to be found in the middle of what seems like a desert. Lake Mead is a result of the Hoover Dam, which was built to regulate the Colorado River. The Hoover Dam also provides power to over a million people. When the Colorado River flows into a dam, the water backs up. At the bottom, it flows through a relatively small hole and water turbines generate electric power from the water kinetic energy. Dams are just one example of how energy can change forms.



**Star Trail (by James Card)**

Caption: This photo is a combination of photos exposed for 30 seconds each for over an hour of the nights sky in Ketchum, ID.





### **Three Spooky Spirits Come Out at Midnight (by Joseph Payson)**

This photo is a long exposure shot (lasting ten seconds) using a limited light source being added and taken away by turning it on and off. In addition to this, high winds and slight movements of the subject create a ghostly and blurry effect despite the camera being completely focused and still. This creates the illusion of the subject being in three places at once.



### **Maverick (by Katie Horn)**

This photo was taken at Langley Air Show. Shown in the photo is an F-16 Fighting Falcon, aka Thunderbird. The jet is increasing in altitude, at a high angle of attack. One of the many physics principles at work here is Bernoulli Principle. The Bernoulli Principle indicates that pressure below the wing is higher than the air pressure above the wing. Due to this difference in pressure, lift is created. This lift pushes the wings upward. Other principles involved are Newton's Laws; an object at rest will stay at rest, force times mass equals acceleration, and for every action there is an equal and opposite reaction.



**The Dumbbell Nebula (by Jacob Gunnarson)**

This nebula is the corpse of a dead star much like our sun. At the end of its life, it released its gaseous outer layers into space. These layers now glow by the light of the remaining core of the star, the bright bluish point at the center of the nebula. Red light signifies hydrogen, while blue indicates oxygen. The shape of the nebula is similar to that of a football, but appears as a dumbbell or apple core because we are viewing it perpendicular to its long axis. (Taken with Small Hall's observatory).



### **Olympus** (by Katie Horn)

This photo was taken from a home video of a storm. Lighting happens when there is a buildup of electrostatic charge in clouds. When positive and negative charges collect and clash. Negative charges build at the bottom of a positively charged cloud, and are then forced down to the ground making the ground positive. This causes more negative charges to be attracted to the ground, and the constant flow of electrons emits light, thus creating lightning. One bolt of lightning can produce around 15 million volts of electricity, and heat the surrounding air to over 60,000 degrees.



### **Rain or Shine (by Stephanie Wang)**

Typically, clouds appear as white. In this image, the clouds are an ominous grey color. This is because it has grown thick and dense, which is the result of accumulating more water droplets and ice crystals. These thick clouds scatter more light, and less light is able to penetrate through them. This results in the grey clouds we see.



**The Falls from Below (by Lauren Vaillancourt)**

Sometimes things are more beautiful if you look at them at a different perspective.



### **Harp Upon the Gale (by Liz Weech)**

The sound a harp makes comes from the standing waves generated by the plucking of its strings. In turn, these vibrating strings cause the air within the sound box - the harp's hollow base - to vibrate, amplifying the sound further. Who says physics can't be pretty?



### **Dancing aurora in a starry sky (by Mi Zhang)**

Auroras are produced when the magnetosphere is sufficiently disturbed by the solar wind that the trajectories of charged particles in both solar wind and magnetospheric plasma, mainly in the form of electrons and protons, precipitate them into the upper atmosphere, where their energy is lost. The resulting ionization and excitation of atmospheric constituents emits light of varying color and complexity.

Above is copied from Wikipedia. All I know is this is a stunning, breath-taking, beautiful phenomenon.





**Interference (by Irina Novikova)**

Volga river (in Russia) is often wide enough so that the waves made by different vessels can run unobstructed and interfere.



**Photo by Rico Xi**

This is shot at the bank of Namtso River, Tibet, showcasing the magnificence of the milky way and the insignificance of earthly objects.



### **Three Suns (by James Card)**

Internal reflection of light within the water molecules of the clouds creates the illusion of the sun's rays being seen in three different locations in the sky.



**Schrödinger's Cat Prior to Observation (by Stephanie Wang)**

The cat "particle", like any other quantum mechanical system, appears as a probability distribution prior to observation. Upon observation, the wave function will collapse into a single physical cat.



### **Namco Presents (by Joseph Payson)**

This photo was a long exposure shot involving light painted with flashlights to create an image of the classic video game character, Pac-Man, being chased by enemy ghosts. The glowing effect of the light is similar to that of a vintage arcade cabinet's screen. For this shot, the camera recorded the mirror image of what was "drawn." Long exposure shots work by keeping the shutter of the camera open for about 5-10 seconds, allowing for the image to be "drawn" using flashlights and the camera absorbing the light's movement.