

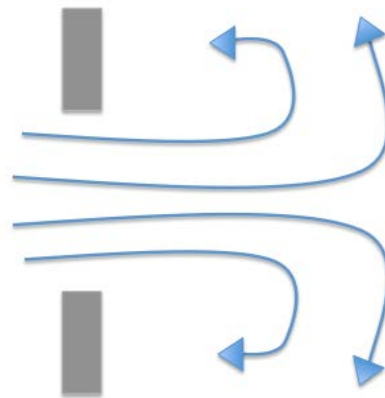
Group Image #2 Report

Lindsey Yarnell

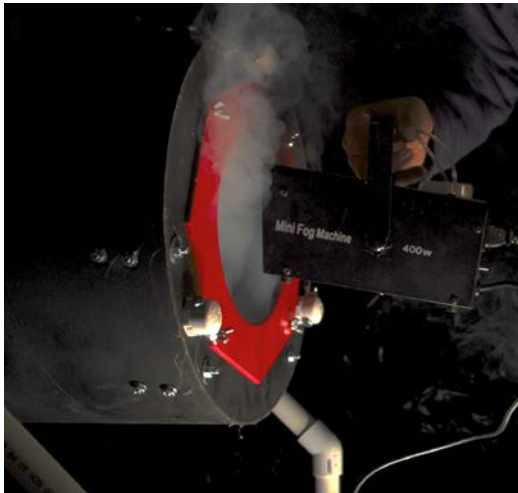


In this image I wanted to capture the flow dynamics that result from shooting air out of a vortex cannon. I wanted to show a vortex ring where you could really see the flow inside it. I already had a vortex cannon that I had built a couple of years ago so all I had to do was take the picture. I ended up not taking this picture with my group because I was unable to meet when they were getting together.

The apparatus I used to create the flow, which is visible in the picture, is a vortex cannon. The cannon is made out of 16" sonotube with an 8" aperture and inside there are three 12" springs attached to a piston plate. The back of the piston plate has a rope, ratcheting mechanism, and a quick release which lets you pull the plate back and fill the chamber and then release it when you want. The vortex ring is created when the air moving out of the chamber slows down near the walls of the cannon while still going the same speed further out from the wall. This creates a rotation motion and the air travels forward in this rotating doughnut shape.



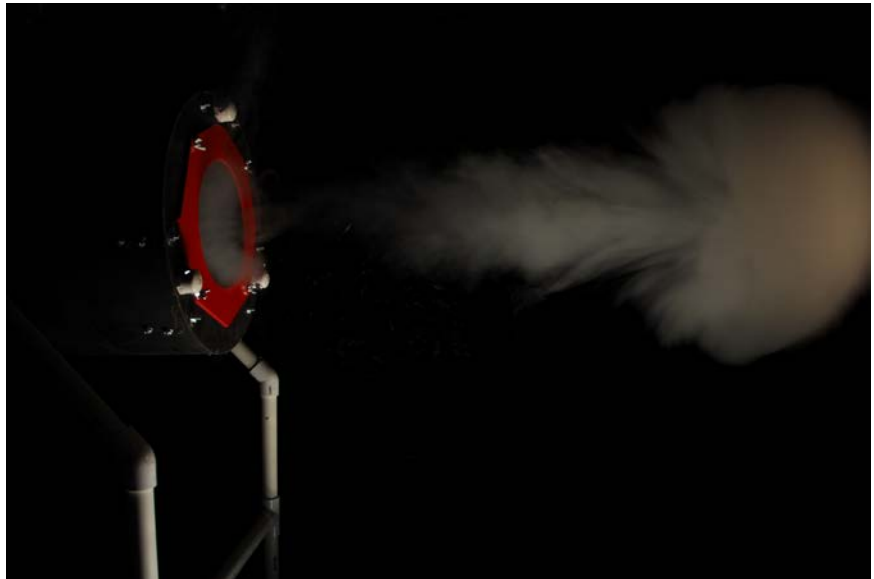
To be able to see the motion of the air I filled the cannon with fog generated by a halloween fog machine. I found that filling the cannon with fog and letting it sit for a few minutes gave the best resulting vortex rings. Another thing I noticed was that the second



and third shots usually produced the best vortex rings. The lighting for this picture was actually really tricky to figure out. I ended up using 3 flashes as well as a shop light in this picture. I had the 3 Nikon SB 700 flashes mounted on arms on the camera with a command module and I had the shop light on the ground pointing up to light up the ring. The lighting took a lot of trial and error but this seemed to give a cool up lighting effect.

I used a Nikon D200 to take this picture with an 18-200mm lens. As mentioned above the lighting was achieved with 3 Nikon SB 700 flashes and the camera was set to ISO 100. The f-stop setting was f/3.5 with a shutter speed of 1/250. The focal length of the lens was 18mm and the camera was about 3 feet from the subject. I would guess that the field of view in the image is about 3 feet tall by 5 feet long. I did edit this image some, mostly increasing the exposure and the definition as well as cropping it up. The pixel size of the final image is 3344 x 1857 pixels.

I think this image shows a cool example of air motion. I really like the shape of the cloud and how you can see the flow going into the center of it. One thing I would change in this image would be my choice in material for the backdrop. I used a black shiny plastic material which ended up reflecting a lot of the light from the flashes and created distracting



spots in the background of the material. I later learned in a lecture that material with more texture, like velvet, is better for a backdrop because it doesn't reflect the light as much. As far as developing this idea further, I would love to get a really nice picture of a vortex. I also think a slow motion video of a vortex could be really cool.