

The Vortex Room

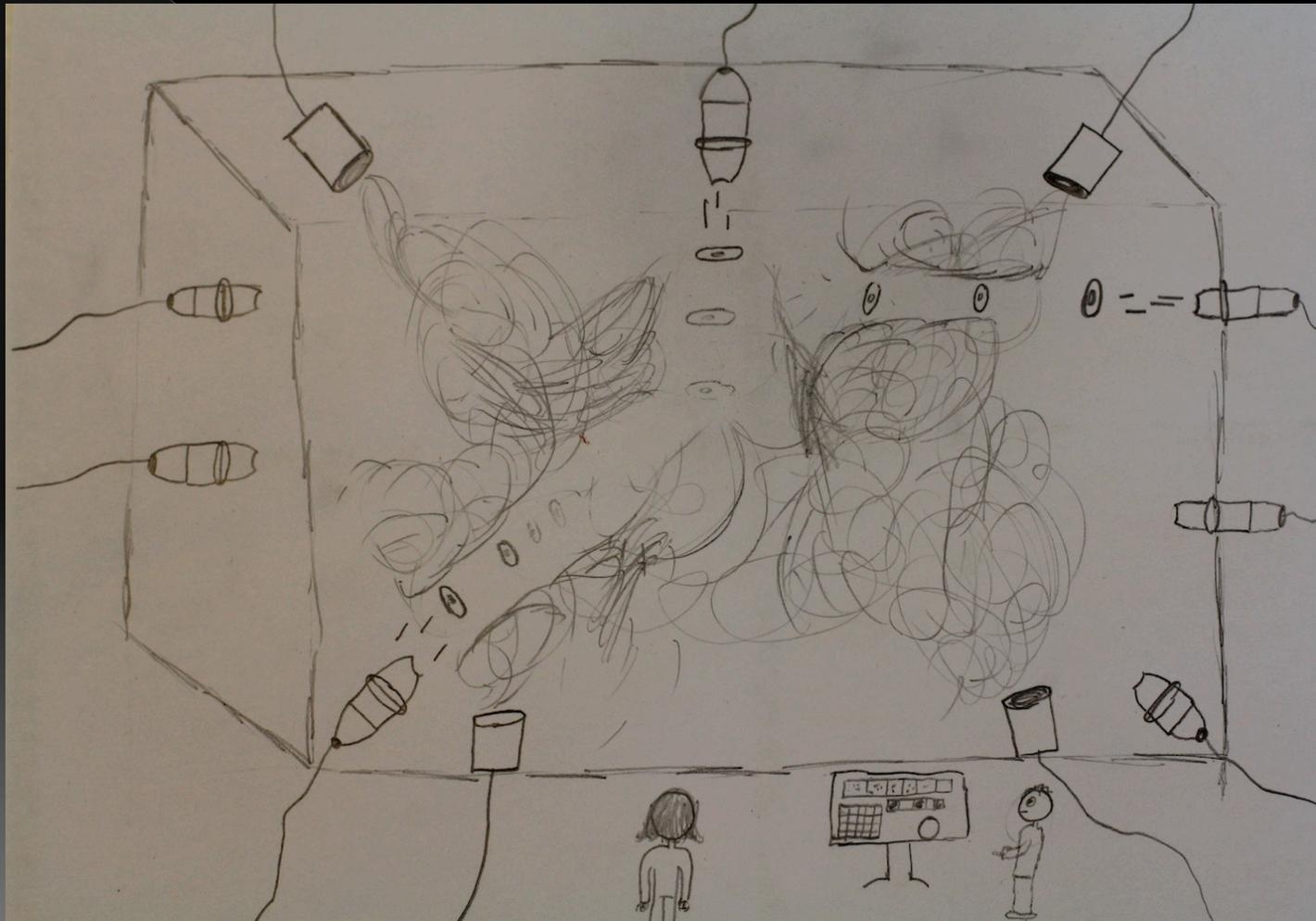
Art Installation

Baxter Frick

Abstract

- Installation will be displayed in a large glass room that could possibly be held in a museum setting
- Technologies
 - > Vortex Guns
 - > Smoke Machines
 - > Control Panel
- The installation will harness the Vortex Guns properties of manipulating smoke

Rough Sketch



Vortex Gun Technology

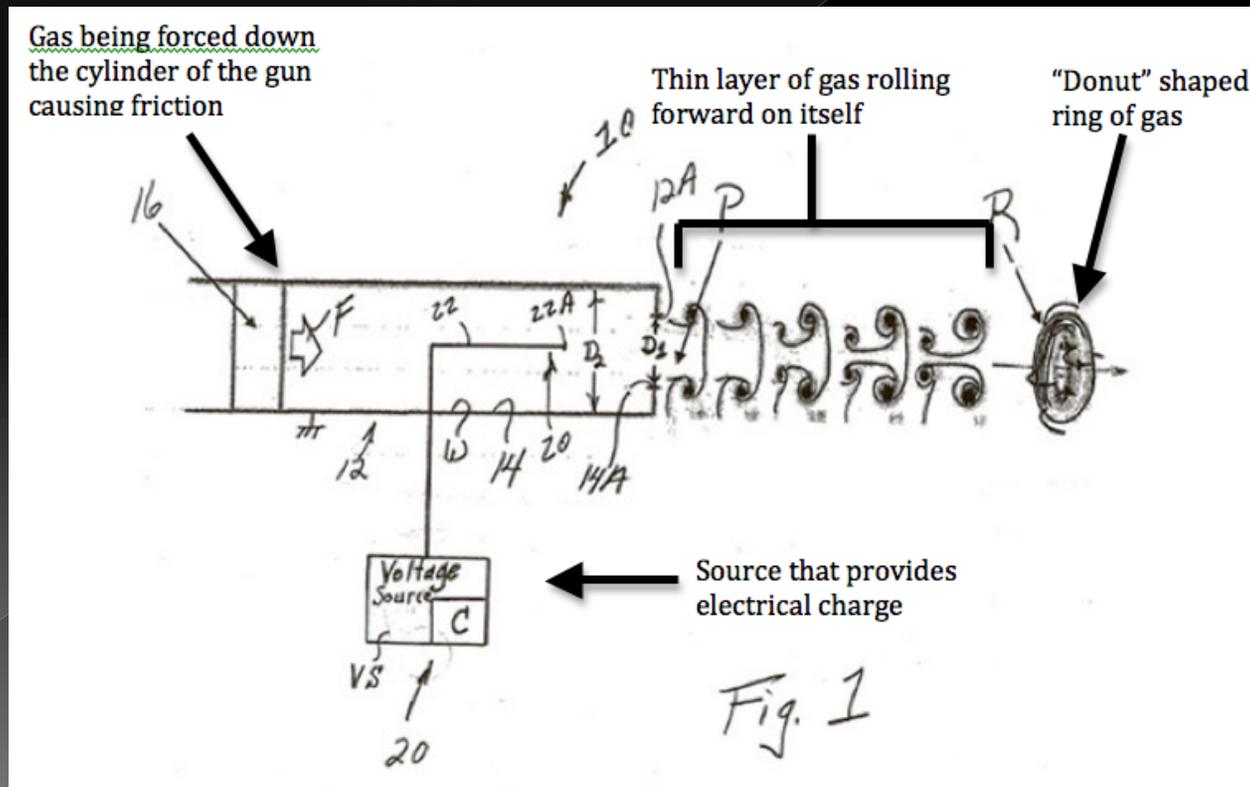
Scientists at Battelle have filed a patent application for a device that shoots out rings of gas—an invention intended to aid firefighters in suppressing smoke

The vortex gun fires rings that reach a high speed of 90 mph upon exiting the muzzle and travel at 60 mph over more than 150 feet. The rings revolve as they fly through the air, but remain calm within the interior — much like the eye of a hurricane — so that they can hold a cluster of electrically charged gas up until hitting their target.

******Having both a positive and negative charge can make tiny smoke particles clump up, fall out of the air like rain droplets and cling to surfaces**

Vortex Gun Schematics

The gun forms vortex rings by forcing gas at high velocity down the gun's cylinder. The ring forms when the friction of the cylinder wall causes a thin layer of the gas to roll forward on itself like a donut.



Vortex Gun/Smoke's Reaction with Electric Charges

The gas being emitted from the Vortex Gun and particles in smoke are electrically conductible, therefore they are able to receive a charge.

The charge given inside the Vortex Gun, ionizes the gas' molecules or atoms (reducing or increase the number of electrons in them), thus turning it into a plasma, which contains charged particles: positive ions and negative electrons. The presence of a non-negligible number of charge carriers makes the plasma electrically conductive so that it responds strongly to electromagnetic fields.

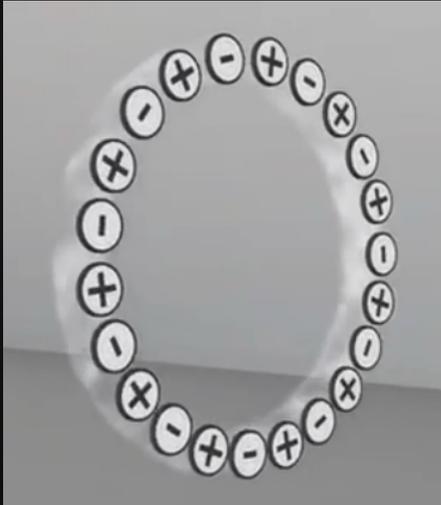
This explains why smoke, which is a collection of solids, liquids, and gases, (depending on the fuel) reacts in the manner suggested by Battelle's developers.

Vortex Gun/Smoke's Reaction with Electric Charges *continued*

Because the Vortex Gun's electrically charged gas rings are very stable up to 150 feet, the rings are able to hold their form as they transfer their electric charge to the surrounding smoke particles in the air.

Once, the smoke particles receive the transference charge they are then pulled toward the magnetic fields in their vicinity. In the case of this installation, the walls and floor of the glass room.

Charge Transfer



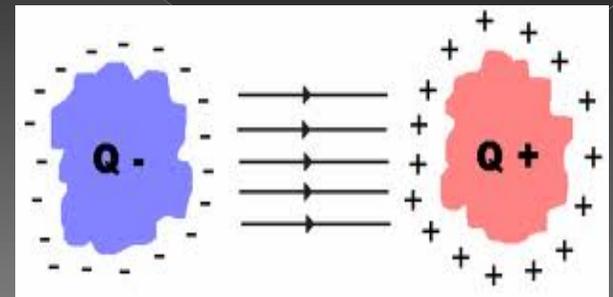
Ionized Ring



Gas Particles



Electrons moving toward positive magnetic field



Actual Vortex Gun by Battelle



Clip of Vortex Gun in Action: <http://www.youtube.com/watch?v=FWcCGlqlwA8>

Auxiliary Technologies

- ◉ **Smoke Machines** – produces billowing clouds of smoke, can also choose different colors of smoke to be emitted
- ◉ **Core System**
 - > Control Panel – Computer Program
 - Micro Controllers – trigger Vortex Guns and Smoke Machines

SMOKE MACHINES



<http://www.youtube.com/watch?v=9COM38PuBso>

CORE SYSTEM - CONTROL PANEL

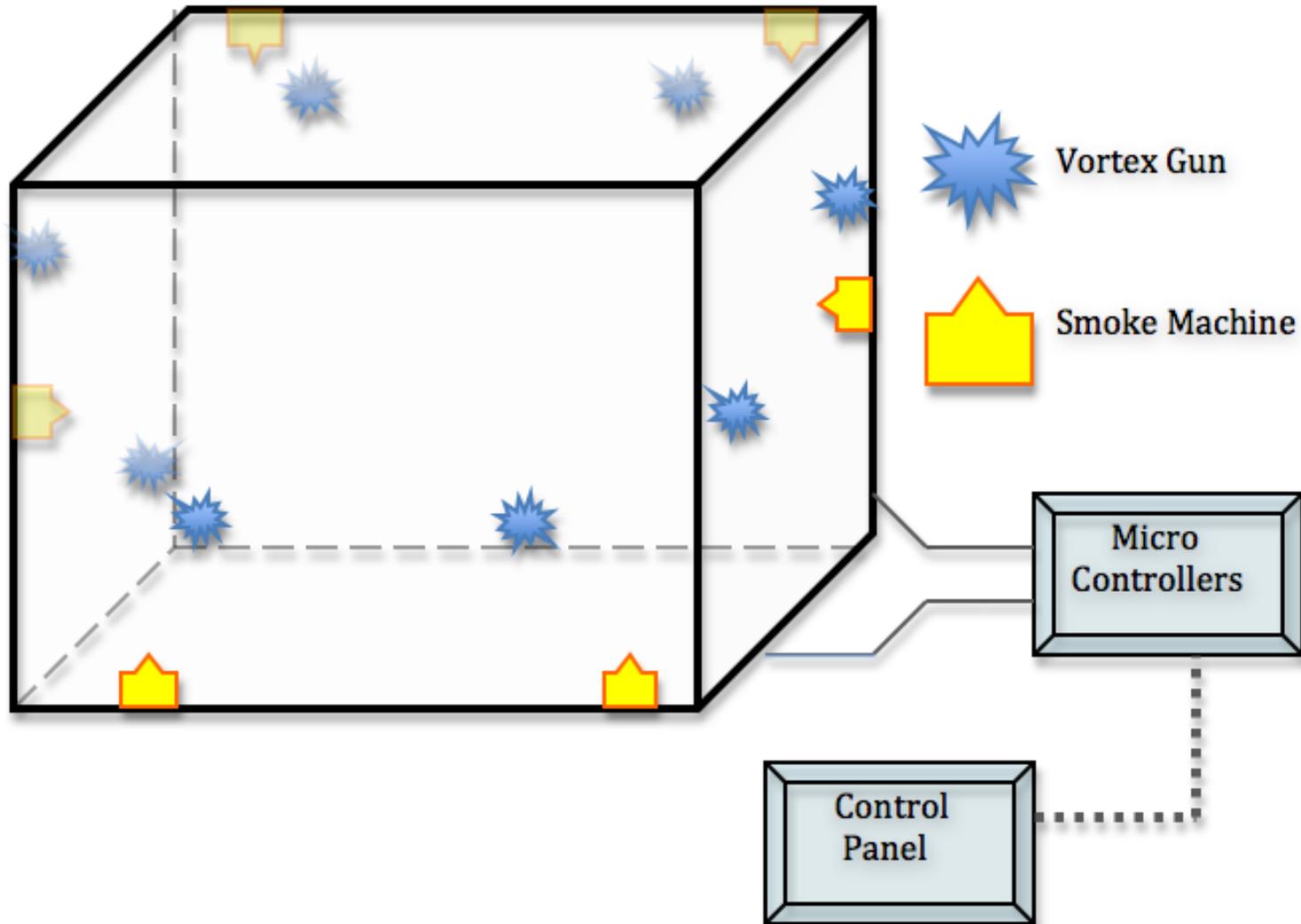


Using a special computer application a user will be able to control multiple Vortex Guns and Smoke Machines

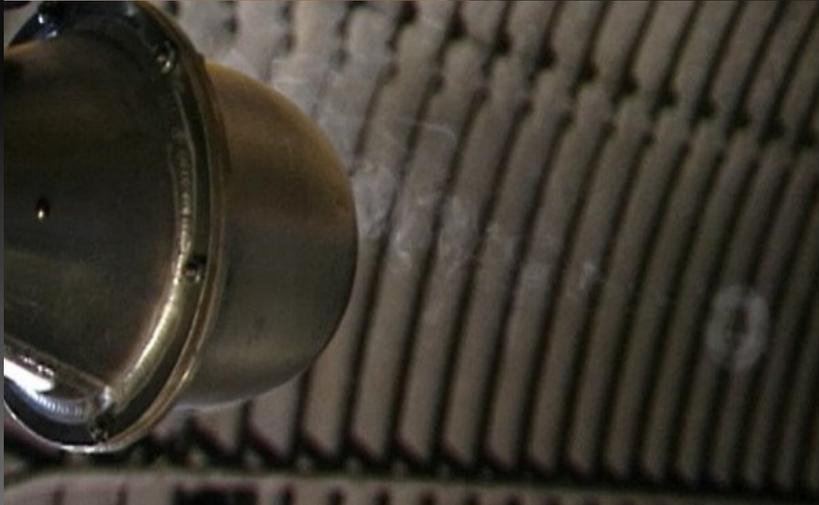
Technology Transformed into Art Installation

- The Vortex Room, is an interactive installation that is "spectacular" in its aesthetic appeal. By harnessing the properties of the Vortex Gun, it will allow a user to manipulate plumes of "controlled" smoke being produced inside of a glass room.

Concept Design



Perceptual Illustration



Interaction

As a person approaches the Vortex Room installation control panel that individual will be able to create their own compositions of smoke and vortex ring patterns.



User Control

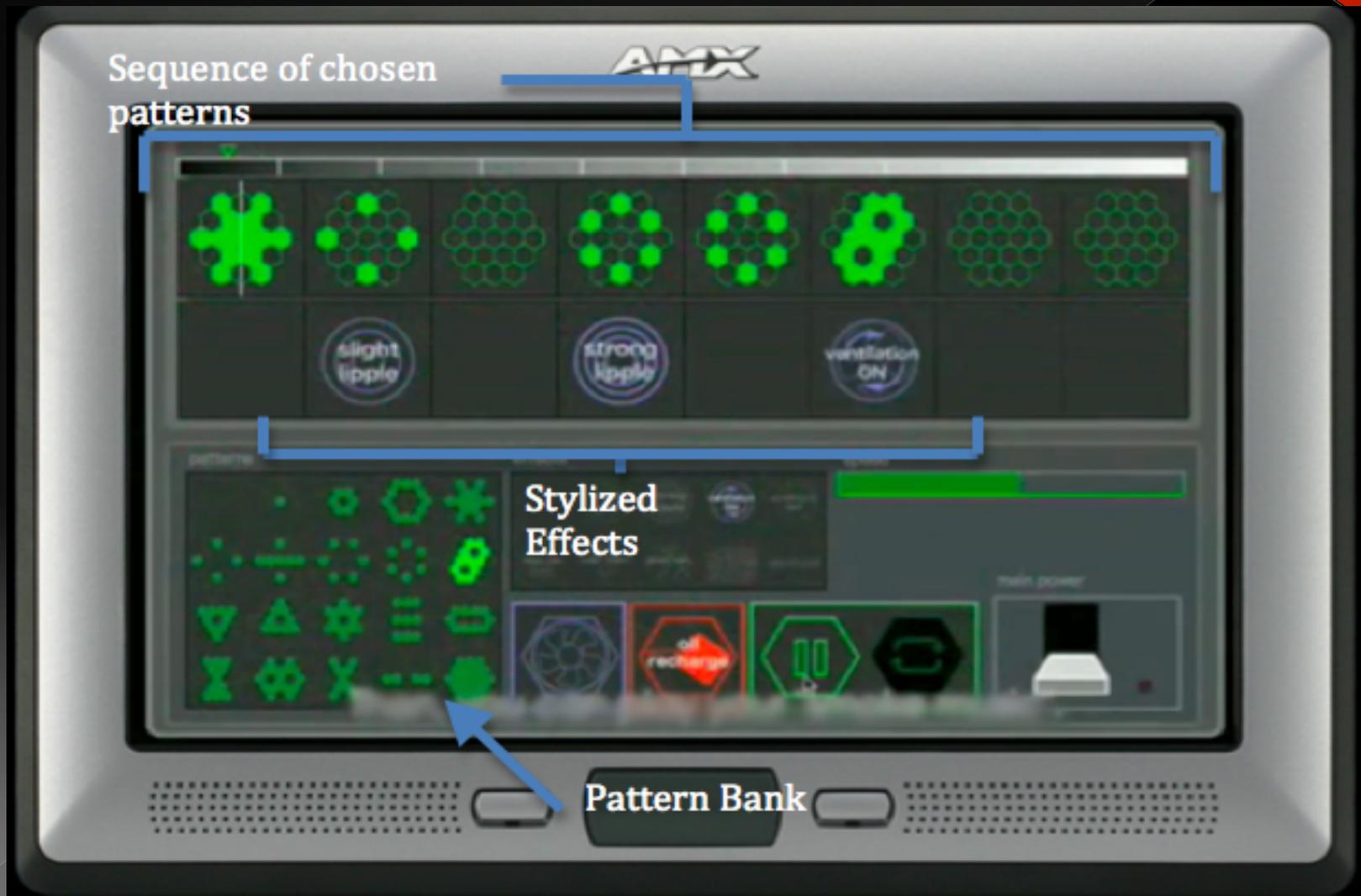
Similar to the image on the right, the user will have different preset patterns they may choose from, as well as the ability to customize their own patterns. Once an arrangement is constructed the user will press the 'start' key and the room will begin performing the chosen sequence.

Stylized effects will be offered too such as: rippling effects of smoke or rapid fire vortex guns



After each period of use, the leftover residue will be vacuumed out to leave a clean space for the next user.

Pattern Sequencing



Final Observations

- Although The Vortex Room may seem simple in concept, its visual aesthetic is widely pleasurable. Its interactive appeal stems from being able to create one's own sequential pattern through a very "clean" and easy to use touch screen. Moreover, users marvel at the feeling of producing clouds of smoke and harnessing the power of the Vortex Gun to create fantastic visual art.

Sources

- Battelle: Battelle Develops Vortex Ring Gun for Firefighters, Pesticide Delivery." *Battelle: Product Development, Research & Commercialization, Energy, Health & Life Sciences, National Security, Laboratory (Lab) Management, FutureGen & Safety Pharmacology*. Web. 20 Mar. 2012. <http://battelle.org/spotlight/2-28-12_vortex.aspx>.
- Luo, Q-Z., R. L. Merlino, and N. D'Angelo. "Shock Formation in a Negative Ion Plasma." Aug. 1998. Web. 18 Mar. 2012. <http://www.physics.uiowa.edu/~rmerlino/nishocks.pdf>. <Via Wikipedia "Plasma">
- "Vortex Gun Fires Electrically Charged Gas Rings at 90 Mph." *LiveScience.com*. Web. 20 Mar. 2012. <<http://www.livescience.com/18771-vortex-gun-electrically-charged-rings.html>>.