



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> Noel L. Lopez	<b>Project Number</b> <b>S0214</b>
<b>Project Title</b> <b>A Revolution in Electrostatic Motors</b>	
<b>Abstract</b> <b>Objectives/Goals</b> I used Plexiglas sheets and aluminum to make these motors. Due to previous problems with building motors, I designed new systems for cutting parts that improve precision and adjustability, including a circle cutter that exhibits superior precision to previous methods. The most sophisticated cutting device I made was a Computer Numeric Controlled Router, which would be capable of accurately cutting and shaping the various complex parts necessary for some of my designs. I had to quickly become an expert #C# programmer from scratch to learn how to make the control software for my device. Although I was not able to complete the CNC Router in time to construct some of my more complex designs, I was able to construct the most advanced motors I#ve ever made. <b>Methods/Materials</b> I performed tests on each design, calculating its power output. Of the designs tested, the model with a plastic rotor produced the most power output, but was one of the heaviest rotors. I was surprised by the poor performance of the rotor with thick aluminum plates, while the rotor with a circular arrangement of aluminum tubes performed well compared to its light weight. From this experiment, I have found that plastic and thin aluminum plates can hold the most charge. <b>Results</b> I determined that heavy plastics can hold a surprisingly large amount of charge on their surfaces. An unexpected result with the aluminum rotors was that the thick rotors did not perform well. This may suggest that aluminum also collects most of its charge on the surface; therefore surface area, not volume, decides the amount of charge a plate can hold. This project is the first stage for achieving my goal. The objective was met by finding the most effective design elements from those evaluated. I plan to complete my CNC Router and perform additional, more extensive testing of further designs. <b>Conclusions/Discussion</b> My project determined that new copper banding, copper with patina, and irrigated copper banding can be used to prevent brown garden snails from reaching their food sources.	
<b>Summary Statement</b> I found community sponsors to donate funds or materials; my younger brother did minor tasks to assist in cutting parts; I borrowed a smart pulley and computer interface from school.	
<b>Help Received</b> This project will test electrostatic motor designs I created or improved to find which produce the most power. I will use this information when designing motors in the future to compare against today#s electromagnetic motors.	