



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> Nitin K. Egbert	<b>Project Number</b> <b>J0709</b>
<b>Project Title</b> <b>The Design and Construction of a Less Expensive Satellite Launcher</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to see if I can propel a satellite to orbital velocities using magnetic attraction. <b>Methods/Materials</b> The satellite launcher was constructed with a stiff tube mounted to point slightly upwards. Coils were wrapped around the tube at intervals to attract the satellite through the tube. Each coil was connected to a capacitor that is discharged by a SCR (silicon controlled rectifier) at the moment the model satellite nears the coil. This accelerates the satellite through the coil. As the nail passes the center of the coil, the charge in the capacitor dissipates, leaving nothing to hold back the satellite as it continues its journey through the tube. This process is repeated at each coil, increasing the satellite's velocity. <b>Results</b> Magnetic attraction can be used to propel a satellite to orbital velocities. <b>Conclusions/Discussion</b> I have learned many things by building this project. Friction is a major problem in this design. The friction in the tube makes it difficult to accelerate the model satellite beyond a certain point. Also, timing circuits are hard to tune and are unreliable for objects of different masses. The self-timed circuit with a phototransistor is a lot more reliable and can handle objects of different masses.	
<b>Summary Statement</b> My project is about a cheaper and more environmentally friendly way to launch satellites.	
<b>Help Received</b> My father helped me choose parts and drill and saw the spacers and the tube mount.	