



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Nigel W. Beckmeier</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">J0603</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Maglev Technology</b>	<b>Division</b> <input checked="" type="checkbox"/> <b>Junior (6-8)</b> <input type="checkbox"/> <b>Senior (9-12)</b>
<b>Preferred Category</b> (See page 5 for descriptions.) <b>6 - Electricity &amp; Electronics</b>	
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>My project concerns Maglev technology as well as the effects of superconductivity. My original goal was to produce a model of a Magnetically Levitated Train. I proceeded with my experimentation to discover whether an increase in current flowing through the magnet wire would strengthen the magnetic field. I believed that the increase in current would increase the magnitude of the magnetic field. Liquid nitrogen was used to accomplish this increase in current. I designed and constructed a model of a Magnetically Levitated Train, which I also used to verify my hypothesis. My experimentation produced graphs of the amount of current flowing through the magnetic wire, with certain voltage inputs, at room temperature and at the decreased temperature due to liquid nitrogen. I discovered that the liquid nitrogen had increased the amount of current that flowed through the magnet wire. Next, I calculated the field strengths of the electromagnets using the formula for the interior of a solenoid. Comparing the magnitudes of the magnetic wire with and without the added current, I came to the conclusion that the added current due to liquid nitrogen did increase the strength of the magnetic field. I am proceeding with my experimentation to design a Maglev Guideway that could levitate and guide the Maglev along the track.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) My project has to do with Maglev design and the effects of liquid nitrogen to a magnetic field strength.	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Tammy Bosler, Stephen Thorpton and Dr. Hoffman answered questions I had through e-mail; Mr. Garcia gave some of my materials and also answered questions that I had.	