

## CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

Name(s) **Project Number** Adam Sowlati 22553 **Project Title Superconductivity Abstract Objectives/Goals** This project is an attempt to understand and learn how superconductors behave agnetic fields affect the electrical resistivity of Type 2 superconductors? This was the question, wh the focus of this project. A second question was later introduced: does the current flowing through the superconductor determine how the magnetic field affects the superconductor's resistivity Methods/Materials An electro-magnet was used to expose the superconductor to a magnetic field, Wrapping a roll oft magnetic-wire around an iron-bar created the electro-magnet. A four-point electrical probe witht Bi(2)Sr(2)Ca(n-1)Cu(n)O(9)(BSCCO) superconductor was attached to a thermocouple, power supply, ammeter, and a voltmeter. The four-point probe was submerged into liquid nitrogen and retrieved only to expose it to the magnetic fields. The resistance was calculating using Ohms law, which states that resistance, is voltage divided by current. The second part of the project was determined by performing the previous experiment with varying currents flowing through the superconductor. **Results** As the magnetic field increases the resistivity greatens. Also, as the current increases the magnetic field affects the superconductor's resistivity more. Conclusions/Discussion The findings of this project are truly fascinating. It has been discovered that magnetic fields do affect superconductors, and that the current flowing through the superconductor determines how the magnetic field affects the superconductor's resistivity. This shows that different types of energies affect superconductors. Summary Statement h the question of how superconductors are affected by magnetic fields. **Help Received** Used Viewpoint School's lab and equipment under teacher's supervision; Technical questions answered by mentor; Teacher gave advice.