



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Guanxiong Mao; Maxwell Radin; Daniel Ram</b>	<b>Project Number</b> <b>S0711</b>
<b>Project Title</b> <b>Digital Telescope Utilizing Tomography</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of the project was to construct a prototype of a digital tomographic telescope that could capture images of targets as far as one hundred feet away as an inexpensive alternative to telescopes that use lenses and mirrors.</p> <p><b>Methods/Materials</b> The mechanism consisted of an illuminated target, a rotating disk with a slit in it, and a light sensing unit that recorded the intensity of light passing through the slit as the disk moved. A series of complex computer programs processed the data using several algorithms based on linear algebra to produce an image.</p> <p><b>Results</b> The prototype was able to image simple shapes as well as complex patterns of geometric arrangements.</p> <p><b>Conclusions/Discussion</b> The project demonstrated that telescopic tomography can be used to capture images digitally. Theoretically, the imaging power can be increased by increasing the size and precision of the apparatus. This technology could be applied to many fields, such as astronomy, topography, and military intelligence.</p>	
<b>Summary Statement</b> The aim of the project was to build a digital telescope that uses tomography instead of lenses or mirrors.	
<b>Help Received</b> Father (Lon Radin) helped construct electronics and operate the mechanical components	