



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Rei J. Landsberger	Project Number S0310
Project Title Design and Testing of a Fluid Based Solar Tracker	
Objectives/Goals To design a simple solar tracking mechanism, and test whether it improves energy output for a solar panel.	
Abstract Methods/Materials The heart of the system is a balancing fluid that moves between two 1 inch glass tubes mounted on each side of a pivoting solar panel frame. When the panel does not directly face the sun, then one tube is more exposed. The heated fluid pushes through ¼ inch polyethylene tubing to the other tube and its weight tilts the frame to better face the sun. Methanol was chosen because its vapor pressure rises steeply with increasing temperature. The support base and pivoting frame are built from ¼ inch foam board. Roller-blade bearings support the pivoting platform at a 30 degree angle nearly parallel to the earth's axis at the local latitude. The solar panel connects to a 12V, 5W water pump serving as its load, and a watt-meter measures electric power output.	
Results Data were collected by recording the watts produced by the tracking solar panel at 30-minute time intervals between 9:00AM and 4:00PM. To compare our Tracker power output to a non-tracking panel that might be fixed to a rooftop, measurements were also recorded at each time with the panel facing south and inclined 30 degree to the horizontal. A final comparison was made with a fixed panel whose angle would be seasonally adjusted to match the sun at noon: steeper in winter, flatter in summer. The 3 data sets - tracking, fixed, and seasonally adjusted fixed - were averaged over four sunny days.	
Conclusions/Discussion Through observations and from the data gathered, it was concluded that the fluid-based solar tracker increases the energy made by the solar panel and was a reliable design.	
Summary Statement My project focused on creating and testing a self-correcting, fluid-powered solar tracking design to increase energy output of a solar panel.	
Help Received My father helped to build my design and to supply me with materials.	