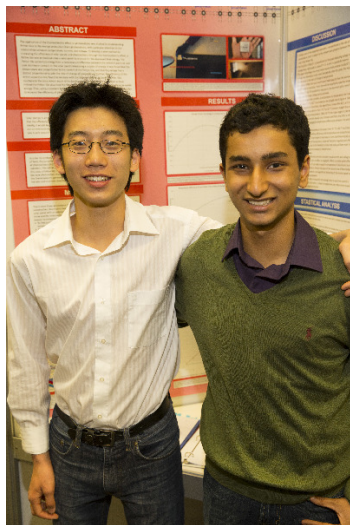


# CWSF 2014 - Windsor, Ontario



## Federico Cao, Adree Khondker

### Augmenting Solar Energy: Application of Thermoelectric Effect on Photovoltaics

**Challenge:** Energy

**Category:** Senior

**Region:** Bay Area

**City:** Hamilton, ON

**School:** Westdale S.S.

**Abstract:** This innovation will increase the efficiency of photovoltaics globally by converting waste heat energy into usable electrical energy using the thermoelectric effect. The apparatus will be tested to find properties of thermoelectric devices with respect to voltage, current, and temperature gradient, utilizing semiconductor junctions and distributions of electric charge when induced by temperature changes.

#### Biographies

Federico - The inspiration for our project came from the idea to improve the world's energy resources so that clean and renewable energy can be used on a larger scale. Through our dedication, my partner and I were able to discover an underdeveloped method to improve the efficiency of solar energy, one of the most prevalent and clean sources of energy. We discovered that with our method, we were able to improve the efficiency of solar energy by incorporating the thermoelectric effect, which converted the heat difference around the solar panel to electrical current. Our future goal is to incorporate quantum mechanics to improve the energy efficiency of ...

Adree - The inspiration for our project came from the desire to enter a scientific domain where few have entered before, yet still have enough information to develop an innovation which could create a change for the betterment of the planet. To improve energy conservation, we chose to use new techniques to reduce waste energy from photovoltaics which could be applied on the industrial scale. In our project, heat could be turned into usable energy. Yet, we still have a long way to go. We want to incorporate quantum mechanics to create a theoretically better energy efficiency increase. My partner and I are interested not only in physics, chemistry, an...

#### Awards

#### Value

Excellence Award - Senior - Bronze Medal Sponsor: Nuclear Waste Management Organization	\$100
University of Ottawa Entrance Scholarship Senior Bronze Medallist - \$1000 Entrance Scholarship Sponsor: University of Ottawa	\$1 000
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
<b>Total</b>	<b>\$2 100</b>

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