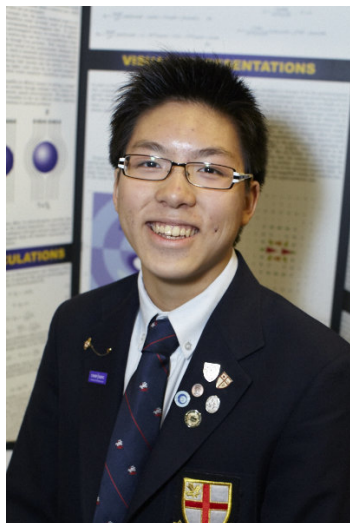


# CWSF 2012 - Charlottetown, Prince Edward Island



## Carlos Daniel Xu

### Gravito-Meissner Effect in Neutron Star Systems

**Challenge:** Discovery

**Category:** Senior

**Region:** Greater Vancouver

**City:** Vancouver, BC

**School:** St George's School

**Abstract:** Under the framework of gravitomagnetism, in which we consider the component of gravity that behaves like magnetism, we can investigate the gravity analogy of the Meissner effect, the phenomenon by which a superconductor repels external magnetic fields, in superfluid neutron stars. Upon deriving mathematical models, we find the hypothesized repulsion of gravito-magnetic fields to be false. Instead, the gravitational Meissner effect magnifies external gravito-magnetic fields.

#### Biography

I am a Grade 11 student at St. George's School in Vancouver, BC. Having emigrated from Argentina 6 years ago, I discovered the wonders of science fair relatively late, in my Grade 10 year. The exhilarating leap from science textbooks to solving real-life science problems is but one of the many reasons I chose to continue science fair this year (this is my first year to CWSF). Although I very much enjoy learning for the sake of learning in general, I am rather lopsided on the math and physics side, planning to major in mathematics and another quantitative science in university. To express my artistic ideas, I, a former VYSO member, like to play the violin. On a tangential note, I secretly dream of owning a Stradivarius.

#### Awards

#### Value

The Manning Innovation Achievement Award Sponsor: Ernest C. Manning Awards Foundation	\$500
The Manning Innovation Achievement Award and \$4000 Manning Young Canadian Innovation Award Sponsor: Ernest C. Manning Awards Foundation	\$4 000
Challenge Award - Discovery - Senior Sponsor: Youth Science Canada	\$1 000
Excellence Award - Senior - Gold Medal Sponsor: Youth Science Canada	\$1 500
Dalhousie University Faculty of Science Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: Dalhousie University, Faculty of Science	\$5 000
UBC Science (Vancouver) Entrance Award Senior Gold Medallist - \$4000 Entrance Scholarship Sponsor: The University of British Columbia (Vancouver)	\$4 000
University of Manitoba Entrance Scholarship Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of Manitoba	\$5 000
University of Ottawa Entrance Scholarship Senior Gold Medallist - \$4,000 Entrance Scholarship Sponsor: University of Ottawa	\$4 000
Western University Scholarship Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University	\$4 000
<b>Total</b>	<b>\$29 000</b>