



## Davidson Fellow

### Steven Wu

(\$10,000 Scholarship Recipient)



#### Personal Info

Steven Wu

Age: 15

Folsom, California

#### School, College and Career Plans

Steven will be a senior at Mira Loma High School this fall. He plans to major in biomedical engineering/bioengineering, combining his interests in biochemistry and mathematics and eventually become a research physician/scientist.

#### Davidson Fellows Submission *(Science)*

In his project, "Optimizing Quadrupole Ion Trap Geometry by Computer Simulations," Steven developed a method to optimize quadrupole ion traps which sort ions by their mass-to-charge ratio using mass spectrometry for molecular analysis. Steven designed a computer simulation algorithm that produces superior results when compared with the current commercial software in terms of better simulation of ion movement due to more accurate electrical field data. Advancements in ion trap geometry can improve all areas of laboratory science through mass spectrometry, as well as better monitoring of atmospheric pollutants and detecting hazardous chemical substances.

#### Biography

Steven began his academic career in Canada and, when he moved to California at the age of 7, he was automatically accelerated from second grade to third. The physical sciences, primarily chemistry, have always interested Steven and he participates in science competitions whenever he can.

Steven initially became interested in the computer simulation of ion traps after speaking to a family friend who was involved in a similar project. Steven worked many weekends on his project, and by brainstorming and organizing the work in a series of steps, he was able to code the programs and run all the simulations. The main difficulty he encountered was finding a good, accurate way to solve for the electrical field which resolved itself after sudden inspiration amidst math homework.

Steven has played the piano for 11 years and also enjoys composing music. He plays junior varsity golf for his high school and enjoys playing basketball and building websites. Steven is the founder and president of the Mira Loma Science Club and for the past three years has been a member of the Northern California Team for American Regional Mathematics League.

*Please see next page.*

**The Davidson Institute for Talent Development**

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**Davidson Fellow**  
**Steven Wu**  
(Cont.)

**Honors/Awards**

- 2006 Davidson Fellow
- 2006 Junior Science and Humanities Symposium Northern California Western Nevada, 2<sup>nd</sup> Place
- 2006 Sacramento Regional Science and Engineering Fair, 1<sup>st</sup> Place Senior Engineering category
- 2006 Yale Science and Engineering Association Award
- 2006 United States Air Force Award for Outstanding Science or Engineering Fair Project
- 2006 National Science Bowl Team Captain, Regional Champions
- 2006 USA Biology Olympiad, National Semifinalist
- 2005 U.S. National Chemistry Olympiad, National Finalist
- 2005 USA Mathematical Talent Search, Silver Medal
- 2004 & 2005 Certificate of Merit Piano and Theory, Advanced Level with Branch Honors, Music Teachers' Association of California
- 2004 National Piano Auditions, American College of Musicians USA Winner
- 2001 Merit Scholar Award, Academic Talent Search at California State University, Sacramento

**Community Activities**

Steven works with Habitat for Humanity in Sacramento on ReStore warehouse work and volunteers for the Children's Hospital, Fudan University Medical School in Shanghai, China. He volunteers at the Eskaton Village senior residence facility and he also volunteered in the Cellular and Molecular Immunology Lab at Toronto General Research Institute, University Health Network, University of Toronto. Steven designed the website for Church on the Move and volunteered for the Folsom Teen Council.

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