

# CWSF 2007 - Truro, Nova Scotia



## Brian Krug

### Ames Test: Chemicals to Cancer

**Division:** Physical & Mathematical Sciences / None

**Category:** Junior

**Region:** Waterloo-Wellington

**City:** Guelph, ON

**School:** King George P.S.

**Abstract:** This research used the Ames test, a standard reverse mutation assay, to assess environmental pollutants for mutagenic activity, mutagens being potentially carcinogens. Literary articles had previously found correlations between environmental pollutants and increased cancer incidence. The Ames test uses 6 strains of *Salmonella typhimurium* to detect reverse mutations in a his- mutant population. A positive response was observed and confirmed testing bus exhaust.

### Biography

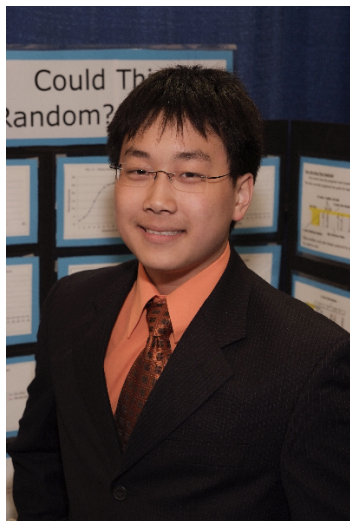
I was born on May 12th 1993. I moved to Guelph when I was 3 years old. I attend French Immersion in Grade 8 at King George Public School. I am a competitive cross-country skier during the winter, but I also enjoy tennis, swimming, biking, badminton, and playing my clarinet. I was grade 6 valedictorian and won the award of academic excellence. This year I won the French Public Speaking Award. I've participated for 2 years in the regional science fair, WWSEF, this year qualifying for CWSF. My future plans are to remain in science, particularly in my interest, molecular genetics.

### Awards

### Value

|   |         |
|---|---------|
| The University of Western Ontario Scholarship<br>Silver Medallist - \$1500 Entrance Scholarship<br>Sponsor: University of Western Ontario | \$1 500 |
| Silver Medal - Life Sciences - Junior<br>Sponsor: Pfizer Canada   | \$700   |
| Total   | \$2 200 |

## CWSF 2007 - Truro, Nova Scotia



### Eddie Kim

#### Could This be Random? Probably!

**Division:** International / None

**Category:** Intermediate

**Region:** Waterloo-Wellington

**City:** New Dundee, ON

**School:** Cameron Heights C.I.

**Abstract:** I wrote computer programs to investigate how shuffled decks approached randomness. The programs tested decks with riffle shuffles compared against random re-orderings. Statistical analysis of the decks revealed that it took three shuffles to have the majority of cards equally likely to appear in any location, whereas it took seven shuffles to have the majority of deck combinations equally likely.

#### Biography

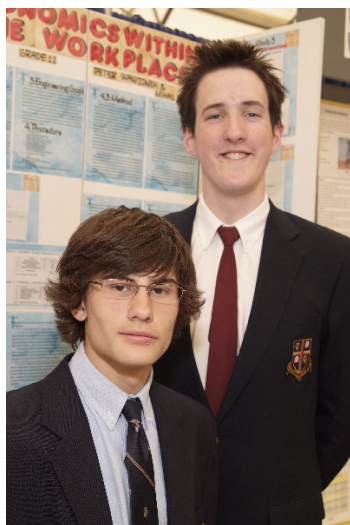
My name is Eddie Kim. I am 14 years old, and I currently attend the Cameron Heights Collegiate Institute IB program. In school, I am involved in a number of activities, namely, the Debate team and Intermediate Band (I play the flute). I don't live directly in Kitchener-Waterloo, so I don't often have a chance to help out around the community. However, I do enjoy volunteering when there is a chess-related event going on, as chess is one of my hobbies. I am also a fan of the card game "Magic: The Gathering." My other main hobby is Tae Kwon Do, in which I am currently a senior red-blue belt. Throughout high school, I plan to study computers, all three strands of science, and math. However, I am currently unsure of any plans for post-school life. All I know now is that I don't want to work in a cubicle.

#### Awards

#### Value

|   |         |
|---|---------|
| The University of Western Ontario Scholarship<br>Bronze Medallist - \$1000 Entrance Scholarship<br>Sponsor: University of Western Ontario | \$1 000 |
| Bronze Medal - Physical & Mathematical Sciences - Intermediate<br>Sponsor: Encana Corporation   | \$300   |
| Total   | \$1 300 |

# CWSF 2007 - Truro, Nova Scotia



## Mihail Buse, Peter Wawzonek

### Ergonomics Within the Workplace

**Division:** Health Sciences / Automotive

**Category:** Senior

**Region:** Waterloo-Wellington

**City:** Kitchener, ON, Cambridge, ON

**School:** St. John's-Kilmarnock School

**Abstract:** Using four case studies, the aim in this science fair is to improve the workplace ergonomic conditions, therein reducing wear and tear on the worker's body. We have set goals to find the most prominently used muscle groups, the relationship between the amount of mass being moved and the level of muscle contraction, and to quantify the effects of several work-place variables on muscle contractions.

### Biographies

**Mihail -** Mihail Buse is a grade twelve honour student at St. John's-Kilmarnock School in Breslau, Ontario. An active member of the Human Rights Committee, Mihail has assumed a leadership role by organizing a silent auction to assist raising funds to help children in Nepal, India. Mihail will travel to Nepal with a group from the school in March 2007, in order to purchase and carry schoolbooks to schools in Nepal and deliver funds which will purchase furniture for two classrooms and learning materials for the children of this community. Mihail enjoys travel and has been to Romania, France, Greece, Cuba and Mexico. He speaks not only English, but Roma...

**Peter -** Peter Wawzonek is a grade 12 honour roll student at St. John Kilmarnock School. A member of senior school council, Peter is Manager of Tuck shop and vending machines, and brought in a "healthy snacks" policy this year. Funds earned are utilized for council initiated events and charitable causes. Extracurricular activities include acting roles in the school play, member of two choirs, rugby, basketball, wrestling teams and badminton, tennis and mountain bike club. Peter is a Shad Valley alumnus; recognized for top project, top financials, top presentation at Memorial University, NL (07/06). As a member of the National Memorial team they co...

### Awards

### Value

|   |                |
|---|----------------|
| The Actuarial Foundation of Canada Award - Senior   | \$1 000        |
| The University of Western Ontario Scholarship<br>Bronze Medallist - \$1000 Entrance Scholarship<br>Sponsor: University of Western Ontario | \$1 000        |
| Bronze Medal - Automotive - Senior<br>Sponsor: AUTO21   | \$300          |
| Bronze Medal - Engineering - Senior<br>Sponsor: Youth Science Foundation Canada   | \$300          |
| <b>Total</b>  | <b>\$2 600</b> |

## CWSF 2007 - Truro, Nova Scotia



### Zachary Alexander Elgood

#### Isotopic Fingerprinting of Human-Emitted Methane

**Division:** International / None  
**Category:** Junior  
**Region:** Waterloo-Wellington  
**City:** New Hamburg, ON  
**School:** Courtland Avenue Senior P.S.  
**Abstract:** This project examines the concentration and isotope signature of human-emitted methane. Breath and colonic samples were analyzed using gas chromatography and isotope ratio mass spectrometry. Vegetarians produced the highest levels of methane. The methane  $^{13}\text{C}$  values confirm that the samples collected were of biogenic origin.

#### Biography

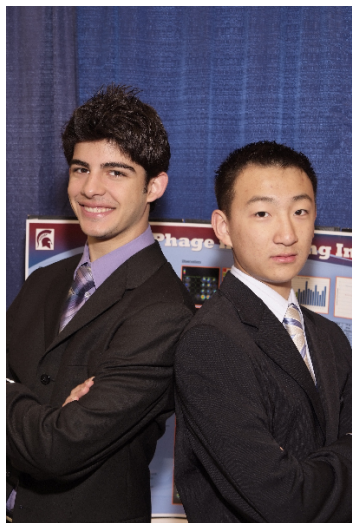
Zach Elgood, age 13, attends Grade 7 in a congregated enrichment/gifted class at Courtland Public School in Kitchener, Ontario. He is on the school wrestling team and plays clarinet in the school band. Travel is a special love of his and he was fortunate to have been chosen by Children's International Summer Villages (C.I.S.V.) to spend a summer in Italy with 47 other 11-year olds from around the world. Reading, research, chess and karate have played important roles in his life for many years. His reading preferences range from fantasy to non-fiction books about magic and mythology. Zach is currently writing a Tolkien-like fantasy book series called the Amulets of Destruction. Because he enjoys nature, Zach particularly loves the spring and summer seasons. He likes hiking and exploring the world around him. He has won several chess and karate awards, as well as some writing and scholastic awards. His aspirations include attending a summer camp hosted by the Perimeter Institute for grade 11 students where only 50 students from around Canada are chosen. He hopes someday to become a professor of astro/theoretical physics to work and research with others at the Perimeter Institute.

#### Awards

#### Value

|   |                |
|---|----------------|
| The University of Western Ontario Scholarship<br>Bronze Medallist - \$1000 Entrance Scholarship<br>Sponsor: University of Western Ontario | \$1 000        |
| Bronze Medal - Physical & Mathematical Sciences - Junior<br>Sponsor: Encana Corporation   | \$300          |
| <b>Total</b>  | <b>\$1 300</b> |

## CWSF 2007 - Truro, Nova Scotia



### Fred Yin, Arshia Azizeddin

#### Using Phage in Fighting Infection

**Division:** Biotechnology / None  
**Category:** Senior  
**Region:** Waterloo-Wellington  
**City:** Guelph, ON  
**School:** Centennial Collegiate & Vocational Institute  
**Abstract:** Using a set of experiments to figure out when is the best time for applying bacteriophage during an bacterial infection (E. coli). E. coli will have lux gene integrated in them and as a result, a colony will emit bioluminescence. Using a special camera called Night Owl, we will be observing the intensity of the light after applying phage to the colonies.

#### Biographies

Fred - My name is Fred Yin. I immigrated from China 6 years ago. I am currently attending Centennial Collegiate and Vocational Institute in Guelph, Ontario, in grade 11. I am working part-time as a computer associate at Staples Business Depot. During my spare time, I like to play guitar, swim and jog. This is my first time at CWSF. After high-school, I plan on going to the University of Toronto for Biotechnology or Pharmaceutical Science, then possibly enrol in medical school.

Arshia - I was born on January 21, 1989 in Tehran, Iran. My family moved to Canada in 1998 and came to Guelph after the Millennium. I have tried to do my best in school, and in doing so, I have always kept a 90+ average since grade 9. Furthermore, I participate in school activities such as mentorship, prefects, concert-band and sport teams. During high school, I took every science course available, which made me realize the passions and interests that I have in that field. Thus, I plan to go on to Medical School and learn to become a skilful surgeon. I took up piano when I was 9 years old and have completed my Grade 9 Conservatory examinations and am ...

#### Awards

#### Value

|   |              |
|---|--------------|
| Honourable Mention - Biotechnology & Pharmaceutical Sciences Senior | \$100        |
| Sponsor: Rx&D Health Research Foundation                            |              |
| <b>Total</b>  | <b>\$100</b> |

## CWSF 2007 - Truro, Nova Scotia



### Andrew Gerwin

#### Who Will Save the Electric Car?

**Division:** Health Sciences / Automotive

**Category:** Junior

**Region:** Waterloo-Wellington

**City:** Guelph, ON

**School:** King George P.S.

**Abstract:** Five electric car batteries were load-tested with four different resistors under three temperature conditions. Weight, volume, cost, capacity, power, charge times and low-temperature performances were evaluated. Lithium-ion batteries made by Altair and A123 outperformed the Lead-acid and Nickel Metal-Hydride batteries. Between the lithium-ion batteries, Altair's battery was less expensive, had greater specific capacity and reached full charge faster, but A123's battery had higher energy density.

#### Biography

My name is Andrew Gerwin, and although I'm only 13, I've already developed a large range of interests and plans for the future. I am the first born child in a family of five kids. Both my parents are teachers. I am currently in grade 8 French immersion at King George P.S. in Guelph, Ontario. My extra curricular interests include playing trumpet, and singing with the Guelph Youth Singers. Recently, I went on a choir exchange trip to Vancouver. For sports, I prefer swimming, biking, and skating. Reading, especially science books, is also one of my pastimes. My favorite subjects in school are science, geography, and music. I enjoy learning to spell challenging words, and I recently finished third in the Guelph Regional Spelling Bee. For a career, I will probably choose Environmental Engineering, since I am very concerned with pollution and global warming. When I won a gold medal and an award of merit at the W.W.S.E.F, I was thrilled to be participating in the Canada-Wide Science Fair. My project on electric car batteries has been the most educational project I've ever done. I look forward to meeting other students who share my strong interest in science.