WWSEF
WATERLOO - WELLINGTON
SCIENCE & ENGINEERING FAIR

Waterloo-Wellington Science and Engineering Fair 2022 Annual Report

The 2022 edition of the Waterloo-Wellington Science and Engineering Fair was a virtual event, as was the Canada-Wide Science Fair. These events didn't have the dazzle of astonishing science fair displays, but the accomplishments of the young researchers still shone brightly. Six of our entries in the CWSF received awards: 2 Bronze Medals, 1 Silver Medal and 3 Gold Medals. Five spectacular projects received Platinum Awards for either Discovery or Innovation. Congratulations to Jasmine Schneider for winning one of them, an outstanding achievement!

Other events that your community's youth participated in were the European Union Contest for Young Scientists (virtual) and the Regeneron International Science and Engineering Fair (hybrid).

Hardit Singh and one other youth represented Canada at the EUCYS and won Second Prize! Hardit and Cindy Cheng were two of the 10-member Team Canada for the 2022 Regeneron ISEF. The team earned 9 awards. Hardit received two of them, a Third Award in Biomedical Engineering and an additional special award.

Plans and expectations for 2023 are to return to a more usual format, both locally (April 11 at Bingemans) and at the Canada-Wide Science Fair in Edmonton. Thank goodness.

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Youth Science Canada
Sciences jeunesse Canada

WWSEF is affiliated with Youth Science Canada

Canada-Wide Science Fair (Virtual)

Nuha Akhand, Senior & Marilyn Turetska, Senior.

Inhibition of Cancer Cells Through Algae Derived EPA

Our project developed 4 experiments focusing on the effects of EPA on cells in severe hypoxia (very low levels of oxygen) and hypoxia achieved through contact inhibition. EPA is a polyunsaturated acid found in fish and green algae. Hypoxia plays a significant role in the development and spread of cancer cells. It causes damage to the cells, such as inflammation, possibly leading to cell death.

EXCELLENCE AWARD - BRONZE MEDAL and Certificate
University of Ottawa and Western University entrance scholarships of $1000

Abigail Chan, Junior

Regulating Digital Eye Strain Using Similarity Index

This project was the development of an app that helps users regulate long screen hours, one of the causes of digital eye strain (DES), and check for related eye conditions. It uses image comparisons and thestructural similarity index measure (SSIM) to identify four symptoms of DES: subconjunctival hemorrhages, red eye, dry eye, and glaucoma. A timer prompts users to take frequent breaks.

EXCELLENCE AWARD - GOLD MEDAL and Certificate
Western University entrance scholarship of $4000

Ashish Chettimada. Junior

Bacteriophages: Curing One Infection With Another

This project studied the use of bacteriophage-based therapy for treating gastro-intestinal diseases. I discovered that phage therapy has been proven to be highly productive. Phage therapy is perhaps better than using antibiotics as phages are targeted to a specific type of bacteria, which prevents it from killing good bacteria. Conversely, antibiotics kill bacteria indiscriminately.

EXCELLENCE AWARD - SILVER MEDAL and Certificate
Western University entrance scholarship of $2000

Hudson Jantzi, Intermediate

Using Robotics to Naturally Trim the Dandelion Cycle - A Novel Approach to Eliminating Chemicals on Lawns

This project was the development of the Dandelion Detector Robot to remove dandelion seeds and heads, preventing spread of this (and other) aggressive weeds. The robot runs autonomously on a lawn utilizing an invisible fence 'GPS', looking for weeds with its camera and sensors. When it finds one, it removes its head and collects the seeds to prevent new growth. The robot can be programmed to remove invasive species and other unwanted seeds.

EXCELLENCE AWARD - GOLD MEDAL and Certificate
Western University entrance scholarship of $4000

Jasmine Schneider, Intermediate

Phosphate Removal from Groundwater Using Mussel Shell Biochar

Biochar can filter contaminants from water. Its ability to remove phosphate, a factor in harmful algal blooms, depends on the original feedstock used to produce the biochar. Several feedstocks were tested for phosphate removal. It was observed that modifying biochar with powdered mussel shell decreased phosphate leaching by about 80%.

EXCELLENCE AWARD - GOLD MEDAL and Certificate
Western University entrance scholarship of $4000

CHALLENGE AWARD -Environmental & Climate Change
GRAND AWARD, PLATINUM DISCOVERY
CRYSTAL AWARD and Certificate

Derek Sheen, Intermediate

A Novel Approach to Detecting Melanoma Using Deep Learning

Early detection of melanoma, a deadly type of skin cancer, highly increases the survival rate. Current diagnostic methods are expensive, inconveniently located, and can take a long time for results. This project developed a deep learning algorithm to provide an alternative that is low cost, provides instant results, is 99% accurate and internet accessible. The algorithm gives a prediction and a confidence score.

SPECIAL AWARD - Actuarial Foundation of Canada - Intermediate $750 cash and Certificate

EXCELLENCE AWARD - BRONZE MEDAL and Certificate
Western University entrance scholarship of $1000

International Fairs

Cindy Cheng

A Novel Bioinspired Skin Substitute for Accelerated Wound Healing

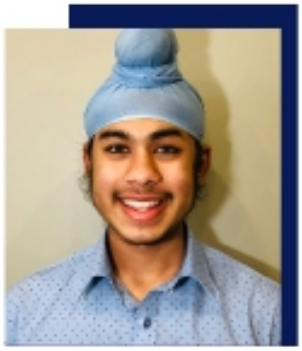
Team Canada
Regeneron International Science & Engineering Fair

Hardit Singh

Speculor: A Comprehensive Teleophthamology Platform for People-Centred Eyecare

2021 European Union Contest for Young Scientists: 2nd prize (€5000)

Team Canada
Regeneron International Science & Engineering Fair
3rd Award Biomedical Engineering ($1000); Special Award



2022

Financials

These graphs reflect the distribution of expenses for our virtual fairs. In-person fairs will take us back to our former expense profile, which will show an increase, especially in science fair day costs.