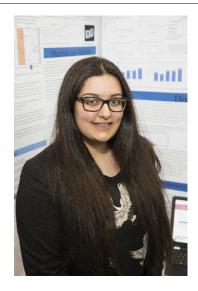




CWSF 2019 - Fredericton, New Brunswick



Pakeeza Mushtaq

A Novel DSSC Using Bio-Photosensitizer Pigments and Diatom Frustules

Challenge: Energy Category: Senior

Region: Southeast Alberta

City: Brooks, AB

School: Brooks Composite High School

Abstract: Drawbacks of sillicon solar cells have prompted research into new

photovoltaic devices such as dye-sensitized solar cells(DSSCs). Current ruthenium-based DSSCs are costly and toxic with poor efficiencies. This

project focused on the development of novel DSSCs using

bio-photosensitizer pigments from algae and plants as well as diatom frustules and activated charcoal counter electrodes to optimize voltage production. Promising results indicate potential for commercial applications.

Value **Awards** Renewable Energy Award - Senior \$1 000 Sponsor: Ontario Power Generation Excellence Award - Senior - Gold Medal Sponsor: Youth Science Canada Challenge Award - Energy - Senior Sponsor: Youth Science Canada Dalhousie University Faculty of Science Entrance Scholarship \$5 000 Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: Dalhousie University, Faculty of Science \$4 000 UBC Science (Vancouver) Entrance Award Senior Gold Medallist - \$4000 Entrance Scholarship Sponsor: The University of British Columbia (Vancouver) University of Manitoba Entrance Scholarship \$5 000 Senior Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of Manitoba University of New Brunswick Canada-Wide Science Fair Scholarship \$5 000 Gold Medallist - \$5000 Entrance Scholarship Sponsor: University of New Brunswick University of Ottawa Entrance Scholarship \$4 000 Senior Gold Medallist - \$4,000 Entrance Scholarship Sponsor: University of Ottawa Western University Scholarship \$4 000 Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University Youth Can Innovate Awards - Senior \$1 000 Sponsor: The Gwyn Morgan and Patricia Trottier Foundation \$29 000 Total

Biography

Pakeeza is a grade 11 student attending Brooks Composite High School. As an avid volunteer she contributes her time to numerous local and global organizations such as the hospital and WE organization. Pakeeza is involved with several youth boards and clubs and is Chair of the local library's Teen Advisory Board. Pakeeza has gained leadership skills as a result of her involvement with Student Council and has been able to further these skills by attending provincial and national leadership conferences. Pakeeza is also a member of the Alberta Education Minister's Youth Council. Pakeeza has received numerous academic awards such as the Highest Academic Achievement Award at her school as well as awards for math competitions. Pakeeza enjoys writing and has had her work published in student prose anthologies. Pakeeza hopes to one day pursue a career in medicine. Pakeeza got the inspiration for this project when learning about photosynthesis in biology class last year which encouraged her to explore how this natural phenomenon could be applied to solar cells. In the future Pakeeza would like to investigate commercializing this innovation. Pakeeza recommends students thinking about doing a project choose a topic they are genuinely interested in.



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