

Cleantech Hub Quarterly Update | September 2023

## Cleantech Hub

[Dr. Jian Liu](#), an associate professor at the UBC Okanagan School of Engineering, has been elected to the Royal Society of Canada as one of its newest members of the College of New Scholars, Artists and Scientists. The College of New Scholars, Artists and Scientists is Canada's first national system of multidisciplinary recognition for the emerging generation of Canadian intellectual leadership.

Dr. Brown, a Cleantech Hub Lab technician, gave two exciting talks about their new XRD software and chaired the "Would you Publish This?" session at the [73rd Annual Meeting of the American Crystallographic Association](#) in July 2023.

Major tire companies commit to ensuring their products contain up to 50 per cent sustainable materials by 2030. [Dr. Lukas Bichler's collaboration with Kal Tire focused on repurposing carbon black material from Kal Tire's recycling operations](#). The team has achieved more than 99 per cent purity of carbon for testing rubber compounds in tires.

Led by Dr. Mohammad Arjmand and funded by the UBC Eminence Program, the Plastic Recycling Research Cluster (PRRC) is a dynamic and collaborative initiative dedicated to advancing the field of plastic recycling. For more info, please visit the [PRRC website](#).

We introduce a new section – [Hub Living](#), - in our Newsletters.

### In this newsletter:

*Note: Anchor links may not work in all email applications. Scroll to view content.*

#### New Projects

- [Dr. Alexandre Uhl and co-workers present the first electron backscatter diffraction studies on ink-based CuIn\(S,Se\)<sub>2</sub> absorber layers](#)

#### New Partners, Investments

- [Dr. Jian Liu received \\$140K through NSERC Discovery and Research, Tools and Instrument grant programs](#)
- [Dr. Alexandre Uhl partners with the City of Kelowna, FortisBC and solar panel installation companies to investigate the feasibility of solar energy](#)

#### Researcher Spotlight

- [Dr. Jian Liu pioneers solid-state lithium-tellurium batteries at UBC's Advanced Materials for Energy Storage Lab](#)

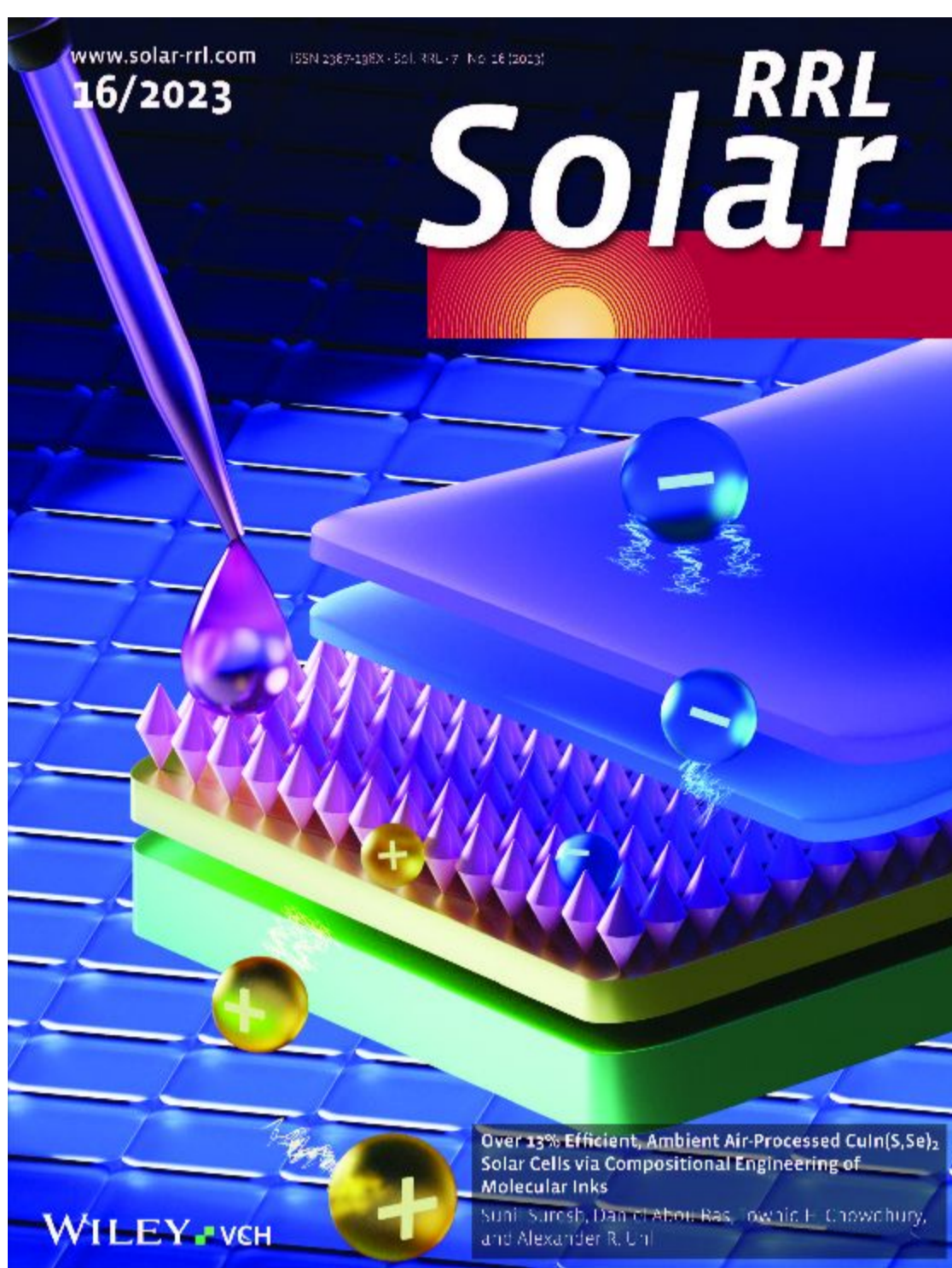
#### Student Spotlight

- [Rubaiya Rumman, UBC Killam Doctoral Scholar, seeks sustainable concrete solutions using wood ash](#)

#### Hub Living

- [Peter Nilsson, Innovation and R&D Manager at Kal Tire brings his lifelong passion for a sustainable future into his lifestyle](#)

### New Projects



Dr. Alexandre Uhl and co-workers present the first electron backscatter diffraction studies on ink-based CuIn(S,Se)<sub>2</sub> absorber layers, prepared using environmentally benign metal chlorides, thiourea, and dimethylformamide. The CuIn(S,Se)<sub>2</sub> solar cells exhibit power conversion efficiencies up to 13.2%, which are amongst the highest of all previously reported non-vacuum methods with comparable bandgap.

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### New Partners, Investments



The Honorable François-Philippe Champagne, Minister of Innovation, Science and Industry announced 13 UBCO-led NSERC Discovery Grants with five Discovery Launch Supplements and one award through the Research, Tools and Instrument grants program, together over \$3.2 million. Dr. Jian Liu received \$140k through the NSERC Discovery grant and Research, Tools and Instrument grant programs to advance his research on interfacial phenomena in next-generation energy storage technologies and study in-situ analysis of mass mechanical changes of interfaces in these systems by electrochemical quartz crystal microbalance.

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Dr. Alexander Uhl and his colleagues partnered with the City of Kelowna, FortisBC, Square Solar, Roost Solar, and Create Solar to investigate the feasibility of solar energy in the City of Kelowna. The research team received \$330k from NSERC and MITACS to deliver the results.

### Researcher Spotlight



Dr. Jian Liu leads the Advanced Materials for Energy Storage Lab at UBC's Okanagan campus. He works in UBC Okanagan's Innovation Precinct, where interdisciplinary researchers come together to solve critical challenges and test new technologies. He and his team are researching materials in order to develop safe and high-performance solid-state lithium-tellurium batteries.

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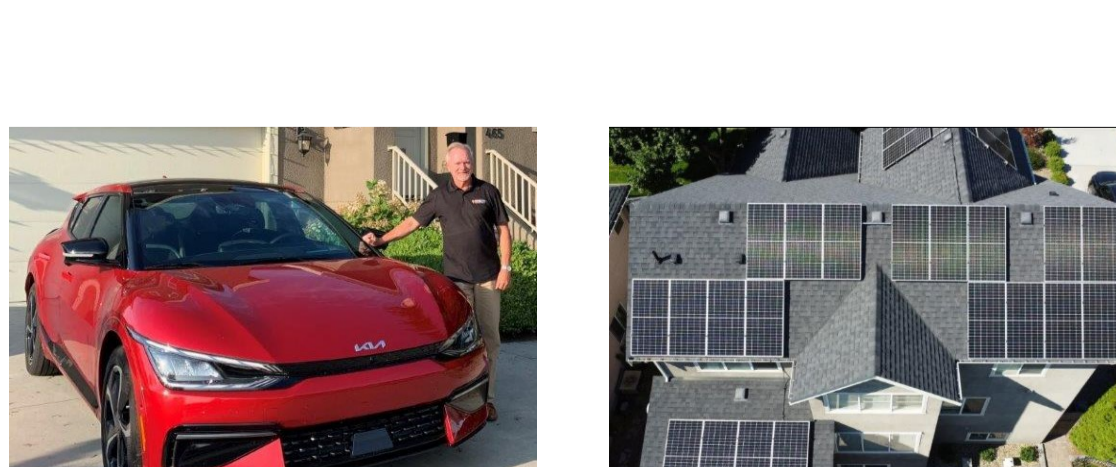
### Student Spotlight



Rubaiya Rumman is a Ph.D. student in Civil Engineering and a UBC Killam Doctoral Scholar at the School of Engineering. Her research focuses on the sustainability and life cycle performance of construction materials. Concrete is a huge emitter of CO<sub>2</sub>, and the main responsible ingredient is cement. A 1000 kg of cement production emits about 900 kg of CO<sub>2</sub> to the environment. Rumman is investigating the feasibility of the use of wood ash, produced in abundance as a by-product of bioenergy in Canada, to be a potential substitute for coal fly ash. Her research aims to reduce the carbon footprint of concrete.

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### Hub Living



[Peter Nilsson](#) is the Innovation and R&D Manager at Kal Tire and Cleantech Hub's committed supporter and partner. In his role, Peter is responsible for developing new services and solutions to global operations on five continents through enhancing safety, productivity, and value to customers. The Kal Tire Innovation Centre has been recognized in the mining industry as a distinct advantage to Kal Tire for bringing new processes and technologies to mine sites worldwide. Peter brings his lifelong passion for a sustainable future into his lifestyle. Since it was installed in July 2023, Peter's 11.83kW solar panels produced 4MWh electricity. His new EV will emit less than 2 grams GHG per km compared to about 250 grams GHG per km for an internal combustion engine vehicle.

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