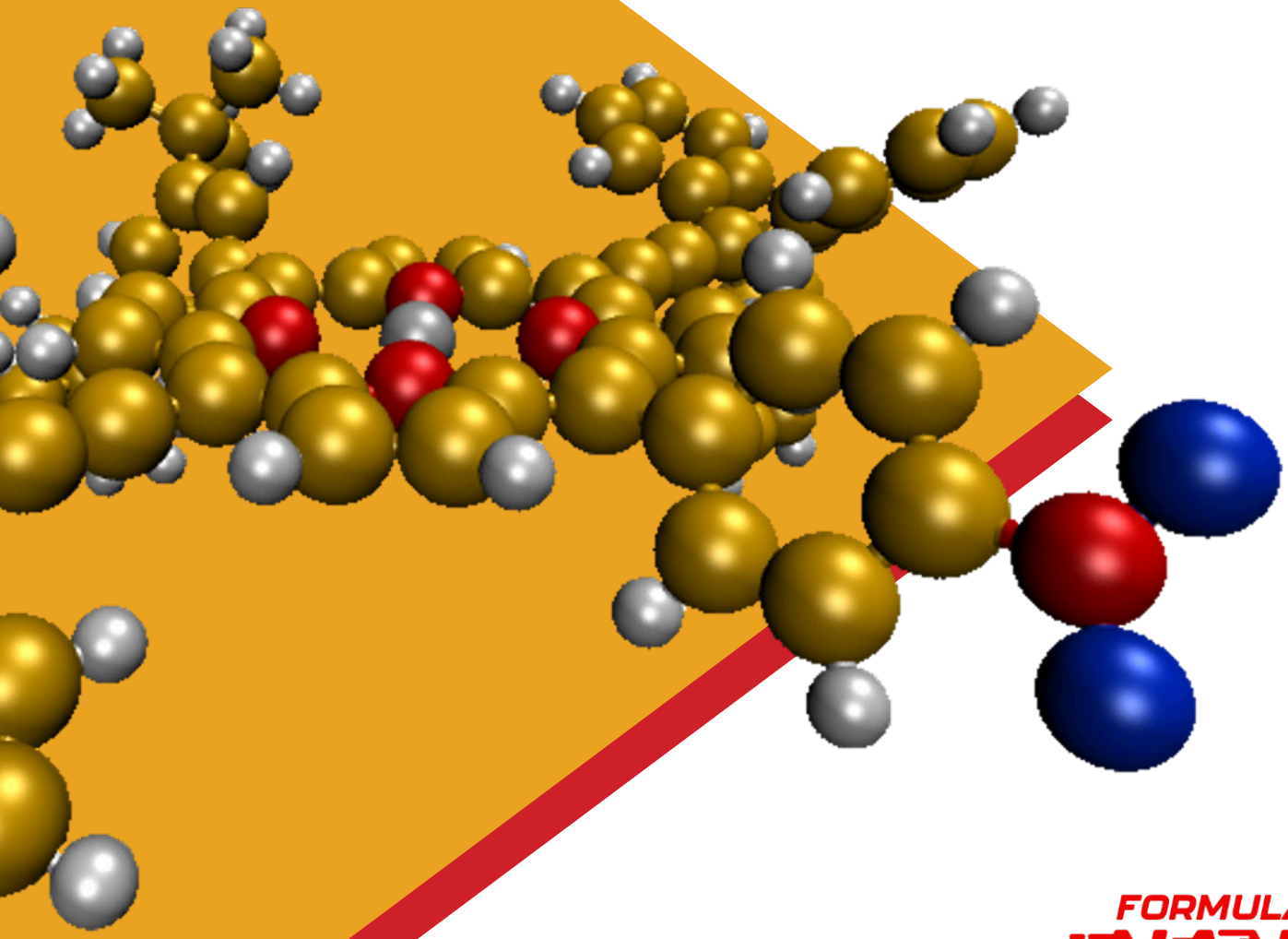
University of Waterloo Design Team

FormulaNano

Sponsorship Package

2024-2025



FORMULA NANO

WEEF

Waterloo Institute for nanotechnology

University of Waterloo

Scaling Down, Speeding Up

Formula Nano began as the passion project of a group of ambitious, naive and rather excited students. We were captivated by the concept of nanocars and molecular machines—and by their charming simplicity.

There are over two dozen student design teams at the University of Waterloo, but little representation for nanotechnology engineering. Given the field's growing importance, we knew that had to change.

We started the team as a way for students like us to gain experience, both technical and leadership. The strength of the University of Waterloo lies not only in its academics and co-op program but also in the innovation fostered through supporting student projects.

Now, we have over 30 members, connections with the Waterloo Institute of Nanotechnology, and advisors from the Faculty of Engineering. Since we began, we have grown significantly from just reading research papers, and we hope to keep growing. We have big ambitions: we aim to compete in the next International Nanocar Race as both the first Canadian and the first undergraduate-led team.

By becoming a Formula Nano sponsor, you are not only supporting our lofty goals but also supporting future engineers and leaders in a way that no classroom can.

We hope you'll join us in this exciting journey!

Sincerely,

Ryan Miller

General Team Lead

Who We Are

Exceeding the Waterloo Standard

The University of Waterloo has consistently produced the most innovative minds in STEM for over 50 years. While Waterloo fosters exceptional talent, our team works hard to be the best we can. Team members are inspired to step outside their comfort zone to hone and grow their skills through direct, hands-on and student-led experiences.

Engineering the Invisible

Founded in 2005, the University of Waterloo's nanotechnology engineering program was the first accredited undergraduate program of its kind in North America. Nanotechnology empowers us to design and control matter at a microscopic scale, where small changes have large impacts on fields like healthcare, energy, and electronics. Through this, we're designing the future, one molecule at a time.

Embodying Diversity

Our team is made up of students from all backgrounds, bringing forward unique perspectives and fostering an inclusive, innovative environment. A diverse group of student leaders ensure every voice is valued, and the team's varied experience leads to creative solutions. We empower each individual to reach their full potential, proving that our diversity is not just an asset, but the cornerstone of our success.

Making the Nanocar

Nanotechnology is the field of science and engineering focused on leveraging the nanoscale realm to solve a vast array of problems. A nanometer is one billionth of a meter—a typical sedan is 4.3 billion nanometers. This is the scale used to design vaccines, computer chips and advanced materials.

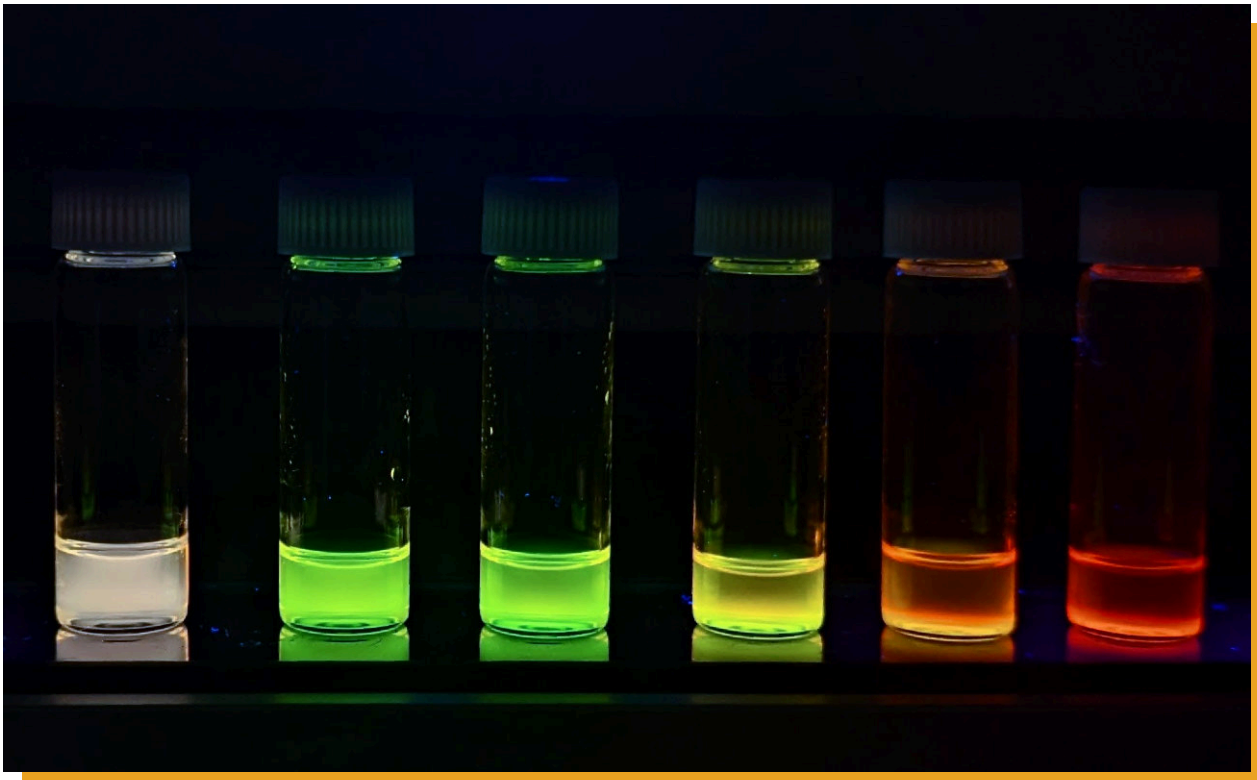
Molecular Machines

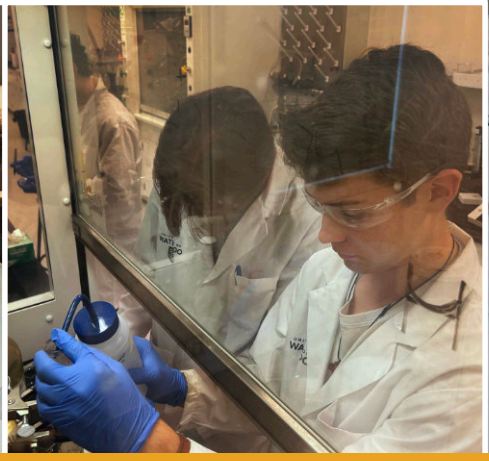
The molecules we work with, known as molecular machines, can replicate basic functions typically observed on a larger scale, such as switches and rotors. Unlike their macroscopic counterparts that rely on electricity or motors, these molecular systems respond to subtle environmental changes and thermal fluctuations.

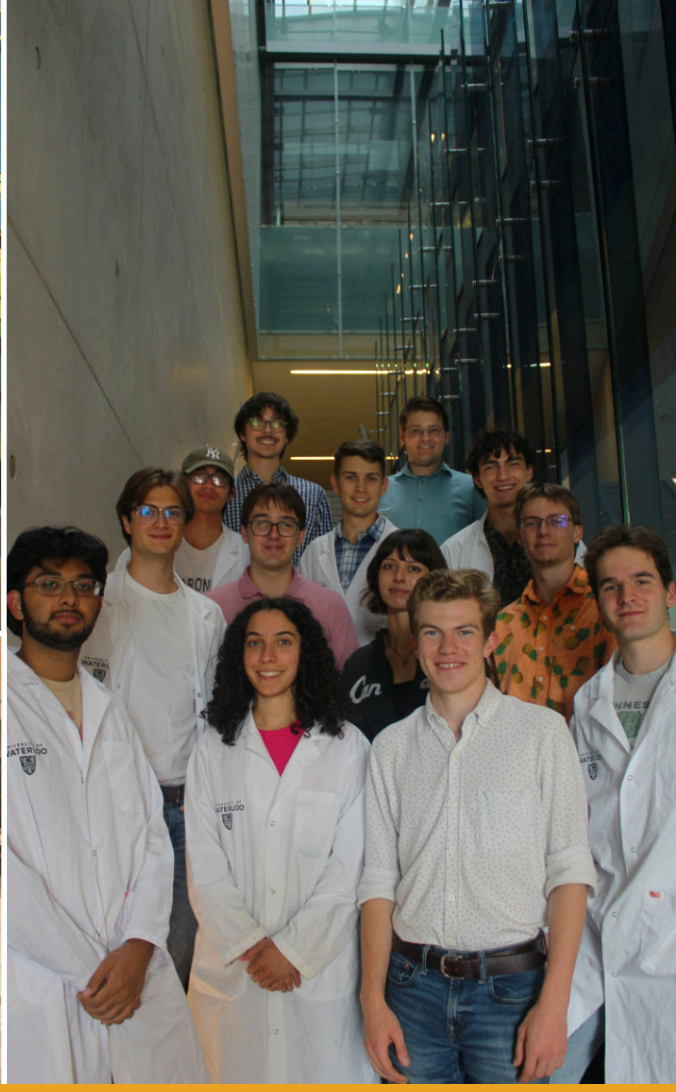
In 2016, the Nobel Prize in Chemistry recognized the "design and synthesis of molecular machines" and showcased one of the first nanocars. Further work on these machines by top universities around the world has been showcased in the two International Nanocar Races in 2017 and 2022.

Expanding Past the Classroom

In their undergraduate lab work, nanotechnology engineering students at the University of Waterloo gain hands-on experience synthesizing nanomaterials, producing microfabricated structures, and characterizing the world at the nanoscopic scale. At Formula Nano, students can apply these skills to exciting new problems that enable them to dive deeper and gain experience and insight into the world of nanotechnology.







Our Teams

Synthetic Chemistry

In the wet lab, students synthesize our complex molecules. The Chemistry team conducts every step in the process with precision, then purifies and thoroughly characterizes our products to maintain control and accuracy throughout the synthesis.

Computing Properties

Using quantum chemistry methods, students can predict the properties of chemical systems outside of the lab. The Computation team designs new molecules with exciting behaviours and establishes reaction pathways to create the molecules in the lab.

Imaging the Nanoscale

To see and control the nanocar, the Instrumentation team is building a budget version of a Scanning Tunneling Microscope. These microscopes can cost tens of thousands to millions of dollars, and typically operate under extremely high vacuums and temperatures close to absolute zero. These microscopes can image surfaces with nanometer resolution and are used to propel a nanocar forward by pulsing the surface with small currents.

We Need Your Support

As we prepare for the next International Nanocar Race, we rely on the support of sponsors, whether through financial contributions or the provision of essential resources. Your generosity enables us to continue advancing innovation in this exciting field.

Shared Success

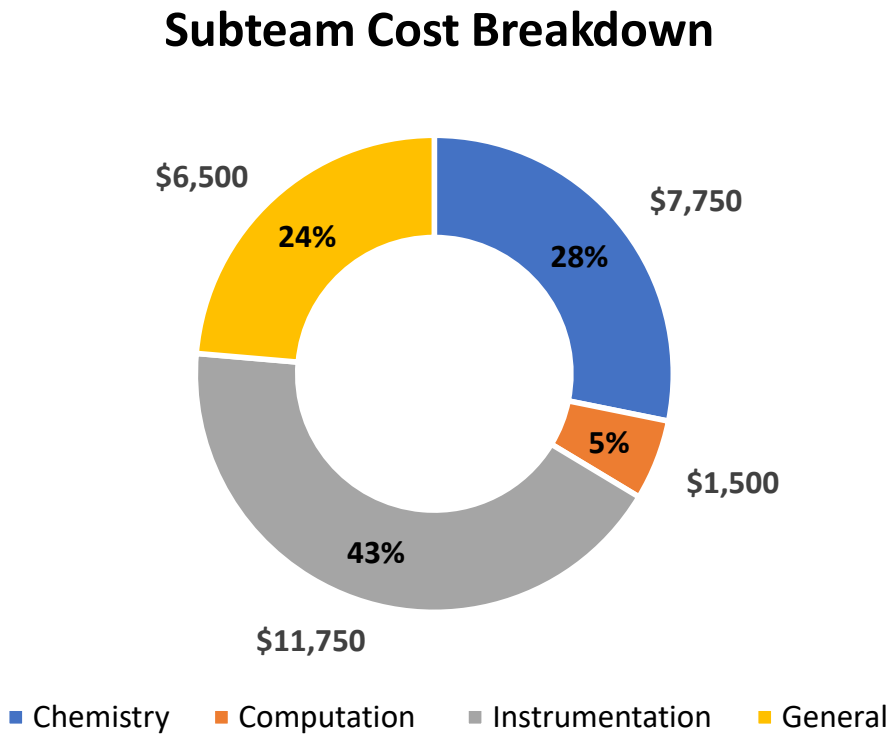
By partnering with Formula Nano, you directly contribute to the success of our students while benefiting from access to exceptional talent and potential collaborations. As a sponsor, you will be able to:

- **Recruit Talent:** Connect with some of the top engineering students at the University of Waterloo, offering early recruitment opportunities for internships, co-op placements, or full-time positions.
- **Collaborate:** Partner with a team of driven students to explore new technologies and innovative solutions.
- **Fund The Future:** Demonstrate how your company is making a positive impact on students within the STEM field and supporting a sustainable industry.

Budget

With a budget of $27,500, we can secure the complex materials, access to cutting-edge technology, and other vital resources necessary to design, optimize, and race our nanocar.

Your support ensures that we are fully equipped to compete at the highest level in the international Nanocar Race.



Perks and Benefits

In kind contributions, such as materials, services or access to software are also greatly appreciated, and will be treated the same as cash contributions.

Looking for other benefits? Please reach out and we can work to accomodate your requests.

	Bronze ($500+)	Silver ($1000+)	Gold ($2500+)
Progress Updates	•	•	•
Logo on Website	•	•	•
Logo on Racing Jacket	•	•	•
Social Media Advertisement	•	•	•
Connect with our Team		•	•
Case Study			•

Contact Us

uwformulanano.ca
uwformulanano@gmail.com
linkedin.com/company/uwformulanano/

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