ETH zürich

ETH CHEMICAL ENGINEERING MEDAL 2023
Wednesday, 18 October 2023, 5 pm, HCI G 3

In recognition of his outstanding achievements in
Digital Chemistry,

Prof. Dr. Alán Aspuru-Guzik

Department of Chemistry and Computer Science
University of Toronto,

will be awarded the 2023 ETH Zurich Chemical Engineering Medal
by the ETH Zürich Vice President for Research, Prof. Dr. Christian Wolfrum

After the ceremony, the awardee will give a talk on

THE FUTURE OF CHEMISTRY IS SELF-DRIVING

Abstract. In this talk, I will overview the growing self-driving laboratories (SDLs) field. Self-driving laboratories are systems that help accelerate the process of scientific discovery or scale-up by employing artificial intelligence and automation for experiment planning and execution. Several SDLs have been already demonstrated globally, and the field is racing towards more robust and complex applications. I will go over essential elements of SDLs and will use examples from research from my group and collaborators as examples. In particular, I will talk about my group's work on organic lasers and organic battery development. I will also cover recent work on artificial intelligence for materials design. I will end with a timely discussion on AI for science. What would be the criteria for advanced AI that carries out chemical experiments? At the University of Toronto, we have launched the Acceleration Consortium. This new significant initiative recently received CAD 200M in funding to accelerate self-driving laboratories for chemistry, materials science and biotechnology. I will briefly discuss what the AC is doing and how to collaborate or get involved with our efforts.

Professor Alán Aspuru-Guzik's research lies at the interface of computer science with chemistry and physics. He works in the integration of robotics, machine learning and high-throughput quantum chemistry for the development of materials acceleration platforms. These "self-driving laboratories" promise to accelerate the rate of scientific discovery, with applications to clean energy and optoelectronic materials. Alán also develops quantum computer algorithms for quantum machine learning and has pioneered quantum algorithms for the simulation of matter. Alán is jointly appointed as Professor of Chemistry and Computer Science, and is the Director of the Acceleration Consortium at the University of Toronto, as well as a faculty member of the Vector Institute for Artificial Intelligence. Previously, he was a full professor at Harvard University where he started his career in 2006. He is currently the Canada 150 Research Chair in Quantum Chemistry, CIFAR AI Chair at the Vector Institute and co-founder of Zapata Computing and Kebotix, two early-stage ventures in quantum computing and self-driving laboratories, respectively.

ICB Institute for Chemical and Bioengineering

DCHAB Department of Chemistry and Applied Biosciences