HTEL Opening Event:

Unlocking Automation, Accelerating Chemistry.

12 February 2026, 13:00 – 17:00

Universität Zürich | Institut für Chemie

Opening Event: Agenda

13:00 – 14:00   Welcome of guests and HTEL tour (Invited guests)

Symposium (Lecture hall Y16-G-05)

14:00 – 14:10   *Welcome and Opening*

Amira Abou-Hamdan, Mathias Cherbuin (Chemspeed), Johannes Schörgenhumer (UZH HTEL)

14:10 – 14:30   *Automating Research in the UZH HTEL: A Holistic Approach.*

Johannes Schörgenhumer (UZH HTEL)

14:30 – 15:00   *ETHZ SwissCAT+, a data-driven automated and high-throughput experimental platform to accelerate catalysis R&D.*

Hannes Frey (SwissCAT+ East, ETHZ)

15:00 – 15:30   *SDL for Homogeneous Catalysis: Evolving Towards an Autonomous and Adaptive Laboratory Intelligence*

Stefano DiLeone (SwissCAT+ West, EPFL)

15:30 – 16:00   *From Automation to Autonomy: The Dawn of the Self-Driving Laboratory*

Loïc Roch (Atinary Technologies Inc.), Mathias Cherbuin (Chemspeed)

Apéro (Y38-G-32), Open Lab Hour (Y38-G-42) and Dinner

16:00 – 17:00   Apéro and Open Lab Hour

18:30   Dinner (Speakers, representatives of CS, HTEL working group, DoC directorate)

Symposium: Abstracts

Dr. Johannes Schörgenhumer (Head of UZH HTEL)

Automating Research in the UZH HTEL: A Holistic Approach.

The youngest core facility at the UZH Department of Chemistry (DoC), the UZH High-Throughput Experimentation Lab (HTEL), has finally opened its doors! Automation and data-driven research are indispensable in the life sciences today. The HTEL is the DoC's answer to meet this demand - and with a broad variety of state-of-the-art automated tools, stands ready to support the DoC in its very multifaceted research endeavors.

This presentation will give some insights into the development of the holistic concept behind the HTEL, which plays not only a crucial role as service facility and for enabling collaborative and independent research projects, but also has been a cornerstone in our new teaching program *Lab Automation and Chemical Data Science.*

As an appetizer for research discussions and Q&A about our equipment later during the apéro and the open lab hour, this presentation will briefly outline some examples of conceptually very different research projects which have been recently conducted or are currently in progress. Topics span from DNA extraction of biological samples to transition-metal catalyzed reactions, reflecting the diversity of research at the UZH DoC – and the versatility of the HTEL.

Dr. Hannes Frey (Scientist Catalyst Characterization, SwissCAT+ East, ETHZ)

ETHZ SwissCAT+, a data-driven automated and high-throughput experimental platform to accelerate catalysis R&D.

More than 90% of our society's industrial-scale processes producing energy, plastics, fine chemicals, and food are based on catalysis. Catalyst discovery and optimization typically require studying vast chemical and condition spaces with millions of potential combinations. Still nowadays most of the R&D proceeds as a highly time-intensive, manual trial-and-error experimental approach. To succeed in the transition to a more sustainable industry, making use of unconventional feedstocks such as greenhouse gases, biomass, and various wastes, there is a need to generate and analyse large amounts of data quickly and efficiently, in a rational, standardized, and reproducible way to design new catalytic technology. The recent global advancements in robotics, automation and artificial intelligence provide new tools for scientists to reach these goals. In 2021, Switzerland launched the SwissCAT+, a national initiative funded by the ETH domain, with the mandate to build a technology platform combining automated and high-throughput experimentation with machine learning to accelerate R&D in the field of catalysis. The platforms, divided into two hubs of expertise (homogeneous catalysis at EPFL and heterogeneous catalysis at ETHZ) provide services to all academic and private research groups.

The presentation will introduce the capability of the ETH Zurich Hub, illustrating, with a case study, how different automated and high-throughput tools have been integrated and combined with Machine Learning (ML) experimental design to accelerate the exploration of CO_2 to methanol heterogeneous catalysts. In 6 weeks, 144 catalysts over 6 generations have been synthesized and tested with limited manual laboratory activity. The catalyst compositions were suggested by an ML Bayesian Optimization algorithm without any human input apart from the initial chemical space, experimental constraints, and study objectives. Between the first and fifth catalyst generations, the average CO_2 conversion and methanol formation rates have been multiplied by 5.7 and 12.6, respectively, while simultaneously dividing the methane production rate by 3.2 and cost by 6.3.

Such demonstration provides the basis for a new, and efficient experimental data-driven methodology to rapidly screen large parameter spaces. It can be applied broadly to other synthesis methods, chemical reactions, and applications.

Dr. Stefano Di Leone (Scientist, SwissCAT+ West, EPFL)

SDL for Homogeneous Catalysis:
Evolving Towards an Autonomous and Adaptive Laboratory Intelligence

Modern laboratory automation has significantly increased experimental throughput; however, it still relies heavily on manual intervention and often suffers from fragmented and poorly structured data. These limitations introduce human error and reduce the reliability of subsequent data analysis and predictive modeling. To address these challenges, the SwissCat+ laboratory at EPFL enables the automated design and management of chemistry workflows, while preserving and structuring experimental data and metadata. Through the progressive integration of complex hardware and software developments, we enable robust, reproducible, and traceable chemical experimentation, with the ultimate goal of creating a fully autonomous laboratory for homogeneous catalysis, capable of adaptive and decentralized decision-making.

Dr. Loïc Roch (Co-Founder and CTO Atinary Technologies Inc.)
Mathias Cherbuin (CTO Chemspeed Technologies AG)

From Automation to Autonomy: The Dawn of the Self-Driving Laboratory

High-throughput experimentation (HTE) has revolutionized chemical discovery, but the next frontier lies in the seamless integration of hardware, data, human expertise, and artificial intelligence. This requires a fundamental shift from traditional automation to autonomous discovery. For decades, the industry has relied on a trial-and-error paradigm and rigid Design of Experiments (DoE) which, while systematic, often struggle to navigate the exponential complexity of modern chemical spaces.

In this talk, I will share insights from our work at Atinary Technologies, where we have pioneered a modular, no-code AI orchestration platform to create a truly Self-Driving Lab®. By integrating the precision of ABB robotics and Chemspeed automated synthesis with high-performance analytical tools from Bruker, Agilent, and Mettler-Toledo, we have closed the loop between experimental design and execution.

Returning to UZH for the opening of the HTEL, I will discuss how replacing linear, pre-programmed workflows with real-time, data-driven optimization allows researchers to discover and optimize new molecules at unprecedented speed. We will explore how AI agents transform the laboratory from a collection of isolated tools into an intelligent, collaborative ecosystem—shifting the chemist's role from manual operator to high-level orchestrator of scientific breakthroughs.

Apéro:

Location: Y38-G-32 (Kitchen area on G floor of Y38)

Interact with our guest speakers, representatives of Chemspeed Technology or the members of the UZH HTEL.

Open Lab Hour:

Location: HTEL, Y38-G-42

Find out all about the UZH HTEL. Have a stroll through the lab, see what the HTEL has to offer and ask us all your questions about our robots, the chemistry and all our means to support all kinds of research in the DoC.
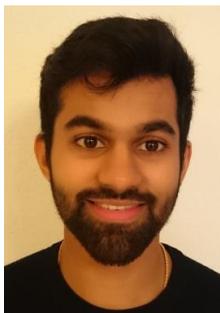
For this occasion, the lab will have open doors and is prepared so that there is no risk of exposure to any hazards. **Hence, lab coats and safety glasses are not required. However, please do not bring any food or drinks to the lab.**

Any questions? Simply find

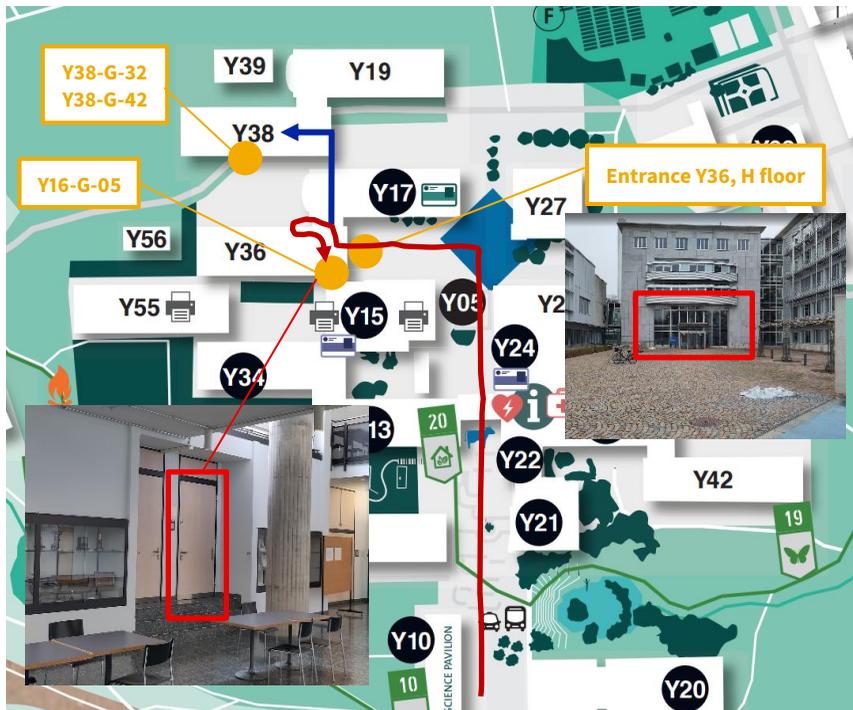Raphael,   Sam   or Johannes.

Venue

University of Zurich
Irchel Campus
Lecture Room Y16-G-05

Heading up the campus, at the blue square, turn left and enter building Y36 on H floor (see picture above). After passing the two entrance doors, take the staircase slightly to the right and walk down one floor. On G-floor, you can already see the access to lecture hall Y16-G-05 when you look to your right (directly beneath the entrance to building Y36).

To go to the apéro and the HTEL, simply follow the corridor on G and enter the wing Y38 on your left when you reach the spiral staircase (blue arrow in the map above).