

EaRTH and an LC-QQQ Preview

A prescriptive element of the University of Toronto Scarborough vision¹ is the advancement of “transformative change for the good of all”. As an embodiment of this vision during a time of climate emergency, UTSC has partnered with Centennial College, Trent University, Durham College and Ontario Tech University to establish the Environmental and Related Technologies Hub (EaRTH) District which harmonizes the expertise of each institution into a collaboration dedicated to:

“providing sector-focused research and comprehensive education to develop innovative, technology driven solutions that will fuel sustainable, resilient communities around the world. This partnership will develop the region’s clean, green, sustainable technology sectors through research, academic programming and commercialization of advanced technology.”² – www.earthdistrict.ca

EaRTH District



Image 1: Obtained from <https://earthdistrict.ca/>.

¹ <https://www.utscc.utoronto.ca/strategicplan/mission-vision-and-values>

² <https://earthdistrict.ca/>

Sited on the Scarborough campus, the EaRTH District will include training, innovation and research facilities as well as plans for a net-zero vertical farm (Image 2).³ The ESCB itself is a supportive element of this district and the TRACES Centre is proudly at the forefront of this initiative.



Image 2: Illustration of a possible vertical farm design. Image obtained from <https://utsc.utoronto.ca/news-events/our-community/u-t-scarborough-and-centennial-college-partnering-develop-canadas-first-net-zero>.

Over the years, TRACES has been securing investment for the continual expansion of its analytical capabilities to better support the future endeavors of both the DPES community and the EaRTH. In 2021, a significant investment totalling \$1.2 million dollars was awarded on a proposal aimed at upgrading aging instrumentation and closing the gaps in our instrument portfolio. With this investment, TRACES made three major and exciting acquisitions. Among these was the purchase of an Agilent 6470 QQQ (triple quadrupole) mass spectrometer (Image 3) to replace our existing single

³ <https://utsc.utoronto.ca/news-events/our-community/earth-district-u-t-scarborough-aims-make-eastern-gta-hub-green-tech-training-and>

quadrupole LCMS system which is over 20 years old! The 6470 QQQ will be coupled to our ultra-high performance liquid chromatography (uHPLC) system for a fully integrated LC/MS/MS setup. This versatile system can perform quantitative analyses for a wide range of low-level contaminants (ex. pesticides, per- and polyfluoroalkyl substances, pharmaceuticals and personal care products) and various biomarkers. A more detailed article discussing the operating principles and capabilities of the 6470 QQQ will be presented in the next issue of the DPES Digest as this will coincide with our first quarter 2023 target to bring this instrument online. The second of the three major instrument acquisitions will also be previewed in the same issue.



Image 3: The Agilent 6470 QQQ. Image obtained from https://www.agilent.com/en/product/software-informatics/emethods/emethod-for-pfas-analysis-in-water-by-lc-ms-ms#zoomELIBRARY_965808.