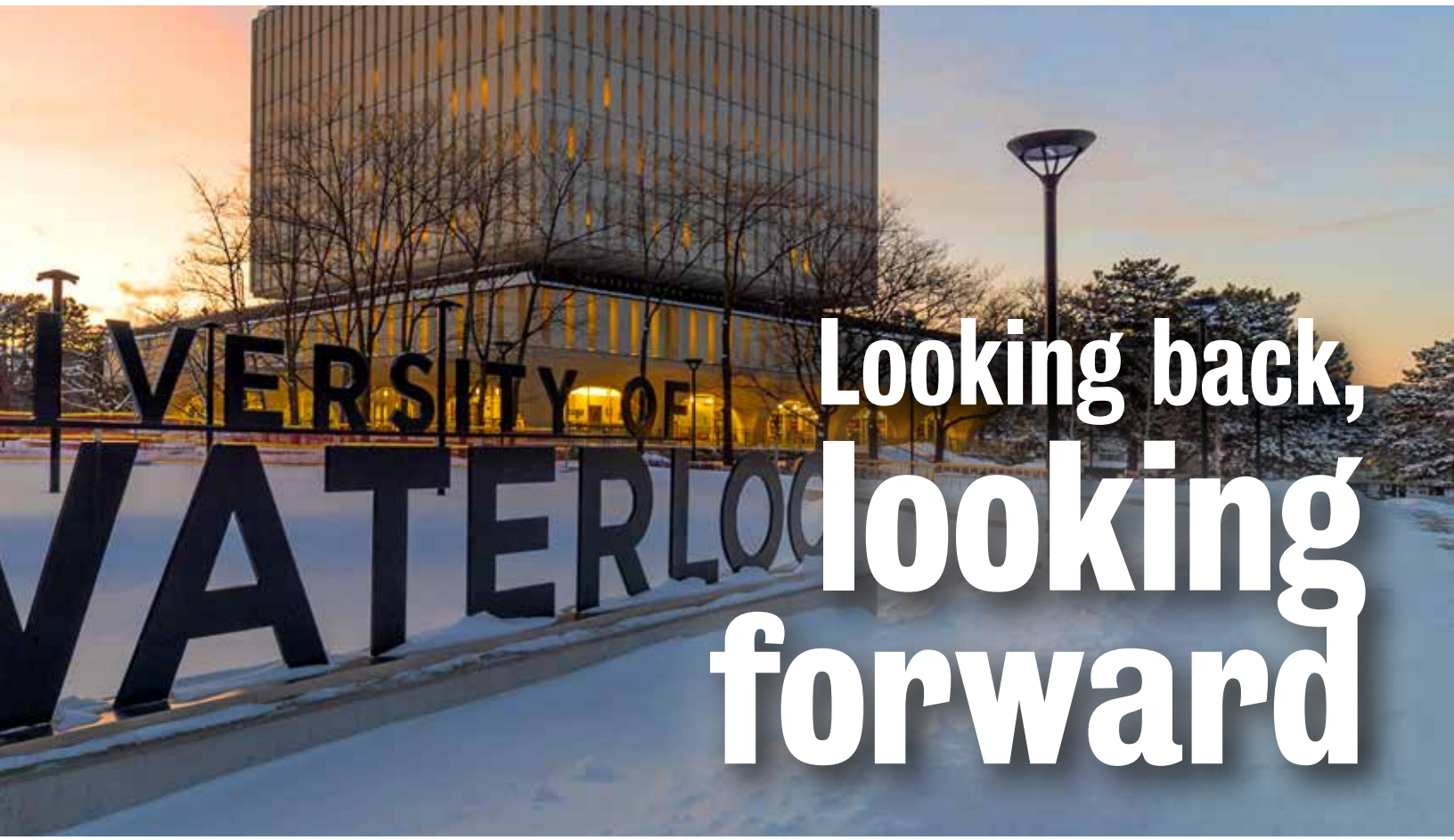
WATtimes

WINTER/SPRING 2025

VOLUME 30 | NUMBER 1

PUBLISHED BY THE RETIREES ASSOCIATION AND THE UNIVERSITY OF WATERLOO



Looking back, looking forward

UNIVERSITY OF WATERLOO

The three "P's" behind the UW Computer Museum

BY SCOTT M. CAMPBELL AND TREVOR GROVE

FIGURE 2: A diorama of the famous Waterloo Red Room.

FIGURE 1: The diagnostic panel of the IBM System/360 Model 75, on display in the museum. It was installed at the University of Waterloo in 1967 and was thought to be the most powerful computer in Canada for a brief time.

When was the last time you typed something on an actual typewriter with no autocorrect, no spell checker and no "delete" button? Or played the video game "Frogger" in glorious 8-bit, 16-colour graphics? Indeed, perhaps you crave replacing that annoying spreadsheet with a slide-rule and an abacus?

Intrigued? Then you'll enjoy a visit to the University of Waterloo Computer Museum, located in the Davis Centre (room DC1316).

The story of UW's Computer Museum can be summed up by three Ps: **perseverance**, **preservation** and **presentation**. Creating the Museum required 15+ years of perseverance by key individuals who wanted to see the "Waterloo story" preserved and presented to the community. Significant artifacts, both hardware and software, were at risk of disappearing, and so preservation became an important goal of the Museum. Over time, with an ever-expanding collection of artifacts, the mission of the Museum evolved to presentation: using the artifacts to interpret and tell the story of computing at Waterloo, and beyond, and to provide a resource for scholarly historical research and teaching.

Today, the Computer Museum at the University of Waterloo is a unit within the David R. Cheriton School of Computer Science. Visitors can see and interact with dozens of artifacts in our welcome centre in the Davis Centre room DC1316, located across from the School's main office and close to the Davis Centre library. Featured artifacts include the diagnostic panel from the IBM System/360 Model 75 that occupied the "Red Room" computing centre (***uwaterloo.ca/computer-museum/exhibits/red-room***) beginning in the late 1960s (**Figure 1**), a diorama of that same computing centre circa 1973 (**Figure 2**), a Commodore SuperPET

FIGURE 4: Davis Centre display for the 40th anniversary of the Apple Macintosh computer

FIGURE 3: Slide-rule display case in the Atrium of the Math 3 building

originally developed by Waterloo researchers as a teaching-related computer, several "classic" personal microcomputers in working order, and other rare artifacts linked to computing-related spin-offs from the university and region.

There are also physical exhibits located elsewhere on campus: a display in Math 3 (**Figure 3**) explores the history and use of slide-rules, and there is a display in the Davis Centre (**Figure 4**) that recognizes the 40th anniversary of the Apple Macintosh computer (***uwaterloo.ca/computer-museum/exhibits/apples-march-future***). A display created by Museum staff for the UW president's office in Spring 2024 featured a sampling of the Waterloo tech innovation story, and the artifacts remain temporarily available to the public in the Davis Centre (***uwaterloo.ca/computer-museum/exhibits/innovation-and-waterloo***). A new exhibit about portable computing at UWaterloo will occupy that display case in 2025.

The Computer Museum was founded in 2010 by Lawrence Folland, a senior manager of research computing in the School of Computer Science (retired in 2022), and Scott Campbell, a historian of computing and a faculty member in Engineering. Before they met, they had the same idea: to preserve and promote the university's technological heritage. Their vision has gained broad support over time, as many members of the University – current and past students, staff, faculty, and retirees – and local community members have artifacts and stories to share, as well as an interest in learning more! To preserve and present these resources, the Museum's mandate includes collecting and interpreting the history of computing at the University of Waterloo and related organizations in the region.

Like many grassroots efforts, the Museum grew in bits and pieces over time. From 2010 to 2022 we were primarily collecting artifacts and cataloguing them in our online database [***computermuseum.uwaterloo.ca***], but the lack of a permanent physical location for displays, storage, or even staff limited our momentum. We placed some surplus display cabinets in high-visibility hallways on the second floor of the Davis Centre (across from the Software Engineering offices, and in the hallway leading to the Engineering 3 building). In 2019 we were asked to create a display in the atrium of the new (at the time) Math 3 building; the result is our slide-rule display, featuring a rare cylindrical slide-rule (**Figure 5**) that we believe once belonged to W.H. Breithaupt, a technology pioneer of Waterloo Region. (***uwaterloo.ca/computer-museum/blog/william-henry-breithaupt-shaping-waterloos-past-present-and***)

FIGURE 5: William Henry Breithaupt's personal slide rule

One of the challenges in establishing the Computer Museum is storage space. As many readers know, campus space is at a premium. During our unofficial startup years, we had to "beg and borrow" temporarily empty offices and unused corners to store and catalogue artifacts. That's part of our perseverance "P", because despite these challenges staff and volunteers have catalogued over 4,000 artifacts over the last 14 years. (***computermuseum.uwaterloo.ca***). The collection primarily covers the 1970s to the 1990s, with an emphasis on personal microcomputing hardware, peripherals, manuals, and software of the era. That includes many popular and several rare and commercially unpopular computers. We also have period-related devices such as IBM Selectric typewriters and a few video game consoles.

To side-step the problem of limited display space, since 2023 we have been hosting "pop-up" one-day exhibits and open houses where we bring interesting artifacts out of storage – that's our presentation "P". Often, we focus on a particular theme. Our June 2024 exhibit day featured portable (sometimes barely "luggable") computers and laptops, from the mid 1970s to the mid 1990s, with an emphasis on educational uses. Our October 2024 open-house featured a "World of Commodore" theme, including a line-up of Commodore PETs – from the original 1977 model to the UW-associated SuperPET.

More broadly, our collection includes artifacts as far back as the 19th century, such as Breithaupt's cylindrical slide rule shown above, and several dozen mechanical calculators and related office machinery from the early to mid-20th century. While not always directly related to the history of the University, such artifacts allow us to tell the broader history of pre-electronic computing and information processing. They often appear in our open house events or in a history of computing course taught by Scott Campbell.

As part of our preservation efforts, we recently began a new project to recover data from collected media. Our primary goal is to restore the educational computing environment of days past: to recover the software and languages produced at Waterloo for higher education, such as WATFOR the student-oriented FORTRAN compiler first developed in 1965 for IBM mainframes or the many WATCOM computer language and database products of the 1980s and 1990s. The research and entrepreneurship of WATFOR and WATCOM helped define the University of Waterloo, so preserving and presenting these accomplishments is an important priority.

In 2022, with the generous support of the Cheriton School of Computer Science, we were able to create our permanent home, which serves as a welcome centre for Museum visitors and a focal point for our displays and exhibits (**Figure 6**). In 2023, the

FIGURE 6: Our Welcome Centre in DC1316, showing a collection of working, featuring Commodore, Apple, and Tandy systems from the late 1970s to early 1980s.

Museum was allocated a small budget to pay for supplies and to hire UW co-op student staff. It is our hope to have our visitor centre staffed permanently and to continue our program of regular pop-up displays and exhibits. Over time, we would like to develop additional permanent displays areas throughout the campus.

Official standing within the School of Computer Science and a permanent display area and office have given us many new promotional and outreach opportunities. Discovering the museum has become a pleasant surprise for many alumni, donors, staff, students, retirees, and people from the community! As a result, we've had more donation offers than ever, challenging our storage capacity and forcing us to reassess our acquisition policies.

Looking forward, we have several plans in progress for exhibits. We expect to continue our research related to computing history and historical teaching and develop our outreach and community work with local computing heritage enthusiasts and regional museum networks. Ultimately, we will do whatever we can to uphold our unofficial motto: "Preserving our past, one BIT at a time."

Scott Campbell is Associate Professor, Teaching Stream, Systems Design Engineering and the Director of UW's Centre for Society, Technology and Values. ***scott.campbell@uwaterloo.ca***

Trevor Grove is a University of Waterloo alumnus and a retired staff, adjunct faculty, researcher, and administrator. ***trevor.grove@uwaterloo.ca***

In his own words: an interview with Trevor Grove

In the '60s, the computer science department at UW ran what they called Computer Science Days, where they brought a busload of high school kids in, sat them down in front of a computer terminal, taught them a little of this and that, and took them on a tour, showing them things like the Red Room, flashing lights, lots of fun stuff.

In Grade 9, I joined one of these tours, and it's not wrong to say I was seduced – absolutely. From then on, everything I did was focused on getting into Waterloo and studying computer science. Lots of people say they don't know where they're going until they're in their 20s or 30s, but I already knew at 14. I started as an undergrad in coop, then dabbled in grad school for a bit in the early 2000s. I have been a student, a staff researcher, a staffer, and an administrator. And in 2015 I was made an Honorary Member of the University – a highlight for me.

After graduating in 1979 through co-op, I joined the Computer Systems Group that was founded by Wes Graham, doing research until the mid-'90s, when the new provincial government cut back funding for higher education. Because of that, and the evolving nature of the computing industry – and Rae Days – our group essentially evaporated. At that point, I accepted an adjunct appointment as a lecturer in Computer Science, which I kept until I rejoined the staff in the School of Computer Science full-time in 2004. I retired from that position in 2014.

Once I retired, I had to confront my "pack-rat-itis," a habit I inherited from my parents. Because I'm one of those people who could never throw anything out, I had accumulated an enormous amount of computer-related stuff. I had some very old working computers and lots of material, development notes related to how software got created – essentially, in my words, "bureaucratic ephemera."

So, I "twisted" the arms of Scott Campbell and Lawrence Folland, who were considering my stuff as a collection of things that might be worth featuring in a museum. And Scott, as a professional historian, reassured me. He reminded me, that's the kind of thing historians love, original sources, to help them reconstruct historical contexts and narratives. Because of the interest in my memorabilia. Scott started storing it in his garage, along with other material he had collected, and the Museum progressed from there.

Once we had consolidated everything, we needed to catalogue it in an online database. Because Scott uses the material in the courses that he teaches, that became a starting point, beginning with my going in one day a week and grabbing a box full of things and saying, okay, here's a thing, here's what it was for, here's why it was important, or here's what it was about.

This is something I've done throughout my career. helping people get their organizational ducks in a row, and getting their governance sorted out. At the beginning of the Computer Museum, there were no governance documents.

So, we set about to create a mission, a vision, and values statement, and a set of policies and guidelines – something we could give to the administration in Computer Science and say this is what we're all about. That work is still in progress, but we originally invested over a year looking at what other museums do, in particular the on-campus Earth Science Museum. We borrowed heavily on their expertise and constructed a set of governance documents.

When Scott first came to Waterloo, in around 2007, 2008, one of the first projects he undertook was to start putting together an oral history, wandering around campus and interviewing people. There are lots of folks around who have interesting stories to tell, and we'd like to get those stories written down while they are still fresh. There's a lot of important stuff that's come out of Waterloo, and we're getting better and better at telling the story.

My favorite personal memory of the 1970s? Well, I got married in 1978, so that was certainly a memorable time. MathSoc (the Math undergraduate society) used to host wine and cheese events and since I was working on campus, and she was in school, we met at one of those. A mutual friend introduced us and that was that – an unforgettable whirlwind romance. Almost fifty years ago.

Nowadays, I spend one day a week on campus at the museum, plus lots of emails and behind-the-scenes organizing. It keeps me in touch with the campus community and allows me to contribute to the mission of the museum. Currently we are taking on a project to recover the data from a set of mainframe data tapes (circa 1991) that we hope will contain the accumulated works of our research group CSG from 1975 to 1990.

Since retiring in 2014, Trevor Grove has been volunteering at the university, both with the computer museum and with the UW Retirees Association. He remained a member of the UWRA Board until 2024. He and his wife, Martha, live in Durham, Ontario.