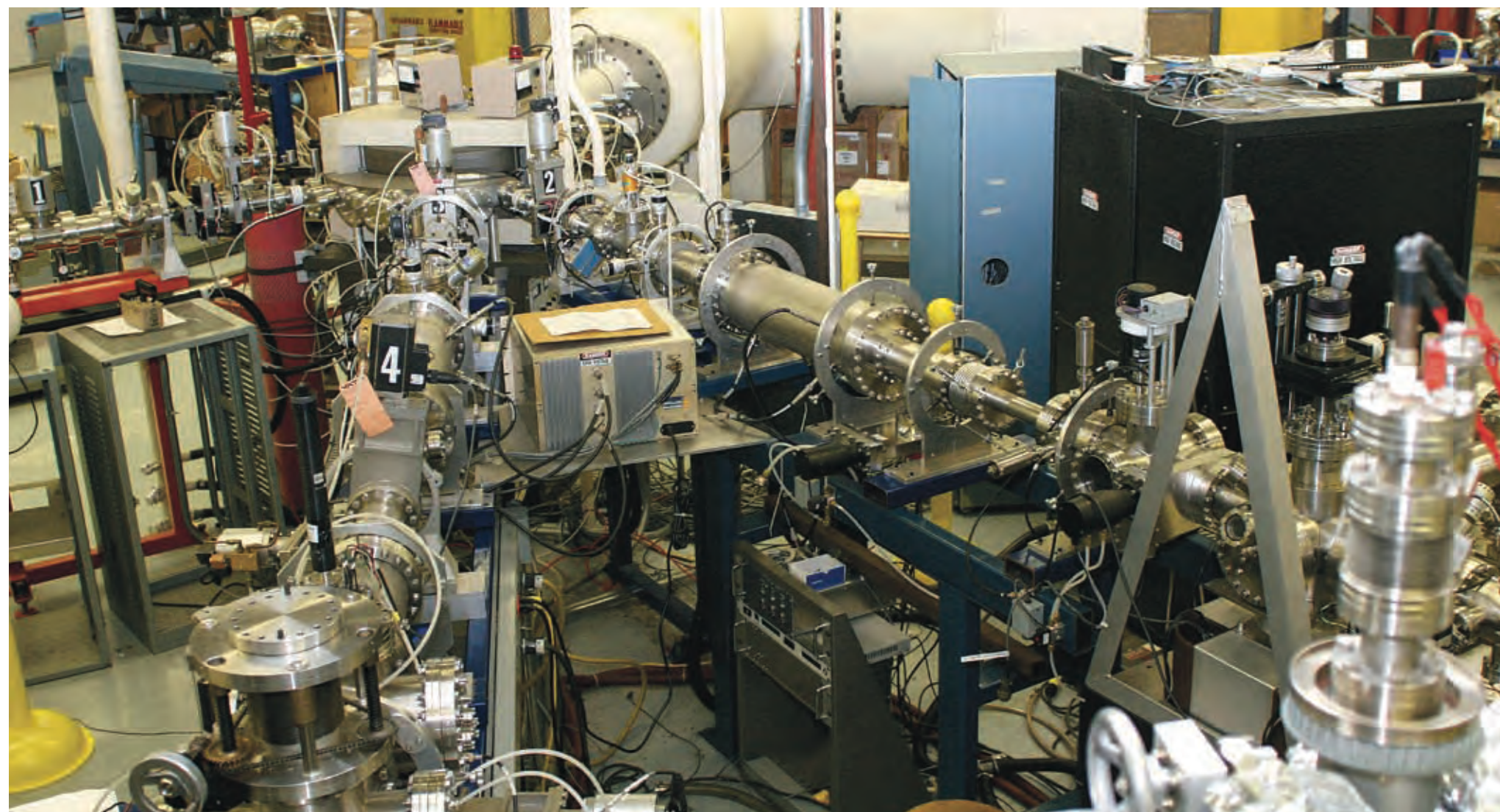


## FACULTY PROFILES

This article is the ninth in a series about how Western faculties are remaking themselves.



Photos by Paul Mayne

As the Faculty of Science prepares to celebrate its 40th anniversary next year, it is experiencing a period of extraordinary renewal, expansion and forging of ties with other faculties. At right, the Tandatron Accelerator Laboratory, an example of the commitment to technological advance, features a 1.7-million-volt, high-current Tandem accelerator that provides ion beams for materials analysis and modification.

# Research-intensive Western Science to focus on quality of teaching

BY ALAN JOHNSTON

The Faculty of Science needs to be "learning-intensive" as well as research-intensive, says Dean David Wardlaw. His vision is part of efforts to make Western the destination of choice for science education in Canada.

"The Faculty of Science is a research-intensive faculty, but why can't we be a learning-intensive faculty? We could and we should with some well-placed programs and changes," Wardlaw says. That is why ideas in the four-year academic plan include training faculty about teaching and learning, not just throwing them into the classroom, but teaching them to be teachers.

"More extensive Teaching Assistant training benefits not only the graduate students but ultimately the undergraduates who receive the TA," Wardlaw says. "That's a big part of my vision for the faculty."

Wardlaw began a five-year term as Dean of Science on July 1, 2006. He joined the Queen's University Department of Chemistry in 1984, and was Department Head from 2002 until his appointment at Western. His areas of academic specialization include chemical physics, chemical reaction dynamics and computational chemistry.

He is a co-investigator in a major Canada Foundation for Innovation-funded national research project involving

## Science Facts

**Faculty:** 211 full-time, 68 part-time  
**Staff:** 280 FTE full-time and part-time  
**Undergrads:** 3,724 (This total does not include 986 students in Years 3 and 4 of the BSc program, who are registered in the Schulich School of Medicine and Dentistry. The BSc program is a joint offering of the Faculty of Science and the Basic Medical Sciences Departments in the Schulich School of Medicine and Dentistry.)  
**Grad Students:** 516  
**Postdoctoral Fellows:** 61  
**Operating Budget:** \$37.2 million  
**Research Funding:** \$200 million  
**How Old:** Established in 1968 from former Faculty of Arts & Science  
**Bragging Items:** Surface Science Western; the Biotron; quality of undergraduate teaching (the Faculty of Science has around 16 per cent of Western's faculty members, and has won 27 per cent of the Awards for Part-time Teaching since 1991 and 25 per cent of the Pleva Awards since 1981); 15 Canada Research Chairs; 28 recipients of the Ontario Early Researchers Awards (ERA).  
**Did You Know?** More than 95 per cent of faculty members hold peer-reviewed research grants, for a total of more than 600 grants.

Source: Western Facts, Dean

high-performance computing and is the recipient of a Natural Sciences and Engineering Research Council Discovery Grant for a project in chemical reaction dynamics.

Long associated with the Canada-Wide Science Fairs, Wardlaw is National

Judge-in-Chief and Chair of the National Judging Advisory Committee of the Youth Science Foundation Canada. He also is Chair of Sci-Tech Ontario, a not-for-profit organization dedicated to celebrating the province's young scientists. Wardlaw says the principal contributions of the Faculty of Science to the university mission are undergraduate, graduate and postgraduate science education, discovery-driven research, and the benefits to society from research and education.

The eight core departments are: Applied Mathematics, Biology, Chemistry, Computer Science, Earth Sciences, Mathematics, Physics & Astronomy, and Statistical & Actuarial Sciences.

Western Science is proud of its interfaculty relationships such as the Bachelor of Medical Science program offered in conjunction with the Schulich School of Medicine & Dentistry and other joint appointments with Social Science, Law, and Information and Media Studies.

The Physics department's Nanofab Lab, used by both Western Science and Western Engineering researchers, is cited as a prime example of interdisciplinary research expansion in the last five years.

Canada Research Chairs and new facilities such as the Biotron, now under construction, help foster interdisciplinary research.

Introduction of more interdisciplinary graduate programs such as one in Computational Science is important as Western Science looks to expand graduate enrolment to as much as 650 from about 500 and increase the faculty complement as well. With about 211 full-time faculty members now, the ratio of graduate students to fac-

ulty is lower than at Queen's and other research-intensive universities, and "we need to keep cranking it up," Wardlaw says.

Undergraduate teaching remains an area of strength for the faculty with 3,724 full-time students and 25,500 course registrants.

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David Wardlaw  
Dean, Faculty of Science



Dean David Wardlaw

The Department of Computer Science recruited Western PhD graduate Mike Katchabaw as an assistant professor in 2002. Given the opportunity to pick what he wanted to teach as a graduate course, Katchabaw chose to offer what was Western's first course on digital entertainment

game development.

"Things snowballed from there, to say the least," he says. Responding to increased demand and supported by the department and Microsoft, Katchabaw was instrumental in the introduction of two senior level undergraduate courses in game development. Research in "this fledgling area of academic study" was undertaken based on the success of the courses.

In September, the Minor in Game Development program was launched with the introduction of a third undergraduate course specific to games - "a two-term project course dealing with the development of a large-scale game, in a team-based setting, with an interdisciplinary flavor to it."

And, since the game courses are all at the senior level, "we will be able to graduate students from this new program at Spring Convocation," Katchabaw says proudly.

Katchabaw grew up in the first generation of young people who had exposure and access to video games, and they fascinated him. "To have the opportunity now to teach courses and conduct research in this area is simply a dream come true," he says. "I could not ask for anything more."

Western Science has identified five research themes where it has great strength or emerging strength:

- Materials & biomaterials,
- Computational sciences,

- Environmental science & ecology,
- Functional genomics & evolution, and
- Planets and stars

"We relate new hires to those areas," says Wardlaw. "We look at the overlap of the new person with that area."

Some Western Science researchers are "international stars" and "a few departments are in the top tier of Canadian departments in their disciplines," Wardlaw says. Surface Science Western, Chemistry and Physics, for example, have longstanding reputations.

The five research themes mentioned in the academic plan are new, but Western Science wants to raise their profile.

"In some of these, we are poised so that after four or five years we could be nationally or internationally known," Wardlaw says.

Materials Science is seen as one strong new research area. The academic plan also emphasizes "the shifts within our research environment towards more Biomaterials, Biological Chemistry, and Environmental Science," the Dean says.

Western Science is pleased to be part of the university-wide effort to increase graduate student numbers. Wardlaw thinks that a 20-per-cent growth is reasonable, but is concerned that every other Ontario university is doing the same.

"It is going to be hard for Western Science to reach the targets, and faculty

recruitment and retention are getting very competitive, more than I have seen in my entire career," he says.

The people Western Science wants to hire are demanding more, not necessarily in salary but in startup funding. Poaching by other Canadian universities is another problem, but finding the right retention tool often is enough to keep someone here, Wardlaw says. It can be something as simple as a small amount of research funding or another way to better their research environment.

Space is called the biggest challenge in academic planning, especially when it comes to meeting graduate expansion targets. "Every graduate student in Science needs a desk space and lab space, so there is pressure and in terms of grouping areas of excellence."

Western Science also aims to ramp up internationalization initiatives and spin-off research. Wardlaw is determined to get more researchers thinking about intellectual property and contract research, and wants to work more closely with the Industry Liaison Office.

Compared to some Science faculties or departments at other universities "we are weak in this area," Wardlaw says. "We need to get this way up and it can be done without compromising the pure science or the discovery-driven research. You can do both of these things at the same time."

The Dean also is excited about explor-

ing a relationship with the Institute for Catastrophic Loss Reduction, which is funded by the insurance companies. "We are in an exploratory phase, but that institute is very interested in making Science their home base," he says.

Delighted to be at Western, Wardlaw says one of his big joys is that the senior administration is supportive and open to changing processes to provide clear guidelines on how to access a funding program, make an application and how it is adjudicated. Space is a problem, but "now there is a comprehensive, university-wide approach to assessing and assigning space," Wardlaw says.

"The systematic way of dealing with academic planning and space allocation is refreshing and I feel very comfortable with it."

Western Science plans to review its research "to find out where we are and at some point we are going to review our undergraduate programs as part of a university-wide review," Wardlaw says. "Then you identify the weaknesses and strengths and decide how to make it better and build."

The Dean wants to increase research intensity, the number of research dollars per faculty member and the number of graduate students and postdoctoral students.

"Western has been at the top of some of the major rankings and I want the university to sustain its position near or at the top of those rankings," he says.