

inventing the future



IMAGE COURTESY OF JOHN CARROLL UNIVERSITY

Let There Be Light

John Carroll University's new Dolan Science Center will do more than open new windows to the mysteries of nature – it will strengthen Catholic higher education

BY ANTON ZUIKER

John Carroll University's Bohannon Science Center is an example of what is often derisively called institutional-style architecture. When I was a student at Carroll in the late '80s, I often imagined my Soviet counterpart studying the same subjects (calculus, psychology, photography) in a similarly drab and depressing building. Bohannon was built, in fact, in the '60s, the era of sputnik and a time of secrecy in scientific research. The science center's racetrack configuration, with windowless classrooms around the edges of the building and closet-like

faculty offices in the center, reflects the chill of the Cold War.

John Carroll's new Dolan Center for Science and Technology (above), for which ground was broken this past summer, will reflect today's realities – in which scientific breakthroughs happen at the overlapping edges of different disciplines, undergraduate science students will get more opportunities to participate in meaningful research and business to collaborate with academia. It is an exciting time for JCU and an indication that science and technology are seen as important areas of undergraduate study.

When it opens in the summer of 2003, the \$66.4-million Dolan Center (the university's costliest construction project ever) will provide 265,000 square feet of academic, research and meeting space, with 20 new classrooms and lab spaces. Outwardly, its design will match the rest of JCU's original red-brick Georgian architecture. Its interior will be another matter.

Professor David Ewing, who heads the Dolan Science Center User Committee, was chair of the chemistry department when the

university began discussing the functional limitations of Bohannon. The input his committee gathered from faculty, students and others has had a profound impact on what that new environment will look like.

Science education is evolving – some might say returning – to a more fluid learn-experiment-discuss pedagogy. Classes are increasingly retreating from a Monday-Wednesday-Friday 10-10:50 a.m. lecture and Thursday lab session, says Ewing. Dolan will offer theory and experiment in the same session, where professors can "take advantage of the teachable moment." In Bohannon, lecture rooms are distinct and separate from laboratories; in Dolan, better-designed rooms will allow lectures and lab activities to flow into each other.

"You'll certainly see far more experiential, hands-on learning going on," says Nick Baumgartner, dean of the school of arts and sciences. "You have to *do* science to effectively learn it," says Ewing. And since most of the classroom/lab spaces will have windows on the hallways, this dynamic process will become a public spectacle. "That's what we call 'science on display,'" says

Ewing. "And that's great for the admissions people."

During my time at Carroll, the only piece of technology a student walking the hallways of Bohannon was apt to come upon was a sputnik-like gray box in the foyer, an object most of us couldn't even have identified as a seismograph. But, throughout the '90s, JCU was acquiring important machines such as a nuclear mass resonance unit and various mass spectrometers. These currently occupy one corner room in the science building. With its door shut, they might as well be invisible. In Dolan, this amazing stuff will be out where everybody can see it (which may also make it easier to raise the additional endowment needed to replace these expensive machines as the technology improves).

Many of Dolan's rooms will have movable tables for flexible and ad hoc small-group learning, and each classroom will be wired to the Internet with state-of-the-art projection cameras and DVD players.

Science education is not only more high-tech these days; it has also become high-touch. "The way to get students interested in becoming scientists is to allow them the opportunity to work on exciting problems," says Baumgartner. "It used to be you had to be a graduate student to do research. We now realize that they can start earlier and earlier, and the further they go, the more excited they become." It's common now for undergraduate science students to assist with faculty and graduate research, and even coauthor papers for peer-reviewed publications. A summer program funded by the National Science Foundation brings undergraduate science majors from across the country to JCU for interactive research projects and discussions of ethics.

The new building will also be a catalyst for interdisciplinary research and learning within the school. "Research is happening at the boundaries of scientific disciplines," says Baumgartner. In Dolan, molecular biology and biochemistry

Almost in Reach

*From the airplane window
I watch the darkness below
Every now and then I follow a trail
Of glittering lights
Threading through that darkness
Until they converge
With other little luminarias
Of some unknown city.*

*Beneath those clusters of lights,
Cities hum with an electrical surge,
Transferring information
Like nerve cells signaling
Action potentials down their axons, exciting
One neighboring cell after the next.*

*All the while I sit
Uncomfortably in my airplane chair,
My porthole view obscuring
What is yet to be seen.
I peer down at this neuronal network.
I am at the edge of something amazing,
But still just hovering above it.*

— Kristen Yankura

Kristen Yankura is a 2001 graduate of John Carroll, where she majored in biology.

will share some facilities. And the university has set aside dedicated laboratory space offered to outside business and industry for on-site research that students can observe and be involved in. An oversight committee will make sure any private research in the building is consistent with the mission and Catholic nature of the university.

At John Carroll, science isn't just for science majors. All students must satisfy certain core requirements, which include science and math courses; so business majors and English majors and history students, too, will find their way to the new science building. Its hallways will feature comfortable alcoves, where small groups can retire to discuss a lesson.

"For the Jesuits, science is a major part of education," says Baumgartner. "Exposing students to more and better science contributes to a strong liberal arts tradition that is at the heart of a

Jesuit education." Discovery is another important value, and John Carroll wants to foster more of it on the campus.

Indeed, with the growing emphasis on science and technology, and multiplication of jobs in those areas, the ability of a university to offer a credible science curriculum is going to become a bigger factor in recruiting students. Peter Anagnostos, who led the capital campaign, is quoted as having said: "Universities that don't invest in a physical plant for the study of science and technology during the next 30 years are probably going to have a hard time continuing to exist. As [John Carroll's president] Father [Edward] Glynn says, people like Charles Dolan are not only contributing to a science center; they are helping ensure the future of Catholic higher education in America." ■

Former editor Anton Zuiker covers the frontiers of technology and change for Live.