Back in the Day

1963 to 2013

The University Of Windsor As We Knew It

Edited by
Kathleen McCrone, General Editor
Sheila Cameron
Ralph Johnson
Kenneth Pryke
Lois Smedick

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Chapter 3

Physics in the 1970s and '80s: The Golden Years*

WILLIAM BAYLIS AND WILLIAM MCCONKEY

Fifty years ago the University of Windsor was a small undergraduate institution which offered a few MA programs primarily by course work. Research activities were not expected from faculty members, nor were they at all prevalent, and the notion of building research-oriented departments was not initially encouraged, certainly not in physics. Fortunately, a number of circumstances came together which allowed Physics to build its research base and later encouraged similar developments in other disciplines.

Lucjan Krause headed the Department of Physics throughout the formative decades of the '60s and '70s. Committed to building a strong research culture which was competitive on a world scale, he was the dominant force behind the Department's rapid growth. Lucjan had grown up in Poland, and as a teenager was part of the resistance in Warsaw fighting the occupying Nazi forces. Krause combined Polish graciousness and generosity with tough single-mindedness and determination. His love of travel, history, good food,

* Much of the information for this paper was adapted from an article, "The Physics Department at the University of Windsor," written by Lucjan Krause for *Physics in Canada* 60, No. 6 (2004): 397-402. See this reference for more detail, especially on the history of the Department between 1980 and 2004.

and music helped him forge close friendships around the world. He also developed a well-honed skill at overcoming obstacles and getting his way. Over the years, he achieved remarkable results for the Physics Department, although sometimes ruffling feathers elsewhere on campus.

Dr. Krause had come here in 1958 from Memorial University of Newfoundland, to join John Huschilt and Rev. N. J. Ruth, CSB, the first Head of Department. In 1959, when Fr. Ruth left the Department to concentrate on his duties as Dean of Arts and Science, Dr. Krause took over as head. Back then, the University of Windsor had not yet been incorporated. Physics was part of Essex College, which had been established in 1956 and affiliated with Assumption University. Anyone wanting to build here a research-oriented physics department offering a PhD was probably crazy. But these were post-Sputnik days, when the Western World was desperate to expand its technological prowess and graduate new scientists and engineers. And Lucjan Krause was determined.

In the year Lucjan became Head, the Department inaugurated a highly skilled machine workshop, under the leadership of Werner Grewe who had vast experience in materials science and other techniques. This was followed in short order by expert electronics and glass-blowing shops. These proved to be essential for the production of the unique pieces of equipment which allowed us to become world pioneers in research in atomic collisions and atomic fluorescence.

The Department offered a general BSc degree in physics as early as 1954 and a four-year honours program in chemistry and physics in 1958. Its first MSc graduate student completed his degree about the same time, as did the first honours physics undergraduate in 1961. With the blessing of the Dean, Fr. Ruth, a PhD program was established in 1962, and the Department awarded its first doctoral degree in 1965 to George Chapman, who became a research scientist at the National Research Council (NRC).

As did other areas of the University, the Department expanded rapidly following the creation of the University of Windsor in 1963. Lucjan hired

wisely, looking for the brightest and best of the crop of young physicists who were available at that time, and also people who would establish a pleasant, mutually helpful environment where energies could be focused and not wasted on petty rivalries. (Bill McConkey recalls this being the case when his father was dying in Ireland, and a colleague, Arie van Wijngaarden, offered to teach his courses while he spent his father's last few days with him.)

By 1969, the Physics Department had already established itself as one of North America's leading centres in atomic physics. That was when Bill Baylis was looking for a research and teaching position after two years as a postdoctoral fellow in Boulder, Colorado. To be sure, the Department at Windsor also housed small research groups in nuclear physics, relativity and condensed-matter physics, but the main emphasis had been in building a reputation in experimental atomic collisions and fluorescence. Gordon Drake and Bill were both hired by the Department in 1969 to add some theoretical dimension to the research. Because of Bill's background in experimental physics, he was to work with experimentalists, helping them analyze data and plan future research.

The real breakthrough came in 1970 when the Department received a half-million dollar Negotiated Development Grant from the NRC for studies in atomic, molecular and optical (AMO) physics. An impressive sum of money in those days, it was intended to cover the salaries of three additional faculty members for three years plus a variety of new equipment. Bill McConkey, one of the three, came from Queen's University, Belfast, with his entire laboratory—nine tons of equipment, in addition to three graduate students and a postdoctoral fellow! However, it was far from automatic that the University would actually continue the appointments beyond the grant period. Despite considerable opposition from some other departments, University President J. Francis Leddy and Dean Ruth, who were always very supportive of Physics, took the bold step of agreeing to the positions becoming permanent.

With these encouragements and motivations, the Physics Department expanded rapidly in both size and prestige. By the mid 1970s, it had 17

faculty members,** all except Fr. Ruth active in research, and eight of them working in atomic, molecular and optical physics, assisted by six technicians as well as numerous graduate students, research assistants and postdocs. Developments in computer technology opened the door, not only to high-speed computational work which revolutionized theoretical research, but also to advanced data collection and analysis techniques on the experimental side. Department personnel took full advantage of these developments. The reputation of the Department grew rapidly, and it began to attract more attention on the world stage, particularly in the area of AMO physics. Faculty and graduate students published in top refereed journals such as *Physical Review Letters* and the *Journal of Chemical Physics,* leading AMO physicists of the day came for visits, for example Peter Farago from Edinburgh, and fruitful collaborations were established with top laboratories in the United States and Europe.

Physics is very much an international discipline, and Dr. Krause used his association with colleagues in Europe and the U.S.A. to bring an international dimension to the Department through exchanges of postdoctoral fellows and sabbatical faculty. His ties to the Nicholas Copernicus University in Toruń, Poland were especially strong. Over the years, about 40 postdocs and visiting scientists came from Poland to collaborate on research. Some of these stayed in North America, and many of those who returned to Poland advanced to senior research and administrative positions there. In 1970, the Polish community in Windsor acknowledged the Department's Polish ties by endowing Nicholas Copernicus Scholarships, two or three of which have been awarded to undergraduate physics students here

** Members of the Physics Department in the mid 1970s, together with their [research field] and (date of initial appointment), were, in order of appointment, Norbert J. Ruth (1952), John Huschilt [relativity] (1953), Lucjan Krause [AMO experiment] (1958), Ed Habib [nuclear experiment] (1959), Nigel Hedgecock [condensed matter, experiment] (1959), Frank Holuj [condensed matter, experiment] (1961), Arie van Wijngaarden [AMO experiment] (1961), Geza Szamosi [relativity] (1964), Hisashi Ogata [nuclear theory] (1965), Mieczysław Czajkowski [AMO experiment] (1967), Mordechay Schlesinger [condensed matter theory and experiment] (1967), Bill Baylis [AMO theory and relativity] (1969), Gordon Drake [AMO theory] (1969), Bill McConkey [AMO experiment] (1970), Brian Atkinson [AMO experiment] (1972), Reinhard Helbing [AMO experiment] (1972), Ed Glass [relativity] (1974).

every year since. The university in Toruń recognized Dr. Krause's efforts to promote collaborative research by awarding him an honorary doctorate several years later.

The research momentum that was established resulted in increased funding from the NRC (later NSERC) and from government organizations in Canada, the U.S. and Europe. For many years, the Department held the highest individual awards in the country from the General Physics Committee of NSERC for both theoretical and experimental work. Further recognition of the Department came as Windsor physics faculty took leading positions on Canadian and international science committees and editorial boards. As their research became well known, the Department hosted several national and international physics conferences, including the first meetings in Canada of the International Conference on Spectral Line Shapes (1978) and of the International Conference on Atomic Physics (1998) (featuring three Nobel Prize Laureates!), the AMO Divisional Meeting of the Canadian Association of Physicists (CAP) (1980), the first joint meeting of the divisions of atomic, molecular, and optical physics of the American Physical Society (APS) and of the CAP (1989), as well as the Annual Congress of the CAP (1992), an international conference on general relativity, and several divisional meetings. In addition, Windsor was a co-sponsor of the 18th International Conference on Photonic, Electronic and Atomic Collisions (ICPEAC) (1995), which Bill McConkey co-chaired in Whistler, B.C., while Bill Baylis organized a two-week summer school on theoretical physics in Banff that produced an important monograph on Clifford Algebras in Physics. More recently, as research emphases changed, the Department hosted the 26th International Conference on Acoustic Imaging (2001).

That the investment by the University in the Physics Department paid off handsomely in national and international reputation was demonstrated further by the remarkable number, for its size, of awards, prizes and fellowships that resulted. These included two Canada Council Killam Fellowships, two Gold Medals from the CAP for Lifetime Achievement in Physics, two fellowships of the Royal Society of Canada, five fellowships

of the American Physical Society, three fellowships of the British Institute of Physics, together with a host of other visiting fellowships at prestigious laboratories around the world. These paid tribute to the achievement of Windsor physicists and, at the same time, helped to change the University's image from that of a largely teaching institution to one where significant research was being carried out.

The 1970s and '80s were a golden age of physics at Windsor, when the Department was a flagship whose success brought recognition to the whole University. As time progressed, other departments in the Faculties of Science and Engineering moved to a greater research emphasis, and creative activity within the entire university community accelerated.

Unfortunately, while gold does not tarnish, golden ages often fade and lose their lustre. Dr. Krause's headship ended in 1983, and by then university budgets in Canada were being squeezed and based ever more strongly on enrolments. Physics is seen by many students to be a challenging subject requiring difficult mathematics, and enrolments in the subject at Windsor—reflecting national and even international trends—were never high. Over the years, the Department introduced initiatives to attract and retain additional students, including new programs in high technology and in medical physics, where there is currently a strong demand for graduates. However, as budgets tightened, there was a need to reward high-enrolment areas at the expense of others, and the Physics Department faced increasing pressure. Retiring faculty were not replaced, so the Department shrank to less than half of its 1975 complement of 17, and lost its role as a research flagship of the University. The recent transition to activity-based budgeting has brought additional restrictions.

However, while it seems unlikely that Physics will soon experience a return to a golden age, the discipline of physics remains the foundation of all science and the enabler of future technology. The Department continues to have a faculty with outstanding achievements and impressive international reputations, and to flourish with innovative work.

Physics can be proud of the stimulus it provided to the rest of the university community to help make front-line research a priority. It is interest-

ing to reflect that the elements that led to the research explosion in Physics in those early days, namely a commitment to research excellence, wise hiring, strategic financial input, skilled technical backup, and openness to technological advancements, are identical to those which are needed to advance the research profile and reputation of the University of Windsor today.