

## Malcolm H. Macfarlane

Malcolm Macfarlane has made significant contributions in the areas of teaching, research, and service since coming to Bloomington. I first met him while I was a graduate student at Oxford University. During the year 1966–67, physics discussions at the Nuclear Physics Center teas seemed unusually lively and witty, even by Oxford standards. This was largely because Malcolm was then visiting Oxford University on a Guggenheim fellowship. There he was one of the first visiting fellows at Oxford's prestigious All Souls College (which, in typical British fashion, is a college with fellows but no students). After receiving my degree I returned to the United States, where I saw Malcolm at various conferences and workshops. I got to know him better when he spent the 1976–77 academic year in Bloomington, and we were delighted when we were able to hire him in 1980 as the founding director of the new Indiana University Nuclear Theory Center (NTC).

It was then that I really came to appreciate Malcolm's great strengths in both research and teaching. He has the ability to reduce extremely complex concepts to their elementary components and to present sophisticated ideas in apparently simple terms. This ability is quite valuable in a field that requires mastery of powerful mathematics, but it is even more powerful in teaching. Students in Malcolm's courses benefited from lectures of great clarity and simplicity. No wonder he was named the outstanding teacher by our graduate students. He was one of the few faculty members able to convey basic physics concepts successfully at every level, from the most elementary to the most advanced course. Indeed, no one in our department has been a more successful teacher across the curriculum.

I was most aware of this during a memorable semester when Malcolm and I team-taught 200 undergraduates in our freshman-level physics survey course. Most students are forced to take this course to fulfill a requirement, and so frequently they are not happy campers. I was struck with the warmth of the students' response to Malcolm. Not only did they appreciate his clarity, wit, and genuine concern, but he was also

especially effective with students who suffered from "math anxiety." Not only did he teach students the logic and power of physics principles; he encouraged even the most reticent students to excel. I saw correspondence from former students who had struggled in science and math classes, but who had mastered Malcolm's physics course, and in doing so had gained the confidence to master any subsequent challenge. For these students, Malcolm's course marked a turning point not just in college classes, but for the rest of their lives.

Malcolm's brilliant teaching and genuine concern for students also extended to our graduate courses. Our grad students are drawn from diverse universities and cultures. They arrive with vastly varied grounding in basic physics precepts, and are then all enrolled in the same core graduate curriculum. This is a daunting experience for students with weak backgrounds. However, Malcolm generously provides individual and small-group mentoring to students who seek help. Over the years, we have been astonished when students who appeared unable to master our courses passed our Ph.D. qualifying exam after Malcolm's guidance.

Malcolm has made numerous significant contributions to physics research, and these have brought him substantial recognition in his discipline. Malcolm's Ph.D. thesis was on single-particle transfer reactions, and his work represented a major advance in our understanding of the structure of the atomic nucleus. With his adviser, Bruce French, he published a major review, based on his doctoral thesis, in the journal *Reviews of Modern Physics*. It became an enduring classic—it has been the second most frequently cited nuclear physics paper in *RMP*, exceeded only by the Bethe/Bacher paper that established the field of nuclear physics!

When Malcolm arrived at IU, he received a research grant from the United States Department of Energy. He continued as principal investigator of that grant for another fifteen years. As NTC director, he was proud to play a major role in hiring young theoretical physicists who helped build one of the strongest groups in nuclear theory in the United States. In 1970, he was named a fellow of the American Physical Society. In 1985, he received an Alexander von Humboldt fellowship to the University of Bonn.

Malcolm's research interests shifted from the shell model of nuclear structure to nuclear reaction theory and techniques. With Argonne National Laboratory colleagues Steve Pieper and Mark Rhoades-Brown, Malcolm developed a major computer program, PTOLEMY, for calculating nuclear reactions. Again, this was a major advance and was widely used by all research groups working in the field. More recently, he has become interested in mathematical techniques used in computation, and in statistical theories of nuclear reactions.

Malcolm has also made significant contributions to his discipline. From 1973 to 1978 he was the associate editor of *Physical Review Letters*, the premier United States journal for important short papers. He was a member from 1983 to 1987 of the Nuclear Science Advisory Committee, which was set up by the Department of Energy and the National Science Foundation to advise them on the most important science in this area and to set research priorities for the field. Malcolm has also been a member or chair of advisory committees for several national laboratories.

Malcolm was born in Scotland and received his M.A. degree in 1955 from the University of Edinburgh. He then traveled to the United States, where he received his Ph.D. from the University of Rochester in 1959. It was there that he met his wife, Ellie. They have now been married for forty-five years, and have four children and six grandchildren. In 1961, Malcolm was given a joint appointment at Argonne National Laboratory and the University of Chicago, where he continued until 1980, when he was appointed professor of physics at Indiana University.

During his many years in the United States, Malcolm's Scottish accent has not disappeared. Indeed, many believe that it gets stronger every year. Malcolm's wit, coupled with his unique accent and deep understanding of English grammar, is a delight to his colleagues.

Malcolm intends to spend a good portion of his retirement with his family. We look forward to continuing contact with Malcolm, to further contributions from him in teaching and research, and to the benefit of his creative mind and his genuine concern for others.

Tim Londergan