According to Dr. Barry, failures are propagated in a manner which may be analogous to the way an epidemic spreads through a population, and in fact, Dr. Jim Betts of the University of Bradford is involved in the advanced statistical analysis of these results. Furthermore, it is apparently the formation of "free radicals", which are harmful to humans, that damage the components. These free radicals are formed by the fast electrons that are generated by the effect of irradiation.

Dr. Barry is quick to point out that these tests are conducted at radiation levels that are far higher than those used for treating humans. The experiments are "accelerated tests" in which the data is analyzed to produce a "local model" of the behaviour of the components under high levels of irradiation. Then, using advanced statistical methods developed by Dr. Marco Meniconi, the local model is used to forecast a "global model" which can be used to predict the behaviour of the components at lower radiation levels.

"PHYSICIANS DON'T HAVE A BACKGROUND IN SEMICONDUCTOR PHYSICS ... THAT'S WHY WE'RE INVOLVED ... TO ADVISE THE MEDICAL PROFESSION AND THE PEOPLE WHO MAKE PACEMAKERS."
-- Dr. Declan Barry

Dr. Marco Meniconi (BEng'86) is a former graduate student and research associate of Dr. Barry. He was one of the first LU students to enrol in a PhD program at another university and to carry out most of his research at Lakehead. Dr. Meniconi subsequently received his PhD from the University of Bradford and in October returned to his second alma mater to take up a position as Lecturer in Engineering.

Recently the Ontario Cancer Treatment and Research Foundation in Thunder Bay received a large grant that has enabled the Foundation to update their equipment to levels which will considerably aid Lakehead's pacemaker and dosimeter research. "In the end," says Dr. Barry, "Research into the reliability of semiconductor devices will help oncology and cardiac specialists in patient management."

Dr. Declan Barry's research has been sponsored by the Canadian Microelectronics Corporation, and the Natural Sciences and Engineering Research Council.

Denis Onen is enrolled in the final year of the Electrical Engineering degree program. He is one of several Lakehead students participating in S.P.A.R.K - LAKEHEAD, a writing program coordinated by the Department of External Relations in conjunction with the Department of Graduate Studies and Research.