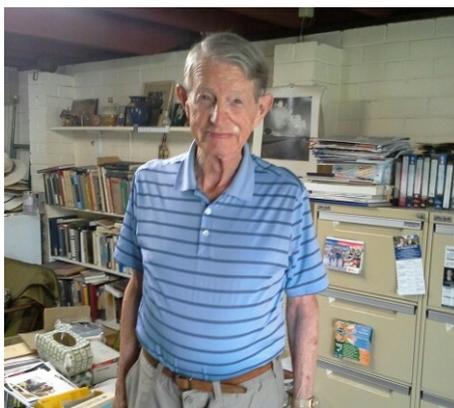


## **An interview with Vincent Hart**

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ABSTRACT. An interview with Vincent Hart, a very early Irish mathematics doctorate, who has spent half a century in Brisbane after starting his career at Cork and at the DIAS.



### 1. INTRODUCTION

Vincent Gerald Hart was born in Hull in 1930, and later brought up in Cork. He attended UCC, and taught there from 1951 to 1966, with forays to DIAS, MIT and the University of Queensland along the way. His January 1958 PhD, earned under the guidance of John L. Synge, seems to have made him the third Irish person to complete a doctorate by research in the mathematical sciences in the Republic of Ireland. (Maynooth’s James McMahan and UCD’s Cormac Smith had earned theirs in 1952 and 1954, respectively, under J. L. Synge and J. R. Timoney.)

Now, half a century after he resettled in Australia—where his career included serving as department head, supervising research, and collaborating in Diarmuid Ó Mathúna’s book *Integrable Systems in Celestial Mechanics* (Birkhäuser, 2008)—Vincent Hart looks back on seven decades of scholarship and life in academia.

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## 2. INTERVIEW

1. *Where did you grow up, what background did your parents have, and what schools did you go to?*

I was born in Hull, Yorkshire, England in 1930, and would probably still be there were it not for the second World War. My mother was a primary school teacher, and my father was an accountant in a shipping office. After primary school, I attended Marist College in Hull, and then, for one term, Wyggeston Grammar School in Leicester—whence we had moved due to the bombing. This lasted until December, 1940, Leicester having been bombed even closer to us in November. My father, who was in the Army by then, decided that my mother, myself, and two younger brothers, should move to family members in Cork, in neutral Ireland. And there I grew up very happily. In Cork I attended the Christian Brothers' College until 1947.

2. *What first drew you to maths, and how old were you when you realized it was something you wanted to pursue above other options?*

At Christians' I received a sound education, my best subject being Latin. I could do mathematics also, but was not enthused by it—until at age seventeen, I read a book explaining how the Bohr atom was described by mathematics applicable also to the solar system: George Gamow's *Mr Tompkins Explores the Atom* (Cambridge, 1945). Then the scales fell from my eyes, and I became, and remained, very interested in the application of mathematics to the problems of the real world.

3. *Tell us about your days as a student at UCC, including noteworthy teachers and fellow students?*

At University College Cork, to which I was admitted on a scholarship in October, 1947, I enrolled for an Honours BSc in Experimental Physics and Mathematical Physics. This meant that I had to attend also the lectures in Mathematics—which gave me about 20 hours per week of contact. I graduated in 1950, with a medal, and took an MSc in Mathematics in 1951. I had good teachers: In Experimental Physics: J J McHenry, C Ó Ceallaigh, D J Stevens. In Mathematics: T M Carey, H St J Atkins. In Mathematical Physics: M D McCarthy for the first two years, and P M Quinlan for the third year.

Fellow students were T M Cronin, P J Donohoe, and P B Kennedy. All were very able, particularly Kennedy who won the 1951 Traveling Studentship in Maths; he was a year ahead of our group of three only. He was in a class by himself in every way (he was the only BSc student in maths who graduated in 1949). We caught up with him for the MSc in 1951. He had two years to prepare for the Studentship; we had but one year to prepare. All four of us (Kennedy, Cronin, Donohoe, me) obtained our MSc (or MA for Donohoe) on our answering on the Studentship examination. P B Kennedy later became Professor of Mathematics, first in Cork, and then in York. I learned a lot from my contemporaries and enjoyed their company very much.



UCC graduation, 1951 <sup>1</sup>

Tim Cronin was a very good mathematician, who had been widely educated. I shared accommodation with him in Dublin, and was impressed by the large number of books on English poetry on his bookshelf. His health was not very good I believe. A very congenial colleague.

<sup>1</sup>(Photo courtesy V G Hart) Front row: Professor H St J Atkins, P B Kennedy, Dr Tadhg (T M) Carey. Back row : T M Cronin, P J Donohoe, V G Hart, one unknown person. PBK is in the honour position since he has just been awarded the 1951 Travelling Studentship.

P J Donohoe had a chequered career. On winning the studentship in 1954 he went to M J Lighthill in Manchester, and was given a project in fluid dynamics. After some months he just gave up without notification and retired to home in Rathmore, County Kerry, to everyone's consternation. After temporary jobs in UCC he obtained a lectureship in QUB—after which he seemed to have returned to the straight and narrow. He was ebullient and brilliant, but erratic. He was outgoing, with a quick intelligence coupled with erudition. But having brought this formidable apparatus to bear, and having achieved something—studentship, DIAS scholarship—he seemed to lose interest, with the obvious consequences. I don't think he published anything, but I'm sure his PhD [QUB, 1966] was good work. He was probably under some pressure to complete it. He probably had too many interests, and the period when he was at QUB was certainly anything but restful for academics.

After the 1950 group, the next maths and maths physics graduates were Kevin O'Donnell and Siobhán O'Shea in 1952. Kevin became an actuary, worked in London for a stockbroker, and moved to Dublin to head a big Irish Insurance Company. I know Kevin well. He and his brother, Des, swept all before them in the 1947 Entrance Scholarship examinations at UCC. At that time, in a College of about 1000 students, there were only about 8 or 10 scholarships offered yearly. Both O'Donnell brothers declined their awards, with Des (who died a few years ago) going to a bank, and Kevin to the Jesuits. After the two year novitiate, Kevin left and came back to maths and maths physics at UCC. I believe he is still happily retired at Ballybride, County Dublin. Both are Cork boys.

Siobhán was a worthy colleague. The stimulus needed to get her moving in research was provided by P B Kennedy after he became Professor in Cork.

*4. After your masters, in 1951, you taught for a while at UCC and began your association with DIAS. How did that come about?*

After BSc graduation in October, 1950, I was offered a teaching post (as Assistant I believe) at UCC. This I held for nearly two years until I applied for and was granted a position as Scholar at DIAS. This was a research position which I held for two years, being supervised by J L Synge, until I was offered a Temporary Lectureship

back at UCC in mid 1954. This became a Statutory Lectureship in 1958, which I held until resignation in 1966.

5. *You were a DIAS Scholar from 1952 to 1954, studying with John Lighton Synge, and then you returned to UCC. Your PhD was conferred in early 1958. What was it like working with Synge, and what was the nature of that research? Did you visit DIAS a lot to do more work with Synge in the period 1954-1957?*

Professor Synge was impressive in various ways. He was an excellent lecturer with a very clear style, as a supervisor he was excellent, very experienced and understanding. I was fortunate to have him as my PhD supervisor: by contrast to the experience of a friend, who was given a problem much too difficult for him by a different supervisor.

From October 1954 I worked at UCC at Lecturer level. And I mean worked: I had 14 lectures per week for a long period of years—with one memorable term when I was asked to give McHenry's lectures while he was in hospital. That gave me 17 lectures per week. All the while I was trying to complete my PhD thesis—with frequent letters to J L Synge. There were only a few visits to Dublin, and those for seminars or lectures.

My research was entirely personal in Cork—except for letters to and fro with JLS. The topic concerned the Hypercircle method; I had previously assisted in the production of Synge's book: *The Hypercircle Method in Mathematical Physics* (Cambridge, 1957).

Mercifully, the lecture load dropped to 11 per week after about half my years as Lecturer at UCC had expired. And I should add that I got away to MIT for the calendar year 1959, and to the University of Queensland for another year, 1964/65. At MIT, I worked with Professor Eric Reissner on problems involving solid mechanics. Two papers on the bending of an annular plate resulted—with D J Evans who contributed numerical skills. I benefited from contact with Professor L N Howard (who we subsequently invited to the University of Queensland). I enjoyed meeting some very able graduate students, including Charles Conley. And my former student Diarmuid Ó Mathúna was pleasant company, since he was there doing a PhD under Reissner. Norbert Wiener's office was two doors away from mine, and we had several chats. There were some excellent

lecture courses, particularly one by Jürgen Moser, which broadened my knowledge base considerably. A very fruitful year for me.

*6. Who else did you know at DIAS?*

At DIAS I met Schrödinger, Synge and Cornelius Lanczos, three Senior Professors, of course. And there was a constant stream of eminent people passing through the Institute: Dirac, Polanyi, Kilmister, Heitler, for example—all very good for us young students. Nearer to my level were Jim Pounder, John Roche, Paddy Donohoe, Fr McHugh, and as postdoc visitors, Martin J Klein from USA, Ernesto Corinaldesi from Italy and Daykin from Canada.

I also knew Henry Sandham [(1917-1963), *another PhD student of Synge's*]; he was not a well man. He was recovering from a lung problem, probably TB which was not unusual for the time, and one could hear his laboured breathing across the room. Nevertheless he was a very pleasant man, always very helpful in discussing mathematics—of which he had a wide knowledge particularly in analysis. He was a mine of information on integrals, series, etc.

*7. Who were your UCC colleagues in the period 1950-1966?*

P M Quinlan (Prof of Math Phys), George Kelly, P B Kennedy, P D Barry, Siobhán O'Shea, Finbarr Holland, Tadhg Carey; all colleagues of varying qualities—mostly good to excellent.

*8. What notable students were at UCC in the period 1950-1966?*

Many. Matt McCarthy, Michael Mortell, Tony Hollingsworth, Brendan McWilliams, Finbarr Holland, Jim Flavin, P D Barry, Diarmuid Ó Mathúna, Richard Scott. M Mortell became President of UCC. P Barry became Head of Mathematics at UCC after Kennedy, and F Holland later a professor there. J Flavin became professor and HOD at UCG, and M McCarthy professor and Registrar there. R Scott became professor at Caltech after PhD there, and D Ó Mathúna, after PhD at MIT, served with NASA in its heroic moon landing stage.

Frank Hodnett became Head of Department at University of Limerick, and Michael J O'Callaghan became Head of Department at UCC—after P M Quinlan's retirement. Tony Hollingsworth and Brendan McWilliams became notable meteorologists, Hollingsworth being chief of the Reading research institute in England. McWilliams remained in the Irish Met service, contributed lively and topical

regular columns to the *Irish Times*. Sadly both have died, but McWilliams's wife has compiled her late husband's columns into an excellent book: *The Book of Weathereye* (Gill and Macmillan, 2008).

Both men were in my Honours BSc class in 1964, which I particularly remember since the students gave me a parting present of six Waterford sherry glasses—still in constant use!

9. *Was there any “institutional memory” of George Boole’s legacy?*

Not really, except for a talk by Sir Geoffrey Taylor in mid 1964. He was a descendant of Boole.

10. *You spent the academic year 1964-5 in Brisbane, were you testing the waters for your permanent move there in 1966? What attracted you to the University of Queensland?*

No. I met in UCC by chance the Head of the Maths Department at the University of Queensland, Clive Davis. He came to Britain and Ireland in February 1964 on a recruiting expedition. My wife and I went to Queensland in mid 1964 for a year, and came back to Cork in mid 1965. Then in late 1965, I got the Readership offer to go back to Queensland—which we did in mid 1966.

11. *How was the adjustment from academia in UCC? It must have been a big culture shock in general?*

Yes, it was a culture shock—but a very agreeable one. The University of Queensland department was much bigger and more diverse than the two departments at UCC (maths and maths physics). The Queensland department comprised Pure Maths, Applied Maths and Statistics, and later Numerical Analysis sections, and had about 15 academics in the mid 1960s. This compared with just Maths and Maths Physics Depts at UCC with a total of just four staff between them.

And conditions at Queensland were better, allowing more time for research and construction of new courses. Another welcome feature was the provision of paid study leave overseas at the rate of three months every three years. *Bozhe moi!*<sup>2</sup>

12. *Did you know you were going to spend the rest of your life there?*

No. I enjoyed the break as an excursion from my normal job at UCC. However it was a most favourable time for academics, with

<sup>2</sup>A Tom Lehrer reference.

Universities expanding everywhere, and by late 1965 I had three offers of jobs, one in Canada, and two in Australia. And so our minds tended to favour perhaps a three year stint overseas—with the acceptance of a Readership offer at the University of Queensland. But this three year period expanded irrevocably. . . .

*13. How did your research interests develop down under? You've had several PhD students?*

Very well. Our department expanded to about 50 academics by the 1970s, and there were excellent opportunities for designing new courses and for engaging with able students. Also the overseas study leave periods, six of which I enjoyed during my 28 years, were very fruitful in generating new contacts and ideas for research. They were taken in Universities of East Anglia (twice), UCD (twice), Nottingham, Auckland and Leeds, the last two on the same leave in 1992.

I had several PhD students, one of whom, J M Hill, became very prolific in research. He has produced a great deal of work, and has held professorial positions at Wollongong and Adelaide Universities.

In administration, I spent eleven years as Head of Department, during which I had a very able Chinese research assistant, Jingyu Shi. He and I turned out ten papers on the stresses in grafted arteries under pulsatile flow. I also spent 16 years as Treasurer of the Australian Mathematical Society. So, all in all, I was very happy with our serendipitous decision to move to Queensland in 1966.

*14. Tell us about your brothers.*

Like me, Julian (1938-2012) and Ian (1939-1980) were born in Hull and moved to Ireland in 1940. Julian preferred the old form of surname: MacAirt. Both both won keenly contested entrance scholarships to UCC: Julian won a Honan entrance scholarship, and Ian won a Keliher entrance. In comparison I won only a College entrance scholarship, after the named awards were distributed. They were bright boys.

Julian also received the gold medal of the UCC Graduates' Club as the most distinguished graduate of 1959—as I did in for 1950—he drowned tragically at The Meeting of the Waters, Wicklow. Julian got BSc (Maths and Stats) and PhD (Economics) at UCC), and a Dunlop Fellowship in Economics at Oxford (1960-63), then worked

at Aer Lingus before becoming Lecturer and Senior Lecturer in Statistics at TCD (1967-95). He wrote two books and 25 papers in statistics.

Ian got his BA, MA, and PhD (in Psychology) at UCC, and a HDip. He worked at the Economic and Social Research Institute in Dublin (1967-80), and wrote 16 papers in clinical psychology. He was regarded as one of pioneers in social work in Ireland on prisoners, deprived children, and drugs, and was one of the early workers in the Simon community for homeless people.

*15. Have you been back to Cork (or Yorkshire) much over the years? What do you miss most about those places?*

Yes. We had six visits to Yorkshire and Ireland to see relatives before retirement in 1995, and three trips after retirement. Having grown up in both England and Ireland I have always been interested in the history, literature and development of both countries. There is a lively conversational style in each that is hard to equal.

*16. What was your role in the book Integrable Systems in Celestial Mechanics (Birkäuser, 2008) by Diarmuid Ó Mathúna of the DIAS?*

This book achieves the complete analytic solution to the problem of a body moving in the gravitational field of two fixed centres, thus completing Euler's solution. Also, by a simple change of sign in the governing equations, it provides the solution of a quite different dynamical problem—that of Vinti, which concerns the motion of a body in a realistic model of the earth's gravitational field. I showed the need to expand the range of parameters that was at first considered in Chapter 3, and I wrote the Appendix, in which illustrations are given of the various orbits occurring. *Maple* codes were supplied by Sean Murray of the DIAS; he helped to get the formulae involving Jacobian Elliptic functions into suitable form. Not many items can improve on the great Euler; I think that is its great strength, and I'm very pleased to have contributed to it.

*17. What have been your favourite courses to teach?*

I liked the small honours classes best I think; special functions, asymptotic methods, fluid mechanics, elasticity.

*18. What course did you create that you are most pleased with?*

I think fourth year honours non-linear elasticity. This started Jim Hill up on his research career, to considerable effect.

*19. What advice do you have for today's students who are interested in applying maths to the real world?*

I think they have to read widely, and, if possible, study the approach of some able applicer of mathematics. I think that I benefited by following Synge's geometrical method rather than an alternative abstract one. But people differ of course. The Study Groups for Industry I attended in Oxford and Australia were fruitful-and these are now widespread of course.

*20. You've seen applications of maths change a lot in your lifetime. What has surprised or excited you the most?*

Both surprise and excitement come from the great facility the computer gives us to research the literature from home. Together with the fine packages such as *Maple* and *Matlab*, which enable much more powerful computation than in the past. This is heartfelt from one who struggled with the Facit, Marchant, and Brunsvigas of the 1960s.

Excitement is not quite the word when I contemplate the change in delivery of instruction. The mode of delivery of courses has changed greatly. Nowadays perhaps only thirty percent of students attend the contact period, the details being available on the screen. This means that the students miss interaction with each other and with the instructor. This is surely a serious detriment. And whatever the educationalists say about self instruction, study of the careful exposition of the great mathematical works is still the only way to learn one's trade.

**Colm Mulcahy** is a UCD graduate (BSc 1978 & MSc 1979) and Professor of Mathematics at Spelman College in Atlanta, Georgia. He is the creator and curator of the free online Annals of Irish Mathematics and Mathematicians, and he blogs monthly at <http://www.mathsireland.ie>. Indeed, an edited excerpt of this interview appeared there as the May 2017 blog.

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