

## Obituary



Dr Hilary Susan Booth  
8 July 1956 – 26 May 2005

Hilary Booth was born in Greensborough, Heidelberg (Vic), the youngest of three, and only daughter of Leslie and Lola (née Edhouse) Booth. Hilary's mother was a geophysicist who sadly died when Hilary was only eight years old. In 1968, at just twelve years of age, Hilary was diagnosed with Hodgkins Disease. She was a (very) long-term survivor, but suffered from the effects of the early chemotherapy and radiotherapy, later developing further life-threatening cancers (bladder, 1980, and breast, 1987 & 1999) and ischaemic heart disease (2004). Despite such setbacks, Hilary lived life to the full, and as she used to say to her friends: "If I go tomorrow I have crammed so much into my life!" She died suddenly and unexpectedly in the early hours of the last Thursday in May.

Hilary was educated in Melbourne, Brisbane and Adelaide, and "aged 14 became the first girl student to win the \$50 junior section of the SA School Mathematics Competition which [was] sponsored by IBM and conducted by the Mathematical Association of SA" (*The News*, 29/6/1971). In 1977 she completed a BSc majoring in Mathematical Physics at the University of Adelaide. During this period Hilary was involved with the surrealist movement as a poet, writer and painter. Over the years, Hilary willingly used these talents to selflessly assist others, and for example designed artwork for the covers of *The ANZIAM Journal* and the *AustMS Gazette*, and this design has been incorporated into all publications and events of the Australian Mathematical Society.

In 1992 Hilary returned to science and mathematics and was awarded a certificate of Equivalent Honours (First Class) at the University of New England (UNE), and from there continued to complete a PhD in Applied Mathematics (awarded March 1999). During 1992–97 she was an Associate Lecturer at UNE, and 1998–2000 at the University of Adelaide. She published six refereed articles in the area of mathematical physics/nonlinear partial differential equations. In 2000, Hilary moved to the Australian National University (ANU) as a Postdoctoral Research Fellow in the Centre for Mathematics and its Applications, and in 2001 joined the newly established Centre for Bioinformation Science (CBiS), becoming a Research Fellow in 2002.

From 2003–2005 Hilary was the main author/co-author on ten refereed publications in bioinformatics. At the time of her death, she had several more papers in preparation in the areas of sequence analysis and gene regulatory networks. She was a Chief Investigator (one of three) on an ARC Linkage Grant “Novel bioinformatics approaches for biological inference from comparative genomics data”, and (one of two) on an ARC Discovery Grant “Sequence to sequence: Rigorous statistical and mathematical analysis of biological sequence data”, and on an NHMRC Program Grant that had reached the final stage. During this time Hilary was invited to visit researchers in bioinformatics at Stanford University, NCBI in Washington DC, the University of Hawaii, Penn State University and Imperial College, London.

Hilary was a natural and gifted teacher, and had the wonderful ability to successfully nurture students, to whom she devoted much of her time. She initiated and developed the ANU Postgraduate Course award in Bioinformatics, and was the main organiser (Chair) of BioInfoSummer2003 and on the organization committee of BioInfoSummer2004, and 2005. Hilary was actively involved with the Australian Festival of Science, and in 2001 she designed the central exhibit for ANU’s contribution on the theme of bioinformatics. School children built a simple model of a section of a gene using polystyrene rings in 4 different colours representing the 4 DNA bases. With the help of two Olympic swimmers, the 600m “gene” was assembled in the Australian Institute of Sport swimming pool and then mounted at the Festival. She contributed to the design of a genome scroller (used at the Festival) that scrolls through chromosome 22. As it scrolls, it calculates how long it will take to get through the genome at the rate it is going. In 2003 (in collaboration with Questacon and Compaq) this was linked to a bike to give the “Voyage (by bicycle!) along the Human Genome”, so that the faster one pedalled the faster the scrolling. Also, she gave a Public Lecture “Voyage through the Human Genome” as part of the Codebreaker Event. In 2002 she organised an exhibition of the fractal-like patterns that demonstrate both the problem concerning the “longest common sequence” (shared by two sequences of length  $N$ , whose elements are chosen at random from a finite alphabet) and the resulting statistical patterns.

Those of us who knew her were always struck by Hilary’s remarkable creativity, and the fact that there was so little conflict between this creativity and the rest of her professional life. She used this creativity in so many different ways. For example, her PhD supervisor, Chris Radford, tells of Hilary about a year into her PhD being dispirited about her negative results, and over coffee he started joking about some really good theorems being just negative results phrased in an appealing way. Hilary took up the banter and started to formulate her negative results in an exaggerated way as a theorem. Soon they realised that Hilary did indeed have a very serious theorem! This theorem, that a static Maxwell-Dirac system is electrically neutral, (after some more serious maths) became the centrepiece of her thesis.

Hilary was a devoted mother and very proud of her children Lila (17) and Natalie (15). Her happy disposition, caring attitude and ever-ready cheery smile, will be sorely missed by so many: family, friends and colleagues.

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