

female researchers, which gives me a great pleasure.

Q. What are some of your interests and activities outside of your professional career?

Antonella: Apart from being a researcher and a professor, I am a wife and the mother of two daughters, 19 and 15. I really like traveling with my family as well as spending relaxing

and pleasant vacations with them, especially in the mountains. We are all very fond of skiing, and, when it is possible, we still practice this sport together. My other favorite hobbies are reading, hiking, sailing, and cooking (trying to keep the Italian cuisine traditions of my family alive). Finally, I am very fond of baroque music. I have been singing in a choir since I was 16. Over the years, I have not always sung

in the same choir, in part because I moved from Genova to Pavia. Now I sing in one of the largest and most lively university choirs in Pavia. This activity is time consuming (twice a week rehearsals and three full days of preparation before concerts), but it is really worth it.

Q. Thank you for your comments.

Antonella: It was my pleasure.

IAN POSTLETHWAITE

Q. What led to your early interest in control systems?

Ian: I read electrical engineering at Imperial College, and the control lecturers were the best. There was Mike Howl teaching linear control systems and Peter Blackman introducing state-variable analysis and relating this to poles and zeros and the root-locus method, which was unusual at that time. David Mayne taught an advanced control course, introducing me to concepts such as observability and controllability, and my project supervisor was John Allwright, who got me to work on “optimal output feedback without trace.” I did the calculations for the example in a paper of his. So I had an excellent introduction to control systems. I enjoyed the underlying theory and found the subject easy when it came to exams, which at that time seemed important. With this foundation in control systems, I went off to Cambridge to do research with Alistair MacFarlane, a great supervisor, and we worked on generalizing classical control techniques to multivariable systems.

Q. Why did you stay in academia and not work as an industrial engineer?

Ian: At each step in my career I have tried to do what I enjoyed rather than what might have seemed more sensible or better paying. I loved being an under-

graduate at Imperial and doing research at Cambridge, so staying in university life suited me. In my final year at Imperial, I did have one interview with a company. It was with Imperial Chemical Industries (ICI), then one of the largest



Elizabeth and Ian Postlethwaite visit Sigurd on a warm day in Norway

manufacturers in Britain, and I asked if they would be interested in me after a PhD. They said they would, but by then I was committed to my research, to teaching, and the freedoms that academia provided.

When I was a research fellow at Cambridge I did spend about six months working at General Electric in Schenectady, New York. They had bought the Cambridge Linear Analysis and Design Package but then needed someone to show them how to use it; that was me. H. Austin Spang III, a distinguished member of IEEE, was trying to persuade his colleagues at GE to use proper multivariable methods in designing their engine-control systems. I really

enjoyed GE and Schenectady, but in the few months that I was there I could see how great the tensions and pressures could be on industrial engineers to deliver to short deadlines. I was happy to return to the freedoms of my research fellowship at Cambridge and then on to a lectureship at Oxford.

Q. What research challenges did you address, are you addressing, and why?

Ian: The why is difficult to answer because I feel that I have been very lucky in the research areas that have simply come my way. I was working with Alistair MacFarlane when there was increased interest in the use of frequency-response methods for multivariable systems. It was an exciting time; there was great debate between different methodologies within the United Kingdom, and more debate was to follow from North America as researchers gained a better understanding of robust control and H_∞ optimization was introduced to design control systems. I was lucky to be at Cambridge when Bruce Francis spent a year and Keith Glover arrived, and lucky to get invited to the ONR/Honeywell Workshop on Advances in Multivariable Control run by John Doyle and colleagues in Minneapolis in 1984. The challenge for me was to keep up with all these developments and to make a contribution.

I worked on mixed-sensitivity H_∞ optimization problems and super-optimal control, developing formulas and algorithms based on state-space

models. But where I may have made a difference was in applying these new methods to real applications. With my team at Leicester, we were the first to design and flight-test an H_∞ controller on a helicopter, a Bell 205 operated by the Canadian Flight Research Labs in Ottawa. Later on, I had some success with an approach for compensating controllers when actuators saturate or hit rate limits. The work is relevant to the reduction of pilot-induced oscillations in aircraft and again the Leicester team demonstrated the new approach in flight in Germany on a test aircraft at DLR, Braunschweig. So the challenges I addressed were all in the area of robust multivariable control, theory, and applications. In more recent years, I looked at autonomous systems, unmanned air vehicles, where real-time path-planning and task-assignment algorithms are required for increased levels of autonomy. I still do a bit of this but not much.

Q. You have a book on multivariable feedback control with Sigurd Skogestad. How did that come about and is it still relevant?

Ian: Well, it all started at the first European Control Conference (ECC) in Grenoble in 1991 when the organizers for the next ECC invited us to give a course on multivariable feedback control at their conference, which would be in Groningen. We started working on the course notes soon after Grenoble and quickly decided that we should write a book together at the same time. Sigurd already had some draft notes, so we initially thought it might not take long. It took ages, but I think this may have had something to do with the fact that we really did enjoy working together. We even took sabbatical leave at the same time at Berkeley in 1994–1995 to speed things up, but it wasn't until 1996 that the book was finally finished. The second edition came out in 2005. Is it still relevant? It is still selling well, and readers frequently e-mail comments and questions, which are always an-

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Authors Sigurd Skogestad and Ian Postlethwaite go to Berkeley to speed things up.

swered, usually by Sigurd. Yes, I think it is relevant. It describes a lot of useful robust control techniques, with sufficient underlying theory, and shows how the techniques can be used in practice.

Q. Where are you now and are you still in control?

Ian: I have recently become CEO of NUIInternational Pte Ltd and dean (Singapore), which means I am leading Newcastle University's operation in Singapore. We already have a strong undergraduate presence out there but I want to

establish a research and innovation center over the next couple of years. Singapore is a great place to do research and is developing initiatives to tackle important societal challenges around sustainability, aging, and digital technologies, areas for which Newcastle has considerable strengths. Am I still in control? I hope to be able to help colleagues develop strong research collaborations. My wife Elizabeth and I are relocating to Singapore in June and looking forward to the challenge. We understand the winters are not as cold as some of our visits to see Sigurd in Norway have been.

Q. What do you do outside of academic life?

Ian: I have always tried to keep fit, ideally through playing football (aka soccer), but recently the opportunities for this have dwindled to the odd game of 5-v-5. In search of something new, I have started spinning, which is high-intensity indoor stationary cycling. Less strenuously, I have started to bake bread. I find kneading therapeutic. Other than that, I like to do ordinary family things.

Q. Thank you for your answers

Ian: My pleasure. I hope the readership finds them interesting.