

PROFILE

Vivien Kirk



In the nature of things, one has few colleagues that command unqualified respect and admiration. One likes one's colleagues, of course, one has to, but it's the unqualified bit that can often be a sticking point.

Not so with Vivien Kirk. She has shown herself to be invaluable in so many spheres; as a research colleague, as an administrator, as a dedicated and wonderful teacher, as an organiser, as an inspiration to so many students, as a source of strength to so many others, and, most particularly, as a rigorous and penetrating mind, accompanied by an unparalleled kindness and empathy. This combination is not so commonly found, and thus Vivien is deservedly regarded as one of the true leaders of the New Zealand applied mathematics community.

It was many years ago, maybe around 16, that I first met Vivien Kirk (that I can remember, anyway). I was giving a talk for a job interview at the University of Auckland, and I was blathering on in typical fashion about the dynamics of something or other. A hand pops up in the audience; it was Vivien. "No", she said, "you're completely wrong." (Well, I paraphrase, as Vivien would never be so directly impolite, but I have accurately conveyed the underlying message.²) From such humble beginnings are collaborations made and friendships built; over the years since then Vivien and I have worked together on many, many problems, and she has become undoubtedly one of my closest, most trusted, and most valued colleagues.

Vivien's early training was at the University of Auckland, in both Mathematics and Physics. I asked her why. It was from her parents, she said. Her father was a maths teacher, and, showing an early penchant for questionable

²If you ask Vivien about this directly she will deny ever having said anything of the sort, and she will accuse me of making up falsehoods. Don't believe her. Trust me. It really happened.

behaviour, she'd bribe him into giving her short math problems (if a watermelon costs \$5.17 and 27 people need to eat it, etc). So doing Maths and Physics at Auckland was a natural extension; much like childhood, really, but without (one hopes) the bribery.

Once she'd finished her BSc in Maths and Physics Vivien had worked out that she didn't want to continue in Maths (the people were too strange), so did her MSc in Physics, with Paul Barker³. On some topic that I forgot to ask about, but in the general area of Nuclear Physics. After that it was Cambridge, in the department of Applied Mathematics and Theoretical Physics, for her PhD with Nigel Weiss. During her PhD Vivien also worked closely with Paul Glendinning and Colin Sparrow, so when she'd finished her PhD, she went off to study with another dynamical systems luminary, in the person of Jerrold Marsden, who was then at Berkeley. When, 18 months later, Marsden moved to CalTech, Vivien went too.

Since those years Vivien has established an enduring interest and international reputation in the field of dynamical systems. Why dynamical systems, I asked her. It's an easy question to ask, but not really a fair one; can anybody really explain to somebody else why they find subject X interesting? Still, Vivien tried. It's the variety, she said. The ability to work on a diverse set of problems, from theoretical to computational to very applied. The connection to experiments, which can add another dimension. The construction of new tools for solving new problems. The qualitative nature of the work, which suits someone not interested in proving theorems.

At any rate, from CalTech it was back to New Zealand, to a job as Lecturer in the Department of Mathematics and Statistics, headed at that time by Alastair Scott. Moving to a Maths department wasn't such a huge leap from Physics, of course, particularly as the field of dynamical systems had, to a considerable extent, migrated to Maths departments by then.

Why New Zealand? I mean, we are talking about a young mathematician of the highest possible pedigree. Cambridge, Berkeley, CalTech; it simply doesn't get any better. Job offers would have been streaming in (yes, they were, says Vivien. Well, at least one.). But as with so many native New Zealanders the answer is simple but hard to explain. Vivien had family in Auckland. She loved New Zealand. She didn't want to spend the rest of her life in the U.S., and the longer you stay the harder it is to move. All small things by themselves, I suppose, and difficult to stack up against a high-performance career doing something you love at the very best places in the world. But these small things get under your skin, and before you know it, you've moved. Against, Vivien adds, the strongly-worded advice of eminent New Zealand mathematicians working overseas, who told her she was crazy.

Vivien disagreed, and home she came, to Auckland in 1992, where Margaret Morton was the only female permanent research faculty. The interest in dynamical systems has persisted, and nowadays Vivien works with a wide range of people, both in New Zealand and abroad. Her work with me concentrates on very applied questions, and links to experiments. Her work with Martin Wechselberger focuses on the construction of new tools for multiple time scale problems. With Mathieu Desroches it's theoretical questions to do with things I don't understand (which doesn't really restrict the field a great deal). Vivien has worked with Hinke Osinga and Claire Postlethwaite, with Jonathan Rubin, Alastair Rucklidge, Mary Silber, and Edgar Knobloch, a roll call of prestigious names in a variety of disciplines. Vivien has maintained this diversity throughout her entire career, and prospered with it.

The prosperity (speaking from a research point of view) is the result of multiple Marsden grants, over many years, yet another striking demonstration of the superlative quality of Vivien's research. I forgot to ask Vivien how many Marsden grants she has had as Principal Investigator. It's been a lot. At least three. Not to mention a string of other grants to fill up the spaces.

On the topic of grants, I asked Vivien if she has any advice for younger researchers about to embark on the dispiriting and intimidating treadmill of grant application writing. She passed on some advice that she originally got from Ivan Reilly. You will write applications, and you will be rejected. Some of the time you might even be successful. But either way, don't take it personally. If your application is rejected it doesn't mean it was bad. It simply means you weren't the lucky one. And the converse is true also. If you get the grant, it doesn't mean you're any better than your peers, just that you were luckier that time around. Next time is likely to be different. It's very good advice, I think.

However, right from the beginning of her career Vivien has been about a lot more than simply doing top-quality research. She has devoted a large part of her time to administration, to organising the best possible teaching, to the construction and running of the Applied Mathematics Unit at the University of Auckland, and, most recently, as Associate Dean of Science (more on this later).

³As an objective interviewer I absolutely should not point out that some people — who wish to remain strictly anonymous — would describe this as out of the frying pan into the fire.

Of course, it's not simply administration. For Vivien, such administrative work is indistinguishable from one of her major passions; the fight for gender equity in Science generally, but in Mathematics in particular. She was trained in a field that was, and remains, highly male dominated. Vivien rattles off some relevant statistics. In all of New Zealand there are 36 professors of mathematics, 2 of whom, at the time of writing, are female. There is a Maths department in New Zealand that has not a single female permanent research faculty member. There have been improvements over the past twenty years, no doubt, but it's sobering to realise that, although in 1997 a significant fraction of Maths PhD students were female, this proportion has not translated to permanent academic jobs. I can remember making this argument myself, 20 years ago. Time will fix the problem, we argued, we just have to wait until the current PhD cohort is old enough, and then gender representation in Maths departments will finally achieve a more equitable balance.

I need hardly point out that we were completely wrong. It hasn't happened. But why not? Well, as with anything there are surely multiple reasons. Often, like a crystal, a seed is needed around which the crystal can coalesce. Maybe for historical reasons, maybe from pure chance, maybe from the persistence of entrenched and unattractive attitudes, this crystal seed hasn't happened in all places. In Auckland I like to think we're doing reasonably well; we have 14 out of 42 female faculty members. Not an equitable balance yet by any means, but moving in the right direction. And for us in Auckland, there is absolutely no doubt that the crystal seed has been Vivien Kirk. She has been a tireless campaigner for gender balance, she has been the quiet (or not) voice of reason in a sea of bias and opinion, she has stood firm time and time again against the forces of narrow-mindedness, and has remained true to her principles even when poorly supported by her administrative superiors. By the way, those are my words, not Vivien's; her language is usually more temperate, at least in public.

The fight for gender equity has, for Vivien, spilled over more recently into more senior administrative duties, where she has taken up the role of Associate Dean of Science with responsibility for doctoral students. Yes, I know it's a mouthful. All PhD students are highly vulnerable. They have no idea what good PhD supervision is — after all, they've never done a PhD before, mostly — and their supervisor can promote or blight their entire future career, for good reasons or for bad.

As Vivien points out, we usually have no problem with oversight of our undergraduate teaching. We get assessments from the students and from our peers. Our exams are carefully checked by others. The students have had dozens of different lecturers and are perfectly capable of telling good from bad. If you say something you shouldn't in class (and I have, you won't be surprised to hear) there are 100 students out there who all know perfectly well you shouldn't have said it, all eager to call you out and haul you over the coals. As they should. But PhD supervision isn't like this. There can be very little oversight. The supervisor, like the student, often has very little experience. It is not always clear, either to the student or the supervisor, where the boundaries lie, and in such fluid and uncertain circumstances lies great potential for things going badly wrong. And that is the space where Vivien likes to work, protecting, as best she can, those who need it, and ensuring that the job is done properly.

Finally, one cannot in fairness talk about Vivien without talking about her dedication to teaching. She is (in my opinion, anyway) a superb teacher. Indeed, if I were being honest, I would have to admit that she's a bit scary, especially to lazy and careless people such as myself. Vivien doesn't tolerate that. She runs a tight ship. She has set up courses properly, has taught them brilliantly herself, and expects everybody else to do likewise. For years, Vivien was the heart and soul of the Applied Maths Unit at Auckland, overseeing the course structure, ensuring that everybody did their jobs properly, and pushing us all, from part-time tutors to full-time professors, to do the best job possible. Like I say, scary, but in a very impressive way.

As my last question I asked Vivien what she does outside her job. "Music", she said immediately, "although I don't play so much now." It transpires that she plays everything. Her mother was a music teacher, Vivien was the third child, and so any time another instrument was needed, Vivien had to play it. They needed an oboe; Vivien had to learn it. They had a spare double bass; Vivien had to learn it. Even now, Vivien has anxiety dreams about showing up to a concert and being made to play an instrument she's never learned. Like the tuba. She can't play the tuba, apparently. Or the bagpipes.

I find this oddly reassuring. It's good to know that there are some things Vivien can't do. Because to the rest of us mere mortals it's not so obvious that such things exist.

James Sneyd