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Frances Separovic

Position: Professor and Head, School of Chemistry, University of Melbourne

How do you introduce yourself at parties?

Hello, I am Frances, Frances Separovic. How are you? It's boring, direct, simple and seems to work if accompanied by a big smile.

How do you use mathematics and statistics in your work and why?

I mainly use nuclear magnetic resonance spectroscopy (NMR) to determine how antimicrobial (antibiotic) and amyloid (from Alzheimer's disease) peptides interact with model cell membranes. This involves determining the structure of these molecules at the atomic level and involves determining distances and angles, which is a mathematical problem. Similarly, analysing and processing the data and interpreting the result involves mathematics. Students studying biology underestimate the importance of mathematics in structural biology and the life sciences.

Do you think that mathematicians deserve the "geek" tag?

Definitely but in a positive sense. Geek or nerd is an accolade in my circles and, even though I don't know the definition, I find them (geeks, nerds, mathematicians) great fun. They are intellectually stimulating, bright and passionate, which makes them endearing.

What has maths done for you lately?

Balanced the budget; paid the bills; helped work out a travel itinerary; determined significance of an experimental result; make a risk assessment; used to cook a meal and plan my day.

Maths is an essential part of my life.

Do you have a favourite application or theory of maths? If you do, why is it so?

Possibly quantum theory. One reason I did NMR was because it was an everyday application of quantum mechanics and necessary to use matrix theory, perturbation theory, spectral theory, operator theory, etc., Galois theory and number theory were fun too. I love algebra and calculus and enjoy being able to apply them.

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Tags: Alzheimer's disease, Frances Separovic, nuclear magnetic resonance spectroscopy, quantum theory

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