

PROFILE

Jörg Frauendiener



Jörg Frauendiener has been Professor of Applied Mathematics and Chair of Applied Mathematics in the Department of Mathematics & Statistics at the University of Otago since 2007. His research focuses on mathematical physics, and he is particularly interested in general relativity and Einstein's equations, as well as numerics of partial differential equations, and topics in differential geometry like Riemann surfaces and air-water interfaces. Interestingly, all of this was probably caused by an unidentified little blue book from a German library. . .

In 1958, Jörg was born in the picturesque Swabian university town of Tübingen in south-west Germany. His secondary school in Tübingen was the Kepler-Gymnasium (often just called "Kepi"), named after the famous astronomer and mathematician Johannes Kepler. This may well have been an early sign that Jörg, like Kepler, would one day reach for the stars and try to understand the secrets of our universe. Indeed, it was in year 11 or 12 of secondary school that Jörg, a regular visitor to the local library, discovered the above-mentioned blue book in the rear shelves of the library. This book about Einstein and relativity impressed him and laid the foundation for his interest in the geometry of space and time, which eventually inspired him to study physics. Unfortunately, Jörg's later attempts to identify and recover this book were futile.

From 1976–1987, Jörg studied at the Eberhard Karls University of Tübingen and completed his Diploma and PhD in Theoretical Physics. Once he told us the story of the time when he struggled with his PhD topic and was stuck with a problem he just couldn't figure out (certainly something that happens to all of us once in a while). The answer finally came to him while he was jogging through Tübingen: he showed that there simply was no solution to the fundamental question in his PhD project. Given this life changing moment and the new insights obtained from this, the title of his PhD was eventually changed, and the article *Nonexistence of stationary axisymmetric dust solutions of Einsteins field equations on spatially compact manifolds* was published in Phys. Letters A.

Afterwards, Jörg had several fixed-term positions, in Pittsburgh, Munich, Oxford, and Potsdam. In Oxford it was none other than the famous Roger Penrose that he had the pleasure to work with, as a postdoc in his group.

In 1997 Jörg returned to Tübingen for his Habilitation (the qualification to conduct university teaching in many European countries). Later, in 2001, he took up the position as a University Lecturer in Tübingen. Jörg particularly likes to remember the enthusiasm of the people in the research group of the late Hans Ruder and, in particular, Ruder himself. This was also the time of a “renaissance of general relativity” in Germany, shortly after the Max Planck Institute for Gravitational Physics was founded and a special research programme on gravitational wave astronomy was established. The latter combined the research efforts at several universities including the one in Tübingen.

Eventually, in 2007, he successfully applied for a position at the University of Otago. (Once he admitted to us that at that time he had never heard of Otago and this University before). When Jörg, together with his wife and daughter, arrived in New Zealand, he immediately started building up a research group. In particular, he was able to get us (Florian Beyer and Jörg Hennig) to Otago as permanent lecturers. Over the years, a number of people have been part of the group and then left to pursue their careers elsewhere, including the postdocs Ben Whale (now lecturer at the University of Wollongong) and Robert Thompson. Joerg has strongly influenced all of us in this group and beyond, and he helped us to become better researchers and teachers. With his knowledge, interests, skills, enthusiasm and his always friendly personality, he has always been a role model for us.

Jörg is well-known in the field of mathematical and numerical relativity and beyond for many important contributions, in particular for his pioneering numerical work on a conformal representation of Einstein’s equations where spacetimes of infinite extent are represented on finite computer grids in a mathematically well-defined manner. This is crucial for the unambiguous and accurate modelling of gravitational waves. His first publication covering this topic is from 1998. This subject has never let him go ever since and has become an even bigger focus for him in recent years since the observational discovery of gravitational waves in 2015 — one hundred years after these tiny ripples in the fabric of space and time were predicted by Albert Einstein himself.

Jörg has extraordinary broad perspective, knowledge and interests, which becomes evident from the research covered in his over 100 research articles, book chapters and conference proceedings. This is one of the reasons why it is particularly enjoyable to work with him: with his great experience, he is able to see and exploit connections between fundamentally different aspects of mathematics and physics. In 2013, Jörg was deservedly elected a Fellow of the Royal Society of New Zealand.

While Jörg tries to deceive us with his youthful appearance, we have indeed celebrated his 60th birthday last year with an international Birthday Colloquium. Renowned speakers from New Zealand and overseas gathered to celebrate this anniversary and his internationally recognised contributions to Einstein’s theory of gravitation.

When we asked Jörg what he particularly enjoys in his work at the University of Otago, he immediately responded that it is the intense contact with students. As a consequence, students can feel that he really cares for them and supports them in every possible way. This was recently acknowledged with a *Supervisor of the Year Award* from OUSA, Otago’s student association.

Occasionally, Jörg is neither working on problems from mathematics or physics nor teaching. Then he particularly enjoys reading (especially Scandinavian detective stories), and listening to music (everything from techno to Jazz and classical music).

Luckily, New Zealand professors (unlike those from Germany) are not forced to retire at a certain age. Hence we are sure that your colleagues and students can continue to enjoy fruitful collaboration, inspiring discussions and enthusiastic lectures for many more years to come!

Florian Beyer and Jörg Hennig