Join Radboud Summer School 2018!

Quantum in the Summer

*change perspective*

Radboud University
One of today’s most fascinating fields of research and innovation involves applying quantum phenomena to new technology. Quantum technologies is an area in which EU has recently committed more than €250 million. Research in quantum technologies has opened a new path to 100% secure communication. Indeed, quantum technologies promise to revolutionise society in this century through secure communication, precision measurement, and powerful computation.

The purpose of this Summer school is to partake in this revolution by encouraging the next generation of researchers into quantum-based research. The aim of the school is to bring the audience up to the cutting edge of research in some aspects of quantum information and computation, and to make it easier to get to that cutting edge in other aspects of the field.

We will offer a coherent, unified, in-depth set of lectures and tutorials. Our focus will be on fundamental theory supplemented by illustrative examples of quantum mechanics in action. By grounding the audience with such a basis, we hope to stimulate future work and inspire the next-generation of research.

Quantum information and computation is one of the fields that benefits most from the creative interaction of mathematicians, physicists, computer scientists, and others. We stress that no prior experience of quantum theory will be assumed. Instead, we delight in introducing the audience to, amongst others:

- The basics of quantum mechanics via well-worked examples
- Fundamental protocols of quantum information science, such as, superdense coding and quantum teleportation
- The widely used model of quantum computation, the so-called quantum circuits model of computation. This is the model in which results such as Shor’s factoring algorithm
- Insights into the ‘spooky’ nature of quantum entanglement and explanation of why “entanglement is a physical resource”
- Properties of quantum communication channels and their application

Finally, we will offer an exciting set of half-hour afternoon research seminars, which will be designed to give the audience a feel for some cutting-edge the research currently underway in the field.
After this course you are able to
• Understand fundamental aspects of quantum mechanics
• Describe the workings of foundational quantum protocols, such as, superdense coding and quantum teleportation
• Understand the concept of entanglement and its importance as a physical resource
• Describe quantum communication channels and be able to define concepts, such as, channel capacity

Number of EC
2 ECTS credits

Entry level
Advanced Bachelor

For whom is this course designed
Quantum information and computation is one of the fields that benefits most from the creative interaction of mathematicians, physicists, computer scientists, and others. We stress that no prior experience of quantum theory will be assumed. Instead, we ask that the audience has an experience of elementary linear algebra and mathematical maturity of a third year undergraduate

Course leader
Colin Michael Wilmott, Senior Lecturer, Mathematics, Nottingham Trent University

Dates
Monday 6 August – Friday 10 August 2018
Want to be part of the RSS experience?

Course fee
€600

Discounts
• 10% discount for early bird applicants. The early bird deadline is 1 April 2018.
• 15% discount for students and PhD candidates from partner universities.

Deadline application
1 June 2018

More than just a course!
Radboud Summer School is more than an academic event. It is a unique opportunity to meet other international students and researchers and to get to know Radboud University and the city of Nijmegen. Our participants come from all over the world and have different cultural and academic backgrounds. Our programme includes the following activities free of charge: welcome reception, guest lecture and farewell drink. We offer sports activities, a BBQ, a river cruise on a Pancake Boat and a city tour for a small fee.

Have a look at what participants have said about their experience!

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www.ru.nl/radboudsummerschool, 5-17 August 2018