

The Challenge of Quantum Reality

Greg Dick, Educational Outreach Consultant
Perimeter Institute for Theoretical Physics, Canada



1.5 hours

Arguably, quantum physics is the single most important theory in all of physics. It describes the subatomic world with unprecedented insight and accuracy.

This presentation gives you a sneak peak at a new educational resource on quantum physics for Grade 12 physics produced by Perimeter Institute for Theoretical Physics. Due for release in late summer, it includes a professionally produced educational video and accompanying student worksheets. The video includes real footage of an authentic double-slit experiment performed with electrons and focuses on the concept of wave-particle duality.

Workshop participants will see clips of the video currently in production and have an opportunity to work through some of the hands-on activities contained within the Teacher's Resource.



About Greg Dick

Greg Dick has been teaching physics to Canadian high school students for 16 years. He is currently on a year's sabbatical from Galt Collegiate where he is the Science Director, to work at Perimeter Institute as an Educational Outreach Consultant. Greg has authored grade 11 and grade 12 physics textbooks, online resources, and Canadian curriculum resources. A recipient of the Barraday Teacher of Excellence Award, Greg engages in educational initiatives, such as resource writing for students and teachers, course design, production management for publishing teams and professional speaking across Canada. Greg is an avid outdoor enthusiast who enjoys mountaineering and back country trekking. He spends his summers playing and coaching beach volleyball, and his winters – in true Canadian spirit - playing hockey.

The Mystery of Dark Matter

Dave Fish, Physics Teacher

Waterloo Region District School Board, Canada



1.5 hours

‘The Mystery of Dark Matter’ is the first installment in a series of in-class educational resources designed to help teachers explain a range of important topics in physics. Perimeter Explorations is the product of extensive collaboration between international researchers, Perimeter Institute’s outreach staff and experienced teachers. Each module has been designed with both the expert and novice teacher in mind and has been thoroughly tested in classrooms.

Teachers will have the opportunity to explore The Mystery of Dark Matter Kit, including a preview of the DVD movie, guidance through student activity questions and learning about dark matter in greater detail. This workshop will showcase a hands-on demonstration using a circular motion apparatus; a discussion on the principles of circular motion and dark matter; and how teachers in Canada are utilizing the resource in their classrooms.

Each workshop participant will receive a “The Mystery of Dark Matter Resource kit including:

- DVD – With state of the art animation and indexed chapters to stop/start as required
- Suggested Ways to Use the Module – Possible lesson outlines
- Curriculum Links – Commonly taught topics related to dark matter
- Dark Matter in a Nutshell – Summary of the video
- Student Activities – Hands-on demonstrations and student worksheets
- Supplementary Information – More details and mathematical appendices
- Dark Side of the Universe – Introductory article about dark matter

About Dave Fish

Dave has been a high school Physics teacher for 19 years. His involvement with the Perimeter Institute dates back to the beginning with the initial development of the International Summer School for Young Physicists (ISSYP), EinsteinPlus and several other outreach activities. His most recent projects include the classroom resources for teaching Dark Matter, Measuring Planck’s Constant, and on the Wave-Particle Duality. He has given workshops on modern physics at local, provincial and national levels. Dave currently teaches Physics at Sir John A Macdonald Secondary School in Waterloo. In his spare time he enjoys reading, travelling, sports and spending time with his wife and three children.

