

# The physics of martial arts

**Rob Howard**

Dublin Institute of Technology



## **SCHEDULE**

Carlow IT – Tuesday 21st January

Waterford IT – Wednesday 22nd January

Cork, UCC – Thursday 23rd January

Limerick, UL – Friday 24th January

Derry, Thornhill College – Tuesday 28th January

Belfast, QUB – Wednesday 29th January

Dublin City University – Thursday 30th January

NUI Galway – Friday 31st January

# Tyndall Lecture for Schools 2014

Combining his love of physics with his love of Taekwon-Do Robert explains the physics behind the awesome power of martial arts. Using the basic physics principles of force, energy and momentum he calculates how much power a martial artist can generate in his or her punches, blocks and kicks.

But it's not all theory, and Robert puts his faith in Newton's laws to smash his way through timber and tiles.

Accompanying Robert on the Tyndall lecture series is his father, well known martial artist, Grandmaster Robert J. Howard. GM Howard is the highest ranked Taekwon-Do instructor in the country and is a pioneer of Taekwon-Do in Ireland. He is held in very high regard throughout the world. At age 75 Grandmaster Howard shows he still has the power.

## **Dr Rob Howard**

Dr Robert Howard graduated in 1991 from Dublin Institute of Technology (applied Science). He then received his MSc from the University of Limerick (1993) and PhD from Trinity College Dublin (1997) in non-linear optics and liquid crystals. He started lecturing in DIT in 2001 and specializes in physics education research.

Robert has also been training in Taekwon-Do since 1979 and is a 7th degree Master in this martial art. He is a well respected instructor and international umpire and is well known at ITF European and World Championships.

Date	Venue	Contacts
Tuesday 21st January	Carlow IT – 12noon	<b>Yvonne Kavanagh</b> yvonne.kavanagh@itcarlow.ie Tel. 059 917 5000
Wednesday 22nd January	Waterford IT – 12noon	<b>Gabriel Gallagher</b> ggallagher@wit.ie Tel. 051 302645
Thursday 23rd January	UCC – 12noon	<b>Irene Horne/Susanna Kent</b> physics@ucc.ie Tel. 021 490 2013
Friday 24th January	UL – 12noon	<b>Carol Ryan</b> Carol.ryan@ul.ie Tel. 061 213113
Tuesday 28th January	Derry – Thornhill College – 11am	<b>Sandra O’Connell</b> sandraoconnell77@hotmail.com Tel. +44 79898 90331
Wednesday 29th January	QUB – 2pm	<b>Wendy Rutherford</b> mp.outreach@qub.ac.uk Tel. +44 2890 973523
Thursday 30th January	DCU – 12noon + 2pm	<b>Emer O’Hara</b> science@dcu.ie Tel. 01 700 8975
Friday 31st January	NUIG – 12noon	<b>Tess Mahoney</b> tess.mahoney@nuigalway.ie Tel. 091 492490

### Admission

**Reservations should be made for all venues and bookings should be made by telephone or e-mail to the contacts listed above. There is no admission charge for this lecture but it is extremely important that tickets are booked for class groups in advance. Cancellations should be made at least 48 hours in advance to facilitate others who may be on waiting lists for tickets.**

**Talk duration** 1 hour

**Audience** 15-18 year olds

### A word about our sponsors

Our thanks to IT Carlow, IT Waterford, University College Cork, University of Limerick, Thornhill College, Queens University Belfast, Dublin City University and the NUI Galway who have assisted the organisers through pre-publicity and provision of venues.

