Department of Physics

Colloquium

Image: *A Antikainen et al. Nonlinearity* ***25*** *R73 (2012)*

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From Rogue Waves to Randomness

day	location	time
MARCH 20, 2013 WEDNESDAY	EE01	16:00

ABSTRACT

A central challenge in understanding extreme events in science is to develop rigorous models linking the complex (often nonlinear) generation dynamics and the associated statistical behavior. Quantitative studies of extreme phenomena, however, can be frequently hampered in two ways: (i) the scarcity of the events under study and (ii) the fact that such events often appear in environments where measurements are difficult. A case of interest concerns the infamous oceanic rogue waves associated with many catastrophic maritime disasters. Studying rogue waves under controlled conditions is problematic, and the phenomenon remains a subject of intensive research. On the other hand, there are many qualitative and quantitative links between wave propagation in optics and in hydrodynamics, and it is thus natural to consider how insights from studying instability phenomena in optics can be applied to other systems. The field of optical rogue wave physics began in 2007 and has since become a major international research effort involving many international groups and consortia. This talk will review the current state of the art in this field and present recent results of both theory and experiments. The potential practical impact and extension of these ideas from optics to other fields will also be reviewed. The talk will be general in nature and appropriate introduction to the wider area of nonlinear dynamics and ocean rogue waves will be provided.

The Physics Colloquia are designed to address a non-specialist, broad audience and introduce topics of contemporary research through lectures by leading experts. We warmly invite all members of the student body, including undergraduates enrolled in any programme.

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