



The Hong Kong University of Science and Technology

Department of Mathematics

Departmental Colloquium

*Twisted X-rays, orbital angular momentum
and the determination of atomic structure*

by

Prof. Richard JAMES

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Abstract

We find exact solutions of Maxwell's equations that are the precise analog of plane waves, but in the case that the translation group is replaced by the Abelian helical group. These waves display constructive/destructive interference with helical atomic structures, in the same way that plane waves interact with crystals. We show how the resulting far-field pattern can be used for structure determination. We test the method by doing theoretical structure determination on the Pf1 virus from the Protein Data Bank. The underlying mathematical idea is that the structure is the orbit of a group which relates to the invariance group of the differential equations (Maxwell's equations, in this case). Joint work with Dominik Juestel and Gero Friesecke, TU Munich.

Date: Wednesday, 23 Aug 2017

Time: 3:00p.m. - 4:00p.m.

***Venue: Room 4504, Academic Building
(near Lifts 25&26), HKUST***

All are welcome!