Introduction

Mathematics and science have developed side-by-side throughout human history. The explosion of scientific knowledge since the Renaissance period (16th century) has been dominated by interaction between new scientific discoveries with mathematical innovations. Many of the great scientists were also good mathematicians, such as Newton, Einstein and Feynman.

Mathematics is essential to many sciences. One important function of mathematics in science is the role it plays in the expression of scientific models. Observing and collecting measurements, as well as hypothesising and predicting, requires mathematical models and extensive use of mathematics.

This project, ***Synchrotron Investigations – connecting science and mathematics*** aims to create connections between mathematics and science using the context of a synchrotron. The Australian Synchrotron, an exciting, cutting-edge research facility has recently been built and opened in Melbourne, Victoria. This project has been developed by Western Australian science and maths teachers in conjunction with research scientists and educationalists at the University of Western Australia.

Science and mathematics have obvious associations, yet there is usually little connection between science and maths departments in Australian schools. This project aims to provide strategies and resources that will enable teachers to connect mathematics and science easily and effectively. The target audience for this resource is high achieving, year 10 high school students. Most of the material will also be very valuable to senior school physics students.

The complete program is ordered in a logical learning sequence and is designed to allow maths and science teachers to select from the stand-alone modules to design a learning program that they feel confident in presenting and that suits student needs.

We encourage collaboration between maths and science teachers in the creation of a joint program that will provide students with a stimulating cross-curricular learning experience. This collaborative process has been shown to be very beneficial to the quality of education in schools. In the past, the problem with collaborative programs has always been time and resource allocation. We have attempted to address this issue by providing easy to use, clear resources that support and encourage cross-curricular projects. We hope this resource is a catalyst for further and future cooperation between departments.