

# IATL Academic Fellowship Interim Report, 28<sup>th</sup> February 2015

## Science, Maths and Music

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### Summary

We are exploring the relationships between music and science/mathematics with a particular focus on development of interdisciplinary teaching at this interface. The project comprises four main activities: (1) Science of Music module development with IATL, (2) a one-day interdisciplinary meeting on the science / music interface, (3) development of live and video-recorded demonstrations to help teach scientific concepts related to sound and music (e.g. waves, frequency, resonance, Doppler effect), and (4) a trial of peer assessment by students to underpin planned peer assessment activities in the Science of Music module.

### Activities

#### *Module Development (Nick Roberts & Gavin Bell)*

We have submitted a revised module proposal to IATL following a meeting 24/02/15. This includes some important practical decisions jointly taken on examination, CATS options and timetabling. We are continuing to refine the syllabus, teaching methods, roles of the Coull Quartet in delivery and teaching spaces to be used. With the help of IATL we plan to liaise with academics from other disciplines (e.g. Psychology, Life Sciences) who might be interested in teaching aspects of the module. Throughout the development of this module, we have liaised with our undergraduate students in Physics principally through PhysSoc – we believe there will be strong demand for the module within Physics. The module web site has been updated with more detailed information on the syllabus and aims: through this and the IATL module fair on 12<sup>th</sup> March we will be able to encourage uptake among students across the University. Our aspiration is to have a balanced cross-disciplinary cohort of students for January 2016.

#### *One Day Meeting (Rudolf Roemer, Roger Coull)*

Dedicated clerical support for this meeting has been arranged in Physics. The target date for the meeting is mid-May. We are engaging with potential external speakers and will meet within the next two weeks to define the scope and speakers more precisely.

#### *Demonstration Development (Rachel Edwards, Oksana Trushkevych, Paul Harrison & John Halpin)*

Demonstrations being developed in this strand of the project aim to explain complex physical concepts in a non-mathematical way that is accessible for students from all disciplines. We are making full use of some excellent demonstrations already developed for Physics outreach activities; moreover, several new visual aids will be developed specifically for the interdisciplinary module. We are working closely with the module curriculum team on this. Nine of the most relevant and exciting demonstrations have been selected for “live” use in the teaching space (e.g. throwing around a

Doppler Effect ball) and/or to prepare video content. These include explaining *waves* using a Rubens tube, visualising *resonance* using tuning forks and Chladni plates, and smashing a wine glass with sound to explore both resonance and energy transfer. Filming of the demonstrations will start 10<sup>th</sup> March using IATL's video equipment.

#### *Peer Assessment Trial (Susan Burrows & Michael Pounds)*

A trial of peer assessment will take place in the summer term (dates to be decided). We discussed extensively within the department what form the peer assessment trial might take and several options were examined. In particular the trial needs to be associated with accessible academic content while also respecting students' privacy and avoiding a burden of extra pressure during assessment. A solution was found by focusing on web-based *group* project work. The trial will consist of individual assessment by 10-20 students of web pages designed by second year student groups (typically 6 students) as part of their 2<sup>nd</sup> year Physics Skills module. These web pages are currently on the Physics Skills module website with restricted viewing permission. After assessing using the same format as the academic assessment, which was completed last term, there will be a group discussion among assessors and academics. A comparison will then be made with the marks and comments from academics given earlier in the year. It is expected that 2<sup>nd</sup> and 3<sup>rd</sup> year M.Phys. students will be invited to take part, up to a maximum of 20. As an incentive the students will be offered £20 in the form of either Amazon vouchers or a Warwick Card top up, to cover a predicted one hour for the assessment and a further one hour for the group discussion. The number of webpages to be assessed is still to be determined; there are currently 21 to choose from.

#### **Communication**

The project group is holding bi-weekly meetings to discuss progress and plan activities. We have made a "developers' corner" web site on the Science of Music module which includes a forum, calendar and areas for the four activities.

[http://www2.warwick.ac.uk/fac/cross\\_fac/iatl/activities/modules/ugmodules/scienceofmusic/developers/](http://www2.warwick.ac.uk/fac/cross_fac/iatl/activities/modules/ugmodules/scienceofmusic/developers/)

This will provide an accessible record of the module development and other activities, and material can easily be ported to the project page. Video content related to the demonstrations and peer assessment trial will be uploaded to the module and project web pages.

#### **Resources**

We are presently spending on staff time for teaching support and direct project activities (Trushkevych & Halpin) and will be purchasing some equipment for demonstration development over the next 4 weeks.