

**University College Cork  
National University of Ireland, Cork**

*Quality Improvement/Quality Assurance*

*Peer Review Group Report*

***DEPARTMENT OF PHYSICS***

(Academic year 2000/2001)

## **Members of the Peer Review Group**

- 1. Professor JR Sodeau, Department of Chemistry, UCC (Chair)**
- 2. Professor LM Brown, Microstructural Physics Group, University of Cambridge, UK.**
- 3. Professor IT McGovern, Department of Physics, Trinity College Dublin**
- 4. Professor DM Clarke, Department of Philosophy, UCC**

## **Timetable**

### **Timetable for conduct of Peer Review Group Site Visit to review the Department of Physics**

#### **Sunday 4 March**

- 18.00 – 19.30 Meeting of members of the Peer Review Group in Kingsley Hotel  
Briefing by Director of Quality Promotion Unit, Dr. N. Ryan.  
Group to agree final work schedule and assignment of tasks for the following 2 days.  
Views exchanged and areas to be clarified or explored identified.
- 20.00 Dinner for members of the Peer Review Group and Head of Department and Departmental Co-ordinating Committee.

#### **Monday 5 March**

- 08.30 – 09.00 Convening of Peer Review Group in Professor J. Sodeau's office, Kane Building
- 09.00 – 13.00 Consideration of Self-Assessment Report and other inputs along with all department staff, including administrative and technical staff. Time will be allowed for private meetings of members of the Peer Review Group with members of staff.  
Venue for the meeting: Room 102. Physics Department, Kane Building.  
Approximate schedule for the session:  
09.00 – 10.00 meeting with staff  
10.00 – 10.30 Professor J. McInerney, Head of Department  
10.30 – 12.00 meeting with staff  
12.00 – 13.00 meetings with individual members of staff  
Coffee/tea provided during the session.
- 13.00 – 14.00 Working lunch
- 14.00 – 14.30 Visit to core facilities of Department
- 14.30 – 15.00 Meeting with Professor A. Moran, Registrar & Vice-President for Academic Affairs
- 15.00 - 17.00 Meetings with representative selections of undergraduate and postgraduate students.  
The Peer Review Group were invited to visit the laboratories and speak to students as they worked.  
Coffee/tea provided
- 17.30 – 18.30 Meeting of Peer Review Group to identify remaining aspects to be clarified and to finalise tasks for the following day
- 19.30 Working private dinner for members for the Peer Review Group in Kingsley Hotel,

#### **Tuesday 6 March**

- 08.30 – 08.45 Convening of Peer Review Group in Professor J. Sodeau's office.
- 08.45 – 09.15 Meeting with Professor B Harvey, Vice-President for Research Policy & Support
- 09.30 – 10.30 Visit to Boole Library – go to Q+2, meet with Ms. Margot Conrick, Head of Information Services and Ms. Una Ni Chonghaile, Subject Librarian  
Note: this was cancelled to allow additional time to meet all members of staff

- 10.30 – 11.00 Visits to facilities such as lecture theatres and Computer Services  
 11.00 – 11.30 Coffee/Tea  
 11.30 – 12.00 Meeting with Professor Patrick Fitzpatrick, Vice-Dean of Science Faculty and M Loughman, Administrative Assistant, Science Faculty  
 12.00 – 13.00 Meeting with Professor McInerney  
 13.00 – 14.00 Working Lunch  
 14.00 – 17.00 Preparation of first draft of final report  
 Coffee/tea provided during the session.  
 17.00 – 17.30 Exit presentation by the Chair of the Peer Review Group, summarising the principal findings of the Peer Review Group in Room 102, Physics Dept., Science Building
- 19.00 Working private dinner in Kingsley Hotel for members of the Peer Review Group to complete drafting of report and finalisation of arrangements for speedy completion and submission of final report.

### **Wednesday 7 March**

Externs departed

### **Interviews**

Professor Aidan Moran	Registrar
Professor Brian Harvey	Vice-President for Research
Professor Pat Fitzpatrick	Vice-Dean, Science Faculty
Mairead Loughman	Administrative Assistant, Science Faculty

### Academic Staff:

Professor John McInerney  
 Dr Patrick McCarthy  
 Professor M Mansfield  
 Professor S Fahy  
 Dr Paul Callanan  
 Dr Guillaume Huyet  
 Professor N Ó Murchadha  
 Dr Tony Deeney  
 Dr Michel Vandyck

### Technicians:

Pat Twomey  
 J Sheehan  
 C Roche

### Administrative Staff:

Margaret Bunce  
 Karmen O'Shea  
 Irene Horne

### Students:

Peter Curran (MSc)  
 James O'Callaghan (PhD)  
 David Prendergast (PhD)

## **PEER REVIEW PROCESS**

### *Methodology*

The Peer Review Group worked as a team at all times. We issued a general invitation to staff members, at our first presentation, to talk to us. All members of the Department who expressed an interest in meeting us were accommodated individually. We also met the Registrar (Professor Aidan Moran), the Vice-President for Research (Professor Brian Harvey), and Professor Pat Fitzpatrick who was deputizing for the Dean of Science in his absence from UCC. A full list of all those interviewed is shown above.

The Peer Review Group visited the undergraduate laboratories and discussed their work with a range of First Science (CK403) students. We also visited the workshop, the laboratories used by the optronics/non-linear science research group, the Advanced Spectroscopy Laboratory, and other laboratories and lecture halls used by the Department.

The Report was drafted in sections by members of the group, and revised collectively by the full Peer Review Group.

### *Self-Assessment Report*

The report appeared to have been prepared hastily. The information provided was difficult to assess. Therefore extra information was requested by the Peer Review Group. The response rate in the academic staff survey was low. The Department was helpful in facilitating the actual visit of the Peer Review Group, and the liaison work undertaken by Dr. Tony Deeney was much appreciated.

## **FINDINGS OF THE PEER REVIEW GROUP (PRG)**

### **Introduction**

The Department of Physics at UCC is very small by international standards. It currently has only seven full-time permanent academic staff and, in addition, two full-time temporary and two part-time temporary/contract lecturers. The financial support it receives from central university sources is inadequate. When considering our assessment, we took these realities into account, and were also aware of the hiatus which occurred prior to the appointment of Professor John McInerney to the chair of Physics. Our comments and recommendations should be seen against this general background.

### **Department Organisation and Planning**

1. *Communication:* The Department needs a more effective system of communicating information and decisions to all relevant people, staff and students. For example there was uncertainty about who was invited to the initial presentation by the Peer Review Group, which led to a late start for this critical meeting.
2. *Department Committee:* One way of improving communication, and of recognising the contributions of different categories of staff to realizing the objectives of the Department, would be to establish a Departmental Committee. This Committee should include academic staff, research staff, administrative staff, technicians, and representatives of both undergraduate and postgraduate students. The primary objectives of such a

committee would be: to provide a means for maximum consultation about new initiatives in the Department, and to share all relevant information [including financial] with the various categories of staff and student who work/study in the Department of Physics.

3. *Headship of the Department of Physics:* It is widely acknowledged that the burdens of headship of a laboratory department such as Physics are so onerous that it is very difficult for any individual to lecture, research, and administer a department for more than a limited number of years. We support the suggestion from the Professor of Physics that, with his agreement, his statute be modified in line with recent statutes which allow for the appointment of a Head of Department, other than the professor, after an initial period of five years.

### **Teaching and Learning**

1. The Peer Review Group find that the major missions of the Department of Physics to educate, train and develop students to the highest international standards is achieved for their Honours students. In particular, we find that students with an Honours degree in Physics find employment or go on to higher degree programs both in Ireland and abroad, that their numbers have substantially increased, and that they enjoy an education of the highest quality at UCC, partly because of excellent contact with all members of the teaching staff. The department provides outstanding laboratory and project work, where innovative experiments with more computer control and data logging have had a beneficial effect.

2. The Peer Review Group find that the above has been achieved despite rather crowded conditions in practical classes, and rather old-fashioned lecture halls. A continuing problem is the library provision of text books, which need more financial support.

3. We find also that postgraduate supervision is excellent, and much appreciated by graduate students. It is noteworthy that there has been a year-on-year increase in the number of graduate students, to the point where there must now be some danger of staff overload, leading to lengthening times of completion of PhDs and MScs. We note that routine provision of short courses in workshop practice and core advanced material might enhance the efficiency and quality of the teaching.

4. The department seems on the whole to be less successful in its provision of service teaching. Like physics departments worldwide, the provision of basic physics to students who will not become professional physicists is problematic. The observed reduction in student numbers from other science programs is, in part, compensated by the increase in Honours students. However the department also requires, both for its intellectual vitality and its academic viability, to make physics an attractive foundation subject for students in environmental sciences, earth sciences, electrical engineering, nursing, and food science. This is by far the most challenging task facing any teaching department and must be done without sacrificing the quality of analysis physicists can bring to bear upon problems. At the same time teachers should not insist upon a full exposure to traditional first-year physics for this cohort.

5. When “service” students are examined, it must be borne in mind that a failure in a subject, seen by students as peripheral to their main interests, can lead to overall failure in the student's degree program. A student should be able *to pass* an examination in physics simply

by demonstrating exposure to the lectures, but of course should not be able to achieve a high mark *except by* demonstrating the ability to solve elementary quantitative problems in relevant areas of physics. The Department should consider making more effective use of the modular degree structure and involve a larger number of teaching staff to provide flexible teaching, which is tailored to the specific needs of students in PY1003, PY1004, PY1005 *etc* (*i.e.* students participating in service-teaching courses).

6. The Peer Review Group find the new degree in Astrophysics to be an exciting prospect, which may well lead to further substantial increases in numbers of Honours students, as well as enhancing the research effort in this area. In our view, it also requires another lecturer in astrophysics. Further initiatives in Engineering Physics are to be welcomed. The 'single point of entry' reform, whereby students will be committed to physics or astrophysics from year one, must be carefully watched to see if the expected increase in student numbers materializes. Attention should be paid to appropriate marketing of the new course.

### **Research and Scholarly Activity**

1. Research activity is of an internationally recognized level, as judged by publication in peer-review journals. Scholarly activity includes the production of no fewer than 4 books over the relevant interval assessed by the Peer Review Group. This activity is achieved despite relatively modest external income from Enterprise Ireland and the European Commission. PhD students are of the highest caliber. The Peer Review Group believes that continued success will require increased research income. Attention should be paid to possible industrial sources.
2. While most staff are research-active, there is a significant variation among the staff. Graduate numbers are probably at saturation but there is imbalance in supervisory loading. In particular the administrative burden of headship is currently combined with the highest research activity.
3. The spectrum of research activity is more appropriate to a larger department. This is an understandable consequence of the policy of 'best person' appointment. It may be necessary to review this policy if 'critical mass' in chosen areas is to be achieved.
4. Fragmentation of research is offset by good instances of inter-department and inter-faculty collaborations, including the NMRC. These collaborations will become increasingly important. Furthermore the NMRC uptake of Physics graduates should offer special opportunities for collaboration. However, the distinctively different missions of an academic department and the NMRC need to be recognized by both institutions in such collaborations. A formal strategic alliance with CIT in the area of Astrophysics (teaching and research) should be encouraged.
5. Finally the recent and dramatic improvements in Irish research funding present additional opportunities. Participation by Physics in the current round of PRTL applications is to be welcomed. Equally, there should be significant new opportunities arising from Science Foundation Ireland. Physics, both in its research staff and in its graduates, is well positioned to benefit.

## **Staff Development**

1. *Contract Staff:* The number of academic staff with limited-term contracts is too high. This arrangement discourages such staff from undertaking long-term research projects in the Department.
2. *Technicians:* The Department of Human Resources should address immediately the implementation of the “Working Team” report on technicians at UCC which was completed in March 1998. The Department of Physics values highly the work of the technicians. There does not appear to be unanimity of opinion about the ideal reporting relations for technicians within the Department. This is an issue that should be addressed in the near future, but its resolution depends, in part, on the response of the college to the report mentioned above.
3. *Administrative Staff:* We recommend an explicit reporting relationship between the Administrative Assistant and the other administrative staff, with a more specific delegation of duties to each individual.
4. *Staff Reviews:* We recommend that the work and responsibilities of each member of the Department of Physics be reviewed annually, so that their contribution can be acknowledged and any relevant changes in their duties can be explicitly discussed.

## **Support Services**

1. The parking provision for staff and the increasing numbers of graduate students is inadequate.
2. The science building communal areas look shabby and dated. They require refurbishment. The toilet facilities are inadequate in numbers and standard.

## **OVERALL ANALYSIS**

We affirm the fundamental importance of a synergy between teaching and research in university departments. Although aspects of UCC research strategy are directed toward the development of research-only institutes, it must beware the danger of draining human resources from university departments, which cannot fairly compete due to their fundamentally different missions.

## RECOMMENDATIONS

We recommend:

- Improvement in communications within the department.
- The establishment of truly functioning Graduate Studies and Staff-Student Committees.
- The establishment of a representative departmental committee.
- A system of rotating headship.
- Annual staff reviews.
- Improvement in laboratory and building infrastructure.
- An in-depth review of service teaching in consultation with the relevant departments.
- That one of the vacant lectureships in the department should be designated specifically for astrophysics.
- The formation of research and teaching Strategic Alliances between the Department of Physics with the NMRC, CIT and the Department of Electrical Engineering.
- That the UCC central management addresses the ongoing issues of employment conditions and promotion prospects for technicians.