



order should ask his bank to correct it. This can always be done without extra cost to either the member or the Society.

I do not wish to discourage members who can do so from paying their subscription fees by means of a standing order; most standing orders are correctly processed and each such one lowers the cost of collecting subscriptions and helps the Society's cash flow. But I do ask any member using a standing order to be careful.

Any member who wants to complete a new standing order to pay his subscription fees should ask me to send him the appropriate form.

David Tipple, Hon. Treasurer

Minutes of Meetings of the Irish Mathematical Society

Ordinary Meeting

20 December 1991

The Irish Mathematical Society held an Ordinary Meeting at 12.15 pm on Friday 20th December 1991 in the DIAS, 10 Burlington Road.

Fifteen members were present. The President, R. Timoney, was in the chair.

1. The minutes of the meeting of 28th March 1991 were approved and signed.
2. **Matters arising:** D. O'Donovan's survey of TCD graduates has been published in the Bulletin. R. Timoney urged other institutions to conduct a similar survey.
3. **President's Report:** The main activities for the year were
 - **European Mathematical Society.** The IMS became an institutional member of the EMS this year and IMS members were offered the opportunity of becoming individual members. Only 11 availed of this opportunity, but I hope more will do so for 1992.

The EMS has produced two issues of its Newsletter (plans are to produce it quarterly from now on) and the most recent issue contained an article on the IMS written by me.

Plans for the European Congress (to be held in Paris on July 6-10, 1992) are advanced and consideration of the location for 1996 has begun.

Brendan Goldsmith is our representative for EMS affairs and he has been dealing with things with his usual enthusiasm and efficiency. He is also "Irish correspondent" for the EMS Bulletin and would welcome items for inclusion (his email address is bgoldsmith@dit.ie). He would also



- welcome subscriptions for EMS individual membership in 1992 (cheques for £11 payable to the IMS).
- **RIA.** Brendan Goldsmith has been extremely attentive as IMS representative on the National Committee for Mathematics and he has just been nominated for a further 4 years.
 - **Points for Leaving Cert Maths.** This issue was debated at length at the Christmas 1990 and Easter 1991 Ordinary Meeting.
 - **September Meeting.** The 1991 meeting was successfully organized at UCG by Ray Ryan and Graham Ellis. The 1992 meeting will be the first at an RTC — Waterford.
 - **Bulletin.** Thanks to the efforts of Fergus Gaines, two issues of the Bulletin have been issued in 1991. Unfortunately we have not really succeeded in making significant progress in catching up on the schedule. This must be a priority for 1992. The Committee is trying to install mechanisms which will enable the technical printing side of producing the Bulletin to be separated from the editor's domain. The new editor is James Ward of UCG, but he will be getting significant help from Rex Dark in the short term.
4. **September Meeting:** The next annual mathematical meeting of the Society will be held in Waterford RTC on Thursday 3rd and Friday 4th September 1992. The Organizers, P. Barry and B. McCann, would welcome suggestions for speakers. It is envisaged that the meeting will have a slightly applied bent.
5. **European Mathematical Society:**
- a) At the 1992 Paris Congress there will be a round-table discussion on mathematical collaboration with developing countries. B. Goldsmith would like details of any such Irish collaboration.
 - b) There will also be round-table discussions on: (i) exchange of students and harmonization; (ii) women mathematicians.
 - c) R. Timoney announced the results of a survey he carried



out for the round-table discussion on women. Only 5% of the permanent mathematical staff of Irish universities are women. None of the nine full professors are women. Last year two women and one man were awarded PhD's. About 30% of honours mathematics students are women. No shift in the proportion of women mathematics students has been detected.

6. **Rule change:** A motion to change the rules of the Society regarding the financial year was deferred to the Easter meeting. This is to allow members three months notice of the proposed change.

7. **Elections:** The following were elected, unopposed, to the committee

(* denotes re-election):

Committee member	Proposer	Seconder
G. Ellis* (Secretary)	R. O. Watson	T. Laffey
E. Gath	G. Ellis	T. Laffey
D. Hurley	M. Ó Searcóid	R. Timoney
P. Mellon	B. Goldsmith	A. O'Farrell
C. Nash	A. O'Farrell	D. Simms
D. Tipple* (Treasurer)	M. Ó Searcóid	S. Dineen

The following have one more year of office:

R. Timoney (President), B. Goldsmith (Vice-President),
F. Gaines, F. Holland, B. McCann, M. Ó Searcóid.

The following have left the committee:

G. Enright, A. O'Farrell, D. Simms, R. O. Watson.

8. **AOB:**

- a) R. Timoney urged individual members of the Society to support a campaign about human rights in South Africa.
- b) S. Smale will talk to TCD Mathematics Society at 8 pm on 13th January in Room 2041b of the TCD Arts Block.
- c) The deadline for applications for Eolas funding of basic research is 31st January 1992. It was felt that the amount of money awarded to any discipline is proportional to the number of applications for research in that discipline.
- d) Members are urged to write/solicit articles for the Bulletin. Articles should preferably be in TEX.



There is to be a Research Announcement section in the Bulletin, along the lines of that in the Bulletin of the AMS. Research announcements must be backed up by a preprint. R. Dark will act as editor of the Bulletin until October 1992.

M. Ó Searcóid has agreed to help with the typesetting.

Graham Ellis,
University College,
Galway.

Partially Ordered Groups

Gerard J. Murphy

1. Introduction

Ordered algebraic structures, such as ordered fields and ordered vector spaces, have long been studied in mathematics, both for their own intrinsic interest, and for their applications. In recent years partially ordered groups have become important in connection with the theory of operator algebras, particularly C^* -algebras. The most important way in which a connection is manifested is by means of K -theory. For example, if A is an AF-algebra, then $K_0(A)$ is a partially ordered group, and this group can be used to analyse and classify A . We discuss this in Section 3. In another direction, if a partially ordered group is given, one can associate to it a certain universal C^* -algebra. In the good cases, this algebra turns out to be the C^* -algebra generated by the Toeplitz operators with continuous symbols on the dual group. The theory of these algebras and operators has been developed by the author and by others, and we discuss some of its aspects both in the following section and in Section 3.

A *partially ordered group* is a pair (G, \leq) consisting of a discrete abelian group G , and a partial order \leq on G which is translation-invariant, that is, if $x \leq y$, then $x + z \leq y + z$ ($x, y, z \in G$), and the positive cone $G^+ = \{x \in G \mid 0 \leq x\}$ generates G (that is, $G = G^+ - G^+$).

Although this definition is a purely algebraic one, we observe that the theory of partially ordered groups has been strongly influenced by functional analysis—specifically, by the theory of partially ordered vector spaces. Also, as indicated above, the applications to operator algebras have largely determined the direction of recent research in this area.