

# Groups St Andrews conferences

Colin M Campbell, University of St Andrews, Scotland



The Old Course, St Andrews

## 1. Introduction to Groups St Andrews conferences

Both Edmund Robertson and I had been involved with the St Andrews Colloquium of the Edinburgh Mathematical Society in the nineteen-seventies. This was a conference held every four years in St Andrews which was, and is, an excellent holiday town at the seaside with two large beaches, the East Sands and the West Sands and also the world-famous Old Course for golf. The Old Course is one of seven golf courses administered by the St Andrews Links Trust. The format for the EMS St Andrews Colloquia was three or four main speakers each giving an instructional series in the morning of about four lectures on a variety of mathematical topics, a time for holiday activities in the afternoon and an

evening social programme (for more details see [2]). I was involved in the Colloquium from 1968 onwards and later was on the EMS St Andrews Colloquium Committee. In 1980 I was the Colloquium Secretary. For the 1972 Colloquium Edmund Robertson and I produced a booklet on 'Walks in St Andrews and Tours from St Andrews'. This, our first joint activity, led over the years to many mathematical discussions, mathematical arguments but also mathematical research output. We were able to work as a team.

In 1979 Edmund Robertson was visited by his friend and colleague Ian Macdonald and a small group theory meeting was arranged in St Andrews so that we could attend a series of lectures by Joachim Neubüser from RWTH Aachen. After discussion with Joachim a further larger meeting was proposed. 1980 was, as I noted above, the year of a St Andrews Colloquium but we decided to organise a one-week group theory meeting for 1981. We initially invited as main speakers Joachim Neubüser, Sean Tobin and Jim Wiegold, the latter two knowing each other from their time as research students at the Victoria University of Manchester. When it became apparent that a larger than expected meeting was likely to take place, a fourth speaker was added to the list. He was Derek Robinson. Derek was a graduate of St Andrews and, like Ian Macdonald, had been brought up in Montrose, a fishing village on the east coast of Scotland. The 1981 meeting was the first of a series of Groups St Andrews meetings that have taken place every four years since then.

Our main speakers for the 1981 conference were: Joachim Neubüser (Aachen), Derek J S Robinson (Urbana, Champaign), Sean Tobin (Galway) and Jim Wiegold (Cardiff).

The topics of the four series of lectures were:

Neubüser: *An elementary introduction to coset table methods in computational group theory*

Robinson: *Applications of cohomology to the theory of groups*

Tobin: *Groups with exponent four*

Wiegold: *The Schur multiplier: an elementary approach*

In MathSciNet the citations for articles 1, 2 and 4 are 24, 23 and 26. Sean Tobin was of course one of the great organisers and supporters of Groups in Galway and he was also highly involved in Groups St Andrews 1993 in Galway.

The Groups St Andrews meetings have been held in several venues.

St Andrews Groups St Andrews 1981  
St Andrews Groups St Andrews 1985  
St Andrews Groups St Andrews 1989  
Galway Groups St Andrews 1993  
Bath Groups St Andrews 1997  
Oxford Groups St Andrews 2001  
St Andrews Groups St Andrews 2005  
Bath Groups St Andrews 2009  
St Andrews Groups St Andrews 2013  
Birmingham Groups St Andrews 2017

We provide brief details of the main speakers and participants at the Groups St Andrews conferences.

1981 main speakers:	Germany, Ireland, U.S.A., Wales	
1985 main speakers:	England (2), France, U.S.A. (2)	366 from 43 countries
1989 main speakers:	Canada, England (2), Germany, U.S.S.R.	293 from 37 countries
1993 main speakers:	England, France, Germany, Israel, U.S.A. (2)	285 from 35 countries
1997 main speakers:	Australia, England (2), Israel, U.S.A.	299 from 41 countries
2001 main speakers:	England (2), Hungary, New Zealand, U.S.A.	230 from 35 countries
2005 main speakers:	England, U.S.A. (3)	230 from 37 countries
2009 main speakers:	England, Germany, New Zealand, U.S.A. (2)	about 200
2013 main speakers:	England, France, U.S.A. (2)	just under 200
2017 main speakers:	Belgium, England, Germany, U.S.A.	just over 200

**Note** that in 1989 we had five main speakers because we were very far from certain that Ol'shanskii from the U.S.S.R. would be able to visit St Andrews. Our Principal at St Andrews and the Rector of Moscow State University worked hard to make the visit possible, the visit taking place at a time of heightened tension between the Soviet Union and the U.K. I still vividly remember taking Ol'shanskii to Edinburgh Airport and his emotion on leaving the 'free world'. How times have changed (or have they?).

## 2. Publications

From the Groups St Andrews conferences we have a series of conference Proceedings published by Cambridge University [4]. We list the number of articles by main speakers and other participants.

Year	Main speaker articles	Other survey and research articles
1981	4	19
1985	5	32
1989	5	29
1993	6	40
1997	5	52
2001	5	42
2005	4	52
2009	5	32
2013	4	26
2017	3	22

## 3. Gender Distribution

In this section we consider the gender distribution. We consider the gender balance of the main speakers and also the gender balance of the authors of the other survey and research articles that form a major part of the Proceedings.

Year	Main speakers		Other survey and research article contributors	
	M/F	Total	M/F	Total
1981	4/0	4	26/1	27
1985	5/0	5	41/2	43
1989	5/0	5	41/2	43
1993	6/0	6	61/4	65
1997	4/1	5	72/8	80
2001	5/0	5	72/11	83
2005	4/0	4	86/13	99
2009	5/0	5	59/10	69
2013	3/1	4	39/11	50
2017	3/1	4	30/5	35

#### 4. Form and role of the conferences

Groups St Andrews is at least a week in length. Although advertised in 1981 as lasting a week, some participants having paid large air fares wished to stay for some days in the second week. This started the tradition of having a two-week conference only shortened in 2005 to an eight day conference because of changing attitudes to the length of a conference.

Groups St Andrews has a variety of talks. At each conference there has been four or five main lecturers each giving a course of three to five lectures. Traditionally these take place in the first week of the conference.

At recent conferences there have also been a certain number of invited speakers each giving a one-hour talk. All participants are invite to speak if they wish so the conferences now have several parallel sessions of seminars.

Additionally there have been special **theme days**:

**1997** Burnside Day, Lyndon Day

**2001** Gorenstein Day

**2009** Engel groups Day, John Cannon and Derek Holt Birthdays.

B H Neumann Day



The four participants at each of the first ten Groups St Andrews conferences

## 5. The mathematics of the conferences

As regards the topics for the **Groups St Andrews conferences**, we were initially very much influenced by the topics chosen by the four main speakers each talking on their specialism: computational group theory, groups with exponent four, the Schur multiplier and applications of cohomology to the theory of groups. We had deliberately stayed clear of the classification problem for finite simple groups. In due course that would change. We invited John Thompson of the classification of finite simple groups fame to speak at the 1989 conference. Reasonably enough he decided to talk on his current research interest 'Galois groups'. Apart from local input we always asked for suggestions and advice for the next conference from the main speakers at the previous conference.

Topics for the main speakers at the 2017 conference were 'Finite simple groups and fusion systems' by Michael Aschbacher, 'Locally compact groups beyond Lie theory' by Pierre-Emmanuel Caprace, 'On characters and  $p$ -blocks of finite simple groups' by Radha Kessar and 'Local-global conjectures' by Gunter Malle. Topics for invited one-hour speakers were 'Simple groups, generation and probabilistic methods', 'Irreducible subgroups of classical groups and related topics', 'Boundaries for  $Out(F_n)$ ', 'On  $l^2$ -Betti numbers and their analogues in positive characteristic' and 'The diameter of the symmetric group: ideas and tools'.

## 6. Groups tourism

The phrase has been coined 'groups tourism'. What have been the tourist delights at these conferences?



St Andrews Links

As regards '**Groups St Andrews**' tourism we wrote about it in the introduction to the re-issue of Groups St Andrews 1981 which commented on twenty-five years of Groups St Andrews conferences. There we noted that the conference had taken us to a variety of interesting and scenic venues in Scotland, Ireland, England and Wales. Bus trips have included Kellie Castle, Loch Earn and Loch Tay, Falkland Palace and Hill of Tarvit, Crathes Castle and Deeside, Loch Katrine and the Trossachs, House of Dun, Connemara and Kylemore abbey, the Burren and the Cliffs of Moher, Tintern Abbey and the Welsh Valleys, the Roman Baths in Bath, Salisbury Cathedral, the Rufus Stone and the New Forest, Stonehenge, Wells Cathedral and the Cheddar Gorge, Blenheim Palace, Glamis Castle. We have been on boats on Loch Katrine, the Thames, and Galway Bay to the Aran Islands. To this list the 2009 Bath conference has added the Stourhead Gardens and Wells and the Birmingham conference has added Warwick Castle and Stratford-upon-Avon.

In addition to 'groups tourism' each of the conferences had a conference dinner.

In 1997 in Bath the conference dinner was held in the historic Bath Assembly Rooms.

We often had a wine reception. Other social events at Groups St Andrews have included music evenings, Scottish country dance evenings, whisky tasting and a visit to Bath races.



Worcester & Birmingham canal at Birmingham university



Warwick Castle

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