

COMBINATORICS

(Volume 6 (1984) Number 2 (July))

pp. 10-19

Combinatorics is the newsletter of the Combinatorial Mathematics Society of Australasia, and is published by the Society. The annual subscription rate for individual non-members and institutions is \$4 (AUST). During 1984 all enquiries should be directed to the CMSA, C/- Professor Cheryl Praeger, Department of Mathematics, University of Western Australia, Nedlands, W.A. 6009, Australia.

1984 SUBSCRIPTIONS ARE NOW DUE!!!

1. The Twelfth Australasian Conference on Combinatorial Mathematics and Computing (XII ACCMC) will be held from

13-17 August 1984

at the University of Western Australia, Perth.

(i) Invited Speakers

Adriano Barlotti (Florence, Italy)
 Paul Erdős (Hungary)
 Chris Godsil (Simon Fraser U, Canada)
 Brendan McKay (ANU)
 Norm Pullman, (Queens, Canada)
 Anne Street (Queensland)

will give one hour addresses. Professor Younger of Waterloo may also give an invited lecture.

(ii) Participants and Proceedings

In addition the following people have indicated that they will attend the conference by completing a registration form; those marked with an * have indicated that they will contribute a 25 minute talk.

- * Professor J.V. Abrham, University of Toronto
- * Dr D.R. Breach, University of Canterbury
- Dr L. Caccetta, Western Australian Institute of Technology
- * Dr L.R.A. Casse, University of Adelaide
- Professor C.J. Colbourne, University of Waterloo
- * Mr E.P. Dawson, Brisbane
- Dr T.J. Dickson, University of Western Australia
- * Dr A. Gardiner, University of Birmingham
- Mr T. Gilham, Perth
- * Dr D.G. Glynn, University of Adelaide
- * Dr D.A. Holton, University of Melbourne
- Professor A. Jaeger, Ruhr University
- Dr Carole LaCampagne, University of Newcastle
- * Dr K.R. McAvaney, Deakin University
- Professor B.H. Neumann, Australian National University
- * Ms C.M. O'Keefe, University of Adelaide
- Mr M.G. Oxenham, University of Adelaide
- * Professor C.E. Praeger, University of Western Australia
- * Dr D.F. Robinson, University of Canterbury
- Mr G. Royle, University of Western Australia
- * Mr D.G. Sarvate, University of Sydney
- * Dr P. Schultz, University of Western Australia
- * Dr J. Seberry, University of Sydney
- * Professor J.L. Selfridge, University of Newcastle
- * Professor M.K. Siu, University of Hong Kong
- Dr D.J. Street, Waite Agricultural Research Institute
- Dr R.P. Sullivan, University of Western Australia
- * Mrs M. Sved, University of Adelaide
- * Mrs E. Szekeres, University of New South Wales
- * Professor G. Szekeres, University of New South Wales
- Dr K. Vijayan, University of Western Australia
- Dr R. Eggleton, University of Newcastle
- Ms T. Galliguez, University of Newcastle

If you wish to come and have not contacted us yet, especially if you wish to give a talk, please let us know as soon as possible by sending in the Registration Form at the back of this newsletter, or by phoning

Cheryl Praeger (09) 380.3344.

We remind those who wish to publish a paper in the proceedings of the Conference that either they may bring their manuscript and submit it at the conference or they may send it by 30th September 1984 to

The Editor, Ars Combinatoria,
Department of Computer Science,
University of Manitoba,
Winnipeg, Manitoba,
Canada, R3T 2N2.

These manuscripts should be typed on the special paper which has been sent to all those who indicated that they would give a talk. If you need some of this paper and a sheet of instructions please write to

Dr P. Schultz,
Secretary, CMSA,
Department of Mathematics,
University of Western Australia,
Nedlands, W.A. 6009,

stating how many pages you need. Any manuscripts typed according to the instructions given in Combinatorics 6, p.3, or in the Conference Announcement will be acceptable. (The typed area will be mounted on the special paper.)

(iii) Registration, programme details

- (a) On Sunday 12th August, from 8 p.m. onwards, there will be a wine and cheese party in Currie Hall (where most participants will be staying) at which participants may register and collect their Conference folder.
- (b) The first lecture on Monday 13th August will be at 10 a.m. in Engineering Lecture Room 1; participants may also register from 9 a.m. in Mathematics Lecture Room 3 in the Mathematics Building where coffee will be available.
- (c) WE WILL TRY TO MEET INCOMING FLIGHTS. PLEASE SEND US YOUR FLIGHT DATE AND NUMBER WHEN AVAILABLE. (The taxi fare from the airport to Currie Hall is around A\$10-12. We are investigating the hire of a minibus from Currie Hall to the airport on Friday afternoon August 17 at a cost per person of ~ A\$5.)

- (iv) Accommodation will be available in Currie Hall at a cost of A\$21 per night for bed and breakfast. A deposit of A\$25 is needed by July 1st or as soon as possible thereafter to secure a room.

2. Matters for discussion at the Annual General Meeting

(i) Aus MS Affiliation

As instructed by the last AGM I have approached the Australian Mathematical Society (Aus MS) about the possibility of a formal link between them and the CMSA. At their recent Council meeting in May the Aus MS Council decided to recommend that the Aus MS Constitution be changed to allow the formation of Special Interest Groups of the Society (along the lines of a special interest group in Computational Mathematics currently being formed within the Division of Applied Mathematics). It would not be necessary for CMSA members to be members of the Aus MS, but for example the Aus MS would like to have a contact person/groups of people (an "Executive Committee"?) within the CMSA with whom it could communicate formally. I am in the process of preparing a document for discussion at the AGM which could be refined into "Rules of Procedure" of a Special Interest Group if we wish to move ahead on this possibility. It is up to us now to make some kind of definite approach to the Aus MS about this. Unless I received many objections I would like to invite the Aus MS Secretary (who lives in Perth) to attend part of the AGM to introduce the idea of a Special Interest Group and to answer questions.

(ii) Publication of Conference Proceedings within Australasia

I have some information to add to the matter of Australasian publication of our Conference proceedings. It would not be possible to publish the proceedings as a special volume of either the Journal or the Bulletin of the Australian Mathematical Society at present. However it might be possible to publish them as part of the new Lecture Note Series of the Australian Mathematical Society. Their rules at present might or might not be acceptable to us, namely they request an independent refereeing procedure (to meet the requirements of Cambridge University Press who do the printing) - so our papers would perhaps have to be refereed twice. This need not add to the publication time; both referees could have the papers at the same time. Alternatively the whole refereeing process could be in the hands of the Editor of the Series. I hope that this and any other possible "Australasian Alternatives" can be discussed at the AGM. (I have had both positive and negative reactions to this suggestion so far.)

3. Honours for Members

- (i) Ralph Stanton has been awarded a Killam Research Fellowship which gives his University a salary replacement for Ralph for two years, and means that Ralph can devote his entire time to research for two years. The award is rather prestigious as only about a dozen are awarded each year and these are distributed over all disciplines.
- (ii) A.R. Thompson, Department of Mathematics, University of Canterbury, was awarded second prize in the Burroughs/NZ Math. Soc. competition for pre-doctoral theses for his M.Sc. thesis on reducible $2-(11,5,4)$ and $3-(12,6,4)$ designs.

4. Other conferences

- (a) The Fifth International Congress on Mathematical Education (ICME 5) will be held in Adelaide, 24-30 August, 1984 - that is "just" after XII ACCMC. It is organised on behalf of the International Commission on Mathematical Instruction through the Australian Subcommittee and the Australian Academy of Science. The congress address is ICME 5, GPO Box 1729, Adelaide, SA, 5001, Australia.
- (b) The next Summer Research Institute of the Australian Mathematical Society will be held at the University of Auckland in January 1985.
- (c) The First International Conference on Fibonacci Numbers and their Application will be held at the University of Patras, Greece, 27-31 August 1984. It is sponsored by the Fibonacci Association and the University of Patras. For further information contact Professor G.E. Bergum, Editor, Fibonacci Quarterly, Department of Mathematics, South Dakota State University, Box 2220, Brookings SD 57007-1297, USA, or Professor A.N. Philippou, Department of Mathematics, University of Patras, Patras, Greece.

5. Recent thesis

B.P. Smetaniuk (Ph.D. 1984, University of Sydney)
 Title: Topics in the theory of latin squares.
 Supervision: Jennie Seberry.

6. Recent Papers/Preprints

(i) Jennie Seberry

1. On orthogonal matrices with constant diagonal (with Clement Lam). J. Linear Algebra and Applications. 46 (1982), 117.
2. The skew-weighting matrix conjecture, University of Indore Research J. Science 7 (1982), 1-7.
3. Regular group divisible designs with $\lambda_1 = 0$
J. Statistical Planning and Inference
(to appear).
4. A new construction for conference matrices (with A.L. Whiteman). Ars Combinatoria
(to appear).
5. Generalized Bhaskar Rao designs (with Clement Lam) J. Statistical Planning and Inference
(to appear).
6. The directed packing numbers $DD(t, v, v)$,
 $t \geq 4$ (with J.E. Dawson and D.B. Skillicorn)
Combinatorica (to appear).
7. Generalized Bhaskar Rao designs with block size three J. Statistical Planning and Inference
(to appear).
8. On Bhaskar Rao designs of block size four,
(with Warwick de Launey) Proceedings of the Calcutta Conference on Combinatorics and its applications (to appear).
9. Maximal Ternary codes and Plotkin's bound
(with Conrad Mackenzie) Ars Combinatoria
(to appear).
10. Generalized Bhaskar Rao designs with block size four (with Warwick de Launey) Congressus Numerantium 40 (1984) (to appear).
11. Computer construction of GBRDSDS (with T. Mark Ellison) (submitted).

(ii) Janet Hoskins

1. Binary interlacement arrays and structural cross-sections, Cong. Num. 40 (1983), 63-76.
2. A faster algorithm for factoring binary matrices, Ara. Comb. 16-B (1983), 341-350.
3. Multi-layered cloths: a Structural approach, Ara Textrina 1 (1983), 137-158.

7. Soddy goes to Limerick, or the kiss precise revisited, by Richard K. Guy, (p)reprinted from the American Mathematical Monthly 1984. Here is Paul Halmos's arrangement of Richard's limerick.

If the pairs of four circles each touch
Then their curvatures' values are such
That their products in pairs
When compared with their squares
Have a total that's just half as much.

Quoting from the AMM: Two other poetic statements of the same result are in the literature. The author of the first is Soddy, who gave it the title "The kiss precise"; the author of the second is Ray Bobo, this Monthly 87 (1980), 715. Bobo accompanied his version by the following note.

"Frederick Soddy (1877-1956) won the 1921 Nobel Prize for Chemistry for his conceptualization of isotopes. His mathematical verses appear in volumes 137 and 138 of Nature and are discussed by Soddy and others in volume 139. By the way, the radial reciprocals of $n + 2$ mutually touching n -spheres have the property that the square of their sum is n times the sum of their squares. The result on four circles was known to Descartes in 1643."

The n -dimensional generalization is due to H.S.M. Coxeter, Loxodromic sequences of tangent spheres, Aequationes Math. 1 (1968) 104-121.

8. I compiled this list of invited speakers to our conferences and thought it might be of some (historical?) interest:

			Overseas	Australasian
1972	I	Newcastle		M W Bunder W B Hall D A Holton A P Street W D Wallis
1973	II	Melbourne	D G Higman	
1974	III	Brisbane	R C Mullin H Shank R G Stanton W T Tutte	
1975	IV	Adelaide	L J Cummings D A Preece	J Seberry
1976	V	Melbourne	W Imrich	R W Robinson

			Overseas	Australasian
1977	Inter-national	Canberra	J A Bondy P Erdős M Hall Jr. H Hanani F Harary D Hughes R C Mullin S Vanstone T V Narayana J N Srivastava R G Stanton M E Watkins	
1978	VI	Armidale	G Andrews R G Stanton	R B Eggleton D Holton S OatesMacDonald D Row
1979	VII	Newcastle	R Mullin R G Stanton S Vanstone	
1980	VIII	Geelong	B R Alspach C C Chen R L Graham J S Hwang R C Read J J Seidel J Sheehan R G Stanton	P J Lorimer
1981	IX	Brisbane	P J Cameron A Gardiner W L Kocay R Mathon U S R Murty V Pless R G Stanton	D Breach C E Praeger
1982	X	Adelaide	C C Chen J W P Hirschfeld A D Keedwell C Lindner N J Pulman D Stinson J A Thas	D A Holton
1983	XI	Christchurch	J Abraham B R Alspach K Heinrich C Thomassen R G Stanton	R Bennett E Billington

9. Finally we have, courtesy of U. Canterbury, a mathematicians calendar, which helps me to believe that preparations for the conference will be completed with no fuss or panic.

NEWSLETTER DEADLINES

Items for inclusion in the *Newsletter* should be sent to the Editor to arrive before the first day of the month prior to publication. To help you meet these deadlines a special Calendar is printed below. This has been developed to handle jobs which are wanted for yesterday. Notice that dates run backwards so that, for example, work started on the 7th could be completed by the 2nd. The 13th is omitted for superstitious reasons. As most deadlines are on

Fridays there are three Fridays per week in this Calendar. A few days have been added to the end of the month to ensure that the first day of the month deadline is reached, even though there is no first of the month. Unpopular Mondays have been abolished. As Mathematicians overtime has never been recognized, Saturdays and Sundays no longer exist. Each week also includes a special, day-- THMDAY—a Theorem day.

Calendar

Fri	Fri	Fri	Thm	Thu	Wed	Tue
8	7	6	5	4	3	2
15	14		12	11	10	9
22	21	20	19	18	17	16
29	28	27	26	25	24	23
36	35	34	33	32	31	30

See you in August.

Cheryl Praeger

REGISTRATION FORM

Please complete and return to:-

Professor C.E. Praeger
 Director, XII ACCMC
 Department of Mathematics
 University of Western Australia
 Nedlands Australia 6009

Name:
 BLOCK LETTERS Title Initials Surname

Name for Conference name tag:

Address:

..... Phone:

(Please tick or leave blank the following boxes
 as appropriate)

I expect to attend the XII ACCMC

I wish to contribute a paper

Title:

My abstract will reach you by July 16th

I enclose an abstract (for the Secretary)

I am willing to chair a session

I will require accommodation at Currie Hall for
 persons from Sunday evening to Friday morning

Other

Special requirements:

I wish to attend the Conference Dinner

and will bring guests.

I wish to go on the Conference Excursion

and will bring guests.

I enclose a cheque for A\$ covering:

Registration fee: A\$

Deposit for accommodation: A\$
 (\$25 per person)

All cheques should be made payable to CMSA.

Arrival Details:

Flight number date time