$\left[\begin{array}{ll}\mathrm{I} & \mathrm{L} \\ \mathrm{A} & \mathrm{S}\end{array}\right] \quad \bullet \xrightarrow{\mathcal{I}} \cdot \xrightarrow{\mathcal{M}} \cdot \xrightarrow{\mathcal{A}} \xrightarrow{\mathcal{G}} \cdot \xrightarrow{\mathcal{E}}\left[\begin{array}{ll}\mathrm{I} & \mathrm{L} \\ \mathrm{A} & \mathrm{S}\end{array}\right]$

# The Bulletin of the International Linear Algebra Society Serving the International Linear Algebra Community 

Issue Number 15, Summer 1995: pp. 1-24.
Joint Editors: Steven J. LEON \& George P. H. STYAN

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# ILAS President/Vice-President Annual Report: June 1995 

1. The following have been elected to ILAS offices as of March 1, 1995:

> Vice-President: Daniel Hershkowitz (three-year term).
> Board of Directors: Angelika Bunse-Gerstner (two-year term), Peter Lancaster (three-year term) Chi-Kwong Li (two-year term), Robert C. Thompson (three-year term).

In addition to the above, the following continue in their offices to which they were previously elected:

> Hans Schneider: President; James R. Weaver: Secretary/Treasurer
> Richard A. Brualdi, Thomas J. Laffey: members of the Board of Directors.

The nominating committee, now consisting of Roger A. Hom (chair), Tsuyoshi Ando, Jose Perdigão Dias da Silva, Thomas J. Laffey and Paul M. Van Dooren, is preparing the 1995 elections (which includes the positions of President and Secretary/Treasurer).
2. A committee consisting of Richard A. Brualdi, Daniel Hershkowitz, Roger A. Horn, Steven J. Leon, Hans Schneider and James R. Weaver (chair) has been appointed by the President to propose changes in the ILAS bylaws in order to establish the publication of journals by ILAS. The proposed changes are to be discussed in the next meeting of the board of directors and the next ILAS business meeting, to be held in Atianta, August 16-19, 1995.
3. ILAS-NET (Manager: Daniel Hershkowitz): In order to improve our service, ILAS-NET has been shifted to a new machine at the Technion (Haifa, Israel). As of June 19, 1995, we have circulated 472 ILAS-NET announcements. ILAS-NET currently has 591 subscribers.
4. ILAS Information Center-IIC (Manager: Daniel Hershkowitz): IIC has gone through major changes. It has been shifted to a new machine at the Technion (Haifa, Israel), and it now has a home page and is accessible via MOSAIC, XMOSAIC, NETSCAPE and LYNX, as well as by FTP and by e-mail. We have extended the services of IIC, which now include: General ILAS information, Information about paper journals, Links to electronic journals, Information about conferences, Links to institutional home pages, Links to personal home pages, Links to publishers, Other links of interest \& Miscellaneous. In addition to the primary site at the Technion, the IIC operates two mirror sites in: Temple University, Philadelphia, USA and in the Technische Universität, Chemnitz, Germany. Since the shift to the new machine on December 21, 1994, IIC has handled over 8500 information requests.
5. A very successful meeting was held in Rotterdam, The Netherlands, in August 1994. There were 36 invited speakers and 160 participants from 36 countries; there were 4 minisymposia with 18 additional invited speakers. Organizing committee: Harm Bart (chair), Ludwig Elsner, Daniel Hershkowitz, Marinus A. Kaashoek, Thomas J. Laffey, Peter Lancaster, A. C. M. Ran, Hans Schneider \& Ion Zaballa.
6. George P. H. Styan has been appointed editor of the ILAS Newsletter Image; he will serve jointly with Steven J. Leon. Image has been considerably expanded and further growth is projected with the forthcoming changes in the LLAS bylaws.
7. Membership dues are now $\$ 20$. Currently we have 355 members.
8. Dues for corporate members are now $\$ 200$. We have a very active corporate members committee (Carolyn Eschenbach, chair, LeRoy Beasley and David Lay). Currently we have 7 corporate members.
9. We have been successful in obtaining support for our 1995 Atlanta meeting from Georgia State University, NSF, NSA and the US Army. The meeting is now in the final stages of organization.
10. The following meetings and workshops are in various stages of preparation:
a. Summer 1995 ATLAST Workshop, Seattle, Washington, June 21-24, 1995. ATLAST Project Director: Steven J. Leon. Assistant Director: Richard Faulkenberry. Workshop presenter: Jane Day.
b. Summer 1995 ATLAST Workshop, Williamsburg, Virginia, July 19-22, 1995. ATLAST Project Director: Steven J. Leon. Assistant Director: Richard Faulkenberry. Workshop presenter: David Hill.
c. 5th ILAS Conference, Alanta, Georgia, August 16-19, 1995. Organizing Committee: Biswa N. Datta, Frank J. Hall (co-chair), Robert E. Hartwig, Daniel Hershkowitz, Charles R. Johnson, Volker Mehrmann, Alex Pothen, Hans Schneider,

Frank Uhlig, Paul M. Van Dooren (co-chair), James R. Weaver \& Margaret H. Wright. Local Arrangements Committee: Frank J. Hall (chair), M. Bakonyi, Jean Bevis, T. Brieske, G. Davis, M. Grady, Carolyn Eschenbach, Z. Li, F. Massey \& V. Miller.
d. 6th ILAS Conference, Technische Universität Chemnitz-Zwickau, Chemnitz, August 14-17, 1996. Organizing Committee: Volker Mehrmann (chair), Bart De Moor, Graciano De Oliveira, Ludwig Elsner, Thomas J. Laffey, G. Michler, Michael Neumann \& Frank Uhlig. Local Arrangements Committee: D. Happel, F. Lowke, C. Rost \& B. Silbermann.
e. ILAS Workshop on Fast Algorithms for Control, Signals and Image Processing, Winnipeg, Manitoba, June 6-8, 1997. Organizing Committee: P.N. Shivakumar (chair), Peter Lancaster, Robert J. Plemmons, Dianne P. O'Leary, Hans Schneider. Program Committee: Robert J. Plemmons (co-chair), Dianne P. O'Leary (co-chair), Moody Chu, Brent Ellerbroek, Thomas Kailath, Peter Lancaster, Franklin Luk, Haesun Park, Hans Schneider, P.N. Shivakumar, Paul M. Van Dooren.
f. ILAS Conference, Madison, Wisconsin, June 3-6, 1998. Organizing Committee: Richard A. Brualdi (chair), Bryan Cain, Biswa Nath Datta, Jose Perdigão Dias da Silva, Shmuel Friedland, Moshe Goldberg, Uriel Rothblum, Jeffrey Stuart, Daniel Szyld \& Richard S. Varga.

The results of the recent elections for ILAS officers are as follows:

President: Richard A. Brualdi<br>Secretary/Treasurer: James R. Weaver<br>Board of Directors: Rajendra Bhatia, Ludwig Elsner.

Brualdi, Bhatia and Elsner have been elected for three-year terms starting 1 March 1996. Weaver has been elected for a four-year term starting 1 March 1996.

My thanks are due to the nominations committee [R. A. Horn (chair), T. Ando, J. A. Dias da Silva, T. J. Laffey and P. M. Van Doorenl for organizing the election process. My thanks are also due to all candidates who agreed to run for ILAS offices.

Hans Schneider: President of ILAS

## News from the ILAS Information Center-IIC

We are happy to announce the establishment of a mirror site for IIC in Chemnitz, Germany. The URL address of this new mirror site is http://www.tu-chemnitz.de/ftp-home/.m/fs75/math.technion.ac.il/iic/index.html. The database in Chemnitz gets updated on a daily basis.
There are three ways to use the services of IIC: MOSAIC, XMOSAIC, NETSCAPE or LYNX—by issuing the command "command http://math.technion.ac.il/iic" where command stands for mosaic, xmosaic, netscape or lynx. FTP-by anonymous FTP to "math.technion.ac.il" (for the IIC database change directory to "iic"). E-mail-by including the command "SEND http://math.technion.ac.il/iic/filename" (where "filename" is the file you request) in the mail body of a message sent to AGORA@MAIL.W3.ORG. The list of files that can be obtained from IIC is included in the file INDEX.HTML. Detailed instructions as to how to use IIC are included in the file IIC.GUIDE.
The IIC is happy to announce several new services:
(a) Links to Electronic journals: so far we have links to: The Electronic Journal of Combinatorics,
(b) Links to institutional home pages: so far we have links to (1) American Mathematical Society, (2) Mathematics Information Servers (PennState University), (3) The World-Wide Web Virtual Library: Math. (Florida State University), (4) Centre for Experimental \& Constructive Mathematics (Simon Fraser University), (5) SIAM's undergraduate WWW pages, (6) Journal of Approximation Theory, (7) MacTutor History of Mathematics Archives, (8) Center for Scientific Computing (Finland), (9) Mathematics Archives-Mathematics Departments, (10) Home pages of various mathematics (\& statistics) departments, (11) NA-NET home page
(c) Links to members' home pages (those who wish to have links from our database center to their home page should email their home page address to HERSHKOW@TECHUNIX.TECHNION.AC.IL).

## ILAS Treasurer's Report: March 1, 1994-February 28, 1995

by James R. Weaver, University of West Florida

Balance on hand March 1,1994
Certificate of Deposits (CD) 8,500.00
Vanguard 7,159.94
Checking Account 13,825.32 29, 485.26

Checking Account Balance on March 1, 1994
$13,825.32$
March 1994
Income:
Interest (First Union)
Expenses:
Sec. of State

| 70.00 | 70.00 |
| :--- | :--- |

(51.48)

April 1994
Income:
Dues Interest on CD (FU) 10.60 Interest (First Union) 17.79 Contributions Regular 18.00
H. Schneider Prize 10.00 F. Uhlig Ed. Fund 10.00 OT/JT Lec. Fund 10.00 400.39

Expenses:
00.00
00.00
400.39

May 1994
Income:
Dues
48.00

Interest on CD (HS)
74.56

Interest on CD (OT/JT) 29.00
Interest (First Union) 19.82
Contributions
Regular 10.00
H. Schneider Prize 10.00
F. Uhlig Ed. Fund 10.00
201.38

Expenses:
00.00
00.00
$\underline{201.38}$
June 1994
Income:
Interest (First Union) $19.28 \quad 19.28$
Expenses:
$\underline{00.00} \quad \underline{00.00}$
19.28

July 1994
Income:
Dues 108.00
Interest (First Union) 18.67
Interest on CD (FU) 10.84
Contributions
OT/JT Lec. Fund 96.35
233.86

Expenses:
Postmaster 75.40
Dixon Brothers Sporting Goods 178.69
Preparation of Dues Notice
Lisa M. Weaver 27.50
Shipping Poste (Dues Notice) 115.60
$\frac{\text { August }}{\text { Income }} \frac{1994}{}$
$\frac{\text { August }}{\text { Income: }}$
Interest (First Union) $21.06 \quad 21.06$
Expenses:
00.00
00.00
(163.33)

September 1994
Income:
Dues
Interest (First Union)
Interest on CD (HS)
, 544.00
21.99
75.38
$\begin{array}{lr}\text { Interest on CD (OT/JT) } & 29.32 \\ \text { T-Shirts } & 200.00\end{array}$
Contributions
Regular
211.50
H. Schneider Prize 165.00
F. Uhlig Ed. Fund 101.00

OT/JT Lec. Fund 397.00
Expenses:
Xeroxing at EUR
Postmaster
75.00
18.52

Producing \& Mailing "IMAGE"
George P. H. Styan
Mailing Expenses Steve Leon Office Depot (supplies) Exchange Rate
11.50
51.50
5.81
668.19
$2,077.00$
October 1994
Income:
Dues

Interest (First Union)
Interest on CD (HS)
Interest on CD (OT/JT)
Interest on CD (FU)
Contributions
Regular
H. Schneider Prize
F. Uhlig Ed. Fund

OT/JT Lec. Fund
Expenses:
510.00
24.00
76.23
29.64
10.84
58.00
65.00
5.00
4.00
782.71
00.00
00.00
782.71

November 1994
Income:
Dues
Interest (First Union)
Contributions
Regular
H. Schneider Prize
462.00
24.19
141.00 8.00
635.19

Office Depot (Supplies) 10.68
Preparation of Dues Notice
Lisa M. Weaver
24.80

The Shipping Poste
Mailing Dues Notice
135.70
174.18
464.01

December 1994
Income:

| Dues | 870.00 |
| :--- | ---: |
| Interest (First Union) | 24.76 |
| Interest (F. Uhlig Ed. Fund) | 10.72 |
| Contributions |  |
| $\quad$ Regular | 38.00 |
| H. Schneider Prize | 520.00 |
| F. Uhlig Ed. Fund | 300.00 |
| OT/JT Lec. Fund | 150.00 |
| Conference | 51.00 |

Expenses
Conference Travel
Daniel szyld 350.00

Producing 100 extra copies of IMAGE
123.37

Xeroxing - UWF
29.54

Preparing ballots Lisa M. Weaver 54.72
Postmaster
59.16

Postmaster 197.73
814.52
$1,149.96$
January 1995
Income:

| Dues | 296.00 |
| :--- | ---: |
| Interest (First Union) | 28.18 |
| Interest on CD (HS) | 76.23 |
| Interest on CD (OT/JT) | 29.64 |
| Contributions |  |
| H. Schneider Prize | 140.00 |
| F. Uhlig Ed. Fund | 120.00 |
| OT/JT Led. Fund | 30.00 |
| Conference | 103.00 |
| Regular | 61.00 |
| Office Depot |  |
| Off in |  |

884.05

Expenses:
Office Depot
42.74
42.74
841.31

February 1995
Income:
Dues
486.00

Interest (First Union)
24.91

Contributions
H. Schneider Prize 6.00
F. Uhlig Ed. Fund
3.00

OT/JT Lee. Fund
3.00

Conference
3.00
525.91

Expenses:
Postmaster
Postmaster
258.00
157.64

Preparation of flyers for 5 th
Conf. UWF Math Club $\quad \underline{69.00}$
484.64

February 28. 1995
19,608.88

Account Balance
Checking Account $19,608.88$
Certificate of Deposit (FU) 1,000.00
Certificate of Deposit
(72\% HS \& 28\% OT/JT) 7,500.00
Vanguard
(72\% HS \& 28\% OT/JT) 7,092.35

General Fund $\quad 11,142.92$
Frank Uhlig Educational Fund $\quad 2,502.81$
Hans Schneider Prize
$12,987.66$
Olga Taussky Todd/John Todd Fund 5,550.61

Conference Fund $\quad 3,017.23 \quad 32,201.23$

## In Memoriam

Arthur Asquith Rayner, Professor Emeritus of Statistics and Biometry at the University of Natal, Pietermaritzburg, South Africa, died on July 10, 1994; he was 77. Bom in Dunedin, New Zealand, he studied mathematical statistics under A. C. Aitken at the University of Edinburgh, gaining his doctorate in 1947; in 1949 he founded the University of Natal Dept. of Biometry. He was Dean of the University of Natal Faculty of Agriculture and President of the South African Statistical Association. The book Generalized Inverse Matrices with Applications to Statistics (with R. M. Pringle, pub. Griffin, 1971) was one of the first three books on matrix generalized inverses. An obituary appears in the New Zealand Statistical Association Newsletter, September 1994, page 11.

Richord D. Sinkhorn, well known for his work in linear algebra and matrix theory, died in Houston, Texas, on April 8, 1995, following a stroke. He was awarded a PhD degree from the University of Wisconsin-Madison in 1962 and then joined the Mathematics Department of the University of Houston, where he quickly became a full Professor and supervised 11 PhD theses as well as many Masters students. In 1985 he was voted Top Professor by the University Mortar Board Society (a student organization) and received the College Teaching Excellence Award in 1992 from the College of Natural Science and Mathematics.

Albert William Tucker of mathematical programming and game theory fame and Professor Emeritus of Mathematics at Princeton University, died near Princeton, on January 25, 1995; he was 89 . The Kuhn-Tucker Theorem is the cornerstone of nonlinear programming. He was President of the Mathematical Association of America (MAA), Vice-President of the American Association for the Advancement of Science (AAAS), and Chair of the Conference Board of the Mathematical Sciences (CBMS). An obituary by Stephen B. Maurer appears in SIAM News, July 1995, page 15.

## Honors and Awards

Persi Diaconis of the Dept. of Mathematics, Harvard University, was elected a Member of the US National Academy of Sciences on April 24, 1995; he gave an invited address on geometry and eigenvalues at the 5th SIAM Conference on Applied Linear Algebra, Snowbird, Utah, June 1994.

Calyampudi Radhakrishna Rao, Eberly Professor of Statistics and Director of the Center for Multivariate Analysis, Pennsylvania State University, University Park, was elected a Member of the US National Academy of Sciences in April 1995; he gave an invited plenary talk on new ways of dealing with multicollinearity at the 5th International Workshop on Matrix Methods in Statistics, Montreal, Quebec, July 1995. The book Generalized Inverse of Matrices and Its Applications (with Sujit Kumar Mitra, pub. Wiley, 1971) was one of the first three books on matrix generalized inverses.

Donald WIford Robinson of the Dept. of Mathematics, Brigham Young University, Provo, Utah, received a Certificate of Meritorious Service to the Mathematical Association of America at the Joint Mathematics Meetings in San Francisco, California, January 5, 1995.

## LMITOOL: An Interface for Solving LMI Problems

A user-friendly MATLAB package for Linear Matrix Inequality (LMI) optimization, called LMITOOL, has been developed by Laurent El Ghaoui, François Delebecque \& Ramine Nikoukhah. This package acts as an interface for the Semidefinite Programming package SP developed by L. Vandenberghe \& S. Boyd. LMITOOL (version 1.0 ) and SP are now both available on the Internet: send e-mail to ELGHAOUI@ENSTA.FR for information on how to get these packages.

Using LMITOOL, a user can in a few minutes solve Linear Matrix Inequality problems with matrix variables. All one has to do is to specify the LMI constraints and linear objective of the problem at hand in a matlab .m file. No special syntax or function is to be learned by the user. LMITOOL allows for arbitrary equality and LMI constraints. The LMITOOL package includes: All source code, a user's guide (a short one, as the package is very easy to learn), a set of control problems solved using LMITOOL (e.g., mixed H2/H-infinity control). A similar package is also available for the MATLAB-like package SCILAB (send e-mail to SCILAB@INRIA.FR for information).

## New Officers of the SIAM Activity Group on Linear Algebra

As the result of the election held this past fall, the new officers of the SIAM Activity Group on Linear Algebra (SIAG/LA) are as follows:

Chair: Paul M. Van Dooren, Vice-Chair: Biswa Nath Datta<br>Secretary: Alan Edelman, Program Director: John R. Gilbert.

They will serve for three year terms, ending December 31, 1997. John G. Lewis is the Past-Chair; Julia Olkin and Juan Meza continue to serve as editors of their electronic newsletter.

## More Books on Linear Algebra and Related Topics: 1994-1995

## by Simo Puntanen, University of Tampere \& George P. H. Styan, McGill University

Listed below are some more books on linear algebra and related topics that have been published in 1994 or in 1995 (or are in press for publication in 1995 or 1996); this list augments and updates that published in Image 14:23-26. References to reviews in Mathematical Reviews [MR] are given in square brackets; ( P ) denotes paperback and (H) hard cover.
Agarwal, Ravi P. \& Pang, Peter Y. H. (1995). Opial Inequalities with Applications in Differential and Difference Equations. Mathematics and lts Applications, vol. 320. Kluwer, x + 393 pp., ISBN 0-7923-3365-9.
Anderson, E.; Bai, Z.; Bischof, C.; Demmel, James; Dongarra, Jack J.; Du Croz, J.; Greenbaum, A.; Hammarling, S. J.; McKenney, A.; Ostrouchov, S. \& Sorensen, Danny C. (1995). LAPACK Users' Guide. Second Edition. SIAM, xix + 325 pp., ISBN 0-89871-345-5 (P). [Original version: 1992, xv + 235 pp., Image 9:20-22]
Bau, David \& Trefethen, Nick. Numerical Linear Algebra. Publication expected in 1996 (by SIAM). [Table of contents \& sample chapters available at http://www.cs.comell.edu/Info/People/lnt/lnt.html]
Bellman, Richard (1995). Introduction to Matrix Analysis. Reprint Edition. Classics in Applied Mathematics, vol. 12. SIAM, Philadelphia, $x x+328$ pp., ISBN 0-89871-346-3 (P). [Reprint of the First Edition: 1960, McGraw-Hill, $x x+328$ pp., MR 23:A153; Second Edition: 1970, McGraw-Hill, xxiii + 403 pp. MR 41:3493]
Brown, J. David; Chu, Moody T.; Ellison, Donald C. \& Plemmons, Robert J., eds. (1994). Proceedings of the Cornelius Lanczos International Centenary Conference. SIAM, lxv + 644 pp., ISBN 0-89871-339-0 (P). [Conference held at Raleigh, North Carolina, December 12-17, 1993.]
Datta, Biswa Nath (1995). Numerical Linear Algebra and Applications. Brooks/Cole, xxii + 680 pp., ISBN 0-534-17466-3.
Gauss, Karl Friedrich (1995). Theory of the Combination of Observations Least Subject to Errors: Part One, Part Two, Supplement. Translated by \& with an Afterword by G. W. Stewart. Classics in Applied Mathematics, vol. 11. SIAM, xi +241 pp. , ISBN 0-89871-347-1 (P).
Gilbert, Jimmie \& Gilbert, Linda (1995). Linear Algebra and Matrix Theory. Academic Press, x +394 pp., ISBN 0-12-282970-0.
Higham, Nicholas J. (1996). Accuracy and Stability of Numerical Algorithms. SIAM, ca. 700 pp ., in press (publication expected in January 1996), ISBN 0-89871-355-2 (P).
Johnson, Eugene W. (1995). Linear Algebra with MATHEMATICA ${ }^{\circledR}$. Brooks/Cole, xi +174 pp., ISBN 0-534-13068-2 (P).
Kolman, Bernard (1996). Elementary Linear Algebra. Sixth Edition. Prentice Hall ca. 576 pp., ISBN 0-13-374729-8. [Original version: 1970, Macmillan; Second Edition: 1977; Third: 1982, xii + $356 \mathrm{pp} . \&$ Answer Manual prepared by James Brooks, 53 pp. (P); Fourth: 1986; Fifth: 1991, xix +487 pp.]
Lawson, Charles L. \& Hanson, Richard J. Solving Least Squares Problems. Second Edition. Classics in Applied Mathematics, vol. 15. SIAM, ca. 355 pp., in press (expected September 1995), ISBN 0-89871-356-0 (P). [Original version: 1974, Prentice-Hall, xii + 340 pp ., MR 51:2270]
Lawson, Terry (1996). Linear Algebra. Wiley, ISBN 0-471-30897-8.
Mangasarian, Olvi L. (1994). Nonlinear Programming. Corrected Reprint Edition. Classics in Applied Mathematics, vol. 10. SIAM, xv + 220 pp., ISBN 0-89871-341-2 (P). [Original version: 1969, McGraw-Hill]

Messer, Robert (1994). Linear Algebra: Gateway to Mathematics. HarperCollins, x + 403 pp., ISBN 0-06-501728-5.

Moonen, M. \& De Moor, Bart, eds. (1995). SVD and Signal Processing III, Algorithms, Architectures and Applications. Proceedings of the 3rd International Workshop, Leuven, Belgium, 22-25 August 1994. Elsevier Science, 498 pp., ISBN 0-444-82107-4.
Robbin, Joel (1994). Matrix Algebra using MINImal MATlab. AK Peters, ISBN 1-56881-024-5.
Sigmon, Kermit. MATLAB ${ }^{\circledR}$ Primer. Fourth Edition. CRC Press, x +101 pp., ISBN 0-8493-9440-6 (P). [Image 13:7. Original ver sion: 1989, Dept. of Mathematics, University of Florida, Gainesville, ii + 22 pp. (P); Third Edition: 1993.]

## Linear Algebra and Its Applications-Forthcoming Special Issues

Proceedings of the Fourth Conference of the International Linear Algebra Society (Rotterdam, August 1994). Special Editors: Harm Bart, Lud wig Elsner \& Andre Ran.
Proceedings of the Fifth Conference of the International Linear Algebra Society (Atlanta, August 1995). Special Editors: Frank J. Hall, Alex Pothen, Frank Uhlig \& Paul M Van Dooren.
Special Issue Honoring J. J. Seidel. Special Editors: Aart Blokhuis, Willem H. Haemers \& Alan J. Hoffman.
Fifth Special Issue on Linear Algebra and Statistics: Dedicated to C. R. Rao in Celebration of his 75th Birthday. Special Editors: R. B. Bapat, George P. H. Styan \& Hans Joachim Werner.
A Guide to Books on Matrices and Books on Inequalities, with Statistical and Other Applications by George P. H. Styan \& Simo Puntanen.

Special issues of Linear Algebra and Its Applications (LAA) are available to individuals at a reduced rate. For further information, please contact Yusuf Guvenc, Journals Customer Service, Elsevier Science Publishing Company, Inc., 655 Avenue of the Americas, New York, NY 10010, USA; FAX (1-212) 633-3990, tel. (1-212) 633-3955.

## Reports on Linear Algebra Events Attended

## Western Canada Linear Algebra Meetings:

## Regina, Saskatchewan: September 24-25, 1993 Lethbridge, Alberta: April 28-29, 1995

## Report by Douglas R. Farenick \& Stephen J. Kirkland

The Western Canada Linear Algebra Meeting (W-CLAM) provides an opportunity for mathematicians in Western Canada working in linear algebra and related fields to meet, present accounts of their recent research, and to have informal discussions. Although this meeting has a regional base, W-CLAM also attracts researchers from outside the area who come to the meetings and develop contacts here. The first two of these meetings were held in Regina and Lethbridge and each attracted 20-30 participants, including people from other parts of Canada, as well as from Denmark, Greece, Korea, Spain \& USA.

The speakers at the Regina meeting were A. Akkerman, S. Cabay, R. Craigen, D. R. Farenick, L. Jodar, S. J. Kirkland, P. Lancaster, L. Marcoux, J. J. McDonald, R. Meleshko, S. Neufeld, M. Rakowski, K. Taylor, M. Tsatsomeros, P. van den Driessche, and P. Zizler. Lectures in Lethbridge were presented by S. Ambikkumar, B. Cain, R. Craigen, D. R. Farenick, H. Karaghani, S. J. Kirkland, M. Krupnik, P. Lancaster, C. Muses, K. Taylor, M. Tsatsomeros, and P. Zizler.

The presentations at the meetings involved research in linear algebra, matrix theory, operator theory, combinatorics, designs, mathematical chemistry, mathematical physics, population dynamics, numerical analysis, differential equations, and linear control theory. In light of the level of interest at the Regina and Lethbridge meetings, further W-CLAMs are anticipated.

# First Southeastern Linear Algebra Conference 

## Chattanooga, Tennessee: May 27-28, 1994

We are very grateful to Ronald L. Smith for identifying the three remaining persons in the photo published in Image 13:10 (see also 14:30): $y_{1}=$ Floyd Christian, $y_{2}=$ Rohan Hemasinha, $y_{3}=$ Ann-Loise Klaus .

# Fourth International Workshop on Matrix Methods for Statistics 

Montréal, Québec: July 15-16, 1995

Report by George P. H. Styan

The Fourth International Workshop on Matrix Methods for Statistics was held in Montréal on Saturday, July 15 and Sunday, July 16, 1995, the weekend immediately following the Joint Annual Meeting of the Statistical Society of Canada (SSC) and the Institute of Mathematical Statistics (IMS). This Workshop was co-sponsored by the International Linear Algebra Society (ILAS). The International Organizing Committee comprised R. William Farebrother (Univ. of Manchester), Simo Puntanen (Univ. of Tampere), George P. H. Styan (McGill University; chair), and Hans Joachim Werner (Universität Bonn). This Workshop is the fourth in a series. The previous three Workshops were held as follows: (1) Tampere, Finland: August 1990, (2) Auckland, New Zealand: December 1992, and (3) Tartu, Estonia: May 1994. The 5th Workshop in this series is scheduled to held in Shrewsbury, England, July 1996.

The purpose of this Workshop was to stimulate research and, in an informal setting, to foster the interaction of researchers in the interface between matrix theory and statistics. Invited guest speakers came from: Canada, Chile, China, Czech Republic, Finland, Germany, India, The Netherlands, New Zealand, Poland, Portugal, Slovenia, Sweden, Turkey, United Kingdom, and the United States. Funding for non-Canadian guest speakers' travel and local expenses was supported in part by the Natural Sciences and Engineering Research Council of Canada (NSERC). There were 56 papers presented in person ( 8 plenary and 48 in three parallel sessions) and 5 by title. It is expected that papers from this Fourth International Workshop on Matrix Methods for Statistics will be published in the Sixth Special Issue on Linear Algebra and Statistics of Linear Algebra and Its Applications.

The eight plenary talks were:
Anderson* \& Stephens: Matrix methods in computation of distributions of goodness-of-fit statistics
Farebrother: A. C. Aitken and the consolidation of matrix theory
Fiedler: Some new results on Hermitian and positive definite matrices
Golub: Method of moments and statistical computations
Mitra* \& Prasad: The nonunique parallel sum
Olkin: A. C. Aitken and compound matrices
Rao* \& Suryawanshi: Some new ways of dealing with multicollinearity in a regression problem Thompson: On the von Neumann trace inequality for singular values.

The other 48 talks were:
Ahmed* \& Bashirullah: Improved biased estimation in a regression model
Akdeniz: MSE comparisons of some biased estimators in the linear regression model
Ambikkumar* \& Drury: Some remarks on the Boyle-Handelman conjecture
Andersson \& Perlman*: Lattice conditional independence models for seemingly unrelated regressions
Andersson* \& Perlman: Matrix invariance groups for lattice conditional independence models
Bebiano: Bounds for the determinant of matrix sums
Bhimasankaram \& Saharay*: On a partitioned linear model and some associated reduced models
Bondar: A partial interlacing theorem for eigenvalues of products and application to MANOVA
Cao-Huu: On computing eigenvalues and eigenvectors of large image matrices for positron emission tomography

Carvalho: A joint estimator for the eigenvalues of the reproduction mean matrix of a multitype Galton-Watson process
Chang* \& Paige: New perturbation bounds for the Cholesky factorization
Dutilleul: Maximum likelihood estimation for the matrix normal distribution
Farenick: Convexity with matrix coefficients
Firinguetti Limone: A note on a less than full rank system of seemingly unrelated regression equations model
Flournoy et al: Stationarity in sequential response-driven designs
Fortiana* \& Cuadras: A family of matrices, the discretized Brownian bridge and distance-based regression
Groß: On contractions in linear regression
Groß \& Trenkler*: On the equality of GLSE and Amemiya's partially generalized least squares estimator
Harville: Use of the Gibbs sampler to invert large, sparse, positive definite matrices
Hodgess* \& Wei: Temporal disaggregation of bivariate time series
Horn \& Olkin*: When does $\mathrm{A} * \mathrm{~A}=\mathrm{B} * \mathrm{~B}$ and why does one want to know?
Im: Observation contemporaneity and GLS efficiency gain in the context of identical regressors
Kovačec: The conjecture of Marcus and de Oliveira
Kozek: On application of local latent roots in nonparametric regression estimation
Leite: Matrix problems arising in nonlinear control
Liu* \& Neudecker: Kantorovich inequalities involving positive semidefinite matrices and efficiency comparisons in linear models
Liu \& Neudecker*: Matrix trace Cauchy-Schwarz inequalities and applications in canonical correlation analysis
Markiewicz: Induced Kiefer orderings and comparison of experiments
Merikoski et al: Bounds for eigenvalues using the trace and determinant
Metz: Shorted operators: an application in potential theory
Meyer: Convex analysis and matrix methods in multidimensional scaling
Nordström \& Mathew*: Inequalities for sums of matrix quadratic forms
Omladič \& Omladič: A linear algebra approach to non-transitive expected utility
Polotski \& Shukhman: Point estimation of mean and variance in the correlated time series equations model
Prasad: Rank 1 factors, minus order and shorted matrices
Provost: On the Craig-Sakamoto theorem and its generalisations
Puntanen* \& Scott: Some further remarks on the singular linear model
Rosenberger et al: Rates of convergence for the generalized Polya urn
Searle: The matrix handling of BLUE and BLUP in the mixed linear model.
Semrl: On a matrix version of Cochran's theorem
Styan \& Subak-Sharpe*: The Campbell-Youla generalized inverse and a consequent fundamental property of resistive electrical networks
Sultan* \& Tracy: Moments of complex multivariate normal distribution
Tian: Completing block matrices with maximal and minimal ranks
Tong: The role of the covariance matrix in the least-squares estimation for a common mean
von Rosen: A generalized complex normal distribution
Watson: Inequalities associated with the efficiency of least squares: history and comments
Werner* \& Yapar: A BLUE decomposition in the general linear regression model
Wolkowicz: Applications of semidefinite programming: linear programming for the 90 s and 00 s .
In addition five papers were presented by title:
Kollo* \& von Rosen: Low-dimensional distributions via high-dimensional distributions
Majumdar: On optimality of duals of optimal block designs
Marsaglia: Generating random matrices
Tian: Reverse order laws for the generalized inverses of multiple matrix products
Wang: Unified theory of least squares and partial ordering of matrices.
Copies of the Programme booklet (with abstracts of all 61 papers in both English and French) are available (free of charge, while supply lasts) from: George P. H. Styan, Dept. of Mathematics and Statistics, McGill University, Burnside Hall, 805 ouest, rue Sherbrooke, Montréal, Québec, Canada H3A 2K6; MT56@MUSICA.MCGILL.CA, FAX (1-514) 3983899.



Photograph by Simo Puntanen

# Selected Forthcoming Linear Algebra Events 

## Fifth Conference of the International Linear Algebra Society

Atlanta, Georgia: August 16-19, 1995

Hosted by The International Linear Algebra Society (ILAS) and Georgia State University, this Fifth ILAS Conference will be held in the Urban Life Conference Center, Georgia State University, 140 Decatur Street, Atlanta, Georgia, August 1619, 1995. The purpose of this conference is to bring together researchers/educators in all fields of linear algebra/matrix analysis, pure and applied, allowing a broad interchange of ideas and discussion of recent developments in these areas. The conference will focus on the usual topics of the ILAS conferences, but in addition will put special emphasis on education of linear algebra and on structured matrices. The conference is being supported by Georgia State University and preliminary commitments have also been made by the National Science Foundation and the National Security Agency.

The Organizing Committee comprises: Biswa Nath Datta, Frank J. Hall (co-chair), Robert E. Hartwig, Daniel Hershkowitz, Charles R. Johnson, Volker Mehrmann, Alex Pothen, Hans Schneider, Frank Uhlig, Paul M. Van Dooren (cochair), James R. Weaver, Margaret H. Wright. The Local Arrangements Committee comprises: Frank J. Hall (chair), M. Bakonyi, Jean Bevis, T. Brieske, G. Davis, M. Grady, Carolyn Eschenbach, Z. Li, F. Massey \& V. Miller.

The invited speakers are: Greg Ammar (Northern Illinois University, USA), Wayne Barrett (Brigham Young University, USA), Harm Bart (Erasmus University, The Netherlands), Angelika Bunse-Gerstner (Universität Bremen, Germany), Ludwig Elsner (Universität Bielefeld, Germany), Shmuel Friedland (Hans Schneider Prize Winner, University of Chicago, USA), John R. Gilbert (Xerox Park, USA), Guershon Harel (Purdue University, USA), Roger A. Horn (University of Utah, USA), Ilse Ipsen (North Carolina State University, USA), Rein Kaashoek (Vrije Universiteit van Amsterdam, The Netherlands), Thomas J. Laffey (University College of Dublin, Ireland), Carl D. Meyer, Jr. (North Carolina State University, USA), Cleve Moler (Mathworks, USA), Michael Neumann (University of Connecticut, USA), Morris Newman (University of Cal-ifornia-Santa Barbara, USA), Wilhelm Niethammer (Universität Karlsruhe, Germany), Dale Olesky (University of Victoria, Canada), \& Gilbert Strang (banquet speaker, Massachusetts Institute of Technology, USA). There will be minisymposia on: Sparse matrices (A. Pothen); Structured matrices (G. Heinig, A. Sayed); Linear algebra in undergraduate education (F. Uhlig, D. Carlson); Distance matrices, geometry and applications (P. Tarazaga).

A special issue of Linear Algebra and its Applications with editors Frank J. Hall, Alex Pothen, Frank Uhlig, and Paul M. Van Dooren will publish the conference proceedings. This issue will contain only papers that meet the publication standards of the journal and that are approved by the normal refereeing processes. Submission deadline for papers is November 30, 1995.

Accommodation. Blocks of rooms have been reserved at the following hotels: Radisson Hotel-Atlanta, 165 Courtland Street NE, Atlanta, GA 30303; tel. (1-404) 659-6500, (1-800) 833-8624, FAX (1-404) 524-1259; The Suite Hotel-Underground Atlanta, 54 Peachtree St. at Upper Alabama, Atlanta, GA 30303; tel. (1-404) 223-5555, (1-800) 477-5549, FAX (1404) 223-0467. Rates at the Radisson Hotel-Atlanta are $\$ 70$ (plus tax) per room with single or double occupancy. Extra charge for third person in a room is $\$ 10$. All persons 18 years of age or younger are free of charge when staying in a room with an adult. A limited number of rooms have been reserved for students at $\$ 70$ (plus tax) for 1-4 people. Parking fee is $\$ 3$ per day for ILAS participants. The Radisson Hotel is approximately 0.8 miles from the Georgia State University Conference Center. Rates at The Suite Hotel/Underground Alanta are $\$ 81$ (plus tax) single and $\$ 91$ (plus tax) double. Extra charge for third person in a room is $\$ 10$. Valet parking is available for $\$ 12 /$ day with unlimited entry and exit. The Suite Hotel is approximately 0.4 miles form the Georgia State University Conference Center. Please make your reservations directly with the hotel and mention that you are attending the International Linear Algebra Conference. Reservations must be made by July 14,1995 , to receive the room rates listed.

Transportation. The Fifth Conference of the International Linear Algebra Society has selected Delta Air Lines Inc. and Carlson Wagonlit Travel as the official air carrier and agency for the August 16-19, 1995 conference. Delta Air Lines is offering special discounted meeting fares. To take advantage of Delta's special fares follow these steps: 1. Call Carlson Wagonlit Travel at (1-800) 999-5430 and tell the reservationist you are attending the International Linear Algebra Society Conference in Atlanta, Georgia. 2. Give the dates you wish to travel. 3. Have the credit card of your choice ready to give to the reservationist. 4. Give the address where tickets should be mailed and a contact telephone number. 5 . Review the schedule and price with the reservationist and your ticketing is complete. Rental car services can also be arranged through Carlson

Wagonlit Travel. Taxi fare from Atlanta International Airport is based on the number of passengers in the cab- $\$ 15 /$ one person, $\$ 16 /$ two people and $\$ 6$ each for three or more passengers. Bus shuttle service is $\$ 8 /$ person. MARTA, our rapid rail system, costs $\$ 1.25$ one way and is located in Delta Airlines' baggage pickup area in the South Terminal. The MARTA system will deposit you within walking distance of both hotels.

# Third Symposium on Matrix Analysis \& Applications: A Look at Recent Developments 

## Kalamazoo, Michigan: October 13-14, 1995

The Principal Speakers will be: Richard A. Brualdi (University of Wisconsin-Madison), P. J. Eberlein (SUNY at Buffalo), Roger A. Horn (University of Utah), Charles R. Johnson (College of William \& Mary) \& G. W. Stewart (University of Maryland). There will be additional invited speakers as well as 20 minute contributed talks. The organizers invite the participation of both specialists and non-specialists interested in matrix analysis and its applications to other fields. Graduate students are also encouraged to submit abstracts for consideration. Preceding the symposium, at 4 pm on Thursday, 12 October 1995, there will be a University Visiting Scholar Lecture by Charles R. Johnson entitled "Ideas of Modern Matrix Analysis". A banquet is planned for the Friday evening.

The deadline for submitting abstracts is August 14, 1995. E-mail submission is welcome. Organizing Committee: Yousef Alavi, John Petro and Niloufer Mackey, Western Michigan University. To submit abstracts or for further information contact: Niloufer Mackey, Dept. of Mathematics \& Statistics, Western Michigan University, Kalamazoo, MI 490085152; NIL.MACKEY@WMICH.EDU, tel. (1-616) 387-4594, FAX (1-616) 387-4530.

## MATLAB Conference

## Cambridge, Massachusetts: October 16-18, 1995

Every two years The MathWorks hosts a MATLAB Conference for customers using MATLAB, SIMULINK and the family of toolboxes. The 1995 MATLAB Conference will be held October 16-18 at the Hyatt Regency in Cambridge, Massachusetts. The conference offers users a chance for direct technical exchange with other users, The MathWorks technical staff, toolbox authors and 3rd party vendors. The conference is a combination of industry leaders in signal processing, fuzzy logic, engineering, controls and mathematics; minicourse classes; expository talks by engineers and toolbox authors; and user-contributed presentations. Additionally, The MathWorks provides a fully equipped and staffed computer lab loaded with the latest products. Special Speakers: John N. Little (President, The MathWorks, Inc.), Cleve Moler (Chief Scientist, The MathWorks, Inc.): "Matrix: Mother of all Data Structures", Ronald W. Schafer (Georgia Institute of Technology), Lotfi Zadeh (University of California, Berkeley).

Minicourses, in the form of a teaching lab, will offer attendees the opportunity to get a hands-on look at our recently released and upcoming products. Minicourses are two hours in length and combine lectures and interactive tutorials. Classes include DSP Design, Fuzzy Logic, System Identification, Image Processing, Statistics, and Symbolic Math. Over 40 Expository Talks are scheduled for this MATLAB Conference. Topics include: DSP Design, Mathematics, Controls, Simulation, Image Processing, and Advanced Signal Processing. User Contributed Presentations, organized in categories including controls, education, electrical engineering, fuzzy logic, image processing, mathematics, real-time applications, signal processing, and simulation, will be given.

Registration fees are $\$ 495$ for commercial customers, $\$ 295$ for educational institutions and universities, and $\$ 75$ for fulltime students with a valid ID. Rooms have been reserved for Conference attendees at the Hyatt Regency. For hotel registration, please call the Hyatt Regency at (1-617) 429-1234. For more information regarding the technical program or registration, call (1-508) 647-4226, FAX (1-508) 653-6284, e-mail: CONFERENCE@MATHWORKS.COM, or write The Math Works Inc., 24 Prime Park Way, Natick, MA 01760 . Additional information can also be found by visiting The MathWorks homepage, URL: http://www.mathworks.com.

# MAA Linear Algebra Session of Contributed Papers 

Orlando, Florida: January 10-13, 1996

There will be an MAA Linear Algebra session of contributed papers at the Joint Meetings of the AMS (American Mathematical Society) and MAA (Mathematical Association of America) in Orlando, Florida, January 10-13,1996. Session Announcement: Innovations in Teaching Linear Algebra: Wednesday afternoon, Thursday evening, and Friday afternoon. Organizers: Donald LaTorre, David Lay \& Steven J. Leon.

The teaching of undergraduate linear algebra is undergoing substantial change. This session invites papers on personal experiences with innovations in teaching linear algebra, including: (1) The creative use of computer algebra systems, super calculators, or computer software; (2) Experiences with the NSF-funded ATLAST workshops; (3) Experiences with the core curriculum recommended by the Linear Algebra Curriculum Study Group (LACSG); (4) "Gems" of exposition in linear algebra; and (5) Other innovative teaching initiatives in undergraduate linear algebra.

Procedure for submitting papers: Anyone wishing to present a paper must send a one-page summary of the paper to the session coordinator: Steven J. Leon, Dept. of Mathematics, University of Massachusetts-Dartmouth, Old Westport Road, North Dartmouth, MA 02747-2300; SLEON@UMASSD.EDU, FAX (1-508) 999-8901. All summaries must be received by August 25, 1995. The summary should enable the organizers to evaluate the appropriateness of your paper for the session. Consequently, you should include as much detailed information as possible within the one-page limitation. The session coordinator will acknowledge receipt of all summaries. If your paper is accepted, you will be sent a standard MAA abstract form. Use this form to prepare a brief abstract. Please return the completed abstract form to the session coordinator by Friday, September 8, 1995. Abstracts received after the deadline will not be published.

## Second China Matrix Theory Conference

## Jilin, China: August 12-16, 1996

The 2nd China Matrix Theory Conference will take place in Jilin, China, from August 12-16, 1996. Supported by the Chinese Mathematical Society and Jilin Normal College, this conference is being organized by a national committee with the collaboration of the Mathematics Department at Jilin Normal College. A conference proceedings will be published. The Chinese Linear Algebra Society (CLAS) will be founded at this conference. For further information, please contact: BitShun Tam, Dept. of Mathematics, Tamkang University, Tamsui, 25137, Taiwan; BSM01@HPAP.TKU.EDU.TW, tel. (886-2)-621-5656 ext. 828, FAX (886-2) 620-9916.

# International Calendar of Events in Linear Algebra \& Related Topics 

## 1995

August 16-19: Atlanta, Georgia. International Linear Algebra Society (ILAS): 5th Conference. Minisymposia: Sparse Matrices, Structured Matrices, Linear Algebra in Undergraduate Education, Distance Matrices, Geometry \& Applications. Georgia State University. [FJ Hall, Dept of Mathematics \& Computer Science, Georgia State University, Atlanta, GA 30303; FHALL@CS.GSU.EDU1 See Image 14:40-41, 15:14.

August 17: Atlanta, Georgia. ILAS Mini-Symposium on Educational Issues in Linear Algebra. Georgia State University [DH Carlson, Dept of Mathematical Sciences, San Diego State University, San Diego, CA 92182-7720; FAX (1-619) 594-6746, CARLSON@MATH.SDSU.EDU] See Image 14:41.

August 21-29: Beiljing, China. International Statistical Institute: 50th Biennial Session. Beijing International Convention Center. [ISI Permanent Office, 428 Prinses Beatrixlaan, Postbus 950, NL-2270 AZ Voorburg; FAX (31-70) 38-60025, ISI@CS.VU.NL]

August 28-September 1: Dunedin, New Zealand. A. C. Aitken Centenary Conference, 3rd Pacific Statistical Congress \& New Zealand Statistical Association Annual Meeting. Session on Matrix Methods for Statistics. Univ of Otago. [BFJ Manly, Dept of Mathematics \& Statistics, Univ of Otago, PO Box 56, Dunedin; FAX (64-3) 479-8427, CASM@MATHS.OTAGO.AC.NZ]

September 3: Harrogate, North Yorkshire. Parallel Processing under MATLAB: One-day Tutorial as part of World Transputer Congress. Royal Baths Assembly Rooms. [http://faith.swan.ac.uk/chris.html/MUGUK/muguk.html; J. Kadlec, J.KADLEC@EE.QUB.AC.UK]

September 25-29: Toulouse, France. Workshop on Linear Algebra in Optimization. Part of Linear Algebra Year at CERFACS. [C Puglisi, Parallel Algorithm Team, CERFACS, 42 avenue G Coriolis, F-31057 Toulouse Cedex; FAX (33) 61.19.30.00, WLAY@CERFACS.FR, http://www.cerfacs.fr/~wlay/LAY/lay.html] See Image 14:36.

October 13-14: Kalamazoo, Michigan. 3rd Symposium on Matrix Analysis \& Applications: A Look at Recent Developments. Western Michigan University. [Niloufer Mackey, Dept of Mathematics \& Statistics, Western Michigan University, Kalamazoo, MI 49008-5152; NIL.MACKEY@WMICH.EDU, FAX (1-616) 387-4530] See Image 15:15.

October 16-18: Cambridge, Massachusetts. MATLAB Conference. Hyatt Regency Cambridge. Keynote Speech by Cleve Moler on "Matrix: Mother of all Data Structures". [The Math Works Inc., 24 Prime Park Way, Natick, MA 01760; FAX (1-508) 653-6284, CONFERENCE@MATHWORKS.COM] See Image 15:15.

October 16-20: Toulouse, France. Workshop on Eigenvalues \& Beyond. Part of Linear Algebra Year at CERFACS. [C Puglisi, Parallel Algorithm Team, CERFACS, 42 avenue G Coriolis, F-31057 Toulouse Cedex; FAX (33) 61.19.30.00, WLAY@CERFACS.FR, http://www.cerfacs.fr/~wlay/LAY/lay.html] See Image 14:36.

October 23-26: Charlotte, North Carolina. SIAM Annual Meeting. Adam's Mark Hotel. [SIAM, 3600 University City Science Center, Philadelphia, PA 19104-2688; MEETINGS@SIAM.ORG, FAX (1-215) 386-7999, tel. (1-800) 447SIAM (USA only)]

December 7-8: Lódz, Poland. 14th Conference on Multivariate Statistical Analysis: MSA'95. Univ of Lódź. A. Rossa, Dept of Statistical Methods, Institute of Econometrics \& Statistics, Univ of Lódź, Rewolucji 1905r. 41, PL 90-214 Lódź; KATSTAT@KRYSIA.UNI.LODZ.PL, FAX (48-42) 78.39.58]

## 1996

January 10-13: Orlando, Florida. Joint Mathematics Meetings: American Mathematical Society (AMS) \& Mathematical Association of America (MAA). MAA Session of Contributed Papers: "Innovations in Teaching Linear Algebra". [Steven J. Leon, Dept. of Mathematics, University of Massachusetts-Dartmouth, Old Westport Road, North Dartmouth, MA 02747-2300; SLEON@UMASSD.EDU, FAX (1-508) 999-8901.] See Image 15:16.

April 1-4: York, England. State of the Art in Numerical Analysis. [Program Chair: G Alistair Watson, Dept of Math \& Computer Science, Dundee University, Dundee DD1 4HN, Scotland; GAWATSON@MCS.DUNDEE.AC.UK]

May 20-22: Victoria, British Columbia. Triennial SIAM Meeting on Optimization. [B Buckley, Dept of Mathematics, Royal Roads Military College, FMO Victoria, BC V0S 1B0, BBUCKLEY@POST.ROYALROADS.CA]

June 12-15: Newport, Rhode Isiand. ATLAST Workshop. Salve Regina University. [Steven J. Leon, Dept. of Mathematics, University of Massachusetts-Dartmouth, Old Westport Road, North Dartmouth, MA 02747-2300; FAX (1-508) 999-8901, SLEON@UMASSD.EDU]

June 17-21: Pontresina, Switzerland. 13th Householder Symposium on Numerical Algebra. Hotel Kronenhof. [Dianne P. O'Leary, Chair: Program Committee; OLEARY@CS.UMD.EDU]

June 20-21: Belgrade, Serbia-Yugoslavia. Dragoslav S. Mitrinović (1908-1995) Memorial Conference. Serbian Scientific Society. [Gradimir V. Milovanović, Faculty of Electronic Engineering, P. O. Box 73, 18000 Nis, Serbia-Yugoslavia; MILOVANOVIC@IPRVS1.UNIV-PAU.FR]

June 24-28: St. Louis, Missouri. International Symposium on the Mathematical Theory of Networks and Systems. Washington University. [Biswa Nath Datta, Dept of Mathematical Sciences, Northern Illinois University, DeKalb, IL 60115; FAX (1-815) 753-1112, DATTAB@MATH.NIU.EDU]

July 7-12: Sydney, Australia. Sydney International Statistical Congress: SISC-96. IMS Special Topics Meeting: Contemporary Nonparametrics; 13th Australian Statistical Conference: Quality \& Environment; Computer Science \& Statistics: 28th Symposium on the Interface. Sheraton-Wentworth Hotel. [John Mulready, Conference Action Pty Ltd, PO Box 1231, North Sydney, NSW 2059; SYDNEY96@SYD.DMS.CSIRO.AU, FAX (61-2) 956-5154]

July 8-12: Prague, Czech Republic. Prague Mathematical Conference in Honor of the 70th Birthdays of Ivo Babuška, Miroslav Fiedler, Jaroslav Kurzweil \& Vlastimil Pták. [Mathematical Institute, Academy of Sciences, Zitrá 25, CZ-115 67 Praha 1; FAX (422-2) 422-7633, PMC96@EARN.CVUT.CZ]

July (3rd or 4th week): Shrewsbury, England. 5th International Workshop on Matrix Methods for Statistics. [RW Farebrother, 11 Castle Road, Bayston Hill, Shrewsbury SY3 0NF; FAX (441-61) 275-4812]

July 27-30: Cambridge, England. Conference on Numerical Mathematics Celebrating the 60 th Birthday of M. J. D. Powell. [MD Buhmann, Mathematics Dept, ETH Zentrum, CH-8092 Zürich; MDB@MATH.ETHZ.CH]

August 4-8: Chicago, Illinois. Joint Statistics Meetings: IMS (59th Annual Meeting), American Statistical Association (ASA) \& International Biometric Society (ENAR/WNAR). Hyatt Regency. [ASA, 1429 Duke Street, Alexandria, VA 22314-3402; MEETINGS@ASA.MHS.COMPUSERVE.COM, FAX (1-703) 684-2037]

August 6-9: Sapporo, Japan. 3rd Workshop on Numerical Ranges \& Numerical Radii. The Sapporo Guest House. [T Ando, Faculty of Economics, Hokusei Gakuen University, Atsubetsu-ku, Sapporo 004] See Image 14:42.

August 12-16: Jlilin, China. 2nd China Matrix Theory Conference. Chinese Mathematical Society \& Jilin Normal College. [Bit-Shun Tam, Dept of Mathematics, Tamkang University, Tamsui 25137, Taiwan; BSM01@HPAP.TKU.EDU.TW, FAX (886-2) 620-9916] See Image 15:16.

August 14-17: Chemnitz, Germany. International Linear Algebra Society (ILAS) Conference. [VL Mehrmann, Fakultät für Mathematik, Technische Universität Chemnitz-Zwickau, PSF 964, D-09009 Chemnitz; FAX (49-371) 5312657, MEHRMANN@MATHEMATIK.TU-CHEMNTTZ.DE]

August 26-29: Beljing, China. 3rd Gauss Symposium. [WA Rodrigues Jr., Division of Math \& Theoretical Physics, Institutum Gaussianum, IMECC-UNICAMP, CP 6065, 13081-970 Campinas SP; WALROD@IME.UNICAMP.BR]

August 26-30: Barcelona, Spain. COMPSTAT96: 12th Symposium on Computational Statistics. Universitat Politecnica de Catalunya. [A Prat, Dept of Statistics, Universitat Politecnica de Catalunya, Avenida Diagonal 647, E-08028, Barcelona; (34-3) 401-6575, PRAT@EIO.UPC.ES]

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1997
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January 10-13: San Dlego, Calfornia. Joint Mathematics Meetings: American Mathematical Society (AMS) \& Mathematical Association of America (MAA). [H Daly, AMS, PO Box 6887, Providence, RI 02904-6887; MEET@MATH.AMS.ORG]

June 6-8: Winnipeg, Manitoba. International Linear Algebra Society (ILAS) Workshop on Fast Algorithms for Control, Signals and Image Processing. [P Lancaster, Dept of Mathematics, Univ of Calgary, Calgary, Alberta T2N 1N4; LANCASTER@ACS.UCALGARY.CA]

August 10-14: Anaheim, California. Joint Statistics Meetings: American Statistical Association (ASA) \& International Biometric Society (ENAR/WNAR). Anaheim Hilton \& Anaheim Marriott. [ASA, 1429 Duke Street, Alexandria, VA 22314-3402; FAX (1-703) 684-2037, MEETINGS@ASA.MHS.COMPUSERVE.COM]

August 18-27: Istanbul, Turkey. International Statistical Institute: 51st Biennial Session. [ISI Permanent Office, 428 Prinses Beatrixlaan, Postbus 950, NL-2270 AZ Voorburg; ISI@CS.VU.NL, FAX (31-70) 38-60025]

## 1998

January 10-13: Baltimore, Maryland. Joint Mathematics Meetings: American Mathematical Society (AMS) \& Mathematical Association of America (MAA). [MEET@MATH.AMS.ORG; H Daly, AMS, PO Box 6887, Providence, RI 029046887]

June 3-6: Madison, Wisconsin. International Linear Algebra Society (LLAS) Conference. [RA Brualdi, Dept of Mathematics, Univ of Wisconsin, Van Vleck Hall, 480 Lincoln Drive, Madison, WI 53706-1388; FAX (1-608) 262-1402, BRUALDI@MATH.WISC.EDU]

August 9-13: Dallas, Texas. Joint Statistics Meetings: IMS (61st Annual Meeting), American Statistical Association (ASA) \& International Biometric Society (ENAR/WNAR). Loews Anatole. [ASA, 1429 Duke Street, Alexandria, VA 22314-3402; FAX (1-703) 684-2037, MEETINGS@ASA.MHS.COMPUSERVE.COM]

## 1999

August: Helsinki, Finland. International Statistical Institute: 52nd Biennial Session. [ISI Permanent Office, 428 Prinses Beatrixlaan, Postbus 950, NL-2270 AZ Voorburg; FAX (31-70) 38-60025, ISI@CS.VU.NL]

August 8-12: Baltimore, Maryland. Joint Statistics Meetings: IMS (62nd Annual Meeting), American Statistical Association \& International Biometric Society (ENAR/WNAR). [ASA, 1429 Duke Street, Alexandria, VA 22314-3402; FAX (1-703) 684-2037, MEETINGS @ASA.MHS.COMPUSERVE.COM]

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