

PROGRAMME

**NINETEENTH
SOUTH AFRICAN SYMPOSIUM
ON
NUMERICAL MATHEMATICS**

SAN LAMEER, 12 - 14 JULY 1993

**SOUTH AFRICAN SOCIETY FOR NUMERICAL MATHEMATICS
AND THE
DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF NATAL
(DURBAN)**

*NINETEENTH SOUTH AFRICAN SYMPOSIUM
ON NUMERICAL MATHEMATICS
SAN LAMEER, 12-14 JULY 1993*

- Venue:* The Royal Palms Conference Centre, Protea Hotel,
San Lameer, Lower South Coast Main Road,
Southbroom 4277.
Tel. (03931) 30011. Fax (03931) 30011 or 30111.
- Registration:* 08:30 - 09:00 on Monday 12 July at the Royal Palms
Conference Centre.
- Registration Fee:* R180 for members of SANUM, and R220 for non mem-
bers. The fee for bona fide full-time students is R140.
This fee covers the use of all conference facilities, at-
tendance at all lectures, a conference programme, sum-
maries of papers to be presented, a copy of the Procee-
dings, lunches, teas and a buffet dinner.
- Proceedings:* All participants wishing their papers to be published
in full in the Proceedings, should submit two copies,
ready for duplicating, to the Secretary of SANUM at
the Symposium.
- Curriculum Vitae:* On registering, all speakers must submit a short cur-
riculum vitae, for use by chairpersons of sessions.
- Entertainment:* A buffet dinner will be held on Monday 12 July at 19:00
at the Meersig Swimming Pool Deck.
- Sanum AGM:* This will take place on Tuesday 13 July at 16:35 in
Royal Palms A at the Conference Centre.
- Enquiries:*
- Ms E M Carte, Department of Computer Science,
University of Natal, Durban 4001. Tel. 031-8163018,
Fax 031-2616550.
 - Dr S Abelman, Department of Computational and
Applied Mathematics, University of the Witwatersrand,
P O Wits 2050. Tel. 011-7163298, Fax 011-3397965.

*NEGENTIENDE SUID-AFRIKAANSE SIMPOSIUM
OOR NUMERIESE WISKUNDE
SAN LAMEER, 12-14 JULIE 1993*

- Plek:* Die Royal Palms Konferensiesentrum, Protea Hotel, San Lameer, Laer Suidkushoofweg, Southbroom 4277. Tel. (03931) 30011. Faks (03931) 30011 of 30111.
- Registrasie:* 08:30 – 09:00 op Maandag 12 Julie by die Royal Palms Konferensiesentrum.
- Registrasiegelde:* R180 vir lede van SANUM, en R220 vir nie-lede. Die fooi vir bona fide voltydse studente is R140. Hierdie fooi sluit in die gebruik van alle kongresfasiliteite, bywoning van alle lesings, 'n kongresprogram, opsommings van lesings wat aangebied gaan word, 'n kopie van die Verrigtinge, middagetes, tee en 'n buffetdinee.
- Verrigtinge:* Alle deelnemers wat verlang dat hulle referate ten volle in die Verrigtinge gepubliseer word, moet twee kopieë, gereed vir duplisering, aan die Sekretaresse van SANUM by die Simposium oorhandig.
- Curriculum Vitae:* By registrasie, moet alle sprekers 'n kort curriculum vitae inhandig, vir gebruik deur voorsitters van sessies.
- Onthaal:* 'n Buffetdinee word op Maandag 12 Julie om 19:00 by die Meersig Swembaddek gehou.
- Sanum AJV:* Dit sal op Dinsdag 13 Julie om 16:35 in Royal Palms A by die Konferensiesentrum plaasvind.
- Navrae:*
- Me E M Carte, Departement Rekenaarwetenskap, Universiteit van Natal, Durban 4001. Tel. 031-8163018, Faks 031-2616550.
 - Dr S Abelman, Departement Toegepaste Wiskunde, Universiteit van die Witwatersrand, PK WITS 2050. Tel 011-7163298, Faks 011-3397965.

PARTICIPANTS - DEELNEMERS

S ABELMAN	<i>University of the Witwatersrand</i>
R ANGUELOV	<i>Vista University</i>
G BALL	<i>Atomic Energy Corporation</i>
J BANASIAK	<i>University of Natal</i>
R A B BOND	<i>University of Natal</i>
D I CARSON	<i>University of Natal</i>
R COOLS	<i>Katholieke Universiteit Leuven, Belgium</i>
K CROUS	<i>Krygkor</i>
E DE KLERK	<i>Universiteit van Pretoria</i>
J M DE VILLIERS	<i>University of Stellenbosch</i>
P DU T FOURIE	<i>Universiteit van Stellenbosch</i>
L D ERASMUS	<i>Potchefstroomse Universiteit vir CHO</i>
D EYRE	<i>Potchefstroom University for CHE</i>
H GINGOLD	<i>West Virginia University</i>
H GOLDSTEIN	<i>University of Natal</i>
C GORDON	<i>University of the Witwatersrand</i>
K S GOVINDER	<i>University of Natal</i>
B K HAKIZUMWAMI	<i>University of the Witwatersrand</i>
S-W JHA	<i>National Central University, Taiwan</i>
M A E KAUNDA	<i>University of Cape Town</i>
A KNOPFMACHER	<i>University of the Witwatersrand</i>
J M KOZAKIEWICZ	<i>University of Zululand</i>
D P LAURIE	<i>Potchefstroomse Universiteit vir CHO</i>
P G L LEACH	<i>University of Natal</i>
R L LEMMER	<i>University of Natal</i>
D S LUBINSKY	<i>University of the Witwatersrand</i>
E MARÉ	<i>Nedbank</i>
L G MASHER	<i>University of the Witwatersrand</i>
D P MASON	<i>University of the Witwatersrand</i>
G M MOREMEDI	<i>University of the Witwatersrand</i>
D M MURRAY	<i>Somkon</i>
S PAHL	<i>University of the Witwatersrand</i>
N PENDOCK	<i>University of the Witwatersrand</i>
C H ROHWER	<i>University of Stellenbosch</i>
H C SCHUTTE	<i>Atomic Energy Corporation</i>
I H SLOAN	<i>University of New South Wales, Australia</i>
I M SNYMAN	<i>Krygkor</i>
A SOLOMON	<i>University of the Witwatersrand</i>
R W STEWART	<i>University of Natal</i>
L STEYN	<i>Gennan Stelsels</i>
P Y TABAKOV	<i>University of Natal</i>
E H A VENTER	<i>Potchefstroomse Universiteit vir CHO</i>
L M VENTER	<i>Potchefstroomse Universiteit vir CHO</i>
M WALKER	<i>University of Natal</i>
C J WRIGHT	<i>University of the Witwatersrand</i>

TITLES OF PAPERS – TITELS VAN REFERATE

- S Abelman.** *First-kind Abel-type integral equations with nonexact data.*
- R Anguelov.** *Monotone properties of hyperbolic differential operators.*
- G Ball.** *A new ray-tracing algorithm applied to nuclear reactor irradiation rigs.*
- J Banasiak, J R Mika & J M Kozakiewicz.** *Diffusion approximation of the neutron transport equation and its numerical aspects.*
- R A B Bond & J R Mika.** *Asymptotic error series for finite difference methods.*
- R Cools.** (1) *The art of constructing cubature formulae.*
(2) *Where cubature formulae of trigonometric degree and lattice rules meet.*
- K Crous.** *Numerical modelling of the sealing process of a driving band.*
- E de Klerk & J A Snyman.** *A new interior feasible-direction method for linear programming in structural optimization.*
- J M de Villiers.** *A blending formula for interpolatory spline approximants.*
- P du T Fourie.** *Sparse matrices in seismic tomography.*
- L D Erasmus, D Eyre & R C Everson.** *Numerical solution of the population balance equation.*
- D Eyre.** *Adaptive mesh grading for two-dimensional integral equations.*
- H Gingold.** *Extrapolations via orthogonal polynomials and conformal maps.*
- H Goldstein.** *A practical approach to using wavelets in signal processing: the dominant scale transform.*
- B K Hakizumwami.** *Numerical solution of the flow past an impulsively started circular cylinder.*
- S-W Jha.** *Numerical solution of the ratio of two leading coefficients of orthogonal polynomials $P_n(x)$ and $P_{n-1}(x)$ which are generated by Freud weight.*
- M A E Kaunda & J B Martin.** *Finite element solution algorithms for nonlinear time-dependent/independent problems in solid mechanics.*
- A Knopfmacher.** *Computer graphics and the Euclidean algorithm.*
- D P Laurie.** *Anti-Gaussian quadrature formulas.*
- P G L Leach.** *Making macro-molecules.*
- D S Lubinsky.** *Product integration rules on $(-\infty; \infty)$.*
- G M Moremedi & D P Mason.** *Limit cycle of a generalised Van der Pol equation using the method of multiple scales.*
- S Pahl.** *Solution techniques for the spectral element method based on domain decomposition.*

N Pendock. *The Brandeis dice problem revisited.*

C H Rohwer. *Local monotonicity and numerical mathematics.*

H C Schutte. *A deterministic method of solving Coulomb friction problems.*

I H Sloan. (1) *Boundary integral methods – a survey.*

(2) *Unconventional approaches to boundary integral equations.*

E H A Venter & D P Laurie. *Numerical integration of absolute functions.*

V E Verijenko, S Adali, R W Stewart & E B Summers. *Application of the method of initial functions to the analysis of anisotropic plates.*

V E Verijenko, S Adali, P Y Tabakov & R Bodger. *Comparison of analytical and numerical solutions for the thick composite cylinder.*

M Walker, S Adali & V E Verijenko. *Maximisation of eigenvalues with applications to the optimal design of composite laminates using the finite element method.*

C J Wright. *Inverse Sturm-Liouville eigenvalue problems.*

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C J Wright. *Inverse Sturm-Liouville eigenvalue problems.*

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Monday 12 July – Maandag 12 Julie

	ROYAL PALMS A	ROYAL PALMS B
08:30–09:00	<i>Registration</i>	<i>Registrasie</i>
09:00–09:10	Opening: Prof. D. Eyre	
09:10–10:10	I.H. Sloan (1)	
10:10–10:30	<i>Tea</i>	<i>Tee</i>
10:35–10:55	D. Eyre	
11:00–11:20	C.J. Wright	
11:25–11:45	J.M. De Villiers	
11:50–12:10	D.P. Laurie	
12:15–12:35	D.S. Lubinsky	
12:40–14:00	<i>Lunch</i>	<i>Middagete</i>
14:00–15:00	R. Cools (1)	
15:00–15:20	<i>Tea</i>	<i>Tee</i>
15:25–15:45	S. Abelman <i>Neishlos*</i>	
15:50–16:10	R.A.B. Bond	
16:15–17:15		Lecture and Computer Demonstration by Vector Network Computers
19:00	Official Opening of Symposium by Prof. C. Cresswell, to be followed by a Buffet Dinner at the Meersig Swimming Pool Deck	Amptelike Opening van Simposium deur Prof. C. Cresswell, gevolg deur 'n Buffetdinee by die Meersig Swembaddek

**Feedback Control in
Genetic Algorithms*

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Tuesday 13 July – Dinsdag 13 Julie

	ROYAL PALMS A	ROYAL PALMS B
08:30–08:50	E. De Klerk	
08:55–09:15	L.D. Erasmus	
09:20–09:40	G.M. Moremedi	
09:45–10:05	B.K. Hakizumwami	
10:10–10:30	<i>Tea</i>	<i>Tee</i>
10:35–11:35	C.H. Rohwer	
11:40–12:00	S. Pahl	
12:05–12:25	N. Pendock	
12:30–12:50	M. Walker	
12:55–14:00	<i>Lunch</i>	<i>Middagete</i>
14:00–14:20	R. Cools (2)	
14:25–14:45	P.Y. Tabakov	
14:50–15:10	R.W. Stewart	
15:15–15:35	<i>Tea</i>	<i>Tee</i>
15:40–16:00	E.H.A. Venter	
16:05–16:25	K. Crous	
16:35	<i>Annual General Meeting</i>	<i>Algemene Jaarvergadering</i>

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Wednesday 14 July – Woensdag 14 Julie

	ROYAL PALMS A	ROYAL PALMS B
08:30–08:50	A. Knopfmacher	G. Ball
08:55–09:15	H. Gingold	H.C. Schutte
09:20–09:40	M.A.E. Kaunda	P. Du T. Fourie
09:45–10:05	P.G.L. Leach	
10:10–10:30	<i>Tea</i>	<i>Tee</i>
10:35–11:05	I.H. Sloan (2)	
11:10–11:30	J.M. Kozakiewicz	H. Goldstein
11:35–11:55	R. Anguelov	
12:00–12:20	S-W. Jha	
12:25–12:40	<i>Closure</i>	<i>Afsluiting</i>
12:45–14:00	<i>Lunch</i>	<i>Middagete</i>