

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 members. The fee for bona fide full-time students is R140. This fee covers the use of all conference facilities, attendance at all lectures, a conference programme, summaries of papers to be presented, a copy of the Proceedings, 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 curriculum 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, by-
woning van alle lesings, 'n kongresprogram, opsom-
mings 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>
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R L LEMMER	<i>University of Natal</i>
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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 Crouse.** 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.*

N Pendock. *The Brandeis dice problem revisited.*

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

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	ROYAL PALMS A	ROYAL PALMS B
08:30–09:00	Registration	Registrasie
09:00–09:10	Opening: Prof. D. Eyre	
09:10–10:10	I.H. Sloan (1)	
10:10–10:30	Tea	Tee
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	Lunch	Middagete
14:00–15:00	R. Cools (1)	
15:00–15:20	Tea	Tee
15:25–15:45	S. Abelman Neishlos*	
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	Tea	Tee
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	Tea	Tee
15:40–16:00	E.H.A. Venter	
16:05–16:25	K. Crouse	
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	Tea	Tee
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	Closure	<i>Afsluiting</i>
12:45–14:00	Lunch	<i>Middagete</i>