# CURRICULUM VITAE

## Batmanathan Dayanand (Daya) Reddy

**March 2010**

University of Cape Town
Department of Mathematics and Applied Mathematics

and

Centre for Research in Computational and Applied Mechanics
7701 Rondebosch, South Africa

Tel: work + 27 21 650 3787
home + 27 21 689 2847
mobile + 27 82 494 0684

Fax: + 27 21 685 2281
Email: daya.reddy@uct.ac.za
URL: http://www.mth.uct.ac.za/~bdr

---

## *Education*

| | |
|---|---|
| 1970 – 1973 | University of Cape Town: BSc(Eng) inCivil Engineering<br>Degree awarded with first class honours |
| 1974 – 1977 | Cambridge University (Gonville and Caius College), United Kingdom:<br>Doctoral studies in Mechanics; PhD degree awarded November 1977<br>Dissertation: *The Elastic and Plastic Buckling of Circular Cylinders in Bending* |

## *Honours and awards*

| | |
|---|---|
| 1974 – 1977 | Smuts Trust Bursary for graduate research at Cambridge University |
| 1992 | Fellow of the Royal Society of South Africa |
| 1992 | Fellow of the University of Cape Town |
| 1996 | Member, Academy of Science of South Africa |
| 2002 | Fellow, South African Academy of Engineering |
| 2004 | Fellow, Academy of Sciences of the Developing World (TWAS) |
| 2004 | National Order of Mapungubwe (Bronze) bestowed by the President of the Republic of South Africa |
| 2005 | Member, Suid-Afrikaanse Akademie vir Wetenskap en Kuns |
| 2006 | Fellow, African Academy of Sciences |
| 2008 | Fellow, International Association for Computational Mechanics (IACM) |
| 2009 | South African Association for Computational and Applied Mechanics Award for Distinguished Service |
| 2009 | African Conference on Computational Mechanics Award for Outstanding Research |

## *Employment*

| | |
|---|---|
| 1974 | University of Cape Town: Junior Lecturer, Department of Civil Engineering |
| 1978 | University College London: Associate Research Assistant (Postdoctoral), Department of Civil and Municipal Engineering |
| 1979 – 1998 | University of Cape Town<br>Departments of Applied Mathematics and Civil Engineering (joint appointment)<br>Lecturer (1979 - 1981), Senior Lecturer (1982 - 1984), Associate Professor (1985 - 1987)<br>Department of Applied Mathematics (since 1995, Mathematics and Applied Mathematics): Associate Professor (1988), Professor (1989 - ) |
| 1984 – | UCT Centre for Research in Computational and Applied Mechanics (CERECAM)<br>Deputy Director (1984 - 1994); Co-Director (1996 - 1999); Director (1999 -) |
| 2002, 2008-9 | Acting Deputy Vice-Chancellor (February – June 2002, July 2008 – March 2009) |
| 1999 – 2005 | University of Cape Town: Dean, Faculty of Science, and Professor of Applied Mathematics |
| 2007 – | South African Research Chair in Computational Mechanics (Department of Science and Technology, and National Research Foundation), tenable at University of Cape Town |

## *Visiting positions*

| | |
|---|---|
| 1982 | Brunel University, Department of Mathematics (January - June).<br>Host: Professor RW Ogden |
| 1987 | Università di Pavia, Istituto di Analisi Numerica del CNR (January - June)<br>Host: Professor F Brezzi |
| 1989 | University of Minnesota, Institute for Mathematics and its Applications (January - February) |
| 1991 | Stanford University, Division of Applied Mechanics (October - November)<br>Host: Professor JC Simo |
| 1993, 1997 | Universität Karlsruhe, Institut für Technische Mechanik and Universität Stuttgart, Mathematisches Institut A (2 months each in 1993 and 1997)<br>Hosts: Professors E Schnack and W Wendland |
| 2003 | Queen's University, Canada; Visiting Professor, Southern African Research Centre (January)<br>Hosts: Professors J Crush and P Oosthuizen |
| 2006 | The University of Texas at Austin, Institute for Computational Sciences and Engineering: Visiting Faculty Fellowship (1 month in September – October)<br>Host: Professor J T Oden |
| 2007 | Technische Universität Kaiserslautern, Institut für Mechanik<br>Host: Professor P Steinmann (February) |
| 2009 | Timoshenko Visitor, Stanford University, Mechanics and Computation Group<br>Host: Professor A Lew (January) |

## *Membership of professional societies*

American Mathematical Society

Gesellschaft für Angewandte Mathematik und Mechanik (Germany)

International Association for Computational Mechanics

Society for Industrial and Applied Mathematics (SIAM) (USA)
Society of Rheology
South African Mathematical Society (SAMS)
South African Society for Numerical Mathematics (SANUM)
South African Association for Theoretical and Applied Mechanics (SAAM)

## *Service on professional committees and boards*

| | |
|---|---|
| 1987 – 91, 1997 – 2001 | South African Mathematical Society: Member of Council |
| 1988 – 1989 | South African Society for Numerical Mathematics: Vice-President |
| 1991 – 1994 | Facilitating Committee for the Establishment of a South African Academy of Science: Member |
| 1993 – 2001 | South African Association for Theoretical and Applied Mechanics (SAAM): Council Member, Treasurer 1993-6, President 1996 – 2001 |
| 1993 – 2000 | SA National Committee for the International Union of Mathematicians: Member, and Chair 1997 - 2000 |
| 1995 – 1997 | FRD Core Programme Evaluation Committee, Mathematical Sciences: Convenor |
| 1995 | FRD Committee for evaluating proposals in Mathematical Sciences, Open Programmes |
| 1995 – 2000 | Member, Rhodes Scholarships (South Africa-at-Large) Selection Committee |
| 1996 – 2003 | SA National Committee, International Union of Theoretical and Applied Mechanics: Chair |
| 1996 – 2001 | Academy of Science of South Africa: Council member |
| 1998 | General Assembly of the International Mathematical Union: South African delegate |
| 1994 - | International Association of Computational Mechanics: Member of General Council |
| 1999 – 2008 | Board of the National Research Foundation: Member, and Chair since July 2002 |
| 2002 – | African Institute for Mathematical Sciences (AIMS), Cape Town: Trustee of the AIMS Trust, Member of the AIMS Council, and Associate Faculty member |
| 2005 – | Centre for High Performance Computing: Member of the Management Committee (till 2007), and of the Scientific Advisory Committee (since 2007) |
| 2005 – 2008 | Meraka Institute (Advanced African Institute for Information and Communications Technology), South Africa: Member of the Research Advisory Panel |

## *University committees and positions*

| | |
|---|---|
| 1989 – 1994 | Head of Department, Department of Applied Mathematics, UCT |
| 1987 – 1994 | Students' Fund for Visiting Speakers (Chair, July 1993 - June 1994) |
| 1989 – 1994 | Financial Aid Committee |
| 1991 – 1994 | Readmission Review Committee |
| 1991 – 1996 | Academic Planning Committee |
| 1995 – 1999 | Assessor, University Court |
| 1996 to date | General Purposes Committee of Senate, (subsequently Senate Executive Committee) |
| 1995 – 2005 | Doctoral Degrees Board (occasionally Deputy Chair and Acting Chair) |
| 2004 – | Steering Committee, UCT-CSIR Memorandum of Understanding |
| 2005 – | Steering Committee, UCT-Mintek Memorandum of Understanding |

| | |
|---|---|
| | Service on selection committees for posts at executive level: |
| 1995 | Post of Vice-Chancellor: elected to serve by Senate; Chairperson |
| 1996 | Posts of Deputy Vice-Chancellor: elected by Senate; Chairperson |
| 1999–2000 | Post of Vice-Chancellor: nominated by deans |
| 2001–2004 | Posts of Deputy Vice-Chancellor: nominated by deans |
| 1996–99, 2002–2008 | UCT Council Member, elected by Senate |

## *Teaching experience and activities*

Between 1979 and 1987 I was responsible for the following courses or projects in the Department of Civil Engineering at UCT: Structural Analysis (2nd and 4th years), Elasticity and Plasticity (Masters), Frame Analysis (Masters), 4th year projects on topics in structural mechanics

Since 1979 I have taught the following courses in the Department of Applied Mathematics (from 1995, Mathematics & Applied Mathematics) at UCT: partial differential equations, classical mechanics, calculus of several variables (2nd year), complex variables, tensor analysis, applied functional analysis, methods of mathematical physics (3rd year), continuum Mechanics, numerical analysis and scientific computing, methods of mathematical physics, finite elements (3rd and 4th years), Honours projects on topics in continuum mechanics, variational methods, and finite element analysis

I have taught courses at Masters level, at Cerecam, on finite element analysis, continuum mechanics, and nonlinear material behaviour.

## *Examining and reviewing activities*

I have served as external examiner for courses in applied mathematics and engineering at a number of South African universities, and as examiner for masters and doctoral dissertations submitted to universities in South Africa, Germany and France.

I have served as an external reviewer on reviews of departments or schools of mathematical sciences at the Universities of the Free State, Pretoria, and the Witwatersrand.

## *Research interests*

My research interests lie at the intersection of continuum mechanics, applied functional analysis, and numerical analysis and computing. My research programmes address some or all of the following issues: the formulation in mathematical terms of problems in continuum mechanics; studies of the well-posedness of such problems; construction by computational means of approximate solutions; and studies of the quality of such approximations. I also have a serious involvement in finite element analysis *per se.* My research involves issues of importance to applied mathematicians and engineering scientists, and much of it has a connection to problems and applications in industry.

## *Research appointees*

Professor J M-S Lubuma, FRD Research Fellow, July 1993 - June 1994

Dr B-H Sun, Postdoctoral Researcher, July 1994 - June 1995

Dr M Küssner, Postdoctoral Researcher, January 1996 - December 1997

Ms D Kleine, Research Officer, July 1998 – February 2002

Dr JMW Munganga, Postdoctoral Researcher, January 1999 – June 2001

Dr F Ebobisse Bille, Postdoctoral Researcher, September 2002 – January 2004

Dr J K Djoko, Postdoctoral Researcher, October 2004 – December 2005

Dr N S Weerasekara, Postdoctoral Researcher, November 2006 -
A T McBride, Research Officer, July 2007 – February 2010
Dr V Udoewa, Postdoctoral Researcher, September 2007 – August 2009
Dr S Jasinoski, Postdoctoral Researcher, January 2009 -

## *Postgraduate students*

*Students have been registered in the Faculty of Science except for those whose names are marked with an asterisk, and who were registered in the Faculty of Engineering and the Built Environment*

### *Masters students*

| | | |
|---|---|---|
| *G A Duffett | 1981 | *Plastic Buckling of Initially Imperfect Cylinders in Axial Compression* |
| *G P Mitchell | 1982 | *A Programming Approach to the Solution of Problems involving Elastic-Plastic Plates* |
| *A C Bolt | 1983 | *The Use of a Non-Classical Friction Law in Finite Element Analysis of Contact Problems* |
| *L R Watkins | 1986 | *Electromagnetic Field Solutions via the Finite Element Method* |
| *R A Eve | 1986 | *Conforming Finite Element Methods for Static and Eigenvalue Problems of Thin Elastic Shells* |
| H F du Toit | 1986 | *Finite Element Analysis of Eigenvalue Problems in the Stability of Fluid Motions*<br>Degree awarded with distinction |
| *M B Nates | 1989 | *Parameters Affecting the Performance of Tube Mills*<br>(co-supervisor: Professor GN Nurick) |
| *K von Bentheim | 1991 | *Dynamics of Balls in Tube Mills*<br>(co-supervisor: Professor GN Nurick) |
| M B Volpi | 1991 | *Mixed Finite Element Approximations for Circular Arches*<br>Degree awarded with distinction |
| C le Roux | 1991 | *Mixed Variational Problems Associated with Viscous Incompressible Free Surface Flows*<br>Degree awarded with distinction |
| K Arunakirinathar | 1991 | *Mixed Finite Element Approximations for Curved Rods*<br>Degree awarded with distinction |
| L H G Chandrasiri | 1992 | *The Solution of Steady-State Free Surface Problems by the Finite Element Method* |
| G C Schroeder | 1993 | *Estimates for the Rate of Convergence of Finite Element Approximations of the Solution of a Time-Dependent Variational Inequality*<br>Degree awarded with distinction |

| | | |
|---|---|---|
| *M A Stülpner | 1995 | *Various Continuum Bone Remodelling Algorithms Applied to the Proximal Femur in Two and Three Dimensions*<br>(co-supervisor: A Spirakis) |
| *I MacKellar | 1998 | *The Mechanical Design Aspects of a Small Diameter Vascular Prosthesis*<br>(co-supervisor: G R Starke) |
| J K Diatezua | 1999 | *Some theoretical aspects of fibre suspension flows* |
| T Koch | 2005 | *Non-linear finite element analyses of the aortic heart valve* |
| H van der Merwe | 2007 | *Development of a numerical tool for the design optimization of vascular prostheses towards physiological compliance*<br>MSc (Med) degree awarded with distinction<br>(co-supervisor: Dr T Franz) |
| S Bartle | 2009 | *Shell finite elements, with applications in biomechanics* |
| K E W Penzhorn | 2009 | *Consistency and convergence of SPH approximations* |
| E B Ismail | 2009 | *Smoothed particle hydrodynamics for nonlinear solid mechanics*<br>(co-supervisor: Prof GN Nurick) |

### *Doctoral students*

| | | |
|---|---|---|
| *G A Duffett | 1985 | *Some Aspects of the Numerical Solution of Equilibrium Problems in Finite Elasticity* |
| *T B Griffin | 1986 | *Variational and Numerical Aspects of Problems in Classical Plasticity* |
| G P Bleach | 1989 | *Acceleration Waves in Constrained Thermoelastic Media* |
| T Gültop | 1992 | *A Finite Strain Theory of Elastoplasticity and its Application to Wave Propagation* |
| R A Eve | 1992 | *Theoretical and Numerical Aspects of Problems in Finite Strain Plasticity* |
| *A Ozinsky | 1993 | *Mathematical Simulation of Dynamic Behaviour of Secondary Settling Tanks*<br>(co-supervisor: Prof GA Ekama) |
| H de G Laurie | 1994 | *Nonlinear Age-Dependent Population Dynamics*<br>(co-supervisor: Prof R Cowling) |
| *W J de Kock | 1994 | *Numerical Simulation of the Plastics Injection Molding Process*<br>(co-supervisor: Professor JB Martin) |
| K Arunakirinathar | 1995 | *Mathematical and Numerical Aspects of the Enhanced Strain Finite Element Method* |
| J M W Munganga | 2000 | *Existence and Stability of Solutions to the Equations for Fibre* |

| | | |
|---|---|---|
| | | *Suspension Flows* |
| B J L Brown | 2001 | *A Variational Approach to Local Optimality in Control Theory* |
| S K F Hattingh | 2002 | *Finite Element Analysis of Flows in Fractured Hydrocarbon Reservoirs* |
| D Kleine | 2003 | *Finite Element Analysis of Flows in Secondary Settling Tanks* |
| M S Yeoman | 2004 | *The Design and Optimisation of Fabric Reinforced Grafts using Finite Element Methods and Genetic Algorithms* |
| M S Tladi | 2004 | *Well-posedness and Long-time Dynamics of $\beta$-plane Ageostrophic Flows* |
| J K Djoko | 2004 | *Convergence in the Incompressible Limit of Finite Element Approximations based on the Hu-Washizu Formulation in Elasticity* |
| A T McBride | 2008 | *Formulation, analysis and solution algorithms for a model of gradient plasticity within a discontinuous Galerkin framework* |
| Q Reynolds | 2009 | *Mathematical and computational modeling of the behaviour of direct current plasma arcs* |

## *Current postgraduate students*

| | | |
|---|---|---|
| Y Kajee* | MSc (Eng) | *Biomechanics of the human tongue* |
| L Adams* | MSc (Eng) | *Computational electromagnetic (co-supervisor: A Wilkinson)* |
| H Morrissey* | MSc (Eng) | *Mechanics of fibre-reinforced composites* |
| N Richardson* | MSc (Eng) | *Algorithms for single crystal plasticity* |
| B Grieshaber | PhD | *Discontinuous Galerkin methods* |
| H Bakri Mohamed | PhD | *Analysis of models for viscoelastic fluids* |
| R Benjamin | PhD | *The Lattice Boltzmann method* |
| J-P Pelteret* | PhD | *Biomechanics of the upper airway* |
| A Chama | PhD | *Mixed finite element methods* |

## *Research colloquia*

I have presented colloquia on my research at the following institutions:

**South Africa:** University of Cape Town (Departments of Applied Mathematics, Civil Engineering, Chemical Engineering, Mathematics), University of the Western Cape, University of Durban-Westville, University of Pretoria, University of Transkei, University of Kwazulu-Natal, National Research Institute for Mathematical Sciences (CSIR, Pretoria)

**United Kingdom**: Brunel University, University of Bath, University of East Anglia, University of Nottingham, University of Glasgow

**Germany:** Technische Hochschule Darmstadt, Universität Karlsruhe, Universität Hannover, Universität Stuttgart, Technische Universität Kaiserslautern

**Italy:** Università di Pavia, Politecnico di Milano

**Switzerland:** Eidgenössische Technische Hochschule (Zürich)

**USA:** Brown University, Carnegie-Mellon University, The University of Texas at Austin, Massachusetts Institute of Technology, Oregon State University, Stanford University, Texas A&M University, University of California at Berkeley, University of Houston

**Canada:** Queen's University

**India:** Tata Institute for Fundamental Research (Bangalore, India), Indian Institute of Technology (Madras)

## *Presentations at conferences*

First ASCE Engineering Mechanics Specialty Conference, University of Waterloo, Waterloo, Canada, 26-28 May 1976
*`A programming approach to the solution of the rate problem in elastic, plastic solids'*

Conference on Wave Phenomena: Modern Theory and Applications, University of Toronto, Toronto, Canada, 20-23 June 1983
*`Acceleration waves in isotropic constrained thermoelastic media',*

21st Annual Meeting, Society of Engineering Science, Virginia Polytechnic Institute and State University, USA, 15-17 October 1984
*`Variational inequalities and penalty methods for a class of problems in elasto-plasticity'*
(invited presentation)

Second International Conference on Variational Methods in Engineering, Southampton University, UK, 17-19 July 1985
*`Penalty-finite element approximations of the rate problem in plasticity'*

Sixth Conference on Mathematics of Finite Elements and its Applications, Brunel University, UK, 28 April-1 May 1987
*`Variational and numerical aspects of eigenvalue problems in the stability of fluids'*

Minisymposium on Plasticity, Institute for Mathematics and its Applications, University of Minnesota, USA, 6-10 February 1989
*`Finite strain plasticity'*

Symposium on the Interaction between Mechanics and Applied Mathematics, University of Cape Town, 15-18 January 1990
*`Convexity and the variational approach to problems in elastoplasticity'* (keynote lecture)

Symposium on Free Boundary Problems, Université de Montreal, Canada, 12-21 June 1990:
*`Qualitative problems in elastoplasticity'*

1st European Colloquium on Elliptic and Parabolic Problems, Pont-à-Mousson, France, 17-21 June 1991:
*`Existence of solutions to quasistatic problems in elastoplasticity'*

3rd International Conference on Computational Plasticity, Barcelona, Spain, 6-9 April 1992:
*`Algorithms for the solution of problems in finite-strain plasticity'*

IMACS International Symposium on Mathematical Modelling and Scientific Computing, Bangalore, India, 7-11 December 1992:
*`Stability and convergence of enhanced strain finite element methods'*

3rd World Congress on Computational Mechanics, Chiba, Japan, 1 - 5 August 1994:
*`Further results for isoparametric enhanced strain elements'*

13th Symposium on Finite Element Methods in South Africa (FEMSA), Stellenbosch, South Africa, 17 - 20 January 1995:
Series of Pre-Symposium Lectures: *`Elastoplasticity'*
*`Enhanced strain finite element methods'* (keynote lecture*)*

3rd US National Congress on Computational Mechanics (USNCCM), Dallas, Texas, 12 - 14 June 1995:
Organiser of Special Session on Enhanced Strain Finite Element Methods as part of the Juan C Simo Memorial Minisymposium, at the USNCCM
*`Why do enhanced strain methods work so well?'* (Distinguished Guest Speaker*)*

Conference Internationale sur les Problèmes Variationnels en Mathématiques Appliquées' Kinshasa, Zaire, 21 - 26 August 1995:
*`The Finite Element Method'* (series of invited lectures)

SIAM Annual Meeting, Charlotte, North Carolina, 23 - 26 October 1995:
Co-organiser of Minisymposium (with W Han) on *`Analytical and Computational Studies of Granular Flow Modelling and Elastoplasticity Problems'*

Minisymposium lecture: *`The variational structure of elastoplastic problems'*

Conference on Research Capacity Building at Colleges of Education in Kwazulu-Natal, Springfield College of Education, Durban, 20 - 21 June 1997:
*Research: What's the Point*? (Keynote lecture)

Interdisciplinary Symposium on Advances in Computational Mechanics, Austin, Texas, 13 - 15 January 1997:
*`Some new results in the development of stable and efficient low-order elements'*

IUTAM Symposium on Rheology and Computation, Sydney University, 20 - 25 July 1997:
*`Finite element simulation of flows of fibre suspensions'*

Fourth US National Congress on Computational Mechanics, San Francisco, 6 - 8 August 1997:
*`Alternative integration rules which lead to stable low-order elements'*

Fourth World Congress on Computational Mechanics, Buenos Aires, 29 June - 2 July 1998:
*'Approximation of Non-Newtonian Flows using Finite Elements'*

Meeting on *'Mathematische Analyse von FEM für Probleme in der Mechanik',* Mathematisches Forschungsinstitut Oberwolfach, Germany, 7 - 13 February 1999:
*`Affine-approximate Finite Element Methods'*

Workshop on Computational Plasticity, Kiel, 20 - 24 August 1999:
*'Some theoretical aspects of problems in perfect plasticity'*

13th International Congress on Rheology, Cambridge, UK, 20 - 25 August 2000:
*'Thermodynamic consistency and stability of equations for fibre suspension flows'*

Workshop on Computational Fluid Dynamics, Indian Institute of Technology, Madras (Chennai), India, 11 - 15 January 2000: *'The Mechanics of Fibre Suspension Flows'* (series of invited lectures)

Meeting on *'Mixed Finite Element Methods and Applications'*, Mathematisches Forschungsinstitut Oberwolfach, Germany, 4 – 10 February 2001: *'Some new mixed finite element methods in elasticity'* (by invitation)

2nd European Conference on Computational Mechanics, Cracow, Poland, 26 - 29 June 2001: *'Stable and efficient finite elements for Mindlin-Reissner plates'* (Keynote Lecture)

IUTAM Symposium on Computational Mechanics of Solid Materials at Large Strains, Stuttgart, 20 - 24 August 2001: *'Affine-approximate finite element methods and stabilization techniques in elasticity'* (by invitation)

Fifth World Congress on Computational Mechanics, Vienna, 7 – 12 July 2002: *'Some new mixed finite elements in elasticity'* (Keynote Lecture)

SFB 'Schlusskolloquium' on Deformation and Failure of Metallic and Granular Structures, Seeheim, Germany, 18 – 19 November 2002: *'Some mathematical problems in perfect and softening plasticity'* (by invitation)

Second European Finite Element Fair, Berlin, 4 – 5 June 2004: *Finite element approximations based on the Hu-Washizu formulation in elasticity'*

Fourth European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS), Jyväskylä, Finland, 24 - 28 July 2004: *'Convergence in the incompressible limit of finite element approximations based on the Hu-Washizu formulation in elasticity'*

Meeting on *'Non-standard Finite Element Methods'*, Mathematisches Forschungsinstitut Oberwolfach, Germany, 28 January – 1 February 2005: *'Discontinuous Galerkin methods for variational inequalities arising in plasticity'* (by invitation)

US National Congress on Computational Mechanics, Austin, Texas, 24 – 27 July 2005: *'Discontinuous Galerkin methods in classical and gradient plasticity'*

International Workshop on Direct and Inverse Field Computations in Mechanics, Linz, Austria, 7 – 11 November 2005: *'A Discontinuous Galerkin method for a variational inequality arising in plasticity'* (by invitation)

Sixth World Congress on Computational Mechanics, Los Angeles, 16 – 22 July 2006: *'DG methods for strain gradient plasticity'*

Meeting on 'Analysis and Numerics for Rate-Independent Processes', Mathematisches Forschungsinstitut Oberwolfach, Germany, 25 February – 3 March 2007: *'Well-posedness and approximation of problems In gradient plasticity and related models '* (by invitation)

7th World Congress on Computational Mechanics, Los Angeles, 16 – 22 July 2006: *'DG methods for strain gradient plasticity'*

US National Congress on Computational Mechanics, San Francisco, 22 – 26 July 2007: *'Algorithms for the solution of problems in gradient plasticity'*

8th World Congress on Computational Mechanics, Venice, Italy, 30 June – 4 July 2008: *'Variational and computational aspects of problems in single-crystal gradient plasticity'*

1st African Conference on Computational Mechanics, Sun City, South Africa, 7 – 11 January 2009: *'Variational and computational aspects of problems in single- and polycrystal gradient plasticity'*

***Local conferences.*** I am a regular contributor to the following local conferences: Annual Congresses of the SA Mathematical Society, Annual Symposia of the SA Society for Numerical Mathematics, and SACAM (SA Conferences on Applied Mechanics)

## *Membership of conference committees*

FEMSA (Finite Element Methods in SA) and SACAM (SA Conferences on Applied Mechanics): Member of Organising Committees

Symposium on the Interaction between Mechanics and Applied Mathematics, University of Cape Town, 15-18 January 1990: Member of Organising and Scientific Committees

International Conference on Theoretical, Applied, Computational and Experimental Mechanics, Kharagpur, India, 1 - 5 December 1998: Member of International Advisory Board

GAMM Workshop on Computational Plasticity, Kiel, 20 - 24 August 1999: Co-organiser (with C Carstensen and M Brokate)

European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2000), Barcelona, 11 - 14 September 2000: Member of Scientific Committee

Finite Elements in Fluids, Austin, Texas, April 2000: Member of Scientific Committee

2nd European Conference on Computational Mechanics, Cracow, Poland, 26 - 29 June 2001: Member of International Scientific Committee,

International Conference on Structural Engineering, Mechanics and Computation, Cape Town, South Africa: 2001, 2004, 2007: Member of International Scientific and Technical Advisory Board

First MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, Massachusetts, June 12 - 14, 2001: Scientific Advisory Board Member

First Asian Pacific Congress on Computational Mechanics, Sydney, Australia, 20 – 23 November 2001: Member of International Scientific Committee

5th World Congress on Computational Mechanics (WCCM V), Vienna, Austria, 8 – 12 July 2002: Scientific Board member

Computational Solid and Structural Mechanics, European Congress on Computational Methods in Applied Sciences and Engineering, Jyväskylä, Finland, 24 – 28 July 2004: Scientific Committee member

US-Africa Workshop on Materials and Mechanics, Cape Town, 24 - 28 January 2005: Co-organiser (with R B Tait, A Needleman, and W Obeyejo)

8th US National Congress on Computational Mechanics, Austin, Texas, 24 – 28 July 2005: Scientific Program Committee member

9th International Symposium on Multiscale and Functionally Graded Materials, Hawaii, 15 – 19 October 2006: International Scientific Committee member

IUTAM Symposium on Theoretical, Modelling and Computational Aspects of Inelastic Media, Cape Town, 14 – 18 January 2008: Convenor and Chair of the Scientific Committee

ECCM2010, Fourth European Conference on Computational Mechanics, Paris, 16 – 21 May 2010: International Advisory Board member

## *Editorial and review activities*

**Reviewing activities:**
Applications for evaluation by the National Research Foundation and the National Science Foundation (USA)

Springer-Verlag (New York and Berlin): book manuscripts

Research articles submitted to the journals

*Applied and Numerical Mathematics*

*Archive for Rational Mechanics and Analysis*

*Communications in Numerical Methods in Engineering*
*Computer Methods in Applied Mechanics and Engineering*
*Computers and Structures*
*European Journal of Mechanics: A/Solids*
*Indian Journal of Pure and Applied Mathematics*
*International Journal for Engineering Analysis and Design*
*International Journal of Engineering Science*
*International Journal for Numerical Methods in Engineering*
*International Journal of Plasticity*
*International Journal of Solids and Structures*
*Mathematical Models and Methods in Applied Sciences*
*Numerische Mathematik*
*Numerical Methods for Partial Differential Equations*
*Quarterly of Applied Mathematics*
*The Royal Society of Edinburgh Proceedings A (Mathematics)*
*SIAM Journal on Numerical Analysis*
*Water SA*
*Zentralblatt für Mathematik*

**Membership of Editorial Boards:**
*Acta Academica Solida Sinica*
*Engineering Analysis and Design*
*Computer Methods in Applied Mechanics and Engineering*
*Computers and Structures*
*International Journal for Computational Civil and Structural Engineering (Russia)*
*South African Journal of Science* (membership ended December 2002)
*International Journal of Computational Methods in Engineering Science and Mechanics*
*Trends in Mathematics*