

**South African Association for Theoretical and Applied Mechanics:
National Committee for International Union of Theoretical and Applied Mechanics, IUTAM
ANNUAL REPORT FOR THE PERIOD 1 January 2007 to 31 December 2007**

1. Executive Summary

The Theoretical and Applied Mechanics community includes both academics and industry practitioners in Computational Fluid Dynamics, Finite Element Methods, and Applied Mechanics. It keeps close ties with the Aerospace community. New areas are mesoscale mechanics, Discrete Element Methods, and the increasing use of multiscale, multiphysics computational methods extending to the nanoscale in both biosciences and materials sciences.

Membership of international committees has increased, with a member of IUTAM Working Party 9 on Capacity Building and Education.

A prestigious IUTAM Symposium on “Theoretical, Modelling and Computational Aspects of Inelastic Media” was successfully held in the Cape by Prof Daya Reddy. The national conference SACAM08 will be held in March 2008. 2008 is a General Assembly year for IUTAM and members will attend ICTAM, the International Conference on Theoretical and Applied Mechanics, at which Prof Diane Grayson is an invited speaker in the Education and Capacity Building session.

Headings	Activities completed- January to December 2007		Activities planned- January to December 2008
<p>2. Background & Composition of National Committee</p> <p>3. (Please indicate if any of the members of the committees have previously been capacity building candidates)</p>	<p>The present composition of the IUTAM NC is:</p> <ul style="list-style-type: none"> • Dr I Gledhill (President)[Defence, Peace, Safety and Security, CSIR] • Prof CG du Toit [North-West University](SA Representative at IUTAM General Assembly) • Dr E Sellers [African Explosives, Limited](Treasurer) • Dr M Kaunda [Central University of Technology] 	<ul style="list-style-type: none"> • Dr M Kataka [Natural Resources and the Environment, CSIR](NSTF Representative) • Dr A Malan [University of Pretoria, moved to Defence, Peace, Safety and Security, CSIR] • Prof Graeme Oliver [Cape Peninsula University of Technology](Secretary) 	<p>An election of the SAAM Executive and National Committee is planned for March 2008.</p> <p>An Annual General Meeting is planned during the period 26-30 March 2008.</p>

Headings	Activities completed- January to December 2007	Activities planned- January to December 2008
4. Participation by South Africans in Union activities	<ul style="list-style-type: none"> • Dr Gledhill: member of Working Party 9, Education and Capacity Building • Dr Gledhill: co-chair of special session at International Conference on Theoretical and Applied Mechanics, ICTAM 2008, on Education and Capacity Building 	<ul style="list-style-type: none"> • The IUTAM General Assembly will be attended by Prof CG du Toit and Dr Gledhill.
3.1. Size of local community	<ul style="list-style-type: none"> • Membership stands at <ul style="list-style-type: none"> • Individual members: 139 • Student members (in addition): 68 • Institutional members: 2 • Corporate members: 3 • Membership is known to increase primarily through two mechanisms: <ul style="list-style-type: none"> • the national conference and • personal contact. <p>The community is experiencing a shortage of both new graduates and experienced practitioners, and various initiatives are being considered by different players.</p>	<ul style="list-style-type: none"> • Note: In 2004, the SAAM Executive committee adopted a new membership policy in the interests of reducing the complexity of financial transactions with members; membership is included in the fee of the national conference, so that every delegate is a member. During the intervening years, new members will be added to the membership list at no charge. The costs of membership are covered through the proceeds of the national conference. • Therefore, membership expands primarily in even-numbered years when the SACAM conference is held.
3.2 South Africans serving on Unions or its subsidiary bodies	<ul style="list-style-type: none"> • Prof du Toit: member of General Assembly of IUTAM • Prof du Toit: member of Assemblies of Int Heat Transfer Conferences • Dr Gledhill: member of Working Party 9, Education and Capacity Building • Dr Gledhill: co-chair of special session at International Conference on Theoretical and Applied Mechanics, ICTAM 2008, on Education and Capacity Building • Dr Malan: Co-chair of Africomp 2009 	<ul style="list-style-type: none"> • Continue these activities, especially in Education and Capacity Building • Participate in General Assembly initiative to approve Associate membership for countries which are currently building capacity and may have a small community of professionals, and find it difficult to afford membership fees
3.3 Attendance of International	<ul style="list-style-type: none"> • Prof du Toit: 9th US Nat Congress on Computational Mechanics, SanFrancisco, July 2007 	<ul style="list-style-type: none"> • Prof Diane Grayson is an invited speaker at ICTAM 2008 and will speak

Headings	Activities completed- January to December 2007	Activities planned- January to December 2008
<p>Congresses/Workshops</p> <ul style="list-style-type: none"> • Number of conferences attended • Number of South African delegates • Number of papers presented by South Africans (indicate any special invitations, e.g. keynote/ plenary talks) 	<p>member ISC; co-chairman of mini-symposium on teaching of finite elements at undergraduate level; presented a paper; attendees from SA = 3</p> <ul style="list-style-type: none"> • Prof du Toit: 4th International Conference of Applied Mathematics and Computing, Ploviv, August 2007; presented an invited paper; attendees from SA =1 	<p>on “A whirlwind tour of research findings on student difficulties in mechanics and a few strategies to address them”.</p>
<p>3.4 Capacity Building with regard to Membership of National Committee and involvement of young scientists in International Meetings</p>	<ul style="list-style-type: none"> • Dr Kaunda, Dr Kataka and Dr Gledhill form a subcommittee on Capacity Building 	<ul style="list-style-type: none"> • Call for candidates to be issued at SA Conference on Computational and Applied Mechanics 2008
<p>3.5 Organisation of Union related Conferences in South Africa</p>	<ul style="list-style-type: none"> • An IUTAM Symposium was accepted for January 2008 for Cape Town. • Planning has proceeded on Africomp 2009. • The national conference SACAM is held every two years. This conference is the primary forum for researchers and practitioners in Computational Fluid Dynamics and Structural Analysis in South Africa. • This biennial conference is aimed at bringing together scientists, engineers and applied mathematicians from academia and the industry in order to encourage scientific interchange of ideas in applied mechanics. The participation of postgraduate students is particularly encouraged. 	<ul style="list-style-type: none"> • An IUTAM Symposium entitled “Theoretical, Modelling and Computational Aspects of Inelastic Media”, was held in Rondebosch in 2008 (appendices B, C), has been organised by Prof Daya Reddy. This is the first IUTAM Symposium to be held in South Africa and the second in Africa (the first was some time ago in Morocco), and is a high prestige event. • See Appendix B. • Prof Arnaud Malan’s proposal to IACM (the International Association of Computational Mechanics) has been accepted for ECCOMAS-Africa, and this

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		<p>world conference will be held in South Africa in 2009 under SAAM/IUTMA aegis, entitled "Africomp". See Appendix C.</p> <ul style="list-style-type: none"> • SACAM08 will be held in March 2008 in Cape Town, under the chairmanship of Prof Graeme Oliver of the Cape Peninsula University of Technology. See Appendix A.
<p>3.6 Contribution by members to key documents and publications (please indicate why they are regarded as key)</p>	<p>The proceedings of the SA Conference on Theoretical and Applied Mechanics, 2006 (SACAM06) were issued. The proceedings CD carries the ISBN registration 1-919966-01-3 awarded by the National Library of South Africa. It has been submitted to the Elsevier Engineering Index (EI) and the Thompson Index to Scientific and Technical Proceedings (ISTP) with the request for inclusion in the searchable and internet accessible data basis.</p> <p>The editor is Prof Thomas Harms of Stellenbosch University.</p> <p>This is the primary record of research work in Computational Fluid Dynamics, Finite Element Methods, and Applied Mechanics, in South Africa.</p>	
<p>3.7 Report back on recommendations made during the in depth review (indicate what were the recommendations and what progress has been made to attend to them.)</p>	<ul style="list-style-type: none"> • n/a 	<ul style="list-style-type: none"> • Points from the review are part of the strategy.

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4. Value to the Community and Benefit to South Africa	<p>Two primary national roles are played by SAAM:</p> <ul style="list-style-type: none"> • through the national conference, and • through IUTAM linkage to the SA community. <p>A summary of major points of value follows:</p> <ul style="list-style-type: none"> • the need for <u>national conference</u> or forum has specifically been recognised • <u>formal and informal interaction</u> within the community; face-to-face communications, the introduction of young practitioners and professionals to the community, the opportunity for the presentation of first papers by graduate students, the potential for collaboration • <u>geographically separated groups</u> are brought together • the national conference <u>links the fields</u> of Computational Fluid Dynamics and Finite Element methods, with a strong additional emphasis on experimental applied mechanics, and other topics • IUTAM provides the <u>right subject coverage</u> to bring together these disciplines and identify emerging areas • there is increasing communication between <u>industry</u>, companies, the consulting world, and user groups on one hand and the academic world, new developments, and the cutting edge of science on the other; professional associations and meetings provide neutral ground and stimulating forums • graduates need help in making the contacts that will enable them to finding <u>jobs</u> that meet their aspirations, or risk being lost to other countries and markets • it becomes increasingly clear that many members emerging into the working world need the simple personal <u>encouragement</u> that a professional association provides • the NC takes to heart the special role that National Committees have to play in <u>overcoming the legacies of</u> 	SACAM 08 is scheduled for March 2008.

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	<p><u>discrimination</u> in South Africa, and SAAM, in particular, has a head start and some success in this role</p> <ul style="list-style-type: none"> • South Africa also has potential divisions between the <u>generations</u>, and SAAM is making particular efforts in this direction in recruiting and involving student members and young professionals • <u>IUTAM</u> is playing an increasing role in Africa, particularly in offering opportunities for real capacity building, and in bringing eminent scientists and engineers onto African ground. 	
<p>5. Public Society Interfaces and Outreach Programmes – self initiated or facilitated by ICSU</p>	<ul style="list-style-type: none"> • <u>SAAM Website</u> • The SAAM website, www.samechanics.co.za, communicates the activities of SAAM as well as other relevant information to the mechanics community in South Africa. • SACAM08 details and report are found on the website. • The website is currently maintained by the SAAM Executive Committee. 	<ul style="list-style-type: none"> • The Executive committee will continue to maintain and upgrade the website. • Africom is linked to the website.
<p>6. Research Highlights/ New Initiatives in South Africa (indicate what benefits will these bring for SA)</p>	<p><u>Research highlights:</u> Rising SA use of Discrete Element Methods; interest in Mesoscale phenomena; increasing use of computational methods in both biosciences and materials sciences.</p> <p><u>“Fluxion”</u> During 2006 a grant programme was initiated by the Department of Defence in computational methods for fluids. The schemes provide attractive grants for 4th years and postgraduates. The programme has produced a strategy covering the scope of suitable research projects, and a number of SAAM members contributed to this strategy. Six 4th year engineering students and one Master’s students received grants, and three startup grants were awarded to</p>	<ul style="list-style-type: none"> • Three Masters grants will be provided by Fluxion in 2008. • Several SAAM members have made project proposals to CHPC.

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	<p>SA universities.</p> <p><u>CHPC</u> The Centre for High Performance Computing has formed a Special Interest Group in Computational Mechanics. The SIG is co-chaired Dr Gledhill and Dr Malan. The SIG has produced a Research Strategy, to which many SAAM members have contributed, and a SIG meeting was held in December 2007. An interesting aspect of this meeting was the attendance of researchers interested in Computational Electromagnetics.</p>	
<p>7. Science Education (Any activities involving teachers, students, school curriculum development, graduate student development)</p>	<p>See project Fluxion above.</p>	<ul style="list-style-type: none"> • The next International Congress on Theoretical and Applied Mechanics (ICTAM) will be in 2008 in Adelaide, Australia. Dr Gledhill has been asked to co-chair the Pre-nominated Session on Education and Capacity Building with Prof Herakovitz, Virginia. • Prof Diane Grayson is an invited speaker at ICTAM 2008 .
<p>8. Financial assistance received by South Africans direct from ICSU bodies during 2007</p>		<ul style="list-style-type: none"> • Proposals will be submitted in 2008, including one for Prof Grayson.

SACAM 2008

Sixth

South African Conference
on

Computational and Applied Mechanics

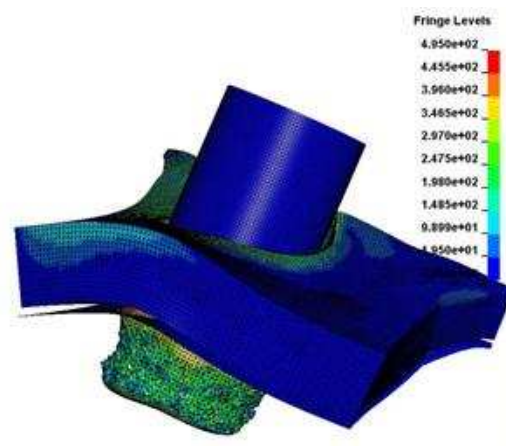
26 - 28 March
BOE Building
V&A Waterfront
Cape Town, South Africa

SACAM IN BRIEF

The South African Conference on Applied Mechanics (SACAM) is held every two years as a forum for presenting the latest developments in all branches of applied mechanics. This is the sixth in a series of successful conferences that have been held in South Africa. The past SACAM conferences attracted both local and international participants and have proven to be excellent forums for the discussion of latest developments in applied mechanics. SACAM08 will follow in this tradition, and welcomes the participation of delegates from all parts of the world. It is aimed at bringing together scientists, engineers and applied mathematicians from academia and the industry in order to encourage scientific interchange of ideas in applied mechanics. The participation of postgraduate students is especially welcome.

CONFERENCE TOPICS

- Computational Methods in Mechanics.
- Mechanics of Vibrations.
- Mechanics of Composites.
- Computational Fluid Dynamics.
- Education in Applied Mechanics
- Stochastic Mechanics
- Structural Mechanics
- Fluid Mechanics
- Soil and Rock Mechanics
- Micro-scale Mechanics
- Solid Mechanics
- Structural Dynamics
- Aerodynamics
- Thermodynamics and Heat Transfer
- Nano-scale Mechanics



CONFERENCE LANGUAGE

The conference language is English and all papers should be prepared in English. Translation services will not be provided.

CALL FOR PAPERS

Papers in the related fields are invited from delegates from South Africa and all parts of the world. Prospective authors of technical papers should submit 600-word abstracts by 15 October 2007. Abstracts should be submitted electronically in text, Microsoft Word or PDF format to oliverg@cput.ac.za and the mail subject should start with SACAM08.

Abstracts will be reviewed and authors will be notified of the decision on their abstracts by 15 November

2007. Eight-page formatted manuscripts will be due by 14 January 2008. The format is available [here](#). All accepted peer-reviewed papers will be published in the conference proceedings and made available to all delegates at the conference. It is understood that the papers will be presented by one of the authors of the paper.

IMPORTANT DATES

15 October 2007	Abstracts (1 page)
15 November 2007	Notification of acceptance and instructions for authors
14 December 2007	Second announcement and registration information
14 January 2008	Submission of 8-page manuscripts

SCIENTIFIC and ADVISORY COMMITTEE

Prof BD Reddy, Director, CERECAM, University of Cape Town

Prof R Owen, University of Swansea, Wales

Prof M Kleiber, Institute of Fundamental Technological Research, Polish Academy of Sciences

Prof Heping Xie, Sichuan University, China

Prof. Zhiming Ye, Shanghai University, China

Prof B Skews, University of Witwatersrand

Prof P Dluzewski, Institute of Fundamental Technological Research, Polish Academy of Sciences

Prof Yapu Zhao, Institute of Mechanics, Chinese Academy of Sciences

Prof CG du Toit, North-West University

Prof J Ronda, AGH University of Science and Technology, Krakow

Prof. J S Yang, University of Nebraska

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ORGANISING COMMITTEE

- o Prof. G J Oliver, Cape Peninsula University of Technology - oliverg@cput.ac.za*
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- o Dr. O Philander, Cape Peninsula University of Technology - philandero@cput.ac.za

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IMPORTANT DATES

	Before 15th December 2007	After 15th December 2007
<i>SAAM members</i>	R2400	R2800
<i>Non-members</i>	R2800	R3200
<i>Registered students</i>	R1200	R1600

The conference fee includes entry to the conference banquet. Further information with respect to accommodation, especially for student attendees, will be forthcoming. Note that US\$1 ½ ZAR7.0

SOCIAL PROGRAMME

A social programme for delegates will be arranged, including a reception and a banquet at a local place of interest, as well as a social programme for accompanying persons.

ACCOMMODATION

Block reservations at preference rates will be arranged by the organisers. Detailed information will be available on the SAAM conference site, on the link [Accommodation](#).

LOCATION



SACAM08 will be held in the BOE Building, V&A Waterfront in the Western Cape region of South Africa, from 26 to 28 March 2008. The Western Cape, with Cape Town as its hub, is one of the major international tourist destinations, offering a variety of attractions, which include a vibrant city and waterfront areas, the beautiful winelands of Stellenbosch and Franschhoek, a number of beautiful beaches and mountain ranges, heritage sites such as Robben Island, and more. Trips can be arranged at the Clocktower precinct adjacent to the conference venue including game viewing day trips.

Modelling of the behaviour of inelastic media continues to present a compelling range of theoretical and computational challenges. A key example is the set of advances over the last fifteen years in modelling the behaviour of inelastic materials at the meso-scale. Particularly strain gradient theories have constituted a major advance in capturing more faithfully plastic behaviour at the meso- and micro-scales.

These developments have in turn spawned new avenues of mathematical and computational research. The new constitutive theories have lead to variational and other formulations that are generally more complex, and which are accompanied by significant challenges of a computational nature.

The aim of this symposium is to provide a forum for the interaction of researchers in modern theoretical and computational developments in inelasticity. Foci of the symposium will include theoretical, modelling and computational aspects of plasticity, viscoplasticity, and damage, at various scales. It is envisaged that there will be a spread of complementary contributions addressing

- constitutive theories, the calibration of material models by simulation of experiments, and solution of inverse problem for parameter identification;
- mathematical issues pertaining to variational formulations, specification of boundary conditions, and well-posedness; and
- finite element and related computational approaches, together with associated algorithms.

Scientific Committee

Daya Reddy (Chair)	Cape Town	daya.reddy@uct.ac.za
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Roger Owen	Swansea	d.r.j.owen@swansea.ac.uk

Organising Committee

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Andrew McBride	Andrew.Mcbride@uct.ac.za
Olivia Goodhind	Olivia.Goodhind@uct.ac.za

List of delegates as of 12th November 2007

Surname	Title	Name	Institution
Acharya	Associate Professor	Amit	Carnegie Mellon University
Alber	Professor	H.-D	Darmstadt University
Armero	Professor	Francisco	U C Berkeley
Balden	Mr	Victor	BISRU, University of Cape Town
Benallal	Professor	Ahmed	Ecole Normal Superieure de Cachan
Benzerga	Professor	Amine	Texas A&M University
Bigoni	Professor	Davide	Universita" di Trento
Bolzon	Professor	Gabriella	Politecnico di Milano
Bonorchis	Mr	Dean	University of Cape Town
Caddemi	Professor	Salvatore	Universita degli Studi di Catania
Carstensen	Professor Dr.	Carsten	Humboldt-Universitat zu Berlin
Cleary	Dr	Paul	CSIRO
Cloete	Mr	Trevor	University of Cape Town
De Souza Neto	Dr	Eduardo	University of Wales, Swansea
Deshpande	Professor	Vikram	University of California
Ebobisse	Dr	Francois	University of Cape Town
Garikipati	Professor	Krishna	University of Michigan
Geers	Professor	Marc	Eindhoven University of Technology
Govender	Mr	Reuben	University of Cape Town
Gurtin	Professor	Morton E	Carnegie Mellon University
Hackl	Professor	Klaus	Ruhr University Bochum
Hanyga	Professor	Andrzej	University of Bergen
Hjjaj	Professor	Mohammed	INSA de Rennes

Ismail	Mr	Ernesto	University of Cape Town
Karagiozova	Dr	Dora	University Of Cape Town
Kaunda	Professor	M	Central University of Technology
Kwofie	Dr	Samuel	Nkrumah - University of Science & Technology
Langdon	Dr	Genevieve	BISRU, University of Cape Town
Lew	Professor	Adrian J	Stanford University
Llorca	Professor	Javier	Catedratico de Universidad
Maier	Professor	Giulio	Politecnio di Milano
Marotti de Sciarra	Professor	Francesco	University of Naples
Matthies	Professor	Hermann G	Institute of Scientific Computing
McBride	Mr	Andrew	University of Cape Town
Miehe	Professor	Christian	University of Stuttgart
Mielke	Professor	Alexander	WIAS
Moës	Professor	Nicolas	Institut GeM-UMR CNRS 6183
Mohr	Dr	R.M.	University of Kaiserslautern
Needleman	Professor	Alan	Brown University
Neff	Dr	Patrizio	Technische Universitaet Darmstadt
Nesenenko	Professor	Sergiy	TU-Darmstadt
Nurick	Professor	Gerald	University of Cape Town
Oerder	Dr	Stacey	University of Cape Town
Oliver	Professor	Graeme	Cape Peninsula University of Technology
Oliver	Professor	Xavier	Technical University of Catalonia (UPC)
Owen	Professor	DRJ	University of Wales, Swansea
Peric	Professor	D	Swansea University
Ponter	Professor	ARS	University of Leicester
Reddy	Professor	Daya	University of Cape Town
Reese	Professor	Stefanie	Institute of Solid Mechanics
Shrivastava	Professor	Suresh	McGill University
Soboyejo	Professor	Winston	Princeton University
Svendsen	Professor	R	University of Dortmund
Tvergaard	Professor	Viggo	Technical University of Denmark
Weichert	Professor	Dieter	Aachen University
Wells	Professor	Garth N	Delft University of Technology
Wieners	Prof. Dr.	Christian	Universitat Karlsruhe
Wohlmuth	Professor	Barbara	University of Stuttgart
Wriggers	Professor	Peter	Institut fur Baumechanik und Numerische Mechanik, Universitat Hannover

PROGRAMME

SUNDAY 13 JANUARY

16.00 – 18.00	Registration, Commodore Hotel
18.00 – 20.00	Welcome reception, Commodore Hotel

Registration on Monday 14 January and all technical sessions will be held
at the BOE Conference Centre, Waterfront

MONDAY 14 JANUARY

07.45 – 08.40	Registration
08.45 – 09.15	<p>Welcome and opening</p> <p><i>Daya Reddy</i></p> <p>The legacy of John Martin</p>
09.15 – 09.45	<p>Shakedown and limit analysis</p> <p><i>Alan Ponter</i></p> <p>Direct evaluation of limits in plasticity and creep deformation</p>
09.45 – 10.15	<p><i>D. Weichert, M Hachemi, S Mouhtamid and An Danh Nguyen</i></p> <p style="text-align: center;">On recent progress in shakedown analysis and applications to large-scale problems</p>
10.15 – 10.45	

	Coffee break
10.45 – 11.15	Material characterization <i>Viggo Tvergaard and Alan Needleman</i> Effect of material parameters in the Izod test for polymers
11.15 – 11.45	<i>Giulio Maier, M Bocciarelli, G Bolzon and E Chiarullo</i> On the assessment of inelastic properties in metal structures by indentation tests and inverse analyses
11.45 – 12.15	<i>Wole Soboyejo</i> Bio-inspired design of dental multilayers: modeling and experiments
12.15 – 13.15	Lunch
13.15 – 13.45	Computational dynamics <i>Francisco Armero</i> Energy-momentum algorithms for the nonlinear dynamics of elastoplastic solids
13.45 – 14.15	<i>Mohammed Hjiaj</i>

<p>14.15 – 14.45</p>	<p>A variational stress update algorithm for the nonassociated Drucker-Prager</p> <p><i>Modify A E Kaunda</i></p> <p>Internal variable formulations of problems in elastoplastic dynamics</p>
<p>14.45 – 15.15</p>	<p><i>Rouven Mohr, Andreas Menzel, and Paul Steinmann</i></p> <p>Time-FE Methods for the nonlinear dynamics of inelastic media</p>
<p>15.15 – 15.45</p>	<p>Coffee break</p>
<p>15.45 – 16.15</p>	<p>Computational aspects I</p> <p><i>Paul Cleary, Raj Das and Mahesh Prakash</i></p> <p>The potential for SPH modeling of solid deformation and fracture</p>
<p>16.15 – 16.45</p>	<p><i>Djordje Perić, E A de Souza Neto, W Dettmer, D D Somer and D C D Speirs</i></p> <p>On computational techniques for multi-scale analysis of inelastic solids</p>
<p>TUESDAY 15 JANUARY</p>	

<p>08.45 – 09.15</p> <p>09.15 – 09.45</p> <p>09.45 – 10.15</p>	<p>Discontinuous Galerkin methods</p> <p><i>Adrian Lew</i></p> <p>Some applications of discontinuous Galerkin methods in solid mechanics</p> <p><i>Krishna Garikipati and J. Ostien</i></p> <p>A discontinuous Galerkin formulation for an incompatibility-based strain gradient plasticity theory</p> <p><i>Andrew McBride and Daya Reddy</i></p> <p>A discontinuous Galerkin formulation for gradient plasticity at finite strains</p>
<p>10.15 – 10.45</p>	<p>Coffee break</p>
<p>10.45 – 11.15</p> <p>11.15 – 11.45</p>	<p>Experimental and computational aspects I</p> <p><i>Steeve Chung Kim Yuen and Gerald N Nurick</i></p> <p>The response of “large” square tubes (width/thickness ratio>45) to opposite lateral blast loads followed by dynamic axial load</p> <p><i>Dora Karagiozova, Genevieve S Langdon, and Gerald N Nurick</i></p> <p>Modelling the behaviour of fibre–metal laminates subjected to localised blast loading</p>

<p>11.45 – 12.15</p> <p>12.15 – 12.45</p>	<p><i>Suresh Shrivastava, Bing Liu, and Kamal Berrada</i></p> <p>Plastic buckling and post-buckling of simply supported rectangular plates - FE simulation of experiments</p> <p><i>Ahmed Benallal</i></p> <p>Experimental, theoretical and numerical aspects of dynamic strain ageing and related instabilities</p>
<p>12.45 – 14.15</p>	<p>Lunch</p>
<p>14.15 – 14.45</p> <p>14.45 – 15.15</p>	<p>Dislocation-based models</p> <p><i>Vladislav Levkovitch, Bob Svendsen</i></p> <p>Dislocation-structure- and texture-based modeling of induced anisotropy in sheet metals subject to complex strain-path changes</p> <p><i>M Wallin, M Ristinmaa, W A Curtin, and Alan Needleman</i></p> <p>Coupling discrete dislocation to continuum crystal plasticity</p>
	<p>Coffee break</p>

15.15 – 15.45	
15.45 – 16.15	<p>Modelling and computation of anisotropy</p> <p><i>Stefanie Reese, Michael Pietryga, Marco Schwarz, and Ivaylo Vladimirov</i></p> <p>Elastic and inelastic anisotropy of metals in forming processes: modelling and finite element technology</p> <p><i>Graeme Oliver</i></p>
16.15 -- 16.45	<p>A dual discretization approach to incorporate mesoscopic scale phenomena in a macroscopic constitutive model using the effective local anisotropy</p>
16.45 -- 17.15	<p><i>Muravleva Ekaterina and Muravleva Larisa</i></p> <p>On Some Composite failure criteria based on homogenization method</p>
WEDNESDAY 16 JANUARY	
08.45 – 09.15	<p>Gradient theories</p> <p><i>Morton E. Gurtin</i></p> <p>Gradient single-crystal plasticity with backstress due to Burgers-vector induced dislocation densities and dissipation due to slip-rate gradients</p> <p><i>Francois Ebobisse, Andrew McBride and Daya Reddy</i></p>
09.15 – 09.45	<p>On the mathematical formulation of a model of strain gradient plasticity</p>

09.45 – 10.15	<p><i>Christian Miehe</i></p> <p>Variational principles for dissipative solids in physical and material space: implications to plasticity and fracture</p>
10.15 – 10.45	<p>Coffee break</p>
10.45 – 11.15	<p>Viscoelasticity and porous media</p> <p><i>Hans-Dieter Alber</i></p> <p>Justification of homogenized models of viscoelastic material behavior and regularity</p>
11.15 – 11.45	<p><i>Andrzej Hanyga and Malgorzata Sredynska</i></p> <p>Hamiltonian theory of viscoelasticity</p>
11.45 – 12.15	<p><i>Garth N Wells, Tim C Hooijkaas, and Xuming Shan</i></p> <p>Aspects of steam injection in porous media</p>
12.15 – 17.00	<p>Free afternoon: excursions, etc.</p>
19.00	<p>Dinner</p>

THURSDAY 17 JANUARY	
	Multiscale models
09.00 – 09.30	<i>Peter Wriggers</i> Material characterization by multi-scale simulations
09.30 – 10.00	<i>Stefan Löhnert</i> Multiscale methods for fracturing solids
10.00 – 10.30	<i>Marc G D. Geers, V G Kouznetsova, and A Balmachnov</i> Inelastic effects in the deformation behaviour of transforming metastable materials
10.30 – 11.00	Coffee break
	Damage and fracture
11.00 – 11.30	<i>Amine A Benzerga</i> Three-dimensional microstructural aspects of ductile fracture: experiments and modeling

11.30 – 12.00	<p><i>Nicolas Moës, Nicolas Chevaugeon and Frédéric Dufour</i></p> <p>A regularized brittle damage model solved by a level set technique: a new tool to handle topological changes in crack growth</p>
12.00 – 12.30	<p>Javier Llorca</p> <p>Void coalescence in model materials: experimental results and numerical simulations</p>
12.30 – 13.30	<p>Lunch</p>
13.30 – 14.00	<p>Simulation of microstructure</p> <p><i>Carsten Carstensen</i></p> <p>Towards effective simulation of effective elastoplastic evolution</p>
14.00 – 14.30	<p><i>Klaus Hackl</i></p> <p>Relaxed potentials and evolution equations for inelastic microstructures</p>
14.30 – 15.00	<p><i>Alexander Mielke</i></p>

	Numerical approaches to rate-independent material models
15.00 – 15.30	Coffee break
15.30 – 16.00	<p>Gradient, non-local theories</p> <p><i>Patrizio Neff</i></p> <p>Notes on strain gradient plasticity: finite strain covariant modelling and global existence in the infinitesimal rate-independent case</p>
16.00 – 16.30	<p><i>Amit Acharya</i></p> <p>Geometric internal variable, an austere free energy, and a global second law: a reliable crank for developing gradient field theories with microstructure?</p>
16.30 – 17.00	<p>Francesco Marotti de Sciarra</p> <p>Stability and convergence for elastoplasticity of integral-type</p>

FRIDAY 18 JANUARY	
	Experimental and computational aspects II
08.45 – 09.15	<p><i>S. Kwofie</i></p> <p>Modeling and simulation of residual stress relief due to mechanical vibration</p>

09.15 – 09.45	<p><i>Salvatore Caddemi and Ivo Caliò</i></p> <p>Generalised functions for modelling singularities: direct and inverse problems</p>
09.45 – 10.15	Coffee break
10.15 – 10.45	<p>Computational aspects II</p> <p><i>Christian Wieners</i></p> <p>Efficient solution methods for incremental plasticity</p>
10.45 – 11.15	<p><i>Barbara Wohlmuth and Stefan Brunssen</i></p> <p>A dynamic, overlapping domain decomposition method with an elastoplastic coupling algorithm for the simulation of forming processes</p>
11.15 – 11.45	<p><i>Hermann G Matthies and Bojana Rosic</i></p> <p>Inelastic media under uncertainty: stochastic models and computational approaches</p>
11.45 – 12.00	Closure

Appendix C.
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