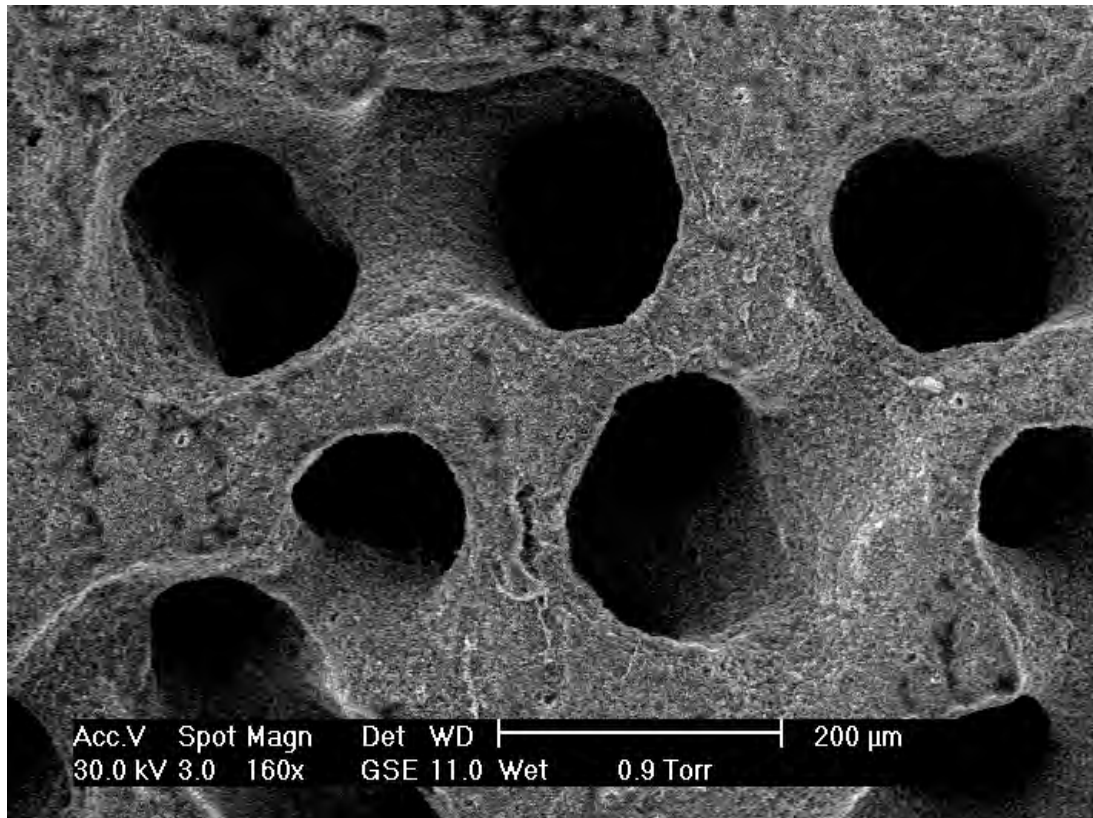




NEWSBULLETIN

OF THE AUSTRALASIAN CERAMIC SOCIETY

VOLUME 19, NUMBER 2, September 2004



OFFICIAL PUBLICATION OF THE AUSTRALASIAN CERAMIC SOCIETY

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Subscriptions should be forwarded to the
National Secretariat

COVER PHOTO

Coral showing macro-pores

Courtesy of Prof. Besim Ben-Nissan
with acknowledgements to Dr. R.
Wuhrer (UTS) and Dr. J. Russell
(UNSW).

PRINTING

The *Newsbulletin of the Australian Ceramic Society* is printed by
Bright Print

MESSAGE FROM THE OUTGOING PRESIDENT

Welcome to your Ceramics Society news bulletin.

I will be moving on from the position of President at the end of August, so by the time you receive this bulletin, I expect that the new Federal Council structure will be in place. I am sure you will continue to support them, as they look at ways to promote the Society for a long future.

Thanks to all the members of the current Federal Council who have contributed to the leadership of the Society.

My special thanks, and the appreciation I am sure of all members, goes to Dan Perera, who is stepping down as Federal Secretary. Dan has very clearly been the guiding hand for the Society's administration for many years, and his thorough, diplomatic, wide ranging influence and advice should not be underestimated.

I urge members to support our principal event, the biannual Austceram 2004, being held in Melbourne on Nov 29th to Dec 1st. With the attendance of overseas delegates and speakers,

this event is the best opportunity to interact with your partners in ceramics, covering academic and commercial fields.

The Federal Council has approved an increase in funding for Students to attend conferences, and we actively encourage students to join, and also gain the benefits from our scholarship fund. It is regrettable, and surprising, that we received no applications for the Joint ACS/JCS award, a substantial funding support for a ceramicist to visit Japan. If you have interest in this, then please check the details on the Society website www.austceram.com, or contact your local branch.

Cathy Inglis has been a great editor for the news bulletin. I encourage your support for the Bulletin by providing news content, photos or papers to the Editor.

Thanks also to the Journal editors, Lou and Besim, I also remind members of the opportunity the Journal provides in publishing your work.

Viv Lawrie



www.azom.com

AZoM's Mission

The aim of AZoM is to become the primary materials information source for the engineering and design community worldwide. It also aims to be the primary publicist of news, views and developments within the materials science community. However, unlike many other materials related organisations AZoM is totally focussed on the needs of the end users of materials. To achieve this aim, all of the educational, informative and news content on AZoM is easy to access and search and is provided on a free of charge, no subscription, no charge per article, totally free basis.

BRANCH NEWS

VICTORIA BRANCH REPORT

June: a site visit to Alcoa's Point Henry aluminium smelter, organised by Nigel Stone. This was well attended, 18 members making the trek to Geelong. Given the enthusiasm of the comments that were reported back afterwards, I think this was one of the most successful visits ever made by the society.

July: a meeting at ARRB Transport Research Ltd, where a presentation was made on concrete by Dr Ahmad Shayan.

August: an interesting site visit was made to CSR Monier Wunderlich, hosted by Michael Dorrough. We had a fine tour of the plant and heard how hard it was to make money when competing with iron and concrete. Michael wished he was making floor tiles where the \$/kg is far higher.

September: a visit to MiniFab (Australia), where the members learned from Erol Harvey about micro and nano technology and how lasers are used in nano manufacturing.

November: the golf day, once again organised by Stephen Zsembery, at Ivanhoe Golf Club. Again everyone went home with a prize thanks to the generosity of the sponsors, although hardly anyone deserved one given the standard of most of the golf.

December: Christmas Dinner held at The Potters Cottage restaurant. We had drinks in the gallery and admired the works of art before enjoying a first class meal in fine company.

Unfortunately there have been no meetings held in 2004 until today's AGM. However, under Martin's stewardship, I am sure the society will

be reinvigorated. A talk is scheduled for October to be given by Graham Sussex on a topic connected with his specialty of corrosion science. Finally, thank you to all the other hard working members of the committee and please help Martin Stuart to make a great success of his year as President.

WESTERN AUSTRALIAN BRANCH REPORT

The June Branch meeting was a tour of the facilities at Concord Engineering. Ten members participated and were given a great insight by member Cathy Hewitt as to the company's manufacturing facilities for its SiConTM silicon carbide product, and polyurethane components used in the mining industry. Following the tour, the company kindly put on some drinks and nibbles. There are sponsorship opportunities and chances to display wares at the accompanying trade exhibition. Please contact Nigel Stone for further details.

The Branch was addressed by Geoffrey Carter of Doral Specialty Chemicals on Tuesday 3rd August at the School of Physical Sciences at Curtin University of Technology. The topic of Geoffrey's talk was "Development of Yttria Stabilised Zirconia for the Solid Oxide Fuel Cell Market by Doral Specialty Chemicals". Geoffrey is Senior Materials Scientist at Doral Specialty Chemicals. Doral Specialty Chemicals (DSC) previously Millennium Performance Chemicals (MPC) located at Rockingham WA has been producing high purity zirconia for a large number of applications for a number of years. In 2001 a new development cycle was initiated to develop super high quality yttria stabilised zirconia suitable for use in the Solid Oxide Fuel Cell (SOFC) market. Geoffrey's talk will in broad brush strokes outline some of the requirements for SOFC's as well as discussing in some detail

the results of some of the research conducted Doral's front running product that is unique in the market place.

The Branch will be addressed by Nigel Kirby on applications of Synchrotron Radiation on Tuesday 5th October.

Following a very successful evening in 2003, the winner of the WA Branch ACS Prize for 2004 will be selected from presentations given by the top two students from each of the Materials and Mechanical Engineering Groups at Curtin University in December.

Tuesday 3rd August. Talk by Geoff Carter on activities/advancements at Millennium Chemicals.

October - Talk by Nigel Kirby on applications of Synchrotron Radiation. Date and time to be arranged.

Wednesday 24th November. Following a very successful evening in 2003, this format of selection of the WA Branch ACS Prize winner will be repeated in 2004.

Friday 10th December. Branch Christmas party.

David Phillips
WA Branch Secretary

NSW BRANCH REPORT

The NSW Branch August function was a technical seminar by Associate Professor Besim Ben-Nissan from the University of Technology, Sydney. Besim presented the current trends in bioceramics research including the current bioceramics in orthopaedics, nano bioceramics, the replacement of bone and biomimetics that emulate nature's biological processes. An excerpt of this seminar is included in this Bulletin.

The October Branch function will be a plant tour of the National Ceramic Industries Tile Manufacturing Plant at Rutherford.

Cathy Inglis
NSW Branch President

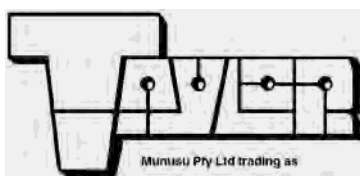
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CURRENT TRENDS IN BIOCERAMICS RESEARCH

ASSOCIATE PROFESSOR BESIM BEN-NISSAN
UNIVERSITY OF TECHNOLOGY, SYDNEY

- Current bioceramics in orthopaedics
- Nano bioceramics: what will they think of next?
- Are we capable of replacing bone?
- Bioceramics and biomimetics: can we emulate nature's biological processes?

The following short news article covers the topic of the coral conversion, which was presented in UNSW, Queensland University of Technology, University of Abo in Turku, Finland and Porto, Portugal during 2003 and our last AGM meeting at ANSTO.

FROM CORAL TO BONE

A unique method of strengthening bone graft material has enormous potential for the fastest-growing market in the medical and health-care sphere, according to the man at the centre of the research.

Associate Professor Besim Ben-Nissan, from the University of Technology, Sydney (UTS), heads an international team, which has developed this new technique of strengthening processed coral to replace fractured or missing bones in the human body. This advance has far-reaching applications and represents a new generation of implant materials, says Professor Ben-Nissan, from the Department of Chemistry, Materials and Forensic Science at UTS.

“We are very excited about it,” he says. “The potential is enormous as this new material can be used for implants and bone grafts in weight-bearing parts of the body, and also in the treatment of such conditions as arthritis and osteo-arthritis, which cost the Australian community alone billions of dollars a year.” Processed coral converted to calcium phosphate is already widely used for medical implants, including bone grafting, orthopaedic implants and artificial eye prostheses. Primarily composed of calcium carbonate, coral is the only natural material in the world that has a similar pore structure to human bones. Through a hydrothermal exchange process, the coral structure can be converted to calcium phosphate with the resultant product, carbonate hydroxyapatite (CHAp), biocompatible with human bone and therefore ideal for helping victims of operations, bone cancer, accidents etc.

At present the most widely used implant material is known commercially as Coralline Hydroxyapatite (HAp). Due to an incomplete conversion process, however, this product has structural weaknesses, making it unsuitable for load-bearing areas of the body unless it can be used with metallic plates, pins, cages etc.

With the help of an ARC grant Professor Ben-Nissan and his co-researchers have succeeded in devising a new method of increasing the strength and durability of the processed coral material by a staggering 120 per cent. The new process involves two steps – firstly completely converting the coral to pure calcium phosphate (hydroxyapatite), then coating the material with a microscopic layer of a substance called Sol-

Gel derived HAp, to cover the coralline micro and nanopores and so significantly reduce any chance of cracks or breakages in the implants.

The international team that has worked with Professor Ben-Nissan over the past few years on this project includes marine biologist Professor Razi Vago of Ben-Gurion University in Israel; Associate Professor William Walsh of the Prince of Wales Hospital in Sydney; ophthalmologist Dr Robert Max Conway of the Sydney Eye Hospital; his brother, maxillofacial surgeon Dr Richard Conway of Westmead Hospital, Sydney; and Adriyan Milev, Douglas Green, Cameron Chai and Dr Kamali Kannangara from the UTS' Department of Chemistry, Materials and Forensic Science.

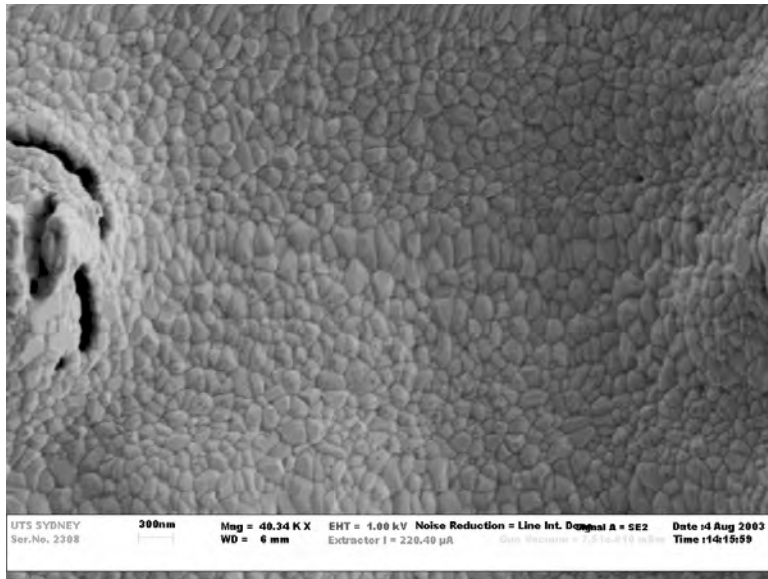


Figure 1. Enlarged surface (the spine) of the coral showing nano and micropores

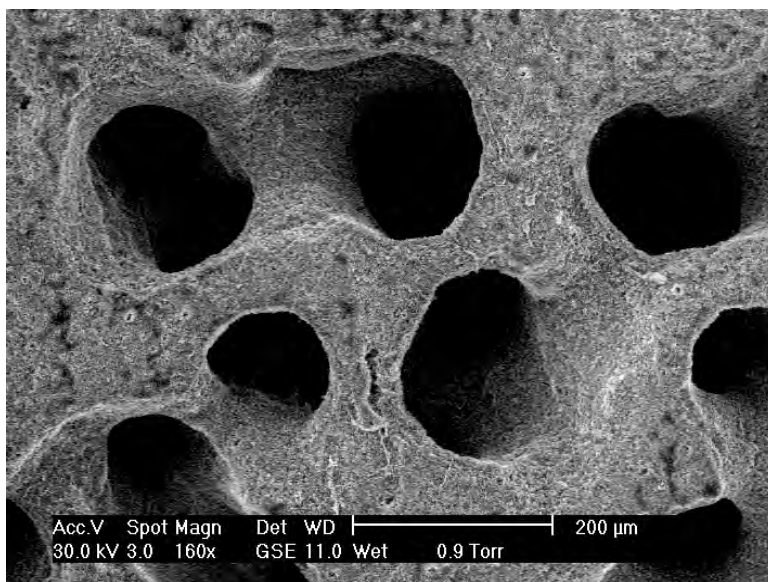


Figure2. Coral showing the macro-pores

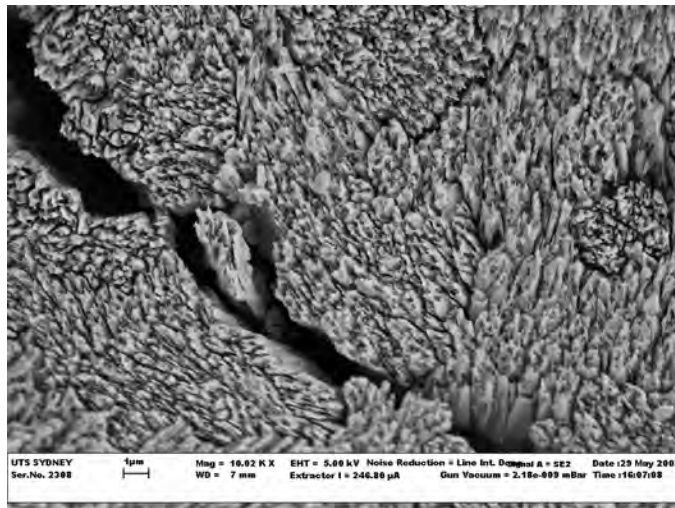


Figure 3. Two stage treated coral; firstly the natural coral was converted to hydroxyapatite then coated with sol-gel derived carbonate hydroxyapatite.

Professor Ben-Nissan's interest in this area began back in 1991 when an ARC Linkage grant of \$308,000 allowed him to develop the modular ceramic knee prosthesis. The need to bond this implant to the bone then led to the development of the Sol-Gel technology of hydroxyapatite coatings. "We suddenly realised there were other applications that needed stronger bone graft materials, and so our work to further develop the Sol-Gel and coralline process began," he says. Now the challenge is to find further funding to conduct animal and clinical trials. Professor Ben-Nissan has applied to both the ARC and the National Health and Medical Research Foundation, and is also seeking investment partners for the product development of this new biomaterial. "We anticipate that our new product and process will appeal to a vast and lucrative global market," he says. "Bone graft substitutes and soft tissue replacement products grew by 44 per cent in 2000. It is a billion dollar industry, given our increasingly ageing population and a greater need for these products for the younger generation."





REGISTRATION FORM

SIMULTANEOUS CONFERENCES



Austceram 2004



THE 3RD INTERNATIONAL CONFERENCE ON ADVANCED MATERIALS PROCESSING (ICAMP-3)

AND

INTERNATIONAL CERAMIC CONFERENCE & EXHIBITION AUSTCERAM 2004

29th November—1st December 2004, Melbourne, Australia
www.mateng.asn.au/AMPA



Platinum Sponsor:



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This project is proudly supported by the *International Science Linkages* programme established under the Australian Government's innovation statement *Backing Australia's Ability*

Dinner Sponsor:



Sponsors:



WHY SIMULTANEOUS CONFERENCES?

The 3rd International Conference on Advanced Materials Processing (ICAMP-3) and the Australasian Ceramic Society Biennial International Conference (Austceram 2004) will be held simultaneously in Melbourne, Australia from 29th November to 1st December, 2004, with the Institute of Materials Engineering Australasia acting as the event secretariat.

The organising committee of each of the two conferences recognised that the nature and thrust of each event was such that delegates wishing to attend one of the events, would also be interested in topics of the other. The synergistic topics of these two conferences will therefore give participants more opportunities to attend joint and parallel sessions covering broader areas of materials science, technology and engineering and to network with internationally and nationally distinguished experts. The conference will also allow for sponsorship and exhibition opportunities for a larger and more diverse audience. The structure of both events has been designed to ensure maximum interaction between delegates of each conference, eg there will be a common set of social activities for delegates and partners; there will also be some common plenary sessions and all luncheon and tea breaks will be joint affairs. Flexible registration packages will allow delegates to attend sessions from both events.

Proceedings

The complete set of texts will be on a fully interactive CD as part of the conference registration along with a printed copy of the abstracts.

Exhibition

An exhibition has been organised to give all delegates a broad cross-section of products and services available. Commercial organisations are encouraged to participate in sponsorship and/or an exhibition held in conjunction with the conference. Enquiries should be directed to Mark Richardson Ph: +61 3 9326 7266 or Email: events@mateng.asn.au

Social Program

Welcome Cocktails 6.00pm—7.00pm Sunday 28th November 2004

All delegates and exhibitors are invited to register and meet other participants or rekindle past friendships, whilst enjoying drinks and canapés.

Poster Judging Cocktails 6.00pm—8.00pm Monday 29th November 2004

All delegates and exhibitors are invited to register and meet other participants or rekindle past friendships, whilst enjoying drinks and canapés.

Optional Conference Dinner Tuesday 30th November 2004

Enjoy an evening of pre-dinner drinks and canapés in the exhibition area prior to proceeding to dinner with fine wine and entertainment at the Carlton Crest. **Tickets cost: AUD \$85.00 (inc GST).**

Partner Program

Link Tours Pty Ltd has been appointed to manage the pre, post and partner tour program for the ICAMP-AustCeram Conference. Tours are not included in the registration fee and are to be paid for separately. Full details of the arranged tours can be obtained from www.mateng.asn.au/AMPA.

Venue

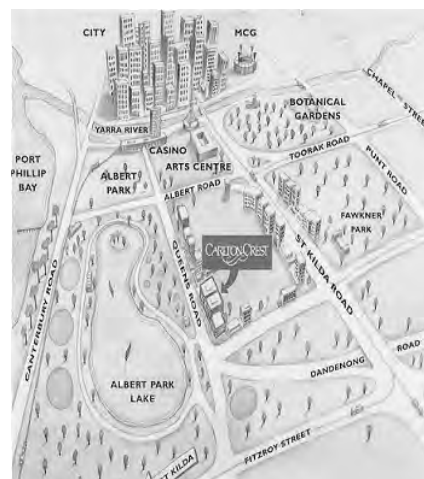
Carlton Crest Hotel
65 Queens Road, Melbourne
Victoria, Australia, 3004

Telephone : + 61 3 9529 4300 Facsimile : + 61 3 9521 3111

Accommodation

Discounted accommodation rates have been negotiated with the Carlton Crest Hotel and other hotels over the conference dates.

To book your accommodation please register on-line at www.mateng.asn.au/AMPA.



Program

Due to the incredible response to this conference we have a total of 52 Invited Speakers, 183 Oral Presentations and 164 Poster Presentations. To supply a full copy of the program was not possible on this registration flyer. FOR FULL DETAILS OF THE PROGRAM PLEASE GO TO www.mateng.asn.au/AMPA.

Monday 29th November 2004			
0900-0910	Welcome and Opening Remarks: Jian-Feng Nie (Chairman ICAMP3) and N.A. Stone (Chairman Austceram)		
0910-0920	Official Opening: The Hon. Tim Holding, MP, Victorian Government		
0920-1000	Plenary Speaker: David Green; Stresses and Distortion in the Sintering of Ceramic Composites, Laminates and Integrated Structures		
1000-1040	Plenary Speaker: David Cockayne; Advances in Nanocharacterisation of Materials		
1040-1100	Morning Tea		
1100-1300	SESSION A: TMP	SESSION C: Composites and Powder Metallurgy	SESSION D: Nano-tubes
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION E: Structures and Phase Transformations
1300-1400			SESSION F: Energy and Fuel Cells
1400-1420	SESSION A: TMP	SESSION C: Composites and Powder Metallurgy	SESSION E: Industrial Ceramics
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION F: Energy and Fuel Cells
1540-1600			SESSION F: Energy and Fuel Cells
1600-1800	SESSION A: TMP	SESSION B: Electro Ceramics	SESSION E: Industrial Ceramics
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION F: Energy and Fuel Cells
1800-2000	Afternoon Tea		
	CONFERENCE COCKTAIL FUNCTION (Judging of Posters)		
Tuesday 30th November 2004			
0830-1030	SESSION A: TMP	SESSION C: Composites and Powder Metallurgy	SESSION D: Sol-Gel, Thin Films and Coating
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION E: Advanced Ceramics and Properties
1030-1100			SESSION F: Spark Plasma Sintering
1100-1300	SESSION A: Light Alloys	SESSION C: Composites and Powder Metallurgy	SESSION D: Sol-Gel, Thin Films and Coating
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION E: Advanced Ceramics and Properties
1300-1400			SESSION F: Spark Plasma Sintering
1400-1540	SESSION A: Light Alloys	SESSION C: Composites and Powder Metallurgy	SESSION D: Sol-Gel, Thin Films and Coating
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION E: Advanced Ceramics and Properties
1540-1600			SESSION F: Ceramic Processing
1600-1740	SESSION A: Light Alloys	SESSION C: Composites and Powder Metallurgy	SESSION D: Sol-Gel, Thin Films and Coating
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION E: Bulk Metallic Glass
1900-2100			SESSION F: Ceramic Processing
	Afternoon Tea		
	CONFERENCE DINNER		
Wednesday 1st December 2004			
0830-1030	SESSION A: Light Alloys	SESSION B: Titanium	SESSION C: Bioceramics & Biomaterials
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION D: Sol-Gel, Coatings & Thin Films
1030-1050			SESSION E: Raw Materials, Minerals & Refractories
1050-1250	SESSION A: Light Alloys	SESSION B: Titanium	SESSION C: Bioceramics & Biomaterials
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION D: Sol-Gel, Coatings & Thin Films
1250-1400			SESSION E: Raw Materials, Minerals & Refractories
1400-1540	SESSION A: Light Alloys	SESSION B: Titanium	SESSION C: Bioceramics & Biomaterials
		Full Details of the program are available at www.mateng.asn.au/AMPA	SESSION D: Sol-Gel, Coatings & Thin Films
1540-1600			SESSION E: Raw Materials, Minerals & Refractories
	Morning Tea		
	CONFERENCE CLOSE		

ICAMP/AUSTCERAM REGISTRATION FORM
Or Register on-line at www.mateng.asn.au

Prof. Dr. Ms. Mr. Mrs. Other _____

Given Name: _____

Surname: _____

Position: _____

Organisation: _____

Address: _____

City: _____ State: _____ Postcode: _____

Tel: _____ Fax: _____ Mobile: _____

Email: _____

REGISTRATION PAYMENT DETAILS: (all prices quoted in AUD\$ and include GST)

Registration Includes: Lunches, all am/pm teas, copies of abstracts and a CD of Proceedings (Please note that registration does not include Dinner). Member registration applies to IMEA, Australian Ceramics Society and all supporting organisations. Group discounts are available on application.

Member:	Registration from 1st October	<input type="checkbox"/> \$900	\$ _____
Non Member:	Registration from 1st October	<input type="checkbox"/> \$1,100	\$ _____
Speakers:	Registration from 1st October	<input type="checkbox"/> \$900	\$ _____
Student:	Registration	<input type="checkbox"/> \$460	\$ _____
Day Registration:	Registration from 1st October	<input type="checkbox"/> \$460	\$ _____

Optional Extra: Dinner is not included in the Registration

Dinner Nos: _____ \$85.00 \$ _____

I wish to pay the total of \$ _____, payable to IMEA by [_____] Cheque, or please debit my credit card (tick one):

MasterCard Bankcard Visa Amex

Card Number: _____ / _____ / _____ / _____ Expiry Date: _____

Cardholder's Name: _____

Cardholder's Signature: _____ Date: _____

Please return completed registration form to: Conference Secretariat, PO Box 19, Parkville, Vic 3052 or Fax: (03) 9326 7272. Enquiries: Tel: +61 3 9326 7266 or E-mail: events@mateng.asn.au

Supporting Organisations:



INDUSTRY NEWS

SALE OF MILLENNIUM CHEMICALS AUSTRALIAN ZIRCONIA OPERATIONS

It is a pleasure to notify you that Millennium Chemicals has completed the sale of its Zirconia plant at Rockingham from its subsidiary Millennium Performance Chemicals (Advanced Ceramics) Pty. Ltd. to Doral Specialty Chemicals Pty Ltd.

Doral Specialty Chemicals Pty Ltd ("Doral"), an Australian company, is a subsidiary of Iwatani International Corporation (Japan), which also owns and operates Doral Mineral Sands Pty. Ltd., and partially owns Australian Fused Materials Pty. Ltd. This acquisition will complement Doral's activities in the heavy mineral sands and downstream product markets worldwide. Information about Doral may be found at: www.doral.com.au.

Millennium Chemicals has continued to operate the Rockingham plant operations to enable a smooth transition and efforts will continue to be made by Millennium Chemicals and Doral to ensure that the transition in ownership and management of the Rockingham plant will have minimal impact on customers. Rockingham plant personnel have transferred to the new company, along with the operating procedures and product specifications.

The new company will continue the manufacture of: Ultra high purity zirconium oxides;(Z2, Z3, Z18, Z0.5, ZY3, ZY3C, ZY8, ZY10A,ZY10) High performance zirconium chemicals;(ZOH, ZOH100, ZOCL, ZOC, ZS11), Zircon Flour and will continue the high quality and specialty services as previously offered by Millennium Chemicals.

Existing purchase orders and supply agreements will be honoured by Doral. It is expected that all customers will be contacted by the commercial

staff of Doral as soon as possible following settlement of the acquisition.

The contact details for the site will remain unchanged. This will be the commercial contact address.

Telephone: +61 8 9439 9000

Facsimile: +61 8 9439 1055

Address: PO Box 283

Rockingham WA 6168

AUSTRALIA

Any correspondence relating to the Rockingham business sent to Millennium Chemicals will be forwarded to Doral. However, customers are requested to update their records and ensure that correspondence is correctly addressed.

Millennium Performance Chemicals (Advanced Ceramics) Pty. Ltd. will continue to operate as a business entity until all administrative matters are resolved. Millennium Chemicals will continue to supply all other existing Performance Chemical products including Titanium Chemicals, Silica and Ultrafine Titanium Oxides, and its Titanium Oxide Pigment businesses are unchanged by the Rockingham plant ownership transfer.

Any questions may be sent to Viv Lawrie on:
viv.lawrie@millenniumchem.com

Or to Stephen Harris on:

stephen.harris@millenniumchem.com

LAUNCH OF THE ONLINE JOURNAL OF NANOTECHNOLOGY AT AZONANO.COM

Uniquely providing totally free access to scientific publications, and offering financial rewards for both authors and peer reviewers

20th October 2004, Sydney , Australia - [AZoM.com Pty. Ltd.](#) Sydney Australia and the Scottish-based [Institute of Nanotechnology](#) are pleased to announce the forthcoming launch of the Online Journal of Nanotechnology.

The Online Journal of Nanotechnology is based on a free access publishing model, coupled with what is believed to be a unique development in the field of scientific publishing – the distribution of journal revenue between the authors, peer reviewers and site operators.

The Online Journal of Nanotechnology at [AZoNano.com](#) will publish high quality articles and papers on all aspects of nanotechnology and related scientific, social and ethical issues. All the contributions will be reviewed by a world class panel of founding editors who are experts in a wide spectrum of nanotechnology science.

The Online Journal of Nanotechnology will publish the first open-access Nanotechnology scientific papers on [www.AZoNano.com](#), the leading nanotechnology information portal, in December 2004.

The revenue received from the journal related advertising and sponsorship will be distributed according to the following general criteria:

- Authors receive a revenue share of 50%.
- Peer reviewers receive a revenue share of 20%.
- The site administrators receive a revenue share of 30%.

- This revenue share will apply throughout the on-line published life of the individual article or paper.

The Online Journal of Nanotechnology papers will benefit from being hosted on the AZoNano.com website and database platform as they will take advantage of the existing AZoNano.com search tools. These search tools make it very easy for site visitors to locate nanotech information which directly relates to their research areas, applications and industrial sectors.

Otilia Saxl, CEO of the Institute of Nanotechnology commented, “It is our hope that by adopting this publishing model we will ensure that the latest developments in nanotechnology are available to the widest possible global audience. For too long, access to money has been the key to access to knowledge. We hope to change this by making nanotechnology knowledge *inclusive*, not exclusive.”

Dr. Ian Birkby , CEO of AZoM.com stated, “We are very optimistic about the potential for the Online Journal of Nanotechnology and AZoNano.com. We believe we have a great opportunity to “do the right thing” with regards to scientific publishing and we encourage contributions from all sectors of Nanotechnology. We will also work very hard with our excellent team of founding editors to ensure the Online Journal of Nanotechnology becomes a leading and highly respected scientific journal”.

Dr. Birkby went on, “We are currently in active discussion with other institutes and trade associations who can benefit from our patent pending online publishing system and we would like to hear from any organisation where our model and publishing platform could be of benefit”.

HOUSES OF THE FUTURE

2004 is the Year of the Built Environment and the Houses of the Future exhibition challenges the perception of what a house is. It demonstrates the qualities of individual building materials, and the inventiveness of some of Australia's best architects in using these materials.

THE GLASS HOUSE

The Glass House showcases the latest in Nanotechnology research from around the world. This will be done using both commercially-available products and prototypes of recent research into materials science to demonstrate the ways in which these products can enhance lifestyle, improve natural lighting, thermal and acoustic performance and result in lower maintenance costs over the lifetime of the building.

The idea was to design an environmentally responsive ultra-low energy living space incorporating state-of-the-art materials technologies. Almost endless potential - smart materials change in response to their surroundings in ways that natural (dumb materials) don't. Some materials may have tiny computers embedded in them which can send signals - like tyres that tell your car when the tread is wearing unevenly, or paint that alerts your house of a gas leak or a electrical fault. Really smart materials could change colour on command, or generate electricity during the day and make it available during the evening. Imagine coatings that refuse to become dirty, and heal themselves when damaged.

THE CLAY HOUSE

There is a long history of brick construction as the most secure form of home, dating back to Roman times. Clay bricks are the most solid, secure, durable and low maintenance building product on the market. The mass of clay bricks provides thermal comfort and means a cavity

brick wall will perform better than most other insulated forms of construction meaning less energy usage. The courtyard style house provides perimeter walls that not only provide security but acoustic insulation from neighbouring houses.

The Clay House of the future will not look like a typical brick house. The external cladding is constructed using a ventilated terracotta tile façade. Terracotta tiles create an external finish that is not only extremely durable but requires very little maintenance. This ventilated façade system, which creates an air space outside the load bearing wall of a building, provides protection from the environment. The internal finish will be face brickwork, using a combination of 70, 90 and 150 mm wide clay bricks. The use of face brickwork and Terracotta clay floor tiles provide thermal mass as well as a durable, low maintenance surface. The Clay Bricks that will be used in the house of the future are not the traditional brick sizes that are familiar. Bricks used will include a large-format brick 90 mm wide, 300 mm high and 300 mm in length which will be diamond ground and laid in thin bed mortar in a stack bond pattern and clay blocks 150 mm wide to construct a central wall which is oriented for solar heat gain in winter. Clay Bricks that are 70mm wide will be used for internal brick panelling to create feature walls. All of these products provide thermal mass to the house.

The roof over the living area is constructed of two layers of glass with louvres sandwiched in between. The operable louvres can be adjusted to control light and shade. The surface of the roof has photo voltaic cells for power generation.



www.housesofthefuture.com.au

FASTS NEWS

SCIENCE MEETS PARLIAMENT

Please be advised that the 2004/5 'Science meets Parliament' will be held in March 2005.

The exact dates cannot be determined until the Parliamentary sitting schedule for 2005 is announced (which is typically done in November) but is likely to be in either the first or second week of March. By holding it in March the election will be well and truly over, politicians and their staff would have had a break and everyone will be much more receptive to good ideas and forward thinking.

Incidentally, Ken Baldwin - Chair of FASTS policy committee and originator of SmP - has been nominated for the *Eureka Prize for promoting the understanding of science* for 'Science meets Parliament'. The Eureka awards - Australia's foremost science prizes - are announced on August 10th and I am sure we all wish Ken good luck.

ANNUAL COUNCIL MEETING

The AGM of the FASTS Board and the Annual Council Meeting will be held on Wednesday 24th of November in Canberra. I would urge all members to ensure their organisation is represented at the Annual Council meeting.

I would also like to draw to the attention of Members that the FASTS President-elect for the 2006-7 term will be voted in at the AGM of the FASTS Board on the 24th.

FASTS ELECTION PRIORITIES

The election priorities FASTS puts forward are the collective view of 60,000 working scientists and technologists. We believe credible science

and technology policies must address the following real priorities.

THE NATIONAL R&D COMMITMENT

- Making Australia competitive with global R&D investment
- Lifting Australia's total investment in R&D to 2.3% of GDP by 2010
- Maintaining Government investment as a % of GDP
- FASTS recommend detailed analysis of the flow on benefits of our national R&D commitment
- Ensure the Australian community gain the benefits that flow from Australian ideas and innovations generated by publicly-funded R&D.

ENVIRONMENTAL SUSTAINABILITY

- Ensure a pluralistic approach to understanding and managing environmental issues
- Change selection criteria for Cooperative Research Centres (CRCs) to re-instate 'public good' strategic research aligned with the National Research Priorities.
- PMSEIC to take on more strategic role evaluating opportunities and deficiencies in the national research profile
- Overcome the inefficient gaps and overlaps in Commonwealth and States responsibilities on the big environmental issues facing Australia.

SCIENCE EDUCATION IN OUR SCHOOLS

- Recognise access to expert science, mathematics and technology teaching is a fundamental equity issue for our students
- commit to ensuring science, mathematics and technology teachers do not suffer higher levels of student debt due to differential HECS.
- Ensure HECS places are available for all science and mathematics DipEd students

INDUSTRY R&D

- a sliding scale of R&D tax deductions that increase with R&D intensity
- a sliding scale for capital gains tax that rewards the longer periods of investment needed for high technology, R&D intensive industries
- providing jointly funded postdoctoral positions in industry to inject scientists into the corporate structure of business

PUBLIC SECTOR R&D

- Appropriate levels of indexation of Commonwealth funding of our universities and public sector research agencies.
- FASTS recommends that research funding agencies should aim to fund the full cost of research and research infrastructure.
- Growth funding for CSIRO to ensure a strong foundation for ‘flagships’.

Request for information concerning research on integrated sustainability assessment as input into the National Academies Forum study:

Sustainability Options in Australia: Integrated Sustainability Assessment and Policy

The National Academies Forum (NAF) through its Joint Academies Committee on Sustainability (JACS) is conducting an ARC-funded research project “Sustainability Options in Australia” to identify current practices for integrated sustainability assessment in Australia and to benchmark Australian and international best practice. A further goal is, to the extent possible, to provide a taxonomy of documented sustainability assessment and policy *integration methods* and an analysis of their strengths and limitations, together with a set of guidelines and management options for conducting integrated

assessment and policy. All this has an inherent value, but for NAF it is also directed at an assessment of what needs to be done for there to emerge an effective integrated sustainability research capacity in Australia.

Hence of interest are case-studies in integrated assessment and policy development that utilise the best current methods. This may include Australian or international projects, and stand-alone short-term projects or ongoing research programs.

A useful case-study will not necessarily be one that applies the latest methods and tools in all aspects of the integrated assessment process. Any given case-study will consist of numerous tools and methods, and those that have only a single pearl of methodological insight in a single integration domain will still be useful. Moreover, absence of explicit integration commentary does not necessarily mean irrelevance, since integration methodologies are invariably suppressed in project descriptions and final project reports. Consequently, it is important to locate individuals involved who know about the methodologies employed. This is one reason why Academy member input to this project is so crucial.

To provide clarity around what we are seeking to do, consider, as an example, the problem of sustainable water regulation for the Murray-Darling Basin. There are three primary integration tasks and one related to process.

The *first* concerns development of integrated **understanding of the system** cause-and-effect relations (including model integration). Models of cause and effect can be represented by formal mathematical or computer simulation models, formal connection diagrams, informal qualitative linguistic accounts, and so on. The Murray-Darling Basin study, for instance, involves bringing together at least hydrological, geochemical and ecological models with agricultural, energy and economic models, all

operating on a variety of space and time scales and at several different hierarchical levels. Again, the “Australian Stocks and Flows Framework” of the CSIRO National Resource Futures Program provides an extensive integrated computer simulation model of Australian physical resource flows.

A *second* task involves rigorously **prioritising and trading off different policy options** that recognise the wider non physical constraints. For the Murray-Darling this may involve resolving real or apparent conflicts between ecosystem preservation, economic productivity, social justice and community stability values. Methods of such evaluative integration include ethico-legal reasoning, either by individuals or through deliberative social processes, and formal methods such as cost-benefit analysis. For example, in order to yield valuable integrated outcomes the Australian Research Centre for Water in Society (ARCWIS) has published research on designing social deliberative processes that ensure that procedural justice norms are respected. Again, the 1992 NSW State Forests, Forest and Timber Inquiry used extended cost-benefit analysis as an evaluative integration tool.

These first two tasks do not stand alone. Evaluative concerns will determine what features of the physical world are salient to the assessment process and essential to understand empirically and model. These issues are often addressed at the problem framing and research scoping stage, and are recognised in much of the literature on both sustainability and trans-disciplinarity as being of crucial importance to the quality of the assessment outcomes. Hence explicit characterisations of scoping methodology for integrated assessment, or case-study examples that represent good practice in this area, are also of interest.

A *third* integration task is strategy development: **determining strategic actions that can be undertaken** that cohere with the decision-

making tools provided by the preceding integration tasks. For instance, recognising that model uncertainties may render optimising strategies inappropriate, and thus pointing to adaptive strategies as more appropriate. In the Murray-Darling Basin, policies and strategies such as the introduction of water rights trading instruments, land-restoration programs, or changed agricultural practices may be selected. Methods for strategy construction and selection include various alternative political processes and such techniques as multi-criteria decision analysis, economic optimisation and adaptive strategy analysis.

A fourth, ‘external’ integration task refers to the integration of the **research/assessment process itself within its own socio-political or institutional context**, and the integration of its implementation with other policy implementation. For the Murray-Darling this involves, for example, ensuring that the strategic options developed have sufficient socio-political legitimacy to be actually implemented by the relevant actors. Similarly, the EU Sustainable Development Strategy attempts to coherently combine all European Union policies on the environment, choosing policies that integrate with the wider policy setting.

So, relevant work will include, but is not limited to Comprehensive theoretical frameworks for integrated assessment tools and methods

- I. Guidelines based on practical experience, for both environmental and non-environmental applications, for one or more of
 - A. managing integrated assessment processes
 - B. scoping integrated assessment processes
 - C. resolving conflicts between evaluative priorities
 - D. developing integrated understanding of cause and effect relations, that is, integrated modelling

- E. developing policy proposals in an integrated way
 - F. integration of stakeholder interests and knowledge, and integration of policy selection with policy implementation (both among different individuals or organisations)
- II. Example case-studies of successful integrated assessment projects, particularly for environmental applications, which provide important methodological insight with regard to one or more of
- A. problem framing/ research scoping
 - B. evaluative integration
 - C. integrated understanding of cause and effect relations
 - D. integrated strategy development
 - E. integration of stakeholder interests and knowledge, implementing the proposed strategy
- III. Explicit accounts of social processes that are instrumental for successful integrated sustainability outcomes. Even more preferable would be methods of designing social processes in order for valuable integrated sustainability outcomes to obtain.

While there is a preference for case studies and theory with environmental applications, research that sheds light on methods in integrated assessment, modelling and decision making, including participatory methods, for any complex decision domain application is also sought, provided high-quality accounts are available.

However, even where methodologies are not explicit, identification of research programs that have made progress in sustainability problems by successfully integrating research across *disciplines* (especially combining socio-cultural with natural scientific assessment) and/or *scales*

(for instance, space, time, and hierarchy scales) may also help. Thus, any research that spans two or more of our Academies to develop a holistic perspective on any problem is useful, since it may contain important methodological insights. Explicit accounts of how successfully integrated researches have been organised cognitively and methodologically, or project managed (including socially organised) are of particular interest.

As a member of the Federation of Australian and Scientific Societies, your expertise is sought in identifying people and/or projects (including yourself and your projects where appropriate) that exemplify best practice in integrated sustainability research. As leaders of Australian research within all disciplines, FASTS is well positioned to take the lead in providing high quality advice, key contacts and best-practice exemplars in this crucial area that will only grow in importance in the years ahead. The project report will form an important part of NAF input to national research policy benchmarks for, and the need for future development of, integrated sustainability science. Please assist this NAF study to provide respected national advice in this matter.

If you are aware of any relevant research, please contact Graeme Pearman (email: graeme.pearman@csiro.au, post: CSIRO Molecular Science, Ian Wark Laboratory Bayview Avenue, Clayton, Vic, 3168) and the Study Director, Dr. Thomas Brinsmead (email: Thomas.Brinsmead@newcastle.edu.au, post: School of Liberal Arts, University of Newcastle, NSW 2308). An expeditious response will be appreciated, since the aim is to produce a web discussion by August and a completed report by December 2004.

NEW FELLOWSHIPS ANNOUNCED

The Minister has just announced that applications for 2005 Federation Fellowships and ARC centres of excellence have opened. Applications for Fellowships close on 15 October 2004. For more information on these and the Centres of excellence visit <http://www.arc.gov.au/>

CHINA REFRACTORY DIRECTORY JUST PUBLISHED

Business Data International Inc., the business and professional information provider, announced that an English-Chinese bilingual edition of China Refractory Directory has just been published. The directory lists about 350 leading refractory enterprises in China. It is the most complete and authoritative directory of Chinese refractory products and enterprises. Information given includes the enterprise name, name of director, full address, phone and fax numbers, email, website, description, qualification of quality system, and product lines. Half enterprises included a few colour photos. In addition, an appendix contains data on output, export and import of refractories in recent years (1997 - 2002).

The 178-page directory is available from: Business Data International Inc., P. O. Box 28547, 5100 Verdun Ave., Montreal, QC H4G 3L7, Canada. Fax: (514) 221-3281, info@businessdataint.com, www.businessdataint.com

P. O. Box 28547
5100 Verdun Avenue
Montreal, QC H4G 3L7, Canada
Phone: (514) 293-6146
Fax: (514) 221-3281
info@businessdataint.com

<http://www.businessdataint.com>

DR. YI-BING CHENG ANNOUNCED AS CERAMIC SOCIETY OUTSTANDING RESEARCHER

Over the last six years Dr. Yi-Bing Cheng has been involved in developing polymer-ceramic composites that perform as polymers at room temperature but transform into ceramic under heat. These products known as ceramifying polymers were initially developed for fire performing cables are now being developed for much broader applications.

The project has been developed jointly between the Universities of Monash and New South Wales, DSTO and CSIRO. Dr Yi-Bing Cheng will speak about the project during Science Week 2004 between August 14-22 as the ceramic society representative.

NANOCERAMIC COMPOSITES 'NOT UP TO SCRATCH'

A recent paper by Nitin Padture et al* has shown that single wall carbon nanotube / alumina composite material although highly resistant to contact damage by sharp and blunt indentation tests are as brittle as straight dense alumina using direct toughness tests. Comparisons with graphite/ alumina mixtures have shown that single wall nanotubes may not play a unique role in determining the unusual contact mechanical response of these composites. While nanotubes may be of benefit in limiting radial indentation fractures these materials have an almost identical fracture toughness to dense alumina of 3.2 MPa.

* Nature Materials Vol. 3 No8. p 539

ROLEX AWARDS FOR ENTERPRISE

Australian nominations for the Rolex Awards for Enterprise 2006 are now open. The Rolex Awards for Enterprise is a worldwide philanthropic program which recognizes the spirit of enterprise in visionary individuals, providing financial support and recognition for projects that advance human knowledge and well-being. The Awards are presented every two years in five areas: Science and Medicine, Technology and Innovation, Exploration and Discovery, The Environment and Cultural Heritage. However a project may be submitted in almost any field of endeavour, provided it contributes to the betterment of humankind. Anyone of any age, from any country or background is eligible to apply.

The five Rolex Laureates are chosen by an eminent international panel. Each receives US\$100,000 and a specially inscribed, gold Rolex chronometer at an official awards ceremony. Five runners-up, the Associate Laureates, each receive \$US35,000 as well as a steel-and-gold Rolex chronometer.

If you or anyone in your organisation knows of any Australian whose exceptional achievements - past and continuing - merit international recognition, we invite you to encourage them to apply for a Rolex award. Information about the awards may be obtained from the Rolex website: www.rolexawards.com

An application kit for nominations may be obtained by ringing 02 9251 8988. For further details of the Awards and rules and conditions, please email or ring me on 0418 639 245.

Prof. Julian Cribb FTSE
Rolex Australia
ph 02 6242 8770 or 0418 639 245
julian.cribb@work.netspeed.com.au

SEMINARS: SENSOR PRODUCTS INC. AND DR. SCOTT BECKWITH, PRESIDENT OF BTG

Composites LLC (an international advanced composites and fiber reinforced plastics(FRP) consultancy), present two special "Composite Materials Design, Testing & Fabrication" seminars during the remainder of this year. The seminar is designed for aerospace, military, materials, infrastructure, energy and transportation industry engineers who are involved in any materials selection and characterization, composites design and manufacturing, product optimisation, and testing and inspection certification (NDT, NDI, QA).

For more information about these two seminars and how to register, visit www.sensorprod.com/composites.



CORPORATE MEMBERSHIP

Is your company interested in becoming a Corporate Member?

Corporate Members may nominate two representatives of their organisation as members and receive free advertising space in a Society publication on one occasion.

A membership form is available on the *Australasian Ceramic Society* website at the following address:

<http://www.austceram>

CALENDAR OF EVENTS

5th International Conference on High Temperature Ceramic Matrix Composites

12 - 16 September 2004, Seattle, WA, USA

Contact: Christine Schnitzer

E-mail: cschnitzer@acers.org

19th Tecnargilla – Exhibition of technologies and supplies for the ceramic and brick supplies

1 – 5 October 2004, Rimini, Italy

E-mail: press@sala-service.it

AUSTCERAM 2004 International Ceramic Conference and Exhibition

November 29 – December 1 2004, Melbourne, Australia

3rd International Conference on Advanced Materials Processing

November 29 – December 1 2004, Melbourne, Australia

29th International Conference on Advanced Ceramics & Composites

23 - 28 January 2005, Cocoa Beach FL USA

kevin.plucknett@dal.ca

2nd International conference on Advanced Materials and Nanotechnology

6-11 February 2005, Queenstown New Zealand

amn2@cont.canterbury.ac.nz

Expo Build China 2005 – Ceramics, Tile and Sanitary Ware China

6 – 9 April 2005, Shanghai New International Expo Centre

www.expobuild.cn



Materials Division

The Australian Nuclear Science and Technology Organisation (ANSTO) is keen to develop collaborative R&D projects, and encourages industry to make use of the facilities and expertise available in the Materials Division.

Some of Our Current Projects are in the Areas of:

- Waste Management/Synroc
- Sol-Gel Processing

Our Key Facilities Include:

- Large Batch Ceramic Powder Processing
- Spray Dryers up to Pilot Plant Size

CORPORATE MEMBERS

ALCOA Australia Ltd
Applecross
WA

Austral Bricks
Horsely Park
NSW

Australian Fused Materials
Rockingham
WA

AZoM.com.P/L
Sydney,
NSW

Boral Bricks P/L
Winston Hills
NSW

Bulli Refractories P/L
Bulli
NSW

Carpenter Advanced Ceramics
Clayton
VIC

Commercial Minerals Ltd
Parramatta
NSW

Ferro Corporation Australia P/L
Moorabin
VIC

Holmesglen Institute of TAFE
Chadstone
VIC

Iluka Resources Ltd
Perth
WA

Mowatt Refractories
Rockingham
WA

Rojan Advanced Ceramics P/L
Spearwood
WA

Selkirk Brick P/L
Ballarat
VIC

Taylor Ceramic Engineering
Mortdale
NSW

Tiwest P/L
Muchea
WA

Unifrax AUSTRALIA LTD
Thomastown
VIC

Unimin Australia LTD
Parramatta
NSW

Warman International Ltd
Artarmon
NSW

POSITIONS WANTED

Chaminda Akmeemana

Relevant experiences : Bioceramic Researcher at Queen Mary, University of London.

Research area: Laminated Object Manufacture (LOM)Electrostatic Atomisation, Hydroxyapatite, Chitsan, Collagen.

Qualifications : Master's Bioceramics

I am a self-motivated, pro-active and success-driven individual with proven leadership skills(several years of managerial experience). A quick learner, equally at home as part of a team or working independently, I am a committed individual who brings a unique blend of academic excellence and adept social skills. Having demonstrated that I am able to think 'outside the box' in my academic career and proven my ability to work effectively under pressure as a Special Constable, I have continuously demonstrated a willingness and ability to lead and excel in everything I do. During my extensive academic studies I have developed keen analytical, problem solving and project management skills, I have also taken on work experience in a diverse range of professional, service-orientated environments. As a result, I believe I have a number of key transferable skills that would suit many employers.

For more details or refer CV please e-mail: vack@rocketmail.com

NEW MEMBERS

Dr. Jacob Jones
Materials Science & Engineering, UNSW.

Mr. Zhi Yi Che
Curtain University

Mrs. Norazimah Duraman
Curtain University

Mr. Rajv V Singh
India



THE NEWSBULLETIN

Members are encouraged to supply news, articles, book reviews, etc, for inclusion in the *Newsbulletin*. Members are also invited to submit interesting images related to ceramics to feature on the front cover of the *Newsbulletin*.

THE AUSTRALASIAN CERAMIC SOCIETY

THE SOCIETY

The Australasian Ceramic Society is an organisation that works towards furthering all aspects of ceramics - science, industry, research, trade and in art. The society aims to bring together all those interested and involved in ceramics for mutual cooperation and the exchange of knowledge and ideas.

FEDERAL COUNCIL OFFICERS

The Society has a Federal Council comprised of representatives from the member branches. These are in New South Wales, Victoria and Western Australia and each operates autonomously with its own Committee. There are corresponding Secretaries in Queensland, South Australia and New Zealand.

ACTIVITIES

Meetings

Regular meetings are held by the member branches. The meetings are usually comprised of informal social gatherings and lectures by invited speakers. Occasionally, there are joint meetings with kindred societies.

Conferences

The Society holds its AUSTCERAM conferences every two years. Since 1988, the AUSTCERAM conferences have become events on the international conference agenda. The conferences cover all aspects of the ceramic area and present both new work and reviews.

Scholarships & Prizes

Several Society scholarships and prizes are given to students undertaking courses in ceramics at tertiary level.

Awards

The Australasian Ceramic Society Award is given every two years to a person who has made a major contribution to ceramics in Australasia. The award encompasses all fields of ceramics. Eligibility is not restricted to Society members. There are also other awards, as determined by the Council.

Excursions

Visits are regularly organised to ceramic research establishments, manufacturing plants, raw material deposits and so on, often in conjunction with Technical Meetings.

PUBLICATIONS

Journal

The Journal of the Society is circulated internationally with a particular concentration in the Australasian region. It contains papers on original ceramic research and industrial development as well as review articles. It is published twice annually and is sent free to members. The Journal may be subscribed to independently of Society membership.

Newsbulletin

The Newsbulletin is the Society's vehicle for news, information and comment. It contains notices, reports of Society activities and other events, letters, articles, opinions, news of members, industry news and other items of interest and concern. It is published four times a year and is sent free to members. Advertising in the Newsbulletin is available to members and others.

Conference Proceedings

Conference proceedings contain the papers presented at the AUSTCERAM conferences and are a comprehensive record of progress and developments in ceramics both in the Australasian region and internationally.

FASTS

The Australasian Ceramic Society is a member of The Federation of Australian and Technological Societies (FASTS). FASTS represent the interests of some 60,000 scientists and technologists in Australia. FASTS works to influence the formulation of science and technology policy to the economic, environmental and social benefit of our nation.

MEMBERSHIP INFORMATION

Membership is open to all individuals, companies and associations. There are five categories of membership.

Member

Benefits of Membership include automatic subscription to the Journal, receipt of the Newsbulletin, and notices of Society activities.

Corporate Member

Corporate Members may nominate two representatives as members and receive free advertising space in a Society publication on one occasion.

Honorary Life Member

This is an honour awarded by the Federal Council to members who have given long and distinguished service to the Society.

Retired Member

Persons who have retired from their profession may apply for Retired Membership at a reduced fee. Retired members receive all the benefits of members.

Student Member

Full time students are entitled to Student membership at a reduced membership fee. Student members receive all the benefits of Membership.

CURRENT ANNUAL MEMBERSHIP FEES

	Cost	GST	Total
One time joining fee	\$10.00	\$1.00	\$11.00
MEMBER	\$80.00	\$8.00	\$88.00
CORPORATE MEMBER	\$200.00	\$20.00	\$220.00
RETIRED MEMBER	\$40.00	\$4.00	\$44.00
STUDENT(no journal)	\$15.00	\$1.50	\$16.50
STUDENT (inc. journal)	\$25.00	\$2.50	\$27.50

*No GST for overseas members



NEWSBULLETIN ADVERTISING CHARGES

The costs for 1/4, 1/2 and full page advertisements in the *Newsbulletin* are \$400, \$600 and \$940 respectively. In addition to this full page colour advertisements cost \$1400. Advertisements are published in the *Newsbulletin* for one year (4 issues).

Companies which advertise in the *Newsbulletin* receive an automatic link to their homepage in the website of the Australasian Ceramic Society.

Please contact the Editor of the News Bulletin if you are interested in advertising in the *Newsbulletin* and receiving a link to your website.



Australasian Ceramic Society

ABN 81 000 468 708
C/o ANSTO, PMB 1 Menai, NSW 2234, Australia

Membership Form

Member Details:

Title	
Surname	
First Name	
Company/Organisation	
Street Address	
Town/Suburb	
State	
Post Code / ZIP	
Country	
Phone (Business)	
Phone (Home)	
Email	
Fax	
Membership Type*	

*(Member, retired member, corporate member, student member)

For Corporate Members Only, Please State Company Nominees

1. Title		Name	
2. Title		Name	

Cost for Membership

One-time Joining Fee:	AUD \$11.00
Membership Fee (Including GST):	AUD \$
Donation to Scholarship Fund:	AUD \$
Postage**	AUD \$
TOTAL AMOUNT DUE:	AUD \$

** (Outside Australia or New Zealand add \$15 for airmail postage, otherwise surface mail)

Please tick: I wish to receive the Journals

Method of Payment

Please tick: Cheque enclosed (Please make cheques payable to the Australasian Ceramic Society)

- Credit card
 Money Order enclosed
 A receipt is required

Credit Card Details

Charge the following credit card: VISA MASTERCARD BANKCARD
 Card No.: _____ Valid until: _____ Today's Date: _____

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 Ph: +612 9717 3477
 Fax: +612 9543 7179
 Email: dsp@ansto.gov.au



NEWSBULLETIN
of
THE AUSTRALASIAN CERAMIC SOCIETY