



NEWSBULLETIN

OF THE AUSTRALASIAN CERAMIC SOCIETY

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SOCIETY WEBSITE

<http://www.austceram.com>

Subscriptions should be forwarded to the
National Secretariat

COVER PHOTO

Diamond-like carbon (DLC) film on sapphire after indentation with a spherical nanoindenter.

Photograph courtesy of Mark Hoffman and Zonghan Xie, University of New South Wales.

FEATURED IN THIS BULLETIN

AUSTCERAM 2004

International Ceramic Conference & Exhibition

29 November - 1 December 2004
Melbourne, Australia



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WESTERN AUSTRALIAN BRANCH REPORT

The Annual General Meeting of the WA Branch was held on Tuesday 6th April 2004 at 6.00 pm in the Seminar Room of the School of Physical Sciences at Curtin University of Technology. Following the short A.G.M., the meeting was addressed by Dr Takuya Tsuzuki, Advanced Powder Technologies, University of Western Australia, who gave a very interesting talk entitled "Ceramic Nanopowders and Mechanical Processing". The talk covered a brief introduction of Advanced Powder Technology Ltd. (ATP), its patentable mechanochemical processing for the large scale production of ceramic nanopowders, current production lines and their applications and R&D activity, with reference to ceramic markets. Lots of food, wine, beer and soft drink after the talk made for a most pleasant evening!

The WA Branch Committee has put together the following program for the remainder of 2004 which we hope will be both interesting and diverse. It is an attempt to cater for all members, but your suggestions as to possible talks/visits would be much appreciated.

June – Visit to Concorde Engineering in Maddington. Date and time to be arranged.

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.

29th November – 1st December – Austceram 2004 in Melbourne.

Friday 10th December. Branch Christmas party.

David Phillips.
Branch Secretary

NANO-DESIGN OF HARD CERAMIC COATINGS FOR ABRASION RESISTANCE

Mark Hoffman
School of Materials Science and Engineering
The University of New South Wales, Australia

Research at the School of Materials Science and Engineering at the University of New South Wales is using novel electron microscopy techniques to design abrasion-resistant ceramic coatings on a nanometer scale. In collaboration with the CSIRO, Department of Technical and Industrial Physics, a broad range of nanostructured single and multilayered coatings have been developed which may be applied to metals resulting in long-lasting resistance to repeated contact and sliding, far in excess of that which is traditionally obtained.

These new initiatives have been made possible through the use of a focussed ion beam (FIB) miller to prepare cross-sections of the coatings both before and after use. This enables detailed understanding of the processes which cause a coating to be degraded. This understanding is then used to develop new and more reliable coating structures. Examples are shown below.

Figure 1 shows that a traditional TiN hard coating deforms by columnar grains sliding past each other under contact. However, if a thin layer of TiSiN is deposited partway through the deposition process as shown in Figure 2, the grains cease to slide and a harder material results. Alternatively, by depositing a nanocomposite TiSiN coating, as shown in Figure 3, hardness values in excess of 40 GPa may be obtained providing exceptional abrasion resistance. A method of depositing this coating in a cheap and fast way has been developed.

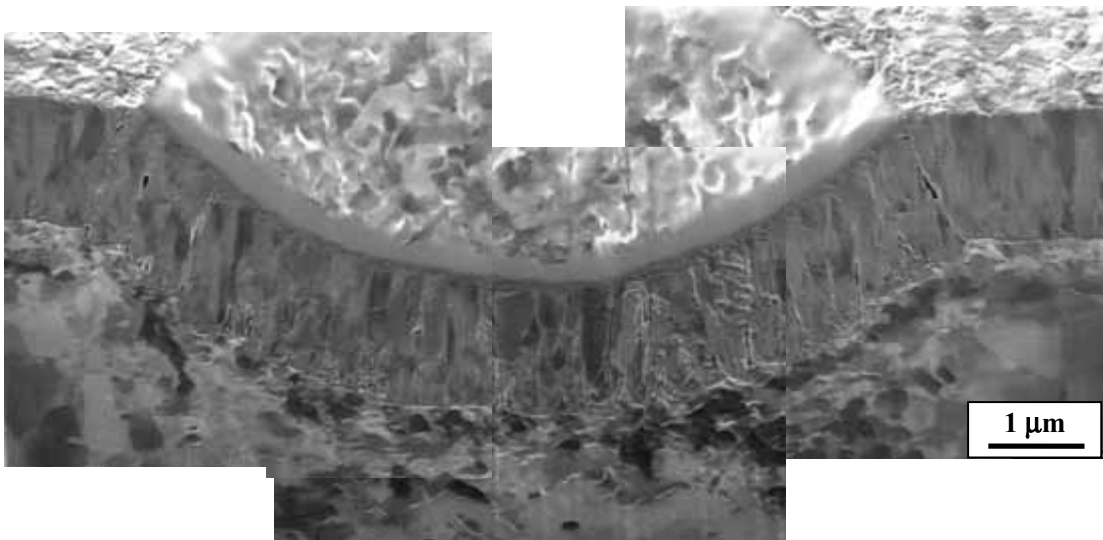


Figure 1 Indented TiN coating on stainless steel, sectioned and imaged in the focussed FIB (Z.-H. Xie).

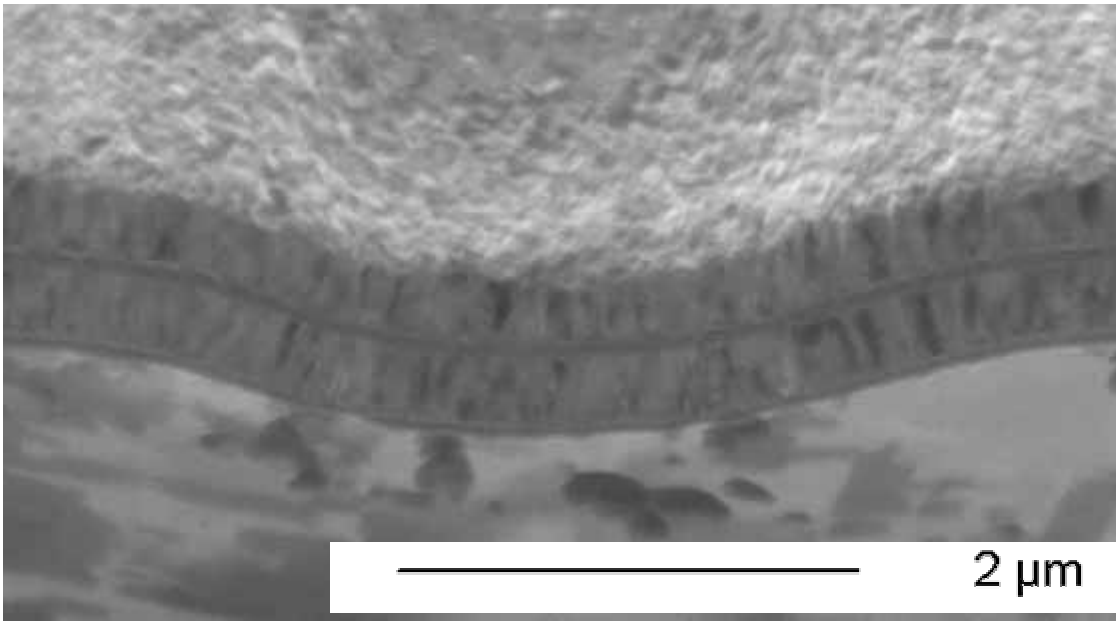


Figure 2 Indented layered TiN coating on stainless steel, sectioned and imaged in the focussed FIB (Z.-H. Xie).

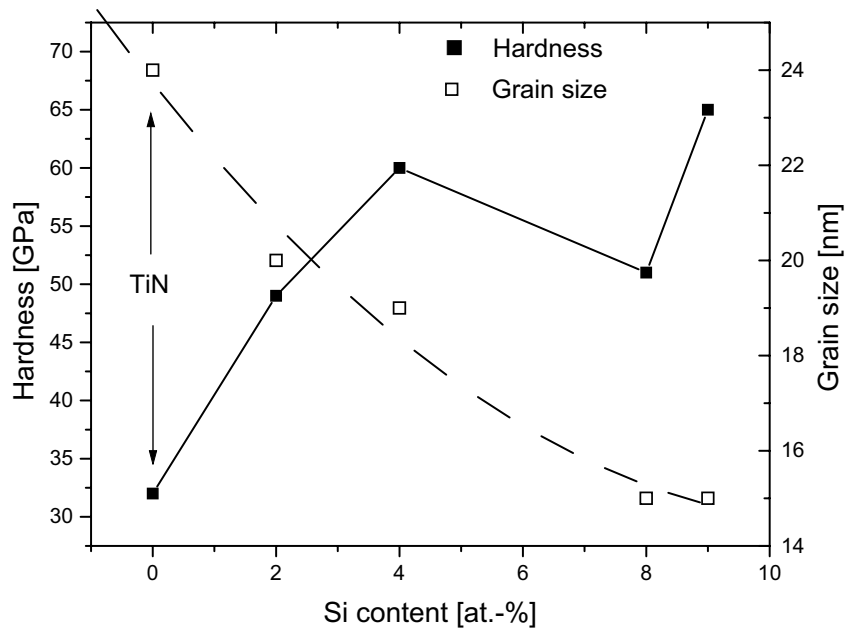


Figure 3 Hardness of TiSiN coatings as a function of Si content (A. Winkelmann, J Cairney).

AZoM.com Press Release Launch of AZoNano.com

AZoM.com and the Institute of Nanotechnology Announce the Launch of AZoNano.com – The A to Z of Nanotechnology

AZoM.com Pty. Ltd. Sydney Australia and the UK-based Institute of Nanotechnology, are pleased to announce the launch of AZoNano.com - the A to Z of Nanotechnology (www.azonano.com) .

The aim of AZoNano.com is to become the primary Nanotechnology knowledgebase for transferring new nanotechnologies into the science, engineering and manufacturing community worldwide.

AZoNano.com is totally focussed on the needs of the end-users of nanotechnology. All of the educational, technical and news content on AZoNano.com is easy to access and search and is provided on a **free of charge, no subscription, no charge per article, totally free basis.**

All articles and news items on the AZoNano.com knowledgebase are classified both in terms of the application (product, process) and the industry sector where the Nanotechnology will impact.

This means it is very easy for the layman to find a nanotechnology that relates 100% to their product or industrial sector. AZoNano.com also contains an Expert and Supplier Network.

Background

The web site is based on the highly successful AZoM.com (The A to Z of Materials) portal and software platform. Since its launch in September 2001, AZoM.com has grown to over 350,000 visitor sessions per month (over 5 million site hits per month).

Ottilia Saxl, CEO of the Institute of Nanotechnology commented, "We are very pleased to announce the launch of www.azonano.com . We believe it is the right product at the right time and will open up nanotechnology to a very broad industrial audience, that is thirsting for knowledge on the subject. We are delighted to be working alongside AZoM.com, as we

have seen at first hand how successful their technology and business model has been since the launch of www.AZoM.com – the A to Z of Materials".

These views were echoed by Dr. Ian Birkby, CEO of AZoM.com, who went on, "The Institute of Nanotechnology was our first choice of partner for this venture, it has a great track record in transferring nanotechnology to the end user base and has the type of "can do" attitude that you need in this type of fast moving industry".

Contact

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Institute of Nanotechnology

The Institute of Nanotechnology (IoN) www.nano.org.uk is a unique source of information on Nanotechnology worldwide. It also organises leading-edge conferences for investors and business on new technology developments, whilst providing up-to-the minute market reports for industry, financial and government organisations.

A membership organisation, IoN members benefit from access to extensive nanotechnology briefings and analyses.

Contact

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THE AUSTRALASIAN CERAMIC AWARD FOR 2004

This prestigious Award, inaugurated in 1982, is presented biennially, on the occasion of AUSTCERAM Conferences, to a person (not necessarily a member of our Society) who has contributed in an outstanding way to the profession and practice of ceramics in Australasia. In the past it has been awarded to the following :

Associate Professor E. R. McCartney, 1982
Mr E. J. Tauber, 1984
Mrs. J. Mansfield, 1986
Dr M. V. Swain, 1988
Mr D. A. Taylor, 1990
Associate Professor R. McPherson, 1992
Mr. H. A. Kanost, 1994
Dr. K. D. Reeve, A.O., 1996
Mr. P. Faulkner, 1998
Associate Professor B. Ben-Nissan, 2000
Dr. R H J Hannink, 2002

Nominations with full documentation supporting the nominee, may be made by any member or Branch Committee of the Australasian Ceramic Society. Nominations should be submitted to the respective Branch or to the undersigned by 1 August 2004.

The judging panel will consist of all members of Federal Council. Judging will be solely on the basis of documentation submitted, so this should cover all relevant supporting materials, including a full CV, publications list, an argued case, etc, with full references if desired (not just referees' names).

Judging Criteria

1. Has the major contribution to the ceramic industry/academia in Australasia been clearly identified?
2. How major was the achievement -
 - known by what proportion of all professional ceramists in Australasia?
 - known overseas through products, personal knowledge, publications, etc?
 - has it been pace- or trend-setting in Australasia?
 - how much has it contributed to the growth of employment opportunities in Australasia?
 - has it helped to establish a new industry, pointed in a new direction, solved a pressing technical problem or problems, increased productivity, introduced new materials or new technology in the industrial scene?
 - how much has it contributed to the 'quality' of ceramic development and enterprise?
 - received awards for teaching or research
 - overall excellence involved in the achievement.

Dr. D. S. Perera
Federal Secretary
Australasian Ceramic Society
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Science Meeting Parliament

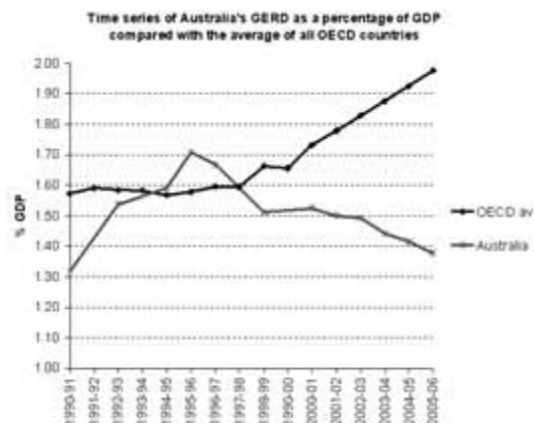
Dr Karlis A. Gross (QEII Research Fellow),
School of Physics and Materials Engineering, Monash Uni., VIC 3800, Australia.
e-mail: karlis.gross@spme.monash.edu.au

"Science meets Parliament" is an event where scientists amass in Canberra to raise the awareness of the research and needs of scientists in Australia, and the importance for supporting this community. I represented the Australasian Ceramics Society, and also the younger generation of scientists. This year, the event was held on October 14-15. This is unique to Australia and is being monitored by other countries to learn of the benefit that this can bring the scientific community. Areas of science represented were quite diverse, and was represented by a relatively large community from the health field. Such an event has been organized for the fifth year running and attracted 25% more scientists and 20% more politicians this year.

My own research activity has involved thermal spray coatings for biomedical applications, but recently has developed an interest in porous biomaterials for tissue engineering scaffolds and micro fabrication. Work at Monash University has developed a scaffold with ridges that can be used for tissue guidance, the only such scaffold available globally. Present research is addressing the internal pore design that is most beneficial for tissue regeneration. The other area of interest is thermal spraying. This is highly specialized and not actively supported in Australia. This new direction is being assessed as a rapid prototype process for micro/nanofabrication of ceramics and composites. While this is difficult for politicians to understand, the applications and capabilities are aspects that can be easily understood.

The first day was a briefing day to equip scientists with ways to effectively communicate with politicians. The second day involved meeting some parliamentarians. I met with Alan Griffin and Julia Irwin, both from the Labor party representing electorates in Melbourne and Sydney. The key issue raised by Alan is the need to get concrete examples from industry to see how the research dollars have provided benefit to the industry. If there are any specific examples in the ceramic industry, this would provide useful case histories in getting more research support. I will be happy to pass this information to Mr. Alan Griffin after it is forwarded to karlis.gross@spme.monash.edu.au. There is lots of general information on how research support is an

investment and provides many returns with more employment and sales of new innovative devices, but local examples are needed.



An increase in funding to the science community through "Backing Australia's Ability" has provided the research community with more funds. At present, the gross expenditure on R&D is at 1.4% of the gross domestic product in Australia, compared to an average of 2% for many countries averaged by the Economic Cooperation & Development Organisation. The science community is looking for a twofold increase in research support that would bring Australia at a comparable level with northern Europe and USA.

Ceramics industry receives a tax benefit when research is supported at universities. FASTS is recommending rewarding greater levels of investment in R&D.

The federal education expenditure in universities is falling annually and is at a level of 0.55% of the gross domestic product. There is a push by the Federation of Australian Scientific and Technological Societies (FASTS) to increase this value. More teachers are needed in science for secondary schools. Any means of increasing the awareness of science to secondary students is an aspect where Mrs Julie Irwin needs support.

FASTS is actively involved with promoting science in Australia and there are ten issues for 2003:

- A long term plan for science and technology is needed
- Boost funding to university science
- Enhance industry innovation
- Encourage industry to be inventive
- Encourage universities to pursue individual excellence in teaching and research
- Scientists need to advise Parliament
- Equal HECS for science and mathematics teachers
- Attract venture capital into new industries
- Implementing national research priorities
- A second step in "Backing Australia's Ability" by 2012

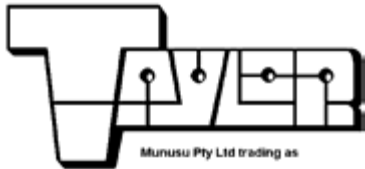
This is a useful event for scientists that bring them into contact with policymakers, who are keen to hear

about the discoveries and innovative work conducted in Australia. This event places scientists at a level where they need to relate to the layperson. The bulletin is a good means of promoting the success of ceramics related industries that can be copied and further disseminated to politicians. I recommend that the Australasian Ceramic Society support this event in the future. Comments from researchers who have previously attended the event are helpful to prepare your visit. Thanks to Viv Lawrie from Millennium Chemicals for advice before my trip to Canberra. Invite your local parliamentarian to your workplace to shed more light on the ceramics activity within Australia. Ceramics is a specialty area that must be actively marketed.

"A lot of things we do are really hard!"
We'd like to do something really hard for you too!

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Simultaneous Conferences

AUSTCERAM 2004

International Ceramic Conference & Exhibition



with the 3rd International Conference on

ADVANCED MATERIALS PROCESSING



29 November - 1 December 2004
Melbourne, Australia

AUSTCERAM 2004

Austceram is a biannual international conference organised by the Australasian Ceramic Society and is the major international ceramic conference held in Australia. The Austceram 2004 conference provides a forum for scientists and industrialists around the world to discuss and exchange information in all areas related to recent developments in science, technology and applications of ceramic materials. The technical program will consist of invited keynotes and lectures, contributed papers, posters and industrial exhibitions.

Supporting Organisations



Advanced Materials Processing (ICAMP-3)

ICAMP-3 is the 3rd in a series of conferences that were initiated in New Zealand in 2000 and has since been held in Singapore. The purpose of ICAMP-3 is to provide a focused forum for the presentation of advanced research and improved understanding of various aspects of advanced materials and processing. This conference will include invited lectures from internationally distinguished researchers, contributed presentations and posters.

Simultaneous Conferences

AUSTCERAM 2004

International Ceramic Conference & Exhibition
with the 3rd International Conference on

ADVANCED MATERIALS PROCESSING



29 November - 1 December 2004
Melbourne, Australia

Registration Details

Registration for ICAMP-3 / AUSTCERAM 2004 is now available. Please proceed to our online registration form. You may first read about pricing details below if you would like.

Prices (AUD\$ including GST)

Registration Includes: Lunches, all am/pm teas and a CD of Proceedings. Member registration applies to IMEA, ACS, IEAust, ASM and AINDT members. Group discounts available on application.

	Early Bird Prior to 31 Aug 2004	Normal From 1 Sept 2004
Member Registration	\$700.00	\$900.00
Non-Member Registration	\$900.00	\$1,100.00
Speaker Registration	\$700.00	\$900.00
Student Registration	\$360.00	\$360.00
Day Registration	\$360.00	\$460.00

Optional Extras:

Dinner Registration (30th November 2004) - \$85.00

Partner Programs

A separate booking form for partner programs, running both before and after the conference, can be downloaded here.

Accommodation Options:

1. Carlton Crest Hotel Melbourne (conference venue)
Standard (3 star) - \$152.00 Corporate (4 star) - \$193.00
Both rates include breakfast served in the hotel restaurant.

2. Bayview on the Park (3 minute walk to conference venue)
Standard (3 star) - \$135.00
Rate includes breakfast served in the hotel restaurant.

Enquiries:

Email: events@mateng.asn.au

Tel: +61 3 9326 7266 Fax: +61 3 9326 7272

Mail: Conference Secretariat, PO Box 19, PARKVILLE, VIC, 3052

For further information and online registration, go to our web page:
www.mateng.asn.au/AMPA

AUSTCERAM 2004



Provisional Technical Program

Note: Some papers listed in the following sessions will only be presented as posters. Invited speakers are also highlighted in italics.

Session topics:

Bioceramics	Cement, Concrete and Geopolymers
Ceramic Composites*	Electro-Ceramics
Energy and Fuel Cells	Industrial Ceramics
Mechanical and Thermal Properties	Nanomaterials*
Porous Ceramics	Processing and Sintering
Raw Materials and Minerals	Refractories
Sol-Gel, Coatings and Thin Films*	Spark Plasma Sintering
Structural Ceramics	

* Joint sessions with ICAMP 03.

Bioceramics

<i>In-vitro Characterization of Thermal Spray Hydroxyapatite Coatings Produced with Nano-structured Feedstock</i>	<i>Mr K A Khor</i>	<i>Nanyang Technological University Singapore</i>
Effect Of Annealing Time On Corona Charged Ethyl Cellulose (Ec) Samples	Manoj Kumar Gaur	Hindustan College of Science and Technology India
Stabilization of Hetro-Charge in Corona Charged Kidney Stones Samples	Manoj Kumar Gaur	Hindustan College of Science and Technology India
Preparation of Porous Hydroxyapatite Block using a Hydrothermal Hot Pressing Methods	Dr Young-Hee Kim	KICET Korea (South)
Development and Production of Calcium Phosphate Bioceramics Phases HA/b-TCP Based on Synthesis Parameters	Dr Herman Mansur	Fedral University of Minas Gerais Brazil
Segregation in TiO ₂	Mr J Nowotny	University of NSW
Thermal decomposition of hydroxyapatite powders and their dissolution behavior	Prof Jong-Kook Lee	Chosun University Korea (South)
Composition and crystallographic influence on dissolution of hydroxyapatite	Prof Jong-Kook Lee	Chosun University Korea (South)
Novel Biomimetic Coating Of Cotton With Calcium Phosphate With 5 × SBF With Cell Attachment Study	E.C. Kolos	University of Sydney

Cement, Concrete and Geopolymers

Review Of Methods And An Experimental Investigation On The Determination Of Concrete Strength	Mr Omer Aryoz	Anadolu University Turkey
Characterization Of Heavy Oil Fly Ash And Its Re-Utilization As An Admixture For Cementious Material	Mr Woo-Teck Kwon	Korea Institute of Science and Technology Korea (South)

Transforming Radioactive Organic Waste Into Apatite Ceramics	Dr Meor Yusoff Meor Sulaiman	Malysian Institute of Nuclear Technology Research Malaya
Effect Of Loading Rate On Apparent Concrete Strength	Mr Ahmet Tuncan	Anadolu University Turkey
Effect Of Sample Moisture Content On Concrete Strength	Mr Mustafa Tuncan	Anadolu University Turkey
Suggested Approach To Determine Optimum Aggregate Gradation Based On Combined Index Of Graded Aggregate Mix	Mr Mohamed Ilyas Anjum	UVCE India
Novel Boroaluminosilicate Geopolymers With Controlled Setting Times	Dr Catherine Nicholson	Industrial Research Ltd New Zealand
Comparison Of The Effect Of Ageing On Geopolymers Made From Fly Ash And Metakaolinite	Dr Dan Perera	ANSTO
Heat Resistant Geopolymers Prepared Using Class F Fly Ash	T. Bakharev	Monash University

Ceramic Composites

<i>Stresses And Distortion In The Sintering Of Ceramic Composites, Laminates And Integrated Structures</i>	David J. Green	Pennsylvania State University USA
Synthesis And Characterization Of Montmorillonites For Application In PET/Organoclay Nanocomposites	Mr Blessie Basilia	University of the Philipines Phillipines
Aluminum Based Metal Matrix Composite Reinforced With Ceramic Particulates	Mr Mohammed Hameedullah	University of Malaya Malaya
Design Processing And Microstructures Of Sic-B ₄ C-Al Laminar Composites	Ms Ayse Kalemtas	Anadolu University Turkey
Pressureless Metal Infiltration Of Fe: Tic Cermet Granules Synthesised From Ilmenite.	Mr Bill Owers	Industrial Research Ltd New Zealand
The Mechanism And Properties Of Making Si ₃ N ₄ -Al ₂ O ₃ Composite Under Oxidation Atmosphere.	Jialin Sun	University of Science and Technology Beijing China
Mechanism Of Forming Compact Layer On The Surface Of Mgo/Si ₃ N ₄ Composite	Yanruo Hong	University of Science and Technology Beijing China

Electro-Ceramics

<i>Electronic And Functional Ceramics, Ceramic Sensors, High-Tc Superconductors</i>	Dr Keith Bowman,	Purdue University USA
Texturing Of PMN-PT Monolithic Ceramics By TGG And Hot Pressing	Dr Jose Antonio Eiras	Universidade Federal de Sao Carlos Brazil
Investigation On The Transformations In Ni ₂ MnGa Single Crystal By Capacitance Dilatometry	Xiadong Wu	Monash University
The Dependence Of Symmetry, Texture, And Orientation On The Domain Switching Fraction In Ferroelectric Ceramics	Dr Jacob Jones	University of New South Wales
Characterisation Of Factors Controlling The Thermal Stability Of Aluminium Titanate Ceramics	Dr Jim Low,	Curtin Unviersity
Research On Effect Of Firing Time On Grain Grow In Zinc Oxide Varistors	Mr Majid Markazi	Niroo Research Institute Iran
69,71Ga And 139La NMR Characterization La _{1-x} Sr _x Ga _{1-x} Mg _x O _{3-x}	Dr Jeff Sellar	Monash University
Effect Of Dispersant On The Slip Casting Of High-K PMN –Based Ceramics	Mr Mei Sen	Queensland University of Technology
Fabrication Of Sintered Bodies Composed Of Mn _(0.5+1.25x) Co _(2.5-2.5x) Ni _{1.25x} (0 ≤ X ≤ 1) Oxides With Cubic Spinel Structure And Their Electrical Properties	Dr Junichi Tatami	Yokohama National University Japan

Electrical Conductivity And Viscosity Measurement In Glass-Ceramic Systems.	Dr Philip Walls	ANSTO
Fabrication And Properties Of PBN Piezoelectric Ceramics	Prof Xiang Zhao	Northeastern University China
Characteristics Of (Bi ^{1/2} Na ^{1/2})TiO ₃ Ceramics By Two Stages Calcination And Hydrothermal Method	Dr Jeong Ho Cho	Korean Institute of Ceramic Engineering & Technology Korea (South)
Characterisation Of Piezoelectric Ceramic	Mr Peter Bryant	Thales Underwater Systems
Polycrystalline Bismuth Titanate Ceramics With Textured Microstructures	Dr. Yi-Bing Cheng	Monash University

Energy and Fuel Cells

<i>High Performance Solid Oxide Fuel Cells With LSCF-Based Cathodes</i>	<i>Dr Hans-Peter Buchkremer</i>	<i>Institute for Materials and Processes in Energy Systems Germany</i>
<i>Imaging And Analysis Of Electrode Reaction At The Electrode/Electrolyte Interfaces For Solid Oxide Fuel Cells</i>	<i>Dr Teruhisa Horita</i>	<i>AIST Japan</i>
Mechanical And Ionic Conductivity Of Ytria-Zirconia Doped With Alumina For Solid Oxide Fuel Cells	Mr Geoffrey Carter	Millennium Chemicals
Modification Of Titanium Dioxide For Dye-Sensitised Solar Cell Application	Mr Timothy Carter	The University of Melbourne
Microwave Heating Of TiO ₂ Films For Dye-Sensitised Solar Cells	Ms Judy Hart	Monash University
Intermediate Temperature Solid Oxide Fuel Cells With Gd _{0.1} Ce _{0.9} O _{1.95} Electrolyte Films Prepared By Dry-Pressing Process	Mr K A Khor	Nanyang Technological University Singapore
Dye-Sensitised Solar Cells Comprising Of Microwave Heat Treated Working Electrodes	Mr David Menzies	Monash University
BaTiO ₃ -Coated TiO ₂ Working Electrodes For Use In Dye-Sensitised Solar Cells	Mr David Menzies	Monash University
Reactivity Between Platinum And Ytria-Stabilised Zirconia	Mr J Nowotny	University of NSW
Ionic Conductivity Of CaTiO ₃	Mr J Nowotny	University of NSW
Deefect Chemistry Of Nb-Doped TiO ₂	Mr J Nowotny	University of NSW
Materials-Related Issues In The Development Of Solar-Hydrogen	Mr J Nowotny	University of NSW
Effect Of Light On The Reactivity At The TiO ₂ /H ₂ O Interface	Mr J Nowotny	University of NSW
Dynamics Of The Open Circuit TiO ₂ - Pt Cell	Mr J Nowotny	University of NSW
Effect Of Thickness On Photo-Electrochemical Properties Of TiO ₂ Thin Film	Mr J Nowotny	University of NSW
Electronic And Ionic Conductivity Of TiO ₂	Mr J Nowotny	University of NSW
Equilibration Kinetics Of TiO ₂ Within N-P Transition	Mr J Nowotny	University of NSW
Chemical Diffusion In TiO ₂ Single Crystal	Mr J Nowotny	University of NSW
Long-Term Equilibration Kinetics For TiO ₂ Single Crystal	Mr J Nowotny	University of NSW
Effect Of Niobium On Properties Of TiO ₂ Thin Films	Mr J Nowotny	University of NSW
Chemical Diffusion In Catio ₃	Mr J Nowotny	University of NSW
Equilibration Kinetics Of Polycrystalline TiO ₂ : The Kinetic Range Determined By The Transport Of Ti Vacancies	Mr J Nowotny	University of NSW
Effect Of Platinum On The Charge Transfer At The Oxygen/Zirconia Interface	Mr J Nowotny	University of NSW
Effect Of Calcium On The Charge Transfer At The Oxygen/Zirconia Interface	Mr J Nowotny	University of NSW
Al ₂ O ₃ Solubility In The Fast Ion Conductor 0.088ZrO _{2-(0.12-x)} Sc ₂ O _{3-x} Al ₂ O ₃ Determined By 27Al NMR	Dr Jeff Sellar	Monash University
Preparation And Characterisation Of Doped Lanthanum Gallate Thin Films For Solid Oxide Fuel Cell Electrolytes.	Mr Andy Singh	Monash University

Synthesis And Analysis Of Inverse Spinel LiNiVO ₄ Cathode Materials For Lithium Batteries	Mrs Titipun Thongtem	Chiang Mai University Thailand
Defect Structure And Oxygen Absorption/Release Property Of CeO ₂ -ZrO ₂ Solid Solution	Mr Yoshio Ukyo	Toyota R&D Labs Japan
Surface Diffusion And Anodic Concentration Polarization In Solid Oxide Fuel Cells	Ralph Williford	Pacific Northwest National Laboratory USA
The Role Of SiO ₂ On The Grain Boundary Impedance And Total Conductivity Of 10mol% Y ₂ O ₃ – ZrO ₂	Dr Sukhvinder Badwall	CSIRO Manufacturing & Infrastructure Technology
Ion Impregnation – An Alternative Fabrication Method For High Performance Electrodes Of Solid Oxide Fuel Cells	San Ping Jiang	Nanyang Technological University Singapore

Industrial Ceramics

<i>Wet Slip Resistance Of Ceramic Tiles As A Function Of Rubber Test Foot Preparation</i>	<i>Mr Richard Bowman</i>	<i>CSIRO Manufacturing & Infrastructure Technology</i>
Calcium Oxide Ceramic Materials for Specialty Laboratory Ware	Dr Ioan Alecu	Rojan Advance Ceramics
XRD Investigations on Non-Equimolar Aluminium Titanate Ceramics	Dr Ioan Alecu	Rojan Advance Ceramics
An Investigation On Isobrick	Mr Gokham Arslan	Anadolu University Turkey
A Brief Review Of Fired Brick Properties And An Experimental Study On The Properties Of Fly Ash-FGD Gypsum-Lime Based Bricks	Mrs Evren Aryoz	Anadolu University Turkey
Development of Matte Glazes for Stoneware Bodies	Dr Alpogut Kara	Anadolu University Turkey
ZrO ₂ -CaO-MgO-SiO ₂ (ZrCMS) System Glass-Ceramic Glazes Suitable for Porcelain Tiles	Mr Guray Kaya	Anadolu University Turkey
Study Of Mineralogical Changes In The Determination Of Ceramic Tile Moisture Expansion	Ms Alexandra Mansur	Federal University of Minas Gerais Brazil
A New Test Method For The Determination Of Resistance To Salt Attack In Heavy Clay Products	Mr Phil Morey	Austral Bricks
An Analysis Of Airborne Sound Insulation Results Of Composite Masonry Walls	Mr Phil Morey	Austral Bricks
Vanadium staining in fired clay bricks - cause and elimination	Dr David Phillips	Curtin University of Technology
Pumice Effects On Properties Of Wall Tile Glazes	Mr Ifran Tore	Anadolu University Turkey
The Expansion Of Clay Bricks After 30 Years	Mr Stephen Zsembery	
Glass-Ceramic Glazes in the CaO-MgO-Al ₂ O ₃ -SiO ₂ (CMAS) System for Porcelain Tiles	Dr Bekir Karasu	Anadolu University Turkey
Closed Cycle Economy And The Sustainable Development Of China's Building Materials Industry - Opportunity And Challenge Faced By Material Science.	Prof Cui Yuan-Sheng	Ceramic Society of China China

Mechanical and Thermal Properties

<i>The Effect of YSZ Microstructure on Young's Modulus</i>	<i>Mr Chris Berndt</i>	<i>Stony Brook University USA</i>
Crack-Healing Behavior of Mullite/SiC Composite under Stress and Resultant Strength at the Healing Temperature.	Prof Kotoki Ando	Yokohama National University Japan
Fatigue Strength of Crack-Healed Al ₂ O ₃ /SiC-Whiskers at Elevated Temperature	Prof Kotoki Ando	Yokohama National University Japan

Indentation Damage of a Functionally-Graded Aluminium Titanate-Mullite/ Alumina Bilayers	Dr Jim Low	Curtin University of Technology
Mechanical Properties Of Functionally Graded Al ₂ TiO ₅ Systems By Using Indentation Responses	Zeyo OO	Curtin University of Technology Malaysia
Indentation Responses Of Functionally-Graded Al ₂ O ₃ -Al ₂ TiO ₅ Bilayers	Zeyo OO	Curtin University of Technology Malaysia
Thermal Properties Of Synroc-C From Ambient Temperature To 1200°C	Dr Dan Perera	ANSTO
Tribological Properties of Gamma TiAl with 800–1000°C Nitridation	Mr Kittichai Sopunna	Chiang Mai University Thailand
Hertzian Contact Damage In Tin Particle Dispersed Si ₃ N ₄ Ceramics	Dr Junichi Tatami	Yokohama National University Japan
Lifetime of All-Ceramic Dental Crowns	Mr Yu Zhang	National Institute of Standards and Technology USA
Investigation On Addition Of ZrO ₂ -3mol% Y ₂ O ₃ Powder On Sintering Behavior And Mechanical Properties Of B ₄ C	Dr H.R. Baharvandi	University of Tehran Iran
Investigation on addition of Talc Powder on Sintering Behavior and Mechanical Properties of B ₄ C	Dr H.R. Baharvandi	University of Tehran Iran
Lu ₂ O ₃ Stabilized β-Sialons: Mechanical And Wear Properties	Mark I Jones	AIST Japan

Nanomaterials

<i>Nanostructure Control Of Interface And Microstructural Design</i>	<i>Dr Suk-Joong L Kang</i>	<i>Korea Advanced Institute of Science and Technology Korea (South)</i>
<i>Ferroelectric Properties Of PZT Nanotube Array</i>	<i>Dr Jeon-Kook Lee</i>	<i>Korea Institute of Science and Technology Korea (South)</i>
Nanoscale Ionic Field Effect Memory And Transistor Based On Ion Transport In Carbon Nanotube	Dr Ho Jung Hwang	Chung-Ang University Korea (South)
Effect Of The Oxidation Temperature On The Morphology Of ZnO Nanowires Synthesized By Directed Melt Oxidation Of Al-Zn Alloy	Mr Geun-Hyoung Lee	Dong-Eui University Korea (South)
Delamination And Re-Assembly Of Sufactant-Containing Li/Al Layered Double Hydroxides	Dr Mahua Singh	Mowatt Refractories
Change In Chemical And Physical Properties Of Carbon Nanotubes By Oxidation With Carbon Dioxide	Dr Junichi Tatami	Yokohama National University Japan
Nano-Fractography Of Alumina By Scanning Probe Microscopy	Dr Junichi Tatami	Yokohama National University Japan
Reverse Micelle Synthesis Of Zirconia Nanopowders	Mr Harpreet Singh	University of Nevada USA
Sintering Of Oxide Nanopowder Layers Deposited On Silica Substrates	JM Heintz	Universite de Bordeaux France
Nanomaterials For Ceramics, Glass And Other Useful Items	Mr Murray Lines	Stratum Resources
Preparation Of Nanometer Yttrium Oxide	Mr Zhi Qiang Liu	Guangzhou Research Institute of Non-Ferrous Metals China
Designing Functional Nanoparticles: Photoactivity And The Incorporation Of Introduced Cations In ZnO Nanoparticles	P. Casey	CSIRO Manufacturing & Infrastructure Technology

Porous Ceramics

Determining Closed Porosity Using Small Angle X-Ray Scattering (SAXS)	Dr Craig Buckley	Curtin University of Technology
Fabrication Of A Low Temperature Minimum Technology Sintered Ceramic Water Filter	Mr Tony Flynn	Australian National University
Hybrid Silica Materials: Structural And Transport Properties	Mr Haryadi Haryadi	University of NSW
Mesoporous Silica Synthesis And Surface Function With Titania And Alumina Doping	Dr Junichi Hojo	Kyushu University Japan
Environmentally Friendly Tape Casting For Porous Alumina-Zirconia Substrate	Dr Angkhana Jaroenworarluck	National Metal and Materials Technology Center Thailand
Permeability And Mechanical Properties Of Porous Mullite-Alumina Ceramics	Mr Bruno Latella	ANSTO
Development Of Ceramic Microporous Membranes For Hydrogen Separation And Evaluation Of Their Potential For Emerging Applications In Hydrogen Economy	Dr Balagopal Nair	Noritake Company Japan
Preparation Of Porous Alumina Using Carbon Black As A Template	Dr Junichi Tatami	Yokohama National University Japan
Fabrication Of Porous Ceramics With Controlled Pore Size And Porosity By Colloidal Processing	Dr Yoshio Sakka	National Institute of Materials Science Japan
Diamond Grain Size Effects On Grinding-Ability Of Porous Metal Matrix Dicing Blades	Takuya Adachi	Nagaoka University of Technology Japan

Processing and Sintering

Non-Equimolar Aluminium Titanate Ceramic Materials	Dr Ioan Alecu	Rojan Advance Ceramics
Line Swept Surface Generation On Insulating Ceramics By Wire Electrical Discharge Machining	Dr Yasushi Fukuzawa	Nagaoka University of Technology Japan
Densification Of RF-Plasma Synthesized Ultrafine SiC Powders	Dr Mikinori Hotta	Kyushu University Japan
Ceramic Solutions For Ultra-High Pressure (UHP) Waterjet Nozzles	Mr. Tim Lowe	JetNet Pty Ltd
Sintering Behavior Of The $\text{Si}_3\text{N}_4\text{-Y}_2\text{O}_3\text{-Al}_2\text{O}_3\text{-TiO}_2\text{-AlN}$ System	Dr Junichi Tatami	Yokohama National University Japan
Preparation Of Transparent Yttrium Oxide Ceramic By HIP Sintering	Dr Kunihiko Yanagita	Niigata University Japan
Low Temperature Of Sintering Of Fine AlN Powder Synthesized By Floating-Type Rapid Nitridation Of Al Powder	Dr Kunihiko Yanagita	Niigata University Japan
Analysis Of Sintering Behavior Of Al_2O_3 Based Ceramics By Master Sintering Curve	Dr Junichi Tatami	Yokohama National University Japan
Elucidation And Control Of Aluminosilicate Species Contributing To Zeolite Crystal Growth	Mr Toru Wakihara	The University of Tokyo Japan
Sintering And Expansion Studies Using Non-Contact Laser Dilatometry	Dr Philip Walls	ANSTO
Powder Morphology And Sintering In The Case Of Yttria	JM Heintz	Universite de Bordeaux France
Hot Isostatic Pressing (HIP) Of $\alpha\text{-Al}_2\text{O}_3$ Nanometric Powders Pressureless Sintered At Different Temperatures	Mr Miguel Humberto	Centro De Investigacion en Materiales Mexico
The Effects Of The Rate Of Kiln Firing On Crystal Development In High-Temperature Ceramic Glazes	Dr Peter Wilson	Charles Sturt University
Perovskite And Titanite Crystallisation From Titanosilicate Melts	Lou Vance	ANSTO

Raw Materials and Minerals

<i>Synthesis Of SiC And SiC + Al₂O₃ Powders From Natural Silicates</i>	<i>Dr Peter Majewski</i>	<i>University of Adelaide</i>
<i>Formation Of β-Spodumene From Topaz + Precipitated Silica + Lithium Carbonate Mixtures</i>	<i>Dr Chris Sorrell</i>	<i>University of NSW</i>
Obtaining High Purity Calcite And Hydromagnesite From Local Kuwaiti Dolomite	Dr Saud Al-Otaibi	Institute for Scientific Research Kuwait
Charaterisation Of Ball Clay From Tapah, West Sarawak, Malaysia	Mr Azemi Hj Eki	Mineral and Geoscience Department of Malaysia Malaysia
Synthesize TiO ₂ Particles By Self Hydrolysis Of TiOCl ₂ Using Domestic Microwave	Ms Miki Inada	Kyushu University Japan
Physical And Chemical Properties Of The Halloysite And Market Applications For This Unique Product	Simon Marsters	
Preparation And Properties Of SiO ₂ From Rice Hulls	Dr Takeshi Okutani	AIST Japan
Phase Equilibria In The System Li ₂ O-Al ₂ O ₃ -SiO ₂	Dr Chris Sorrell	University of NSW
Structural Change Of Activated Carbons Made Form Coconuts Shell And Coal By Heat Treatment	Dr Junichi Tatami	Yokohama National University Japan
Synthesis Of Nano-AlN Powder From γ -Al ₂ O ₃ By Reduction-Nitridation In A Mixture Of NH ₃ -C ₃ H ₈ Gases.	Dr Junichi Tatami	Yokohama National University Japan
The Onset Of Whisker Formation During Thermal Conversion Of Fluoride-Rich Topaz To Mullite	Dr Tim Harvey	CSIRO Manufacturing & Infrastructure Technology
The Use Of Magnesium To Inhibit Mullite Whisker Growth In Flourine-Rich Topaz	Dr Tim Harvey	CSIRO Manufacturing & Infrastructure Technology

Refractories

<i>Packaging Natural Graphite Into Castables For Steelmaking Applications</i>	<i>Prof Michel Rigaud</i>	<i>Ecole Polytechnique Canada</i>
In Situ Observation Of MgO Dissolution	Dr Sharon Nightingale	University of Wollongong
The Resistance To Molten Metal Attack Of Sialon Bodies Reinforced With Ceramic Particles	Ms Carolyn Sheppard	Industrial Research Ltd New Zealand
The Role Of Alkalies In Reducing Refractory Life	W.W. Wright	CSIRO Manufacturing & Infrastructure Technology
Utilization Of Waste Plastics As A Fuel In The Precalciner	Mr Woo-Teck Kwon	Korea Institute of Science and Technology Korea (South)
The Effect Of Fine Calcined Alumina And Dispersants On The Hot Strength Of Silica Free Low Cement Castables	W.W. Wright	CSIRO Manufacturing & Infrastructure Technology

sol-Gel, Coatings and Thin Films

<i>Non-Linear Behaviors Of The Compositionally Graded (Ba,Sr)TiO₃ Thin Films Derived By A Sol-Gel Process</i>	<i>Dr Hayden Chen</i>	<i>City University of Hong Kong Hong kong</i>
<i>Preparation Of Photosensitive Titania-Doped Hybrid Polymer Via Anhydrous Sol-Gel Process</i>	<i>Dr Congji Zha</i>	<i>Australian National University</i>
Studying Corrosion Of Coated Titanium Anodes In NaCl Solution	Mr Ehsan Bakhshi	National Petrochemical Company Iran
High-Resolution Transmission Electron Microscopy Investigation Of The Nanostructure Of Nanocrystalline Pulsed Laser Deposition SnO ₂ Thin Films	Dr Zhiwen Chen	City University of Hong Kong Hong kong
Structure And Properties Of The Si ₃ N ₄ Nitride Ceramics With PVD And CVD Coatings	Mr Leszek Dobrzanski	Silesian University of Technology Poland

Structure And Properties Of PVD And CVD Coated Oxide Ceramic Tool Material Based On Al ₂ O ₃ .	Mr Leszek Dobrzanski	Silesian University of Technology Poland
Dielectric Characterization Of PZT Thin Films In The Microwave Region	Dr Jose Antonio Eiras	Universidade Federal de Sao Carlos Brazil
Hydrothermal Epitaxy Of KNbO ₃ And KTaO ₃ Films	Dr Gregory Goh	Institute of Materials Research and Engineering Singapore
1.5-Mm Emission And Infrared-To-Visible Upconversion Luminescence Of Er ³⁺ /Yb ³⁺ In Oxyhalide Glasses	Dr Qinyuan Zhang	South China University of Technology China
Optical Properties Of Solution Deposited TiO ₂ Films	Dr Gregory Goh	Institute of Materials Research and Engineering Singapore
Effect Of Sintering On Thermophysical Properties Of Segmented Thermal Barrier Coatings	Dr Hongbo Guo	The University of Tokyo Japan
Design And Fabrication Of Thin-Film Filters For Optical-Communication Applications	Mr S H Keshmiri	Ferdowsi University Iran
Development Of Novel Ceramic Materials For High Temperature CO ₂ Separation	Dr Balagopal Nair	Noritake Company Ltd Japan
Magnetron Sputtered Carbon And Carbon-Based Nanocomposite Coatings Of High Hardness And Low Residual Stress: A Review	Associate Professor Sam Zhang	Nanyang Technological University Singapore
Photosensitivity Of Titania-Doped Hybrid Sol-Gel Glassy Thin Films	Dr Congji Zha	Australian National University
Microstructural Studies Of Ceramic Coatings Prepared By Sol-Gel Process	Dr Nancy Quaranta	Universidad Tecnologica Nacional Argentina
Characterizations Of VO ₂ Thin Film By Inorganic Sol-Gel Method	Mr Byung Ik Kim	Korean Institute of Ceramic Engineering & Technology Korea (South)

Spark Plasma Sintering

<i>Sintering Of Stacking Disordered SiC By Spark Plasma Sintering</i>	<i>Mr Manshi Ohyanagi</i>	<i>Ryukoku University Japan</i>
Consolidation Of Various Yttria-Stabilised Zirconia Powders By Spark-Plasma-Sintering (SPS) And By Conventional Sintering Methods	Mr K A Khor	Nanyang Technological University Singapore
Spark Plasma Sintering Of Silica-Doped Hydroxyapatite	Mr K A Khor	Nanyang Technological University Singapore
Thermoelectric Properties Of β -SiC Prepared By Mechanical Alloying –Spark Plasma Sintering Method.	Mr Yasuhiro Kodera	Ryukoku University Japan
Melilite Formation And Re-Melting In Sm-Stabilized α -Sialon Ceramic During Post Heat-Treatment By Spark Plasma Sintering	Mr Yu Ligen	Nanyang Technological University Singapore
In-Situ Reinforced Li-Sialon Ceramics By A New Processing Strategy	Ms Hong Peng	Stockholm University Sweden
SPS - Synthesis Of Ternary Carbides (TM + Al + C)	Mr Yu Grin	Max-Planck-Institute Chemical Physics of Solids Germany
Spark Plasma Sintering Of X-Sialon	Mr Glen Barris	Industrial Research Ltd New Zealand

Structural Ceramics

<i>Silicon Nitride Nano-Ceramics</i>	<i>Dr Zhijian Shen</i>	<i>Stockholm University Sweden</i>
Hightemperature Deformation Of Y And Ca Doped α/β SIALONS	Prof B S B Karunaratne	University of Peradeniya Sri Lanka
Thermal Diffusivity Of Various α/β -Sialon Ceramics	Mr Seniz Reyhan	Anadolu University Turkey
Properties Of Liquid Phase Pressureless Sintered SiC-Based Materials Obtained Without Powder Bed	Dr Giuseppe Magnani	ENEA Italy
Kinetics Of The Tetragonal To Monoclinic Phase Transformation In Zirconia During Low Temperature Environmental Degradation	Dr Derek Northwood	University of Windsor Canada
Characterisation Of Vacuum Heat Treatment Synthesize $Ti_3 SiC_3$ -TiC Ceramic In Argon By Neutron Diffraction	Zeyo OO	Curtin University of Technology Malaysia
In-Situ Study Of The Phase Stability Of Ti_3SiC_2 In Argon By Neutron Diffraction	Zeyo OO	Curtin University of Technology Malaysia
Oxidation Mechanism Of Reaction-Bonded Silicon Nitride	Dr Kuljira Sujjrote	National Metal and Materials Technology Center Thailand
Corrosion Resistance Of Ca- α Sialon Nano Ceramics In Aqueous Solutions	Dr Junichi Tatami	Yokohama National University Japan
Exploiting New Synthesis Routes For Sialon And Sialon Ceramics	Mr Vaughan White	Industrial Research Ltd New Zealand
Lu_2O_3 Stabilized α -Sialons: Mechanical And Wear Properties	Mr Mark Jones	AIST Japan
Densification And High Temperature Stability Of Low-Cost α -Sialons Derived From Slag Via Carbothermal Reduction – Nitridation	M.R.Terner	Monash University

NEWS FROM FASTS

The Government has published its response to the recommendations of the three research reviews. Last year, Minister Nelson initiated three reviews on aspects of research;

- * Evaluation of Knowledge and Innovation Reforms (1999 White paper)
- * Closer collaboration of universities and major publicly funded research agencies
- * National Research Infrastructure Taskforce.

The Government has now responded to all of the recommendations in the three reviews. The full response can be found at http://www.dest.gov.au/highered/research/review_re.p.htm

Below is a brief summary of key elements.

Knowledge and Innovation

- * Leveraging - Government acknowledges that leveraging through MNRF and other programs are inflexible and may inhibit universities' capacity to develop new research strengths (refer FASTS press release 24 March 2004). Government says it will in future avoid inflexible leveraging, where appropriate. (Comment: Not clear how they will do this without substantial top ups to grants to avoid requirement of matching/leveraged funds).
- * Government will maintain balance of performance-based block and competitive funding (comment: this only meaningful if leveraging diminished).
- * In next two years Govt to establish Quality and Accessibility Frameworks for Publicly Funded Research (appears to be sort of an analogue of the UK Research Assessment Exercise). However, it is not decided if this will be used as part of resource allocation.
- * No change to operation of RIBG.
- * Research Training Scheme (RTS) to be redesigned although no specific comment on separations pool or incentives for early completions.
- * Retaining capping arrangements to be considered. Decision to be made for 2005.
- * No change in Institutional Grants Scheme (IGS) formula.
- * Research and Research Training Management Reports will continue as annual exercise but may be replaced by Quality and Accessibility Frameworks for Publicly Funded Research in two years.

* Regional protection will be extended for four years (comment: of particular importance for Newcastle and JCU who received over \$1m and \$600,000 respectively last year).

- * Contestability arrangement for IAS at ANU to be retained.

Collaboration

- * Government will consider making co-location (between universities and PFRAs) an element of the new National Research Infrastructure Strategy (announced in BAA2). Co-location will be included in triennial agreements with PFRAs where cost-effective. (Recommendation that co-location be default was much stronger);
- * Will not establish a Strategic Research Council but will pursue strengthening of co-ordination through PMSEIC and other (unnamed) fora.
- * Govt supports encouraging understanding of IP and dissemination of IP information but declined to form an expert group to reconsider National Principles of Intellectual Property Management for Publicly Funded Research. (NB: There is no comment on the suggestion of a \$500m contestable fund for collaboration).

Infrastructure

- * Declined to establish a National Research Infrastructure Council but is providing \$542m from 2004-05 - 2010-11 for a national Collaborative Research Infrastructure Strategy (BAA2). This will take account of some of the Taskforce's comments but there doesn't appear to be a specific brief to examine ongoing commitments and prioritise research infrastructure requirements.
 - * The Government has not responded to specific suggestions such as establishing a process to identify and prioritise Australian Landmark Facilities or cost recovery.
- Comment: The Government's response to the Infrastructure Inquiry is thin and clearly FASTS will need to very carefully examine the National Collaborative Research Infrastructure Strategy, as that appears to be the answer the Government is proffering for most issues raised in the review.

Bradley Smith
Executive Director

FEDERATION OF AUSTRALIAN SCIENTIFIC AND TECHNOLOGICAL SOCIETIES

Science and Technology for the Social, Environmental and Economic Benefit of Australia

1. Bradley Smith appointed new Executive Director, FASTS

We welcome Bradley Smith to FASTS. He will start work at the Dome on 2 February 2004 as Executive Director. Bradley was formally a policy advisor on the staff of the leader of the Australian Democrats, where his main portfolio responsibilities were higher education, science and biotechnology, R&D and innovation. He successfully negotiated improvements to more than 30 bills and regulations affecting science and technology including the R&D Tax Concession in 2001, the Research Involving Human Embryos Act and the Australian Research Council Act. Before that, he was the President of the Council of Australian Postgraduate Associations (CAPA) and a doctoral candidate in the history and philosophy of science. Bradley says that he relishes the opportunity to assist FASTS to build on its achievements, to further strengthen the organisation and enhance its capacity to successfully influence Government, media and community understanding and support of science and technology.

2. Top Ten Policies for 2004 announced

2004 is an election year, and FASTS is encouraging the Australian Government to bring on *Backing Australia's Ability (II)*. This is our most important policy object.

In 2001 the Australian Government announced the \$2.9 billion *Backing Australia's Ability* investment package to boost Australia's research and innovation capacity. This was a positive step, and one essential for the nation's future prosperity and well being. Most of the investment through *Backing Australia's Ability* is set to end in 2006. After the many reviews conducted in 2003 into Science and Innovation, the government should be ready to announce *BAA (II)* in this year's budget. FASTS has previously applauded the Government's investment in *Backing Australia's Ability* which, following the key contribution of Chief Scientist Robin Batterham, supported by FASTS and other organizations, brought about a sea change in Australia's investment in science and technology.

However Australia still lags behind most of our OECD competitors in terms of investment in research and innovation. The European community has recently set a target for investment in research of 3 percent of GDP by 2010, and the US and our other international competitors are moving in the same direction. Australia is currently investing about half that amount. We need a national strategy to boost this investment in the next stage of *Backing Australia's Ability (II)* to remain competitive.

FASTS Ten Top Policies for 2004

1. BRING ON "BACKING AUSTRALIA'S ABILITY (II)"

BAA was a first step to invest in Australian science. It's time to take the second step and increase our national investment to match the OECD average.

2. RETAIN OUR BRIGHT YOUNG RESEARCH SCIENTISTS

Recent science graduates have plenty of employment opportunities, but postdoctoral researchers have run into a career bottleneck. The best ideas will flourish if BAA (II) creates attractive career opportunities in research and industry.

3. PhD SCIENCE GRADUATES TO INVIGORATE INDUSTRY

BAA (II) should provide matching Government funds to employ new PhD graduates in industry for 2 years, to bring fresh scientific ideas for new methods and new products, and to forge science-based industry career paths.

4. ENCOURAGE INDUSTRY TO BE MORE INVENTIVE

Give increased tax breaks on a sliding scale to reward companies prepared to increase their investment in research, because enterprising and inventive companies grow and provide more jobs.

5. ATTRACT VENTURE CAPITAL INTO NEW INDUSTRIES

Venture capital is in short supply. Make it more attractive to invest in new ideas and new industries that have long term payoffs by lowering capital gains tax for long term investments.

6. NOW WE HAVE THE MAP, AUSTRALIA NEEDS A COMPASS

The National Mapping exercise has shown us where we are. We should create a plan for up to 10 years into the future that sets goals and national directions, including national action plans on limiting climate change and on sustainable energy strategies.

7. HECS BREAKS FOR SCIENCE AND MATHEMATICS TEACHERS

Science and maths teachers are in short supply in Australia, but they pay higher HECS fees than other teachers and thus take home less pay. Bring in HECS breaks for science graduates when they take on teacher employment.

8. COLLABORATION, NOT COMPETING SILOS

Destructive competition between separate research organizations for the funding dollar limits research outcomes. Provide more collaborative funding incentives to build on the different strengths of universities and Government funded research agencies.

9. QUALITY SCIENCE GRADUATES

Quality science and technology graduates are vital to Australia's economic and environmental future. We

need measures to ensure that the new Higher Education funding arrangements help reverse the current decline in Higher Education science enrolments.

10. WE ARE NOW 20 MILLION AND GROWING

Australia is a fragile continent with an expanding population. We need to develop a scientifically based population strategy that takes into account limits to growth determined by, for example, water resources and soil salinity. These issues will form the core of our policy priorities in this election year.

4. Higher Education Reforms pass in the Senate

The *Higher Education Support Bill 2003* passed through the Senate on 4 December and is now law. Passage of the legislation means that implementation of the reforms can start as scheduled in 2004. Unfortunately, the Government was not prepared to provide adequate indexation of operating grants. As a result, the value of the additional funding will be eroded in the not too distant future, without increased contributions from government. The main changes to the original package entitled *Our Universities: Backing Australia's Future*, which was released in May 2003, are listed below:

- Doubling the growth places from 1,400 to 2,800 in 2007.
- Introduction of a 20% loan fee to apply to loans for undergraduate courses under FEE-HELP and all loans under OS-HELP.
- The maximum student contribution amounts per place have been set at an amount equivalent to current HECS rates plus 25%.
- An increase to the repayment threshold at which students begin to repay their HECS and other loans to \$35,000 in 2004-05. As is current practice this will be indexed to bring it up to \$36,184 in 2005-06.
- An additional 7,500 Commonwealth Accommodation Scholarships by 2008.
- Commonwealth Learning Scholarships will not be subject to the social security income test.
- A review of cost adjustment factor indexation for Commonwealth funding of universities from 2007-08.
- Removing the interest charge on FEE-HELP and OS-HELP.
- Extending the learning entitlement to seven years while maintaining the capacity for extra years if necessary.
- Relaxation of the Workplace Relations requirements necessary to receive an increase in the basic grant amount under the Commonwealth Grant Scheme.
- A review of indexation must be completed prior to February 2005.
- A review of the impact on the higher education sector of the reforms enacted through the

legislation must be commenced prior to 31 December 2006. The net result is an increased government commitment of \$313.6 million and the abolition of the workplace reforms outlined in the May policy paper.

5. Is strategic public-good research doomed?

Indications are that they may be problems in the longer term for strategic research undertaken for the public good, because it is not clear where this work is going to be done in the future and who is going to do it. The universities will evidently be focusing their efforts on basic research funded by the ARC, so they may not be doing much. There is pressure on CSIRO to earn more external earnings so don't like it will have significant big programs in this area. And the key selection criteria from the new guidelines for CRCs will, if they are strictly adhered to, result in the death knell for any "Public Benefit" research under the CRC banner. The Guidelines state: "Applications will be assessed on the extent to which they meet the following selection criteria:

1. The outcomes will contribute substantially to Australia's industrial, commercial and economic growth (*Further to this criterion, it is also stated that "...business cases that rely solely on public benefit outcomes are unlikely to be competitive"*).
 2. The path to adoption (commercialisation/utilisation) will achieve the identified outcomes.
 3. The collaboration has the capability to achieve the intended results.
 4. The funding sought will generate a return and represents good value for the taxpayer.
- These selection criteria will be used in Stage 1 and Stage 2. Selection criteria (1) and (2) will be given greater weight in the overall judgement at each stage."

These words provide a clear statement that CRCs focused solely on public benefits outcomes are unlikely to be successful. So who is going to do research on climate change, floods droughts and greenhouse gas emissions?

Who is going to work on dry land salinity and land degradation?

Who is going to work on environmental factors affecting the coastal zone and urban development?

Who is going to work on developing new techniques to explore the earth?

Not at all clear.

6. Scientists in 2004 Australia Day Honours list.

It was good to see several scientists recognised in the Australia Day Honours list this year.

Dr Robin Batterham, who has been Chief Scientist since 1999, became an Officer of the Order of Australia; **Professor Graeme Clark**, inventor of the cochlear implant the foundation director of Melbourne's Bionic Ear Institute inventor of the cochlear ear implant; and **Professor Adrienne**

Clarke, of the Plant Cell Biology Research Centre at the University of Melbourne, became Companion of the Order of Australia. Clarke was a past chairman of the board at the CSIRO and works on cellular recognition in plants. Two Australians now working in the USA, Dr Victor Fazio and Professor Enid Gilbert-Barness also became Officers of the Order of Australia: **Dr Victor Fazio** graduated from the University of Sydney but is now working in the colorectal surgery department of the Cleveland Clinic in Ohio. He was honoured for his work on Crohn's disease; Fellow University of Sydney graduate **Professor Enid Gilbert-Barness**, an Emeritus Professor of Pathology and Laboratory Medicine at the University of Wisconsin-Madison, was honoured for her research into cardiovascular, genetic and metabolic disease. Congratulations to these scientists, who can be found along with all the other awardees at:

http://www.itsanhonour.gov.au/about_honours.html

7. Vicki Sara leaves ARC

Professor Vicki Sara, CEO of the Australian Research Council (ARC), has announced her departure from the Council. Professor Sara will continue as the CEO until the Government's May Budget. Professor Sara has led the ARC for over seven years, having been appointed as its first CEO in July 2001, and Chair from September 1997 to June 2001. During this period the Council has undergone tremendous change and recognised ground-breaking achievements. Professor Sara, was the principal architect behind the establishment of the ARC as an independent agency, and its National Competitive Grants Program, which embodies a commitment to excellence and recognises the value of Australia's research talent. The ARC is playing a key role in the implementation of the Government's innovation program, *Backing Australia's Ability* which included an additional \$736M over 5 years to double the

ARC's funding. Vicki Sara will be missed as head of the ARC and we wish her well in her future endeavours.

8. National Security Division of PM&C establishes SET Unit to fight terrorism

A Science, Engineering and Technology (SET) Unit has been established in the National Security Division of the Department of the Prime Minister and Cabinet (PM&C). Staff for the Unit have been seconded from the Defence Science and Technology Organisation, CSIRO, DEST, the AFP and the intelligence community. The Unit will provide an overarching view of national research requirements and priorities for counterterrorism that is currently lacking. Although some agencies with responsibility for counterterrorism (user agencies) have means of accessing research, opportunities are being missed due to lack of knowledge of the needs or the capability of SET agencies to provide solutions. The Unit will also provide the focus for international collaboration in this area. The Unit is developing a set of priority requirements for possible research based on capability gaps identified by the user agencies. At the same time, it is developing a research programme to support the best research proposals in line with the priority requirements. To this end, it is consulting widely both in the counter terrorism and SET communities.

The SET Unit can be contacted on setu@pmc.gov.au or by phone to Susan Wishart (who provided this information) on (02) 6271 5247. More details are available at www.pmc.gov.au

DISCLAIMER: The Federation of Australian Scientific and Technological Societies (FASTS) has taken all reasonable precautions and made all reasonable efforts to ensure the accuracy of material contained in this document. However, FASTS makes no warranties, express or implied, with respect to any material published in Science News.

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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.ozemail.com.au/~ausceramsoc>



Millennium Performance Chemicals is a unit within the Growth & Development division of Millennium Chemicals. It was specially created to handle the following inorganic specialty products:

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For more details please contact:

Stephen Harris
Market Developer
(e) stephen.harris@millenniumchem.com
(T) 08 9411 1239
(F) 08 9411 1275



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
- High Temperature Materials Fabrication
- Remaining Life Studies of Materials & Structures
- Hot Isostatic Pressing
- Surface Engineering
- Functional Ceramics
- Advanced Ceramics
- Finite Element Analysis

Our Key Facilities Include:

- Large Batch Ceramic Powder Processing
- Spray Dryers up to Pilot Plant Size
- Hot Presses & Sinter Hot Isostatic Presses
- Laser Dilatometry of Large Samples
- Particle Size & Surface Area Characterisation
- Electron Microscopy
- X-Ray Diffraction Analysis
- Vibrational Spectrometry
- High Temperature Mechanical Testing

Additional facilities and expertise relevant to materials R&D also exist in other Divisions within ANSTO to complement the above.

To arrange a visit to ANSTO to discuss your problems or ideas, or for further information please contact:

GEORGE COLLINS, Materials Division ANSTO

PMB 1, Menai, NSW 2234

Ph: (02) 9717 3400

Fax: (02) 9543 7179

POSITIONS WANTED

Name: Bruno Coumes-Marquet

7, rue François Longaud

31400 Toulouse France

Tel : +33 (0) 561 521 476

<mailto:bruno.coumes@laposte.net>

<http://homepage.mac.com/coumes>

Ceramic project engineer in DIATOMIC - France -

www.diacer.com. Performed all development

activities under timelines dictated by customers.

Developed new and improved ceramic process and materials for Europe and United-States customers.

Micromechanic : zirconia / alumina components for automotive and aircrafts industry and aesthetics components for watchmakers. Medical : custom zirconia parts for dental crowns and bridges.

Qualifications :

Master's in advanced ceramic and processes -

ENSCI : Advanced ceramic engineering school

(Ecole nationale superieure de ceramique

industrielle), France.

Name: P.S.Sankara Rama Krishnan.

Qualification: M.Tech (Ceramic Technology)

Brief Description of Skills:

My qualification and experience are approved by Institute of Engineers - Australia. I am having a wide experience in Research and Development of Advanced Ceramics, Refractories, Cement and Concrete. I have a good knowledge of Processing of ceramics, Iron and Steel, various analytical techniques like XRD, SEM, TGA, DTA etc.

Expecting to migrate to Australia soon. Suitable employers / Universities please free to contact through e-mail / phone.

E-mail - pssrk@engineer.com,

pssankara@yahoo.com,

Phone - 91+422+5583922 .

Name: John Michael Calderwood

Qualifications BA Honours Ceramics, Post-Graduate Diploma Ceramics

Brief description of my skills:

Technical skills, Studio, Throwing, Slab building, Press moulding, Coiling, Modelling (clay, plaster, wood and styrofoam), Carving (clay, plaster, wood and styrofoam), Sculpting (clay, plaster, wood and styrofoam), Industrial skills, Model making (clay, plaster, wood, metal, styrofoam and plastic), Mould making (plaster, resin, fibreglass and polyurethane), Block + casing (plaster, resin, fibreglass and polyurethane), Profiling (2 dimensionally: 3 dimensionally), Slip casting, Jigger + jolly, Lathe turning using plaster or wood, Whirler turning (plaster and clay)

Other skills:

Wood working, Metal fabrication, Glass slumping, Computer (Mac OS 10 applications: Adobe Photo Shop, Apple Works 6), Technical teaching within Universities

Personal Research: Reduced pigment lustre

My email address johnslustre@bigpond.com

Further information such as a full CV or illustrations of my work. I can be contacted at this e-mail address or on (02) 9585 0650.

CALENDAR OF EVENTS

CIMTEC 2004 3rd International Conference on Computational Modelling and Simulation of Materials
May 30 – June 4 2004, Pragati Maidan, New, Dehli, India
E-mail: congress@technagroup.it

ELECTROCERAMICS IX International Conference on Electroceramics and Their Applications
May 31- June 3 2004, Cherbourg, France
Web Site: www.chbg.unicaen.fr/lusac/ELECTROCERAMICS

Ceramics China 2004
June 15-18 2004, Guangzhou, China. Contact:
Contact: Rita Jia
E-mail: gzunionf@pub.quangzhou.gd.cn

7th Australasian Masonry Conference
July 13-16 2004, Newcastle, NSW, Australia
Contact: Dr. Mark Masia
E-mail: mark.masia@newcastle.edu.au

9th International conference on Ferrites
August 8 2004 San Francisco Ca. USA
patton@lamar.colostate.edu

5th International Conference on High Temperature Ceramic Matrix Composites
September 12-16 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
October 1 – 5 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 January 2005- 28 January 2005 Cocoa Beach FL USA
kevin.plucknett@dal.ca

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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

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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 \$
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TOTAL AMOUNT DUE:	AUD \$

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

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NEWSBULLETIN
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THE AUSTRALASIAN CERAMIC SOCIETY