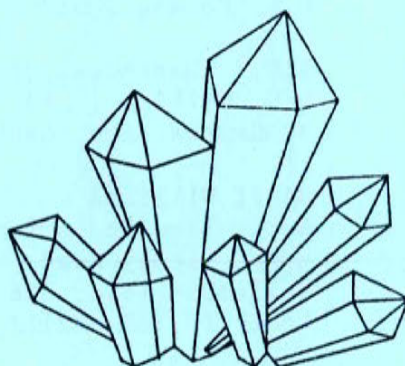


# SOCIETY OF CRYSTALLOGRAPHERS IN AUSTRALIA

NEWSLETTER No.18



OFFICIAL RECORD OF THE  
BUSH CRYSTALLOGRAPHERS

JULY 1989

## SOCIETY OF CRYSTALLOGRAPHERS IN AUSTRALIA

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Newsletter Editor:	Geoff Williams Australian Radiation Laboratory Lower Plenty Road Yallambie, Vic. 3085 [tel. (03)433-2211; fax (03)432-1835]

## IMPORTANT MESSAGE

There must be a lot happening out there amongst us Bush Crystallographers that would be of interest to others, and worthy of a line or two in our Newsletter - if only the editor knew of it. So, a plea for any articles, news of people or happenings, or just snippets of gossip - they can all be sent quickly by fax, or just pop them in an envelope. When I have enough the next Newsletter will appear. Remember, to a large extent the quality (and frequency of appearance) of our Newsletter depend on your contributions. Thanks to those who have contributed material for the present issue ...ed.



## COUNCIL NEWS

A meeting of the SCA Council was held at Lorne on the 17th February 1989. The agenda items for the Business Meeting were discussed, and it was agreed to support a motion to continue membership of FASTS at the increased contribution level of \$3.50 per member.

The Business Meeting of the SCA was held at Lorne on the 18th February 1989. A summary of the items discussed is as follows:

- the motion 'that the Society continue membership of FASTS, to be reviewed at the next Business Meeting' was carried;
- in presenting the President's report, Peter Colman reported that Council is of the view that the substantial funds resulting from the 1987 Perth Congress should be invested to maintain their real value, and used for the purpose of providing scholarships, studentships and fellowships as detailed in Newsletter no. 16 of March 1988;
- the Treasurer, Colin Kennard, was able to clarify the situation regarding the Society's income and taxation with the good news that all SCA income is exempt from tax. Motions were passed requiring two signatures on all financial transactions, and requiring Council to appoint an auditor each year. A motion to alter the current arrangement of having two trustees to administer the Perth investment funds was not carried;
- the nomination of Professor Sandy Mathieson for Honorary Life Membership of the Society was sponsored by Dr Ted Maslen, Professor Hans Freeman and Dr Peter Colman. It was supported unanimously by the Meeting. A copy of the citation is presented below;
- Hans Freeman presented a report from the ANCCr, the main feature of which was a summary of the 'Big Science' report;
- David Winkler (CSIRO) gave a summary of the current status of the Cambridge Data Base in Australia. The cost to Australia in 1989 will be ca. \$20000, requiring individual subscriptions of ca. \$1175 from the 17 current subscribers. Options for the future were presented:
  - 1) Government to pay the total cost;
  - 2) all universities to contribute ca. \$500 each;
  - 3) a levy on all crystallographers;
  - 4) maintain the present situation, attempting to increase the number of subscribers;
- Mark Spackman very kindly offered to host Crystal 17 at the University of New England in the autumn of 1991;
- new members of Council are John White (President), Allan White (Vice President) and Chris Howard.

#### 'Big Science' Report

The report by The Australian National Committee for Crystallography entitled 'A Requirement for Australian Research Access to "Big Science" Facilities' was released in March 1989 and a copy has been posted to all SCA members. This report addresses the need for access by Australian scientists to both synchrotron radiation sources and intense neutron beams. In particular, the report recommends the purchase of a beam-line at an overseas synchrotron facility, involvement in an overseas neutron beam facility, the refurbishment of the Australian HIFAR reactor, and upgrading instrumentation at HIFAR. It is hoped that SCA members will wholeheartedly support these recommendations.

## A. McL. Mathieson

Honorary Life Member of the Society of Crystallographers in Australia

– an appreciation

It is almost a surprise to recall the start of the distinguished scientific career of Alexander McLeod Mathieson – Sandy, to his many friends – in *chemical* crystallography. With the legendary J. Monteath Robertson at Glasgow, Sandy analysed the structure of anthracene, carefully locating the hydrogen atoms. Although the location of hydrogen atoms is a routine procedure today, in 1950 that was a notable achievement, based on careful visual estimates of X-ray film intensities analysed by laborious hand calculations. The published results were typical of physics, rather than chemistry – techniques in an initial paper, with the structural consequences following.

That emphasis on high precision lay dormant for two decades, awaiting a revolution in instrumentation. The state of crystallography at that time encouraged work in bio-organic chemistry, to exploit advances in the solution of organic structures. Established at the CSIRO Division of Chemical Physics, then at Fisherman's Bend, Sandy first determined configurations of amino acids – the building blocks for proteins.

By the mid-1950's Sandy had realised that crystallography could determine not just molecular geometry, but also chemical connectivity *ab initio*. That theme recurs in a fruitful collaboration with Janis Fridrichsons, which resolved progressively more complex problems in natural product chemistry.

Other work endeared him to generations of Australian crystallographers, stemming as it did from his willingness to assist other people. Typical was his study of a problem in ruthenium chemistry with D. P. Mellor and Neville Stephenson in 1952; his encouragement of Hans Freeman about 1956, when Sandy had the only state-of-the-art instrumentation in Australia (an X-ray generator and Weissenberg camera); his critical comment on the accuracy of layer silicate structures with Ted Radoslovich in 1959; the analysis of a fragment of Jacobine with John Taylor in 1963; a monoterpene's structure determined with Jack McConnell and Benno Schoeborn in 1964; and a CSIRO Forest Product Division's problem resolved with Bruce Poppleton in 1967.

Sandy assisted with the International Conference on Electron Diffraction and the Nature of Defects in Crystals, held in Melbourne, 16-21 August, 1965, as a member of the Organizing Committee chaired by Ray Garrod. That initiated Sandy's association with the Committee's Secretary Jim King, appointed shortly afterwards as Executive Secretary to the International Union of Crystallography.

By the 1960's the attribute which characterized so much of Sandy's work, namely his ability to anticipate important developments, had emerged. The need for more intense



X-ray sources was foreshadowed by his development of a rotating anode generator. The limitations of Patterson superposition methods based on light-heavy atoms, such as sulphur, described in 1962, indicated the need for new techniques to analyse larger structures. By the middle of that decade Sandy had mastered the measurement of diffraction patterns reproducibly at low temperature. That work progressed rapidly, but it was the prelude to the high precision measurements which were the hallmark of the later part of his career.

What motivated that transition? Sandy's papers show his growing interest in the absolute configuration of molecules, which required data far more accurate than that needed for simpler structure analyses. He would have quickly recognised the need for photon counting. Today that observation is almost trite. Early diffractometers were cumbersome devices, however, and their perfection took decades to achieve.

In 1958 Sandy had designed a mechanical device enabling a diffractometer to scan along a reciprocal lattice vector. His commitment to high precision emerged at full strength with his election to the IUCr Commission on Crystallographic Apparatus in 1960. He became Commission Chairman in 1963, serving in that position until 1972. He was Organizing Chairman for the Inter-Congress Conference on Intensities and Structure Factors at Cambridge in 1968. With Ulrich Arndt, Sandy compiled and edited the proceedings, which were published as the January 1969 issue of *Acta Crystallographica* (*Acta Cryst* 25, 1-276). He was heavily involved with the IUCr project on accurate structure factor measurement for D(+) tartaric acid in 1970. Some of us can recall his concern at the large discrepancies in measurements from different laboratories, involving especially those using linear diffractometers.

Sandy's careful comparison of absolute configurations determined from X-ray measurements with those predicted from circular dichroism was published in 1973 with another CSIRO stalwart – Andrew Hurley – as co-author. Otherwise there is a break from 1972-4, puzzling to those not familiar with crystallographic history. Australia was about to host the 1974 International Conference on Real Atoms and Real Crystals, with Sandy at the helm.

Running an international meeting on a limited budget is difficult enough when events go as planned. The Australian Government withdrew its pledge of financial support at a late stage as part of an economy drive. Many circulars advertising the meeting were not delivered. Saddest of all was the sudden death of Sandy's close colleague Barrie Dawson, who was responsible for a third of the program. Communications were repeatedly disrupted by mail strikes. After the program had been 'finalised' it was found that lists of abstracts at Sydney and Melbourne did not correspond. A significant fraction of those submitted had vanished without trace in Sydney's mail exchange. A

high speed redrafting of the program was necessary. Sandy remained imperturbable through the crisis, and the meeting was a resounding success.

Having completed the burden of conference management, Sandy recognised that the quality of the diffraction experiment would be limited ultimately, not by instrumentation, but by the properties of the crystal. The role of kinematic theory, by which photon scattering can be treated as a simple one-shot process, is crucial. Deviations from that theory are summarised in corrections for extinction. Others described that phenomenon in terms of models, with parameters optimised to minimise the disagreement between observed and calculated structure factors. In typical style Sandy pressed that extinction must be understood if it is to be properly corrected.

Experience gained from slabs of simple materials was applied to the smaller crystals which are more generally available. The research reaches its climax in a paper with that marvellous title 'The Anatomy of a Bragg reflection.' The results describe the thorough approach to experiment that we have come to know so well. Those taking up high precision diffraction measurements in future would do well to study Sandy's work. They will find there a careful study of its problems and the means by which many difficulties may be resolved.

It is not surprising that as the 'father figure' of crystallography in Australia, Sandy played a leading role in a number of official capacities. Sandy was Chairman of the Australian delegation to the Sixth IUCr General Assembly in Rome, 9-14 September 1963, and a delegate to the Seventh General Assembly in Moscow, 12-19 July 1966. He was again Chairman of the delegation to the Eighth General Assembly in Stony Brook, 13-21 August 1969. Sandy was elected to the IUCr Executive Committee at that meeting, serving for six years until the tenth General Assembly in Amsterdam in 1975. He was a member of the Commission on Structure Reports from 1961 until 1972, and during that time was the Section Editor for the Organic Compounds Section for Volumes 22 and 27 of *Structure Reports*, covering the year 1958 and 1962 respectively.

Sandy was Chairman of the Australian National Committee of Crystallography from 1969 to 1978, and served as a member when Alec Moodie was Chairman from 1978 to 1981. He has been a Fellow of the Australian Academy of Science since 1967, and a member of its Council from 1975 to 1978. Throughout that time of distinguished service Sandy had that enviable combination of high scientific standards with friendly approachability, which has continued in his recent work, especially with Steve Wilkins, Sylvia Mair, Andrew Stevenson, and of course Maureen Mackay, but also with a long list of other crystallographers which would read like a "Who's Who" from the World Directory.



## PEOPLE

We are pleased to welcome the following new members:

- |                           |                                   |
|---------------------------|-----------------------------------|
| • Miss Joanne Etheridge   | RMIT                              |
| • Mrs. Saswati Sengupta   | La Trobe University               |
| • Dr. Pamela Oliver       | Footscray Institute of Technology |
| • Dr. Larry Calvert       | Lakes Entrance, Vic.              |
| • Miss Jennifer Wilson    | University of Melbourne           |
| • Miss Christine McKenzie | University of Melbourne           |
| • Mr. Barry Fields        | University of Sydney              |
| • Mr. Tony Brown          | University of New England         |
| • Dr. Ian Mackinnon       | University of Queensland          |

A New Fellow Congratulations to our immediate Past President, Dr. Peter Colman, on his election as a Fellow of the Australian Academy of Science. Peter and his colleague, Jose Varghese, have recently also had the honour of a detailed article on their work on the structure of the influenza virus appearing in the national press. Graeme O'Neill, science writer for the Melbourne 'Age', writes that attempts to synthesise molecules that will fit into a pocket of the neuraminidase protein are showing early promise. As we cough and splutter through another winter, I'm sure we all wish Peter and Jose speedy success!

David Rivett Medal Dr. Rod Hill of the Port Melbourne laboratories of the CSIRO Division of Mineral Products has won the 1988 CSIRO Officer's Association David Rivett Medal for fundamental research in crystallography and application of this expertise in the improvement of lead acid battery performance. The award is made every two years and is made alternately for work in the physical and biological sciences. Rod's application of novel computer analysis methods to X-ray and neutron powder diffraction data has led to new knowledge of the chemical changes that occur during manufacture and discharge of lead acid batteries, and to the preferred conditions for producing the best battery plates. Some of this work is presently being utilised by battery manufacturers.

Rod was also awarded the 1988 RACI Solid State Division Medal for his accomplishments in crystal chemistry, materials science and powder diffraction analysis.

Dr. Thomas Zemb of CEN Saclay will be visiting the CSIRO Division of Materials Science as well as the Department of Applied Mathematics and the Research School of Chemistry at ANU for 3 months from November 1989. Dr. Zemb's main field of research is small-angle X-ray scattering and the development of instruments for studies of microemulsions.

Further sightings of Syd Hall...there seems to be no truth in the rumour that Syd was working for the NSCA (Victorian Division), but he is quite elusive nevertheless. As reported in the previous Newsletter, Syd is at the Max-Planck-Institut in Mülheim, and despite a couple of brief re-appearances in Australia, he will be contactable at the following address until the end of October:

Prof. S.R. Hall  
Röntgenlabor  
Max-Planck-Institut für Kohlenforschung  
Lembkestrasse 5  
D-4330 Mülheim a.d. Ruhr  
F.R.G. (West Germany) Fax: (49)208-306-407

Congratulations to Prof. J.D. Dunitz, the '1987 Fellow' at Crystal XVI, upon his election as a Foreign Associate of the U.S. National Academy of Sciences.



## NOTES FROM CRYSTAL XVI

The 16th meeting of the Society of Crystallographers in Australia was held at Erskine House, Lorne, Victoria during February 16-19, 1989. The meeting was attended by 74 delegates, including 14 students. Also 12 accompanying persons attended.

The Conference Lecture, 'Atomic Motions in Molecular Crystals; What can one Learn from Diffraction Studies?', was delivered by Professor Jack Dunitz (Swiss Federal Institute of Technology, Zurich). Dr. Alex Moodie of RMIT delivered the Ewald Award Medallist Lecture, 'Slices, Paths and Scattering in Crystals', and Dr. Gill Norris of Massey University, New Zealand, as overseas delegate, delivered the lecture 'Structural Studies on Human Apolactoferrin'. These keynote lectures, as well as the other presentations and poster sessions, set a high scientific standard and there was much lively discussion. Other presentations included a thought-provoking talk by Dr. Larry Calvert (formerly of The National Research Council of Canada) on 'The Powder Diffraction File' and Dr. David Winkler of CSIRO gave a brief account of the current position regarding the Cambridge Data File.

Sponsors were Computer Knowledge (Apple Computer Centre), Sietronics Pty. Ltd., Jeol (Australasia Pty. Ltd.) and John Morris Scientific. Thanks from all the SCA!

A Special Session 'In Memory of John Vasey Sanders' was chaired by Dr. Sanders' long-standing friend and colleague Professor D.J.M. (Judge) Bevan, at which speakers included Alex Moodie (RMIT), Chris Rossouw (CSIRO), David Cockayne (University of Sydney) and Richard Welberry (ANU).

Below, and in other parts of the Newsletter (space and photo-copier willing), are some candid snapshots from the conference.





Modification to POLAROID Type 57 film, commonly used in  
LAUE cameras.

Polaroid recently made some "minor" modifications to their Type 57 high speed land film packs, commonly used in Laue cameras with Polaroid XR-7 camera backs. In particular, the metal tab which pulls the film from the pack for exposure, has been altered slightly. Unfortunately, though the modifications seem trivial, users will find the new film jams in XR-7 camera bodies. The metal tab catches in the bottom of the camera, resulting in the developing jelly distributing itself throughout the camera and leading to a very messy clean-up job.

Polaroid (Australia) have examined the problem. There are two types of camera back, Type 500 (old model) and Type 545 (new model), though this model type designation does not appear on the camera. Only the later model can be adjusted by Polaroid, the earlier model requiring complete replacement. For those of you with old camera bodies this could mean considerable expense... a camera purchased approximately three years ago cost in the order of six hundred dollars.

But the situation may not be as desperate as it appears. One of the Type 500 cameras was dismantled, and the film movement carefully examined. The problem was seen to stem from a small step in the surface of the tab catching bar at the bottom of the camera. It was alleviated by judicious application of araldite to create a smooth surface, and the camera now appears to work satisfactorily.

For further information on the remedy, contact:

David Hay  
CSIRO Division of Materials Science and  
Technology,  
Locked Bag 33, Clayton 3168  
Tel. (02) 542 2698

Polaroid (Australia) have indicated they are willing to explain the reason for the film changes if necessary. The contact is the Service Manager, Mr Leo Rappa, who can be contacted on 008 226 785.



### New Proposal to Obtain Funding for an Australian Instrument Station at the Photon Factory

With the strong encouragement of DITAC, a new proposal for constructing an Australian instrument station on a branch beam-line at the Photon Factory is being prepared as this report goes to press. The proposal is to construct a versatile two-axis diffractometer with particular application to high-resolution powder diffraction (HRPD), small-angle x-ray scattering (SAXS) and single-crystal studies, as described in Barnea et al (Rev. Sci Instrum. to appear June 1989). The proposal includes requests for funds to:

- i) construct the branch beam-line and the instrument,
- ii) support one scientist full-time at PF,
- iii) provide travel and living expenses to SR sources in general (not just PF) for peer-reviewed projects
- iv) support a local technical director and infrastructure,
- v) provide local travel for project team members.

Partly as a result of the special funds for science announced on May 8, we are optimistic that the proposal has a very good chance of success this time.

### Call for Proposals and Letters of Support

It would be very valuable if interested potential beam-line users could send to the ASBUG Secretary (address below) approx one paragraph outlines of their proposed areas of interest in SR research and the type of instrument best suited to that work. Indications as to which existing instrument in the world is the most appropriate, would also be of value. Letters of support for the ASBUG proposal to DITAC would also be appreciated, especially from the wider community of potential SR users.

### Formation of ASBUG

ASBUG was formally constituted on May 24 at a meeting held at DMST and a constitution promulgated. Aims include general fostering of using SR for research, dissemination of information on SR, contact and co-operation with related overseas bodies involved in SR research, holding of local meetings, to make representations on behalf of SR users to those national bodies responsible for financing and developing policies in relation to scientific research, and encouragement and promotion of education in SR research and its applications. Applications for membership of ASBUG are cordially invited (\$10/yr and \$2 for students). Members will receive newsletters and have their names passed on to corresponding organizations overseas for e-mail purposes etc.

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PLEASE SEND ALL ASBUG CORRESPONDENCE TO:-

DR S.W. WILKINS,                      TEL 03-542-2918                      FAX 03-544-1128  
THE ASBUG SECRETARY  
c/o CSIRO DIVISION OF MATERIALS SCIENCE AND TECHNOLOGY  
LOCKED BAG 33, CLAYTON, VIC 3168



Report on the  
*Summer School on Crystallography and its Teaching*

Colin HL Kennard  
Department of Chemistry  
University of Queensland  
ST LUCIA, QLD 4067

A very successful school, organised by the *Teaching Commission of the International Union of Crystallography*, was held from 15-24 September 1988, at the Long Fan Hotel, in Tianjin, an industrial city of seven million people, about 100 km south of Beijing in the Peoples Republic of China. There were one hundred academic staff and postgraduate students from all over China (Tianjin, Beijing, Shanghai, Sichuan, Fuzhou, Wuhan, Shandong, etc.). Lecturers included Herb Hauptman, Medical Foundation of Buffalo, USA, *Direct Methods*; Kasai Nobutami, Osaka, *Polymers*; Jenny Glusker, *Data Bases*; Colin Kennard, *Teaching Aids and Micro computing*; Yao Jia-Xing, Beijing, *Random methods*; K Rasmussen, *Consistent Force Field Calculations*; Bill Clegg, Newcastle, UK, *Measuring Data and Graphing Structures*; Paul Beurskens, Nijmegen, Netherlands, and Christer Nordman, Michigan, *Patterson Methods*; Carlo Gramaccioli, Milan, *Temperature Factors*; Theo Hahn, Aachen, FRG, *Symmetry*; Ron Jenkins, JCPDS, USA, *Powder Methods*; Dave Brown, McMaster University, Canada, *Data Bases*; Fan Hai-Fu, Beijing, *New Application of Direct Methods*; Dave Watkin, Oxford, *Refinement*; Dieter Schwazenbach, Lausanne, *Constraints and Restraints*; Richard Goddard, Max Planck Institute, Mulheim, FRG, *Accurate Electron Density*; Peter Main, York, *Multi-Solution Direct Methods*; and Liu Shi-Xiang, Fuzhou, *Texan Program*. The format of the school consisted both of one hour lectures and three hour work sessions, with micro-computing demonstrations of Apple ][ teaching software and the use of data bases on a VAX. On the last night, there was a general poster session featuring current research work.

Unfortunately the organiser, Henk Schenk from Amsterdam was sick, so Jenny Glusker, Institute for Cancer Research, Philadelphia, took the helm. Local organisers, Miao Fang-Ming and Shao Mei-Cheng, did a good job in co-ordinating the lecturers and students. The school produced a book of abstracts which covered many useful topics not reported elsewhere.

The opening ceremony was covered by T.V. and broadcasted on the 10 o'clock news nationwide. Crystallography probable has never had a greater audience. In the closing ceremony, the banner for the summer school was taken down from the hotel and handed



over to Phathana Phavanantha who plans to have teaching school sometime in the December-January period 1989-90 or 1990-91 in Bangkok, Thailand.

T-shirts with the logo of the school, a sort of abstract modification of the Chinese character for crystal, were made within 48 hours of being ordered and were given by the visitors to all the participants. Visits were made to the Peking Opera, the film "The Last Emperor", carpet and artcraft factories, and sightseeing tours around the city. Ballroom dancing soon became a nightly feature which helped to break the normal barriers between lecturers and students. The closing banquet, the usual feast of exotic Chinese dishes, saw the hidden musical talents of some well known crystallographers being performed.

It was a very successful school with most participants whether they be students or lecturers learning a lot from this sort of interaction.





## THE MOLECULAR DESIGN SOCIETY

The Molecular Design Society is a group of scientists drawn from research organisations, academic institutions, hospitals, and medical and industrial laboratories around Australia who are actively engaged in many aspects of molecular design. The Society aims to foster interactions between people with widely differing approaches to the design of biologically active compounds. The current members have research interests in drugs, peptides, genetic engineering, pesticides, bioactive polymers, molecular modelling, synthetic chemistry, bioassays, theoretical chemistry, enzymology, crystallography, medicine, pharmacy, and others.

The aim of the Society is to provide a forum for the exchange of ideas, techniques and experiences relating to the design, synthesis and testing of biologically active molecules. As crystallography plays a crucial part in these studies, the Society would welcome membership enquiries from crystallographers.

The Society has informal meetings six to eight times per year. Enquiries should be directed to the Secretary, Dr. Ted Lloyd, Victorian College of Pharmacy (tel. (03)387-7222) or to one of the following interest group representatives:

Industrial	Mr. Richard Hume Leading Edge Technologies	(03)647-9811
Hospital	Mr. Robert Flegg Howard Florey Institute	(03)344-7284
Academic	Dr. Bob Brownlee Chemistry, La Trobe University	(03)479-2582
Government	Dr. David Winkler CSIRO	(03)542-2244

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## NEW JOURNAL 'STRUCTURAL CHEMISTRY'

A new international journal, 'Structural Chemistry', concerned with energy, structure and their relationship to chemical, physical and biological properties will appear early in 1989 and bimonthly thereafter. The Journal will publish research papers, communications and timely critical reviews. Manuscripts should follow the style and format of American Chemical Society journals, and be submitted in triplicate to either of the Editors:

- Istvan Hargittai, Department of Chemistry, University of Connecticut, Box U-60, Storrs, CT 06268 U.S.A.;
- Arthur Greenberg, Chemistry Division, New Jersey Institute of Technology, Newark, NJ 07102 U.S.A.

'Structural Chemistry' aims to be comprehensive, embracing the condensed and gaseous states of matter, involving all techniques of the determination of structure and energetics, and the results and conclusions derived from these studies. It emphasises broad discussions, the observation of relationships, and the application of structure and energy information in all domains of chemistry. It is also concerned with new methodologies. Publisher: VCH Publishers, Inc., New York.

## International Union of Crystallography

### NOMINATIONS FOR THE EWALD PRIZE

The International Union of Crystallography is pleased to invite nominations for the Ewald Prize for outstanding contributions to the science of crystallography. The Prize is named after Professor Paul P. Ewald, in recognition of his significant contributions to the foundations of crystallography and to the founding of the International Union of Crystallography. Professor Ewald was the President of the Provisional International Crystallographic Committee from 1946 to 1948, the first Editor of the Union's publication Acta Crystallographica from 1948 to 1959, and the President of the Union from 1960 to 1963.

The Prize consists of a medal, a certificate and a financial award. It is presented once every three years during the triennial International Congresses of Crystallography. The first Prize was presented at the XIV Congress at Perth in 1987. The second Prize, for which nominations are now being invited, will be presented at the XV Congress in Bordeaux, France, in July 1990.

Scientists who have made contributions of exceptional distinction to the science of crystallography are eligible for the Ewald Prize, irrespective of nationality, age or experience. The only exceptions are the current members of the Prize Selection Committee and the President of the Union, none of whom are eligible. No restrictions are placed on the time or the means of publication of the nominee's contributions. The Prize may be shared by more than one contributor to the same scientific achievement.

Nominations for the Ewald Prize should be submitted in writing, preferably using the Ewald Prize Nomination Form and accompanied by supporting documentation, to the Executive Secretary of the International Union of Crystallography, 5 Abbey Square, Chester CH1 2HU, England, from whom copies of the Nomination Form, the names of the Selection Committee and advice on the submission of nominations may be obtained. The closing date for nominations is 31 August 1989.

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## MISCELLANEA

Attention is drawn to the recent J. Chem. Ed. article on crystallographic teaching; 'Symposium on Teaching Crystallography', Journal of Chemical Education, 1988, Vol. 65, 473-511.

The Australian Academy of Science, in collaboration with other foreign societies, operates exchange programmes for scientists who are permanent residents of Australia. Currently, the Academy is calling for applications for 1990/91 exchange programmes to the U.K. (closing date July 1, 1989), Japan (closing October 1, 1989) and China (closing December 1 1989). At time of going to press, events in China may cast doubt on the practicality of the latter. However, for the U.K. and Japan exchanges, a post-doctoral collaborative research project should be proposed with preference being given to visits which are short-term and highly focused. Support will not be given to attend conferences. In the case of Japan, as well as short-term visits, some post-doctoral fellowships (6-12 months) may also be offered. For application forms, contact:

International Exchanges Officer  
Australian Academy of Science  
GPO Box 783  
Canberra, A.C.T. 2601 (tel. (062)47-3966)

A reminder that the Australian Journal of Physics has recently published two special conference issues which will be of interest to many readers. The first is X-ray Powder Diffractometry (International Symposium, Fremantle, Australia, 20-23 August 1987), price \$50, and the second is Accuracy in Structure Factor Measurement (International Symposium, Warburton, Australia, 23-26 August 1987), price \$45. These journals are available from the Publications Sales Office, CSIRO, 314 Albert Street, East Melbourne, Vic. 3002. Prices include postage; cheques are payable to 'Collector of Moneys CSIRO'.

**Membership** - There continues to be a steady trickle of new memberships. Please put any prospective new members in touch with the Secretary for membership details and application forms. Currently our membership numbers 161.

**Postdoc's** - We understand that Dr. Vivian Cody of the Medical Foundation of Buffalo has two postdoctoral Research Fellowships available. Dr. Cody's work is in the areas of drug design and the structures of biologically significant molecules. Anyone interested should contact Dr. Cody at the Molecular Biophysics Department, Medical Foundation of Buffalo, 73 High Street, Buffalo, New York 14203-1196, U.S.A.

## FORTHCOMING MEETINGS

July 24-25, 1989. IUCr Workshop on Crystal Structure Determination at High Pressure - Future Developments; Munich, F.R.G. Contact Dr. H. Sowa, Workshop Secretary, Inst. für Kristallographie und Mineralogie, Universität München, Theresienstr. 41, D-8000 München 2, F.R.G.; Telefax 89/5203386.

July 26, 1989. ESRF Workshop on High-Pressure Single-Crystal Diffraction; Munich, F.R.G. Contact Dr. H. Sowa, Workshop Secretary, Inst. für Kristallographie und Mineralogie, Universität München, Theresienstr. 41, D-8000 München 2, F.R.G.; telefax 89/5203386.

August 21-26, 1989. ECM 12, European Crystallographic Meeting; Moscow, USSR. Contact Organising Committee, 12 European Crystallographic Meeting, Leninsky pr. 59, Moscow 117333, U.S.S.R.

September 16-26, 1989. X-Ray Crystallography and Drug Action; Erice, Sicily. Contact Prof. L. Riva de Sanseverino, Piazza Porta San Donato 1, I-40127 Bologna, Italy.

October 2-6, 1989. 2nd European Conference on Progress in X-ray Synchrotron Radiation Research; Roma, Italy. Contact L. Invidia, INFN, Laboratori Nazionali di Frascati, CP 13 00044 Frascati, Italy.

March 14-15, 1990. SGK Symposium 'Chemistry and Structure - A Symposium in Honour of Professor J.D. Dunitz'; Zürich. Contact Dr. Howard Flack, Laboratoire de Cristallographie aux Rayons X, Université de Genève, 24 quai Ernest Ansermet, CH-1211 Genève 4, Switzerland.

July 16-18, 1990. Short Range Order in Ill Ordered Material; Orsay, France. Contact Dr. D. Raoux, LURE, Bât. 209C, F-91405 Orsay, France.

July 16-18, 1990. Powder Diffraction; Toulouse, France. Contact Dr. J. Galy, Chimie de Coordination-CNRS, 205 route de Narbonne, F-31400 Toulouse, France.

July 19-28, 1990. Fifteenth General Assembly and International Congress of Crystallography; Bordeaux, France. Contact Dr. M. Hospital, Laboratoire de Cristallographie et de Physique Cristalline, Université de Bordeaux 1, 351 cours de la Libération, F-33405 Talence, France; telefax 56/800837.

July 29-31, 1990. Complementary Applications of Diffraction by Neutrons and by X-ray Synchrotron Radiation; Alpe d'Huez (nr. Grenoble), France. Contact Dr. M. Marezio, Cristallographie, CNRS, BP 166X, F-38042 Grenoble cedex, France.

July 29-31, 1990. Symmetry in Physical Space and in Superspaces: Quasicrystals, Incommensurate Phases; Chatenay-Malabry (nr. Paris), France. Contact Prof. Weigel, Ecole Centrale, F-92295 Chatenay-Malabry cedex, France.

July 29-August 5, 1990. International School on Crystallographie Computing; Bischenberg (nr. Strasbourg), France. Contact Dr. J. C. Thierry, IBCM, 15 rue Descartes, F-67084 Strasbourg cedex, France.

August, 1991. Sagamore X Conference on Charge, Spin and Momentum Densities; Konstanz, F.R.G. Contact W. Weyrich, Fakultät für Chemie, Universität Konstanz, Postfach 5560, D-7750 Konstanz 1, F.R.G.