

ARCHIVE EDITION OF IRPS BULLETIN

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Nanostructures in Technology and Biomedicine

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FROM THE
EDITOR
**Paul
Bergstrom**

This edition of the IRPS Bulletin is devoted almost exclusively to providing a directory of members of the Society. Many thanks go to Michael Farquharson for the compilation and to Shirley McKeown for getting it ready for publication. The Members' Contact Details on this web site (via the Home Page) have been updated from this directory.

Due to the length of the listing, we are not publishing additional articles at this time. The next edition of the Bulletin will be published in June. In that issue we will present the two contributions already in hand and, hopefully, additional contributions that should be received by me by mid-May.

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Moves towards Australian Synchrotron Radiation

Dudley Creagh

Vice President, Australia

email: d-creagh@adfa.edu.au

In late 2001 the Victorian Government announced that it would underwrite the construction of an Australian synchrotron at the Monash University Campus in Clayton, Victoria. The synchrotron to be built will operate at 3 GeV and 200mA and have an emittance of about 7 nm.rad.

The initial planning stage is under way and, as part of this, four committees have been set up. One of these, the Steering Committee, at present comprises mostly Victorian State Government employees under the chairmanship of John Neve. It is expected that the membership of this committee will ultimately contain only one Victorian representative. This committee works directly with the Deputy Premier and Treasurer for Victoria, the Honourable John Brumby.



Figure 1. Dudley Creagh and Stephen Wilkins the “godfathers” of Australian synchrotron radiation involvement, at the Third Workshop of the Australian Synchrotron Research Program at which Minister Brumby promised that his government “would build an Australian synchrotron”.

A second committee, the International Machine Advisory Committee, including eminent designers of synchrotron sources and Professor John Boldeman (University of Queensland, formerly Facilities Director of the ASRP, the principal designer of the proposed synchrotron), has met to discuss Professor Boldeman’s designs and has agreed on two possible configurations which might be built.

A third committee is the International Scientific Advisory Committee which consists of the following leaders in synchrotron radiation research:

Professor H Kamitsubo (Director, Spring 8)
 Professor T Matushita (Director, Photon Factory)
 Professor H. Moser (Singapore Synchrotron Light Source)
 Dr N. Smith (Director, ALS, Berkeley)
 Dr G. Shenoy (Actg. Director, Advanced Photon Source, Argonne)
 Professor V. Saille (Director, IMG GmbH)
 Professor A. Wrulich (Director, Swiss Light Source)
 Professor F. Larkins (University of Melbourne)
 Dr M. Bancroft (Canadian Light Source).

The fourth committee is the National Scientific Advisory Committee (NSAC). This committee consists of eminent Australian scientists in a wide range of fields and from different Australian States. It includes:

Dr David Cohen (ANSTO)
 Professor Dudley Creagh (Uni. Canberra)
 Dr Ian Gentle (Uni. Queensland)
 A/Prof Andrea Gerson (Uni. South Australia)
 Professor Syd Hall (Uni. Western Australia)
 A/Prof Brendan Kennedy (Uni. Sydney)
 Professor Robert Lamb (Uni. New South Wales)
 Professor Frank Larkins (Chairman: Uni. Melbourne)
 Professor Robert Leckey (Latrobe Uni.)
 Professor Robert Lewis (Monash Uni.)
 Professor Keith Nugent (Uni. Melbourne)
 Professor Brian O’Connor (Curtin Uni.)
 Dr Mark Ridgeway (Australian National Uni.)
 Dr Jose Vargese (CSIRO)
 Dr Stephen Wilkins (CSIRO)
 Professor Jim Williams (Uni. Western Australia)
 Professor John White (Australian National Uni.).

This committee met for the first time on 22 March 2002 (**Figure 2**).



Figure 2. Attendees at the inaugural meeting of the NSAC.

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CONTACTS

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wombats1@tpg.com.au

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**NEW
MEMBERS,
ADDRESS
CHANGES**

Welcome to New Members :

Mr. Vasquez Pazmino Nicolas, [**Ecuador**](#)

Prof. Libor Makovicka, [**France**](#)

Prof. Ioannis Kandarakis, [**Greece**](#)

Prof. Akira Iwasaki, [**Japan**](#)

Dr. Paul L. Csonka, [**U.S.A.**](#)

New Members' addresses are listed in the Contact Members' Details
(click on country next to name)

***Changes to Members' Addresses and Contact
Information :***

Dr. D. McLean [**Australia**](#)

Mr. H. M. Mahesh [**India**](#)

Mr Teodoro Montalvo-Rivera [**Mexico**](#)

Dr Christopher C. Goddard [**U.K.**](#) *(from Oman)*

Mr. Patrick J. Byrne [**U.S.A.**](#)

Dr. Steve B. Jiang [**U.S.A.**](#)

Prof. K.J. Kearfott [**U.S.A.**](#)

Asst. Prof. Chan-Hyeong Kim [**U.S.A.**](#)

Mr. A. Nick Schreuder [**U.S.A.**](#) *(from South Africa)*

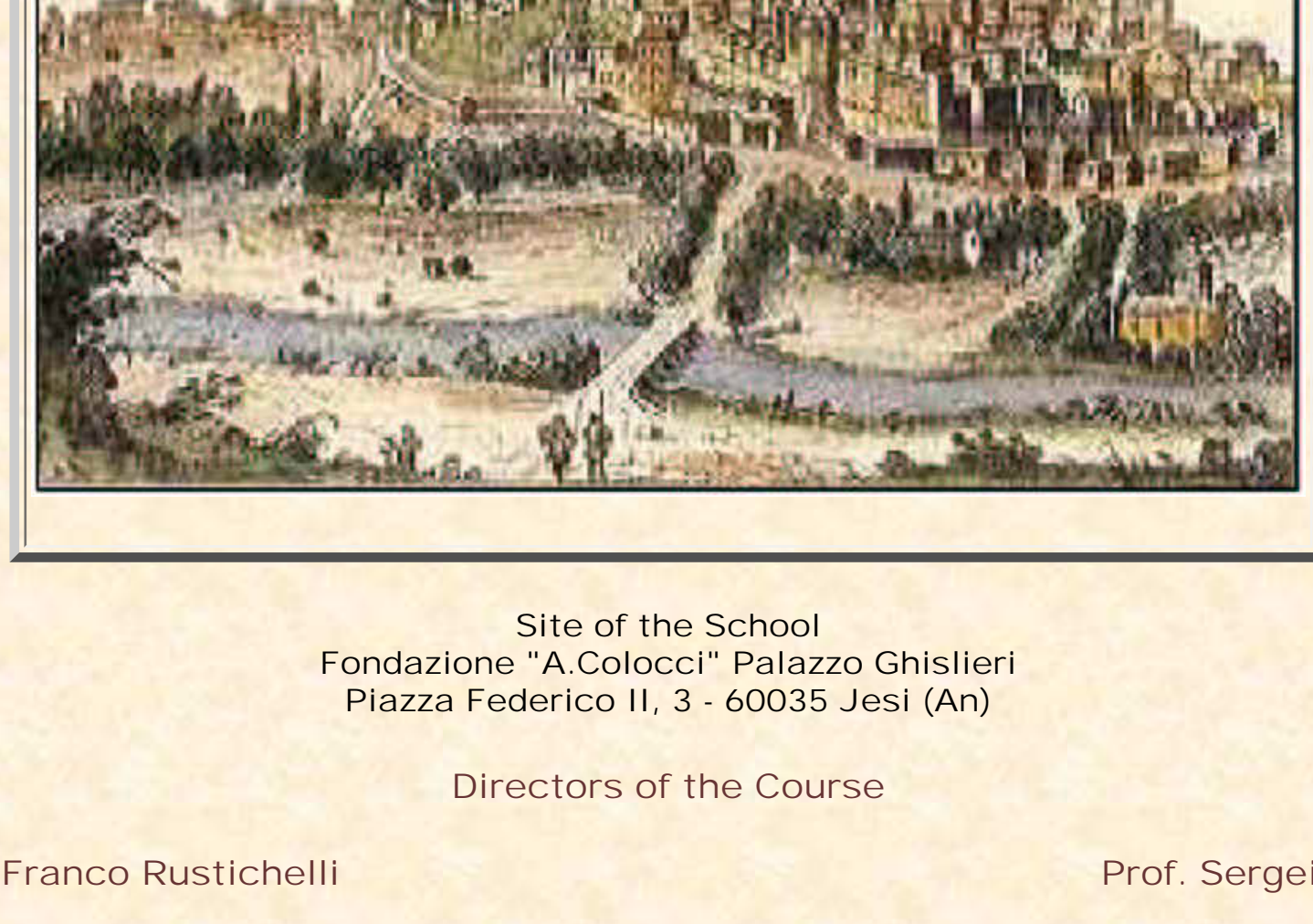
Members' new addresses and contact information are listed in the Contact
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4th Course

NANOSTRUCTURES IN TECHNOLOGY AND BIOMEDICINE

2nd - 6th September, 2002

Jesi - Ancona, Italy



Site of the School
Fondazione "A.Colocci" Palazzo Ghislieri
Piazza Federico II, 3 - 60035 Jesi (An)

Directors of the Course

Prof. Franco Rustichelli
Dobatkina
University of Ancona - Italy

Prof. Sergei
Russian Academy of Science, Moscow

Registrations close : 17 August, 2002

INFORMATION

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Purpose of the Course

Nanostructures are characterised by a length scale smaller than 100 nanometers at least in one dimension. Even in conventional materials such as steels, the reduction of the grain size to nanoscale dimensions greatly improves mechanical properties, in particular ductility, hardness and strength.

Nanostructures are characterised by a length scale smaller than 100 nanometers at least in one dimension. Even in conventional materials such as steels, the reduction of the grain size to nanoscale dimensions greatly improves mechanical properties, in particular ductility, hardness and strength.

In particular coatings produced with a nanostructured organisation exhibit greatly improved protective characteristics due to their superior physical and chemical characteristics as compared to conventional micron-sized coatings of the same materials. These are examples, in the field of structural inorganic materials and components, of the importance of nanoscience. In many other fields of science and technology, the reduction of structures to the nanometer scale has extremely important and fruitful consequences, and this explains the flourishing of this kind of investigations occurring all over the world.

In fact in addition to metallurgy, nanoscience can find applications in the fields of tribology, catalysis, electrochemistry, semiconductors, superconductors, electronics, photonics, detectors, biomaterials, biosensors, medicine, manipulation of biological and inorganic structures, hybrid organic-inorganic systems.

The aim of the school is to present latest developments of nanoscience and nanotechnology in some important research fields related to material science and biomedicine. In particular several methods of production of nanostructured metallic materials will be considered together with induced improvements of their mechanical properties and their possible applications as structural materials for automotive, space and aircraft industries and medical devices production.

In this frame, for instance, the improvements induced by nanostructures in coatings (including biomaterials) and in shape memory alloys for medical applications will be treated, then the implications of nanoscience in the electronic revolution driven by the continuous reduction of the device dimensions will be considered. Then the influence of nanostructures in the development of magnetic cores used in the manufacturing of several devices, like cellular phones, telecommunication, radars, computers, satellites and automobiles will be considered.

Moreover several applications of organic nanostructures will be presented, for instance in the field of optoelectronics, "plastic electronics" organic photovoltaics, organised layers of biomolecules including proteins and DNA, and biosensors; In particular the intersection of material research, at nanoscale, with molecular biotechnology will be presented, with pharmaceutical and biomedical applications, including recombinant DNA technology. The school is addressed to physicists, chemists, engineers, materials scientists, biologists, medical doctors of universities, research centres and industries.

Possible co-operation within European projects and preparation of proposals will be discussed.

The following teachers have already accepted to give lectures:

F. Beltram - *Scuola Normale Superiore and INFN, Pisa (Italy)*

A. Benedetti - *Department of Chemistry Physics, Venice (Italy)*

C. J. Bustamante - *University of California, Berkley (U.S.A.)*

R. Cingolani - *University of Lecce and INFN (Italy)*

S. Dobatkina - *Russian Academy of Science, Moscow (Russia)*

V. Erokhin - *University of Genova (Italy)*

F. Evangelisti - *University Roma 3 (Italy)*

G. P. Felcher - *Argonne National Laboratory (U.S.A.)*

P. Milani - *University of Milano (Italy)*

C. Taliani - *C.N.R. Bologna (Italy)*

O. Thomas - *Cornell University (U.S.A.)
and University of Aix-Marseille III (France)*

S. Oscarsson - *Uppsala University (Sweden)*

B. Samori - *University of Bologna (Italy)*

Seminars :

P. Fogarassy - *C.C.T.T., Timisoara (Romania)*

F. Spinozzi - *University of Ancona (Italy)*

L. Valkova - *University of Ivanovo (Russia)*

The main foreseen subjects are:

- Methods for processing structural nanocrystalline materials: powder metallurgy, crystallisation from amorphous state, severe plastic deformation;
- Physical and mechanical properties of nanostructured materials;
- Possible fields of applications of nanomaterials;
- Nanostructured shape memory Ti-Ni based alloys for medical applications;
- Performances of nanostructured coatings including biomaterials;
- Interfacial structure and mechanical properties in nanostructures for electronic applications;
- Basic properties of organic thin films;
- Manufacturing and processing of organic nanostructures;
- Organic based devices and hybrid spintronics;
- Langmuir-Blodgett films of biological molecules and their applications;
- Quantistic effects in organic nanoparticles grown in Langmuir-Blodgett films;
- Biomimeticism applied to the design of azoporphyrine sensors materials for biologically important analyses;
- Surface functionalisation, orientation, conformation and positioning of macromolecules at the nanometer scale;
- Single molecule manipulation.
- Review of on going EU Projects on nanoscience and nanotechnology.

General Information

The official language of the Course is English.

Scientists and Engineers who wish to attend should specify within a maximum of one page:

- Full name(s), age, sex, citizenship;
- Postal address, phone, fax, e-mail;
- Present position and scientific and technological interests;
- The correct and complete heading for the invoice regarding the registration fee payment. Please, indicate also the Italian fiscal code or the VAT number.

This information should be sent by fax or by e-mail to:

Secretary Fondazione Colocci
Palazzo Ghislieri
Piazza Federico II, 3
60035 Jesi (An) Italy

Tel: +39 0731 213234 **Fax:** +39 0731 56999

E-mail: segreteria@fondazionecolocci.it

www.isf.unian.it www.fondazionecolocci.it

The total fee is 250 euro + VAT 20% and includes attendance, proceedings and lunches (excluded Friday 06/09/2002). Partial support can be granted only to a few qualified young applicants who explicitly will make the request.

Payment should be made by bank transfer to:

Bank: Banca delle MARCHE Agenzia di Jesi - Corso Matteotti

Account name: Fondazione A.Colocci

Account number: 13832/89 - 6055

Please specify for: The International School on Advanced Material Science and Technology.

Registration will be confirmed within 10 days after receiving the application form. Payments should be done immediately after confirmation. Please send by fax a copy of the bank transfer.

Closing date for registration: 17th August, 2002.

No special application form is required. Priority will be given to the earlier registrations. The number of participants is restricted to 40.

For any other communication, please use e-mail or fax.

Accommodation

The participants have to provide the Hotel's reservation. They have to contact the hotel's staff, before 17th August, 2002

Hotels	Single	Double for single use	Double
FEDERICO II **** Tel. +39 0731 211079 Fax. +39 0731 57221		78 euro	114 euro
MARIANI *** Tel. +39 0731 207286 Fax. +39 0731 200011	47 euro	56 euro	65 euro
DEINANI **** Tel. +39 0731 4846 Fax. +39 0731 222533	42 euro	52 euro	57 euro

Students interested in hostel accommodation (cheapest price) (Ostello "Villa Borgognoni" tel +39 0731 214088, fax +39 0731 223702) in Jesi can contact directly the hostel's staff.

Tourist information can be found on the following websites:

www.turismo.marche.it www.conero.it www.frasassi.it

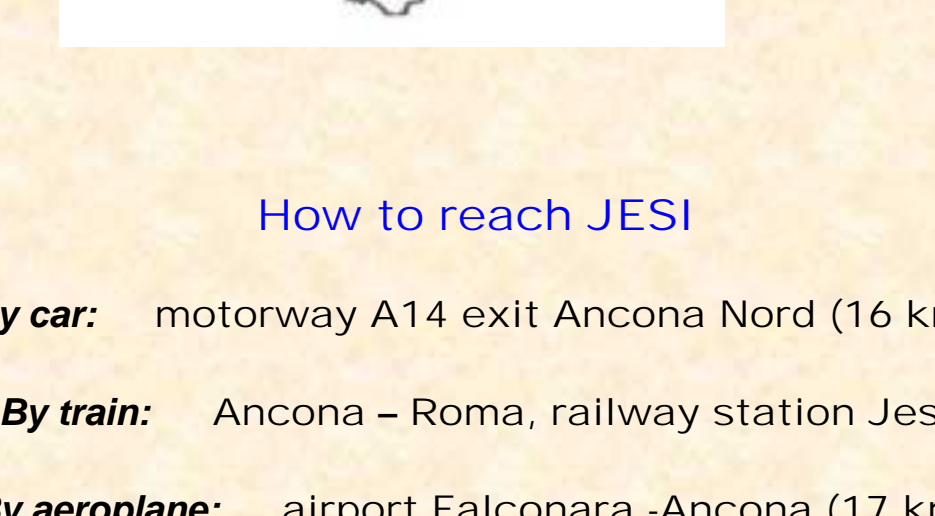


How to reach JESI

By car: motorway A14 exit Ancona Nord (16 km)

By train: Ancona - Roma, railway station Jesi

By aeroplane: airport Falconara -Ancona (17 km)



Historical Summary

Jesi rises up in the centre of the Ancona province, in the very heart of the Marche Region between the Appennine mountain range and the Adriatic Sea which is at a distance of 15 km.

Historians seem to have found that it's origins date back to an Umbrian immigration. It became Etruscan land. With time the river Esino became the southern border of the Galli Senoni territory and finally with the Roman legion " Aesis " became a colony. First County and then Free Community the city began to grow and spread towards the nearby "Castelli" and feudal abbeys.

The territorial expansion flourished with the protection of Federico II of Svevia who was born here in 1194.

The Roman "AESIS" is situated around Federico II square (Piazza Federico II) in the proximity of the "CARDO and DECUMANO" crossing. The medieval centre is closed within a complete "Cage of Wall". This medieval centre features many buildings, convents, churches and narrow pebble stone streets that when are too steep have adjacent staircases. In the 1700's the centre finally expanded out of these walls along what is now known as Corso Matteotti with many new churches, noble buildings, and new residential palaces. Very beautiful is the Pergolesi theatre, officially opened in 1798.