
Information and Announcements



Inter-University Consortium for Department of Atomic Energy Facilities (IUC-DAEF)

IUC-DAEF was conceived as an institution for bringing together the scientific fraternity of the country from the universities and the Department of Atomic Energy (DAE) for utilisation of major experimental research facilities developed by the latter. The main facilities identified for this include the various neutron spectrometers on the Dhruva and Cirus reactors at Bhabha Atomic Research Centre (BARC) Mumbai, the upcoming synchrotron radiation source, INDUS-1 at Centre for Advanced Technology (CAT) Indore and the Variable Energy Cyclotron (VEC) at Calcutta. While playing a pivotal role in organising the research projects by university scientists on these facilities, IUC-DAEF found it imperative to develop certain infrastructure which would help the researchers to utilise these facilities in a better way.

IUC-DAEF is a registered autonomous society of the University Grants Commission, New Delhi and is collocated with Devi Ahilya Vishwa Vidyalaya at Indore; it also has centres at Mumbai and Calcutta. Each centre has a core scientific staff which assists and collaborates in the interaction between the scientists from both the universities and DAE and pursues its own research and development work.

Mumbai Centre

The activities of this centre are focused on the neutron scattering facilities at BARC around the Dhruva reactor. The Solid State Physics Division (SSPD) of BARC is responsible for running these instruments and IUC acts as a facilitator for university scientists to utilise them. The following instruments are available for research: profile analysis powder diffractometer and single crystal diffractometer for magnetic and chemical crystallography, triple axis spectrometer for inelastic scattering studies, polarised neutron analysis spectrometer for magnetic investigations, high-Q diffractometer for liquids and amorphous materials, high resolution quasi elastic



spectrometer and small angle neutron scattering machine. In-house facilities include a small angle X-ray scattering camera on one window of a 12 KW rotating anode X-ray generator of SSPD. A light scattering set up will also be established shortly.

IUC-DAEF in association with SSPD conducts an annual course on various aspects of neutron scattering. The courses are attended by 25–30 researchers from various institutions who help in the formulation of research proposals. These are reviewed every six months and the review meetings also provide ground for presentation of new project proposals. Most popular in the university community is the use of powder diffraction with Rietveld analysis for structural studies for a variety of compounds such as perovskites, spinels and magnetic materials. Small angle scattering is also very much used for study of micelles, colloids, ferrofluids etc. Uses of inelastic scattering, neutron reflection and depth profiling have also been attempted with some interesting results.

Indore Centre

Most of the work at this centre is directed towards utilisation of INDUS-1. One beam line using a toroidal grating monochromator for photoelectron spectroscopic work is being erected. With the help of three gratings it will be possible to use monochromatised radiation from INDUS-1 in the energy range 200 to 7 eV (wavelength 60 to 1600 Å). The experimental station will be an angle integrated photoelectron spectrometer being developed at IISc, Bangalore.

The in-house infrastructural facilities include the following: (i) a VSW photoelectron spectrometer, (ii) a 12 KW rotating anode X-ray generator with a commercial powder diffractometer (with high and low temperature attachments), (iii) an indigenous EXAFS spectrometer, (iv) an indigenous soft X-ray source of the rotating anode type with aluminium target and double crystal monochromator, (v) an indigenous ac magnetic susceptibility set-up operating at temperatures from room temperature to liquid nitrogen with provision for measuring real and imaginary parts of susceptibility up to seventh harmonic, (vi) an indigenous automated resistivity set-up to measure resistivity from room temperature to 15 K, (vii) an indigenous automated thermopower set-up in the same temperature range, (viii) a magnetoresistance measurement set-up down to 2 K with field up to 8 Tesla, (ix) a differential scanning calorimetry set-up, (x) an X-ray reflectometer and (xi) a Mössbauer spectrometer. Recently a UHV deposition system has been developed for metallic multilayers and neutron and X-ray mirror development.





Figure 1. The photograph shows part of the beamline to be put on INDUS-1. The toroidal grating monochromator is seen on the left, the computer controlling the grating angular position is in the front and the post-mirror section is on the right.

The research pursued is in the area of condensed matter physics – EXAFS studies of glassy systems, magnetic studies on Li doped NiO, transport properties of high T_c superconductors, magnetic measurements on rare earth compounds, X-ray reflectivity studies on multilayers etc.

Calcutta Centre

The main work of this centre is around the utilisation of the various facilities available at the VEC. The experiments conducted by university users at VEC broadly fall into two categories: nuclear physics and nuclear technique based condensed matter physics. The centre has developed in-house facilities for supporting the experiments. These include detectors such as HP Ge, Si(Li) and neutron detectors, Compton suppresser, fast COMPTEC multiparameter system etc. Mössbauer spectroscopy, positron annihilation set up for both Doppler broadening and life time measurements and TDPAC set-ups are also available.



Work is going on towards developing low energy positron and electron accelerators and ion implanter, preparation of Mössbauer sources and sample preparation for various experiments like PIXE, biosciences and atomic absorption spectrometry. A full fledged target preparation laboratory for nuclear physics experiments has been set up. The Centre has also developed Si surface barrier detectors for experiments at VECC.

If this institution succeeds in bringing together scientists from universities and DAE in the pursuit of a common goal of quality research it would have served its purpose. Till now it has served more than fifty universities from 17 states and performed several hundred measurements for university groups.

*Ashok V Pimpale and BA Dasannacharya
IUC-DAEF, University Campus, Khandwa Road
Indore 452 001, India.*

Third Annual International Environmental Essay Contest Francis Marion University (FMU)

1 Purpose: To stimulate interest in international environmental issues among college students around the world.

2 Subject theme: Describe the most critical environmental issues in your country, in terms which will influence public opinion, and articulate how those issues will impact international understanding and the global economy in the next decade.

3 Awards : First Place: US \$500.00 and Publication
Second Place: US \$300.00 and Publication
Third Place: US \$200.00 and Publication
Fourth Place: US \$100.00 and Publication
Honorable Mentions: Publication

4 Eligibility: Undergraduate students from the USA and students outside the USA who attend institutions equivalent to American undergraduate colleges and universities are

For more information about the contest and to read award-winning essays in the previous years, please visit their web site at "<http://www.fmarion.edu/meel/meel.htm>" or e-mail to "essay@fmarion.edu".



eligible for the contest. Students who plan to participate must submit a 'registration note' prior to **March 15, 1998**. In the registration note, students must include their names, addresses (both current and permanent addresses), phone numbers (both current and permanent numbers), schools attended, and countries. The registration note can be

- 1) e-mailed to ESSAY@FMARION.EDU or
- 2) mailed to Dr. Lucia Huang, Francis Marion University, P.O. Box 100547, Florence, SC 29501 USA Fax: (803)661-1366.

5 Technical Requirements: Essays a). must be written in English b). may not be less than 1500 or more than 2000 words in length c). must not have been previously published d). must be typewritten, double spaced, and properly documented. e). must include the student's name, address, phone number, e-mail address (if available), student's school, and student's country on a separate page

6 Deadline for Submissions: (i) Entries must be e-mailed in ASCII format to the following Internet Address, by 5:00 p.m. American Eastern Standard Time **May 15, 1998**. ESSAY@FMARION.EDU or

(ii) Entries must arrive at the following address by or before May 15, 1998

Dr. Lucia Huang Francis Marion University P.O.Box 100547 Florence, SC 29501 USA,
Fax: (803) 661-1366

7 Copyright and Publication: By entering the Essay Contest, contestants grant permission for FMU to publish all or part of the submitted essays without royalty or other consideration. The winning essays will be published in a short monograph and posted on the World Wide Web.

8 Standards for Judging: All essays will be judged anonymously. The winners will be selected by a committee appointed by FMU.

9 Announcements of Results: The final result will be announced on or before **June 30, 1998**. The winners will be informed directly.

Sujatha Byravan
TIFR, IISc Campus, Bangalore

