



GALILEO GALILEI
BUILDING

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July 1986

INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

NEWS FROM ICTP



**INTERNATIONAL
ATOMIC ENERGY
AGENCY**



**UNITED NATIONS
EDUCATIONAL,
SCIENTIFIC
AND CULTURAL
ORGANIZATION**

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SPECIAL CONTRIBUTION FROM THE DEPARTMENT FOR COOPERATION TO DEVELOPMENT

In Autumn 1984, Mr. G. Andreotti, Minister for Foreign Affairs of the Government of Italy, who had been invited by Professor Abdus Salam to preside over the ceremony of the 20th anniversary of the ICTP, had promised an extra contribution for the consolidation and the expansion of the scientific programme of the Centre. This contribution which amounted to US \$4,250,000 approximately allowed the Centre to increase the participation of scientists from developing countries by 30% with respect to 1984 and in particular to establish the Office for External Activities.

A letter from Mr. Andreotti to the Director of the Centre, dated 19 May 1986, announced that the Department for Cooperation to development would contribute US \$4,500,000 again in 1986. The ICTP is most grateful to the Government of Italy for this gesture of generosity.

The new contribution will be utilized for the consolidation of the training-for-research activities, the Associate Membership and the Federation Agreement Schemes, the Programme for Training and Research in Italian Laboratories and the building up of Physics and Mathematics in the developing countries (Office of External Activities). In short, these fresh funds will permit the ICTP to maintain in 1986 the level of activity reached in 1985.

The generosity of the Government of Italy is a clear sign that the work of the ICTP is appreciated by the host country. This is due to the quality of the ICTP leadership, of the research and of the training done at the Centre. This should be perceived as an encouragement to do even better in the future.

DIRAC MEDAL AWARD CEREMONY

On 8 August 1985, birthday of the late P.A.M. Dirac, Professor Abdus Salam, Nobel Laureate 1979, announced the first award of the Dirac Medals of the International Centre for Theoretical Physics (ICTP) of Trieste, to Professor Yakov Zeldovich (Space Research Institute, Moscow, USSR) and Professor Edward Witten (Princeton University, USA) for their outstanding contributions to relativistic astrophysics and quantum field theory, respectively. The award ceremony took place on 7 February 1986 at 11.00 a.m., on the second day of the two-day symposium on "Perspectives in Particle Physics", in the Lecture Hall of the International Centre for Theoretical Physics in Trieste. Among the distinguished guests were Professor C. Rubbia (CERN), Nobel Laureate 1984, Professor A. Zichichi (CERN) and Professor R. Marshak (Virginia Polytechnic), both members of the Scientific Council, and Professor G. t'Hooft (Rijksuniversiteit, Utrecht, The Netherlands) in addition, of course, to Professor E. Witten. Professor Ya. Zeldovich who was also expected, could not attend.

Professor Abdus Salam, in his congratulation address to Professor Witten, recalled some of the main subjects to which he has contributed, i.e.: photon structure function; multi instanton solutions; large N QCD and hadrons (baryon and meson spectrum); solvable 2-dimensional models with non-Abelian bosonization; superunification; dynamical symmetry breaking of supersymmetry; Kaluza Klein theory; Morse theory; effective Lagrangians and Skyrme model; monopole catalysis of Skyrmeion decay; positive energy theorem in Einstein gravity; gravitational anomalies; global gravitational anomalies on the world-sheet of strings; compactification schemes for strings and related phenomenology; cosmic strings and quark matter; noncommutative geometry.

The gold medal was then presented to Edward Witten by Professor Zichichi on behalf of the awarding Committee*.

The day before, Professor Abdus Salam had opened the International Symposium on Perspectives in Particle Physics. Professor Witten was the first lecturer of the day. He spoke on phenomenology of superstrings. This exhaustive review on what is going on in modern physics was followed by a discussion which involved the younger generation of theoreticians as well as internationally established scientists. Edward Witten was to give another three lectures. Professor Carlo Rubbia (CERN, Geneva, Switzerland) Nobel Laureate 1984, and Professor Gerard t'Hooft then lectured on the future of experimental physics and on the quantization of black holes with the same passionate participation of the attendance in the debate which followed.

The symposium also provided an opportunity to formalize the already existing collaboration between the International Centre for Theoretical Physics in Trieste, the Third World Academy of Sciences, both directed by Professor Abdus Salam, and the Centre for Scientific Culture "Ettore Majorana" in Erice (Sicily, Italy).

The Italian Minister of Foreign Affairs Giulio Andreotti had sent a telegram in which he confirmed the interest of the Italian Government in the development of the three institutions which promote East-West and North-South collaboration for the benefit of mankind. In his view, the agreement for cooperation is looked upon as an important step towards the realization of the first phase of the World Lab, a project at the heart of modern science and technology wherein scientists from developing countries must be involved.

* The Dirac Medals Award Committee is composed of : Stig Lundqvist (Göteborg University, Sweden), Robert Marshak (Virginia Polytechnic, USA), Abdus Salam (ICTP, Trieste, Italy), Julian Schwinger (University of California - Los Angeles, USA), Leon Van Hove (CERN, Geneva, Switzerland) and Steven Weinberg (University of Texas - Austin, USA).

VISIT OF THE IAEA BOARD OF GOVERNORS TO THE ICTP

On 9 May 1986, the ICTP was honoured with the visit of 9 members of the Board of Governors of the International Atomic Energy Agency (Vienna, Austria). The group was accompanied by Prof. M. Zifferero, Deputy Director General for Research and Isotopes and Mr. M. Sanmuganathan, Secretary of the Board, both from the IAEA secretariat.

This is the second time in the Centre's history that Members of the Board come to Trieste for a direct contact with the reality of the ICTP. The first visit took place in 1983.

The group of distinguished visitors included: H.E. Mrs. A. Sudirdjo, Governor, Chairman of the Board of Governors and Ambassador from Indonesia.

The group of distinguished visitors included: H.E. Mrs. A. Sudirdjo, Governor, Chairman of the Board of Governors and Ambassador from Indonesia, Mr. J. Iljas, Scientific Attaché at the Embassy of Indonesia, H.E. Mr. J.C. Beltramino, Alternate Governor and Ambassador from Argentina, Mr. A. Carrea, Minister for Atomic Energy at the Embassy of Argentina, H.E. Mr. J.R. Kelso, Governor and Ambassador from Australia, H.E. Mr. J. Gignac, Governor and Ambassador from Canada, H.E. Mr. Cao Guisheng, Alternate Governor and Ambassador from the People's Republic of China, Ms. Duan Cunhua, Counsellor to the Governor from the People's Republic of China, Mr. S. Gopal, First Secretary to the Ambassador from India, Mr. L. Noè, Governor and Member of the Italian Senate, Mr. A. Lamparelli, Alternate to the Resident Representative from Italy, H.E. Mr. S.A. Pasha, Alternate Governor and Ambassador from Pakistan, and Mr. M. Katz, Counsellor for Nuclear Technology to the Ambassador from the United States of America.

The Centre had hoped that Members of the Executive Board of UNESCO, a body with similar functions of the IAEA's Board, would have come as well. Unfortunately, this was not possible and this visit will take place at a later date.

The programme started with an exhaustive presentation of the history, objectives and results of the ICTP by its Director, Professor Abdus Salam, followed by a short presentation by Profs. L. Fonda, D. Romeo and M.H.A. Hassan on the Synchrotron Light Radiation Laboratory, the International Center for Genetic Engineering and Biotechnology and the Third World Academy of Sciences, respectively.

After a tour of the facilities of the Centre, the group went to lunch at the Adriatico Guest House with all the 250 scientists present at the Centre. Each delegation was assigned a table so that their Members could meet with their fellow countrymen or scientists from neighbouring countries. The afternoon was devoted to discussion in interview sessions with the scientists. Five groups, each including ten physicists who had been associated with the Centre for a long time as well as first timers, were formed so that the Members of the Board had a reasonable spectrum of interlocutors and could collect a great variety of impressions. Such contacts are extremely important for the ICTP since the Board is the body which has the authority to carry the functions of the IAEA of which the Centre is part and in particular, on its matters of finance and administration. The more the Board is conversant with the operation of the ICTP, the better.

The following Member States are presently represented in the Board of Governors: Algeria, Argentina, Australia, Brazil, Canada, China, Côte d'Ivoire, Czechoslovakia, Ecuador, Egypt, Finland, France, German Democratic Republic, Federal Republic of Germany, Greece, Guatemala, India, Indonesia, Italy, Japan, Jordan, Republic of Korea, Malaysia, Mexico, Mongolia, Morocco, Norway, Pakistan, Peru, Poland, Sudan, Sweden, USSR, UK and USA.

We feel that the meeting has been extremely useful in that the Board is now more familiar with the work of the ICTP and the scientists have had an opportunity to present their opinions and aspirations to a group of people playing an important role in the decision-making process of the IAEA. There is, however, a disappointing note to the conclusion of this communication and that is that the developing countries were not sufficiently represented.

MATHEMATICS AT THE ICTP

For a number of years, Professor Giovanni Vidossich from the International School for Advanced Studies of Trieste and consultant to the Centre, has coordinate the activities in mathematics at the ICTP. Prof. Vidossich is internationally known as an expert in boundary value problems in Ordinary Differential Equations. While he was on sabbatical leave in 1985, Professor L.K. Shayo, a mathematician from the University of Dar-es-Salaam (Tanzania) took over the responsibility of looking after the ICTP mathematics. From 1982-83 onwards and in addition to the colleges and workshops in mathematics held each year, the ICTP has been running a programme for visiting mathematicians addressing itself, in particular, to scientists from developing countries taking their sabbatical leave. The number of mathematicians invited in 1985 to take part in the throughout-the-year programme could be increased (46 scientists for 94.77 man/months) thanks to an extra contribution that the ICTP will receive and this will allow the ICTP to make a further step in the consolidation of its research in mathematics.

Prof. James Eells, from Warwick University (UK), will join the ICTP in September and remain in residence for all of 1986-87 and for most of 1987-88 and will bring at the Centre a group of mathematicians including Aithal (India), Ezin (Benin), Gamedze (Swaziland), Liu (China), Rigoli (Italy) and Tribuzy (Brazil). Other mathematicians will join the team later.

Prof. Eells is an internationally known expert in differential geometry and has been associated with the ICTP mathematics programmes as a director or lecturer in the extended courses and workshops since 1972. The mathematics group will establish close links with various Third World centres of excellence like the Centre of Advanced Studies (Mexico), IMPA (Brazil), Tata Institute of Technology (Bombay), Nankai Institute (China), to quote only a few. Prof. G. Vidossich will of course continue to collaborate with the group as will Prof. Shayo.

DR. GAUTAM MUKHOPADHYAY APPOINTED FULL PROFESSOR

We learn that Dr. Gautam Mukhopadhyay (on leave from the Indian Institute of Technology, Bombay) has now been appointed a full professor in the Department of Physics, Indian Institute of Technology, Powai (Bombay) with effect from May 1986. He has been associated with the ICTP since 1972 and is currently spending two years here (July 1985 - June 1987) as a Solid State Fellow.

The ICTP extends its heartfelt congratulations to Dr. Mukhopadhyay on his appointment as a full professor.

CONDENSED MATTER VISITING/GUEST SCIENTISTS

T. Arai (USA)	January - September 1986
C. Bocchetta (SISSA/ICTP, Italy)	January - October 1986
M.P. Das (India)	March 1986 - February 1987
J.M. Dong (P.R. China)	January 1986 - December 1987
M.K. El Mously (Egypt)	June - September 1986
G. Garcia Calderon (Mexico)	January - July 1986
M.K. El Mously (Egypt)	June - September 1986
G. Garcia Calderon (Mexico)	January - July 1986
J.C. Lin (P.R. China)	January 1986 - December 1987
G. Mukhopadhyay (India)	January 1986 - June 1987
E. Martina (Mexico)	June 1986 - March 1987
K.L. Sebastian (India)	April - June 1986
K.K. Singh (India)	May 1986 - May 1987
F. Vericat (Argentina)	January - September 1986
Xia Jian Bai (P.R. China)	January - September 1986
Huang Yun (P.R. China)	April - August 1986
R. Mohan (USA/India)	May - November 1986
H.M. Miesenbock (SISSA/ICTP, Austria)	July 1986 - January 1987
M.J. Ponnambalam (Nigeria/India)	July - December 1986

VISITING MATHEMATICIANS PRESENT AT CENTRE

Name	at ICTP until	Office no.
S. ASGHAR (Islamabad, Pakistan)	7 September 1986	119
K.S. CHAUDHURI (Calcutta, India)	9 August 1986	128
J.O.C. EZEILO (Nsukka, Nigeria)	16 June 1986	123
JIANG JIAHE (Beijing, P.R. China)	24 August 1986	203
LI SHUJIE (Beijing, P.R. China)	30 September 1986	126
S.H. MAKARIOUS (Sokoto, Nigeria/ Egypt)	31 August 1986	108
F.I. NJOKU (Nsukka, Nigeria)	31 October 1986 (as SISSA student)	
W.OGANA (Nairobi, Kenya)	9 August 1986	120
S.C. RASTOGI (Nsukka, Nigeria/India)	4 November 1986	110
<u>E X P E C T E D</u>		
J. ANYANWU (Nsukka, Nigeria)	After end computing school (31 Oct) for a few weeks	
A.R. BESTMAN (Port Harcourt, Nigeria)	October 1986 for 6 months	
BINGGEN ZHANG (Shandong, P.R. China)	last week July for 3 months	
H.A.M. DZINOTYIWEYI (Harare, Zimbabwe)	July/August or October 1986 for 1 month	
M.E.A. EL TOM (Khartoum, Sudan)	15 June - 5 July	
Yu Yu FENG (Hefei, P.R. China)	17 July for 6 months	
Mu Li LEITE (Beijing, P.R. China)	1 month in September	
M.L. LEITE (Brazil)	1 month in September	
LI YI-SHEN (Hefei, P.R. China)	August for 3 months	
L. NAGAMUNI REDDY (Tirupati, India)	6 - 13 July	
P. NOWOSAD (IMPA, RJ, Brazil)	1 July for 3 months	
N. PARHI (Berhampur, India)	25 June for 6 months	
N.H. PAVEL (Iasi, Romania)	approx. 10 June for 3 months	
M. SAEED-IL-ISLAM (Kano, Nigeria/ Pakistan)	12 July for 3 months	
M. SITARAMAYYA (Hyderabad, India)	2 July for 9 months	

LIST OF REPRESENTATIVES TO
THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

In this issue, we publish a list with the addresses of the Representatives to the International Atomic Energy Agency for the benefit of those wishing to communicate with them.

The list of Representatives to UNESCO will be published in a later issue.

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Research Policy Institute
University of Lund, Sweden

Research Policy Institute Graduate Program on Science and Technology Policy

1. Background

There has been a strong interest in the role of science and technology in society lately. One reason is that technology is increasingly seen as a basic driving force in economic development and, at the same time, the effects of major innovations reach nearly every corner of society. A number of initiatives have been taken in order to promote research and development as well as technological innovation. Also the question of management of new technologies and the possible future effects of innovations is a major concern - not only for industry and government, but also for a wider public. At the same time various groups in society have expressed sceptical attitudes to the role of technology and subsequently proposed alternative frameworks for the development of science and technology.

Science and technology policy thus constitutes an important and multi-faceted field which evokes a variety of social perspectives and value-judgements. Therefore it is also a controversial subject. Research on issues related to science and technology policy tends to be multi-disciplinary, including perspectives from the theory of science, sociology, economics, etc. Consequently, there is a need for a synthesis at the level of advanced training in this area of research. The specific competence developed at training in this area of research. The specific competence developed at the Research Policy Institute during two decades of research reflects this kind of synthesis.

2. Objectives

The objective of the graduate program as envisaged here is to give students a theoretical as well as a practical understanding of issues related to the study of driving forces and effects of science and technology. Basic methodologies for science and technology policy research will be introduced, and the students will be given practical experience through study visits in Sweden.

Students are made familiar with current theories relevant for the study of R&D policies, technological innovation, management of new and traditional technologies, and social effects of technological change. In addition, the program provides participants with alternative perspectives on future technologies. Finally, the program covers issues related to technological development in advanced industrialized countries as well as those issues that are related to science and technology policy in developing countries.

Students must write a substantial research paper (Master's Thesis) in order to acquire the basic skills for independent study in this area, i.e. the necessary background for working both practically and theoretically with key problems in the area of science and technology policy research. Field studies in Sweden or in the student's home-country will provide an additional option for in the student's home-country will provide an additional option for empirical studies related to the thesis.

In this way students who have

received a Master's Degree in Science and Technology Policy from the Research Policy Institute have received basic qualifications for undertaking management of science and technology issues at the national and local level. In addition, the graduates may extend the basic training towards undertaking advanced research and advisory services for policy-makers.

3. Entrance Requirements

Participants in the course must have completed an undergraduate degree, equivalent to a Bachelor of Arts (BA) in an academic discipline, preferably social sciences, natural sciences or engineering sciences. In addition, the participants must demonstrate advanced reading/writing capability in English, since this will be the working language of the course - including the research paper.

Furthermore, participation in the Graduate Program requires basic knowledge of social science theory and methodology. Experience in some form of management of research and development will also provide a valuable background to participation in the course, but is not formally required.

In order to be admitted to the Graduate Program students must submit the attached application form duly filled in, together with letters of recommendation or references.



1986

4. The Graduate Program (Leading to a Master's Degree)

The graduate program covers a one and a half year period leading to a Master's Degree in science and technology policy studies. Students may use this degree to go on to advanced research in the same subject or as a base to continue to a doctoral training in a related subject.

4.1 General Structure

The graduate program includes a basic course and four additional courses, plus a paper, or Master's thesis, which involves adequate time and supervision (handled-ning). The basic course is equivalent to one term of full-time studies (20 points) while the four additional courses, together represent the equivalent of another term (20 points); a thesis is the equivalent of a final term of full-time studies (20 points). The Program thus covers a period of 1 1/2 years and will consist of 60 points, which is equivalent to the number of points required in the Master's programs at other departments of the University of Lund.

The graduate program will be initiated during the Autumn Term 1986, starting on September 1. Completed applications should be submitted by June 1, 1986. Applicants will be notified of acceptances shortly thereafter. Late applications will also be considered.

4.2. Costs

No tuition fees are required, once the student has been admitted into the Graduate Program. Expenses for living in Sweden are considerable, though, and students must assure satisfactory financial resources for their stay.

sources for their stay.

5. The Courses

5.1 Basic Course: Science and Technology in Society (20 p.)

The aim of this course is to give the students a fundamental overview of the key issues involved in science and technology policy studies.

- I. Technology in society: an introduction
- II. The historical perspective
- III. Technology and the economy
- IV. Technological innovation
- V. Science and technology policy
- VI. Technology and social change
- VII. Technology in the future society: two scenarios

5.2 Science and Technology Policy: Theory and History (5 p.)

The aim of the course is to place contemporary science and technology policy in a historical perspective.

- (1) The emergence of science and technology policy
- (2) Conceptual problems of science and technology policy
- (3) Recent trends in science and technology policy

5.3 Technological futures - the future of technology (5 p.)

The aim of the course is to provide an overview of the expected developments in technology that can be of importance in terms of social consequences/economic development, and policy action.

- (1) Forecasting and assessment of technology: an introduction
- (2) Microelectronics/information technology
- (3) Biotechnologies
- (4) Other new technologies
- (5) Technological futures and their policy implications

5.4 Technology and development (5 p.)

The aim of the course is to provide the student with an understanding of the role technology plays in the development process, focussing on the developing countries.

- (1) The cultural roots of technology
- (2) The international context
- (3) Choice of technology in the Third World
- (4) Transfer of technology
- (5) The generation of technological capabilities in the Third World
- (6) Technology policies and the development of technological capabilities in selected countries

5.5 Information Technology and Social Change (5 p.)

The aim of the course is to discuss the implications of the diffusion of modern information technology.

- (1) Background: what is information technology?
- (2) Information, automation, and work
- (3) Social and cultural implications
- (4) Policies related to information technology

Director of the Institute
Professor Jon Sigurdson

Course Director
Dr Andrew Jamison

Senior Research Fellows specialize in the following areas:

Comparative studies of trends in technological development; world industry studies; transfer of technology; diffusion of new technology, e.g. automation technology; organisation of R&D systems and science & technology policy; development of military technology and military R&D systems; history of S&T; national technology programs and industrial renewal; information systems and technological development; industrial production culture.

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High Energy Physics preprints and internal reports issued

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- (45) D. SAHDEV and R.B. ZHANG - A comment on the covariant spectrum of the open bosonic string.
- (46) N.F. NASRALLAH - The correction to the Goldberger-Treiman relation and the QCD condensates.
- (51) G.C. GHIRARDI - Quantum description of microscopic and macroscopic systems: Old problems and recent investigations.
- (54) P. BAEKLER, F.W. HEHL and E.W. MIELKE - Non-metricity and torsion: Facts and fancies in gauge approaches to gravity.
- (56) AMITAVA DATTA, ADITI RAY and AMITAVA RAYCHAUDHURI - Light gluinos and CP violation.
- (57) E.H. SAIDI - Renormalizable $N=2$ supersymmetric and gauge invariant interactions from the $N=2$ harmonic superspace with central charges.
- (58) T. LHALLABI and E.H. SAIDI - On the renormalizable interactions of the $N=2$ Maxwell and scalar multiplets in the $N=2$ harmonic superspace.
- (59) A. EL HASSOUNI, T. LHALLABI, E.G. OUDGRHIRI-S and E.H. SAIDI - $N=2$ SQED in the $N=2$ harmonic superspace.
- (60) E.H. SAIDI - Spontaneous $N=2$ supersymmetry breaking in the $N=2$ harmonic superspace à la Fayet-Iliopoulos.
- (63) AMITAVA DATTA, ADITI RAY and AMITAVA RAYCHAUDHURI - Constraints on the squark mass matrix from CP-violation and Susy predictions for the $B^0 - \bar{B}^0$ systems
- (65) SWEE-PING CHIA - Behaviour of coupling constants at high temperature in supersymmetric theories.
- (70) R. ORELLANA and H. VUCETICH - The principle of equivalence and the Trojan asteroids.
Trojan asteroids.
- (73) E. BERGSHOEFF and E. SEZGIN - The $(4,0)$ heterotic string with Wess-Zumino term.
- (74) A.D. LINDE - Eternal chaotic inflation.
- (75) A.D. LINDE - Eternally existing self-reproducing inflationary universe.
- (78) A. KUNDU - Integrability of classical and semiclassical derivative non-linear Schrödinger equation with non-ultralocal canonical structure.
- (80) BELAL E. BAAQUIE - An exact realization of the Kac-Moody algebraic and derivation of the Wess-Zumino chiral action.
- (83) H.J. SHIN - Spontaneous breaking of global and local symmetries in six dimensional Einstein-Maxwell- σ theory.

- (84) C.A. DOMINGUEZ and N. PAVER - Tensor gluonium spectrum in QCD.
- (94) J. STRATHDEE - Extended Poincaré supersymmetry.
- (97) V.K. DOBREV and V.B. PETKOVA - Reducible representations of the extended conformal superalgebra and invariant differential operators.
- (98) V.K. DOBREV and V.B. PETKOVA - All positive energy unitary irreducible representations of the extended conformal superalgebra.
- (106) MIAO LI - Compactifications and θ -structures in string theories.
- (115) E. BERGSHOEFF, T.W. KEPHART, ABDUS SALAM and E. SEZGIN - Global anomalies in six dimensions.
- (119) A.O. BARUT and N. UNAL - A new approach to bound state quantum electrodynamics-II: Spectra of positronium, muonium and hydrogen.
- (121) M.W. MORSY - The Schrödinger differential operator and intrinsic self adjointness.
- (123) V.K. DOBREV - Characters of the irreducible highest weight modules over the Virasoro and super Virasoro algebras.
- (124) K. KIKKAWA-- Covariant field theory of the interacting string.
- (126) J. STRATHDEE - Vacuum stability in Kaluza-Klein theories.

Nuclear Physics preprints and internal reports issued

in April-June 1986

- (52) XU FUXIN - The application of nuclear data to the research of nuclear theory.
- (86) JIRI CHYLA and JIRI RAMES - On the rôle of higher twists in describing scaling violation.
- (105) M.I.W. LABOR - An oblique target transmission technique in measuring stopping powers.

Solid State Physics preprints and internal reports issued

in April-June 1986

- (50) GIULIA GALLI, WANDA ANDREONI and M.P. TOSI - Stability and ionization-induced structural transitions of sodium chloride microclusters from Hartree-Fock calculations:
 $\text{NaCl}_2^{(+)}$ and $\text{Na}_2\text{Cl}^{(+)}$.
- (53) LI FULI - Correlation control theory of chaotic laser systems.
- (55) ALEJANDRO SPINA and HECTOR VUCETICH - Collective motions and non-polynomial Lagrangians in Fokker-Planck dynamics.
- (62) S. LIU, L.Y. XIONG and C.W. LUNG - The image force modified dislocation distribution in a cracked finite width material.
- (64) R. RAMANATHAN - Quantum mechanics, stochasticity and space-time.
- (66) DEREJE SEIFU and P. MIKUSIK - Energy band structure of Cr by the Slater-Koster interpolation scheme.
- (72) A. KUNDU and A. ROY CHOWDHURY - A multi-dimensional phase-space approach to chaos in perturbed soliton system.
- (77) W.-K. LIU and B. GUMHALTER - Potentials and scattering cross sections for collisions of He atoms with adsorbed Co.
- (79) J.A. GONZALEZ - Exact soliton-like solutions of perturbed Ψ^4 equation.
- (82) NGUYEN BA AN - Bistable behaviour of biexciton population in a dense exciton-biexciton system in semiconductors.
- (85) NGUYEN BA AN and NGUYEN VAN HIEU - Resonant electronic Raman scattering on donor levels in CdTe.
- (87) IVAN DVORAK and JAROMIN SISKA - On some problems encountered in calculating the correlation dimension of EEG.
- (88) L. DAHMANI, M. SEBBANI and A. BREZINI - Nature of eigenstates near the mobility edge in random binary alloys.
- (89) WAN-SUN NI - The period-adding phenomena in a two-dimensional mapping with three parameters.
- (95) T. TEL - Escape rate from strange sets as an eigenvalue.
- (96) A. BREZINI, M. SEBBANI and L. DAHMANI - Localization in random systems-I: Effect of off-diagonal disorder.
- (99) A.G. SAIF and L.N. SHEHATA - Magnetic pinning interaction of a type-II superconducting cylinder.
- (100) A.G. SAIF - The effects of the surface barriers on a critical state of a type II superconducting slab.

- (101) M.K. BELIC - Holographic four-wave mixing as a Sturm-Liouville problem.
- (102) M.E. ELZAIN, D.E. ELLIS and D. GUENZBURGER - Mössbauer isomer shift at ^{57}Fe in vanadium.
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- (108) J.L. CARRILLO, G. LUNA-ACOSTA, J. ARRIAGA and M.A. RODRIQUEZ - Influence of recombination centres on the relaxation process of a 2D photo-excited hot electron plasma.
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- (118) A.G. SAIF - Structure of the surface barrier in a critical state of an edged type-II superconductor.
- (120) A.G. SAIF - AC losses in a type-II superconducting slab including surface barrier effects.
- (122) J.A. GONZALEZ and J.A. HOŁYST - Solitary waves in one-dimensional damped systems.
- (125) H. ENGLISCH - The phase formalism for one-dimensional random Schrödinger operators (dedicated to the 65th anniversary of Prof. Gerhard Weber).

Plasma Physics preprints and internal reports issued

in April-June 1986

- (49) QUI YUN-QING - The effect of transitional particles driven by single waves.

Mathematics Physics preprints and internal reports issued

in April-June 1986

- (61) A. ROY CHOWDHURY and SIRAJ AHMAD - On a prolongation structure approach in three dimension for the conservation laws and Lax pairs of B-0 equation.
- (67) R.C. RASTOGI - A note on Finsler spaces admitting parallel vector fields.
- (68) R.C. RASTOGI - On projective invariants based on non-linear connections in a Finsler space - I.
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- (90) LI SHUJIE - Some existence theorems of critical points and applications.
- (92) KRIPASINDHU CHAUDHURI - Dynamic optimization of combined harvesting of a two-species fishery.
- (103) A. ROY CHOWDHURY and FU-CHO PU - On the quantum R-matrix for the partially fermionic three wave interaction.
- (104) A. ROY CHOWDHURY and PRANO K. CHANDA - On the quantum inverse problem for the continuous Heisenberg spin chain with axial anisotropy.
- (111) S.C. RASTOGI - Submanifolds of a Finsler manifold - I.
- (113) A. ROY CHOWDHURY and SWAPNA ROY - On the group-theoretic approach to the conservation laws of K-P equation in Lagrangian and Hamiltonian formalism.
Hamiltonian formalism.
- (117) S.A. EL WAKIL, H.M. MICHALI, M. MADKOUR and E.A. SAIED - Operational method for the particle slowing down problem

Preprints and internal reports issued in other fields

in April-June 1986

- Solar Energy (47) K. ANANE-FENIN - Global solar radiation in Trieste.
- Solar Energy (48) K. ANANE-FENIN - Estimating solar radiation in Ghana.
- Cosmology (69) M.D. POLLOCK - On the stochastic approach to inflation and the initial condition in the universe.
- Reactor Physics (91) M.I.W. LABOR - A split-target technique in determining the dE/dx of 1.0-5.0 MeV Tritium in Al, Ni and Au.
- Chaotic Dynamics (93) LADISLAV ANDREY - Evidence of chaotic dynamics during the onset of cancerous growth of hematopoietic system.
- Meteor. (110) M. RIZK - Wind characteristics and the available wind energy in Egypt.
- Misc. (114) I.A. ELTAYEB, M.H.A. HASSAN and E.A. HAMZA - Formation and propagation of Sand Dunes: A non linear treatment.

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- SMR.202 International Workshop on Remote sensing and Resource Exploration 9 February - 6 March
- SMR.203 Spring College on Geomagnetism and Aeronomy 2 - 27 March
- SMR.204 Winter College on Atomic and Molecular Physics 9 March - 3 April
- SMR.205 Spring School and Workshop on Supersymmetry, Supergravity and Superstrings 1 - 15 April
- SMR.206 School on Polymer Physics 27 April - 15 May
- SMR.207 Workshop on Surface Science and Catalysis 4 - 9 May
- SMR.208 Spring College in Material Science on Metallic Materials 11 May - 19 June
- SMR.209 Workshop on Intermediate Nuclear Physics 18 - 22 May

SMR.210	Spring College on Plasma Physics	25 May - 19 June
SMR.211	ICFA School on Instrumentation in Elementary Particle Physics	8 - 19 June
SMR.212	Summer Workshop on High Energy Physics and Cosmology	29 June - 7 August
SMR.213	Research Workshop in Condensed Matter, Atomic and Molecular Physics	22 June - 4 Sept.
	Adriatico Research Conferences	Summer
SMR.214	Working Party on "Physics of Porous Media"	17 - 28 August
SMR.215	Workshop on the Physics of Nonconventional Energy Sources and Material Science for Energy	31 August - 18 Sept.
SMR.216	Workshop on Telematics	7 Sept. - 2 October
SMR.217	Workshop on Economics, Modelling, Planning and Management of Energy	14 - 25 September
SMR.223	Conference on Interaction between Physics and Architecture in Environment-conscious Design	21 - 25 September
SMR.218	Fourth College on Microprocessors: Technology and Applications in Physics	5 - 30 October
SMR.219	Workshop on Mathematical Ecology	12 October - 6 Nov.
SMR.220	Third College on Soil Physics	2 - 20 November
SMR.221	College on Riemann Surfaces	9 November - 18 Dec.
SMR.222	Second College on Cloud Physics and Climate	23 Nov. - 18 Dec.

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