UNIVERSITY OF CATANIA

DEPARTMENT OF PHYSICS AND ASTRONOMY

ACTIVITY REPORT 2001

The new building which hosts the Department of Physics and Astronomy at the "Cittadella" University campus

INDEX

Report edited by Prof. G.Belvedere and Prof. A. Rapisarda

INTRODUCTION

The Department of Physics and Astronomy is a methodologic one, where most of the research and teaching activities in the field of Physics conducted at University of Catania take place. Most Professors of the courses for the Degree ("Laurea") in Physics are members of the Department. Many of them teach courses for other Degrees of the Science Faculty and of other Faculties. Professors and assistant professors of the Department are currently 78. Technicians and Administrative staff of the Department amount to 30.
The Department has a Library and its own Administrative and Technical Services.
The Department takes care of the PhD program in Physics.
The Department hosts also:

1. the local Section of INFN (Istituto Nazionale di Fisica Nucleare), whose personnel work in close collaboration with Department members, in the fields of nuclear sub-nuclear and applied physics
2. the local Section of INFM (Istituto Nazionale di Fisica per la Materia), for research in the field of condensed matter and molecular physics
3. the Sicilian Centre for Nuclear and Solid State Physics (CSFNSM), which sponsors research in interdisciplinary fields of physics

In the year 2000 the Institute of Astronomy joined the Department of Physics and the name changed in Department of Physics and Astronomy. It was then formed the Astrophysics Section of the Deparment.
Several members of the Department have been instrumental in realizing the Laboratorio Nazionale del Sud (LNS) of INFN, which is located in Catania. They conduct research activity at this Laboratory.
Other Department members have a research collaboration with the CNR Institute for Microelectronics Methodologies and Techniques, which operates in close collaboration with the research department of the ST Company, a microelectronics manifacturer whose plant is located in Catania.
Several members of the Department collaborate with the Osservatorio Astrofisico di Catania (OAC).
For the purpose of organizing this report, the research activity of the Department has been divided into 5 sections: A) Applied Physics, B) Experimental Nuclear and Particle Physics, C) Theoretical Physics, D) Solid State Physics, E) Astrophysics.
Each category includes several fields. Moreover, some researches belong to more than one category.
The publication list included in this report is only partial, as it does not include a large number of contributions to national and international Conferences and Schools, magazine reports, technical notes, etc.

DIRECTION

DIRECTOR
LO NIGRO Salvatore

Director Board [Giunta]
ARENA Nicolò (Vice Director), BAERI Pietro, BARBERA Roberto, CUNSOLO Angelo, MAZZEO Carmela, PORTO Francesco, SCALIA Augusto, TERRASI Antonio, GIUDICE Nunzio

Responsible of the Astrophysics Section
BELVEDERE Gaetano

PROFESSORS
AGODI Attilio, ALBERGO Sebastiano, ARENA Nicolò, BAERI Pietro, BARBARINO Sebastiano, BELLIA Giorgio, BELLINI Vincenzo, BELVEDERE Gaetano, BLANCO Carlo, BURRAFATO Giuseppe,CATALANO Francesco, CATARA Francesco, CAVALLARO Salvatore, CAVALLARO Sebastiano, COSTA Salvatore, CUNSOLO Angelo, DI TORO Massimo, EBERLE Enrico, FARACI Giuseppe, FONTE Giacomo ,FOTI Antonino ,FOTI Gaetano , GIANSIRACUSA Giuseppe, GIORDANO Roberto, GRIMALDI Maria Grazia, GUTKOWSKI Diego, IMMÉ Giuseppina, INSOLIA Antonio, LATTUADA Marcello, LOMBARDO Umberto, LO NIGRO Salvatore, MIGNECO Emilio, PAPPALARDO Giuseppe, PARISI Rosa, PATERNO' Lucio, PENNISI Agata Raffaella, PORTO Francesco, POTENZA Renato, PRIOLO Francesco, PUCCI Renato , RACITI Giovanni, RAPISARDA Andrea , RIGGI Francesco, RIMINI Emanuele, RIZZO Francesca, RODONO' Marcello, RUSSO Giovanni Valerio, RUSSO Giuseppe, SIRINGO Fabio, SAMBATARO Salvatore (*), SCALIA Augusto,

STRAZZERI Andrea, SPERDUTO Maria Leda, TROJA Sebastiano Olindo, VINCIGUERRA Domenico, ZAPPALA' Rosario Aldo, ZUCCARELLO Francesca

(*)Deceased on January 27th,2001

ASSISTANT PROFESSORS
ANGILELLA Giuseppe, BARBERA Roberto, CASTORINA Paolo, COSTANZO Evelina, GIUSTOLISI Francesco, LANZAFAME Alessandro, LATORA Vito, LO MONACO Luigi , MACCARRONE Gaetano Daniele, MUSUMECI Paolo, PAPPALARDO Lorenzo, PAPPALARDO Salvatore, PETTA Catia, PICCITTO Giovanni, POLITI Giuseppe, REITANO Riccardo, SIMONE Francesca, TERRASI Antonio, TOMASELLO Pasquale, TRICOMI Alessia, TUVÉ Cristina.

RESEARCH STAFF AFFILIATED WITH OTHER AGENCIES

I.N.F.N. RESEARCH STAFF - SEZIONE DI CATANIA
AIELLO Sebastiano, ANDRONICO Giuseppe, BADALÀ Angela, BALDO Marcello, BURGIO Fiorella, CARDELLA Giuseppe, CONSOLI Maurizio, DE FILIPPO Enrico FONTE Roberto , ITALIANO Antonino (Messina), LANZA Giuseppe Edoardo, LANZANÒ Gaetano, PAGANO Angelo, PALMERI Armando, PAPA Massimo, PAPPALARDO Giuseppe Salvatore, PIRRONE Sara, RANDAZZO Nunzio, SAMBATARO Michelangelo, SUTERA Concetta Maria, ZAPPALA' Dario.

I.N.F.M. RESEARCH STAFF - CATANIA
FRANZO' Giorgia

C.N.R. RESEARCH STAFF
ALBERTI Alessandra, COFFA Salvatore, IACONA Fabio, LIBERTINO Sebania, LA VIA Francesco, LIBERTINO Sebania, LA MAGNA Antonino, LOMBARDO Salvatore, MANNINO Giovanni, PENNISI Agostino, PRIVITERA Vittorio, RAINERI Vito, SPINELLA Rosario Corrado.

O.A.C. RESEARCH STAFF
ANTONUCCIO Vincenzo, BECCIANI Ugo, BONANNO Alfio, BONANNO Giovanni, BARATTA Giuseppe, CATALANO Santo, COSENTINO Rosario, CUTISPOTO Giuseppe, LANZA Antonino, LANZAFAME Giuseppe, LEONE Francesco, LETO Giuseppe, MESSINA Sergio, MARILLI Ettore , PAGANO Isabella, PALUMBO Maria Elisabetta, SCUDERI Salvatore, SPADARO Daniele, STRAZZULLA Giovanni, VENTURA Rita.

NOTO CNR-VLBI RESEARCH STAFF
TRIGILIO Corrado, UMANA Grazia

C.S.F.N.S.M. RESEARCH STAFF
FRISONE Fulvio

TECHNICIANS AND ADMINISTRATIVES

DEPARTMENT'S ADMINISTRATION
ANASTASI C., FORMICA L., MARINO E., MAZZEO C. (Segretario Amministrativo), SPAMPINATO C.

ACCOUNTING OFFICE
FORTUNA L., NICOTRA N., RAPICAVOLI M. R., CIMINO M.

TEACHING SERVICES
AULINO G., FERLITO P. , LA ROCCA A. , TIMPANARO G.

GENERAL SERVICES
COSENTINO S., D'AGUSTA A. (LSU), LONGO N.

LABORATORIES
LEOTTA S., MARINO N., PARASOLE O., SALEMI M. (INFN)

ELECTRONICS SERVICES
D'ANDREA M. (INFN), FICHERA F. (INFN), GIUDICE N., GUARDONE N., LIBRIZZI F. (INFN), NICOTRA D. (INFN), REITO S. (INFN), SACCÀ G. (INFN), URSO S. (INFN)

LIBRARY
GIUFFRIDA G., MURE G., PLUCHINO S.

COMPUTER CENTRE
BELLUOMO P. (INFN), CANGIANO E. (INFN), ROCCA C. (INFN), SAVA G. (INFN)

TECHNICAL SERVICES
ARRIVA F., CONTI O. (INFN), LO FARO S. (INFN), MARINO E., MAZZEO M., PLATANIA B. (INFN), RAPICAVOLI A., RAPICAVOLI C. (INFN), RIZZA G. (INFN), SPAMPINATO C., SPARTI V. (INFN)

SPECIAL TASKS
BRUNO G. (CNR), CONNELLI V. (CNR), POLI G., SCUDERI V.

RECEIVING & STORES
LEOTTA S., PELLICANE M. (INFN)

C.S.F.N.S.M. ADMINISTRATION
D'ARRIGO A. M. , SCOLLO M. R.

RESEARCH FELLOWS

CAPUZZELLO	Francesco	CRRNSM
CARRUBBA	Simona	CRRNSM
GIANNAZZO	Filippo	
GUELI	Anna Maria	
LANZALONE	Gaetano	
MARZO	Fabio	CRRNSM
MASTELLONE	Andrea	CRRNSM
MIRABELLA	Salvatore	CSFNSM
MORELLI	Daniela	CRRNSM
NICOLETTI	Luisa	
ROMANO	Stefano	
PEDALINO	Alberto	CRRNSM
PELLEGRITI	Maria Grazia	CRRNSM
PIZZONE	Rosario	CRRNSM
PRIVITERA	Giuseppe	CRRNSM
PRIVITERA	Stefania	CRRNSM
PUGLISI	Rosaria	
RICCOBENE	Giorgio	CRRNSM
SABINI	Maria Gabriella	CSFNSM
SIRAGUSA	Carmelo	CRRNSM
SFIENTI	Concettina	CRRNSM
TUDISCO	Salvatore	CRRNSM
ZUCCARELLO	Agnese	CRRNSM

VISITORS

Andres M. , University of Sevilla, Spain
Baran Virgil, NIPNE and Univ. Bucharest, Romania
Baur G. - Germany - KFA, Julich
B.Liu, - IHEP Beijing, China
Betchel Françoise - France - Centre de Recherche en Physique Appliquée à l'Archéologie (CRPAA), Talence
Branchina V. - Oberhausbergen, France
Brink David , Oxford University- United Kingdom
Cazenave Sandrine - France-Centre de Recherche en Physique Appliquée à l'Archéologie (CRPAA), Talence
Ceretta Moreira Eduardo, Università Federale do Rio Grande do Sul, Brasile.
Chomaz Philippe, Ganil France
Chritiansen Enrik Esmann - Denmark - Risø National Laboratory, Roskilde
De Luca Louis, Reasearch Engineer, JEOL Europe, Paris France
Drago A., Univ. Ferrara
Elstner Dieter, Astrophysicalisches Institut, Potsdam, Germany
Fabbri G., Univ. Firenze
Goryunov O. Yu. - Ukraine - Institute for Nuclear Research, Kiev
Janik Michal, University of Technology, Warsaw, Poland.
Katsova Maria M., Stenberg Astronomical Institute, Moscow, Russia
Kuzanyan Kirill M., IZMIRAN (Institute for Electromagnetic Research, Troitsk (Moscow) Russia
Livshits Moissei A., Stenberg Astronomical Institute, Moscow, Russia
Lahaye Christelle - France - Centre de Recherche en Physique Appliquée à l'Archéologie (CRPAA), Talence
Lonnroth T. - Finland - Abo Academy, Turku
March N.H., Oxford University, UK and University of Antwerp, Belgium
Martini M., Univ. Milano Bicocca
Matera F., Univ. Firenze
Miljanic Dj. - Croatia - Institut R. Boskovic, Zagreb
Ostashko V. V. - Ukraine - Institute for Nuclear Research, Kiev
Pommier Pierre - France - University of Bordeaux 3
Rolfs C., Ruhr Universitaet, Bochum, Germany
Ruediger Guenther, Astrophysicalisches Institut, Potsdam, Germany
Schattl H., Dept. Physics, University of Liverpool, UK
Schulze H.J. - Liegi, Belgium
Schuck P. - Orsay, France
Soic N. - Croatia - Institut R. Boskovic, Zagreb
Sourani Eleni - Greece - University of Thessaloniki
Sunbera Michal, Institute of Physics, Rez, Czech Republic.
Szarwas Piotr, University of Technology, Warsaw, Poland.
Tsallis C. - Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro, Brazil
Typel S. - USA - Michigan State University, East Lansing
Van Giai Nguyen - Orsay, France
Wolter Hermann, -Univ. Muenchen, Germany.
Zaporozhets Serguei, JINR, Dubna, Russia
Zaqarashvili Teimuraz, Abastumani Astrophysical Observatory, Tbilisi, Georgia
Zuo Wie - Inst. Modern Physics Academia Sinica - Univ. Lanzhou – China
Zverev M. - Kurchatov Institute Moscow, Russia

COURSES HELD IN THE ACADEMIC YEAR 2001/2002

"LAUREA" IN PHYSICS PROGRAMME (equivalent to MASTER OF SCIENCES)

ANALISI MATEMATICA I
ANALISI MATEMATICA II
ASTROFISICA
ASTRONOMIA
CALCOLO ELETTRONICO
CAMPI ELETTROMAGNETICI
CHIMICA
ELETTRONICA APPLICATA
ESPERIMENTAZIONI DI FISICA I
ESPERIMENTAZIONI DI FISICA II
ESPERIMENTAZIONI DI FISICA III
FISICA DELL'AMBIENTE
FISICA DEI DISPOSITIVI ELETTRONICI
FISICA DEI MATERIALI
FISICA DEI SEMICONDUTTORI
FISICA DELLO SPAZIO
FISICA DELLO STATO SOLIDO
FISICA GENERALE I
FISICA GENERALE II
FISICA MOLECOLARE
FISICA NUCLEARE
FISICA SOLARE
FISICA STELLARE
FISICA SUPERIORE
FISICA TEORICA
FISICA TERRESTRE
GEOMETRIA
ISTITUZIONI DI ASTROFISICA
ISTITUZIONI DI FISICA NUCLEARE E SUBNUCLEARE
ISTITUZIONI DI FISICA TEORICA
LABORATORIO DI ASTROFISICA
LABORATORIO DI ELETTRONICA
LABORATORIO DI FISICA DELL'AMBIENTE
LABORATORIO DI FISICA DELLA MATERIA
LABORATORIO DI FISICA NUCLEARE
MECCANICA RAZIONAMECCANICA STATISTICA
METODI MATEMATICI DELLA FISICA
METODOLOGIE FISICHE PER I BENI CULTURALI
RADIOASTRONOMIA
RADIOATTIVITÀ
REAZIONI NUCLEARI
SPETTROSCOPIA NUCLEARE
STORIA DELLA FISICA
STRUTTURA DELLA MATERIA
TEORIA DEI CAMPI

COURSES HELD IN THE ACADEMIC YEAR 2001/2002

FOR OTHER KINDS OF "LAUREA" (DEGREE)

CORSO INTEGRATO DI FISICA PER MEDICINA E CHIRURGIA I

CORSO INTEGRATO DI FISICA PER MEDICINA E CHIRURGIA II
CORSO INTEGRATO DI FISICA PER MEDICINA E CHIRURGIA III
DISPOSITIVI ELETTRONICI PER INGEGNERIA ELETTRONICA
ESERCITAZIONI DI FISICA SPERIM. PER CHIM. E CHIM. IND.
FISICA GENERALE I PER MATEMATICI
FISICA GENERALE II PER MATEMATICI
FISICA PER SCIENZE NATURALI
FISICA PER FARMACIA
FISICA PER CHIMICA E TECN. FARM. (CTF)
FISICA I PER SCIENZE GEOLOGICHE
FISICA II PER SCIENZE GEOLOGICHE
FISICA I PER SCIENZE DELL'INFORMAZIONE
FISICA II PER SCIENZE DELL'INFORMAZIONE
FISICA PER SCIENZE BIOLOGICHE
FISICA GENERALE I PER CHIMICA
FISICA GENERALE II PER CHIMICA
FISICA I PER ING. MECCANICA
FISICA II PER INGEGNERIA ELETTRICA
FISICA PER MEDICINA - ODONTOIATRIA -
LABORATORIO DI FISICA PER SCIENZE BIOLOGICHE
LABORATORIO DI FISICA PER CHIMICA
MICROONDE

DOTTORATO DI RICERCA (equivalent to Ph.D.) IN PHYSICS PROGRAM

The Physics Department is the main hub for the activities of the PhD in Physics at University of Catania. Available PhD majors are:
[1] Nuclear and Particle Physics
[2] Solid State Physics
[3] Theoretical Physics
[4] Astrophysics
Although funds granted by University of Catania have been particularly poor, a consistent part of the funds were given by the European Community. An intense activity has been organized, including lecture courses and special seminars, held also by foreign Scholars. The possibility for students to conduct part of their research at foreign Universities or Laboratories has been granted.
Collaboration with other local research Institutions helps students fulfill their research goals. These Institutions include the Institute of Physics of the Engineering Faculty, the Astrophysics Observatory, The Institute of Astronomy, all belonging to the University of Catania, as well as INFN and CNR.

PhD Activities

XIV CYCLE

Coordinator: F. Catara
Teacher Staff: A.Agodi, G.Belvedere, C.Blanco, A.Cunsolo, M.Di Toro, G.Faraci, G.Giaquinta, S.Lo Nigro, M.Rodonò, C.Spitaleri, S.O.Troja.

The students of XIV cycle are:
A. DI LORENZO, A. FIASCONARO, E. GERACI, V. GRECO, A.L. MELITA, C. NOCIFORO, R.G. PIZZONE, S.M.S. PRIVITERA, P. VENTURA

XV CYCLE

Coordinator: F. Catara

Teacher Staff: A.Insolia, G.Belvedere, C.Blanco, A.Cunsolo, M.Di Toro, G.Faraci, R. Fazio, S.Lo Nigro, L. Paternò, C.Spitaleri, S.O.Troja, R.A. Zappalà.

The students of XV cycle are:
M. CHIORBOLI, L. CONTARINO, C. IACONO MANNO, A. LAZZARO, D. LO PRESTI, G. LO RE F.D. MAMMOLITI, D. MORELLI, S. MIRABELLA, A. MURABITO, P. ROMANO

XVI CYCLE

Coordinator: F. Catara
Teacher Staff: A.Insolia, G.Belvedere, C.Blanco, A.Cunsolo, M.Di Toro, G.Faraci, G.Giaquinta, S.Lo Nigro, L. Paternò, R. Pucci, C.Spitaleri, S.O.Troja, R.A. Zappalà.

The students of XVI cycle are:
D. PACIFICI, E. LA GUIDARA , C. DISTEFANO, G. PALAZZO, M. SPADAFORA, A. PULVIRENTI, M. ALESSANDRINO, A. GIUSA, G. CIRRONE, A. SCIUTO, M. VENTURA

XVII CYCLE

Coordinator: A. Insolia
Teacher Staff: G.Belvedere, C.Blanco, F. Catara, A.Cunsolo, M.Di Toro, G.Faraci, G.Giaquinta, S.Lo Nigro, L. Paternò, R. Pucci, C.Spitaleri, S.O.Troja, R.A. Zappalà.

The students of XVII cycle are:
S. BONINELLI, B. CAFRA, A. COSENTINO, S. DI GIORGIO, D. FERRO, G. IMPELLIZZERI, S. LECCIA, S.ORRIGO, A. PLUCHINO,A. RINOLLO, A.ROMEO, S. TERRANOVA,A. ZUCCARELLO.

DOTTORATO DI RICERCA (equivalent to Ph.D.) IN MATERIAL SCIENCE PROGRAM

The activity is organized in collaboration with the Department of Chemistry of the Catania University and the Dipartments of Physics and Chemistry of the Padua University.

XIV CYCLE

Coordinator: I. Fragalà
Teacher Staff: R.Bozio(Pd),S.Di Bella (Ct), A.Drigo (Pd), I.Fragalà (Ct), G.Marletta (Ct), P.Mazzoldi (Pd), G.Montando (Ct), F.Priolo (Ct), R.Pucci (Ct), O.Pugliesi (Ct), E.Rimini (Ct), E.Tondello (Pd)

The students of XIV cycle are:
A. BAERI, A. COATI, F. GIANNAZZO

XV CYCLE

Coordinator: I. Fragalà
Teacher Staff: R.Bozio (Pd), S.Di Bella (Ct), A.Drigo (Pd), I.Fragalà (Ct), A.Grassi (Ct), A.Licciardello (Ct), G.Marletta (Ct), P.Mazzoldi (Pd), F.Priolo (Ct), R.Pucci (Ct), O.Pugliesi (Ct), E.Rimini (Ct), E.Tondello (Pd)

The students of XV cycle are:
P. SCHIAVUTA, E. SCIACCA

XVI CYCLE

Coordinator: F.Priolo
Teacher Staff: R.Bozio (Pd), S.Di Bella (Ct), A.Drigo (Pd), I.Fragalà (Ct), A.Grassi (Ct), A.Licciardello (Ct), G.Marletta (Ct), P.Mazzoldi (Pd), F.Priolo (Ct), R.Pucci (Ct), O.Pugliesi (Ct), E.Rimini (Ct), E.Tondello (Pd)

The students of XVI cycle are:
A. AUDITORE, A. IRRERA, I. CRUPI , S. PADOVANI, S. DAL TOÈ, N. ARGIOLAS, M. VITICOLI , B. MECHERI , G. BOTTARO

PARTNERSHIPS, SPECIAL PROJECTS AND NETWORKS

- National CNR project on:"Studio di sistemi molecolari in condizioni estreme di temperatura e pressione". Institutions involved are Dip. Catania, Dip. Roma, Firenze, IEQ Firenze, ISM Roma.
- Agreement of scientific collaboration with Jaghellonic University of Cracovia and Silesian University of Katowice.
- Contract with CORIMME CT on the projects :
  "Impianti ad alta energia di B e di Al in campioni strutturati",
  "Caratterizzazione elettrica e strutturale di strati SIPOS",
  "Controllo della vita media di portatori minoritari tramite impianti di Pt".
- Contract with ST Microelectronics - Agrate Brianza (MI) for the projects "Studio degli impianti ad alta energia", "Microscopia elettronica".
- Agreement with CNR - IMETEM, for the SCOOP Project.
- Agreement with Istituto Nazionale di Fisica Nucleare
- Agreement with Istituto Nazionale di Fisica per la Materia.
- Agreement with Istituto Nazionale di Fisica Nucleare for the CATANA project
- Agreement with Provincia Regionale di Ragusa .
- Agreement with Osservatorio Astrofisico di Catania in order to ensure an effective and competitive development of astrophysical research in the Catania area.
  The funding is provided by : Ministero dell'Università e della Ricerca Scientifica e Tecnologica (MURST), Consiglio Nazionale in the delle Ricerche (CNR), Agenzia Spaziale Italiana (ASI), Regione Sicilia.
- Agreement of Scientific, technological and administrative collaboration with Consorzio Interuniversitario per la Fisica Spaziale (CIFS) for carrying out the space astrophysical projects in which the Section scientific staff operates, also through a local CIFS research unit. Associated universities are: Firenze (Dip. di Astronomia e Scienza dello Spazio), L'Aquila (Dip. di Fisica), Milano (Dip. di Fisica), Roma La Sapienza (Dip. di Fisica), Roma Tor Vergata (Dip. di Fisica), Torino (Dip. di Fisica), Trieste (Dip. di Astronomia).The funding is provided by Agenzia Spaziale Italiana.
- Contract with Consiglio Nazionale delle Ricercheon the subject Discovery and observation of asteroids orbiting in the Earth's vicinity, in the framework of ITANET project. Partners: Università di Padova (Dip. Astronomia), Osservatorio Astronomico di Brera (MI), Università di Pisa (Dip. Matematica), Istituto di Astrofisica Spaziale CNR (Reparto di Planetologia), Osservatorio Astronomico di Torino.
  Funding: CNR.
- Contract with Agenzia Spaziale Italiana with the Purpose: Co-ordinated research on asteroids, in the framework of the space project "Esplorazione del Sistema Solare", with a special interst in ESA-ROSETTA mission. Partners: Università di Pisa (Dip. Matematica), Osservatorio Astronomico di Brera (MI), Osservatorio Astronomico di Torino. Funding: Agenzia Spaziale Italiana

.

EMSPS European Mobility Scheme for Physics Students

Our Department is involved in the EMSPS, the European Mobility Scheme for Physics Students. An explanatory note to the history and aims of the convention is given below.

- Youth exchange and mobility of students in particular are now generally recognized as a promising means to further international understanding. For Europe, with its recent epoch-making political developments, it will represent an important element in the promotion of cooperation and integration. It also takes into consideration the aspiration of the young generation open to the world.
- Several supranational organizations, notably the Council of Europe and UNESCO, have established conventions with a view to encourage the mobility of students in Europe. The European Community (EC) has adopted its pioneering programme ERASMUS, which recently has been extended to the European Free Trade Association (EFTA) countries. EC has also set up its programme TEMPUS with the aim to further student mobility with regard to Central/Eastern Europe (C/EE).
- A certain number of physics students in Europe benefit right now from these programmes, mainly in the framework of Inter-university Cooperation Programmes (ICP) of ERASMUS. Exchange is however limited to students from those institutions which are involved in ICP's in physics. The overall fraction of students who have access to such programmes is therefore rather small.
- For this reason, and in view of the political developments mentioned above, it SEEMED timely to envisage a mobility scheme that will, in principle, be open to physics students from all institutions from all of Europe. The European Physical Society (EPS) has decided to propose to European institutions giving an academic degree in physics (universities and equivalent institutions) to set up together such a scheme. EPS has long-standing experience in promoting cooperation among European physicists, including those from C/EE countries.
- After the preliminary proposal of April 1991, EPS has consulted the relevant institutions in October 1991 in more detail, sending them a draft convention and a questionnaire. More than 150 positive replies have been returned, confirming thus the substantial interest among institutions from all of Europe for such a scheme. The Mobility Working Group has then adapted the Convention, taking into account the comments received. This new version of the Convention, dated 28 March 1992, has been approved by the Council of EPS who at the same time has taken the formal decision to launch the scheme.
- The aim of the mobility scheme is the following:
  a) to allow physics students of all of Europe to spend, if they desire, and under certain conditions, a "mobility period" of study in another institution, called the "host institution", and
  b) to ensure that such a period will be recognized when the student comes back to his "home institution", subject of course to the student's satisfactory performance. Other key elements of the scheme are its openness to all institutions who desire to participate, and from all of Europe. It is intended as a permanent scheme, governed by a Convention to which the institutions are committed. The scheme is based on mutual trust regarding all academic aspects. It requires no adaptation or harmonization of the curricula, nor of the courses given or of their content.
- One essential element of the scheme is that the full academic responsibility for the student remains with the home institution. It is therefore only from this home institution that the student will get his final degree. In view of this responsibility, it is up to the home institution to select the students which may benefit from the scheme and to establish the relevant conditions. The role of the host institution, on the other hand, is to offer its courses (i.e. the courses it gives anyhow for its own students) and to assess the performance of the student according to the established programme. Participating institutions must also be prepared to take a number of practical measures in order to facilitate the exchange of students, notably regarding counselling, language preparation, housing, and mobility grants.
- Each institution may determine the number of students it is willing to accept in a given year, and it may impose particular requirements. As a corollary, each institution shall not send out more of its own students than it is willing to accept. However a precise balanced flow is not strived for, and not probable to take place anyhow.
- The practical functioning of the scheme relies heavily on the devotion of the "coordinators", in both the home and the host institutions. They advise the students on all academic and practical aspects and help to solve the arising problems. Coordinators also play an important role on the level of the overall scheme: a Mobility Committee

has been formed, having coordinators as its members, which decides on the practical organization, in particular the flow of information and the deadlines.

- In view of the choice of the host institution, and the preparation of the study programme, students and coordinators must have access to the relevant information (on academic and practical matters) regarding all participating institutions. This documentation is available through a remote-access computerized database, located at the Physics Department of the University of Manchester.
- "Mobility grants" for students (meant to cover additional expenses) are essential for promoting mobility. Applications for such grants to ERASMUS and TEMPUS have been filed. Hopefully, institutions will ask for and obtain complementary means on a national or local basis.
- The scheme has been realized as follows:

a) In April 1992 the Convention was sent to all institutions having expressed their interest in the scheme, asking them to return a "request of adherence letter".

b) In June 1992 the Mobility Committee was formed by enlarging the former Working Group so as to achieve a balanced representation of the various countries participating in the scheme. The Mobility Committee has advised EPS on the acceptance of the institutions for participation in the scheme, elaborated the guidelines for the flow of information, and called on the help of Coordinating Institutions for the applications to ERASMUS and TEMPUS.

c) In October 1992 the institutions having applied have been informed on the acceptance in the scheme and were asked to provide the relevant academic and practical information regarding their institution. For the academic year 1993/94 122 institutions from 25 countries all over Europe are involved in the scheme.

d) In October 1992 an application has been filed with ERASMUS for funding of the scheme as an Inter-University Cooperation Project (ICP) and it was accepted; altogether 94 institutions from 16 EC and EFTA countries are involved. A similar request has been submitted in January 1993 to TEMPUS for a Joint European Project (JEP); here, besides the EC countries, only Hungary and Latvia could participate in 1993/94.

e) Work on the preparation of the database has continued so that it has been ready for input from participating

f) Institutions and fully operational since January 1993.

g) In spring 1993 interested students were able to consult the database, choose their host institution, and establish the study programme to which the Coordinator was to give his approval. The student's file has then been transmitted to the host institution which has the obligation to rapidly inform the student on acceptance or refusal. Around 100 students take part in this exchange programme during the academic year 1993/94.

h) In autumn 1993 accepted students began studies abroad and the scheme became operational.

- Further information on the scheme may be obtained from Dr. Catia Petta.

Since the year 1997 the Program Erasmus has been changed in the Program Socrates.

AREA A : APPLIED PHYSICS

Defects and diffusion in Si and Si heterostructures

S. Alessandrino, G Franzò, F. Giannazzo, M.G. Grimaldi, F. Iacona, A. Irrera, F. Mammoliti, S. Mirabella,D. Pacifici, F. Priolo, S. Privitera, M. Re, S. Scalese, M. Spadafora, E. Rimini, A. Terrasi.

The injection and diffusion of point defects in silicon has been investigated under several conditions. Si layers with buried B-doped regions were prepared by ion implantation and molecular beam epitaxy. The anomalous transient enhanced diffusion of B was then used as a marker for the injection and diffusion of Si interstitials atoms introduced at the sample surface by ion implantation or thermal oxidation. Samples with a layer of Si:C (the percentage of C being below 1%) were also prepared by MBE to study the role of C as a trap for interstitial atoms. In particular we found that two substitutional carbon atoms can trap one interstitial Si by the following mechanism: the first substitutional C exchanges its position with the interstitial Si, then it migrates as interstitial C until forming an immobile dimer with the second substitutional C atom.

Silicides

S. Alessandrino, G Franzò, F. Giannazzo, M.G. Grimaldi, F. Iacona, A. Irrera, F. Mammoliti, S. Mirabella,, D. Pacifici, F. Priolo, S. Privitera, M. Re, S. Scalese, M. Spadafora, E. Rimini, A. Terrasi.

The electrical and structural properties of nanometric grains of titanium silicides have been studied as a function of the Ti concentration, size and average distance of the grains. The electrical characterization has been performed by sheet resistance and Hall mobility measurements between T=4 K and T=500 K. Samples with a Ti concentration of 20% in volume show electrical transport by percolation between the metallic grains at low temperature, while hopping conduction was observed at high temperature. Samples with a volume fraction of Ti of about 14% exhibit a conductivity peak at 100 K, a dramatic decrease at lower temperatures and, again, a decrease proportional to 1/T at higher temperatures.

Physical methodologies applied to the study, preservation and restoration of cultural heritage

S.O. Troja, G. Burrafato, A. Cosentino, A.M. Gueli, A. Manera, G. Placenti, A. Zuccarello

The research activity concerns in the dating of pottery sherds or terracotta and in the crono-sedimentary reconstruction of archaeological and geological stratigraphies through the absolute dating of totally bleached sediments using thermally (TL) and/or optically stimulated luminescence (OSL) methodologies. Many pottery sherds of archaeological origin, taken from numerous Sicilian and foreign sites, and sediments have been dated. It is the first group in Italy to have performed coarse-grain TL and OSL dating of pottery and geological sediments from very different periods. In co-operation with Italian and foreign researches, the group participate in many programmes regarding methodologies of thermally and optically stimulated luminescence for archaeometric and dosimetric applications.Considering that not all methodologies are applicable to all types of materials and to specimen of all ages, EPR (Electron Paramagnetic Resonance) characterization and dating is developing at the present time. In the last year the characterization of minerals and pigments by Raman Spectroscopy to study frescoes and paintings was applied and developed. Imaging methodologies based on IR, UV and VIS reflectometry are also setted. These techniques are very important for the non-invasive diagnostic pre-restoration of works of art.
The group takes part also to researches in the domain of dosimetric characterization of detectors used for relative dosimetry of conventional and hadronic beams in radiotherapy. In this field the activity regards the 2D and 3D dose distribution determination in proton beam radiotherapy with GafChromic? film detectors.

Radon as tracer of geodynamical features of Mount Etna

G. Immè, D. Morelli, G. Patané (Dip di Scienze Geol.), E. Fontana, S. Lo Nigro.

In the framework of the Cluster-11 MIUR project, in the year 2001 we studied the possibility to relate radon investigation to understanding of geodynamical features of the volcanic edifice of Etna and in particular we investigated on the envisaged correlation to seismic and volcanic events. Two stations along the direction NE-SW on Mt. Etna were located, in Vena and Biancavilla villages respectively. Simultaneous continuous measurements of soil gas Radon concentration and seismic activity monitoring started in July 2001. Radon investigation allow the characterization of the two flanks, evidencing their different behaviour, that could be linked to a different faulting mechanism, even if the two fault systems lie on an unique direction. The fault system near Biancavilla (SW flank) seems to have a tectonical behaviour, while that one near Vena (NE flank) seems to have both a tectonical and a volcanic behaviour. Preliminary results on the mechanisms of faulting and then what superficial structures located near the seismic stations could be possible preferential radon collectors, allow us to draw some considerations about a possible link between strange radon behaviour and eruptive events.

Physical processes in tephra fall-out from Etna eruption

G. Immè, S. Scollo, M. Coltelli*, P. Del Carlo* (*Istituto Naz. di Geofisica e Vulcanologia, Sez.di Catania)

In 2001, in collaboration with INGV- Catania Section, we started a study on the problem of the fall-out of tefra from volcanic eruptions. The interest for this study is both of environmental aspect, because the deposit of piroclastic fragments can be dangerous for transport, agriculture and for humans, on the other hand the study of piroclastic deposits allows to enlight the understanding on dynamics and thermodynamics in the magma coming-up process, in the eruptive column formation phenomenon and in the processes of dispersion and deposit of lapilli. Grainsize analyses of tephra, acquired in the 2001 eruption in the large interested etnean area, have been performed to investigate on fragmentation, transport and deposition of volcanic particles. Grainsize distribution on ground and the variations with the distance from the vent reflect the dynamics of the eruptive column and its evolution. Moreover, the granulometric data, compared with those from the 1998 eruption and with a simulation model of tephra transport and deposition, can allow a best characterization of the eruption.

A new portable XRF spectrometer with a bean stability control

G. Pappalardo, G. Calvi, E. Furia, S. Garraffo, C. Marchetta, L. Pappalardo, F. Rizzo, F.P. Romano, A. Rovelli

A new portable XRF spectrometer, based on a X-ray tube with a new stabilisation control system, has been designedand realised at the LNS/INFN LANDIS laboratory of Catania (Italy) in collaboration with the C.N.R.-Agenzia 2000 Project (Italy). It consists of the portable X-ray tube coupled to an ancillary Si-PIN detector for controlling the stability of the beam (both in energy and in intensity) and of a second Si(Li) detector for acquiring the characteristic X-ray spectra emitted by the sample being analysed. During the measurement the X-ray beam crosses a thin target composed of two few microns thick-layers of Ag and Ba. Monitoring the fluorescence emitted by their characteristic K-lines with the Si-PIN detector it is possible to evidence, through a suitable algorithm, any variations on the energy and on the intensity of the beam. The control of the stability is made by using a specific software purposely developed. Quantitative results have been obtained by using the system in trace elements analysis of samples of archaeological interest.

CATANA project

S. Lo Nigro, G.A.P. Cirrone, G. Cuttone, L. Raffaele, D. Rifuggiato, A. Rovelli, M.G. Sabini, V. Salamone, L. Valastro, P. Lojacono, I.V. Patti

In the framework of the CATANA project we have studied and developed dosimetric techniques on proton beams. Particularly we have studied absolute dosimetry with ionization chambers, either cylindrical and parallel plate. These chambers have been successfully intercompared at PSI and CCO representing the first detectors available in

Italy to access absolute dose delivered with proton beams. Moreover detectors for relative dosimetry have been characterized too. In particular silicon diode, radiographic and radiochromic films, thermoluminescent dosemeters (TLD) have been kindly studied to be employed in lateral and longitudinal dose distribution reconstructions. Effects of radiation and thermal damage on TLD have been deeply studied in order to get informations about the LET dependence in TL response. Montecarlo simulations have been carried out to study the effects of the nuclear interaction of proton beams with tissue-equivalent material. The CATANA treatment beam line has been studied and designed in order to get a proton beam suitable for medical applications in radiotherapy.
This means that the 62 MeV proton beam has to show an homogeneous lateral and depth dose distribution. In order to obtain such condition we developed a program of study based on Monte Carlo simulation. Simulation helped us to develop the passive scattering system, needed to obtain an optimal lateral dose distribution, and the modulation system for the realization of the clinical depth dose distribution (Spread Out Bragg Peak).
During the 2001 we developed the system for the control of the patient and monitoring of the dose during the irradiation. The system is based on CAN Link system from National Instrument interfaced by a LabView application running on Microsoft NT 4.0 SP 6.
Finally we completed the absolute and relative dosimetric characterization using, principally, the Markus ionisation chamber, GAF Chromic Film and silicon diode detectors and we are ready to start with the first treatment, that is scheduled at the beginning of 2002.
we developed a program of study based on Monte Carlo simulation. Simulation helped us to develop the passive scattering system, needed to obtain an optimal lateral dose distribution, and the modulation system for the realization of the clinical depth dose distribution (Spread Out Bragg Peak). During the 2001 we developed the system for the control of the patient and monitoring of the dose during the irradiation. The system is based on CAN Link system from National Instrument interfaced by a LabView application running on Microsoft NT 4.0 SP 6. Finally we completed the absolute and relative dosimetric characterization using, principally, the Markus ionisation chamber, GAF Chromic Film and silicon diode detectors and we are ready to start with the first treatment, that is scheduled at the beginning of 2002.

Cryoelectrophoresis experiment

R. Potenza, C. Tuve', S. Albergo, A. Aloisi, S. Basso, M. Chiorboli, S.Costa, A. Tricomi, M. G. Vittorio

Cryoelectrophoresis is a technique to painlessly administer medicines through the skin with electro-thermal methods. A water solution of the medicine is frozen and acts as the active electrode of a power supply which generates an electrical current with non-zero average value, made of direct and alternate components. The tissues to be treated are placed between this electrode and a return one made of inert material. The low temperature limits (by vasoconstriction) blood circulation in the area, thus allowing the medicine to penetrate without being immediately sucked in the bloodstream. The direct component causes transport of the medicine to great depths by electrophoresis and/or electroosmosis. The alternate component increases the epidermis permeability favoring widening of the pores, thus allowing even greater penetration and diffusion of the medicine towards the interior.
This technique has been used, with excellent clinical results, in rheumatology, urology, aesthetics, phlebology, anesthesiology and treatment of bacteria infections.
In year 2002 scintigraphic images *in vivo* were obtained of penetration of medicines doped with radioactive tracer ^{99}Tc, and attention was devoted to two questions:

- Comparison of transfer *in vivo* of medicines by crioelectrophoresis, to transfer by traditional ionophoresis. Applications occurred on rats, in a thigh, using a) technetic acid enriched in ^{99}Tc, a low molecular weight substance; b) chondroithynsulfate, a high molecular weight organic polymer, doped with ^{99}Tc. Measurements were done with the YAP-chamber. Scintigraphs have shown that i) transfer by cryoelectrophoresis of both low and high molecular weight substances occurs from the inlet point (near the active electrode) to the point were the return electrode is placed: the medicine crosses the whole thigh of the rat; ii) transfer by traditional ionophoresis (at room temperature) always causes serious burns of the epidermis of the animal, if the current values allowed in cryoelectrophoresis (6 - 10 mA) are used. Since the amount of medicine that can be transferred is proportional to the average charge carried by the circuit during the application, cryoelectrophoresis proves to be a way more efficient method to transfer therapeutically effective doses of the employed medicines through the skin.
- Design of a SPECT-chamber for more detailed and higher-efficiency scintigraphic measurements, especially of the intermediate zone between the two electrodes of the cryoelectrophoretic apparatus. This study is just beginning.

Nuclear particle detection as a probe for diamond defect characterization

V. Bellini, R. Potenza, C. Randieri, C. Sutera, C. Tuvè, M. Marinelli, E. Milani, A. Paoletti, G. Pulcella, A. Tucciarone, G. Verona-Rinati

Diamond was shown to be a suitable material for application in high energy particle detection due to its striking electronic properties, such as high carrier mobility, wide band- gap, good radiation hardness and very high breakdown voltage. Recently high quality diamond films could be deposited by microwave plasma enhanced chemical vapor deposition (CVD). We have extensively studied the transport properties of synthetic diamonds grown in Roma Tor Vergata Laboratory.The measurements using ^{12}C energetic beam allow scanning the detection properties of the whole sample thickness. To this purpose ^{12}C ions produced by the 15 MV TANDEM accelerator of the Laboratorio Nazionale del Sud (LNS) of INFN in Catania (Italy) are used as a probe. The ion beam energy is varied in the 22-91 MeV range (penetration depth from 10.5 ?m to the thickness of the used samples). Particle detection is here used since it appears a well promising technique to allow fine adjustments of deposition parameters to the aim of reproducible specimens.

AREA B : EXPERIMENTAL NUCLEAR AND PARTICLE PHYSICS

NEMO Experiment

S. Aiello, L.Caponetto, R.Coniglione, L.Lo Nigro, D.LoPresti, E. Migneco, L.Pappalardo, C.Petta, P.Piattelli, N.Randazzo, S.Reito, G.Riccobene,G.V.Russo, P.Sapienza

The NEMO Collaboration (Bari, Cagliari, Catania, Genova, Messina, Roma La Sapienza, INFN LNS) proposes to construct a large area water Cherenkov detector in the deep Mediterranean Sea, near Sicilian shores, optimised for the detection of muons from high-energy astrophysical neutrinos. The observation of high energy neutrinos will open a new window on the universe. The primary aim of the experiment is to use neutrinos as a tool to study particle acceleration mechanisms in energetic astrophysical objects such as active galactic nuclei and gamma-ray bursts, which may also shed light on the origin of ultra-high-energy cosmic rays. At somewhat lower energies, non-baryonic dark matter (WIMPs) may be detected through the neutrinos produced when gravitationally captured WIMPs annihilate in the cores of the Earth and the Sun. The characteristics of the proposed site are an important consideration in detector for the construction and deployment of the detector. The role of Catania in the collaboration concerns many primary tems: 1) low power, low size front-end detector, 2) R&D of the Optical modules and 3) design, realisation and use of a Deep Water Light Scatter meter. As regard the first item a set of high speed AMS .35 mm chips are designed and are actually under. These chips are dedicated to the trigger and sampling of the signals coming from the optical sensors. For the R&D of the Optical modules two equipments has been designed ed realised: a) an Hyperbaric Camera to test devices at 350 Atm. And b) a big Dark Room to characterise the basic properties of optica detectors (ECLAP). Besides and complicated instrument (DEWAS) has been designed and realised to measure, in the deep ocean the scattering effect of the water to the light. This equipment had been already used in several measurement campaign.

Neutrino's detection using an undersea detector: ANTARES Experiment

S. Aiello, L.Caponetto, L.Lo Nigro, D.Lo Presti, L.Pappalardo, C.Petta, N.Randazzo, S.Reito, G.V.Russo

The ANTARES Collaboration proposes to construct a dimostrator for a large area water Cherenkov detector in the deep Mediterranean Sea, near Toulone, optimised for the detection of muons from high-energy astrophysical neutrinos. It surface is foreseen to be 0.1 km2. The construction of this dimostrator is very importan in view of the realisation of a large volume (1 km^3) neutrino underwater detector. The role of Catania in the collaboration is the construction, and the qualification test of 300 Local Control Modules. The latter are the containers with the most part of submarine electronics for the whole detector. The Test Bench is pratically ready

Observatory "Pierre Auger" (Malargue, Argentina): the Engineering Array.

C. Aramo, E. Cangiano, R. Fonte, A. Grimaldi, A. Insolia, N. Guardone, D. Nicotra, G. Raia e S.Urso
(For the AUGER Collaboration)

Construction of the first stage of the Pierre Auger Observatory has begun. The first phase of the project has been the building and operation of a prototype system, known as the engineering array. This has now been completed in Malargue (Province of Mendoza, Argentina). It has allowed all the sub-systems that will be used in the full Observatory to be tested under field conditions. The Catania group is actively involved in the Costruction of the Fluorescence Detector, specifically contributing to the mechanical supports for all the 24 cameras hosting 440 PMT's each, the low and high voltage supply, the relative calibration set-up including the relevant measurements.

Observatory "Pierre Auger" (Malargue, Argentina): Extensive Air Showers (EAS) simulations in the low energy region

C. Aramo, E. Cangiano, R. Fonte, A. Insolia, G. Raia
(For the AUGER Collaboration)

Within the present project (in collaboration with the groups in Torino and Alessandria), the Catania group will take care of the "Development of simulation codes for EAS in the atmosphere". In particular, we will perform a systematic analysis of EAS in the energy range 10^{16} - 10^{18} eV, mainly using the Monte Carlo CORSIKA. We will put special care in the quantities (like the longitudinal development and the shower maximum X_{max}) that can be measured by the Fluorescence Detector (FD) of the project P. AUGER, especially for the FD lowest energy yevent (those between the FD energy threshold and 10^{18} eV). We will mention here simply that the discrimination of the nature of the primary (proton, heavy nucleus) is done either by the ratio of the electron to muon density for the ground array at the detection level or by the different longitudinal development by comparing with the proper EAS simulations. The longitudinal development and the shower maximum X_{max} will be measured by the Fluorescence Detector (FD) of the project P. AUGER. We plan comparison with the data from the Kascade - Grande experiment in Karlsruhe (Germany) where EAS shower up to 10^{18} eV should be detected. Actually the two sets of data (from the AUGER FD and form Kascade - Grande array) should join around $3\text{-}5*10^{17}$ eV. They will provide a cross energy calibration for both detectors.

Observatory "Pierre Auger" (Malargue, Argentina): Analysis of the relative calibration events.

C. Aramo, E. Cangiano, R. Fonte, A. Insolia, G. Raia
(For the AUGER Collaboration)

The goal of the relative calibration is to provide a method to monitor periodically the time dependence (if any) of the individual PMTs of each optical telescope. The fluorescence light produced during the development of an EAS is characterized by a wave length in the range 310 nm - 410 nm, with a temporal life of the order of a few milliseconds. It is therefore of great importance that the source used for the monitoring covers the whole considered range of wave lengths. The light pulse needs to last for a few milliseconds. We have chosen a xenon lamp with 1 microsec light pulses. With the use of proper filters one can select a given range of wave length and intensity. The idea is to use a single light source (the xenon lamp) for any optical site (made of 6 or 12 telescopes) and to distribute the light, via optical fibers by means of an optical splitter, to given light diffusers

located at the center of the mirror (one diffuser), along the vertical edges of the camera body (two diffusers) and at the level of the entrance window (two diffusers facing a tyvek reflecting screen). The length of the optical fibers should the same in order to ensure the uniform intensity at the given light point sources and, generally speaking, to optimize its distribution. Laboratory tests have been preformed in Catania and Rome, together with detailed simulation aiming to the zero order ray tracing between the different light sources and the camera's PMTs. It has been already assembled and fully tested the relative calibration set up for the first two telescopes, build on the AUGER Observatory site in Malargue (Province of Mendoza, Argentina). The calibration data for the two prototypes are now currently being analyzed.

The ALICE Experiment at the CERN LHC

A. Badalà, R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, A. Pulvirenti , F. Riggi

The activity of the local group of researchers involved in the ALICE Experiment at the CERN LHC in the year has followed three main streams:
- characterization of detectors: the full chain (probe station, mechanical remote control, custom electronics, data acquisition system) to test the silicon detectors and chips of the pixel layers of the ALICE Inner Tracking System (ITS) has been installed and tuned inside the dedicated clean room at the Department of Physics and Astronomy.
- simulation of the detector: extensive Montecarlo simulations of the ALICE ITS have been perfomed using AliRoot, the official simulation and analysis framework based on Root. In particular, procedures for 2D and 3D vertex finding and for track recognition and reconstruction, based both on the Kalman filter algorithm and modified Hopfield auto-associative memory, have been implemented and tested.
- disributed computing: first tests of geographically distributed computing have been carried out using the grid middleware of the Globus Toolkit (http://www.globus.org). In 2001, Catania has coordinated two rounds of Montecarlo event productions using a web user interface locally developed in conjunction with an italian web technology company.

The NA57 Experiment at the CERN SPS

A. Badalà, R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, A. Pulvirenti,F. Riggi

In the year 2001 the activities of the local group of researchers involved in the NA57 Experiment at the CERN SPS have concerned the reconstruction and analysis, with the local dedicated farm of PC's, of the Pb-Pb data at 160 A GeV/c and the participation to the data taking at 40 A GeV/c with a more relaxed centrality trigger.Results confirm the increase of hyperon production yields as a function of both event multiplicity and strangeness content and are compatible with the existence of the phase of "deconfined" quark-gluon plasma.

The INFN Grid and EU DataGrid Projects

G. Andronico, R. Barbera, P. Belluomo, A. Calvagna, E. Cangiano, S. Cavalieri,S. Costa, S. Monforte, A.Palmeri, C. Rocca, G. Sava, O. Tomarchio, A. Tricomi

In the year 2001 the INFN Grid Project (http://www.infn.it/grid) has entered its second year of activity. Catania is an official site of the INFN Grid testbed for what concerns both the ALICE and CMS Experiments. During this year the farms dedicated to ALICE, CMS and to the tests of the grid middleware have been installed and put into operation. This has allowed the completion of the evalution of the Globus Toolkit (http://www.globus.org). The year 2001 has also been the first year of the European Union funded DataGrid Project (http://www.eu-datagrid.org). Catania is also a site of the DataGrid testbed and local researchers are involved in the realization of a grid resource broker, in the implementation of the grid data management system architecture and in the grid network and resource monitoring. ALICE and CMS of researchers in Catania have also actively participated in the testing phase of the first version of the grid iddleware released by the Project in november.

CMS experiment

S.Albergo, V.Bellini, S.Costa, M.Chiorboli, R.Potenza, G.Russo, M.L.Sperduto, C.Sutera, A Tricomi, C.Tuvè

CMS is a general purpose proton-proton detector designed to run at the highest luminosity at the CERN Large Hadron Collider . Higgs and particle searches are the two main goals of the CMS Physics program. The contribution of the Catania group to the experiment can be schematically summarized in the following activities: detector construction; software development; computing; physics studies. Catania is a production center of silicon microstrip modules for the CMS Tracker. Its construction responsibilities are related to module assembly, bonding and testing. The CMS Catania group is also strongly involved in the development of b tagging algorithms based on impact parameter methods, to be implemented into the general reconstruction software. Catania is one of the Regional Centers which contribute to the official CMS Monte Carlo production. A computing farm is devoted to this task, whereas another farm is dedicated to the development of tools for a grid network for LHC experiments. During the year 2001 in Catania a method has been also studied to reconstruct squark and gluino mass peaks. It was shown that CMS will be able to reconstruct strongly interacting particles, in the low tanβ regime, even at the beginning of the data taking period.

The HADES Time Of Flight wall

C.Agodi, A.Bassi, R.Bassini, G.Bellia, M.Benovic, C.Boiano, S.Brambilla, R.Coniglione, L.Cosentino, P.Finocchiaro, S.Hlavac, I.Iori, W.Koenig, A.Kugler, C.Maiolino, T.Marek, P.Piattelli, R.Pleskaã, P.Sapienza, S.Spataro, M.Suk, A.Taranenko, P.Tlusty, I.Turzo, D.Vassiliev, V.Wagner, D.Zovinec

In the framework of the HADES (High Acceptance DiElectron Spectrometer) collaboration a Time of Flight wall subdetector has been developed. In order to efficiently select rare events with dilepton pairs produced in the nuclear matter, in a high hadron multiplicity environment, such a wall must be able to resolve electrons from pions up to 0.5 GeV/c and from protons up to 2 GeV/c. The short flight path of about 2 m requires a time resolution better than 150 ps, while impact position and multiplicity measurements need adequate granularity. These requirements have been fulfilled by employing scintillator rods (BC408 from BICRON) read-out at both ends by photomultipliers, that provide two signals, each one further split into two. By combining these informations one can extract time of flight (tof), hit position (x), deposited energy (E) and redundant hit position (). The really important parameter for TOF is however the time-of-flight resolution, being the position resolution proportional to it by means of the group velocity V_g . Therefore time-of-flight resolution is relevant for the overall performance of the TOF system, as it affects the capability of discriminating electrons from hadrons based on their velocity, as well as the precision fast tracking for triggering purposes. The inclusive *tof* spectrum for all particles, integrated over the whole rod set after renormalization of the trajectories to equal flight path can be nicely fit by a gaussian; whose width - the overall *tof* resolution - takes into account for the relevant contribution of the the electronic noise to the start detector during the beam run when these data were produced. The effective resolution was estimated by means of the aid of the MDC tracking subdetector and the correct data show a gaussian shape with σ_{tof} *? 150 ps*. During the same run a number of dileptons, i.e. e+e- pairs mainly coming from π^0 decays and/or gamma conversion in the target, were detected. The *tof* difference between the two leptons, practically moving at the speed of light, (after renormalization to equal flight path length) should in principle be zero. The resulting plot is a gaussian distribution whose sigma value, divided by √2, is another independent measurement of σ_{tof} *? 150 ps* . The last two σ_{tof} values, which are consistent with each other, express the overall *tof* resolution of the TOF detector excluding the contribution of the start detector with its related electronics. The HADES spectrometer for di-lepton physics is now nearly ready, with its TOF wall detector complete and already fully operational. It has shown capable of fulfilling the tasks it was meant for, achieving the design performance in terms of time-of-flight and position resolution: s_{tof} *? 150 ps*, s_x *? 25 mm.* In addition, TOF has shown to be quite stable and easily managed even throughout a long beam run. A preliminary physics run in November 2001 has proved that TOF can efficiently operate in selecting and tracking the searched rare events with e+e- pairs produced in the nuclear matter, thus preluding the beginning of systematic physics investigations with HADES in 2002.

Nuclear phase transition at intermediate energies: temperature and density determination

G.Immé, G.Raciti, M.De Napoli, E.Rapisarda, S.Rascunà, L.Spezzi, C.Sfienti, N.Giudice

In the framework of the liquid-gas phase transition, excitation energy, temperature and density of quasi target nuclei formed in deep inelastic reactions in the 20-40 A MeV incident energy were measured for a variety of systems. The experiments were performed in 2001 at the LNS-CT exploring a wide range of projectile and target masses and energies by means of a high granularity hodoscope (HODO-CT) (96 three-folds telescopes: 50 μm + 300 μm Silicon detectors followed by a 6 cm long CsI(Tl)) coupled to the multidetector FIASCO[*)] (24 position sensitive gas detectors (PPAD), 96 silicon telescopes and 158 phoswich telescopes).
The clearly evidenced binary character of the reaction allows a unambiguous determination of the excitation energy deposited into the system up to around 8-9 MeV/u. The calorimetric analysis for these highly excited systems, confirms the plateau-like behavior of the caloric curve, already interpreted as a strong evidence of a first-order liquid-gas phase transition in nuclear matter. As recently reported, a dependence of the observed shape of the caloric curve from the mass of the fragmenting system seems confirmed, in particular, the limiting temperature analysis shows a monotonously decrease with increasing system mass. The low densities, extracted via particle-particle correlation analysis, reached by the system, increasing the excitation energy, indicate that both partners of the deep inelastic channel reach extreme conditions before their decaying.

The CHIMERA detector and its first experiment: REVERSE

M. Alderighi, A. Anzalone,R. Barna, V. Baran ,I. Berceanu, A. Bonasera, B. Borderie, R. Bougault, M. Bruno, G. Cardella, S. Cavallaro, A. Chbihi, M. Colonna, M. D'agostino, R. Dayras, E. De Filippo, D. De Pasquale, M. Di toro, E. Geraci, F. Giustolisi, A. Grzeszczuk, P. Guazzoni, D. Guinet, M. Iacono Manno, A. Italiano, S. Kowalski, G. Lanzano', G. Lanzalone, N. Le Neindre, S. Li, U. Lombardo, S. Lo Nigro, C. Maiolino, Z. Majka, T. Paduszynski, A. Pagano, M. Papa, C. M. Petrovici, E. Piasecki, S. Pirrone, G. Politi, A. Pop, F. Porto, M. F. Rivet, E. Rosato, S. Sambataro(*), G. Sechi, V. Simion, M.L. Sperduto, J. C. Steckmeyer, C. Sutera, A. Trifiro', M. Trimarchi, G. Vannini, M. Vigilante, J.P. wieleczko, J. Wilczynski, H. Wu, Z. Xiao, L. Zetta, W. Zipper

(*)Deceased on January 27th,2001

The CHIMERA (Charged Heavy Ion Mass and Energy Resolving Array) multielement detector was designed in order to detect and identify light charged particles and fragments emitted in heavy ion collisions, to investigate many topics of the heavy ion physics at intermediate energies. During the 2000 the forward part of CHIMERA, made of 688 telescopes covering the polar angular range 1°-30° was used in the CICLOPE vacuum chamber at the LNS of Catania in the mainframe of the REVERSE experiment, to study some heavy ion collisions in reverse kinematics (^{112,124}Sn + ^{58,64}Ni and ^{27}Al at 25 and 35 MeV/A).During the 2001 the analysis of the data coming from this experiment has been carried on and the first results have been presented and published. They show performances of the detector that are in agreement with the design, confirming the very good detection capability of the apparatus; on the other side we obtained some preliminary results on the effects of isospin degree of freedom on the multifragmentation process. In the framework of a possible improvement of the detector performance, some tests have been carried on to study the pulse shape discrimination technique applied to the silicon and the Caesium Iodide scintillators. The experimental program will be completed and integrated in 2002 with the study of some other systems. All the remaining (504) modules and the related electronics have been mounted in the CYCLOPE Chamber in the second half of 2001. A first run on calibration will be done in January 2002 and all the campaign will be run during the first half of the year.

Photoreactions by using polarized photon beams

V. Bellini, A. Giusa, L. Nicoletti, C. Randieri, G. Russo, M.L. Sperduto, M.C. Sutera

The study of photoreactions on nucleons and nuclei has constituted the main activity of our group. In the past we have worked at the Laboratori Nazionali di Frascati, Brookhaven National Laboratory and the European Synchrotron Radiation Facility (ESRF). At the LNF we took part toexperiments using a polarized gamma ray beam obtained by backward Compton scattering of laser light on the high energy electrons circulating in a storage ring

(Ladon beam on Adone). So we carried out experiments by using an original technique for the production of polarised gamma-ray beams, which is now employed in the USA, Russia, France and Japan. Today our activity is concentrated on two facilities: the LEGS beam (k=3D180-475 MeV) at Brookhaven National Laboratory (BNL USA) and the Graal beam (k=3D500-1593 MeV) at the European Synchrotron Radiation Facility (ESRF France). In the Graal facility we contributed to build a polarized gamma ray beam based on the same basic principle as Ladon. Vincenzo Bellini is responsible for the backward angle detector of the raal equipment and is a member of the collaboration board. In both laboratories the beam is now operational and has a cryogenic target and an associated large acceptance detector. The LEGS detector is built around a crystal box made of 400 NaI crystals. It has a large rectangular opening in the centre for the beam, the target and vertex detectors. Presently it contains a neutron detector made of 32 plastic scintillators and complemented by a thin detector to discriminate against charged particles. Catania group plans to contribute to the experimental data analysis.The Graal detector is built around a BGO crystal ball made of 480 crystals which covers the polar angle between 25^0 and 155^0. Inside the ball two cylindrical wire chambers and a barrel made of 32 plastic scintillators are located. The forward cone is covered by two plane wire chambers, two scintillating odoscopes covering an area of 9 square metres each and a shower wall made of 4 alternating layers of scintillator and lead for the detection of gamma rays and neutrons. Thebackward cone is covered by two scintillating disks separated by one centimetre of lead. The tagging detector, located at one centimetre from the stored electron beam, consists of 10 scintillators and 128 microstrip channels. In each laboratory a Coherent Innova laser and its associated optical system provide light in the visible and UV (351 and 330 nm). The LEGS collaboration has already started to collect data with a polarized beam on a polarized HD frozen spin target. The Graal collaboration has realized a similar polarized target in its Dilution Refrigerator and is now building the In Beam Cryostat.

CICLOFUS Experiment

N. Arena, Seb. Cavallaro, E. Geraci, G. Lanzalone, S. Pirrone, G. Politi, F.Porto, S. Sambataro.

The CICLOFUS experiment has been supported by the INFN from 1997 to 2001. In this experiment we put forth the study of complete and incomplete fusion of heavy ions in light systems ($A_P+A_T<50$) at projectile energies higher than 10 MeV/A. The interest in the fusion reactions and competing processes at energies higher than 10 MeV/A, is due to the controversial question about the fusion cross section in this energetic region. For this reason we proposed the measurements for the asymmetric systems $^{32}S + {}^{12}C$,$^{28}Si + {}^{12}C$ and $^{35}Cl + {}^{12}C$ at energies between 15 and 30 MeV/A. We performed a first measurements in November 1998, for the system $^{32}S + {}^{12}C$ at 20 MeV/A, whose results have been published in 2001. A second system, $^{35}Cl + {}^{12}C$, was studied in 2001 and the analysis is in progress. The experiment was realized at the Laboratori Nazionali del Sud with the Gas detector system, an experimental apparatus that allowed us a complete identification in charge, mass and energy of the reaction evaporation residues.The inclusive velocity spectra of each identified evaporation residue indicates different reaction components. The separation of these is possible with complex deconvolution techniques, that show a complete fusion, an incomplete fusion and a direct reaction contribution. The discrimination of the different reaction components allows us to obtain the cross sections for the processes. The results on the $^{32}S + {}^{12}C$ are in a good agreement with the theoretical systematic. Besides we studied the trend of the critical angular momentum for the fusion versus the excitation energies. Our results show a saturation at high energy, that could be consistent with the hypothesis that the limitation of fusion cross section is due to compound nucleus effects. A further confirmation could come from the last studied system.

MonTe ARRAY: present use and future developments

F.Rizzo, Amorini, A. Bonanno, G. Cardella, A. Di Pietro, G. Fallica, P. Figuera, M. Papa, G. Pappalardo, A. Pinto, W. Tian, S.Tudisco, G. Valvo.

Monolithic silicon detector telescopes where developed in collaboration between University of Catania (Dipartimento di Fisica e Astronomia), INFN (Sezione di Catania and Laboratori Nazionali del Sud) and ST Microelectronics in order to have a compact detector able to charge identify low energy particles using the known DE-E technique. The physical problem to solve was to reduce as much as possible the threshold for the charge identification of particles using a compact detector, avoiding the use of gas detectors. MonTe ARRAY (Monolithic Telescope ARRAY) consists of monolithic strip DE-E detection units. One unit is formed by 2 strips each one having 5 separate DE stages (3x4 mm^2, 1 mm thick) with a common E stage, 400 mm thick. This device is particularly useful in nuclear astrophysics studies where the environment is affected by a very high b^+-b^- background due to the beam decay. Using monolithic telescopes such particles can be discriminated by heavier particles by the fact that they do not release enough energy in the DE stage. Due to the easy discrimination between ? and b it is possible to hypothesize the use the monolithic detector telescope as a radiation monitor, especially when to control the radioactive environments it is necessary to discriminate between different unknown radioactive sources. Works are in progress also to verify the X and g ray sensitivity of the device in order to obtain, when coupled to a CsI(Tl) crystal, a complete radioactive environments detection system.

Clustering in light nuclei

M. Lattuada, S. Romano, O.Yu. Goryunov, T. Lonnroth, M. Milin, D. Miljanic, V.V. Ostashko, N. Soic, A. Tumino

The analysis of data from recent experiments performed at the Laboratori Nazionali del Sud (LNS) allowed to deduce new results on clustering aspects of light nuclei. The excitation of ^{24}Mg states up to 50 MeV, followed by decay into the ^{16}O-^{8}Be channel, were interpreted as revealing the pre-formation of such clusters, as predicted by different versions of the Cluster Model. The ^{10}Be cluster configurations were also studied by different exclusive and inclusive experiments performed at both LNS and R. Boskovic Institute. A comparative evaluation of the data allowed to draw original results on the α–^{6}He and α–^{6}He* clustering in ^{10}Be.
A further experiment on the ^{18}O + ^{9}Be reaction was performed at the LNS, in order to investigate exotic cluster configurations in light neutron-rich nuclei like ^{14}C and ^{12}Be, where structures made of α particles bound by valence neutrons are predicted. Data analysis is in progress.

Nuclear reactions in the astrophysical context and the electron screening effects

M. Lattuada, S. Romano, M. Aliotta, S. Cherubini, A. Di Pietro, P.P. Figuera, D. Miljanic, A. Musumarra, M.G. Pellegriti, R.G. Pizzone, C. Rolfs, C. Spitaleri, A. Tumino, S. Typel, H.H. Wolter

The studies in the field of nuclear astrophysics have concerned indirect experiments, aimed at the extraction of information on the cross section and the astrophysical factor of astrophysically relevant nuclear processes.
Radioactive beam experiments performed at CRC - Louvain La Neuve allowed to extract the parameters of the ^{19}Ne states excited in the radiative α capture from ^{15}O, one of the potential break out reactions from the hot CNO cycle. In experiments performed at the tandem accelerator of Laboratori Nazionali del Sud (LNS), the Trojan Horse (TH) indirect method was used to deduce the astrophysical factors of some reactions that play a major role in the Lithium burning process. Information on the electron screening effects was also obtained from the same experiments. Moreover the same TH method was also tested at the Dynamitron accelerator of Bochum University for a future application to the radiative α capture process from ^{12}C, whose relevance is related to the understanding of the relative ^{12}C and ^{16}O abundances in the Universe. The first results are encouraging and allow to regard the method as an additional tool to deduce information on a process that represents a big challenge for experimentalists working in the field of nuclear astrophysics. Lastly, the set up and test of the instrumentation needed to measure the ^{4}He(^{8}Li,n)^{11}B cross section with a secondary ^{8}Li beam produced by a primary ^{7}Li beam impinging on a ^{2}H target at LNS are in progress.

The MAGNEX large-acceptance magnetic spectrometer

A.Cunsolo, F.Cappuzzello, A.Foti, A.Lazzaro, A.L.Melita, C.Nociforo, J.S.Winfield

We describe a large-acceptance (53 msr) high-resolution magnetic spectrometer "MAGNEX", which has been designed primarily for the radioactive beam facility EXCYT at INFN-LNS Catania. The configuration is a vertically-focusing quadrupole followed by a 55° bend angle dipole. These elements, together with their high power power supplies, has been designed, ordered and are presently under construction (foreseen arrival at the LNS June 2002). The rotating platform supporting the spectrometer has been studied and ordered (foreseen arrival at the LNS July 2002). The new prototype of the focal plane detector has been successfully tested with α source and heavy ion beams. Based on the results of the test the final focal plane detector has been designed (foreseen arrival at the LNS end of 2002). Part of this detector, which includes a silicon hodoscope is presently under construction (electronics already at the LNS, detectors arrival at the LNS July 2002). The project of the vacuum system has been completed.

Excited States of ^{11}Be

F. Cappuzzello, A. Cunsolo, A. Foti, C. Nociforo, S.Boninelli, S.Orrigo

The (^{7}Li,^{7}Be) charge exchange reaction has been performed at low bombarding energy as a probe for spectroscopy of light exotic nuclei. The selectivity and the high energy resolution achieved with the (^{7}Li,^{7}Be) reaction at Tandem energies, provides useful information about the structure of light neutron-rich nuclei. The experimental technique is based on the interplay of a Tandem Van de Graaf ^{7}Li beam and a magnetic spectrometer. Interesting results have been found for the ^{11}B(^{7}Li,^{7}Be)^{11}Be, ^{15}N(^{7}Li,^{7}Be)^{15}C and ^{14}C(^{7}Li,^{7}Be)^{14}B reactions at 57 MeV. In the former case we have observed both ^{11}Be single particle states and structures related to the core polarization and Spin Dipole Resonance. The preliminary results on the ^{15}C indicates a similar behaviour for this nucleus, for which a narrow state far from the neutron emission threshold and a broad bump in the region where the SDR mode could be expected are observed. For ^{14}B all the presently known states have been observed.

AREA C : THEORETICAL PHYSICS

Low-dimensional superconductors close to an electronic topological transitions

G. G. N. Angilella, G. Balestrino, P. Cermelli, E. Piegari, R. Pucci, P. Podio-Guidugli, A. A. Varlamov

We have studied the superconducting properties of a two-dimensional superconductor close to an electronic topological transition (ETT). In contrast to the 3D case, we find that the superconducting gap at T=0, the critical temperature Tc, and the impurity scattering rate are characterized by a nonmonotonic behavior, with maxima occurring close to the ETT. In particular, our results are in good qualitative agreement with the phenomenological trend recently observed for the maximum Tc as a function of the hooping ratio t'/t across several cuprate superconductors. Our results also provide a microscopic description of the nonmonotonic dependence of Tc on strain, as experimentally observed in epitaxially grown thin films of LSCO.

The hadron-quark phase transition in neutron stars

M. Baldo and G.F. Burgio

The nuclear matter equation of state is the fundamental input for buildingmodels of neutron stars according to the Einstein's general theory ofrelativity. For this purpose we have developed a microscopic equation of state for hadronic matter using the Brueckner-Bethe-Goldstone many-body theory, including modern nucleonic two and three-body forces. However, deconfined quark matter can be present in the stellar core, because of its large densities. We have studied the structure of those stars in the framework of the MIT bag model and found that the maximum mass falls in a range between 1.5-1.6 solar masses, no matter the equation of state used for describing the hadronic phase. Therefore, the existence of a star with larger mass could indicate that quark-quark interaction plays an important role, hence

disproving partially the MIT bag model. This study has been one of the research areas of the GISELDA (Gruppo Italiano di Studio E Lavoro sul Deconfinamento Adronico) collaboration.

Observational signatures of a hadron-quark phase transition in neutron stars

M. Baldo, G.F. Burgio and P. Sahu

One of the most currently debated subjects in nuclear astrophysics concerns possible observational signatures of a deconfined phase of quark matter inside neutron stars. In collaboration with Dr. Pradip Sahu, post-doc fellow at INFN Sezione di Catania, we have analized the radial modes of oscillating neutron stars and found that the oscillation periods of neutron stars with quark matter in their core show a kink. This kink has turned out to be associated with the presence of a hadron-quark mixed phase in the stellar core. This kink is absolutely absent in the oscillation periods of purely hadronic stars.

Short range correlations in nuclear matter and electron - nucleus scattering.

L. Lo Monaco, M. Baldo

The microscopic many-body theory of the Nuclear Equation of State is discussed in the framework of the Bethe-Brueckner-Goldstone method. The expansion is extended up to the three hole-line diagrams contribution. Within the same scheme, the hole spectral function is calculated in nuclear matter to assess the relevance of nucleon-nucleon short range correlations. The calculation is carried out by using several nucleon-nucleon realistic interactions. Results are compared with other approaches based on variational methods and transport theory. Discrepancies appear in the high energy region, which is sensitive to short range correlations, and are due to the different many-body treatment more than to the specific N-N interaction used. Both nuclear matter Equation of State and spectral function appear to be dominated by two-body correlations.

Multiphonon excitation in heavy ion collisions

F. Catara, E.G. Lanza, M. V. Andres, Ph. Chomaz, M. Fallot, J. A. Scarpaci

Multiple excitation of Giant Resonance (GR) (multiphonons) are well established from an experimental point of view. However, the theoretical inelastic cross sections are almost always smaller than the measured ones (from 30% up to a factor of 2). To eliminate this discrepancy, corrections to the standard harmonic approximation have been included, like anharmonicities in the internal hamiltonian and non-linearities in the external field. Good agreement with the experimental relativistic Coulomb excitation cross section for the 208Pb+208Pb system has been found. Including the nuclear excitation, the cross section for 40Ca + 40Ca has been calculated at lower incident energy (50 MeV/A). The agreement with the experimental data is very good.

Coupling of dipole mode to gamma-unstable quadrupole oscillations.

C.E. Alonso, M.V. Andres, J.M. Arias, E.G. Lanza, A. Vitturi

The coupling of the high-lying dipole mode to the low-lying quadrupole modes for the case of deformed γ-unstable nuclei has been studied. Results from the geometrical model were compared to those obtained within the dipole boson model. Consistent results have been obtained in both models. The dipole boson model was treated first by using the intrinsic frame and then projected onto the laboratory frame.

Study of a two-electron `metal cluster'

M. Sambataro and F. Catara

We have studied a system of two electrons moving in a Coulomb field generated by a uniform positive charge distribution and interacting with each other. This system, while allowing for an exact calculation of its excitation spectrum, contains several features of a jellium model description of metal clusters. Special attention has been devoted to the dipole collective mode and to its multipole excitations. It has been shown that, in addition to a quasi-vibrational

band based on the ground state, other bands exist whose vibrational character is much less pronounced.

RPA-like calculations within limited particle-hole spaces

M. Sambataro

Working in a boson formalism, we have defined a new class of phonon operators for RPA-like calculations. These operators remind the standard RPA ones, namely they have ``upward'' and ``backward'' amplitudes and an overall one-particle one-hole nature. However, their structure is more complex. As a basic feature, the vacuum of these phono operators is characterized by only a limited (and variable at will) set of particle-hole. In addition, multiphonon states constructed by repeated actions of these phonon operators on the vacuum state have a particle-hole structure never exceeding in complexity that of the vacuum itself. We have verified advantages and disadvatages of the new formalism by showing some applications within an exactly solvable model.

Anisotropic alpha - decay in Am, Es and Fm isotopes

D. S. Delion (IPNE Bucharest Romania) , A. Insolia, R. J. Liotta (KTH, Sweden)

A microscopic analysis of the alpha-decay from odd mass axially deformed nuclei is performed to predict the anisotropies for Am, Es and Fm isotopes. Realistic mean field plus pairing residual interaction has been used,together with a single particle basis consisting of two different harmonic oscillator representation. The probability of emitting an alpha particle in the polar direction (or in the equatorial direction) is strongly dependent on the emission angle. For prolate (oblate) deformations polar (equatorial) emission is preferred. Within the present model, as the mean field is assumed spherical, the observed anisotropy has to be ascribed entirely to the deformed barrier. We were also able to reproduce both total decay width and spectroscopic factors.

Collective Dipole Bremsstrahlung in Dissipative Reactions

M.Di Toro, V.Baran , D.M.Brink , M.Colonna , Ph.Chomaz , M.Cabibbo, N.Pellegrini and N.Tsoneva

We estimate the dipole radiation emitted in fusion and deep inelastic processes. We show that a classical bremsstrahlung approach can account for both the preequilibrium and the thermal photon emission. We give an absolute evaluation of the pre-equilibrium component due to the charge asymmetry in the entrance channel. We study the energy, mass and impact parameter dependence in order to optimize the observation. Characteristic signatures are expected to be the low energy shift and the anisotropy of the photon emission. This dynamical dipole radiation could be a relevant cooling mechanism in the fusion path with important application in the synthesis of heavy elements. We stress the interest in experiments with the new available radioactive beams.

Isospin Effects in Nuclear Fragmentation

M.Di Toro, V.Baran, M.Colonna (LNS Catania) , V.Greco, M.Zielinska-Pfabe' and H.H.Wolter

We investigate properties of the symmetry term in the nuclear equation of state, EOS, from fragmentation experiments. For charge asymmetric systems we expect a qualitative new feature in the liquid-gas phase transition, the onset of chemical instabilities that will show up in a novel nature of the unstable modes, given by amixture of isoscalar and isovector components, leading to a neutron distillation effect. The space-time structure of the instabilities is discussed, in particular for the dependence on the symmetry term. Relative effects on fragment observables (mass/charge-correlations, kinetic energies, radial velocities) and on reaction mechanism scenarios (interaction times) are discussed. Very important is the analysis of neck-fragmentation events for semi-central collisions, which represent a large part of the reaction cross section. The fragments produced with this mechanism appear systematically more neutron-rich for a dynamical nucleon migration effect which is very sensitive to the symmetry term in regions just below normal density. From comparison with MSU and LNS experiments some indications for a stiff density dependence of the symmetry term are emerging. In general the isospin dynamics has an important role in all the steps of the reaction, from prompt nucleon emission to the sequential decay of the primary fragments.

Asymmetric Nuclear Matter in Quantum Hadro Dynamics

M.Di Toro, V.Greco, M.Colonna (LNS Catania), V.Baran (NIPNE-HH, Bucharest, Romania), B.Liu (IHEP, Chinese Academy of Sciences, Beijing, China) and F.Matera (Universita' di Firenze)

We discuss the Equation of State and the collective response of Asymmetric Nuclear Matter based on the Quantum Hadro-Dynamics effective field picture. We focus our attention on the equilibrium and dynamical effects of the interplay between scalar and vector channel contributions. An interesting ``mirror" structure in the form of the effective meson contributions in the isoscalar/isovector degree of freedom is revealed. A complete parallelism is observed in the interplay between scalar and vector mesons in determining respectively compressibility and symmetry energy. All that seems to support the introduction of an explicit coupling to the scalar-isovector channel of the nucleon-nucleon interaction. In particular we study the influence of this coupling (to a δ -meson-like effective field) on the collective response of asymmetric nuclear matter. Interesting contributions are found on the propagation of isovector-like modes at normal density and on an expected smooth transition to isoscalar-like oscillations at high baryon density. Important ``chemical" effects on the neutron-proton structure of the mode are shown. For dilute Asymmetric Matter we have the isospin distillation mechanism of the unstable isoscalar-like oscillations, while at high baryon density we predict an almost pure neutron wave structure of the propagating sounds. Starting from the same effective Lagrangian a relativisic transport equation is constructed. Simulations are performed for heavy ion collisions at intermediate energies. Important isospin effects are shown for collective flows, very sensitive to the covariant structure of the fields contributing in the isovector channel. A fully consistent microscopic hadronic picture of the reaction dynamics is achieved in a wide range of beam energies, from the coulomb threshold up to relativistic collisions. Deviations from the expectations of this "Reaction Standard Model" will be used in the search of precursor signals of new forms of nuclear matter.

Isospin and Deconfinement at High Baryon Densities

M.Di Toro, A.Drago (Univ Ferrara), V.Greco and A.Lavagno (Politecnico di Torino)

We show that a systematic study of the isospin dependence of the Equation of State of matter at densities of the order of 2-3 times nuclear matter saturation density can give important information concerning quark deconfinement. In particular the region of proton fraction Z/A around 0.3-0.4 is the most interesting, since for these values of the asymmetry the critical density at which quarks start deconfining can drop dramatically. A fully consistent relativistic transport simulation shows that similar conditions can be reached in semicentral collisions of neutron rich Sn isotopes in the beam energy range of 1 GeV per nucleon. Possible signals of the onset of such mixed phase with quark bubbles are suggested.

Non-Gaussian equilibrium in a long-range Hamiltonian system

V. Latora, A. Rapisarda and C. Tsallis (CBPF, Brazil)

In the framework of the Hamiltonian Mean Field model, a model of classical fully coupled spins, we have showed that, when the thermodynamic limit is taken before the infinite-time limit, the system does not relax to the Boltzmann-Gibbs equilibrium, but exhibits different equilibrium properties, characterized by stable non-Gaussian velocity distributions and dynamical power-law correlation in phase-space. Our results are in agreement with the non-extensive thermodynamic formalism proposed recently by C. Tsallis.

Nuclear multifragmentation

V. Latora and A. Rapisarda

Nuclear fragmentation has been investigated within the framework of classical molecular dynamics. We have focused on the importance on non-equilibrium effects on the variables measured (caloric curves, specific heat) to extract information on the critical behavior of nuclear systems.

Complex Networks

V. Latora, M. Marchiori (MIT, Usa), P. Crucitti (Scuola Superiore di Catania), A. Rapisarda.

Many complex systems can be modeled as a network, where the vertices are the elements of the system and theedges

represent the interactions between them. Coupled biological and chemical systems, neural networks, socialinteracting species, computer networks or the Internet are only few of such examples. Characterizing the structural(the connectivity) properties of the networks is the first step in order to understand the complex dynamics of thesesystems. We have proposed a new formalism to describe small-worlds networks based on the concept of information transport over the network and valid not only for topological networks, but also for weighted networks.

Statistical Properties of DNA

V. Latora, P. Grigolini (Univ. North Texas), N. Scafetta (Duke University, North Carolina).

DNA can be considered as a long message written with an alphabet of 4 letters. We want to study the information contained in this message, its regularities and the statistical properties. We have developed the Diffusion Entropy (DE) analysis, a new method based on entropic concepts and able to determine the scaling properties of a generic series without any need of detrending methods. By means of the DE we find that long-range (power-law) correlations are not only present in non-coding (in agreement with recent work of other authors), but also in coding sequences.

Modelling of Geophysical Systems

S. Vinciguerra, V. Latora, S. Bicciato (MIT, USA), R. Kamimura (MIT, USA).

We have studied the clustering properties of seismic data sets of Mt. Etna Volcano. We think that the pattern of seismic activity prior to the eruptions can be used as a diagnostic tool as well as a physical modeling support in eruption forecasting.

Equation of state of nuclear matter

U. Lombardo, M. Baldo, E.E. Saperstein, A. Lejeune

Some aspects of the EOS of nuclear matter have been developped within the microscopic Brueckner theory. The saturating effect of the three-body force on the EOS has been evaluated in the BHF approximation. Extension to spin and isospin polarized states of nuclear matter enabled us to extract the spin and spin-isospin Landau parameters. The latter has been used to calculate the neutrino propagation in neutron stars. The EOS in isospin-asymmetric nuclear matter has been aplied to study the competition between mechanical and chemical instabilities in the sphse space of nuclear matter in view of understanding the isospin fractionation found in HIC.

Superfluidity of nuclear matter

U. Lombardo, W. Zuo and P. Schuck

The superfluidity in nuclear matter in the channel 1S0 has been studied in a general context where one takes into account on the same footing the medium vertex corrections of the pairing interaction and the medium corrections of the selfenergy. A strong suppression has been found in the case pure neutron matter, but opposite trend is expected for the case of symmetric nuclear matter. Finite size effects of the pairing have been studied in a slab geometry with an effective pairing interaction derived from the G-matrix. Several aspects of the transition from a superfluid Fermi system to a Bose condensate of deuteron have been investigated: shize-shrinking of deuterons, Pauli blocking effect.

Chiral Symmetry Restoration

U. Lombardo

A new research issue is the medium modification of the hadron properties, as manifestation of the chiral symmetry restoration, invoked to interpret the enhancement of the dilepton production rates in RHIC (CERES,HADES,..). In particular, we want to see if the nuclear matter EOS can constrain the Rho-Brown mass scaling of hadrons and quark condensate.

Excitation and ionization electronic Molecular Spectra by ab-initio Many-body techniques

P. Tomasello, M. Ehara, H. Nakatsuji(Kyoto University) and W. Von Niessen (TU, Braunschweig and Muenchen)

Main research activiy has long been theoretical description and interpretation of electronic molecular structure, in cooperation with the Japanese and German groups, for a series of interesting halogenized molecules(R-X, X=F, Cl, Br,I) which play a relevant role into the photodynamical behaviour of chain photo-reaction occuring into the high terrrestrial atmosphere and nowadays by the scientific community believed fundamentally responsible to an accurate description of the seasonal observed destruction of Ozone. With respect to the pretty much abundant experimental data on the kinetic, of essentially photchemical nature, very little and unfirm is known on the electronic structure of compound such as Cl2O, F2O and ClOOCl et similia intervening ubiquitously into the various reaction steps which absorb visible and UV light by releasing very reactive radical which annihilate Ozone. Therefore accurate many-body ab-initio studies were prformed to gain in detail information on their spectra and confront them with the few existing experiments. Studies of their electronic structure have therefore been extended also to their p.s. structure as well. These studied should be fundamental for a full fotodynamical description of the reaction pathways. Two paper sofar have been completed and presented to the interested scientific community. One of them already published and another one in press.
Together and bound with the above research-line calculations of the same kind have been conducted on some vynil-halides(C2H3-X, X=F, Cl,BR, I) and preliminary studies are still in progress. Another series of preliminary studies have been performed on some kind of beta-lactoen showing interesting biologic activity, i.e. the 2(5H)-furanone, which seems to act as inhibitor for cell ingestions in the human body while his promoter activity on the fish growth-factor has been already assessed.

Definition of chaos in quantum dynamics.

P. Falsaperla, G. Fonte, G Salesi

We have introduced a definition of chaos in quantum dynamics, which is based only on elements of the theory of chaos in dynamical systems.

Cold Fusion

F. Frisone

Apart from my unaltered interest in the mechanism which tends to lower the Coulomb barrier, I am researching into the amplification of the tunnelling effect within crystalline lattices subjected to thermodynamic stress, and I am attempting to calculate this effect in a microcrack as a function of lattice deformation. I am also studying the influence that temperature can have on the phenomenon of deuteron fusion within metal lattices with CFC or EC
structure, hypothesising that a kind of chain reaction, catalysed by the microcracks which arise as a result of thermodynamic variations or for other motives, can favour the process.

Lattice Field theory

A. Agodi and G. Andronico

Studies have been carried out and are in progress on alternative definitions of relativistic quantum field theories in connection with the equivalence problem and with the structure and degeneracy of the physical vacuum for generalized free fields. Special attention is given to the Higgs sector of the Standard Model, involving a critical analysis of the data from lattice calculations, the conditions for dynamical mass generation in a renormalizable scale invariant theory and the constraints from neutrino oscillations.

Spontaneous symmetry breaking, phenomenology of the Higgs particle, lattice simulations of $\lambda\varphi^4$ theory

M. Consoli, P. Cea (Bari Univ.), L. Cosmai (Bari Univ.) and P.M. Stevenson (Houston Univ.)

According to renormalization-group improved perturbation theory, the `triviality' of $\lambda\varphi^4$ theories implies the scalar sector of the Standard model to be just an effective theory, i.e. valid up to some cut-off scale. Without a cut-off, the argument goes, there would be no scalar self-interactions and without them, no spontaneous symmetry breaking. The

validity of this interpretation has been questioned by us in a series of theoretical papers. The key-argument is that spontaneous symmetry breaking is a many-body effect involving an infinite number of degrees of freedom.
In the infinite cut-off limit, an infinitely increasing density of particles in the condensate compensates for the vanishing strength of the elementary 2-body processes (`triviality') thus producing a non-vanishing and negative energy density. Recent, precise lattice tests seem to confirm this picture of the phenomenon with potentially important consequences for the phenomenology of the Higgs particle.

Wilsonian Renormalization Group and flow equations

G. Andronico, A. Bonanno, D. Zappalà

In the context of the differential formulation of the renormalization group flow, a particular version of the renormalization group equations, obtained by resorting to a a proper time regularization of the infrared modes, has been derived and applied to various models. Namely, some critical exponents of the O(N) symmetric scalar field theory at the nongaussian fixed point have been computed and the large N limit has been analitically studied. In the case of sharp limit of the proper time regulator the determinations of the critical exponents are in very good agreement with the determinations obtained by other methods. The same approach has been used to calculate the gap between ground and first excited state of the quantum mechanical double well potential in the strong and weak coupling regimes and the determinations are in excellent agreement with the estimates obtained by numerically solving the Schroedinger equation.

Variational methods in field theory

F. Siringo

The mass and the decay width of a Higgs boson in the minimal standard model are evaluated by a variational method in the limit of strong self-coupling interaction. The non-perturbative technique provides an interpolation scheme between strong-coupling regime and weak-coupling limit where the standard perturbative results are recovered. In the strong-coupling limit the physical mass and the decay width of the Higgs boson are found to be very small as a consequence of mass renormalization. Thus it is argued that the eventual detection of a light Higgs boson would not rule out the existence of a strongly interacting Higgs sector.

AREA D : SOLID STATE PHYSICS

Electrochromic materials

A. Pennisi, F. Simone

The research was mainly devoted to preparation and characterization of transparent, thin films electrodes (tungsten trioxide, nickel oxide, vanadium pentoxide) for electrochromic devices (ion intercalation electrodes with mixed conductivity). The thin film samples were produced on different substrates utilizing the r.f. sputtering deposition technique and it was investigated the possibility to get improvements mainly related to film morphology, structure and composition in order to get highly transparent and rapidly switching electrodes. Particular attention was paid to the study of the mechanisms that regulate the process of ion insertion into the films and their deintercalation, by measurement of exchanged charge and cyclic voltammetry. Analysis of the optical transition between the coloured and bleached state of the electrochromic films was carried on by spectrophotometric measurements in the uv-vis range.

Silicon-based microphotonics

S. Alessandrino, G Franzò, F. Giannazzo, M.G. Grimaldi, F. Iacona, A. Irrera, F. Mammoliti, S. Mirabella,, D. Pacifici, F. Priolo, S. Privitera, M. Re, S. Scalese, M. Spadafora, E. Rimini, A. Terrasi.

The light emission from Si nanocrystals interacting with Er ions in a SiO_2 matrix has been investigated. The energy transfer in the nanocrystal network has been demonstrated, as well as its reduction depending on the nanocrystal

average distance. This can be obtained, for example, by confining the nanocrystals into Si/SiO2 multilayers. The cross-section for the excitation of isolated nanocrystals has been measured, finding a value of 1e-16/cm2. When Er ions are introduced into Si nanostructures, there is a preferential energy transfer between the nanocluster and the Er, which leads to light emission at 1.54 microns. We also measured the excitation cross-section for the Er ions in presence of nanocrystals, finding a value very near to that of the nanocrystal. Finally, monocromatic and highly directional light emission has been obtained by using Si nanocrystals as active medium in an optical microcavity.

SiGe alloys grown by MBE

S. Alessandrino, G Franzò, F. Giannazzo, M.G. Grimaldi, F. Iacona, A. Irrera, F. Mammoliti, S. Mirabella,, D. Pacifici, F. Priolo, S. Privitera, M. Re, S. Scalese, M. Spadafora, E. Rimini, A. Terrasi.

Si/SiGe heterostructures have been grown by molecular beam epitaxy to study the relaxation process of pseudomorphic films. In particular, SiGe films with Ge concentration between 5% and 30 % and thickness between 50 nm and 840 nm were grown at temperatures of 350 °C, 450 °C and 550 °C. This large range of experimental parameters has allowed to obtain both strained defect free, and relaxed dameged films, which have been investigated by many techniques (RBS, TEM, SIMS, XRD, AFM; XPS). All samples were annealed after the growth at higher temperatures to induce a complete relaxation of the structure. Our studies show that films grown at low temperature (350 °C) can overcome the metastable critical thickness and result in a good quality, low defects, materials. However, further post-growth annealings induce a sudden and strong relaxation, with a higher density of defects with respect to films grown at 550 °C.

Cluster physics

G. Faraci, A. R. Pennisi, R.Puglisi.

In 2001 our activity has been developed along the following main lines:
1) We installed the Cleta (Cluster evaporation through ablation) machine financed by the INFM for our laboratory Corumbos. This apparatus consists in three ultra-high vacuum chambers: the first is the source producing a microplasma of particles by means of the ablation of the cathode eroded by a He ion gun; the beam expands in supersonic regime in the second chamber producing clusters of the conducting material put as cathode; in the third chamber a TOF (time-of-flight) high resolution analyser permits the diagnosis of the beam. This system allows the deposition of clusters mass selected within a size distribution.
2) We studied the initial phases of Co precipitation in Ag, corresponding to lower Co concentrations, where smaller clusters start forming. The nucleation of very small clusters sets in from about 1 at.%. These intriguing particles remain superparamagnetic for Mössbauer observation down to very low temperatures, below which they feature an interface magnetic hyperfine field, which is about 15 % lower than the bulk value. We have observed an unexpectedly strong population, up to 75%, of the smallest aggregates, namely Co dimers. The complementary structural and lattice dynamical information that we extracted from EXAFS spectroscopy is of paramount importance.One of our goals was also to compare both the structural and dynamical information for ion implanted samples to that of samples prepared by co-sputtering, where we observed important differences in the interface quality and therefore in the Debye temperature ?D values.
3) We also report on a successful X ray Grazing incidence X ray diffraction investigation of Xe as-implanted Si: we obtained the X-ray structural characterization of Xe clusters (including nn distance and coordination) showing evidence of the formation of a Xe compressed fluid phase. Also the Si matrix was contemporarily checked and verified to be in an amorphous phase; here too, nn distance and coordination were detected. The simultaneous measurements both on the matrix and on the Xe inclusions were possible using a new X-ray diffraction method which combines the grazing incidence geometry, highly collimated, very intense Synchrotron Radiation beams and the two-dimensional detection. This method permitted to maximize the implanted thin layer contribution. The compressed fluid phase was simply explained in the frame of the Hard Sphere (HS) model
4) A study on semiconductor quantum dots was performed by EXAFS spectroscopy, at the ESRF Gilda beamline, obtaining important information on the size confinement of high gap $InBO_3$ agglomerates; molecular clusters InO_3 and InO_6 were also investigated using a high dilution of In_2O_3 in a glass matrix.

AREA E : ASTROPHYSICS

Solar and stellar magnetic activity

Belvedere, Busà, Contarino, Lanzafame, Marino, Paternò, Rodonò, Romano, Zappalà, Zuccarello (+ researchers of Osservatorio Astrofisico di Catania)

This is the traditional research line of the Institute, carried out for more than thirty years. The problem is approached from different points of view: observation, data analysis, data interpretation, theory. The comparison of activity phenomena in the Sun and stars allows us to understand the basic mechanisms that determine stellar variability and control activity cycles. While high resolution solar observations permit a detailed description of magnetic phenomena, on the other hand stellar observations describe a wide phenomenology in different physical conditions and timescales. In more detail, this research activity consists of:

1)Systematic patrol observation of photospheric and chromospheric phenomena by means of the Istituto and Osservatorio solar instrumentation (white light, H-alpha and Calcium K-line and onboard satellites (UV and X).

2)Simultaneous photometric, spectroscopic and multi-band radio observations of single and binary RS CVn type active stars, performed, in the framework of international collaborations, by Istituto and Osservatorio instrumentation, as well as available instrumentation at the European Southern Observatory (ESO) and CNR Istituto di Radioastronomia (Noto radiotelescope). Also UV and X satellite data are used.

3)Development of data analysis techniques for different atmospheric level stellar observations, for an accurate mapping of surface dishomogeneities in active stars, differential rotation and activity cycle studies.

4)Development of non-linear dynamo models based on the interaction of rotation, convection and magnetic field in order to describe magnetic, cyclic or chaotic, activity.

5)Dynamical and kinematical effects of stellar activity in close binary and millisecond pulsars.

Chemically peculiar stars

Catalano, Marino (+ researchers of Osservatorio Astrofisico di Catania)

The aim of this research is to develop appropriate observations in order to attain a clear phenomenological scenario, useful for understanding the mechanisms that determine anomalies in the surface elements abundances of some star types (CP). The research, both observational and theoretical, is carried out by means of observations performed by Istituto and Osservatorio instrumentation, as well as instrumentation of ESO and "El Leoncito" Observatory in Argentina. The following are the important points:

- Accurate photometric determination of the rotational period of CP stars, in order to study the correlation among various types of observed variability. To this point, the continuous updating of the "Catalogue of Periods of CP-stars" is related.
- Study of the infrared variability of CP-stars.
- Analysis of high resolution spectra of CP-stars, and determination of abundances and photospheric parameters through atmospheric models.
- Determination of the incidence of CP-stars among stars in the same spectral interval, by means of direct observations and the use of Hipparcos satellite catalogues.

Structure and dynamics of the solar interior by means of helioseismology

A. Bonanno, L. Paternò (+ Ph. D. student of Messina University)

The inversion of solar oscillations frequencies measured in the Sun with very high precision (helioseismology) is a powerful tool for the study of its internal structure and dynamics. This theoretical research uses data available from worldwide networks of solar stations (GONG, IRIS,) and from SOHO satellite, where three instruments for measuring oscillations are operating. This research is carried out along three lines:

i)Elaborating a very high precision solar model, including the most recent physics related to the equation of state, the cross section of nuclear reactions and the inward diffusion of elements. This is the reference model to which the data inversion is to be compared.

j)Developing numerical codes for data inversion, both 1-D (sound speed, density, helium abundance) and 2-D

(rotation).

k) Study of relativistic effects on oscillation frequencies. These effects could be important, since the level of precision of frequency measurements is quite high.

Nuclear Astrophysics

Cassaro, Costa, Pizzone, Zappalà (+ researchers of Laboratorio Nazionale del Sud in Catania, which belongs to Istituto Nazionale di Fisica Nucleare)

Nuclear reactions of astrophysical interest are characterized by an energy of colliding nuclei much less than the Coulomb barrier, and so it is very difficult to study them in laboratory experiments. In order to overcome this limitation, an indirect method is used (Trojan Horse), by means of which the reactions [Li-6 (d, alpha) He-4] and [Li-7 (p, alpha) He-4] have been studied. These reactions are respectively obtained from the 3-body quasi-free reactions [Li-6 (He-3, 2 alpha) p] and [Li-7 (d, 2 alpha) n]. The cross sections measured this way, compared to the values extrapolated from direct measurements, allow us to get information about the computation of the electronic screening contribution, which is very important for reactions occurring at energies of astrophysical interest.

Accretion disks onto collapsed objects

Belvedere (+ researchers of Osservatorio Astrofisico di Catania)

This research consists of 3-D numerical simulations of the formation, structure and dynamics of accretion disks in interacting binary systems with a collapsed primary (white dwarf or neutron star). Numerical simulations are very important in order to understand the physics of these systems, since analytical models are not able to describe the great complexity of the phenomenology of interacting plasmas in rotating systems. These simulations are performed in the framework of "Smooth Particle Hydrodynamics", an interpolating lagrangian "particle" numerical method, which has revealed faster and more flexible than traditional grid methods.

Formation and dynamical evolution of galaxies and clusters of galaxies

Bonanno (+ researchers of Osservatorio Astrofisico di Catania)

This research concerns the study of the effect of the presence of sub-structures on the formation of galaxies and clusters of galaxies. This effect induces an increase in the gravitational collapse scale-time, and influences the observed mass distribution in clusters and groups of galaxies, and the distribution of galaxies relative to dark matter. The research is carried out by developing "N-body" numerical codes to simulate the formation and evolution of large-scale structures in the universe.

Study of minor bodies in the solar system

C. Blanco (+ researchers of the Osservatorio Astrofisico di Catania)

This research, carried out essentially by observations performed with instruments of Istituto and Osservatorio, is aimed to accurately determine the rotational axis orientation and aspect ratio of a statistically relevant number of asteroids. This is the substantial observational basis in order to define a collisional evolution model of these minor bodies of the solar system, thus allowing us to understand the spatial fragmentation of a hypothized original large body.

International programs
Ground-based observations

- European Working Group on Ap-stars
- Ground-based support to the COROT space mission
- GONG (Global Oscillations Network Group)
- ITANET (Italian Network for the discovery and tracking of "Near-Earth Objects")
- VLBI (Very Large Baseline Interferometry)
- World Solar Data Center

Observations from space

- COROT (COnvection ROtation and planatary Transits, CNRS-ASI-ESA
- EUDOSSO (An experiment for measuring the solar diameter and oscillations onboard ISS (International Space Station)) NASA/ESA
- EUSO (ex AirWatch) Telescopio spaziale per lo studio degli EECR (Extreme Energy Cosmic Rays) ASI-ESA-NASA
- FUSE (Far Uv Satellite Explorer) NASA
- GOLF-SOHO (Global Oscillations at Low Frequencies onboard SOHO) NASA/ESA
- RXTE (Rossi X-ray telescope) NASA
- UVCS-SOHO (Ultraviolet Coronagraph Spectrometer onboard SOHO) NASA/ESA
- UVISS (UV telescope for the International Space Station)
- WSO-UV (World Space Observatory for the UV)

Publications in APPLIED PHYSICS

- Sorbellini F., Mangano A., Aloisi A., Potenza R.
  La Crioelettroforesi in Flebologia - 5° Congresso Nazionale SIES "Novita' e aggiornamenti in tema di Medicina e Chirurgia Estetica" - Bologna, 15-17 febbraio 2002 - Rendiconti, pag 115.

- Sisti G., Aloisi A., Matera M., Potenza R., Ricca R., Santoro G., Torregrossa R., Tuve' C. - La Crioelettroforesi: nuova prospettiva terapeutica nel campo della Medicina dello Sport - 7° Congresso Nazionale di Medicina dello Sport "Conoscere lo Sport nell'eta' evolutiva" - Firenze, 2 - 4 Maggio 2002 - Rendiconti, pag. 59 - 64, Editori: V. Cupelli e S. Orioli.

- Aloisi A., Matera M., Potenza R., Santoro G., Sisti G., Torregrossa R., Tuve' C. and Vespasiani A. - A New Perspective in Physical Therapy: Cryoelectrophoresis - 4th Mediterranean Congress of Physical and Rehabilitation Medicine - Siracusa, Italy June 25-28, 2002 - Proceedings, pag. 55.

- Nicolosi D., Sorbellini F., Del Gaudio S., Aloisi A., Mangano A., Matera M., Potenza R. - Nuove Prospettive per Anestesie in Soggetti a Rischio: La Crioelettroforesi - Congresso Nazionale su Anestesia, Riabilitazione e Terapia Antalgica - Capri, 26 - 28 settembre 2002.

- Aloisi A., Potenza R., Ricca S., Santoro G., Potenza R., Tuve' C. - Crioelettroforesi: Nuova Prospettiva Terapeutica Fisiopediatrica - XXX Congresso Nazionale S.I.M.F.E.R. "Dal Bambino le Radici delle Nostre Conoscenze" - Reggio Emilia 24 - 28 settembre 2002.

- G. Cuttone, A. Amato, A. Bartolotta, M.Brai, G.A.P. Cirrone, A Giammò, S.Lo Nigro, G.A. Nicoletti, J. Ott, G. Privitera, L.Raffaele, M.L.Rallo, C. Rapicavoli, A. Reibaldi, D. Rifuggiato, N. Romeo, A. Rovelli, M.G. Sabini, V, Salamone, G. Teri, F.Tudisco
  Use of 62 mev proton beam for medical application at infn-lns: catana project
  Physica Medica, Vol. XVII, Supplements 3, 2001

- M. Bicchieri, F. P. Romano, L. Pappalardo, L. Cosentino, M. Nardone, A. Sodo
  Non-destructive analysis of the Bibbia Amiatina by XRF, PIXE-□and Raman
  Qvinio: International Journal on the History and Conservation of the Book, 3 (2001), 169-179

- M. Bicchieri, M. Nardone, G. Pappalardo, L. Pappalardo, F.P. Romano, A. Sodo
  PIXE-a and micro-raman analysis for a non destructive characterisation of the salerno *exultet*
  CD-ROM of Proceedings of the 3rd International Conference Science and Technology for the safeguard of Cultural Heritage in the Mediterranean Basin, Alcalà (Spagna), Luglio 2001. Articolo n. 139.

- M. Bicchieri, M. Nardone, G. Pappalardo, L. Pappalardo, F.P. Romano, P.A. Russo, A.Sodo
  The *Salerno Exultet*: its characterisation by Raman and PIXE-alpha analyses
  Proceedings of SPIE - LASER TECHNIQUES AND SYSTEMS IN ART CONSERVATION, Ed. Renzo Salimbeni, Vol. 4402 (2001) 217-219

- M. Bicchieri, G. Pappalardo, F.P. Romano, F.M. Sementilli, R. De Acutis
  Characterisation of foxing stains by chemical and spectrometric methods RESTAURATOR
  International Journal for The Preservation of Library and Archival Materials, Vol. 22 (2001), N. 1, pp. 1-19

- S.O. Troja, A.M. Gueli, F. Marzo
  Luminescence dating. La databilità di strutture già scavate : le fornaci cretesi di Festòs ed Haghia Triada
  Atti dei Convegni Lincei , Accademia Nazionale dei Lincei, Roma, 173, 527-546

- A. Gueli
  Laboratorio di datazione tramite luminescenza (LDL), Catania
  Notiziario AIAr, Patron Editore, Bologna, 13-14

- A. Zuccarello
  Luminescence et RPE. Chronologie du bâti ancien par OSL : datation de la cuisson de briques et recherches sur la databilité de leur (ré)emploi. Recherches sur la databilité par RPE de galets de quartz chauffés solutréens.Mémoires de la série "Formation à et par la recherche, eds. CRPAA, Bordeaux, 484.

- A.M. Gueli, F. Marzo, A. Pedalino, S.O. Troja
  TL Dating of Cuba of Saint Domenica (Castiglione di Sicilia)Proceedings of 3rd International Congress on "Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin".

- A.M. Gueli, F. Marzo., P. Mazzoleni, A. Pezzino, S.O. Troja
  Characterisation and TL Dating of Materials Lining Kilns of Festòs and Haghia Triada (Creta, Grecia Proceedings of 3rd International Congress on "Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin".

- M.Russo, C.Petta, G.V.Russo, U. Becciani, N. Randazzo
  Fuzzy processing of Silicon Drift Detectors' signals
  Int. Jou of Knowlwdge-Based Int. Eng. Syst., Vol.5, (2001) 125

- F. Giannazzo, F. Priolo, V. Raineri, V. Privitera
  Two-Dimensional Profiling and Size Effects on the Transient Enhanced Diffusion of Ultra-Low Energy B Implants in Si
  Appl. Phys. Lett. 78, 598 (2001)

- E. Napolitani, A. Carnera, V. Privitera, F. Priolo
  Ultrashallow Profiling of Semiconductors by Secondary Ion Mass Spectrometry: Methods and Applications
  Materials Science in Semicond. Processing 4, 55 (2001)

- F. Giannazzo, V. Raineri, V. Privitera, F. Priolo
  High Resolution Scanning Capacitance Microscopy by Angle Bevelling
  Materials Science in Semicond. Processing 4, 77(2001)

- E. Napolitani, A. Coati, D. De Salvador, A. Carnera, S. Mirabella, S. Scalese, F. Priolo
  Complete Suppression of the Transient Enhanced Diffusion of B Implanted in Preamorphized Si by Interstitial Trapping in a Spatially Separated C-Rich Layer
  Appl. Phys. Lett. 79, 4145 (2001)

- F.La Via, M.G.Grimaldi, D.B.Migas, L.Miglio
  Defect-induced tetragonalization of the orthorhombic TiSi2 phase: X-ray diffraction and first principles calculations
  Appl. Phys. Lett. 78, 739 (2001)

- La Via F, Mammoliti F, Grimaldi MG, Quilici S, Meinardi F
  Effect of a thin Ta layer on the C49-C54 transition
  MICROELECTRON ENG 55: (1-4) 123-128 MAR 2001

- La Via F, Mammoliti F, Corallo G, Grimaldi MG, Migas DB, Miglio L
  Formation of the TiSi(2)C40 as an intermediate phase during the reaction of the Si/Ta/Ti system
  Appl. Phys. Lett. 78: (13) 1864-1866 MAR 26 2001

- Privitera S, Spinella C, La Via F, Grimaldi MG, Rimini E

Simulation of the transformation from the C49 to the C54 phase of TiSi2 in blanket films and narrow conductors
APPL PHYS LETT 78: (11) 1514-1516 MAR 12 2001

- Makhtari, V. raineri, F. La Via, G. Franzò, F. Frisina, and L. Calcagno
  Oxidation of Ion Implanted Silicon Carbide;
  Mat. Sci. in Semicond. Proc. 4, 345 (2001)

- P.K. Giri, V. Raineri, G. Franzò, and E. Rimini
  Mechanism of Swelling in Low-Energy Ion-Irradiated Silicon
  Phys. Rev. B 65, 012110 (2001)

- E.Sciacca, S.Lombardo, D.Patti, M.Ghioni, F.Zappa, E. Rimini, S.Cova.
  Silicon p-n junctions biased above breakdown used as monitors of carrier lifetime
  Materials Science Semic. Processing 4, 159-161 (2001)

- A.Alberti, F.La Via, C.Spinella, E.Rimini
  Structural relationship of polycrystalline cobalt silicide lines to (001) silicon substrate and their thermal stability
  Microelectronic Engineering 55, 163-169, (2001)

- P.K.Giri, S.Coffa, V.Raineri, V. Privitera, G.Galvagno, A.La Ferla, E.Rimini
  Photoluminescence and structural studies on extended defect evolution during high-temperature processing of ion - implanted epitaxial silicon
  J.Appl. Phys. 89, 4310-4317 (2001).

- A.Alberti, .La Via, S.Ravesi, and E.Rimini
  Improvement of $CoSi_2$ thermal stability by cavity formation
  Appl. Phys. Lett. 79, 3419, (2001).

- S.Lombardo, C.Spinella, C.Gerardi, M.Melanotte, and E.Rimini.
  Memorie MOS a < floating gate > : verso il singolo elettrone
  Il Nuovo Saggiatore, 17, 57-65(2001).

- V.Raineri, S.Giuffrida and E. Rimini
  In situ sensor for interstitial trapping during Si thermal oxidation using He implantation-induced voids"
  Appl. Phys. Lett. 79, 3259, (2001).

Publications in EXPERIMENTAL NUCLEAR AND PARTICLE PHYSICS

- A.Capone, T.Digaetano, A.Grimaldi, R.Habel, D.Lo Presti, E.Migneco,R.Masullo, F.Moro, M-Petruccetti, C.Petta, P.Piattelli, N.Randazzo,G.Riccobene, E:Salustri, P.Sapienza, M.Sedita, L.Trasatti, L.Ursella
  Measurement of light transmission in deep sea with the AC9 trasmissometer
  Nucl. Instr. & Meth. A487, (2002) 423

- Antares Collaboration
  The Antares Optical Module
  Nucl. Instr.& meth. A484, (2002) 369

- Ambrosio M, Aramo C, Bracci F, et al.
  The camera of the Auger fluorescence detector
  IEEE T NUCL SCI 48 (3): 400-405 JUN 2001

- Argiro S, Camin DV, Cattaneo P, et al.

The analog signal processor of the Auger fluorescence detector prototype
Nucl. Instr. Meth. A 461 (1-3): 440-448 APR 1 2001

- Ambrosio M, Aramo C, Bracci F, et al.
The camera of the Pierre Auger Observatory Fluorescence Detector
Nucl. Instr. Meth. A 478 (1-2): 125-129 FEB 1 2002

- Aramo, R. Fonte, A. Insolia, D. Nicotra, S. Urso, G. Raia, J.A.J. Matthews, F. Bracci, P. Facal San Luis, P. Privitera, E. Tusi, G. Vitale
Laboratory test for the FD relative optical calibration
GAP-note 2002-017

- C. Aramo, R. Fonte, A. Insolia, G. Raia, J.A.J. Matthews
Ray tracing simulation for the FD optical relative calibration
GAP-note 2002-018

- A. Badalà, R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, F. Riggi,
Primary vertex reconstruction in ALICE by silicon pixel detectors in stasnd-alone mode", ALICE Internal Note ALICE/INT 2001-11.

- A. Badalà, R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, A.Pulvirenti, F. Riggi,
Full 3D event-by-event vertex reconstruction in ALICE bypixel layers", ALICE Internal Note ALICE/INT 2001-26.

- G. Andronico et al., "EnginFrame: the computing portal to "the GRID" to be
used in the event production for the ALICE Physics Performance Report", ALICE Internal Note ALICE/OFF 2001-27.

- A. Badalà, R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, A.Pulvirenti, F. Riggi,
Tracking inside the ALICE ITS: some results on TPC-ITS matching,
ALICE Internal Note ALICE/INT 2001-39.

- A. Badalà', R. Barbera, G. Lo Re, A. Palmeri, G. S. Pappalardo, A.Pulvirenti, F. Riggi,
Status of the simulation for the silicon pixel detector
in ALICE", ALICE Internal Note ALICE/INT 2001-48.

- R. Barbera, "Grid activities at ALICE", "3rd ROOT Workshop", FNAL (USA).

- R. Barbera, "Grid activities at ALICE", "1st Euro Globus Workshop",
Marina d'Ugento (Italy).

- F. Antinori et al., Nucl. Phys. A 681 (2001) 165.

- F. Antinori et al., J. Phys. G 27 (2001) 383.

- F. Antinori et al., J. Phys. G 27 (2001) 391.

- F. Antinori et al., "Results on cascade production in lead-lead interactions
from the NA47 experiment", "XXXVIth Rencontres de Moriond - QCD and High Energy
Hadronic Interactions", Les Arcs 1800 (France) (2001).

- R. Alfieri et al.,
Report on the INFN-GRID Globus evaluation,
Report I.N.F.N. TC-01 del 22.03.2001.

- S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, C. Biino, G.M. Bilei, D. Bisello, D. Boemi, F. Bosi, L. Borello, S. Braibant, H. Breuker, M.T. Brunetti, M. Bruzzi, A. Buffini, S. Busoni, A. Candelori, A. Caner, R. Castaldi, A. Castro, E. Catacchini, B. Checcucci, P. Ciampolini, C. Civinini, M. Costa, D. Creanza, R. D'Alessandro, N. DeMaria, M. De Palma, R. Dell'Orso, S. Dutta, G. Favro, L. Fiore, E. Focardi, M. French, K. Freudenreich, A. Frey, M. Friedl, A. Furtjes, A. Giassi, M. Giorgi, A. Giraldo, W. Glessing, W.H. Gu, G. Hall, R. Hammarstrom, T. Hebbeker, A. Honkanen, A. Honma, J. Hrubec, M. Huhtinen, A. Kaminsky, V. Karimaki, S. Koenig, M. Krammer, P. Lariccia, M. Lenzi, M. Loreti, K. Lubelsmeyer, W. Lustermann, P. Mattig,

G. Maggi, M. Mannelli, G. Mantovani, A. Marchioro, C. Mariotti, G. Martignon, B. MacEvoy, M. Meschini, A. Messineo, E. Migliore, S. My, A. Neviani, A. Paccagnella, F. Palla, D. Pandoulas, A. Papi, G. Parrini, D. Passeri, M. Pernicka, M. Pieri, S. Piperov, R. Potenza, V. Radicci, F. Raffaelli, M. Raymond, F. Rizzo, A. Santocchia, G. Segneri, G. Selvaggi, L. Servoli, G. Sguazzoni, R. Siedling, L. Silvestris, A. Starodumov, I. Stavitski, B. Surrow, P. Tempesta, G. Tonelli, A. Tricomi, J. Tuominiemi, T. Tuuva, P.G. Verdini, G. Viertel, Z. Xie, Y. Li, S. Watts, B. Wittmer
Optimization of the silicon sensors for the cms tracker
Nucl. Instrum. and Meth. A466 (2001) 300.

- G.Lindstrom, M.Ahmed, S.Albergo , P.Allport, D.Anderson, L.Andricek, M.M.Angarano, V.Augelli, N.Bacchetta, P.Bartalini, R.Bates, U.Biggeri, G.M.Bilei, D.Bisello, D.Boemi, E.Borchi, T.Botila, T.J.Brodbeck, M.Bruzzi, T.Budzynski, P.Burger, F.Campabaal, G.Casse, E.Catacchini, A.Chilingarov, P.Ciampolini, V.Cindro, M.J.Costa, D.Creanza, P.Clauws, C.DaVia, G.Davies, W.DeBoer, R.Dell 'Orso, M.DePalma, B.Dezillie, V.Eremin, O.Evrar, G.Fallica, G.Fanourakis, H.Feick, E.Focardi, L.Fonseca, E.Fretwurst, J.Fuster, K.Gabathuler, M.Glaser, P.Grabiec, E.Grigoriev, G.Hall, M.Hanlon, F.Hauler, S.Heising, A.Holmes-Siedle, R.Horisberger, G.Hughes, M.Huhtinen, I.Ilyashenko, A.Ivanov, B.K.Jones, L.Jungermann, A.Kaminsky, Z.Kohout, G.Kramberger, M.Kuhnke, S.Kwan, F.Lemeilleur, C.Leroy, M.Letheren, Z.Li, T.Ligonzo, V.Linhart, P.Litovchenko, D.Loukas, M.Lozano, Z.Luczynski, G.Lutz, B.MacEvoy, S.Manolopoulos, A.Markou, C.Martinez, A.Messineo, M.Miku, M.Moll, E.Nossarzewska, G.Ottaviani, V.Oshea, G.Parrini, D.Passeri, D.Petre, A.Pickfor, I.Pintilie, L.Pintilie, S.Pospisil, R.Potenza, V.Radicci, C.Raine, J.M.Ra, P.N.Rato, R.H.Richter, P.Riedler, S.Roe, P.Roy, A.Ruzin, A.I.Ryazanov, A.Santocchia, L.Schiavulli, P.Sicho, I.Siotis, T.Sloan, W.Slysz, K.Smith, M.Solanky, B.Sopko, K.Stolze, B.Sundby Avset, B.Svensson, C.Tivarus, G.Tonelli, A.Tricomi, S.Tzamarias, G.Valvo, A.Vasilescu, A.Vayaki, E.Verbitskaya, P.Verdini, V.Vrba, S.Watts, E.R.Weber, M.Wegrzecki, I.Wegrzecka, P.Weilhammer, R.Wheadon, C.Wilburn, I.Wilhelm, R.Wunstorf, J.Wustenfel, J.Wyss, K.Zankel, P.Zabierowski, D.Zontar
  Radiation hard silicon detectors developments by the rd48 (rose) collaboration
  Nucl. Instrum. and Meth. A466 (2001) 308-326

- C.Agodi, G.Bellia , E. Migneco et al
  Nucl. Instr. And Meth. A492 (2002) 14

- A.Pop,A.Andronic, I.Berceanu, M.Duma, D.Moisa, M. Petrovichi, V.Simion, A.Bonasera, G.Immé, G.Lanzanò, A.Pagano, G.Raciti, N.Colonna, G.D'Erasmo, A.Pantaleo, H.Fedmeier, J.Schnack
  Global Features of Dissipative Processes in Heavy Ion Collisions
  Nuclear Physics A679 (2001) 793

- B. Zwieglinski, T.Odeh, C. Groß, C.Schwarz, R. Bassini, M. Begemann-Blaich, S. Fritz, S.J.Gaff-Ejakov,D.Gourio, G. Immé, I.Iori,U.Kleinevoß,G.J.Kunde,W.D.Kunze, U.Lynen V.Maddalena,M.Mahi,T.Möhlenkamp,A.Moroni,W.F.J.Müller,C.Nociforo,B.Ocker, F. Petruzzelli, J. Pochodzalla, G. Raciti, G. Riccobene, F.P. Romano, A. Saija, H. Sann, M. Schnittker, A. Schüttauf, W. Seidel, V.Serfling,C.Sfienti, W.Trautmann, A.Trzcinski,G. Verde, A. Wörner, Hongfei Xi
  Interplay of equilibrium and nonequilibrium phenomena in the nuclear liquid-gas phase Transition
  Nuclear Physics A681 (2001) 275

- C.Schwarz,S.Fritz, R. Bassini, M.Begemann-Blaich, S.J.Gaff-Ejakov, D.Gourio, C. Groß, G. Immé, I.Iori, U.Kleinevoß, G.J.Kunde,W.D.Kunze,U.Lynen, V. Maddalena, M .Mahi, T. Möhlenkamp, A. Moroni, W.F.J.Müller, C.Nociforo, B.Ocker, T.Odeh, F.Petruzzelli, J. Pochodzalla, G. Raciti, G. Riccobene, F.P. Romano, A. Saija, M. Schnittker, A. Schüttauf, W. Seidel, V.Serfling,C.Sfienti, W.Trautmann, A.Trzcinski, G. Verde, A. Wörner, Hongfei Xi, B. Zwieglinski.
  Times Scales in Spectator Fragmentation
  Nuclear Physics A681 (2001) 279

- G.Immé, S.Fritz, I.Iori,U.Lynen,T.Moehlenkamp,W.F.J.Mueller,B.Ocker,T.Odeh, J.Pochodzalla,G.Raciti,G.Riccobene,A.Saija,C.Schwarz,V.Serfling,W.Seidel,C.Sfienti, W.Trautmann,A.Trzcinski,G.Verde,B.Zwieglinski.
  Systematics of thermodynamic observables and nuclear caloric curve
  Proceedings IWM2001 - International Workshop on Multifragmentation and related Topics 28-30 Nov. 2001 Catania (invited talk).

- M.Alderighi, A.Anzalone, M.Bartolucci, G.Cardella, S.Cavallaro, E.De Filippo, E.Geraci, F.Giustolisi, P.Guazzoni, G.Lanzalone, G.Lanzano' S.Lo Nigro, G.Manfredi, A.Pagano, M.Papa, S.Pirrone, G.Politi, F.Porto, S.Russo, Sala A., S.Sambataro, G.Sechi, L.Sperduto, L.Zetta

A spatial density analysis technique for the automatic classification of 4π detector data.
IEEE Trans. Nucl. Sci. 48 (3), 385, 2001

- A. Pagano, S. Aiello, M. Alderighi, A. Anzalone, M. Baldo, R. Barnà, M. Bartolucci, I. Berceanu, A. Bonasera, B. Borderie, A. Botvina, R. Bougault, M. Bruno, G. Cardella, Sl.Cavallaro, M. Colonna, M. D'Agostino, V. D'amico, R. Dayras, N. De Cesare, E. De Filippo, D. De Pasquale, M. Di Toro, S.Feminò, E. Fuschini, E.Geraci, M. Geraci, P. Guazzoni, C. Iacono-Manno, A. Italiano, G. Lanzalone,G. Lanzanò, M. Licandro, U. Lombardo, S. Lo Nigro, G. Manfredi, A.Musumarra, M. Papa, S. Pirrone, G. Politi, F. Porto, A. Rapisarda, F. Rizzo, S.Sambataro, M.L. Sperduto, C. Sutera, L. Zetta.
  Physics with the CHIMERA detector at LNS in Catania: the REVERSE experiment
  Nucl. Phys. A 681 (2001) 331.

- Alderighi M, Anzalone A, Bassini R., Berceanu I, Blicharska J., Boiano C., Borderie B., Bougault R., Bruno M., Calì C., Cardella G., Cavallaro Sl., D'Agostino M, D'Andrea M., Dayras R., De Filippo E., Fichera F., Geraci E., Giustolisi F., Grzeszczuk A., Guardone N., Guazzoni P., Guinet D., Iacono-Manno C.M., Kowalski S, La Guidara E., Lanchais A., Lanzalone G., Lanzanò G., Le Neindre N., Li S., Maiolino C, Majka Z., Manfredi G., Nicotra D., Paduszynski T., Pagano A., Papa M., Petrovici C.M., Piasecki E., Pirrone S., Politi G., Pop A., Porto F., Rivet M.F., Rosato E., Saccà G., Sechi G., Simion V., Sperduto M.L., Steckmeyer J.C., Trifiro A., Trimarchi M., Urso S., Vannini G., Vigilante M., Wilczynski J., Wu H., Xiao Z., Zetta L., Zipper W.
  Particle identification method in the CsI(Tl) scintillator used for the CHIMERA 4pi detector
  Nucl. Instr. and Meth. A489 (2002) 257

- Le Neindre N, Alderighi M, Anzalone A, Barnà R, Bartolucci M, Berceanu I, Borderie B, Bougault R, Bruno M, Cardella G, Cavallaro S, D'Agostino M, Dayras R, De Filippo E, De Pasquale D, Geraci E, Geraci M, Giustolisi F, Grzeszczuk A, Guazzoni P, Guinet D, Iacono-Manno M, Italiano A, Kowalski S, A.Lanchais, Lanzano G, Lanzalone G, Li S, Lo Nigro S, Maiolino C, Manfredi G, Moisa D, Pagano A, Paduszynski T, Papa M, Petrovici M, Piasecki E, Pirrone S, Politi G, Pop A, Porto F, Rivet MF, Rosato E, Russo S., Sambataro S, Sechi G, Simion V, Sperduto ML, Steckmeyer JC, Sutera C, Trifiro A, Vannini G, Vigilante M, Wilczynski J, Wu H, Xiao Z, Zetta L, Zipper W,
  Mass and Charge identification of the Chimera Silicon-CsI(Tl) telescopes
  Nucl. Instr. and Meth. A490 (2002) 251.

- S. Pirrone, G. Politi, G. Lanzalone, S. Aiello, N. Arena, Seb. Cavallaro, E. Geraci, F. Porto, S. Sambataro.
  Fusion and competing processes in the 32S+12C reaction at E(32S) = 19.5 MeV/nucleon
  Phys. Rev. C 64, 024610 (2001).

- P. Figuera, A. Di Pietro, F.Amorini, C.Angulo, G.Cardella, S.Cherubini, T.Davinson, J.Lu, H.Mahmud, M. Milin, A.Musumarra, A.Ninane, A.Ostrowski, M.Papa, G.Pappalardo, M.G.Pellegriti, R.Raabe, F.Rizzo, C.Ruiz, A.C.Shotter, N.Soic, S.Tudisco.
  Fusion reaction studies with RIBs and possible experimental techniques.
  Prog.Part.Nucl.Phys. 46 (2001) 317.

- J.Lu, P.Figuera, F.Amorini, G.Cardella, A. Di Pietro, A.Musumarra, M.Papa, G.Pappalardo, F.Rizzo, S.Tudisco.
  Pulse shape discrimination of charged particles with a silicon strip detector.
  Nucl. Instr. Meth. A 471 (2001) 374.

- A.Di Pietro, P.Figuera, R.Neal, C.Sukosd, F.Amorini, F.Binon, W.Bradfield-Smith, M.Cabibbo, G.Cardella, R.Coszach, T.Davinson, P.Duhamel, A.Emmi, R.Irvine, P.Leleux, J.Mackenzie, A.Musumarra, A.Ninane, M.Papa, G.Pappalardo, F.Rizzo, A.C.Shotter, S.Tudisco, J.Vanhorenbeek, P.J.Woods.
  Different aspects of nuclear structure and reaction mechanisms in the collision $^{13}N+^{11}B$.
  Nucl.Phys. A689 (2001) 668.

- D.Pierroutsakou, A.Boiano, A.De Rosa, M.Di Pietro, G.Inglima, M.La Commara, A.Ordine, V.Roca, M.Romoli, M.Sandoli, M.Trotta, F.Rizzo, L.Stroe.
  Recent results on pre-equilibrium GDR in heavy ion collisions.
  Nucl. Phys. A687 (2001) 245.

- F.Amorini, G.Cardella, A. Di Pietro P.Figuera, G.Lanzalone, J.Lu, A.Musumarra, M.Papa, S.Pirrone, F.Rizzo, S.Tudisco.
  GDR excitation close to the liquid-gas transition of nuclear matter

Proc. Intenational Physics at Border Lines, ed.by G.Fazio, G.Giardina, F.Hanappe, G.Immè N.Rowley. Lipari, 21-24 May 2001. World Scientific pag.26.

- P.Figuera, A.Di Pietro, A.Musumarra, F.Amorini, G.Cardella, J.Lu, M.Papa, M.G.Pellegriti, F.Rizzo, S.Tudisco, T.Davinson, H.Mahmud, C.Ruiz, A.C.Shotter, C.Angulo, S.Cherubini, A.Ninane, M.Milin, N.Soic, R.Raabe, L.Weissman.
  The reaction ^{6}He+^{64}Zn around the Coulomb barrier.
  Proc. Intenational Physics at Border Lines, ed.by G.Fazio, G.Giardina, F.Hanappe, G.Immè, N.Rowley. Lipari, 21-24 May 2001. World Scientific pag.93.

- A.Di Pietro, P.Figuera, A.Musumarra, F.Amorini, C.Angulo, G.Cardella, S.Cherubini, T.Davinson, J.Lu, H.Mahmud, , M.Milin, A.Ninane, M.Papa, M.G.Pellegriti, F.Rizzo, C.Ruiz, A.C.Shotter, N.Soic, R.Raabe, S.Tudisco, L.Weissman.
  ^{6}He+^{64}Zn around the Coulomb barrier.
  Proc.ISOL '01 , Oak Ridge, Tennessee, March 11-14, 2001.

- M. Laird, A.N. Ostrowski, S. Cherubini, C. Spitaleri, M. Aliotta, T. Davinson, A. Di Pietro, P. Figuera, W. Galster, J.S.Graulich, D. Groombridge, J. Hinnefeld, M. Lattuada, P. Leleux, A. Musumarra, A. Ninane, M.G. Pellegriti, A.C. Shotter, A. Tumino, J. Vervier, P.J. Woods;
  Hot CNO breakout: status of the d(^{18}Ne,p)^{19}Ne*(α)^{15}O reaction
  Nucl. Phys. A 688 (2001) 134c

- S. Cherubini, W. Galster, J.S.Graulich, P.Leleux, M. Loiselet, A. Musumarra, A. Ninane, G. Ryckewaert, J. Vervier, M. Aliotta, P. Figuera, M. Lattuada, M.G. Pellegriti, C. Spitaleri, T. Davinson, A.M. Laird, A.N. Ostrowski, A.C. Shotter, P.J. Woods, J. Hinnefeld, S. Typel, H. Wolter;
  The ^{15}O(α,γ)^{19}Ne reaction using a ^{18}Ne radioactive beam
  Nucl. Phys. A 688 (2001) 465c

- C. Spitaleri, S. Typel, R.G. Pizzone, M. Aliotta, S. Blagus, M. Bogovac, S. Cherubini, P. Figuera, M. Lattuada, M. Milin, D. Miljanic, A. Musumarra, M.G. Pellegriti, D. Rendic, C. Rolfs, S. Romano, N. Soic, A. Tumino, H. Wolter, M. Zadro;
  The Trojan Horse Method applied to ^{2}H(^{6}Li,α)^{4}He at astrophysical energies
  Phys. Rev. C 63 (2001) 055801

- M.G. Pellegriti, M. Aliotta, P.Figuera, M. Lattuada, D. Miljanic, A. Musumarra, R.G. Pizzone, C. Rolfs, S. Romano, C. Spitaleri, S. Tudisco, A. Tumino, S. Typel, H.H. Wolter;
  The α-^{12}C radiative capture process and the Trojan Horse Method
  Nucl. Phys. A 688 (2001) 543c

- M. Lattuada, R.G. Pizzone, S. Typel, P.Figuera, D. Miljanic, A. Musumarra, M.G. Pellegriti, C. Rolfs, C. Spitaleri, H.H. Wolter;
  The bare astrophysical S(E) factor of the ^{7}Li(p,α)α reaction
  Astroph. Journ. 562 (2001) 1076

- A. Musumarra, R.G. Pizzone, S. Blagus, M. Bogovac, P. Figuera, M. Lattuada, M. Milin, D. Miljanic, M.G. Pellegriti, D. Rendic, C. Rolfs, N. Soic, C. Spitaleri, S. Typel, H.H. Wolter, M. Zadro;
  Improved information on the ^{2}H(^{6}Li,α)^{4}He reaction extracted via the Trojan Horse Method
  Phys. Rev. C 64 (2001) 068801

- D. Miljanic, N. Soic, S. Blagus, S. Cherubini, E. Costanzo, M. Lattuada, M. Milin, A. Musumarra, R.G. Pizzone, C. Spitaleri, A. Tumino, M. Zadro;
  ^{10}Be and molecular states
  Fizika B 10 (2001) 193

- A. Tumino, M. Lattuada, S. Romano, C. Spitaleri, D. Vinciguerra, Z. Basrak, O.Yu. Goryunov, V. Ostashko, S. Szilner, P. Figuera, D. Lo Presti, C. Petta, N. Randazzo, S. Reito, G.V. Russo, S. Tudisco;
  ^{16}O-^{8}Be break-up states and cluster structure of ^{24}Mg
  Europ. Phys. Jour. A 12 (2001) 327

- A. Insolia, S. Costa and C. Tuve`,
  Phase Transitions in Strong Interactions: Status and Perspectives,
  Proceedings of the International Conference CRIS 2000, Acicastello (Italy, 2000) Nuclear Physics A, 681 (2001).

- R. Alba, C. Agodi, C. Maiolino, A. Del Zoppo, P.M. Milazzo, G. Bellia, M. Bruno, N. Colonna, M. Colonna, R. Coniglione, M. D'Agostino, M.L. Fiandri, P. Finocchiaro, F. Gramegna, I. Iori, K. Loukachine, G.V. Margagliotti, P. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R. Rui, D. Santonocito, P. Sapienza, F. Tonetto, G. Vannini
  Hard photons: production mechanisms and nuclear dynamics
  Nucl. Phys. A 681 (2001) 339c

- P. Sapienza, R. Coniglione, , M. Colonna, E. Migneco, C. Agodi, R. Alba, G. Bellia, A. Del Zoppo, P. Finocchiaro, V. Greco, K. Loukachine, C. Maiolino, P. Piattelli, D. Santonocito, P.G. Ventura, Y. Blumenfeld , M. Bruno, N. Colonna, M. D'Agostino, , L. Fabbietti, M.L. Fiandri, F. Gramegna, I. Iori, G.V. Margagliotti, P.F. Mastinu, P.M. Milazzo, A. Moroni, R.Rui, J.A. Scarpaci, G. Tannini
  Strong enhancement of extremely energetic proton production in central heavy ion collision at intermediate energy
  Phys. Rev. Lett. 87 (2001) 070701

Publications in THEORETICAL PHYSICS

- G. G. N. Angilella, N. H. March, R. Pucci, Phys. Chem. Liquids 39, 405 (2001)

- G. G. N. Angilella, R. Pucci, Nonlin. Analysis A47, 3537 (2001)

- G. G. N. Angilella, E. Piegari, R. Pucci, A. A. Varlamov, invited contribution to the NATO ARW on ``Frontiers of High Pressure Research II: Application of High Pressure to Low-dimensional Novel Electronic Materials", ed. by H. D. Hochheimer, B. Kuchta, P. K. Dorhout, J. L. Yarger (Kluwer Academics, Dordrecht, 2001)

- G. G. N. Angilella, A. Grassi, G. M. Lombardo, N. H. March, R. Pucci,
  in ``Recent Research Developments in Quantum Chemistry", ed. by S. G. Pandalai, vol. 2 (Transworld Research, Trivandrum, 2001)

- G. G. N. Angilella, E. Piegari, A. A. Varlamov,
  Phys. Rev. B 66, 014501 (2002)

- G. G. N. Angilella, E. Piegari, R. Pucci, A. A. Varlamov,
  High Press. Res. 22, 435 (2002)

- G. G. N. Angilella, E. Piegari, R. Pucci, A. A. Varlamov,
  J. Phys.: Condens. Matter 14, 10737 (2002)

- G. G. N. Angilella, G. Balestrino, P. Cermelli, P. Podio-Guidugli, A. A. Varlamov,
  Eur. Phys. J. B 26, 67 (2002)

- A. Bonanno, D. Zappalà
  Chiral symmetry breaking in the Wegner-Houghton RG approach
  Nucl. Phys. A681 (2001) 108

- A. Bonanno, D. Zappalà
  Towards an accurate determination of the critical exponents with the Renormalization Group flow equations
  Phys. Lett. B504 (2001) 181

- P. Castorina
  Twist-four corrections to the violation of the Callan-Gross relation in nuclei
  Phys. Rev. D 65 (2002) 097502

- M. Consoli
  Long-wavelength excitations of Higgs condensates
  Phys. Lett. B 512 (2001) 335

- M. Consoli
  A weak, attractive, long-range force in Higgs condensates
  Phys. Lett. B 541 (2002) 307

- M. Consoli
  Spontaneous symmetry breaking and the p -> 0 limit
  Phys Rev. D 65 (2002) 105017

- P. Cea , M. Consoli, L. Cosmai
  Dynamics of the scalar condensate in thermal 4D self-interacting scalar field theory on the lattice
  Nucl Phys B proced. Sippl. 106 (2002) 953

- F. Siringo
  Light Higgs bosons from a strongly interacting Higgs sector
  Europhys. Lett. 59, pp.820-826 (2002)

- D. Zappala
  Improving the renormalization group approach to the quantum-mechanical double well potential
  Phys Lett A 290 (2001)

- M. Mazza, D. Zappala
  Proper time regulator and renormalization group flow
  Phys Rev D 64 (2001) 105013

- D. Zappalà,
  Perturbative and nonperturbative aspects of the proper time renormalization group
  Phys. Rev. D 66 (2002) 105020

- G. Andronico , V. Branchina, D. Zappalà
  Comment on "Feynman effective classical potential in the Schrodinger formulation
  Phys. Rev. Lett. 88 (2002) 178901

- M. Baldo and L. Lo Monaco,
  Nuclear matter hole spectral function in the Bethe-Brueckner-Goldstone approach,
  Phys. Let. B 525 (2002) 261.

- M. Baldo and G.F. Burgio,
  Microscopic Theory of the Nuclear Equation of State and Neutron Star Structure,
  Lecture Notes in Physics, Springer Verlag, Marzo 2001, pag.1-30.

- G.F. Burgio, M. Baldo, P. Sahu, A. B. Santra and H.-J. Schulze,
  Maximum mass of neutron stars with a quark core,
  Physics Letters B526, 19 (2002).

- M. Baldo, and G.F. Burgio,
  The Bethe-Brueckner-Goldstone theory of the nuclear equation of state and neutron stars,
  Proceedings of the 11th International Conference on Recent Progress inMany-Body Theories, Manchester (Great Britain), 8-13 July 2001, World Scientific, pag. 176.

- P. Sahu, G.F. Burgio and M. Baldo,
  Radial modes of neutron stars with a quark core,

Astrophysical Journal Letters 566, L89 (2002).

- M.V. Andres, F. Catara, E. G. Lanza, Ph. Chomaz, M Fallot and J. A. Scarpaci,
  Microscopic description of Coulomb and nuclear excitation of multiphonon states in ^{40}Ca + ^{40}Ca collisions,
  Phys. Rev. C 65 (2001) 014608.

- C.E. Alonso, M.V. Andres, J.M. Arias, E.G. Lanza and A. Vitturi,
  Coupling of dipole mode to γ-unstable quadrupole oscillations,
  Nucl. Phys. A 679 (2001) 359.

- E. G. Lanza,
  Double giant resonance in heavy ion collisions
  Nucl. Phys. A 687 (2001) 162c.

- Latora, M. Marchiori,
  Efficient Behavior of Small-World Networks,
  Phys. Rev. Lett. 87(2001)198701

- Latora, A. Rapisarda and C. Tsallis,
  Non-Gaussian equilibrium in a long-range Hamiltonian system ,
  Phys. Rev. E64 (2001) 056134

- Latora, A. Rapisarda,
  Dynamical Quasi-Stationary States in a System with Long-Range forces,
  Chaos Solitons and Fractals 13 (2001) 401

- Baranger, V. Latora, and A. Rapisarda,
  The time evolution of thermodynamic entropy for chaotic systems and at the edge of chaos,
  Chaos Solitons and Fractals 13 (2001) 471

- Latora, A. Rapisarda,
  Microscopic dynamics of a phase transition: equilibrium vs out-of-equilibrium regime,
  Nucl. Phys. A681(2001)406c.

- V. Latora and A. Rapisarda,
  Non-equilibrium effects on a second-order phase transition,
  Conf. Proc. Bologna 2000 World Scientific (2001)

- Latora, and M. Marchiori,
  Is the Boston subway a small-world network ? ,
  Physica A 314 (2002) 109.

- N. Scafetta, V. Latora, P. Grigolini,
  Levy Scaling: the diffusion entropy analysis applied to DNA sequences,
  Phys. Rev. E 66 (2002) 031906

- N. Scafetta, V. Latora, P. Grigolini,
  Levy statistics in coding and non-coding nucleotide sequences ,
  Phys. Lett. A 299 (2002) 565

- Latora, A. Rapisarda and C. Tsallis,
  Fingerprints of nonextensive thermodynamics in a long-range Hamiltonian system ,
  Physica A 305 (2002) 129.

- A. Rapisarda
  Caos e complessità: il nucleo come laboratorio ideale,
  INFN Notizie 6 (2001) 23.

- C. Tsallis, A. Rapisarda, V. Latora, F. Baldovin,
  Nonextensivity: from low-dimensional maps to Hamiltonian systems
  Chapter of Lecture Notes in Physics Vol. 602, Springer (2002).

- T. Dauxois, V. Latora, A. Rapisarda, S. Ruffo, A. Torcini,
  The Hamiltonian Mean Field Model: from Dynamics to Statistical Mechanics and back
  Chapter of Lecture Notes in Physics Vol. 602, Springer (2002).

- S. Vinciguerra, V Latora, S. Bicciato and R. Kamimura
  Identifying and discriminating seismic patterns leading flank eruptions at Mt. Etna Volcano during 1981-1996,
  Journ. Volc. Geotherm. Res. 106 (2001) 211

- F. Catara and M. Sambataro,
  Excitation spectrum of a two-electron `metal cluster'
  J. Phys.: Condens. Matter 13(2001)L705

- M. Sambataro,
  Testing a new class of phonon operators for RPA-like calculations within an exactly solvable model
  Proceedings of the Workshop on calculations of double- beta decay matrix elements (MEDEX '01), Prague,
  Czech. Journal of Phys. 52 (2002) 5219C

- Falsaperla P, Fonte G, Salesi G
  Quantum Lyapunov exponents
  Found. Phys. 32 (2002) 267

- V. Baran, M.Cabibbo, M.Colonna, M.Di Toro and N.Tsoneva,
  Nucl. Phys. A679 373 (2001).

- V.Baran, Ph.Chomaz, M.Colonna and M.Di Toro
  Pre-Equilibrium Hot Giant Dipole Resonance Excitation in N/Z Asymmetric Nuclear Reactions
  in "Isospin Physics in Heavy-Ion Collisions" Ed.s Bao-An Li and U.Schroeder, Nova Sci.Publ. New York 2001,
  ch.8, pp.223-238

- M.DiToro, V.Baran, M.Cabibbo, M.Colonna and N.Tsoneva
  Nucl. Phys. A 687, 72 (2001)

- V.Baran, D.M.Brink, M.Colonna and M. Di Toro,
  Phys.Rev.Lett. 87, 182501 (2001).

- M.Colonna and M.DiToro,
  Nuclear Transport Models and Effects of Isospin-Dependent Equation of State on Dissipative Heavy-Ion
  Collisionsin "Isospin Physics in Heavy-Ion Collisions" Ed.s Bao-An Li and U.Schroeder, Nova Sci.Publ. New York
  2001, ch. 9, pp.239-256

- M.Di Toro, V.Baran, M.Colonna, S.Maccarone, M.Pfabe' and H.H.Wolter
  Nucl.Phys. A681 (2001) 426-433

- A.Pagano,..M.DiToro...et al.
  Nucl.Phys. A681 (2001) 331

- V.Baran, M.Colonna, M.Di Toro, V.Greco
  Phys.Rev.Lett. 86 (2001) 4492

- V.Baran, M.Colonna, M.Di Toro, M.Zielinska-Pfabe, H.H.Wolter,
  What can we learn from nuclear matter instabilities?
  Int.Conf.on Nuclear Physics, Bologna 2000, eds G.C.Bonsignori et al., World.Sci. 2001, Vol.I pp.293-298

- E.Geraci,...M.Di Toro..,and REVERSE Collab.
  Reverse Experiment at Laboratori Nazionali del Sud
  Int.Conf.on Nuclear Physics, Bologna 2000, eds G.C.Bonsignori et al., World.Sci. 2001, Vol.I, pp.379-382.

- M.Di Toro, V.Baran, M.Colonna, V.Greco, S.Maccarone and M.Cabibbo
  Eur.Phys.J. A13 (2002) 155-161

- M.Colonna, V.Baran, M.Di Toro and V.Greco
  Isospin effects on instabilities and fragmentation mechanisms"
  in "Nuclear Physics at the Border Lines"Eds. G.Giardina et al., World Sci. 2002, pp.68-76.

- V.Greco, V.Baran, M.Colonna, M.Di Toro, G.Fabbri and F.Matera
  Instabilities in a mean field dynamics of asymmetric nuclear matter
  in "Theoretical Nuclear Physics in Italy", Eds. G.Pisent et al.World Sci. 2001, pp.385-392.

- M.Di Toro, V.Baran, M.Colonna and V.Greco
  Reactions mechanisms with radioactive beams: isospin effects on nuclear dynamics"
  Proc."Int.Symposium on Exotic Nuclei", Baikal 2001, Eds.Yu.E.Penionzhkevich and E.A.Cherepanov, World Sci. 2002, pp.189-204.

- M.Di Toro, V.Baran, M.Colonna and V.Greco
  Reaction dynamics with exotic nuclei
  Yukawa Int.Sem. on "Physics of unstable nuclei" Ed.H.Horiuchi, Progr.Theor.Phys. 2002, in press

- V.Baran, M.Colonna, M.Di Toro, V.Greco, M.Zielinska-Pfabe' and H.H.Wolter
  Nucl.Phys. A703 (2002) 603-632

- M.Di Toro, V.Baran, M.Colonna, V.Greco, M.Zielinska-Pfabe' and H.H.Wolter
  Dynamical influence of the isospin degree of freedom on fragment production
  Proc.Int.Workshop on Multifragmentation and Related Topics, chimera/Indra Collab., Eds.G.Agnello, A.Pagano and S.Pirrone INFN 2002, pp.123-129

- V.Greco, F.Matera, M.Colonna, M.DiToro and G.Fabbri ,
  Phys.Rev.C63 (2001) 035202

- V.Greco, M.Colonna, M.Di Toro, G.Fabbri and F.Matera
  Phys.Rev.C64 (2001) 045203

- B.Liu, V.Greco, V.Baran, M.Colonna and M. DiToro
  Phys.Rev.C65 (2002) 045201

- D.Catalano, G.Giansiracusa and U.Lombardo
  Chemical instability in asymmetric nuclear matter
  Nucl Phys. A681 (2001) 390

- Lombardo U, Nozieres P, Schuck P, et al
  Transition from BCS pairing to Bose-Einstein condensation in low-density asymmetry
  Phys. Rev. C 64 (2001) 064314

- U. Lombardo , P. Schuck , W. Zuo
  Self-energy effects in the superfluidity of neutron matter
  Phys. Rev. C 64 (2001) 021301

- M. Baldo, U. Lombardo, E.E. Saperstein, et al.
  Brueckner G matrix for a planar slab of nuclear matter
  Phys. Atom. Nucl. 64 (2001) 203

- E. Garrido , P. Sarriguren, E.M. de Guerra, et al.
  Nuclear pairing in the T=O channel reexamined
  Phys. Rev. C 63 (2001) 037304

- U. Lombardo, P. Schuck
  Size shrinking of deuterons in very dilute superfluid nuclear matter
  Phys. Rev. C 63 (2001) 038201

- M.Papa, T.Maruyama, A.Bonasera
  Constrained Molecular Dynamics Approach to Fermionic systems
  Phys. Rev. C 64 (2001)

- M. Baldo, U. Lombardo, H.J. Schulze, et al.
  Self-energy effects on isospin singlet pairing in nuclear matter
  Phys. Rev. C C 66 (2002) 054304

- G.X. Peng , U. Lombardo, M. Loewe,
  Another approach to the in-medium chiral condensate.
  Phys. Lett. B 548 (2002) 189

- W. Zuo, U. Lombardo
  Effects of three-body forces and relativistic effect on equation of state of nuclear matter.
  High energy phys. Nucl. 26 (2002) 1134

- W. Zuo, U. Lombardo, H.J. Schulze, et al.
  Short-range effects on nuclear pairing
  Phys. Rev. C 66 (2002) 037303

- W. Zuo , A. Lejeune , U. Lombardo , et al.
  Microscopic three-body force for asymmetric nuclear matter
  Europhys. J A 14 (2002) 469

- M. Baldo, U. Lombardo, E.E. Saperstein, et al
  Local-potential approximation for the Brueckner G matrix and ..
  Phys. Atom. Nucl. 65 (2002) 1243

- W. Zuo , A. Lejeune , U. Lombardo , et al.
  Interplay of three-body interactions in the EOS of nuclear matter
  Nucl. Phys. A 706 (2002) 418

- W. Zuo , U. Lombardo, Z.H. Li , et al.
  Properties of isospin asymmetric nuclear matter and extended BHF approach
  High Energy phys. Nucl. 26 (2002) 703

- M. Baldo , U. Lombardo , E.E. Saperstein , et al.
  Existence of nuclei with unusual neutron excess?
  Phys. Lett. B 533 (2002) 17

- M. Baldo, U. Lombardo , E.E. Saperstein , et al.
  The local potential approximation for the Brueckner G-matrix and ...
  Eur. Phys. J A 13 (2002) 307

- M. Baldo , A. Fiasconaro , H.Q. Song et al.
  High density symmetric nuclear matter in the Bethe-Brueckner-Goldstone approac
  Phys. Rev. C 65 (2002) 1

- P. Tomasello, M. Ehara and H. Nakatsuji
  Electronic excitation Spectra of Cl2O, F2O and ClOOCl…..
  Jour. of Chem. Physics. Vol. 116(6) 2425, 2002,

- Frisone F
  Theoretical model of the probability of fusion between deuterons within deformed crystalline lattices with microcracks at room temperature
  Fusion Sci. Technol. 40 (2001) 139

- Frisone F
  Deuteron interaction within a microcrack in a lattice at room temperature
  Fusion Sci. Technol. 39 (2001) 260

Publications in SOLID STATE PHYSICS

- F.Aleo, A.Pennisi, S.Scalia, F.Simone:
  Optical and energetic performances of an electrochromic window tested in a PASSYS cell
  Electrochimica Acta 46, 2243, 2001

- E.Cazzanelli, L.Papalino, A.Pennisi, F.Simone,
  Space variation of structural order in sputtered WO_3 films
  Electrochimica Acta 46, 1937-1944, 2001

- F.Artuso, F.Decker, A.Krasilnikova, M.Liberatore, A.Lourenco, E.Masetti, A.Pennisi, F. Simone,
  Indium-Vanadium oxides deposited by RF sputtering; new thin films transparent material for Li-insertion electrochemical devices,
  Chemistry of materials, 14, 636-642, 2002

- L.Ottaviano, A.Pennisi, F.Simone. A.M.Salvi,
  R.F. spttered electrochromic V_2O_5 films" International Meeting on Electrochromics 5, Denver, CO, USA, August 2002

- G. Compagnini, G. G. N. Angilella, A. Raudino, O. Puglisi,
  Nucl. Instr. and Methods B, 175-177, 559 (2001)

- F. Zontone, F. D'Acapito, G. Faraci, A. R. Pennisi,
  Evidence for a compressed fluid phase of Xe clusters in as-implanted Si
  Eur. Phys. Journal B 19, 501, 2001

- G. Faraci
  Photoemission Applied to Volcanology: Another Idea of Hans Cristoph. Siegmann,
  Invited paper at the International workshop in honor of the 65th birthday of H.C. Siegmann "Physics of Low Dimensional Systems" Oaxaca, Mexico 16-20 January 2000, Ed. J.L .Moran-Lopez, Plenum Press, N.Y. 2001, p. 167.

- G. Faraci, A. R. Pennisi, A. Balerna, H. Pattyn, G. Koops, G. Zhang,
  X-ray Studies on Co Clusters" International workshop "Physics of Low Dimensional Systems
  Oaxaca, Mexico 16-20 January 2000, Ed. J.L. Moran-Lopez, Plenum Press, N.Y. 2001, p. 33.

- G. Faraci, A. R. Pennisi, A. Balerna, H. Pattyn, G. Koops, G. Zhang,
  Co dimers observed by Extended X ray Absorption Fine Structure Spectroscopy"
  Physical Review Letters 86, 3566, 2001.

- G. Faraci , A. R. Pennisi, A. Balerna, G. Koops, H. Pattyn, G. Zhang,
  Evidence of Co dimers in Ag
  ESRF Highlights - 2001 p. 84, 2002.

- G. Faraci , A. R. Pennisi, R. Puglisi, A. Balerna, I. Pollini:
  Confinement of InO_3, InO_6, and $InBO_3$ clusters in a glass matrix
  Phys Rev. B 65, 24101, 2002.

- G. Faraci , A. R. Pennisi , A. Balerna , H. Pattyn , G. Koops , G. Zhang
  Dimeri e clusters di Co in matrice di Ag
  Invited Paper Folgaria meeting, GILDA-ESRF 2001, jan. 2001

- A. R. Pennisi , G. Faraci , A. Balerna , I. Pollini
  Confinamento di agglomerati di InO_3 e In_2O_3 in matrice vetrosa.
  Invited Paper Folgaria meeting, GILDA-ESRF 2001, jan. 2001

- G. Faraci, A.R. Pennisi, F. D'Acapito, F. Zontone
  Confinamento di cluster di Xe impiantati in Si
  Invited paper SILS Firenze 2001

- M. Troccoli, G. Scamarcio, B. Fraboni, F. Priolo, A. GasparottoDeep Level Electroluminescence at 3.5 ?m from Semi-Insulating InP Layers Ion-implanted with Fe
  Semicond. Science and Technol. 16, L1 (2001)

- F. Priolo, G. Franzò, F. Iacona, D. Pacifici, V. Vinciguerra
  Role of Energy Transfer on the Optical Properties of Undoped and Er-Doped Interacting Silicon Nanocrystals
  J. Appl. Phys. 89, 264 (2001)

- G. Franzò, E. Ceretta Moreira, D. Pacifici, F. Priolo, F. Iacona, C. Spinella
  Ion Beam Synthesis of Undoped and Er-Doped Si Nanocrystals
  Nucl. Instrum. Meth. B 175-177, 140 (2001)

- B. Fraboni, A. Gasparotto, F. Priolo, G. Scamarcio
  High $Fe^{2+/3+}$ Trap Concentration in Heavily Compensated Implanted InP
  Appl. Phys. A73, 35 (2001)

- F. Iacona, G. Franzò, E. Ceretta Moreira, F. Priolo
  Silicon Nanocrystals and Er Ions in an Optical Microcavity
  J. Appl. Phys. 89, 8354 (2001)

- Gasparotto, B. Fraboni, F. Priolo, F. Enrichi, A. Mazzone, G. Scamarcio,M. Troccoli, R. Mosca
  Assesment of Electrical and Optical Properties of Heavily Fe-Implanted Semi-Insulating InP;
  Materials Science and Eng. B80, 202 (2001)

- F. Priolo, G. Franzò, F. Iacona, D. Pacifici, V. Vinciguerra
  Excitation and Non-radiative De-excitation Processes in Er-Doped Si Nanocrystals
  Materials Science and Eng. B81, 9 (2001)

- S.Scalese, G. Franzò, S. Mirabella, M. Re, A. Terrasi, F. Priolo, E. Rimini, A. Carnera
  Si:Er:O Grown by Molecular Beam Epitaxy: Structural, Electrical and Optical Properties
  Materials Science and Eng. B81, 62 (2001)

- M. Re, S. Scalese, S. Mirabella, A. Terrasi, F. Priolo, E. Rimini, M. Berti, A. Coati, A. Drigo, A. Carnera, D. De Salvador, C. Spinella, A. La Mantia
  Structural characterization and stability of $Si_{1-x}Ge_x$/Si (100) heterostructures grown by molecular beam epitaxy
  J. Crystal Growth 227-228, 749 (2001)

- Fraboni, A. Gasparotto, T. Cesca, F. Priolo, G. Scamarcio, A. Mazzone, M. Troccoli
  High Fe Solubility in InP by High Temperature Ion Implantation
  Nucl. Instrum. Meth. B 178, 275 (2001)

- G. Vijaya Prakash, N. Daldosso, E. Degoli, F. Iacona, M. Cazzanelli, F. Rocca, Z. Gaburro, P. Dalba, E. Ceretta Moreira, D. Pacifici, G. Franzò, F. Priolo, C. Arcangeli, A.B. Filonov, S. Ossicini, L. Pavesi
  Structural and Optical Properties of PECVD Grown Silicon Nanocrystals
  J. of Nanoscience and Nanotechnology 1, 159 (2001)

- F. Iacona, G. Franzò, V. Vinciguerra, A. Irrera, F. Priolo
  Influence of the Spatial Arrangement on the Quantum Confinement Properties of Si Nanocrystals
  Optical Materials 17 , 55 (2001)

- Mazzone, M. Troccoli, G. Scamarcio, B. Fraboni, F. Priolo, A. Gasparotto
  Mid-ir (3.5 ?m) Electroluminescence from Heavily Fe^{2+} Ion Implanted Semi-insulating InP
  Optical Materials 17, 189 (2001)

- L. Dal Negro, L. Pavesi, G. Pucker, G. Franzò, F. Priolo
  Optical Gain in Silicon Nanocrystals
  Optical Materials 17, 41 (2001)

- L. Dal Negro, G. Franzò
  Più luce dal Silicio;

Sapere 3, 50 (2001)

- P.K.Giri, S.Coffa, and E.Rimini.
  Evidence for small interstitial clusters as the origin of photoluminescence W-band in ion implanted silicon"
  Appl. Phys. Lett. 78, 291-293(2001).

Publications in ASTROPHYSICS

- Blanco C., Riccioli D., Cigna M.
  Mutual events between Jupiter satellites observed in Catania during the PHEMU97 campaign, Planetary and Space Science 49, 31-34, 2001

- Bonanno A., Murabito, A.L., Paterno' L.
  Relativistic effects in the solar EOS: a helioseismic forward analysis.
  Astron. Astrophys. 375, 1062-1064, 2001

- Brooks D.H., Costa V.M., Lago M.T.V.T., Lanzafame A.C.: Understanding the atmospheric structure of T Tauri stars-II UV spectroscopy of RY Tau, RU Lupi, GW Ori and CV Cha, Mon. Not. R. Astron. Soc., 327, 177-190, 2001

- Cutispoto G., Messina S., Rodonò M.
  Long-term monitoring of active stars. IX. Photometry collected in 1993,
  Astron. Astrophys. 367, 910-930, 2001

- Lanza A.F., Rodonò M.
  The residual orbital eccentricity in close binaries.An application to millisecond binary pulsars
  Astron. Astrophys., 376, 165-174, 2001

- Lanza A.F., Rodonò M., Mazzola L., Messina S.
  Long-term starspot evolution, activity cycle and orbital period variation of SZ Piscium
  Astron. Astrophys., 376, 1011-1030, 2001

- Lanza A.F., Spadaro D., Lanzafame A. C., Antiochos S. K., MacNeice P., Spicer D., O'Mullane M.
  EUV Transition Region Line Emission during the Dynamic Formation of Prominence Condensations,
  Astrophys. J., 547, 1116-1129, 2001

- Lanzafame G., Maravigna F.., Belvedere G.
  Spiral structures and shocks on accretion disks in close binary systems: the role of the injection velocity at the inner lagrangian point, Publ. Astron. Soc. Japan, 53, 139-142, 2001

- Messina S., Rodonò M., Guinan E. F.
  The "Rotation-Activity Connection": Its extension to photospheric activity diagnostics,
  Astron. Astrophys. 366, 215-228, 2001

- Pagano I., Rodonò M., Linsky J.L., Neff J.E., Walter F.M., Kovari Zs, Matthews L.D.
  Spectral imaging maps of AR Lacertae. I. Results from IUE observations in 1994 October,
  Astron. Astrophys., 365, 128-143, 2001

- Renson P., Catalano F.A.
  Fifth supplement to the catalogue of observed periods of Ap stars
  Astron. Astrophys. 378, 113-115, 2001

- Riccioli D., Blanco C., Cigna M.
  Rotational periods of Asteroids.II,
  Planetary and Space Sciences, 49, 657-671, 2001

- Rodonò M., Cutispoto G., Lanza A.F., Messina S.

The Catania Automatic Photoelectric Telescope on Mt. Etna: a systematic study of magnetically active stars
Astron. Nachr., 322, 5/6, 333-342, 2001

- Rodonò M., Lanza A. F., Becciani U.
  On the determination of the light curve parameters of detached active binaries. I. The prototype RS Canum Venaticorum,
  Astron. Astrophys., 371, 174-185, 2001

- Ruediger G., Pipin V.V., Belvedere G.
  Alpha-effect, helicity and angular momentum transport for a magnetically driven turbulence in the solar convection zone,
  Solar Physics, 198, 241-251, 2001

- Thuillot V., Arlot J.-E., Ruatti C., Berthier J., Blanco C., Colas F., Czen W., Damani M., D'Ambrosio V., Descamps P., Dourneau G., Emelyanov N., Foglia S., Helmer G., Irsmambotova T.R., James N., Laques P., Lecacheux J., Le Campion J.-F., Ledoux C., Le Floch J.-C., Oprescu G., Rapaport M., Riccioli D., Starosta B., Tejfel V.G., Trunkovsky E.M., Viateau B., Veiga C.H., Vu D.T.
  The PHESAT95 catalogue of observations of the phenomena of the Saturnian Satellites,
  Astron. Astrophys. Suppl. Ser., 371, 343-349, 2001

- Trigilio C., Buemi C.S., Umana G., Rodonò M., Leto P., Beasley A.J., Pagano I.: *The radio corona of AR Lacertae,* Astron. Astrophys., 373, 181-, 2001

- Zerbi F.M. , Chincarini G. ,Ghisellini G., Rodonò M. , Tosti G. , Antonelli L.A., Conconi P. ,Covino S. ,Cutispoto G. , Molinari E. , Nicastro L., Palazzi E. , Akerlof C. , Burderi L. ,Campana S. , Crimi G. , Danzinger J., Di Paola A. , Fernandez-Soto A. , Fiore F. , Frontera F. ,Fugazza D., Gentile G. , Goldoni P. , Israel G. , Jordan B. , Lorenzetti D. , McBreen B. , Martinetti E. , Mazzoleni R. , Masetti N. , Messina S. , Meurs E., Monfardini A. , Nucciarelli G. , Orlandini M. , Paul J. , Pian E., Saracco P. , Sardone S. , Stella L. , Tagliaferri L. , Tavani M. , Testa V. , Vitali F.
  The REM telescope: detecting the near infra-red counterparts of Gamma-Ray Bursts and the prompt behavior of their optical continuum, Astron. Nachr., 322 5/6, 275-285, 2001

- Zuccarello F., Contarino L., Romano P.
  Description of a procedure to analyze EUV loops,
  Solar Phys., 199, 97-105, 2001

- Belvedere G., Lanzafame G.
  SPH Simulations of Spiral Shocks in Discs around Black Holes
  Publications of the Astr. Soc. Japan, - 54, 781-785, 2002

- Bonanno A., Schlattl H., Paternò L.
  The Age Of The Sun And The Relativistic Corrections In The Eos
  Astron. Astrophys., - 390, 1115-1118, 2002

- Bonanno A., Elstner D., Rüdiger G., Belvedere G.
  Parity Properties Of An Advection-Dominated Solar ?2 ?-Dynamo
  Astron. Astrophys., - 390, 673-680, 2002

- Catalano S., Biazzo K., Frasca A., Marilli E., Messina S., Rodonò M.: Temperature And Size Of Starspots From Line Depth Ratios - Astron. Nachr., - 323, 260-264, 2002

- Lanza A.F., Catalano S., Rodonò M., ?bano?lu C., Evren S., Ta? G., Cakirli Ö., Devlen A.
  Long-Term Starspot Evolution, Activity Cycle And Orbital Period Variation Of Rt Lacertae
  Astron. Astrophys., - 386, 583-605, 2002

- Lanza A.F., Rodonò M.
  Asteroseismic Tests For Models Of Magnetically Active Close Binaries With Orbital Period Modulation
  Astron. Astrophys., - 390, 167-172, 2002

- Lanza A.F., Rodono`M.
  Gravitational Quadrupole-Moment Variations In Active Binaries
  Astron. Nachr., - 323, 424-431, 2002

- Lanzafame A.C., Brooks D.H., Lang J., Summers H.P., Thomas R.J., Thompson A.M.
  Adas analysis of the differential emission measure structure of the inner solar corona. Application of the data adaptive smoothing approach to the serts-89 active region spectrum
  Astron. Astrophys., - 384, 242-272, 2002

- Paternò L., Belvedere G., Kuzanyan K.M., Lanza A.F.
  Asymptotic Dynamos In Late-Type Stars
  Mon. Not. R. Astron. Soc., - 336, 291-298, 2002

- Zaqarashvili T., Javakhishvili G., Belvedere G.
  On a Mechanism for Enhancing Magnetic Activity in Tidally Interacting Binaries
  Astrophys. J., - 579, - 810-816, 2002

- Lanza A. F., Rodonò M.
  Magnetic activity and dynamic phenomena in close binaries, in the Proceedings of the Meeting in Celebration of Peter Eggleton's 60th Birthday, Bormio, Italy, 25 June - 1 July 2000, Evolution of Binary and Multiple Star Systems, Ph. Podsiadlowski, S. Rappaport, A. R. King, F. D'Antona, L. Burderi (Eds.), ASP Conf. Series 229, p. 177-186, 2001

- Paternò L.
  The Standard Solar Model and the Neutrino Problem: present status and future perspectives, 2nd National Meeting on the Italian Solar research, eds. P. Francia, E. Pietropaolo, B. Caccin , L'Aquila, 3 - 5 July 2000, Mem. Soc. Astr. Ital. 72, 483-490, 2001

- Rodonò M., Cutispoto G., Lanza A. F., Messina S
  The Catania Automatic Photoelectric Telescope on Mt. Etna: A Systematic Study of Magnetically Active Stars. In: Annual Scientific Meeting of the Astronomische Gesellschaft at the Joint European and National Meeting JENAM 2001, Astron. Gesellschaft Ab. Ser., Vol. 18

- Spadaro D., Lanza A.F., Lanzafame A.C., Karpen J.T., Antiochos S.K., Klimchuk J.A., MacNeice P.J. Hydrodynamic simulation of coronal loops subject to transient heating - in Proceedings of the SOHO 11 Symposium on From Solar Min to Max: Half a Solar Cycle with SOHO, 11-15 March 2002, Davos, Switzerland. A symposium dedicated to Roger M. Bonnet. Edited by A. Wilson, ESA SP-508, Noordwijk: ESA Publications Division, ISBN 92-9092-818-2, 331-334, 2002

- Zuccarello F.
  The Sun at optical wavelengths, Conference Proceedings Vol. 75 "Sun-Earth Connection and Space Weather", M. Candidi et al. (Eds.), SIF, 69-83, 2001

- Amado P., Cutispoto G., Lanza A.F., Rodonò M.
  AB Doradus: Long and short-term light variations and spot parameters, in "The 11th Cambridge Workshop on Cool Stars Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, and M.R. Zapatero Osorio (eds.), ASP Conf. Series, 223, 895-900, 2001

- Belvedere G.,Kuzanyan K.M., Lanza A.F., Paterno' L.
  Asymptotic dynamo Wave Models of Magnetic Close Binaries with account of their evolutionary status, in IAGA-IASPEI Joint Scientific Assembly, Hanoi, 19-31 August 2001, IAGA Session G7.04, Abstracts of papers

- Belvedere G., Kuzanyan K.M., Sokoloff D.
  Solar internal rotation and dynamo waves: a two-dimensional asymptotic solution in the convection zone, in Proc. IAU Coll. 179, Cyclical evolution of solar magnetic fields, Kodaikanal, India, 13.16 Dec. 1999, R. Cowsik et al. (Eds.) J. Astrophys. Astron. 21, 579-580, 2001

- Belvedere G, Lanzafame G.
  Spiral waves and shocks in discs around black holes: low compressibility and high compressibility models. In: Proc. 1st Korean Astrophysics Workshop, Numerical Methods for Astrophysical Flows, Pusan, Korea, 26-29 June 2001, J. Korean Astron. Society 34, 313-315, 2001

- Bernacca P.L. Catalano S., Maraschi L., Rodonò M., G. Tondello, G.E. Villa, M. Badiali, G. Bonanno, A. Bucconi, L. Buson, D. Cardini, A. Cavaliere, D. de Martino, M. della Valle, A. Emanuele, R. Falomo, C. Facchinetti, E.

Fantino, A. Gregorio, Lanzafame A. C. Mirra, U. Munari, G. Naletto, Pagano I. et al.:, M.G. Pelizzo, P. Pizzolati, L. Poletto, R. Ragazzoni, R. Rampazzo, B. Saggin, S. Scuderi, P. Trampus, M. Uslenghi, M. Zannoni, G. Zennaro, A. Bressan:
`Ultra-Violet Italian Sky Surveryor (UVISS) on the International Space Station (ISS). Study report", to be published on, Instrumentation for UV/EUV for Astronomy and Solar Missions", SPIE Proc. 4139, 21, 2001

- Berrilli F., Caccin B., Cantarano S., Egidi A., Penza V., Criscuoli S., Del Moro D., Pietropaolo E., Consolini G., Ermolli I., Lepreti F., Mainella G., Severino G., Zuccarello F.,

  Analysis of high resolution and full disk solar images, Proceedings of "Solar Encounter : The First Solar Orbiter Workshop", ESA SP-493, 173 - 176, 2001

- Blanco C.
  Primi risultati della stazione meteorologica dell'isola Lachea, In Boll. Acc. Gioenia Sci. Nat. 34,360, 23-30, 2001

- Bonanno A., Paternò L.
  The astrophysical factor for the pp-reaction and the determination of the age of the Sun by helioseismology, II Convegno sulla Ricerca Solare Italiana L'Aquila, 3 - 5 Luglio 2000, Mem. Soc. Astr. Ital.72, 496-499, 2001

- Busà, I., Lanzafame A.C., Rodonò, M.
  Chromospheric NLTE Modelling of the active binary system V711Tau using Doppler Imaging constraints in 11th Cool Stars, Stellar Systems and the Sun Workshop. Edited by Ramon J. Garcia Lopez, Rafael Rebolo, and Maria Ros Zapaterio Osorio. San Francisco, ASP Conf. Series 223, CD 1213, 2001

- Costa V.M., Brooks D.H., Lago M.T.V.T., Lanzafame A.C.
  UV Specroscopy of T Tauri Stars: Analysis of LH alpha 332-21 and RY Tau, in "The 11th Cambridge Workshop on Cool Stars Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, and M.R. Zapatero Osorio (eds.), ASP Conf. Series, 223, CD-497, 2001

- Kovari Zs., Pagano I., Neff J.E., Rodonò M., Walter F.M.
  UV, Spectral Image of AR Lac in Oct 1994, in R. J. Garcia Lopez, R. Rebolo, M. R. Zapatero Osorio (Eds.), ASP Conf. Ser., 223, p. 1262-1267, 2001

- Lanza A.F., Rodonò M : Orbital Period Modulation and Magnetic Cycles in Active Close Binaries in"The 11th Cambridge Workshop on Cool Stars Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, and M.R. Zapatero Osorio (eds.), ASP Conf. Series, 223, 1456-1461, 2001

- Lanzafame A.C., Spadaro D., Consoli L., Marsch E., Brooks D.H.
  Velocity Fields in an Active Region Loop System Observed on the Solar Disc with SUMER/SOHO, in "The 11th Cambridge Workshop on Cool Stars Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, and M.R. Zapatero Osorio (eds.), ASP Conf. Series, 223, CD-691, 2001

- Leto G., Pagano I., Rodonò M., Umana G.,
  VLA observations of dMe stars, in R. J. Garcia Lopez, R. Rebolo, M. R. Zapatero Osorio (Eds.), ASP Conf. Series, 223, p.1003-1007, 2001

- Messina S. , Cutispoto G., Pastori L., Rodonò M., Tagliaferri G
  The EUV source HD 52452: discovery of a likely triple system" IAU Comm. 27 &42, IBVS 5014, 2001

- Pagano I., Rodonò M., Linsky J.L., Neff J.E., Walter F.
  The circumstellar enviroment of AR Lacertae, Proceedings of the meeting "Xray-Astronomy 2000", R. Giacconi, L. Stella and S. Serio (eds), ASP Conf. Series, 234, 2001

- Spadaro S., Lanza A. F., Lanzafame A.C., Antiochos S. K., O'Mullane M. G.
  EUV line emission during the dynamic formation of prominence condensation, Mem. Soc. Astr. Ital. 72, 591-594, 2001

- Spadaro D., Lanza A.F., Lanzafame A.C., Karpen J.T., MacNeice P.J., Antiokos S.K.
  Hydrodynamics of Coronal loops subject to transient heating in Proc. Of Solar Encounter: The First Solar Orbiter Workshop", Puerto de La Cruz, Tenerife, Spain, 14-18 May 2001,B.Battrick and H.Sawaya-Lacoste (eds.) ESA SP-493, 367-370, 2001

- Zuccarello F., Contarino L., Romano P.
  Coordinated space and ground based observations of rapidly evolving active regions, Proceedings of "Solar Encounter : The First Solar Orbiter Workshop", ESA SP-493, 439-443, 2001

- Zuccarello F., Contarino L., Romano P.
  Evolution of solar flares observed by TRACE, in Secondo Convegno sulla Ricerca Solare Italiana, Mem. Soc. Astr. Ital. 72, 579-582, 2001

- Zerbi F.M., Chincarini G., Rodonó M.; Ghisellini G., Antonelli A., Covino S., Cutispoto G., Molinari E.
  REM -- Rapid Eye Mount. A Fast Slewing Robotized Telescope to Monitor the Prompt Infra-Red Afterglow of GRBs - Scientific Drivers for ESO Future VLT/VLTI Instrumentation Proceedings of the ESO Workshop held in Garching, Germany, 11-15 June, 2001., Eds. L. Bergeron, G. Monnet, Berlin Springer Verlag, ISBN 354043755X, 42, 2002

- Blanco C.
  Osservazione di asteroidi
  Giornale di Astronomia, 28 n.1, 36-40, 2001