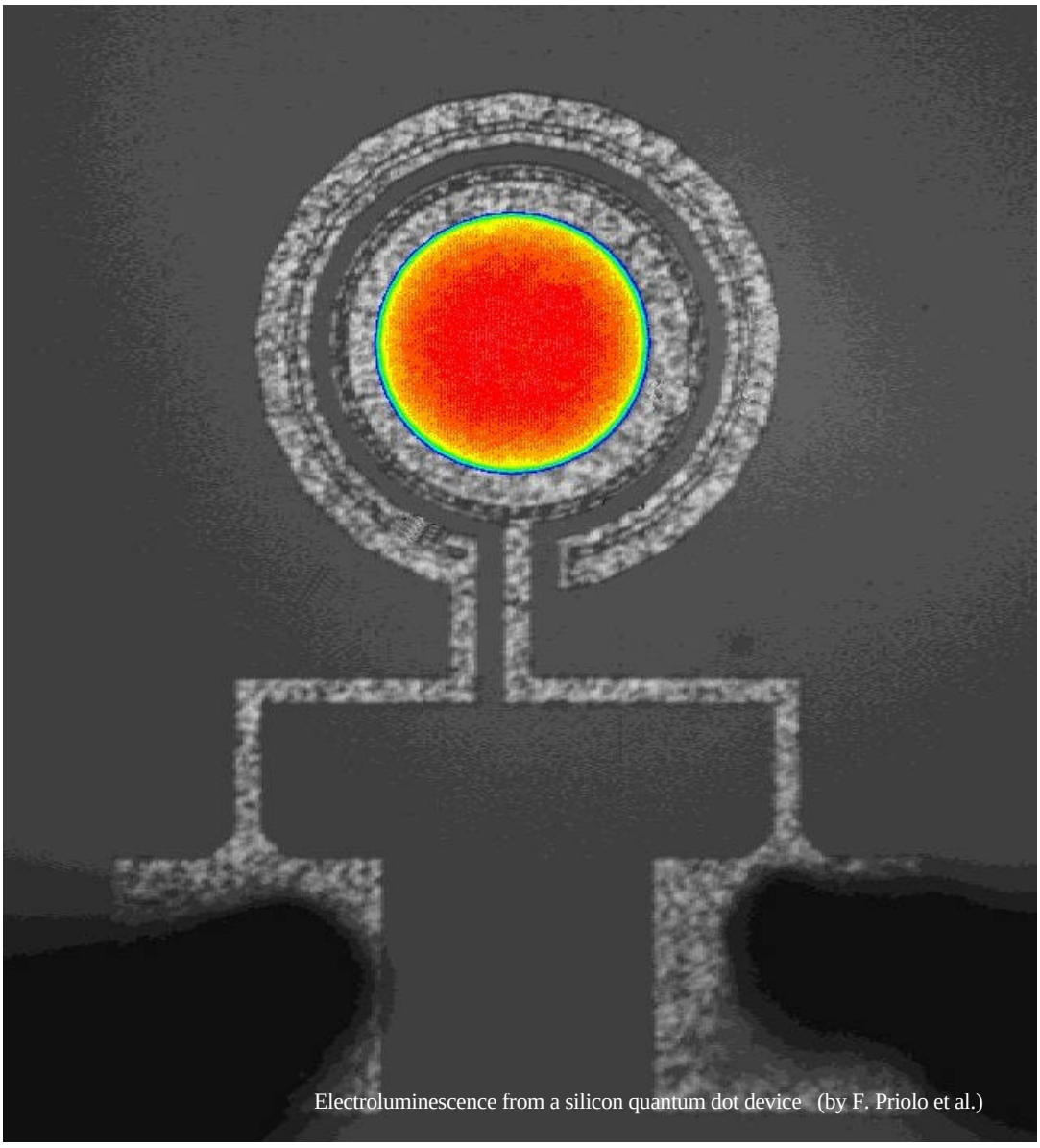
UNIVERSITY OF CATANIA

DEPARTMENT OF PHYSICS AND ASTRONOMY

ACTIVITY REPORT 2000



Electroluminescence from a silicon quantum dot device (by F. Priolo et al.)

INDEX [(*)]

[(*)] *Report edited by Profs. G. Belvedere and 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 Researchers of the Department are currently 75. Technicians and Administrative Personnel 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:

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 and sub-Nuclear 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 National Southern Laboratory (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's 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, non-specialistic scientific papers, 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
CUNSOLO	Angelo
DI TORO	Massimo
EBERLE	Enrico
FARACI	Giuseppe
FAZIO	Rosario
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
RODONO'	Marcello
RUSSO	Giovanni Valerio
RUSSO	Giuseppe
SAMBATARO	Salvatore
SCALIA	Augusto
STRAZZERI	Andrea
TROJA	Sebastiano Olindo
VINCIGUERRA	Domenico
ZAPPALA'	Rosario Aldo

RESEARCHERS

BARBERA	Roberto
CASTORINA	Paolo
COSTA	Salvatore
COSTANZO	Evelina
GIUSTOLISI	Francesco
LANZAFAME	Alessandro
LO MONACO	Luigi
MACCARRONE	Gaetano Daniele
MUSUMECI	Paolo
PAPPALARDO	Lorenzo
PAPPALARDO	Salvatore
PETTA	Catia
PICCITTO	Giovanni
POLITI	Giuseppe
REITANO	Riccardo
RIZZO	Francesca
SIMONE	Francesca
SIRINGO	Fabio
SPERDUTO	Maria Leda
TERRASI	Antonio
TOMASELLO	Pasquale
TUVÉ	Cristina
ZUCCARELLO	Francesca

RESEARCHERS AFFILIATED WITH OTHER AGENCIES

I.N.F.N. RESEARCH PERSONNEL - CATANIA

AIELLO	Sebastiano
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 PERSONNEL - CATANIA

FRANZO’	Giorgia

C.N.R. RESEARCH PERSONNEL

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 PERSONNEL

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 PERSONNEL

TRIGILIO	Corrado
UMANA	Grazia

C.S.F.N.S.M. RESEARCH PERSONNEL

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.	
MURÉ'	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

ANDRONICO	Giuseppe	CRRNSM
ANGILELLA	Giuseppe	UNIVERSITÀ
CIRRONE	Giuseppe	CSFNSM
CAPUZZELLO	Francesco	CRRNSM
GUELI	Anna Maria	CNR

LATORA	Vito	UNIVERSITÀ
LO PRESTI	Domenico	INFN
MARZO	Fabio	CRRNSM
MASTELLONE	Andrea	CRRNSM
MIRABELLA	Salvatore	CSFNSM
MORELLI	Daniela	CRRNSM
ROMANO	Stefano	UNIVERSITÀ
PELLEGRITI	Maria Grazia	CRRNSM
PRIVITERA	Giuseppe	CRRNSM
RICCOBENE	Giorgio	CRRNSM
SABINI	Maria Gabriella	CSFNSM
SCALESE	Silvia	INFM
SFIENTI	Concettina	CRRNSM
TRICOMI	Alessia	INFN- UNIVERSITÀ
TUDISCO	Salvatore	CRRNSM
TUMINO	Aurora	CRRNSM

FOREIGN GUESTS

ALFORD T. -ISM di Grenoble, France
ANDRES M. V.- University of Sevilla, Spagna
AUBRY P. - Association CLAP 33, Pessac, France
BARAN V. – NIPNE Institut of Bucharest, Romania
BARRÈ J. – University of Lyon, France
BAUMBACH M. – University of Heidelberg , Germany
BAUER W. – MSU National Lab. , USA
BENYAICH F. - Univ. Meknes - Morocco
BLANTER I. - Dep.of Theoretical Physics Univ.di Ginevra, Switzerland
BRANCHINA V. – Oberhausbergen, France
BRINK D.– University of Oxford, U.K.
CAMPI X. – Orsay, France
CHOI MAHN-SOO - Univ. Basilea Switzerland
CHOMAZ Ph. – GANIL , France
CHRISTIANSEN E. E. –Risø National Laboratory, Roskilde , Denmark
DELPRAT S. –Institut Universitaire de Technologie I.U.T. « B », Gradignan, France
DES COURTILS J. –University of Bordeaux 3, France
DAUXOIS T. . – University of Lyon, France
DEZHANG Z. -Institute of Nuclear res. Univ.Shanghai , China
DKAKI M. - Univ. Meknes, Morocco
DORSO C. – University of Buenos Aires, Argentina
ECKERN U. - Inst.of Für Physik Universität Augsburg , Germany
ELSKENS Y. - University of Marseille, France
EIZENBERG M. - Institute of Technology di Haifa - Israel
FIRPO M.C. – University of Marseille, France
GLAZMAN L. - Univ. Minneapolis , Usa
GORYUNOV O. YU. –Institute for Nuclear Research, Kiev, Ukraine
GREINER W. - Frankfurt University, Germany
GROSS D.H.E - HMI Berlin, Germany
GUIBERT P. – Centre de Recherche en Physique Appliquée à l'Archéologie (CRPAA), Talence, France
HATZOPOULOS M. – K.E.R.A., Athens, Greece
JURT J. - University of Freiburg, Germany
LU J. – Institute of Modern Physics, Academia Sinica, Lanzhou, People Republic of China
KUZANYAN K. - Department of Physics Mosow, Russia
MAKHTARI A. - Univ. di Meknes - Morocco

MARCH N. H. - Oxford University, Oxford, U.K., and University of Antwerp (RUCA), Antwerp, Belgium.
MAYER JAMS W. - Arizona State University – Tempe, Usa.
MIDDENDORF H. D. - Clarendon Laboratory, Oxford University, Oxford, U.K., and ISISE, Oxford, U.K.
MILIN M.– Institut R. Boskovic, Zagreb, Croatia
MORETTO L. – L.B.L. , Usa
OLKOVSKY V. -Istituto Ricerche Nucl. Acc.Naz.Sc. Kiev, Ucraina
OSTASHKO V. V. – Institute for Nuclear Research, Kiev, Ukraine
PANEA N. – University of Craiova , Romania
POLONYI J. A. - Università di Strasburgo, France
POMMIER P. – University of Bordeaux 3, France
ROLFS C. - Ruhr Universitaet, Bochum , Germany
REUTER M. - Inst.f.Physik – Univers.Mainz, Germany
RUEDIGER G.- Potsdam Astrophisikalische Institut, Potsdam, Germany
SANTRA A. B. – Bhabha Research Centre, Mumbai , India
SIERRA G. - Istituto de Matem.Fisica Fundamental, CSCI, Madrid , Spain
SKORUPA W. - Forschungszentrum Rossendorf di Dresda, Germany
SOIC N. - Ruder Boscovic Institute di Zagabria, Croatia
SOURANI E. – University of Thessaloniki, Greece
STEPANOV A. - Université d'Aix-Marseille III, Marseille, France
SCHULZE H.J. - Liegi, Belgium
SCHUCK P. - Orsay, France
TSALLIS C. – Centro Brasileiro de Pesquisas Fisicas, Rio de Janeiro, Brazil
VAN DER WAL C. - TU-Delf, The Netherlands
VAN GIAI Nguyen - Orsay, France
VON OERTZEN W.– Hahn – Meitner Institut, Berlin, Germany
WOLTER H. – University of Munchen ,Germany
ZUO WEI - Inst. Modern Physics Academia Sinica - Univ. Lanzhou - China
ZVEREV M. - Kurchatov Institute Moscow, Russia

ITALIAN GUESTS

BALLONE P. - Dipartimento di Fisica, Università di Messina, Messina
BERNARDINI C. - Dipartimento di Fisica, Università di Roma La Sapienza, Roma
CONIGLIO A. - Dipartimento di Fisica, Università di Napoli, Napoli
DRIGO A. - Dipartimento di Fisica, Università di Padova, Padova
FUBINI A. - Dipartimento di Fisica Università di Firenze, Firenze
GIANSANTI A.- Dipartimento di Fisica, Università di Roma La Sapienza, Roma
INGUSCIO M.- Dipartimento di Fisica Università di Firenze, Firenze
MIGLIO L. - Dipartimento di Fisica, Università di Milano, Milano
MANTEGNA R. - Dipartimento di Ingeneria, Università di Palermo, Palermo
RUFFO S. - Dipartimento di Energetica, Università di Firenze, Firenze
TORCINI A.- Dipartimento di Fisica, Università di Roma La Sapienza, Roma
VALISA P. - SIRGEMMA Laboratory, Milano
VARLAMOV A. - Istituto Nazionale per la Fisica della Materia, Roma
ZATELLI G. - Az.Osp.”Careggi” , Firenze

COURSES HELD IN THE ACADEMIC YEAR 2000/2001

"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 RAZIONALE

MECCANICA 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 2000/2001

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 meager, 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 Engeneering Faculty, the Astrophysics Observatory, The Institute of Astronomy, all belonging to the University of Catania, as well as INFN and CNR.

PhD Activities

XIII 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 XIII cycle are:

P. CASSARO *Blazar e schemi di unificazione* (Tutor: Prof. A. Zappalà)

V. COSTA *A new approach to the problem of the light p isotopes under production in type ii supernovae* (Tutor: A. Zappalà)

G. GAROZZO PhD Thesis will be defended next year (Tutor: Prof. E. Rimini)

A. GRASSO PhD Thesis will be defended next year (Tutor: Dr. M. Baldo)

M. GRASSO *A microscopic study of particle-hole and particle particle correlations in finite fermion system* (Tutor: Prof. F. Catara)

S. MACCARONE *Effetti di correlazione nella dinamica delle collisioni tra ioni pesanti* (Tutor: Prof. M. Di Toro)

A. MASTELLONE *Superconducting correlations in ultrasmall metallic grains* (Tutor: Prof. G. Giaquinta)

M.G. PELLEGRITI *The á-^{12}celastic scattering studied via the trojan horse method* (Tutor: Prof. C. Spitaleri)

G. RAGUNÌ *Laboratory synthesis of molecular hydrogen on water ice surfaces in condition of astrophysical Relevance* (Tutor: Prof. V. Pirronello)

A. G. S. SAIJA PhD Thesis will be defended next year (Tutor: Prof. G. Immè)

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.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 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.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 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

Procedures to operate this cycle will start at the beginning of 2001.

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.

XIII 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 XIII cycle are:

M. RE	*Epitassia da fasci molecolari per micro ed opto elettronica integrata in silicio* (Tutor: Prof. E. Rimini)
C. SADA	*Erbium duping of Lithium niobate crystals by the ion exchange process* (Tutor: Prof. P. Mazzoldi)
C.SOTRIANO	*Cells,liposomes and proteins adsorption onto surfaces modified by irradiation* (Tutor: Prof. G. Marletta)
B. PIGNATARO	*Ordered molecular assembles on solid surfaces: forces,structures and properties on nanometric scale* (Tutor: Prof. G. Marletta)
V. VINCIGUERRA	*Silicon nanostructures and their interaction with Er^{3+} ions* (Tutor: Profs. F. Priolo, E. Rimini)

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

XVII CYCLE

Procedures to operate this cycle will start at the beginning of 2001.

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 silicon-based materials

G. Franzò, M.G. Grimaldi, F. Iacona, F. Mammoliti, G. Mannino, S. Mirabella, E. Moreira, F. Priolo, S. Privitera, V. Privitera, M. Re, E. Rimini, S. Scalese, C. Spinella, A. Terrasi, V. Vinciguerra

The interaction between B and point defects during ultra low energy ion implantation has been studied. In particular the role of the B clustering in presence of super-saturation of interstitial was investigated, showing that there are two main sources determining the transient enhanced diffusion of B: self-interstitial clusters and clusters made of B and Si interstitials. The electrical activation of dopants in ultra shallow juctions obtained by B implantation has been related to these phenomena, showing that the best conditions are produced by rapid thermal annealings.

Silicides

G. Franzò, M.G. Grimaldi, F. Iacona, F. Mammoliti, G. Mannino, S. Mirabella, E. Moreira, F. Priolo, S. Privitera, V. Privitera, M. Re, E. Rimini, S. Scalese, C. Spinella, A. Terrasi, V. Vinciguerra

The C49-C54 phase transition in $TiSi_2$ has been studied. In particular the investigations have been performed on pure $TiSi_2$ and on Ti/Ta/Si systems, both on blank and micro-patterned substrates. The kinetics of the process has been determined separating the contribution of nucleation from that of grain growth. Activation energies as well as the nucleation site density have been calculated from the experimental data. Moreover, a new phase of $TiSi_2$ has been observed (C40). The same transition has been investigated in nanoclusters of $TiSi_2$ embedded in polycrystalline Si. The optical and structural characterization β-$FeSi_2$ precipitates obtained by ion implantation has been concluded. The intense photoluminescence signal has been attributed to indirect transitions within the precipitates having a bulk-like structure. Precipitates smaller than 20 nm do not shown optical activity at 1.54 microns

CATANA project

M.G. Sabini, G.A.P. Cirrone, G. Cuttone, S. Lo Nigro, L. Raffaele A. Rovelli, A. Reibaldi, V. Salamone

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.

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

S.O. Troja, G. Barbagallo, F. Bonaccorso, G. Burrafato, A.M. Gueli, F. Marzo and E. Turrisi

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. 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 precursor of earthquakes

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

In the framework of the Cluster-11 MURST project, in the year 2000 we started with the investigation on the possibility to use Radon as precursor of seismic – geodynamic activities. Radon variations, in fact, would seem to be a good precursor of crustal motion resulting in earthquakes. This fact encourages to find a way of using this phenomenon for earthquakes and eruptions prediction. The origin and the mechanisms of radon anomalies and their relationship to earthquakes is yet poorly understood, although there are several evidences of a correlation between radon anomalies and seismic activity. Mount Etna, owing to its geophysical position, is a good laboratory to study this kind of phenomena. Two sites were chosen in the Etna area for continuous measurements of soil gas Radon concentration at 1 meter deep simultaneously with seismic activity continuous monitoring and, because radon concentration also depends on atmospheric conditions, continuous measurements of temperature, atmospheric pressure and wind speed are performed.

Digital Radiology: (MARE Collaboration)

L.Caponetto, L.LoNigro, D.LoPresti, L.Pappalardo, C.Petta, N.Randazzo, S.Reito, G.V.Russo

We are developing a digital radiological apparatus. It uses electronic dedicated devices. The main aim is a very good resolution and a reduction of the total dose for each radiological investigation. The detector used is an array of GaAs pixels (200 micron pitch). The readout is a set of VLSI chip developed by the collaboration. The foreseen result can be obtained exploiting the capability to select X-rays energy. A 8 channel preamplifier-shaper has been designed and it is just under test.

The new portable PIXE-á-system

G.Pappalardo, G.Calvi, C. Marchetta, L.Pappalardo, F.Rizzo, F.P. Romano

A new portable PIXE-á-system has been recently designed and realised in collaboration between the CEA/DAMRI (Saclay-France), the LNS/INFN (Italy) and the CNR–Progetto Finalizzato Beni Culturali (Italy). The system allows to perform a non destructive analysis of ancient pigments and pottery gloss since PIXE analysis is sensitive to light elements and concerns only the surface layers. The PIXE- á-system consists of a 1 m Ci sealed ^{210} Po source emitting alpha particles of about 5 MeV; ^{210}Po is electroplated on a silver baking evaporated on a Mylar annular support. A 0.2 ìm layer of aromatic epoxy resin is deposited on the ^{210}Po layer to further ensure the confinement. Two 2 ìm thin Kapton foils are glued on the faces of the source. The diameter of the spot is about 1 cm. Due to the á particles energy the analysed depth is about 15 ìm and the elemental analysis is limited to the surface of the sample. Experimental results show that K lines of light and medium atomic number elements, from Na to Zn and L and M lines of heavy elements such as Pb, Hg, Au and Ba can be easily analysed at concentration of some percent.

AREA B : EXPERIMENTAL NUCLEAR AND PARTICLE PHYSICS

NEMO Experiment

S. Aiello, L.Caponetto, R.Coniglione, L.LoNigro, D.LoPresti, E. Migneco, L.Pappalardo, C.Petta, P.Piattelli, N.Randazzo, S.Reito, G.Riccobene, G.V.Russo and 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 three primary items: 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 m chips are designed and are actually under test. 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 tho 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.

Neutrino's detection using an undersea detector: ANTARES Experiment

S. Aiello, L.Caponetto, L.LoNigro, D.LoPresti, 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 km^2. 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.

ALICE Experiment

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

The ALICE Collaboration is building a dedicated heavy-ion detector to exploit the unique physics potential of nucleus-nucleus interactions at the largest energies of the Large Hadron Collider (LHC) at CERN. The ALICE Collaboration includes at present about 1200 researchers from 87 Institutes and 27 countries. The aim of such experiment is the study the physics of strongly interacting nuclear matter at extreme energy densities, where the formation of a new phase of matter, the Quark-Gluon-Plasma (QGP), is expected. The main challenge of heavy-ion physics is recording the enormous number of particles which emerge from the collisions. While at CERN's present day energies, about 1500 particles are produced in each collision, at the LHC, the multiplicity will go up to about 50000 particles. A large fraction of these must be tracked and identified. Only then can a clear picture emerge, and key signals be found pointing to different stages in the evolution from ordinary matter to QGP. The experiment has just entered the construction phase, after a research and development period over the last years. The detector will be completed in 2004. The local group of researchers in Catania, together with the technical staff is involved in the construction of the two innermost layers of the vertex detector, which are based on the silicon pixel technology, as well as in the reconstruction software for all the Inner Tracking System. Significant progresses have been made this last year in the set-up of a suitable test laboratory for the electronic read-out chips in a clean room environment, and

in the overall organization of the tracking algorithms wich make use of object-oriented technologies. A large contribution is also being devoted to the development of the GRID technologies for the required simulation and off-line computing in ALICE.

NA57 Experiment

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

The study of relativistic heavy-ion collisions provides a unique opportunity to search for a new predicted state of matter, the Quark-Gluon-Plasma (QGP). A number of experimental signatures of the transition to the QGP phase have been proposed and are currently studied in several experiments at the BNL AGS and CERN SPS. The enhancement of strange and (multi)strange particles produced in heavy-ion collisions with respect to the proton-nucleus case are an important signature of such a phase transition. The NA57 Collaboration, which includes about 100 physicist from several countries has built a dedicated detector at CERN for the measurement of strange and multistrange baryons and antibaryons (K0, Lambda, Xi and Omega) produced in proton-nucleus and nucleus-nucleus collisions at the SPS energies (40-160 GeV/nucleon). The detection technique makes use of a silicon pixel telescope (about 1.1 million channels), together with microstrip detectors. Measurements at 40 and 160 GeV/nucleons have been carried out, both for the p-Be and p-Pb systems, as well as for the heavy-ion system Pb-Pb. The results have pointed out a strong enhancement in Pb-Pb (up to a factor 15 for the Omega baryons) with respect to the proton-nucleus case, thus suggesting evidence for a different regime.

CMS experiment

S.Albergo, V.Bellini, S.Costa, M.Chiorboli, R.Potenza, 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 LHC of CERN. It is also well adapted for studies at the initially lower luminosities. The CMS Collaboration consists of almost 1900 scientists and engineers from 152 institutes in 32 countries. The main design goals of CMS are: i) a highly performant muon system; ii) an electromagnetic and a hadron calorimeter; iii) a high quality central tracker; iv) a large volume superconducting magnet. The CMS detector has been designed to search clear signatures from new physical phenomena in p-p reactions and is particularly suited to search the Higgs boson in a wide mass range: a Standard Model (SM) Higgs boson with mass between 95 and 150 GeV would be discovered via its two photon decay after an integrated luminosity of about 3.10^4 pb^{-1}. The same integrated luminosity gives a discovery range covering masses from 135 to 525 GeV in the four lepton channel, with only a small gap in the coverage around 2 m_w. An integrated luminosity of 10^5 pb^{-1} would allow discovery via these channels over the full range between 85 and 700 GeV. During 2000 the CMS group of Catania was mainly involved into radiation damage studies of silicon microstrips for the inner tracker and also in the construction of the planned milestones for the CMS microstrip detector. A collaboration between Bari and Catania (Regional Center) for CMS silicon microstrip production has been established. During 2000 Catania has produced parts (the vacuum control systems) of an authomatic assembly system of microstrip detectors. The parts produced in Catania have been delivered in 7 different laboratories of the collaboration. The Catania group is also involved in the computing project for the CMS experiment, and a pc farm has been realized in Catania during 2000.

EOS Experiment

S. Albergo, Z. Caccia, S. Costa, A. Insolia, R. Potenza, G. V. Russo, A. Tricomi, C.Tuve`

The EOS experiment was performed at the LBNL Bevalac in 1992. Its goal is the exclusive study of nuclear collisions at relativistic energies with almost complete reconstruction of all charged particles and neutrons on an event by event basis. Beam ions from Ne to Au have been used on targets from C to U with incident energies ranging from 400 to 2100 MeV/nucleon. The data analysis began in 1993 and is still going on. It has established, between 1994 and 1999, very many important results. The analysis has continued in 2000. Although the LBNL involvement has nearly disappered, a quite fruitful collaboration between the Purdue group and our Catania group is continuing and keeps producing relevant results on the Multifragmentation and Liquid-Gas Phase Transition

subjects, as testified by the papers published in 2000, which have been led by either group.The inclusive light fragment (Z<7) yield data in Au+Au reactions, measured by the EOS Collaboration at the LBNL Bevalac, have been studied as a function of multiplicity. Moving from central to peripheral collisions the measured charge distributions develop progressively according to a power law which can be fitted, within errors, by a single exponent independently of the bombarding energy except for the data at 250A MeV. In addition, the location of themaximum in the individual yields of different charged fragments, for a given beam energy, shifts towards lower multiplicity as the fragment charge increases from Z = 3 to Z = 7. This trend is common to all six measured beam energies. Moments of charge distribution were also investigated. The universal features observed in the present Au + Au data are consistent with previous experimental findings in the Au + C multifragmentation reaction at 1A GeV.The dynamics of multifragmentation has been studied for the reverse-kinematics systems Au+Kr and Au+La, in addition to Au+C previously studied. Again, evidence has been found for a two-stage process, involving the emission of prompt light particles, followed by the disassembly of an equilibrated remnant in a later, slower stage. Universal features possibly exhibited by the three systems when suitably scaled for size have been sought, but no evidence of such an universal behaviour has been found. Deviations from scaling observed in the IMF multiplicity and in the size of the largest fragment suggest that the increasing Coulomb energy of heavier projectiles may lead tomore extensive multifragmentation. However, differences between the different projectiles do disappear when various quantities are plotted vs. reduced multiplicity m/Zproj. In this case the caloric curves also agree closely. For the same three systems a systematic search for signals of a continuous phase transition has been conducted. This analysis follows up on earlier (starting 1994) pioneering determination of critical exponents for Au+C. Several critical exponents, the critical point and the scaling function expected to be possessed by systems which possess a critical point, have all been extracted for all three systems. Moreover, it has been shown that the Fisher droplet model, percolation and nuclear multiframentation as measured by the EOS Collaboration share the common features of reducibility (stochasticity in multiplicity distributions) and thermal scaling (one-fragment production probabilities are Boltzmann factors).

E896 Experiment

S.Albergo, D. Boemi, Z. Caccia, S. Costa, A. Insolia, R. Potenza, A. Tricomi, C. Tuve`

The E896 experiment is dubbed the definitive search for the elusive 6 quarks particle (uuddss) named H0, postulated by Jaffe on basis of the MIT bag model. The H0 would be copiously formed in central collisions between heavy ions at sufficiently high energies, such as the Au+Au at 11.6 GeV/c, affordable at the Brookhaven AGS. The H0 is sought in E896 by looking for characteristic topologies of its expected decay modes in aptly designed tracking detectors. The Catania group's contribution to E896 consists of the neutron spectrometer Muffins, which had been built and used for previous experiments at the LBNL Bevalac and was slightly modified for use in E896. The purpose of Muffins was to aid in recognizing the characteristic decay topology exepcted for the H0 decay channel H0 -> Sigma- + p -> n + pi- + P by identifying at least in some events the neutron which would escape from detection in the other charged-particle tracking devices (A Silicon Drift Deterctor and a Drift Chamber). E896 took beam for 30 days in April 1998. This run went technically very well. We recorded on tape about 100 million events with central trigger. These data are all of excellent quality, with a typical track multiplicity in the Drift Chamber of only 20. Despite many analysis efforts, discovery of the H0 cannot yet be claimed. Possible candidates have all vanished after closer scrutiny with refined calibrations and improved analysis software. To check the overall reconstruction chain those events have been studied in which the decay vertex reconstructs to a Lambda particle.Lambda yields and polarization are now well understood so results on the Lambda production will follow soon, and will be reported here next year. The whole E896 apparatus, including the Muffins detector was fully dismanteled in December 2000.

Using thermal photons to probe nuclear dynamics

R. Alba, C. Agodi, C. Maiolino, A.Del Zoppo,M.Colonna, G.Bellia, M. Bruno, N. Colonna, R. Coniglione, M. D'Agostino, M.L.Fiandri, P.Finocchiaro, F.Gramegna, I.Iori, K. Loukachine, P.M.Milazzo, G.V.Margagliotti, P.F.Mastinu, E.Migneco, A.Moroni, P.Piattelli, R.Rui, D.Santonocito, P.Sapienza, G.Vannini

Experimental data and theoretical calculations on hard photon ($E\gamma \geq$ 25 MeV) production at intermediate energy indicate that they are mainly emitted as bremsstrahlung radiation in individual first chance neutron-proton collisions occurring in the interaction zone just at the beginning of the reaction. Additionally, in the energy range 25-50 MeV, photons also come from a later and more equilibrated phase of the reaction when the system, after an expansion phase, undergoes a second compression leading to the formation of a heavy system (HS) . This picture evidences the interest of this photons as probes to study the dynamical evolution of the collision since their production is strongly influenced by processes inhibiting the formation a HS surviving the density oscillations. At intermediate energy the most interesting competing process is the dynamical multifragmentation of a fast expanding source. To study this interplay, a set of experiments has been performed at the Laboratori Nazionali del Sud with the Superconducting Cyclotron beams. High energy photons and IMF's have been detected in ^{58}Ni + ^{197}Au at 30A and 45A MeV reactions using the coupled MEDEAand MULTICS multidetector arrays. The experimental correlation factors between thermal photons and IMF's have been deduced, for both the incident energies, as a function of centrality. The observed trend is different: in the 30A MeV data the two nuclear species are always uncorrelated; in the 45A MeV data, instead, central collisions show a significant degree of anticorrelation when IMF's with small (around the nucleus-nucleus c.o.m.) parallel velocity are selected. This evidences that the emission of this subset of IMF's actually prevents the second compression. The dynamical character of such effect is supported by simulations of the collision dynamics. On the other hand, the lack of correlation in the 30A MeV data indicates that at this lower bombarding energy the bulk of fragment emission comes from statistical deexcitation of the HS.

First results on characterization of the MACISTE detector

D. Santonocito, G.Bellia, P.Finocchiaro, C.Agodi, R.Alba, L.Calabretta, R.Coniglione, L. Cosentino,.Del Zoppo, C.Maiolino, E.Migneco, P.Piattelli, D.Rifuggiato, P.Sapienza

The characteristics of gas ionization detectors as, e.g., their ability to localize particle trajectories to less than one millimeter even on a wide detection surface, their ease of operation and maintainance, their resonable cheapness along with the increasing interest in this kind of detectors tempted us to make use of the structure of the LNS User Support Service to build gas ionization position detectors, by following the design of the wire chambers of MACISTE. Two MACISTE telescopes, one of the old type and one of the new type, were assembled on their supports into the vacuum chamber for an in-beam testing comparison. The elastic scattering of a 40 MeV/amu ^{58}Ni beam, delivered by the LNS SCC, on a Au target was used to study the response functions of each stage of the telescopes. The signal from the cathode plane was used to measure the time of flight of the particles relative to the radiofrequency of the cyclotron and was also used to trigger the events. Time of flight information allowed to separate the elastic scattering events from the reactions. The impact point on the detector was determined by collecting the charge at both ends of each delay line. The preamplifier output signals were sent to a CFD discriminator whose output was used as a stop to a TDC started by the signal from the cathode. The sum of the left and right signals of the delay line represents the length of the wire chamber and it was used as a condition to select the events giving clean signals out of the detector. The impact point was then calculated only among the events fulfilling the previous condition. A rough preliminary analysis of the data from the two telescopes was performed. The first thing to be checked was the difference in the response of the two wire chambers. The comparison of the data between the two detectors shows no difference and therefore the newly built wire chambers perform correctly from both mechanical and electronic points of view. A rough calibration of the sum of the signals from both ends of the delay lines was performed and a resolution (FWHM) of about 3 mm in the x direction and about 5 mm in the y direction was deduced. The response of the drift chambers shows a dependence on the impact point in both x and y directions; this effect can be clearly observed in the E -vs-x and E -vs-y matrices, and it has been interpreted as due to a combination of charge recombination, space charge effects and non linearity of the electric field near the chamber edges. Similarly, a position dependence response was observed for the scintillation detector confirming a previous measurement of the response function of the scintillation detector; this dependence on the impact point is due to an incomplete light collection. The analysis is still in progress in order to deduce the full response functions of the three elements of each telescope.

Dilepton spectrometry with HADES

C.Agodi, G.Bellia, R.Coniglione, P.Finocchiaro, C.Maiolino, P.Piattell, P.Sapienza, D.Vassiliev, A.Bassi, R.Bassini, C.Boiano, S.Brambilla, I.Iori, A.Kugler, R.Pleskac, A.Taranenko, P.Tlusty, V.Wagner, M.Benovic, S.Hlavac, D.Zovinec for the HADES collaboration.

At energies around 1A GeV several authors have argued a possible partial chiral symmetry restoration, precursor of a new phase transition: from hadron matter to quark-gluon plasma and several models have been proposed and developed throughout the last years, in order to try to foresee the behaviour of hadronic matter at higher and higher temperature and density. The most frequently faced problem concerns the mass of mesons, mainly because their structure is intrinsically simpler than barions. Nearly all the proposed models do not foresee relevant variations in the mass of ð, ç and k, while concerning ñ, ù and ö the subject is somewhat intricate. As direct measurements of vector mesons are not possible, as their mean lifes are about 10^{-23} s, a possible alternative solution is to measure their decay products, in order to reconstruct the original mass by exploiting the invariant mass method. A decay channel, though extremely rare, consists of its transformation into a virtual photon which, in its turn, decays into an e^+e^- pair, which represents an ideal undisturbed probe with respect to their preferentially hadronic decay channels which information is washed out by the final state interaction. Nevertheless many different processes can lead to an e^+e^- pair in the final state, and these will represent a consistent background noise in the mass spectrum and these processes have therefore to be taken into account, if we want to extract significant informations from the measured data. The experiments so far performed shown the need an e^+e^- spectrometer with large geometrical acceptance and capable of operation at high counting rates, in order to achieve invariant mass and momentum resolution around 1%. This is the reason why the HADES (High Acceptance Di-Electron Spectrometer) collaboration has been formed, with the precise issue of studying hot and dense nuclear matter by exploiting the di-electron decay channel. An additional important entrance channel is represented by pion-nucleus collisions, and to this purpose a pion beam facility has been recently developed at GSI. The detector is made up of several cascaded detection systems in hexagonal symmetry. Moving along the same direction as the particles to be detected, there are respectively a ring imaging Cherenkov detector (RICH) allows to uniquely identify the leptons and accurately measure their emission direction; two layers of multi-drift chambers (MDC), followed by six superconducting solenoids, producing a toroidal field, and by other two layers of MDC: this system can determine with a very high precision the particle momenta, by measuring the trajectory displacement induced by the magnetic field within a position error of <100µm; a time of flight wall (TOF), made of 320 rods of BC408 scintillator, covering the polar angles between 44° and 88°, to measure the event-by-event multiplicity that is an indication of the centrality of the collision, and the time of flight and direction of each detected particle; a pre-shower detector (SHOWER), placed on the polar range 13°-45°, made of three gas chambers intermixed with two lead converter layers, in order to operate the lepton/hadron discrimination; in front of the SHOWER a 24- slab low-granularity tof wall (TOFINO) furtherly helps in lepton/hadron discrimination. Several tests and commissioning runs have been performed throughout last years, mainly using C beams at 1-2A GeV, finally showing that the spectrometer is capable of fulfilling all the design requirements.

Pre-equilibrium emission and cooperative effects in heavy ion reaction around the Fermi energy

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, N. Colonna , M. Bruno , M. D'Agostino ,P.F. Mastinu, F. Gramigna, I. Iori, L. Fabbietti, A. Moroni, G.V. Margagliotti , P.M. Milazzo, R. Rui , G. Vannini, Y. Blumenfeld, J. A.Scarpaci

The ^{58}Ni + ^{58}Ni reaction at 30A MeV was investigated at Laboratori Nazionali del Sud with the MEDEA and MULTICS apparatus. Energetic protons were detected in coincidence with photons, light charged particles (Z=1,2) (LCP) and intermediate and heavy fragments on an event by event basis. Protons with energy extending up to almost 20 % of the total available energy,namely much larger than expected by coupling the relative motion with a sharp nucleon Fermi momentum distribution (kinematical limit), were measured. We have also investigated the average proton multiplicity as a function of the number of partecipating nucleons A_{part} (b) and a striking behaviour with increasing proton energy is found. Indeed, the experimental proton multiplicity displays the expected linear dependence on A_{part} (b) for energy close to the kinematical limit (60 E_p^{NN} 80 MeV), while the multiplicity of extremely energetic protons (130 E_p^{NN} 150 MeV) exhibits an almost quadratic increase with A_{part} . The

comparison with dynamical calculations which include the momentum dependence in the effective potential shows that the features of the energetic proton emission are well reproduced up to 110 MeV while this approach fails to explain the almost quadratic dependence on the number of participant nucleons of the yield of very energetic protons (E_p^{NN} 130 MeV). So, the observed behaviour calls for the introduction of mechanisms beyond the mean field and two body nucleon-nucleon collisions such as cooperative effects. In conclusions, these results shed some light on the emission of extremely energetic protons and can improve the understanding of the mechanism responsible for deep subthreshold particle production. Moreover, the detailed comparison with dynamical calculations allows to get a deeper insight on the first non equilibrated stage of the reaction where the highest temperatures and densities are reached.

Multifragmentation and nuclear phase transition at intermediate and relativistic energies.

G.Immé, G.Raciti, G.Riccobene, A.Saija, C.Sfienti, G.Verde, N.Giudice and the ALADiN Collaboration.

The liquid-gas phase transition continues to act as a major motivation for studying multifragmentation processes in order to answer, in particular, the question of how fragments are formed and of identifying the dominant mechanisms. Break-up temperatures and excitation energies of the fragmenting system were measured and correlated in the resulting caloric curves. But temperatures and excitation energies are only two of the thermodynamical quantities of interest that characterize the break-up states. Among the other break-up parameters the density is of particular importance because an expansion to low density is a basic ingredient of the multifragmentation scenario. Low densities in agreement with model expectation were recently reported for spectator decays following 197Au on 197Au reactions at 1000 MeV per nucleon. Proton-proton correlations and correlations of p-alpha, d-alpha, and t-alpha from spectator decays have been measured with an highly efficient detector hodoscope (HODO-CT). In particular, we constructed correlation functions for pairs of particles detected at backward angles and we selected protons with E>20 MeV, so little affected by sequential feeding. Comparing the results with MonteCarlo simulations within the Koonin-Pratt interferometry formalism freeze-out radii of R=8 fm (larger than the ground state radii of target spectators) were deduced and emission times of ô=10-15 fm/c were surprisingly short. The results are found to be consistent with low breakup densities with values close to those assumed in the statistical multifragmentation models and short emission time differences with values close to those predicted for volume breakup. Because the times between the emission of protons result to be in the order of passing time of the projectile through the target, we cannot exclude that the protons come from the fireball, which grows with the centrality of the reaction, in agreement with the observed variation of the source extension with impact parameter. A reaction where the partners are diluting each other by scattering out the fireball nucleons would explain the large radii without substantial amount of expansion

Nuclear polymers and cluster states.

M. Lattuada, S. Romano, A. Tumino, D. Vinciguerra, O.Yu. Goryunov, M. Milin, D. Miljanic, A. Musumarra, V.V. Ostashko, N. Soic, C. Spitaleri

The study of deformed cluster configurations in light nuclei has been extended to the so called *nuclear polymers*, exotic chains made of á-particles bound by neutrons, which play the same role of valence particles as electrons do in atomic molecules. The existence of such structures is mainly due to the nature of the á – á potential which is attractive at large distances and shows a repulsive core at small distances as an effect of the Pauli principle. The valence neutrons are expected to increase the binding energy of an á chain and to stabilize it. An experiment was performed at the tandem accelerator of the Laboratori Nazionali del Sud , with the aim of studying such *polymeric* structures formed in the interaction of a 120 MeV ^{18}O beam on a ^{9}Be target. The analysis of data is still in progress.

Nuclear reactions in the astrophysical context and the electron screening effects.

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

The Trojan Horse Method (THM) allows the indirect measurement of nuclear reaction cross sections in the region of ultra low interaction energy (around the Gamow peak) that is typical of nuclear processes in the astrophysical context. The method has been applied to the experimental study of some nuclear processes relevant for the understanding of the element abundances in the universe. A set of experiments performed at the Laboratori Nazionali del Sud, at the Dynamitron Laboratorium of the Bochum University and at the Tandem Laboratory of the R. Boskovic Institute has allowed for the measurement of the astrophysical factors at zero interaction energy S(0). From the same experiments an evaluation of the screening potential due to the presence of atomic electrons has been deduced. Moreover a preliminary study has been recently performed on the production of a secondary ^{8}Li beam at the Laboratori Nazionali del Sud. It will be used to measure the cross section of the ^{4}He(^{8}Li,n)^{11}B reaction, that is a key process in the description of the synthesis of metals in the Inhomogeneous Big Bang Model.

Fusion cross section measurements in reaction induced by nuclei halo.

A.Di Pietro, P.Figuera, A.Musumarra, F.Amorini, G.Cardella, S.Cherubini, J.Lu, M.Papa, M.Pellegriti, F.Rizzo, S.Tudisco

Controversial effects on the fusion cross-section have been predicted by different theoretical models in reactions induced by halo nuclei at low bombarding energies. These models agree that the larger spatial extent of halo nuclei, and the coupling with possible low lying resonant states, would increase fusion cross-section. However different models disagree about the role played by the break-up of the loosely bound halo nucleons on the fusion cross-section. Break-up in fact can be considered either as a loss of flux for fusion decreasing the cross-section, or as an additional channel which enhances the cross-section. The systems studied so far are ^{6}He+^{209}Bi , ^{6}He+^{238}U, ^{11}Be+^{209}Bi . In these experiments controversial results were obtained. In the reactions induced by ^{6}He beams a strong enhancement of the fusion cross-section below the Coulomb barrier was observed but this was not seen in the ^{11}Be induced reaction. To try to resolve this controversy we recently studied at the CRC laboratory of Louvain la Neuve the reaction ^{6}He+^{64}Zn at 9.1 MeV end 12.4 MeV beam energies. To overcome the difficulty to detect directly the evaporation residues (E.R). produced in the fusion reactions because of their low recoil energies, the fusion cross section was measured through the off-line X-ray activity of the radioactive E.R. produced in the reaction. The reaction ^{6}He+^{64}Zn produces infact E.R. decaying by Electron Capture (E.C.) which then emit low energy X-rays that were measured by a Si(Li) detector surronded with a lead shield to suppress background.. The fusion excitation function was performed at fixed beam energy using the activation technique. As a comparison but also to check the normalisation procedure, the reaction ^{4}He+^{64}Zn was investigated at the same centre of mass energy.
Using an array of highly segmented large solid angle Silicon strip detectors with a total solid angle Ù 2ð and covering the angular range 0 ö 2ð and 5 ^{0} è 64 ^{0} and 120^{0} è 160 ^{0} , charged particles such as *p*, á and ^{6}He were detected. The elastic scattering angular distribution was measured at two beam energies and from it the total reaction cross-section was extracted. The results show that at the same centre of mass energies the total reaction cross-section is a factor of two higher for reactions induced by the halo nucleus ^{6}He than for the non-halo ^{4}He nucleus. The excitation function for fusion was measured for the ^{6}He+^{64}Zn and compared with ^{4}He+^{64}Zn. It seems that in the energy region explored in this experiment, no strong enhancement of the fusion cross-section is present. This results seems different than what previously found in other ^{6}He induced reactions, but in agreement with the results of the reaction induced by ^{11}Be.

Limiting excitation energy for GDR gamma decay.

S.Tudisco, G.Cardella, F.Amorini, A.Anzalone, A.Di Pietro, P.Figuera, F.Giustolisi, G.Lanzalone, A.Musumarra, J.Lu, M.Papa, S.Pirrone, F.Rizzo.

The region around 15 MeV in the ã-ray energy spectra produced in heavy ion reactions is dominated by the GDR decay. Indications on the GDR disappearance at excitation energy above 250 MeV were observed for systems around mass 110. The GDR disappearance is a signature of the loss of collectivity of the nuclear matter. Recently a connection between this disappearance and the liquid-gas phase transition of nuclear matter has been proposed. The limiting excitation energy (2.5 MeV/A) resulting from the used $E^{*}_{cut\text{-}off}$ seems too low with respect to the energy at which the phase transition is expected. However the statistical analysis performed up to now suffers from some inaccuracy. In fact the statistical code CASCADE used accounts only for neutron (n), proton (p) and á -particle decays. More complex fragments that can be evaporated at this high excitation energy are neglected. The main aim

of our work is to improve the reliability of the statistical calculations at high excitation energy in order to extract more precise information on the maximum excitation energy at which we still observe collective excitations in nuclear matter. We studied the systems ^{40}Ca+^{48}Ca,^{46}Ti at 25 A MeV. The experiment was performed at the Superconducting Cyclotron of the Laboratori Nazionali del Sud (LNS) Catania. We analysed the gamma spectra taken in coincidence with the evaporation residues produced in fusion-like reactions. The comparison of experimental spectra with theoretical predictions was obtained taking properly into account the bremsstrahung contribution and introducing in the CASCADE code the dependence of isospin and the Reisdorf parameterization for the level density. Moreover we added the deuteron decay channel to the CASCADE code because such particles have, for the investigated systems, an emission probability similar than -particles. From this comparison the extracted excitation energy per nucleon at which we still have GDR excitation is 4.6 MeV and 3.8 MeV respectively for ^{48}Ca and ^{46}Ti. They represents the lower limit energy at which a collective behavior persists. In fact, in case an increasing $\tilde{A}_{GDR}$ is assumed, a higher excitation energy (5.6 MeV/A for the ^{48}Ca target) is obtained.

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

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. CHIMERA is an array of 1192 telescopes, covering 94% of the total solid angle. Each telescope is made of a 300 mm thick silicon detector and a CsI(Tl) crystal coupled to a photodiode. Its shape and dimensions allow also TOF technique measurements and therefore a mass identification of the detected particles. During the 2000 the forward part of CHIMERA, made of 688 telescopes covering the polar angular range 1°-30° has been used in the CICLOPE vacuum chamber at the LNS of Catania in the mainframe of the REVERSE experiment, supported by an international collaboration of physicist from China, France, Poland and Rumenia. This experiment intend to study the multifragmentation, and the effect of the isospin degree of freedom on this mechanism, in some heavy ion collisions in reverse kinematics, (^{112,124}Sn + ^{58,64}Ni and ^{27}Al at 25 and 35 MeV/A), where the reaction products are focused in the forward direction, well covered by this part of the detector. Some of the proposed reaction have been performed and the experimental program will be completed in 2001. The performances claimed in the project presentation have been totally fulfilled, and the data analysis is now in progress.
All the remaining (504) modules and the related electronics have been acquired during 2000 and they will be mounted in the dedicated reaction chamber at LNS as soon as the relative beam line will be ready.

CICLOFUS Experiment

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

The CICLOFUS experiment is 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 cyclotron energies, i.e. 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, with a beam of ^{32}S on a ^{12}C target at 20 MeV/A, and in 2000 we submitted the results that are now in press. 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 are in a good agreement with the theoretical systematics. 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.In 2001 the experimental program will be completed with the study of the two reactions $^{28}Si + ^{12}C$ and $^{35}Cl + ^{12}C$ at 20 MeV/A.

AREA C : THEORETICAL PHYSICS

Theoretical physics of fundamental interactions

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 ö^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 ö^4 theories implies the scalar sector of the Standard model to be just an effective theory, i.e. valid up to some cutoff scale.Without a cutoff, 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 cutoff 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.

Models and phenomenology of unconventional superconductors

G. G. N. Angilella, R. Pucci and N. H. March (Oxford Univ.)

For unconventional heavy fermion superconductors, typified by UBe_{13}, the superconducting transition temperatures T_c have been shown to correlate with a characteristic energy $^2/m^*\xi^2$, m^* being the effective mass, and ξ the coherence length. For four of the six materials for which T_c, m^*, and ξ are available, $k_BT_c \approx 20\ ^2/(m^*\xi^2)$. One heavy fermion material, UPd_2Al_3, reveals a tendency for the above linear behavior to saturate at substantially larger $^2/(m^*\xi^2)$ than for UBe_{13}. The sixth material considered, URu_2Si_2, falls between UBe_{13} and UPd_2Al_3. To embrace *d*-wave pairing in cuprates, a log-log plot reveals that $k_BT_c \approx\ ^2/(m^*\xi^2)$, but more materials for which m^* and ξ are measured will be required to substantiate the correlation in these high-T_c substances.

Wilsonian Renormalization Group and flow equations

A. Bonanno, D. Zappalà

Some properties of the differential Renormalization Group equations, derived according to the blocking procedure originally introduced by Kadanoff and Wilson, have been investigated. Specifically, the dependence on the approximation scheme and on the infrared regulator employed has been studied. The critical exponents of the scalar theory in three dimensions at the non-gaussian fixed point have been numerically evaluated for a particular regulator introduced using the Schwinger proper time formalism and an excellent agreement with the epsilon-expansion determinations is found. The Renormalization Group equations of the linear sigma model of scalar mesons coupled to fermions have also been considered with particular attention to the wave-function renormalization of the meson fields.

Neutron star structure

M. Baldo G.F. Burgio and H.J. Schulze

The nuclear matter equation of state is the fundamental input for building models of neutron stars according to the Einstein's general theory of relativity. In fact typical properties like masses and radii depend strongly on the equation of state at densities 8-10 times larger than the nuclear matter saturation point. For this purpose we have developed a microscopic equation of state for nuclear matter using the Brueckner-Bethe-Goldstone many-body theory, including modern nucleonic two and three-body forces. If we assume a conventional description for the stellar core, e.g. mainly composed by nucleons and leptons, we find an upper limit for the mass equal to 1.8 solar masses and a radius of about 10 km, in good agreement with the observational data. However, at those high densities, strange particles like Σ^- and Λ may appear, leading to a softening of the equation of state. This decreases the value of the maximum mass to about 1.25 solar masses, below the observational data (1.44 solar masses). On one hand, this addresses the question of a complete, microscopic study of the three-body nucleonic forces. On the other hand, it calls for the need of more experimental data on the nucleon-hyperon and hyperon-hyperon interaction.

Hybrid stars structure

M. Baldo and G.F. Burgio

Neutron stars can reach values of the central densities up to 8-10 times normal nuclear matter density. Therefore quark matter can be present in the stellar core. Those stars are called hybrid stars. If we assume a description of quark matter in terms of a free Fermi gas according to the MIT bag model and exploiting the experimental data obtained at CERN on a possibile quark-gluon phase transition, we have calculated the maximum mass for those stars. This falls in a range between 1.5-1.6 solar masses, no matter how one describes the hadronic phase. Therefore, the existence of a star with larger mass (as claimed by some groups) could indicate that : a) quark-quark interaction plays an important role, hence disproving partially the MIT bag model; b) the correct theory for describing gravitation could not be the general theory of relativity.

Nuclear matter hole spectral function in the Bethe-Brueckner-Goldstone approach.

M. Baldo and L. Lo Monaco

The hole spectral function is calculated in nuclear matter to assess the relevance of nucleon-nucleon short range correlations. The calculation is carried out within the Brueckner scheme of many-body theory 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. Another conclusion is that the momentum dependence of the G-matrix should be taken into account in any self consistent approach.

Average energy of quark matter in a cluster mode.

D. M. Brink (Oxford Univ.)and L. Lo Monaco

The idea is to calculate the mean energy of quark matter where the quarks are collected into white-colour clusters by using a model analogous to the alpha particle model of light nuclei. We have a number of sites and 3 quarks on each site with the same orbital wave-function and some colour-flavour wave function. If the nucleons are quark clusters there should be no exchange between them at large distance and no divergence in the colour potential at large distances.

Dynamics and statistical mechanics of a system with long-range forces

V. Latora, A. Rapisarda and S. Ruffo (Univ. Firenze)

In the framework of the Hamiltonian Mean Field model, a model of classical fully coupled spins, we have studied the connection between microscopic chaotic dynamics and second-order macroscopic phase transition. A direct link between the Lyapunov exponent and the Kolmogorov-Sinai entropy with the fluctuations in kinetic energy has been found. The model has been studied in detail both analytically and numerically and very general features have been found. A very slow relaxation to equilibrium and the existence of quasi-stationary states has been found . In correspondence one gets also superdiffusion and Lèvy walks. This very interesting effect is sensitive on the size of the system. The cross-over time from anomalous to normal diffusion corresponds to the equilibration time.

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 we also 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. The first paper on the subject is in press on Physical Review E.

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.

Boltzmann entropy and Kolmogorov-Sinai entropy

V. Latora and M. Baranger (MIT, Usa)

It has been studied the relationship between the entropy for a thermodynamical system S (the one of Boltzmann and Clausius) and the Kolmogorov-Sinai entropy K used for dynamical systems, which measures the degree of chaoticity of a system. We have found that the linear rate of increase with time of S gives exactly K for conservative systems. A first paper has been published in Physical Review Letters in 1999 and a second one is in progress.

Non-estensive thermodynamics and the logistic map at the edge of chaos

V. Latora, A.Rapisarda, M. Baranger (MIT, Usa) and C. Tsallis (CBPF Brazil)

We have studied the connection between the Boltzmann entropy and the Kolmogorov-Sinai one for dissipative maps, extending a formalism already found in conservative systems. We have also applied with success the nonextensive Tsallis entropy to the logistic map at the edge of chaos, i.e. at the critical point between order and chaos. Our results confirm the importance of the nonextensive formalism for systems with fractal phase space and long-range correlations.

Diffusion in chaotic systems with low dimensionality

A. Rapisarda, M. Robnik (Maribor, Slovenia) and T. Prozen (Ljubliana, Slovenia)

Diffusion in strongly chaotic systems with low dimensionality has been investigated. The numerical dyanmical simulations for strong chaos have been compared with success with a probabilistic model. We have also been working on a model to describe diffusion in the case of a mixed (regular and chaotic) regime.

Small-World Networks

V. Latora and M. Marchiori (W3 and MIT, Usa)

The connection topology of many biological, technological and social networks is neither completely regular nor completely random. These networks are named small-worlds. We have formulated a new theory of small-worlds based on the concept of efficiency in theinformation transport over the network. Our formalism is valid both for topological (unweighted) and metrical (weighted) networks, and can be applied to all such systems where the the physical distance between points is of fundamental importance. We have published a first paper and a second one with new applications to real neural systems, communications and transport networks has been submitted to PRL.

Time Series Analysis and Modeling of Geophysical Systems

V. Latora, A. Rapisarda and S. Vinciguerra (UCL London)

Critical behavior are ubiquitous in nature and the geophysical systems are systems where chaos, fractals and dynamical aspects are very important. Since few years we have a close collaboration with a group of geophysicists. This year we have published a new paper on the clustering properties of seismic data sets of Mt. Etna Volcano (Italy).

Study of DNA Sequences

V. Latora and P. Grigolini (Univ of North Texas, USA)

DNA can be considered as a long message written in a 4-letters alphabet. By using a new entropic method we are studying the information contained in this message, the regularities and its statistical properties. A first paper has been recently submitted for publication.

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.

Variational methods in field theory and condensed matter: mass and ground state of the Higgs boson

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. The possible existence of Higgs-Higgs bound states is explored using the variational method. Within the conventional scenario, where a not-too-large cutoff is invoked to avoid ``triviality," we find, as usual, an upperbound on the Higgs mass. Bound-state solutions are only found in the very strong coupling regime, but at the same time a relatively small physical mass is required as a consequence of renormalization. For d=3 the results are relevant in the framework of the Ginzburg-Landau description of superconductivity in presence of the electromagnetic field.

Nontrivial extension of the Higgs model and molecular ordering

F.Siringo

A recently proposed molecular model is discussed as a non-trivial extension of the Ising model. For d=2 the two models are shown to be equivalent, while for d>2 the molecular model describes a peculiar second order transition from an isotropic high temperature phase to a low-dimensional anisotropic low temperature state. The general mean field analysis is compared with the results achieved by a variational Migdal-Kadanoff real space renormalization group method and by standard Monte Carlo sampling for d=3. By finite size scaling the critical exponent has been found to be equal to 0.44, thus establishing that the molecular model does not belong to the universality class of the Ising model for d>2.

Extension of RPA

F.Catara, M.Grasso and M.Sambataro

In the last few years we have studied possible extensions of RPA. One such extension is based on the equations of motion method but avoiding the Quasi Boson Approximation used in deriving the RPA equations. This method, as other extensions of RPA, presents the problem that it violates the Energy Weighted Sum Rules. We have shown that this problem can be eliminated by enlarging the space of the elementary modes beyond the the particle-hole ones. This enlarged version of the approach has been applied to a solvable 3-level model. Work is in progress in order to apply it to realistic nuclei.

Multiphoton excitations in heavy ion collisions

F.Catara and E.G.Lanza

Recently heavy ion inelastic scattering experiments have clearly shown the existence of states in the high excitation energy region of states which can be descrbed as a Giant Resonance (GR) built on top of another GR. The systematics on the energies and widths is in qualitative agreement with the harmonic picture. However, the inelastic cross sections are almost always smaller than the measured ones, the discrepancy ranging from 30% up to a factor 2. In order to eliminate this discrepancy, corrections to the harmonic approximation have been included, like anharmonicities in the internal hamiltonian and non-linearities in the external field. Good agreement with the experimental Coulomb excitation cross section for the ^{208}Pb+^{208}Pb system has been found.

A new class of phonon operators for RPA-like calculations

M. Sambataro

We have investigated the use of a phonon operator different from the standard RPA one. As a major feature, this new phonon operator has a vacuum carrying only a limited number particle-hole excitations and so with a form well different from the exponential one of RPA. In addition, multiphonon excitations have a particle-hole structure never exceeding in complexity that of this vacuum, no matter how large is the number of phonons involved. We have examined advantages and disadvantages of using this new form of phonon operator in two cases: the standard two-

level Lipkin model and the Na_8 metal cluster. In both cases we have made comparisons between exact and approximate calculations.

Transverse Flow

A. Insolia

Exclusive transverse flow in Au + Au reactions, has been calculated within the BNV transport model with a momentum dependent microscopic mean field + phase space coalescence model. The results have been compared with the data from the EOS experiment, taken at LBNL Bevalac. The mean field has been obtained in the framework of the Brueckner theory up to the third order in the G - matrix. The calculated exclusive flow for protons, deuterons and alphas follow the observed experimental trend versus the energy and the fragment mass.

Nuclear Dynamics under extreme conditions and effective interactions

V. Baran , L. Bo (IHEP Beijing), A. Bonasera , M. Cabibbo, M. Colonna, M. Di Toro, V. Greco , U. Lombardo , S. Maccarone , T. Maruyama (JAERI Japan), S. Terranova

The aim is to develop new trends in nuclear dynamics of large interdisciplinary interest, like the competition between regular and chaotic motion in correlated systems, the nuclear collective response in stable and unstable regions, the thermodynamics of finite systems, the nuclear equation of state under extreme isospin and density conditions and related compact star problems. Of course the starting point is the problem of the effective nuclear interactions in the medium, in non-relativistic and relativistic approaches. In the last year some attention has been also focussed on the transition to a deconfined nuclear matter, in particular at high baryon densities. At the same time a great effort is put in maintaining always a close connection to experimental groups, not only at the LNS. In particular we note the nice results obtained in the last year working with the collaborations Medea-Multics, Chimera and Trasma at the LNS, Indra at Ganil and Miniball at MSU. Some members are also actively participating in NuPeCC working groups, in particular in the discussion of the new European Radioactive Beam Facilities.
In the following the main results obtained in the last year are listed:
1) *Hot nuclei.*
- Formation: entrance channel effects, in particular charge and mass symmetry; The Dynamical Dipole.
- Hot collective response. Possibility of the observation of a transition zero-to-first sound.

2) *Nuclear fragmentation and liquid-gas phase transition.*
- Dynamical mechanisms based on the spinodal decomposition
- Mid-rapidity emissions and neck instabilities
- Fluctuations in transport approaches
- Critical phenomena in finite systems
- Chaos in quantum field theories
- Volume and shape instabilities: quantum vs semiclassical predictions

3) *Asymmetric nuclear matter.*
- Collective response and new mechanical plus chemical instabilities
- Density dependence of the symmetry term: critical observables in fragmentation and collective flows
- Nucleon-Nucleon cross sections in nuclear matter
- Pairing correlations in dilute asymmetric NM
- Microscopic approaches and predictions for stellar evolution and neutron star properties
- Effective Field Theories: the role of Fock terms on the symmetry energy

4) *Quark-Gluon Plasma and Chiral Symmetry Restoration*
- In medium meson modifications
- Color molecular dynamics for high baryon density matter
- Relativistic hadron and string cascade models
- Hadronization features: bag models and kinetic approaches

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.

AREA D : SOLID STATE PHYSICS

Si based optoelectronics

G. Franzò, M.G. Grimaldi, F. Iacona, F. Mammoliti, G. Mannino, S. Mirabella, E. Moreira, F. Priolo, S. Privitera, V. Privitera, M. Re, E. Rimini, S. Scalese, C. Spinella, A. Terrasi, V. Vinciguerra

The research on the Si-based optoelectronics has been focused on the study of structural, electrical and optical properties of epitaxial Si films doped with Er and O, grown by MBE. The O/Er ratio has been varied in the range 0-20, showing as this parameter is the main responsible for the electrical and optical response of the material. In particular has been demonstrated that a ratio O/Er = 6 produces the highest photoluminescence signal at 1.54 μm at low temperatures (18 K), while for room temperature the best signal is obtained for O/Er = 2.
The optoelectronics activity has also regarded the light emission from Si nanocrystals embedded into SiO_2 matrix, doped with Er. It has been shown that these nanostructures strongly emit around 800 nm because of the quantum confinement. Moreover, nanocrystals prepared by ion implantation have shown for the first time optical gain, which is one of the technical need for the fabrication a Si-based laser. Si nanocrystals have also been fabricated by high temperature thermal annealing of Si/SiO_2 super-lattices. The introduction of Er in the Si nanostructures causes a preferential energy transfer from Si to the Er ion, with the consequent light emission at 1.54 μm. This emission is two orders of magnitudes higher than that observed in SiO_2 doped with Er, being a very promising results for the fabrication of optical amplifiers.

SiGe alloys grown by MBE

Epitaxial $Si_{1-x}Ge_x$ films have been grown by Molecular Beam Epitaxy, with $0<x<0.3$ and thickness in the range of 50 to 800 nm. These films are strained if grown under appropriate conditions, but a post-growth thermal annealing can induce a partial or total release of the stress by the introduction of misfit dislocations. The relaxation of SiGe films have been studied as a function of several parameters, giving evidence of the role played by the substrate temperature during the SiGe deposition. In fact, sample deposited at 350 °C show a step-like relaxation with respect to samples deposited at 550 °C. The mechanism of relaxation in this case has not been yet clarified and further investigations will be necessary.
Another important research based on MBE SiGe layers has been performed in collaboration with the STMicroelectronics concerning the HBT (Heterojunction Bipolar Transistors). In this contest, SiGe layers have been deposited on micro-patterned 6 inches Si wafers, showing the great capability of our MBE system to growth good quality material also for practical industrial applications. Boron doped SiGe has also been deposited for the base region of a real HBT device, and the first attempt to fabricate a working HBT has been done with very promising results. Finally, studies on the thermal oxidation of SiGe alloys by RTO (Rapid Thermal Oxidation) have been performed, showing the unexpected formation of mixed oxides (SiO_2 + GeO_2) and the enhancement of the oxidation rate due to the presence of Ge.

Electrochromic Thin Films

A.Pennisi, F.Simone

Thin films electrodes of transition metals oxides having electrochromic properties , typically Vanadium, Nickel and Tungsten oxides, have been prepared and characterized in order to improve coloration efficiency and to get a rapid kinetic of ion insertion, when the electrodes are interfaced with a polymeric electrolite with opportune salts inserted. Chemical composition and morphology have been analyzed as a function of depostion parameters while electrochromic performances have been tested by cyclic voltammetry.

Cluster Physics

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

1) We studied the initial phases of Co precipitation in Ag, corresponding to lower Co concentrations, where smaller clusters start forming. We have recently initiated a study of the dose dependence of the different sites taken up by Co in Ag, starting from 0.05 at.% corresponding to a reference situation where essentially the substitutional site is populated. 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. The latter observation deserved a deeper investigation. At the intermediate concentration range, around 0.5 at. %, 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 is of paramount importance.
A major challenge in this study consists in preparing a sample with a sufficiently high areal density of dimers. At the somewhat larger concentration range, we performed a full structural characterization of the nano-clusters in terms of the mean coordination number and nearest neighbor distances, in view of unraveling the interface structure as well as the crystal structure. Recent N.M.R. results on Co clusters in Ag point towards a h.c.p. structure, while there is also conflicting evidence favouring the f.c.c. structure. At the same time, we complemented the few (because of the very long times involved) experimental Θ_D(Co$\underline{Ag}$) values and compared them to theoretical values which we could recently obtain in M.D. calculations. One of our goals was also to compare both the structural and dynamical information for this case of ion implanted samples to that of samples prepared by co-sputtering, where we observed important differences in the interface quality and therefore in the Θ_D values.

2) We also reported 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.

Amorphous and crystalline Silicon Carbide

G. Foti, P. Baeri L. Calcagno, R. Reitano, P. Musumeci.

1. Amorphous Silicon-Carbon alloys
Amorphous Silicon-Carbon alloys has attracted a great deal of attention due to the possibility of tayloring the physical properties to specific needs by varying the alloy concentration. Indeed, both electrical transport properties and optical properties vary greately throughout the composition range. In particular, the possibility of fabbricating light emitting devices from the near infrared to the green-blue seems promising.
We studied the properties of these alloys deposited by Plasma Enhanced Chemical Vapour Deposition in the carbon concentration range 0 -0.65. Vibrational (IR and Raman) and nuclear (RBS and ERDA) spectroscopies and luminescence (CW and time resolved) has been employed for the characterization. The effect of ion irradiation and of thermal annealing have been used as tools for the control of defect concentration and relaxation state of the material.

2. Crystalline Silicon Carbide
Silicon Carbide is by now the most promising large gap semiconducting material for high power and high temperature electronic aplllications. Nevertheless, many material issues are still to be solved. In particular, we have studied the formation of ohmic and rectifying contacts on 6H-SiC. Also, we explored the possibility of etero-epitaxy on silicon from possible integration of silicon carbide based devices with silicon electronics. The formation and characterization of point defects by ion irradiation has been started and will continue in the future.

AREA E : ASTROPHYSICS

Solar and stellar magnetic activity

Belvedere G., Busà I., Contarino L., Lanzafame A., Marino G., Paternò L., Rodonò M. , Romano, Zappalà R.A., Zuccarello F.

This is the traditional research line of the former Institute of Astronomy, 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.

This research activity is done in collaboration with the universities of Cambridge (UK), Moscow (Russia),Potsdam (Germany), Strathclyde (UK), Utrecht (Nederlands), Yale (Usa), Padua (Italy) and OAC, VLBI, ESA, JOSO.

Chemically peculiar stars

Catalano F., Marino E.

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:
1) 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.
2) Study of the infrared variability of CP-stars.
3) Analysis of high resolution spectra of CP-stars, and determination of abundances and photospheric parameters through atmospheric models.
4) 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.

This research activity is done in collaboration with the universities of San Juan (Argentina), Strasbourg (France)and OAC.

Structure and dynamics of the solar interior by means of helioseismology

Bonanno A., Paternò L.

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:

1) 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.
2) Developing numerical codes for data inversion, both 1-D (sound speed, density, helium abundance) and 2-D (rotation).
3) Study of relativistic effects on oscillation frequencies. These effects could be important, since the level of precision of frequency measurements is quite high.

This research activity is done in collaboration with the universities of Saclay (France), Warsaw (Poland), Yale (Usa), Roma *Tor Vergata* (Italy) Pisa (Italy) , OAC and GONG.

Nuclear Astrophysics

Cassaro P., Costa V., Pizzone G.R. , Zappalà A.R.

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.
This research activity is done in collaboration with LNS-INFN Catania (Italy).

Accretion disks onto collapsed objects

Belvedere G., Lanzafame G.

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.
This research activity is done in collaboration with the universities of Kobe (Japan), Bangalore (India), Palermo (Italy), and LNS-INFN Catania (Italy).

Filaments and clusters of galaxies in N-body simulations.

V. Antonuccio, U. Becciani

Significant improvements in the parallel efficiency of our cosmological N-body code (FLY) have allowed us to perform numerical simulations of the formation of the Large Scale structure of the Universe with unprecedented dynamical range. Our simulations confirm the scnario where Clusters of galaxies form at the intersection of very long filaments of matter. The latter have tunred out to possess a coherent structure also in phase space. This demonstrates the role of large-scale tidal fields in determining the structural properties of dark matter halos within clusters. This work was conducted in collaboration with the Theoretical Atrophysics Center (TAC, Copenhagen, Denmark) and with the Royal Observatory Edinburgh (Scotland, UK).

Study of minor bodies in the solar system

Blanco C.

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. This research activity is done in collaboration with OAC.

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")
- Noto 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

- E. Napolitani, A. Carnera, R. Storti, V. Privitera, F. Priolo, G. Mannino, S. Moffatt
  Depth Profiling of Utra-Shallow B Implants in Silicon Using a Magnetic-Sector SIMS Instrument
  J. Vacuum Science and Technol. B18, (2000) 519.

- E. Schroer, V. Privitera, F. Priolo, E. Napolitani, A. Carnera, S. Moffat
  Clustering of Ultra-Low Energy Implanted Boron in Silicon during Activation Annealing;
  Materials Science and Eng. B 71, (2000) 219

- E. Schroer, V. Privitera, F. Priolo, E. Napolitani, A. Carnera, S. Moffatt
  Transient Enhanced Diffusion of Ultra-Low-Energy Implanted Boron in Silicon: The Localization of the Source;
  Appl. Phys. Lett. 76, (2000) 3058

- V. Privitera, E. Schroer, F. Priolo, E. Napolitani, A. Carnera
  Electrical Behavior of Ultra-Low-Energy Implanted Boron in Silicon;
  J. Appl. Phys. 88, (2000) 1299

- E. Schroer, V. Privitera, F. Priolo, E. Napolitani, A. Carnera
  Activation Annealing of Ultra-Low Energy Implanted Boron in Silicon: A Study Combining Experiment and Process Modelling
  Materials Science in Semicond. Processing 3, (2000) 303

- C.Spinella, S.Coffa, C.Bongiorno, S.Pannitteri, M.G.Grimaldi
  Origin and perspectives of the 1.54 mm luminescence from ion beam synthesized b-FeSi2 precipitates in Si
  Applied Physics Letters, 76, (2000) 173

- A.Alberti, F.La Via, M.G.Grimaldi, S.Ravesi
  Effect of lateral dimension scaling on the thermal stability of thin CoSi2 layers reacted on polycrystalline silicon
  J.Vac.Sci.Technol. B18, (2000) 717

- F.La Via, V.Raineri, M.G.Grimaldi, L.Miglio, M.Iannuzzi, F.Marabelli, S.Bocelli, S.Santucci, R.Phani
  Role of the substrate in the C49-C54 transformation of TiSi2
  J.Vac.Sci.Technol. B18, (2000) 721

- F.La Via, S.Privitera, M.G.Grimaldi, E.Rimini, S.Quilici, F.Meinardi
  Determination of the C54 nucleation site density in narrow stripes by sheet resistance measurements and m-Raman spectroscopy
  Microelectronic Engineering 50, (2000) 139

- S.Privitera, F.La Via, C.Spinella, S.Quilici, A.Borghesi, F.Meinardi, M.G.Grimaldi, E.Rimini
  Nucleation and growth of C54 grains into C49 TiSi2 thin films monitored by micro Raman imaging
  J. of Appl. Phys. 88, (2000) 7013

- M.G.Grimaldi, S.Coffa, C.Spinella
  Ion beam synthesized b-FeSi2 precipitates in Si: Structural characterization and origin of the 1.54 mm luminescence
  Silicide:fundamentals and applications, World Scientific, Singapore (2000), Science and Culture series. Pg.93

- S.O. Troja and R.G. Roberts,
  Luminescence dating,
  Modern Analytical Methods in Art and Archaeolog , John Wiley & Sons Inc., New York, Ch.18, 585

- S.O. Troja, E. Egger, P. Francescon, A.M. Gueli, A. Kacpereck, M. Coco, R. Musmeci, A. Pedalino

2D and 3D dose distribution determination in proton beam radiotherapy with GafChromicÔ film detectors
Technology and Health Care, IOS Press, THC193, 8, 1-10

- S.O. Troja, C. Amore, G. Barbagallo, G. Burrafato, R. Forzese, F. Geremia, A.M. Gueli, F. Marzo, D. Pirnaci M. Russo, E. Turrisi
  Optically Stimulated Luminescence Dating of sediments
  Nuclear and Condensed Matter Physics, AIP Press, CP513, 409.

- S.O.Troja, G.Barbagallo, M.P.Di Mauro, A.M.Gueli, F.Marzo, D.Pirnaci
  Calibration and inter-calibration of sources used for artificial irradiation in TL and OSL dating
  Proceedings of 2nd International Congress on "Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin", Paris, 307.

- S.O.Troja, F.Foti, A.M.Gueli, C.Guzzone, V. La Rosa, A.Le Maresquier, R.Panvini
  TL dating of prehistoric pottery from Milena (Sicily)
  Proceedings of 2nd International Congress on "Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin", Paris, 295.

- S.O.Troja, G.Barbagallo, M.P.Di Mauro, A.M.Gueli, F.Marzo, D.Pirnaci
  Dating of architectonic structures of the old Calispera church (Contrada Contesse, Messina)
  Proceedings of 2nd International Congress on "Science and technology for the safeguard of Cultural Heritage in the Mediterranean Basin", Paris, 301.

- S.O. Troja, A.M. Gueli, M.P. Di Mauro
  Datazione mediante luminescenza stimolata
  Atti della Giornata di Studio su "Manufatti di interesse archeologico ed artistico: Tecniche fisiche applicate alle problematiche del settore", xerografato presso Centro Siciliano per le Ricerche Atmosferiche e di Fisica dell'Ambiente (C.S.R.A.F.A.) a cura di G.Mondio

- A.Biagi, N.Giudice, G.Immé, D.Morelli, S.Urso
  Radon as tracer of diffusive motions in atmosphere
  Nuclear and Condensed Matter Physics" 513, 2000, p.34 Ed. American Institute of Physics 2000.

- G.V.Russo, U.Becciani, L.Caponetto, C.Caligiore, L.Lo Nigro, D.Lo Presti, S.Panebianco, L.Pappalardo,C.Petta, N.Randazzo. S.Reito, M.Russo
  Smart Reodout of Silicon Drift Detector using ON-LINE Fuzzy Logic
  Nucl. Instr. & Meth. A 443 (2000) 478

- 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.P.Romano, L.Pappalardo, A.Carastro
  The X-ray microbeam spectrometer of LNS-Catania
  Proceedings of "2nd International Congress on science and technology for the safeguard of cultural heritage in the mediterranean basin", Parigi 5-9 Luglio 1999, Ed. Elsevier, Vol. 1, pp. 659-660, 2000.

- L.Pappalardo, F.P.Romano, J. De Sanoit
  Black gloss characterization of Greek Attic pottery carried out by means of the new non destructive PIXE-alpha portable system
  Proceedings of "2nd International Congress on science and technology for the safeguard of cultural heritage in the mediterranean basin", Parigi 5-9 Luglio 1999, Ed. Elsevier, Vol. 1, pp. 661-663, 2000.

- M.G. Branciforti, S. Garraffo, L. Pappalardo, F.P. Romano, S. Santangelo, A.Taormina
  Recenti applicazioni del microfascio X del laboratorio LANDIS/INFN nel settore dei beni archeologici
  Bollettino dell'Accademia Gioenia di Scienze Naturali, Vol. 33, n. 358, pp. 15-34, 2000.

- C. Aurisicchio, S. Nunziante Cesaro, G. Pappalardo, L. Pappalardo, F.P. Romano.
  Analisi non distruttiva di un minerale di berillio mediante il sistema PIXE-alfa, XRF e microfascio X del LANDIS
  Bollettino dell'Accademia Gioenia di Scienze Naturali, Vol. 33, n. 358, pp. 5-14, 2000.

- A.Carastro, L. Pappalardo, F.P.Romano
  Protocolli di indagine con tecniche non distruttive sulla composizione di canne di antichi Organi della Sicilia
  Bollettino dell'Accademia Gioenia di Scienze Naturali, Vol. 33, n. 357, pp. 165-173, 2000.

- G. Pappalardo, M. Bicchieri, C. Giuliani, L. Pappalardo, F.P.Romano
  Il Sistema PIXE- in una ricognizione "IN SITU" su un dipinto attribuito al Botticelli
  Bollettino dell'Accademia Gioenia di Scienze Naturali, Vol. 33, n. 357, pp. 415-420, 2000.

- M. Bicchieri, G. Pappalardo, L. Pappalardo, F.P. Romano, P.A. Russo, A. Sodo.
  Raman and PIXE analysis of Salerno EXULTET
  Qvinio, International Journal on the History and Conservation of the Book, Vol.2, pp. 233-240, 2000.

Publications in EXPERIMENTAL NUCLEAR AND PARTICLE PHYSICS

- S.Aiello, A.Anzalone, C.Cali', G.Cardella, Sl. Cavallaro, E. De Filippo, S.Femino', E.Geraci, M.Geraci, F.Giustolisi, A. Grzeszczuk, P.Guazzoni, C.M.Iacono Manno, G.Lanzalone, G.Lanzano', S.LoNigro, D.Mahboub, D.Nicotra, T.Paduszynski, A.Pagano, M.Papa, S.Pirrone, G.Politi, F.Porto, C.Rapicavoli, S.Sambataro, M.L. Sperduto, C.Sutera, L.Zetta, W.Zipper.
  Status and perspectives of the 4ð charged particles multidetector chimera
  Acta Physica Polonica B31, (2000), 1489.

- S. Aiello, M.Alderighi, A. Anzalone, M. Bartolucci, M.G. Campisi, G. Cardella, Sl. Cavallaro, E. De Filippo, S.Femino', E. Geraci, M.Geraci, F.Giustolisi, A.Greco, P. Guazzoni, M. Iacono-Mannno, G. Lanzalone, G. Lanzano', S. LoNigro, G.Manfredi, A. Pagano, M. Papa, S. Pirrone, G. Politi, F. Porto, D.Salvadori, S. Sambataro, G.Sechi, M.L. Sperduto, C.Sutera, L. Zetta.
  The enhanced data acquisition system for the 4ð detector chimera
  IEEE Trans. on Nucl. Sc. 47 (2000) 114.

- S. Aiello, M.Alderighi, A. Anzalone, M. Bartolucci, G. Cardella, Sl. Cavallaro, E. De Filippo, S.Femino', E. Geraci, M.Geraci, F. Giustolisi, A.Greco, P. Guazzoni, M. Iacono Manno, G. Lanzalone, G. Lanzano', S. Lo Nigro, G.Manfredi, A. Pagano, M. Papa, S. Pirrone, G. Politi, F. Porto, D.Salvadori, S. Sambataro, G.Sechi, M.L. Sperduto, C.Sutera, L. Zetta.
  The on-line computational and control system for the 4ð detector chimera
  IEEE Trans. on Nucl. Sc. 47 (2000) 196.

- G. Politi for the REVERSE Collaboration
  Reverse: the first experiment with the chimera detector
  Proc. of Conf.," Bologna 2000 Structure of the nucleus at the dawn of the century", Bologna , Italy, 29 May 3 June 2000, World Scientific (2001) in press.

- M.Alderighi for the CHIMERA Collaboration
  Preattentive neural system for the analysis for nuclear physics experiments
  IEEE_NPSS Real Time Conference RT2001, Valencia 4-8 June 2001.

- M.Alderighi for the CHIMERA Collaboration
  A novel approach to the classification of multidetector array data
  IEEE Nuclear Science Symposium and Medicla Imaging Conference, Lione, France, 15-20 Oct 2000

- V.Bonvicini, L.Busso, P.Giubellino, A.Gregorio, M.Idzik, A.Kolojvary, L.M. Montano, D.Nouais, C.Petta, N. Randazzo, A.Ravesky, S.Reito, F.Tosello, A.Vacchi, L.Vinogradov, N.Zampa.
  Laboratory and test beam result from a large area silicon drift detector
  Nuclear Instruments and Methods, A 439, 2000, pp. 476.

- V.Bonvicini, P.Giubellino, M.Idzik, A.Kolojvary, L.M. Montano, D.Nouais, C.Petta, N.Randazzo, A.Ravesky, S.Reito, F.Tosello, A.Vacchi
  Beam test of very large area linear silicon drift detector
  Nuclear Instruments and Methods (2001) in press.

- M.Papa, F.Amorini, G.Cardella, M.Cavallaro, P.Figuera, A.Musumarra, G.Pappalardo, F.Rizzo, S.Romano, S.Tudisco, B.Heusch, Wang Qi, Si Songlin, Lu Jun, Tian Wendong, Hu Pengyu.
  Fluctuations in the excitation functions of dissipative collisions induced on the 27Al+27Al system in the laboratory energy range 114.2-123 MeV
  Phys.Rev. C 61 (2000) 044614.

- F.Amorini, G.Cardella, A.Di Pietro, P.Figuera, G.Lanzalone, Lu Jun, A.Musumarra, M.Papa, G.Pappalardo, S.Pirrone, F.Rizzo, S.Tudisco.
  New results on preequilibrium gamma ray emission and GDR saturation on reactions at 25 AMeV.
  Proc.of Conf. Bologna2000 - Structure of the Nucleus at the Dawn of the Century Bologna, Italy, May 29 - June 3, 2000, ed. by M.Bruno, World Scientific (2001) in press.

- Lu Jun, F.Amorini, G.Cardella, A.Di Pietro, P.Figuera, A.Musumarra, M.Papa, G.Pappalardo, F.Rizzo, S.Tudisco.
  A simple pulse shape discrimination method applied to silicon strip detector.
  Proc.of Conf. Bologna2000 - Structure of the Nucleus at the Dawn of the Centuryî. Bologna, Italy, May 29 - June 3, 2000, ed. by M.Bruno, World Scientific (2001) in press.

- F.Amorini, G.Cardella, A.Di Pietro, P.Figuera, G.Lanzalone, Lu Jun, A.Musumarra, M.Papa, G.Pappalardo, S.Pirrone, F.Rizzo, S.Tudisco.
  Preequilibrium gamma ray emission and GDR saturation at high excitation energy: new results on reactions at 25 MeV/A.
  Proc.of the 9th International Conference on Nuclear Reaction Mechanisms. Varenna, Italy, 5-9 June 2000 ed. by E.Gadioli, Ricerca Scientifica ed Educazione Permanente, N.115, p.427.

- C. Spitaleri, M. Aliotta, P. Figuera, M. Lattuada, R.G. Pizzone, S. Romano, A. Tumino, C. Rolfs, L. Gialanella,F. Strieder, S. Cherubini, A. Musumarra, D. Miljanic, S. Typel, H. Wolter,
  The á-^{12}C scattering studied via the Trojan-Horse method
  The European Physical Journal A 7 (2000) 181.

- M. Aliotta, C. Spitaleri, M. Lattuada, A. Musumarra, R.G. Pizzone, A. Tumino, C. Rolfs, F. Strieder
  Improved information on electron screening in ^{7}Li(p, á)^{4}He using the Trojan Horse method
  The European Physical Journal A 9 (2000) 435.

- 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*(á)^{15}O reaction
  Nucl. Phys A 688(2001) 134

- 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 $^{15}O(á,á)^{19}Ne$ reaction using a ^{18}Ne radioactive beam
  Nucl. Phys. A 688 (2001) 465

- 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 $^{2}H(^{6}Li,á)^{4}He$ 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 á–^{12}C radiative caprture process and the Trojan Horse Method
  Nucl. Phys. A 688 (2001) 543

- 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 $^{7}Li(p\ ,á)á$ reaction
  Astroph. Journ. (2001), in press

- 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 informations on the $^{2}H(^{6}Li,á)^{4}He$ reaction extracted via the Trojan Horse Method
  Phys. Rev. C (2001) , in press

- Tumino, M. Lattuada, S. Romano, C. Spitaleri, D. Vinciguerra, Z. Bazrak, O.Yu Goryunov, V.V. Ostasko, S. Szilner, P. Figuera, C. Petta, N. Randazzo, G.V.Russo, S.Tudisco
  Evidence for shape isomeric states in ^{24}Mg at high excitation energy
  Proceedings of the VII Intern. Conf. on Nucleus Nucleus Collisions, July 3-7 2000, Strasbourg, France (2001) in press.

- A.Musumarra, M.Aliotta, S. Blagus, M. Bogovac, S. Cherubini, P.Figuera, M. Lattuada, M. Milin, D. Miljanic, M.G. Pellegriti, R.G. Pizzone, D. Rendic, N. Soic, C. Spitaleri, A. Tumino, S. Typel, H. Wolter, M. Zadro
  Indirect measurement of the $^{6}Li(d,á)^{4}He$ astrophysical factor
  Proceedings of the VII Intern. Conf. on Nucleus Nucleus Collisions, July 3-7 2000, Strasbourg, France, in press

- M. Aliotta, S. Cherubini, L. Gialanella, P. Figuera, M. Lattuada, D. Miljanic, A. Musumarra, M.G. Pellegriti, R.G. Pizzone, C. Rolfs, S. Romano, N. Soic, C. Spitaleri, F. Streider, A. Tumino, S. Typel, H.H. Wolter
  Study of the quasi-free reaction mechanism in the $^{6}Li(^{12}C,^{12}Ca)^{4}He$ reaction: astrophysical implications
  Nuclear and Condensed Matter Physics, AIP Conf. Proceedings (2000) p.261.

- M.G. Pellegriti, M. Aliotta, S. Cherubini, M. Lattuada, D. Miljanic, R.G. Pizzone, S. Romano, N. Soic, C. Spitaleri, M. Zadro, R.A. Zappalà
  Study of the $^{7}Li(p,\ )^{4}He$ reaction at astrophysical energies through the Trojan Horse Method
  Nuclear and Condensed Matter Physics, AIP Conf. Proceedings,(2000) p.298.

- N. Randazzo, G.V.Russo, D. Lo Presti, S. Reito, L. Todaro, G. Fallica, G. Valvo, M. Lattuada, S. Romano, A. Tumino, V. Bonvicini, A. Vacchi
  Low noise integrated preamplifier in intermediate energy physics experiments
  Nuclear and Condensed Matter Physics, AIP Conf. Proceedings, 2000, p.306.

- Tumino, O.Yu. Goryunov, M. Lattuada, V.V. Ostashko, S. Romano, C. Spitaleri, D. Vinciguerra
  The role of clusters in 4N self-conjugated nuclei
  Nuclear and Condensed Matter Physics, AIP Conf. Proceedings, 2000, p.322, in press

- R.G. Pizzone, M. Aliotta, S. Blagus, S. Cherubini, P. Figuera, M. Lattuada, M. Milin, D. Miljanic, M.G. Pellegriti, D. Rendic, S. Romano, N. Soic, C. Spitaleri, M. Zadro, R.A. Zappalà
  Experimental study of the ^{6}Li(d,á)^{4}He reaction and its astrophysical implication via the Trojan Horse Method
  Nuclear and Condensed Matter Physics, AIP Conf. Proceedings, 2000, p.385, in press

- R.Coniglione, P.Sapienza, E.Migneco, C.Agodi, R.Alba, G.Bellia, A.Del Zoppo, P.Finocchiaro, K.Loukachine, C.Maiolino, P.Piattelli, D.Santonocito,
  High energy proton emission in heavy ion reactions close to the Fermi energy,
  Physics Letter B 471 (2000) 339

- N.V.Rabin, D.A.Vasil'ev, S.V.Vladimirov, A.G.Nekhaev, V.T.Smolyankin, V.I.Ushakov, P.N.Shishov, H.Bokemayer, W.Koenig, W.Kuhn, H.Schon; C.Agodi, G.Bellia, R.Coniglione, L.Cosentino, P.Finocchiaro, C.Maiolino, E.Migneco, P.Piattelli, P.Sapienza, A.Bassi, R.Bassini, C.Boiano, C.Brambilla, I.Iori, A.Kugler, T.Marek, R.Plescac, A.Taranenko, A.Tikhonov, P.Tlusty, M.Benovic, S.Hlavac, and I.Turzo,
  A Time-Of-Flight measurement system for the HADES wide-aperture dielectron spectrometer,
  Instruments and Experimental Techniques (Pribory i Tekhnika Exsperimenta) 43(2000)1

- S. Albergo, D. Boemi, R. Potenza, A. Tricomi, M. Pillon, M. Angarano, D. Creanza, M. De Palma (CERN RD48 - ROSE Collaboration)
  Fluence Determination from Scattering Measurements
  Nuclear Instruments and Methods in Physics Research A 439 (2000) 8.

- N. Demaria, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. M Bilei, D. Bisello, D. Boemi, G. Bolla, F. Bosi, L. Borrello, D.Bortoletto, C. Bozzi, S. Braibant, H. Breuker, M. Bruzzi, A. Buffini, S. Busoni, A. Candelori, A. Caner, R. Castaldi, A. Castro, E. Catacchini, B. Checcucci, P. Ciampolini, C. Civinini, D. Creanza, R. D'Alessandro, M. Da Rold, M. de Palma, R. Dell'Orso, R. Della Marina, S. Dutta, C. Eklund, A. Elliott-Peisert, G. Favro, L. Feld, L. Fiore, E. Focardi, M. French, K. Freudenreich, A. Fürtjes, A. Giassi, M. Giorgi, A. Giraldo, B. Glessing, W. H. Gu, G. Hall, R. Hammerstrom, T. Hebbeker, J. Hrubec, M. Huhtinen, A. Kaminsky, V. Karimaki, St. Koenig, M. Krammer, P. Lariccia, M. Lenzi, M. Loreti, K. Luebelsmeyer, W. Lustermann, P. Mättig, G. Maggi, M. Mannelli, G. Mantovani, A. Marchioro, C. Mariotti, G. Martignon, B. Mc Evoy, M. Meschini, A. Messineo, E. Migliore, S. My, A. Paccagnella, F. Palla, D. Pandoulas, A. Papi, G. Parrini, D. Passeri, M. Pieri, S. Piperov, R. Potenza, V. Radicci, F. Raffaelli, M. Raymond, A. Santocchia, B. Schmitt, G. Selvaggi, L. Servoli, G. Sguazzoni, R. Siedling, L. Silvestris, K. Skog, A. Starodumov, I. Stavitski, G. Stefanini, P. Tempesta, G. Tonelli, A. Tricomi, T. Tuuva, C. Vannini, P. G. Verdini, G. Viertel, Z. Xie, Li Yahong, S. Watts and B. Wittmer
  New results on silicon microstrip detectors of CMS tracker,
  Nuclear Instruments and Methods in Physics Research A 447 (2000) 142.

- M. M. Angarano, A. Báder , D. Creanza, M. de Palma, L. Fiore, G. Maggi, S. My, V. Radicci, G. Raso, G. Selvaggi, L. Silvestris, P. Tempesta, S. Albergo and R. Potenza ,
  Beam test results on n+-on-n type silicon microstrip detectors before and after neutron irradiation
  Nuclear Instruments and Methods in Physics Research Section A 440 (2000) 136.

- M. Meschini, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. M. Bilei, D. Bisello, D. Boemi, F. Bosi, L. Borrello, C. Bozzi, S Braibant, H. Breuker, M. Bruzzi, A. Buffini, S. Busoni, A. Candelori, A. Caner, R. Castaldi, A. Castro, E. Catacchini, B. Checcucci, P. Ciampolini, C. Civinini, D. Creanza, R. D'Alessandro, M. Da Rold, N. Demaria, M. de Palma, R. Dell'Orso, R. Della Marina, S. Dutta, C. Eklund, A. Elliott-Peisert, L. Feld, L. Fiore, E. Focardi, M. French, K. Freudenreich, A. Fürtjes, A. Giassi, M. Giorgi, A. Giraldo, B. Glessing, W. H. Gu, G. Hall, R. Hammerstrom, T. Hebbeker, J. Hrubec, M. Huhtinen, A. Kaminsky, V. Karimaki, St. Koenig, M. Krammer, P. Lariccia, M. Lenzi, M. Loreti, K. Luebelsmeyer, W. Lustermann, P. Mättig, G. Maggi, M. Mannelli, G. Mantovani, A. Marchioro, C. Mariotti, G. Martignon, B. Mc Evoy, A. Messineo, S. My, A. Paccagnella, F. Palla, D. Pandoulas, A. Papi, G. Parrini, D. Passeri, M. Pieri, S. Piperov, R. Potenza, V. Radicci, F. Raffaelli, M. Raymond, A. Santocchia, B. Schmitt, G.

Selvaggi, L. Servoli, G. Sguazzoni, R. Siedling, L. Silvestris, K. Skog, A. Starodumov, I. Stavitski, G. Stefanini, P. Tempesta, G. Tonelli, A. Tricomi, T. Tuuva, C. Vannini, P. G. Verdini, G. Viertel, Z. Xie, Li Yahong, S. Watts and B. Wittmer
Performance of CMS silicon microstrip detectors with the APV6 readout chip
Nuclear Instruments and Methods in Physics Research A 447 (2000) 133.

- E. Focardi, S. Albergo, M. Angarano, P. Azzi, E. Babucci, N. Bacchetta, A. Bader, G. Bagliesi, A. Basti, U. Biggeri, G. M. Bilei, D. Bisello, D. Boemi, F. Bosi, L. Borrello, C. Bozzi, S. Braibant, H. Breuker, M. Bruzzi, A. Buffini, S. Busoni, A. Candelori, A. Caner, R. Castaldi, A. Castro, E. Catacchini, B Checcucci, P. Ciampolini, C. Civinini, D. Creanza, R. D'Alessandro, M. Da Rold, N. Demaria, M. de Palma, R. Dell'Orso, R. Della Marina, S. Dutta, C. Eklund, L. Feld, L. Fiore, M. French, K. Freudenreich, A. Frey, A. Fürtjes, A. Giassi, M.Giorgi, A. Giraldo, B. Glessing, W. H. Gu, G. Hall, R. Hammarstrom, T. Hebbeker, A. Honma, J. Hrubec, M. Huhtinen, A. Kaminsky, V. Karimaki, St. Koenig, M. Krammer, P. Lariccia, M.Lenzi, M. Loreti, K. Leubelsmeyer, W. Lustermann, P. Mättig, G. Maggi, M. Mannelli, G. Mantovani, A. Marchioro, C. Mariotti, G. Martignon, B. Mc Evoy, M. Meschini, A. Messineo, E. Migliore, S. My, A. Paccagnella, F. Palla, D. Pandoulas, A. Papi, G. Parrini, D. Passeri, M. Pieri, S. Piperov, R. Potenza, V. Radicci, F. Raffaelli, M. Raymond, F. Rizzo, A. Santocchia, B. Schmitt, G. Selvaggi, L. Servoli, G. Sguazzoni, R. Siedling, L. Silvestris, A. Starodumov, I. Stavitski, G. Stefanini, B. Surrow, P. Tempesta, G. Tonelli, A. Tricomi, T. Tuuva, C. Vannini, P. G. Verdini, G.Viertel, Z. Xie, Li Yahong, S. Watts and B. Wittmer
  The CMS silicon tracker,
  Nuclear Instruments and Methods in Physics Research A 453 (2000) 121.

- 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).

- A.Insolia, C.Tuve`, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.Cebra,A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, J.B.Elliott, M.Gilkes, J.A.Hauger, A.S.Hirsch, E.L.Hjort, M.Justice, D.Keane, J.Kintner, M.Lisa, H.S.Matis, M.McMahan, C.McParland, D.L.Olson, M.Partlan, N.T.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.L.Romero, G.V.Russo, R.Scharenberg, A.Scott, Y.Shao, B.K.Srivastava, T.J.M.Symons, M.Tincknell, S.Wang, P.G.Warren, H.H.Wieman, K.L.Wolf (EOS Collaboration)
  Universality in Fragment Inclusive Yields from Au + Au Collisions
  Physical Review C, 61 (2000) 044902

- J.A.Hauger, B.K.Srivastava, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, J.B.Elliott, M.L.Gilkes, A.S.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.A.Lisa, H.S.Matis, M.McMahan, C.McParland, W.F.J.Muller, D.L.Olson, M.D.Partlan, N.T.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann, R.P.Scharenberg, A.Scott, Y.Shao, T.J.M.Symons, M.Tincknell, C.Tuve`, S.Wang, P.Warren, H.H.Wieman, T.Wienold, and K.Wolf (EOS Collaboration)
  Two-Stage Multifragmentation of 1A GeV Kr, La, and Au
  Physical Review C, 62 (2000) 024616

- J.B.Elliott, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, M.L.Gilkes, J.A.Hauger, A.S.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.A.Lisa, H.S.Matis, M.McMahan, C.McParland, W.F.J.Muller, D.L.Olson, M.D.Partlan, N.T.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann, R.P.Scharenberg, A.Scott, Y.Shao, B.K.Srivastava, T.J.M.Symons, M.Tincknell, C.Tuve`, S.Wang, P.G.Warren, H.H.Wieman, T.Wienold and K.Wolf (EOS Collaboration)
  Statistical signatures of critical behavior in small systems
  Physical Review C, 62 (2000) 064603

- J.A.Hauger, B.Srivastava, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, J.Elliott, M.Gilkes, A.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.Lisa, H.S.Matis, M.McMahan, C.McParland,W.F.J.Muller, D.L.Olson, M.D.Partlan, N.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann,

R.Scharemberg, A.Scott, Y.Shao, T.J.M.Symons, M.Tincknell, C.Tuvè, S.Wang, P.Warren, H.H.Wieman, T.Wienold, K.L.Wolf
Nuclear Multifragmentation, Percolation, and the Fisher Droplet Mode: Common Feature of Reducibility and Thermal Scaling
Physical Review C 65 (2000)

- J.B.Elliott, L.G.Moretto, L.Phair, G.J.Wozniak, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, M.L.Gilkes, J.A.Hauger, A.S.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.A.Lisa, H.S.Matis, M.McMahan, C.McParland, W.F.J.Muller, D.L.Olson, M.D.Partlan, N.T.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann, R.P.Scharenberg, A.Scott, Y.Shao, B.K.Srivastava, T.J.M.Symons, M.Tincknell, C.Tuve`, S.Wang, P.G.Warren, H.H.Wieman, T.Wienold, and K.Wolf (EOS Collaboration)
  Nuclear Multifragmentation, Percolation and the Fisher Droplet Model: Common Features of Reducibility and Thermal Scaling
  Physical Review Letters, 85 (2000) 1194

- L.G.Moretto, J.B.Elliott, L.Phair, G.J.Wozniak, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L. Chance, Y.Choi, S.Costa, M.L.Gilkes, J.A.Hauger, A.S.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.A.Lisa, H.S.Matis, M.McMahan, C.McParland, W.F.J.Mueller, D.L.Olson, M.D.Partlan, N.T.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann, R.P.Scharenberg, A.Scott, Y.Shao, B.K.Srivastava, T.J.M.Symons, M.Tincknell, C. Tuve`, S.Wang, P.G.Warren, H.H.Wieman, T.Wienold and K.Wolf (EOS Collaboration)
  Nuclear multifragmentation, percolation and the Fisher Droplet Model: common features of reducibility and thermal scaling
  38th International Winter Meeting on Nuclear Physics Bormio, Italy, 24-29 January 2000 Proceedings, pag. 469

- N.Porile, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, J.L.Chance, Y.Choi, S.Costa, J.Elliott, M.Gilkes, J.A.Hauger, A.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.Lisa, H.S.Matis, M.McMahan, C.McParland,W.F.J.Muller, D.L.Olson, M.D.Partlan, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero, G.V.Russo, H.Sann, R.Scharemberg, A.Scott, Y.Shao, B.Srivastava, T.J.M.Symons, M.Tincknell, C.Tuvè, S.Wang, P.Warren, H.H.Wieman, T.Wienold, K.L.Wolf
  Comparison of the 1A GeV 197Au + C Interation with First-Stage transport Codes
  Physical Review C (2001) in press.

- J.L.Chance, S.Albergo, F.Bieser, F.P.Brady, Z.Caccia, D.A.Cebra, A.D.Chacon, Y.Choi, S.Costa, J.Elliott, M.Gilkes, J.A.Hauger, A.Hirsch, E.L.Hjort, A.Insolia, M.Justice, D.Keane, J.C.Kintner, V.Lindenstruth, M.Lisa, H.S.Matis, M.McMahan, C.McParland,W.F.J.Muller, D.L.Olson, M.D.Partlan, N.Porile, R.Potenza, G.Rai, J.Rasmussen, H.G.Ritter, J.Romanski, J.L.Romero G.V.Russo, H.Sann, R.Scharemberg, A.Scott, Y.Shao, B.Srivastava, T.J.M.Symons, M.Tincknell, C.Tuvè, S.Wang, P.Warren, H.H.Wieman, T.Wienold, K.L.Wolf
  Mass Dependance of the transverse Momenta of Au Projectile Fragments at 1 A/GeV
  Physical Rev. C, (2001) in press.

- A.Badalà, R.Barbera, A.Palmeri, G.S.Pappalardo, F.Riggi et al. …(The NA57 Collaboration)
  Probing the specific entropy produced in ultrarelativistic heavy ion collisions with a silicon pixel multiplicity detector
  Nuclear Instruments and Methods A452(2000)323

- W.Trautmann for the ALADIN Collaboration
  Equilibration and Phase Transition in spectator reactions.
  Proceedings "7th International Conference on Clustering Aspects of nuclear structure and dynamics (Cluster 99)" 14-19 Jun 1999,Rab, Croatia. Ed. World Scientific, Marzo 2000

- W.Trautmann for the ALADIN Collaboration
  Kinetic energies in multifragmentation
  Proceedings "XXXVIII International Winter Meeting on Nuclear Physics", Bormio, 24-29 January 2000, Ed. Ricerca Scientif. ed Educaz. Permanente 2000, Milano.

- G. Immé, G.Raciti, G.Riccobene, F.P.Romano, A.Saija, C.Sfienti, G.Verde,N.Giudice and the ALADIN Collaboration
  Nuclear caloric curve. A systematic study
  "Nuclear and Condensed Matter Physics" 2000, p.290 Ed. American Institute of Physics 2000.

- T. Odeh, R. Bassini, M. Begemann-Blaich, S. Fritz, 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. Mohlenkamp, A. Moroni, W.F.J. Muller, C. Nociforo, B. Ocker, F. Petruzzelli, J. Pochodzalla, G. Raciti, G. Riccobene, F.P. Romano, A. Saija, M. Schnittker, A. Schuttauf, C. Schwarz, W. Seidel, V. Serfling, C. Sfienti, W. Trautmann, A. Trzcinski, G. Verde, A. Worner, Hong-fei Xi, B. Zwieglinski
  Fragment kinetic energies and modes of fragment formation.
  Phys.Rev.Lett.84 (2000) 4557.

- C.Schwarz, S.Fritz, R.Bassini, M.Begemann-Blaich, S.J.Gaff-Ejakov, D.Gourio, C.Groß, G. Immé, I.Iori,U.Kleinvoß, 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, H.Xi, B.Zweglinski
  Time scales in spectator fragmentation
  Proceedings 3rd Catania Relativistic Ion Studies on Phase Transitions in Strong Interactions: Status and perspectives. CRIS2000 May 2000 – Acicastello, Italy

- G.Raciti, R.Bassini, M.Begemann-Blaich, S.Fritz, C.Groß, G.Immé, I.Iori, U.Lynen, M.Mahi, T.Möhlenkamp, W.F.J.Müller, B.Ocker, T.Odeh, J.Pochodzalla, G.Riccobene, F.P.Romano, A.Saija, C.Schwarz, M.Schnittker, A.Schüttauf, W.Seidel, V.Serfling, C.Sfienti, W.Trautmann, A.Trzcinski, G.Verde, A.Wörner, H.Xi, B.Zweglinski
  Surveying temperature and density measurements in nuclear calorimetry
  Proceedings Intern.Conference on "Structure of the Nucleus at the dawn of the century" 29May-3June 2000 – Bologna, Italy World Scientific (2001) in press.

- C.Schwarz for the ALADiN Collaboration
  Proton emission times in spectator fragmentation
  Proceedings Intern.Conference on "Structure of the Nucleus at the dawn of the century" 29May-3June 2000 – Bologna, Italy World Scientific (2001) in press.

- R. Coniglione, P. Sapienza, E. Migneco, C. Agodi, R. Alba, G. Bellia, A. Del Zoppo, P. Finocchiaro, K. Loukachine, C. Maiolino, P. Piattelli, D. Santonocito
  High energy proton emission in heavy ion reactions close to the Fermi energy
  Phys. Lett., B 471 (2000) 339

- P.M. Milazzo, G. Vannini, M. Sisto, C. Agodi, R. Alba, G. Bellia, N. Colonna, R. Coniglione, A. Del Zoppo, L. Fabbietti, P. Finocchiaro, F. Gramegna, , I. Iori, C. Maiolino, , G.V. Margagliotti, , P.F. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R.Rui, D. Santonocito**,** P. Sapienza, P.G. Ventura
  Intermediate mass fragment production from neck-like structures in peripheral $^{58}Ni+^{58}Ni$collisions at E/A=30 MeV
  Acta Phys. Hun. NS Heavy Ion Physics 11 (2000) 293

- N.V. Rabin, D.A Vasil'ev, S. Vladimirov, A. G. Nekhaev, V.T. Smoliankin, V. Ushakov, P. Shishov, H.Bokemeyer , W. Koenig, W. Kuhn, H. Schon, C. Agodi, G. Bellia, R. Coniglione, L. Cosentino, P. Finocchiaro, C. Maiolino, E. Migneco, P. Piattelli, P. Sapienza, A. Bassi, R. Bassini, C. Boiano, C. Brambilla, I. Iori, A. Kugler, T. Marek, A. Taranenko, A. Tikhonov, P. Tlusty, M. Benovic, S. Hlavac, I. Turzo
  A time- of-flight measurement system for the Hades wide-aperture dielectron system
  Instruments and Experimental Techniques Vol. 43 N° 4 (2000)

- 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.M. Milazzo, G. Vannini, M. Sisto, C. Agodi, R. Alba, G. Bellia, M. Belkacem, M. Bruno, M. Colonna, N.Colonna, R. Coniglione, M. D'Agostino, A. Del Zoppo, L. Fabbietti, P. Finocchiaro, F. Gramegna, , I. Iori, C. Maiolino, , G.V. Margagliotti, , P.F. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R.Rui, D. Santonocito, P. Sapienza, P.G. Ventura
  Contemporary presence of dynamical and statistical production of intermediate mass fragments in mid peripheral $^{58}Ni+^{58}Ni$ collisions at 30 MeV/nucleon
  Phys. Lett: B (2001) in press.

- 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. (2001) , in press

- P. Sapienza, R. Coniglione, E. Migneco, C. Agodi, R. Alba, G. Bellia, M. Colonna, A. Del Zoppo, P. Finocchiaro, V. Greco, K. Loukachine, C. Maiolino, P. Piattelli, D. Santonocito, P.G. Ventura, N. Colonna, M. Bruno, M. D'Agostino, P.F. Mastinu, M.L. Fiandri, F. Gramegna, I. Iori, L. Fabbietti, A. Moroni, G.V. Margagliotti, P.M. Milazzo, R.Rui, F. Tonetto, G. Vannini, Y. Blumenfeld, J.A: Scarpaci
  Pre-equilibrium emission and reaction dynamics around the Fermi energy
  Proceedings of the XXXVIII International Winter Meeting on Nuclear Physics, Bormio, Italy, 24-29 January 2000, pag. 492

- P.M. Milazzo, G. Vannini, M. Sisto, C. Agodi, R. Alba, G. Bellia, N. Colonna, R. Coniglione, A. Del Zoppo, L.Fabbietti, P. Finocchiaro, F. Gramegna, , I. Iori, C. Maiolino, , G.V. Margagliotti, , P.F. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R.Rui, D. Santonocito, P. Sapienza, P.G. Ventura
  Contemporary presence of dynamical and statistical Intermediate Mass Fragment production in mid-peripheral $^{58}Ni+^{58}Ni$ collisions at 30 MeV/nucleon
  Proceedings of the International Conference on Structure of the Nucleus at the Dawn of the Century, Bologna, Italy, 29 May-3 June 2000, vol I pag. 363

- R. Coniglione**,** P. Sapienza, E. Migneco, C. Agodi, R. Alba, G. Bellia, M. Colonna, A. Del Zoppo, P. Finocchiaro, V. Greco, K. Loukachine, C. Maiolino, P. Piattelli, D. Santonocito, P.G. Ventura, N. Colonna, M. Bruno, M. D'Agostino, P.F. Mastinu, M.L. Fiandri, F. Gramegna, I. Iori, L. Fabbietti, A. Moroni, G.V. Margagliotti, P.M. Milazzo, R. Rui, F. Tonetto, G. Vannini, Y. Blumenfeld, J.A Scarpaci
  Energetic proton emission and reaction dynamics in heavy ion reaction close to the Fermi energy
  Proceedings of the International Conference on Structure of the Nucleus at the Dawn of the Century, Bologna, Italy, 29 May-3 June 2000, vol I pag. 327

- P. Sapienza, R. Coniglione, E. Migneco, C. Agodi, R. Alba, G. Bellia, M. Colonna, A. Del Zoppo, P. Finocchiaro, V. Greco, K. Loukachine, C. Maiolino, P. Piattelli, D. Santonocito, P.G. Ventura, N. Colonna, M. Bruno, M. D'Agostino, P.F. Mastinu, M.L. Fiandri, F. Gramegna, I. Iori, L. Fabbietti, A. Moroni, G.V. Margagliotti, P.M. Milazzo, R.Rui, F. Tonetto, G. Vannini, Y. Blumenfeld, J.A. Scarpaci
  Fast proton emission in heavy ion collisions: per-equilibrium phenomena and cooperative effects
  Proceedings of the 9th International Conference on Nucler Reaction Mechanisms, Varenna, Italy, 5-9 June 2000, pag. 437

- C. Agodi, R. Alba, 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. Tannini
  Thermal photon as a probe of the dynamical character of IMF emission
  Proceedings of the XXXIX International Winter Meeting on Nuclear Physics, Bormio, Italy, 24-29 January 2001

- R.Coniglione, P.Sapienza, E.Migneco, C.Agodi, R.Alba, G.Bellia, A.DelZoppo, P.Finocchiaro, K.Loukachine, C.Maiolino, P.Piattelli, D.Santonocito
  High energy proton emission in heavy ion reactions close to the Fermi energy
  Phys. Lett., B 471 (2000) 339

- P.M. Milazzo, G. Vannini, M. Sisto, C. Agodi, R. Alba, G. Bellia, N. Colonna, R. Coniglione, A. Del Zoppo, L. Fabbietti, P. Finocchiaro, F. Gramegna, , I. Iori, C. Maiolino, , G.V. Margagliotti, , P.F. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R.Rui, D. Santonocito**,** P. Sapienza, P.G. Ventura
  Intermediate mass fragment production from neck-like structures in peripheral $^{58}Ni+^{58}Ni$collisions at E/A=30 MeV
  Acta Phys. Hun. NS Heavy Ion Physics 11 (2000) 293

- N.V. Rabin, D.A Vasil'ev, S. Vladimirov, A. G. Nekhaev, V.T. Smoliankin, V. Ushakov, P. Shishov, H. Bokemeyer , W. Koenig, W. Kuhn, H. Schon, C. Agodi, G. Bellia, R. Coniglione, L. Cosentino, P. Finocchiaro, C. Maiolino, E. Migneco, P. Piattelli, P. Sapienza, A. Bassi, R. Bassini, C. Boiano, C. Brambilla, I. Iori, A. Kugler, T. Marek, A. Taranenko, A. Tikhonov, P. Tlusty, M. Benovic, S. Hlavac, I. Turzo
  A time- of-flight measurement system for the Hades wide-aperture dielectron system
  Instruments and Experimental Techniques Vol. 43 N° 4 (2000)

- 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. Tannini
  Hard photons: production mechanisms and nuclear dynamics
  Nucl. Phys. A 681 (2001) 339c

- P.M. Milazzo, G. Vannini, M. Sisto, C. Agodi, R. Alba, G. Bellia, M. Belkacem, M. Bruno, M. Colonna, N. Colonna, R. Coniglione, M. D'Agostino, A. Del Zoppo, L. Fabbietti, P. Finocchiaro, F. Gramegna, , I. Iori, C. Maiolino, , G.V. Margagliotti, , P.F. Mastinu, E. Migneco, A. Moroni, P. Piattelli, R.Rui, D. Santonocito, P. Sapienza, P.G. Ventura
  Contemporary presence of dynamical and statistical production of intermediate mass fragments in mid-peripheral $^{58}Ni+^{58}Ni$ collisions at 30 MeV/nucleon
  Phys. Lett: B (2001)

- P. Sapienza, R. Coniglione, , M. Colonna, E. Migneco, C. Agodi, R. Alba, G. BelliaA. 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. (2001) in press

- S. Pirrone, G. Politi, G. Lanzalone, S. Aiello, N. Arena, Seb. Cavallaro, E. Geraci, F. Porto, S. Sambataro.
The complete fusion and competitive processes in the $^{32}S+^{12}C$ reaction at E(^{32}S)=19.5 MeV/nucleon.
Proc. of Conf.," Bologna 2000 - Structure of the nucleus at the dawn of the century", Bologna , Italy, 29 May - June 2000.

Publications in THEORETICAL PHYSICS

- A.Agodi, G. Andronico
Mass determination from constraint effective potential
Nucl.Phys.Proc.Suppl. 83 (2000) 653

- 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

- M. Consoli and P.M. Stevenson
Physical mechanisms generating spontaneous symmetry breaking and a hierarchy of scales
Int. J. Mod. Phys. A 15 (2000) 133

- P. Cea, M. Consoli and L. Cosmai,
Large rescaling of the Higgs condensate: theoretical motivationsand lattice results
Nucl. Phys. B (proc. suppl.) 83 (2000) 658

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

- G. G. N. Angilella, N. H. March and R. Pucci
*Is the asymptotic scenario of precursor **r** space Bosons consistent with observation of electron (hole) liquids in underdoped high-Tc cuprates?*
Phys. Chem. Liquids 38, (2000) 615

- G. G. N. Angilella, N. H. March and R. Pucci
Tc for non-s-wave pairing superconductors correlated with coherence length and effective mass.
Phys. Rev. B 62, (2000) 13919

- G. G. N. Angilella, A. Sudbø, R. Pucci
  Extended d_(x^2 - y^2)-wave superconductivity. Flat nodes in the gap and the low temperature asymptotic properties of high-Tc superconductors.
  Eur. Phys. J. B 15, (2000) 269.

- G. G. N. Angilella, A. Sudbø, R. Pucci
  Extended $d_{x^2-y^2}$-wave gap anisotropy in three model theories of high-T_c superconductivity
  Int. J. Mod. Phys. B 14, (2000) 3306.

- G. G. N. Angilella, R. Pucci
  Pressure effects in high-Tc superconductors with n inequivalent layers
  In: *Science and Technology of High Pressure*, ed. by M. H. Manghnani, W. J. Nellis, M. F. Nicol, Vol. 2, pp. 670 (Universities Press, Hyderguda, 2000).

- G. G. N. Angilella, R. Pucci
  Mixed-symmetry solutions of the BCS gap equation.
  Nonlin. Analysis: Series A Theory and Methods 47, (2001) 3537.

- G. G. N. Angilella, A. Grassi, G. M. Lombardo, N. H. March, R. Pucci
  Bond-order, stretched chemical bonds and electron correlation
  In: *Recent research developments in quantum chemistry*, ed. By S. G. Pandalai (Transworld Research Network, Trivandrum, India, 2001, in press).

- G. G. N. Angilella, N. H. March, R. Pucci
  Electron (hole) liquids flowing through both heavy Fermions and cuprate materials in superconducting and normal states.
  Phys. Chem. Liquids (2001, in press).

- F. Siringo
  Nontrivial extension of the two-dimensional Ising model: the d-dimensional ``molecular'' model.
  Phys.Rev. E 62, (2000) 6026.

- F. Siringo
  Variational study of bound states in the Higgs model
  Phys. Rev. D, 62, (2000) 116009

- E.Kwasniewicz, F.Catara and M.Sambataro
  Description of A=22 nuclei in the collective pair approximation
  Acta Physica Polonica, B 31 (2000) 2029

- M.Grasso and F.Catara
  Extension of random phase approximation preserving energy weighted sumrules: an application to a 3-level Lipkin model
  Phys. Rev. C 63 (2000) 014317

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

- E.G.Lanza
  Double Giant Resonances in heavy ion collisions
  Nucl Phys. A 687 (2001) 162c

- M. Sambataro
  Multistep variational approach to collective excitations
  Czechoslovak Journal of Physics, 50 (2000) 537

- F.Catara and M.Sambataro
  Excitation spectrum of a two-electron metal cluster
  Journal of Physics: Condensed matter (2001) in press

- M. Baldo, U. Lombardo, E.E. Saperstein and M. V. Zverev,
  A simple model for the microscopic effective pairing interaction
  Phys. Lett. B477 (2000) 410

- M.Baldo, G.Giansiracusa, U.Lombardo and H.Q.Song
  Bethe-Brueckner-Goldstone expansion in neutron matter
  Phys. Letters B473 (2000) 1.

- M. Baldo, G.F. Burgio and H.-J. Schulze,
  Hyperon stars in the Brueckner-Bethe-Goldstone theory,
  Physical Review C61 (2000) 055801

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

- M. Baldo, G.F. Burgio and H.-J. Schulze,
  Strange hadronic stellar matter within the Brueckner-Bethe-Goldstone theory,
  Proceedings of the International Conference ``Bologna 2000 - Structure of the Nucleus at the Dawn of the Century", Bologna (Italia), May 29 - June 3, 2000, World Scientific, in press.

- M. Baldo, G.F. Burgio and H.-J. Schulze,
  Hyperon-rich matter in neutron stars,
  Rendiconti del ``VIII Convegno su problemi di Fisica Nucleare Teorica", Cortona (Italia), 18-20 October 2000, in press.

- A.Insolia,U. Lombardo, N. Sandulescu,
  Transverse flow in Au+Au collisions
  Phys. Rev. C61 (2000) 067902.

- V. Latora, A. Rapisarda and S. Ruffo,
  Chaotic dynamics and superdiffusion in a Hamiltonian system with many degrees of freedom,
  Physica A280 (2000) 81.

- V. Latora, A. Rapisarda and S. Ruffo
  Chaos in the thermodynamic limit,
  Progr. Theor. Phys. Suppl. 139(2000) 204.

- V. Latora, A. Rapisarda,
  Dynamical Quasi-Stationary States in a System with Long-Range forces ,
  Chaos Solitons and Fractals , in press

- V. 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) in press

- V. Latora, M. Baranger, A. Rapisarda and C. Tsallis,

The rate of entropy increase at the edge of chaos,
Phys. Lett. A273 (2000) 97.

- M. 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, in press.

- V. Latora, A. Rapisarda and C. Tsallis
Non-Gaussian equilibrium in a long-range Hamiltonian system
Phys. Review E (2001) in press.

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

- M. Marchiori and V. Latora,
Harmony in the Small World,
Physica A285 (2000) 539.

- 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.

- G.Roepke, A. Schnell, P. Schuck and U. Lombardo
Isospin singlet (pn) pairing and quartetting contribution to the binding energy of nucleons
Phys. Rev. C60 (2000) 24605.

- U. Lombardo and A. Sedrakian,
Thermodynamics of n-p condensate in asymmetric nuclear matter
Phys. Rev. Letters 84 (2000) 602.

- Lejeune, U.Lombardo and W. Zuo
Nuclear matter EOS with a three-body force
Phys. Lett. 477 (2000) 45

- B. Santra and U. Lombardo,
Effect of in-medium meson parameter modification on nuclear matter equation of state
Phys. Rev. C62 (2000) 18202.

- V.Kondratiev, A.Bonasera and A.Iwamoto
Kinetics of sub-barrier fusion of spherical nuclei
Phys. Rev. C61 (2000) 44613

- A .Bonasera, M.Bruno, C.Dorso and P.F.Mastinu
Critical phenomena in nuclear dynamics
Riv. Nuovo Cimento 23 (2000) 1

- A.Bonasera
Color dynamics in phase space
Phys. Rev. C62 (2000) 052202

- A.B.Larionov, J.Piperova, M.Colonna and M.DiToro
Strongly damped nuclear collisions: zero or first sound?
Phys. Rev. C61 (2000) 064614

- M. DiToro, V.Baran, M.Cabibbo, M.Colonna, A.B.Larionov and N.Tsoneva

The nuclear Giant Dipole Resonance under extreme conditions
El.Part.and Nuclei 31 (2000) 433-451

- Guo Hua, Liu Bo and M.DiToro
  Phase transitions in warm nuclear matter
  Phys. Rev. C62 (2000) 035203

- J.Cibor, A.Bonasera, J.B.Natowitz, K.Hagel et al.
  Light particle probes of expansion and temperature evolution: Coalescence model analyses of heavy ion collisions at 47A MeV
  Phys. Rev. C62 (2000) 34607.

- V.Greco, F.Matera, M.Colonna, M.DiToro and G.Fabbri ,
  Fock Exchange Terms in Non-Linear Quantum Hadrodynamics
  Phys. Rev.C63 (2001) 035202

- V.Baran, M.Cabibbo, M.Colonna, M.DiToro and N.Tsoneva
  The dynamical dipole mode in dissipative heavy ion collisions
  Nucl. Phys. A679 (2001) 373

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

- A.Pagano,.. A.Bonasera ..M.DiToro, M.Colonna et al.
  Physics with the Chimera detector at LNS: the Reverse experiment
  Nucl. Phys. A681 (2001)331

- A.Bonasera
  Color dynamics in phase space: the Balescu-Lenard-Vlasov approach
  Nucl. Phys. A681 (2001) 64c

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

- M.DiToro, V.Baran, M.Cabibbo, M.Colonna and N.Tsoneva
  The Dynamical Dipole Mode
  Nucl. Phys. A687 (2001) 72c

- V.Baran, M.Colonna, M.DiToro and V.Greco
  Nuclear fragmentation: sampling the instabilities of binary systems
  Phys. Rev. Lett. 86 (2001) 4492

- B.Borderie,...M.Colonna et al.
  Evidence for spinodal decomposition in nuclear multifragmentation
  Phys. Rev. Lett. 86 (2001) 3252.

- Ph.Chomaz, D.Lacroix, S.Ayik, M.Colonna,
  Collisional damping and collisional coupling in collective response
  Phys. Rev. C62 (2000) 4307

- J.D.Frankland, B.Borderie, M.Colonna et al.,
  Multifragmentation of a very heavy nuclear system (II): bulk properties and spinodal decomposition
  Nucl. Phys. A689 (2001) 940

- J.B.Natowitz,..A.Bonasera et al.
  Probing dynamic evolution in intermediate heavy ion collisions
  Acta Phys.Pol. B31 (2000) 1449

- A.Pop,..A.Bonasera..et al.
  Global features of dissipative processes in light heavy-ion collisions
  Nucl. Phys. A679 (2001) 793

- P.Balenzuela, A.Bonasera and C.O.Dorso
  Local (in time) maximal Liapunov exponents of fragmenting drops
  Phys. Rev. E62 (2000) 1063-651

- T.Maruyama, A.Bonasera and S.Chiba
  Nuclear fragmentation by tunneling
  Phys. Rev. C63 (2001) 057601

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

- U.Lombardo and P.Schuck
  Size-shrinking of deuterons in very dilute superfluid nuclear matter.
  Phys. Rev. C63 (2001) 038201

- E.Garrido, P.Sarriguren, E.Moya de Guerra, U.Lombardo, P.Schuck and H.-J.Schulze,
  Nuclear pairing forces in the T=0 channel reexamined
  Phys. Rev. C63 (2001) 037304

- U.Lombardo, P.Schuck and W.Zuo
  Self-energy effects in the superfluidity of neutron matter
  Phys. Rev. C64 (2001) 021301(R)

- M.DiToro, M.Colonna, S.Maccarone and L.Scalone
  Isospin in heavy ion reaction mechanisms: terrestrial tests on asymmetric nuclear matter
  Int.Conf. on "Heavy Ion Reaction and Beyond" Lanzhou (China) Ed.G.M.Jin et al., World Sci. 2000, p 106

- I.N.Mikhailov, T.I.Mikhailova, I.V.Molodtsova and M.DiToro
  Dynamical effects in the approach phase of nuclear fusion
  in "Nuclear Structure and Related Topics", Dubna June 2000, Ed.s R.Jolos and V.Voronov

- V.Greco, M.Colonna, M.DiToro, G.Fabbri and F.Matera,
  Effective Field Models of Nuclear Matter: the Role of Fock Terms
  Int.Winter Meeting on Nuclear Physics, Bormio 2000,Ed.I Iori, RSEP Milano 2000 vol.116 pp.314-325

- 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, World.Sci. (2001) in press

- M.Di Toro et al.
  The case of RIB at intermediate energies: isospin effects on nuclear dynamics
  Int. Conf. RIB00, Hayama Tokyo 2000, Eur.Phys.Jour, 2001 in press

- U. Lombardo and W.Zuo
  Equation of State of Isospin Asymmetric Nuclear Matter
  in "Isospin Physics in Heavy Ion Collisions", Eds. Bao An Li and U.Schroeder, Nova Science Publishers, New York. 2001 in press

- M.Colonna and M.DiToro
  Nuclear Transport Models and Effects of Isospin-Dependent Equation of State on Dissipative Heavy-Ion Collisions
  in "Isospin Physics in Heavy-Ion Collisions" Ed.s Bao-An Li and U.Schroeder, Nova Publ. 2001 in press

- V.Baran, Ph.Chomaz, M.Colonna and M.Di Toro
  Pre-Equilibrium Hot Giant Dipole Resonance Exctitation in N/Z Asymmetric Nuclear Reactions"
  in "Isospin Physics in Heavy-Ion Collisions" Ed.s Bao-An Li and U.Schroeder, Nova Publ. 2001 in press

- F. Frisone
  Deuteron interaction within a microcrack in a lattice at room temperature .
  Fusion Technology , 39 (2000) 260.

- F. Frisone
  Probability of deuteron - plasmon fusion at room temperature within microcracks of crystalline lattices with deuterium loading
  8th Int. Conf. on "COLD FUSION", 21 - 26 may 2000, Lerici, Italy, in press.

- F. Frisone
  Theoretical hypotesis on the correlation between the probability of fusion on the surface and within microcracks of a deuterium loaded crystalline lattice at room temperature
  8th Int. conf. "Cold Fusion and nuclear trasmutation", Sochi – Moscow, 3 - 11 October 2000, in press.

Publications in SOLID STATE PHYSICS

- G. Compagnini, G. G. N. Angilella, A. Raudino, and O. Puglisi
  Memory effect of ion beam induced depolymerization of PMMA
  Nucl. Instr. And Methods B 175-177, (2001) 559.

- G. Franzò, F. Iacona, V. Vinciguerra, F. Priolo
  Enhanced Rare Earth Luminescence in Silicon Nanocrystals;
  Materials Science and Eng. B 69-70, (2000) 335.

- G. Franzò, V. Vinciguerra, F. Priolo
  Room Temperature Luminescence from Rare Earth Ions Implanted Into Si Nanocrystals
  Phil. Mag. B80, (2000) 719.

- G. Franzò, D. Pacifici, V. Vinciguerra, F.Priolo, F. Iacona
  Er Ions-Silicon Nanocrystals Interactions and Their Effects on the Luminescence Properties
  Appl. Phys. Lett. 76, (2000) 2167

- F. Giannazzo, F. Priolo, V. Raineri, V. Privitera
  High Resolution Scanning Capacitance Measurements of Si Devices
  Appl. Phys. Lett. 76, (2000) 2565

- V. Vinciguerra, G. Franzò, F.Priolo, F. Iacona, C. Spinella
  Quantum Confinement and Recombination Dynamics in Si Nanocrystals Embedded in Si/SiO_2 Superlattices;
  J. Appl. Phys. 87, (2000) 8165

- S. Scalese, G. Franzò, S. Mirabella, M. Re, A. Terrasi, F. Priolo, E. Rimini, C. Spinella, A. Carnera
  The Effect of O:Er Concentration Ratio on the Structural, Electrical and Optical Properties of Si:Er:O Layers Grown by Molecular Beam Epitaxy
  J. Appl. Phys. 88, (2000) 4091

- L. Pavesi, L. Dal Negro, C. Mazzoleni, G. Franzò, F. Priolo
  Optical Gain in Silicon Nanocrystals
  Nature 408 (2000) 440

- A. La Ferla, G. Galvagno, P.K. Giri, G. Franzò, E. Rimini, V. Raineri, A. Gasparotto, and D. Cali
  Oxidation Induced Precipitation in Al Implanted Epitaxial Silicon;
  J. Appl. Phys. 88, (2000) 3988

- F. Iacona, G. Franzò, and C. Spinella
  Correlation between Luminescence and Structural Properties of Si Nanocrystals;
  J. Appl. Phys. 87, 1295 (2000) 1295

- G. Franzò, F. Iacona, C. Spinella, S. Cammarata, and M.G. Grimaldi
  Size Dependence of the Luminescence Properties in Si Nanocrystals;
  Mat. Sci. & Eng. B 69/70 (2000) 454

- F. Priolo, G. Franzò, F. Iacona
  Silicon Nanostructures and their Interactions with Erbium Ions
  in *Frontiers of Nano-Optoelectronic Systems*, Edited by L. Pavesi and E. Buzaneva, NATO Science Series, vol. II/6 (Kluwer Academic Publisher, 2000) p.161

- G.Di Marco, M.Lanza, A.Pennisi, F.Simone,
  Solid state electrochromic device: behaviour of different salts on its performance
  Solid State Ionics, 127, (2000) 23

- 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, (2001) 501

- 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, (2001) 3566.

- R.Puglisi, G. Faraci, A. R. Pennisi, S. Vinati, P. Dilani,
  Cluster beam deposition equipment for nanocrystalline thin film synthesis
  INFM Meeting, Roma 18-22 giugno 2001, p. 92.

- G. Faraci, A. R. Pennisi, R.Puglisi, A. Balerna, I. Pollini,
  SnO_2 and In_2O_3 cluster confinement in a glass matrix
  INFM Meeting, Roma 18-22 giugno 2001, p. 47.

- L. Calcagno, F. Giorgis, A. Makhtari, P. Musumeci, R. Reitano,
  Ion beam processing of a-SiC:H grown by Plasma Enhanced Chemical Vapour Deposition
  Phil. Mag. B 80, (2000) 539.

- R. Reitano, G. Foti,
  *Oscillator strength and effective charge in amorphous silicon carbon alloy*s
  Sol. St. Communications 115, (2000) 375.

- Baeri, R. Reitano, A.M. Malvezzi, C. Arena,
  Time resolved photoluminescence in keV proton irradiated a-SiC:H alloys
  Nucl. Instr. Methods B 166-167, (2000) 426.

- P.Musumeci, L.Calcagno, A.Makhtari, P.Baeri, G.Compagnini and C.F.Pirri,
  Ion beam effects on the hydrogenated bonds of amorphous silicon carbide",
  Nucl .Instr. Meth. B 166, (2000) 40

Publications in ASTROPHYSICS

- Belvedere G., Kuzanyan, K. M., Sokoloff D.
  A two-dimensional asymptotic solution for a dynamo wave in the light of the solar internal rotation,
  Mont. Not. Royal Astron. Society, 315 (2000) 778.

- Blanco C., Di Martino M., Riccioli D.
  New rotational period of 18 asteroids,
  Planetary and Space Science, 48 (2000) 271

- Blanco C., Cigna M., Riccioli D.
  Pole and shape determination of asteroids. II,
  Planetary and Space Science, 48 n. 10 (2000) 973

- Brooks D. H., Fischbacher G.A., Fludra A., Harrison R.A., Innes D.E., Landi E., Landini M., Lang J., Lanzafame A.C., Loch S.D., McWhirter R.W.P., Summers H.P.
  A study of opacity in SOHO-SUMER and SOHO-CDS spectral observations I. Opacity deduction at the limb,
  Astron. Astrophys. 357 (2000) 697.

- Costa V., Rayet M., Zappalà R.A., Arnould M.
  The synthesis of the light Mo and Ru isotopes: how now, no need for an exotic solution?,
  Astron. Astrophys. 358, (2000) L67

- Cutispoto G., Pastori L., Guerrero M.A., Tagliaferri G., Messina S., Rodonò M., De Medeiros J.R.
  Photometric and spectroscopic studies of cool stars discovered in EXOSAT X-ray images. IV. The northern hemisphere sample,
  Astron. Astrophys. 364, (2000) 205.

- Gavryuseva E., Gavryusev V., Di Mauro M.P.
  Solar core rotation from LOW-1 multiplets of oscillations observed by GONG,
  Prisma v Astronomichesky Zhurnal v.26, n.4, (2000) 261

- Lanza A.F. Rodonò M., Rosner R.
  Dynamo action and period gap in cataclysmic variables,
  Mon. Not. R. Astr. Soc., 314 (2000) 398.

- Lanzafame A.C., Busà I., Rodonò M**.**
  Chromospheric two-component NLTE modelling of the binary system V711 Tau=HR 1099,
  Astron. Astrophys. 362 (2000) 683.

- Lanzafame G., Maravigna F., Belvedere G.
  Spiral Structures and Shocks in Accretion Discs in Close Binary Systems: the Role of the Stellar Mass Ratio,
  Publ. of the Astronomical Society of Japan, 52 (2000) 515

- Leto G., Pagano I., Linsky J. L., Rodonò M., Umana G.
  VLA observations of dMe stars,
  Astron. Astrophys. 359 (2000) 1035

- Messina S., Marino G., Rodonò M., Cutispoto G.
  Serendipitous discovery of an Irregular and a Semi Regular-type variable in the field of BY Draconis,
  Astron. Astrophys., (2001) in press

- Rodonò M., Messina, S., Lanza, A. F., Cutispoto, G., Teriaca, L.
  The magnetic activity cycle of II Pegasi: results from twenty-five years of wide-band photometry,
  Astron. Astrophys. 358 (2000) 624

- Rodonò M., Pagano I., Leto G., Walter F., Catalano S., Cutispoto G., Umana G.
  Beppo-Sax Observations of AR Lacertae,
  Astron. Astrophys. 346, (2000) 811

- Spadaro D**.**, Lanzafame A.C., Consoli L., Marsch E., Brooks D.H., Lang J.
  Structure and dynamics of an active region loop system observed on the solar disc with SUMER on SOHO,
  Astron. Astrophys. 359 (2000) 716

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

- Cutispoto G., Messina S., Rodonò M**.**
  Long-term monitoring of active stars. IX. Photometry collected in 1993,
  Astron. Astrophys. (2001) in press

- 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., (2001) in press

- 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, (2001) in press

- Messina S., Rodonò M., Guinan E. F.
  The Rotation-Activity Connection: its extension to photospheric activity diagnostics,
  Astron. Astrophys., (2001) in press

- 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., (2001) in press

- Rabello-Soares, M.C., Sarbani Basu P., Christensen-Dalsgaard J., Di Mauro M.P.
  The potential of solar high-degree modes for structure inversion, in Helioseismic Diagnostic of Solar Convenction and Activity
  The 9th SOHO Workshop, Stanford, California, USA, Solar Physics (2001) in press

- Riccioli D., Blanco C., Cigna M.
  Rotational periods of Asteroids.II,
  Planetary and Space Sciences, (2001) in press

- 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., (2001) in press

- Ruediger G., Pipin V.V., Belvedere G.
  Alpha-effect, helicity and angular momentum transport for magnetically driven turbulence in the solar convection zone,
  Solar Physics, (2001) in press

- Thuillot V., Arlot J.-E., Ruatti C., Bethier J., Blanco C., Colas F., Czen W., Damani M., D'Ambrosio V., Descamps P., Dourneau G., Emelyanov N., Foglia S., Helmer G., Irsmanbotova 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., (2001) press.

- Zuccarello F., Cotarino L., Romano P.
  Description of a procedure to analyze EUV loops,
  Solar Phys., (2001) in press

- Catalano S., Rodonò M., Cutispoto G., Frasca A., Marilli E., Marino G., Messina S.
  H-alpha line and photometric variability in magnetically active stars, in Variable Stars as Important Astrophysical Tools,
  C. Ibanoglu (Ed.) NATO-ASI, Kluwer Academic Publisher, (2000) 687

- Lanza A.F., Rodonò M.
  On the connection between magnetic activity and orbital period modulation in close binaries, in Variable stars as important astrophysical tools,
  C. Ibanoglu (Ed.), NATO-ASI C-Series, Kluwer Ac. Publ., Dordrecht, (2000) 701

- Paternò L.
  The history of the solar neutrino problem, in Long and Shurt Term Variability in Sun's History and Global Change,
  163-188, W. Schroeder (ed.), Science Edition, 2000

- Rodonò M.
  Magnetic activity phenomena on stars from the photosphere up to the transition region layers, in Stellar clusters and associations: convection, rotation and dynamos
  Invited review at the II "Three-islands Euroconference", R. Pallavicini G. Micela, S. Sciortino (eds.), Am. Soc. Pacific Conf. Series, v. 198 (2000) 391

- Lanza A. F., Rodonò M.
  Magnetic activity and dynamic phenomena in close binaries,
  Proc. Peter Eggleton's 60th Birthday Celebratory Meet.,"Evolution of binary and multiple star systems" Ph. Podsiadlowski et al. (Eds.), ASP Conf. Ser., in press [vol.229, p.177-186, 2001]

- Amado P., Cutispoto G., Lanza A. F., Rodonò M.
  AB Doradus: Long- and short-term light variations and spot parameters,
  Proc. 11th Cambridge Workshop on "Cool Stars, Stellar Systems and the Sun", R. J. Garcia Lopez, R. Rebolo, M. R. Zapatero Osorio (Eds.), ASP Conf. Ser., vol. 223 (2000) 895

- Belvedere G., Kuzanyan, K.M., Paternó L., Sokoloff D. D.
  2-D Asymptotic Solar Dynamo Wave in the Light of Internal Rotation, in Magnetic fields and solar processes,
  Ninth European Meeting on Solar Physics, A. Wilson ed., ESA-SP 448, Vol. 1 (2000) 59

- Belvedere G., Kuzanyan, K. M., Paternó L., Lanza, A. F.
  Asymptotic Dynamo Wave Models of Magnetically Active Close Binaries in the framework of the solar-stellar connection,
  in Magnetic fields and solar processes, Ninth European Meeting on Solar Physics, A. Wilson ed., ESA-SP 448, Vol. 1 (2000) 65.

- 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, P. Venkatakrishnan et al. eds., J. Astrophys. Astron., 21, (2000) 379

- Belvedere G., Pipin V.V., Ruediger G.
  Alpha-effect current and kinetic helicities for a magnetically driven turbulence and solar dynamo,
  in Proc. IAU Coll. 179, Cyclical evolution of solar magnetic fields, P. Venkatakrishnan et al. eds., J. Astrophys. Astron., 21, (2000) 387

- Blanco C.
  Fotometria di asteroidi,
  in Planetary Science Third Italian Meeting held in Bormio, Italy, January 23-30, 2000, A. Manara and E. Dotto (Eds.) , (2000) 87

- Brooks D.H., Costa V.M., Lago M.T.V.T., Lanzafame A.C.
  On the atmospheric structure of T Tauri stars, Stellar Cluster an Associations,
  in Proc. of "Stellar clusters and associations: convection, rotation and dynamos", R. Pallavicini, G. Micela, S. Sciortino (Eds), ASP Conf. Ser., vol. 198, , p. 431-434, 2000

- Busà I., Rodonò M., Pagano I., Neff J.E.
  Chromospheric imaging of the active binary system V 711 Tau (=HR 1099) from NEWSIPS IUE data,
  in Stellar clusters and associations: convection, rotation and dynamos, Proc. 2nd "Three-islands Euroconference", R. Pallavicini G. Micela, S. Sciortino (eds.), Am. Soc. Pacific Conf. Series, v. 198, p. 435-438, 2000

- Busà I., Lanzafame A.C., Rodonò M.
  Two component semi-empirical chromospheric modelling of V711 Tau (=HR1099),
  Proc. 11th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, R. J. Garcì a Lòpez, R. Rebolo, M. R. Zapatero Osorio (Eds.), ASP Conf. Ser., vol. 223, p. 1213-1219, 2000

- Costa V. M., Brooks, D. H., Lago M. T. V. T., Lanzafame A. C.
  UV spectroscopy of T Tauri stars: analysis of LHa 332-21 and RY Tau,
  Proc. 11th Cambridge Workshop on "Cool Stars Stellar Systems and the Sun", R. J. Garcì a Lòpez, R. Rebolo, M. R. Zapatero Osorio (Eds), ASP Conf. Ser., vol. 223, (2000) 497

- Cristaldi S., Mangano A., Rodonò M.
  Contributo dell'Osservatorio Astrofisico di Catania al progetto della "Cart du ciel",
  in Atti del Convegno Annuale di Storia dell'astronomia, "Storia del servizio internazionale delle latitudini e delle imprese di cooperazione internazionale (1850-11950) & Astronomia e archeoastronomia, P. Calledda e E. Proverbio (Eds.), CUEC, (2000) 133

- Di Mauro M.P., Murabito A.L., Paternò L.
  Mass and angular momentum loss of the Sun by magnetically driven winds,
  in Proc. of "Stellar Clusters and Associations: Convection, Rotation, and Dynamos", R. Pallavicini, G. Micela, S. Sciortino (Eds.), ASP Conf. Ser. Vol.198,(2000) 353.

- Gavryusev V., Gavryuseva E., Di Mauro M.P.
  Solar core rotation from LOW-1 multiplets of oscillations observed by GONG, in Magnetic fields and solar processes,
  Ninth European Meeting on Solar Physics, A. Wilson ed., ESA-SP 448, Vol. 1 (2000) 115

- Kovari Zs., Pagano I., Neff J., Rodonò M., Walter F.
  UV spectral image of AR Lac in Oct 1994,
  Proc. 11th Cambridge Workshop on "Cool Stars Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, M.R. Zapatero Osorio (eds.), ASP Conf. Ser., vol. 223 (2000) 1262

- Lanza A.F., Rodonò M.
  Orbital period modulation and hydromagnetic dynamo action in active binaries, in Stellar clusters and associations: convection, rotation and dynamos, Proc. 2nd Three Islands Conf. R. Pallavicini G. Micela, S. Sciortino (eds) PASP, v. 198, (2000) 357.

- Lanza A.F., Rodonò M.
  Orbital Period Modulation and Magnetic Cycles in Active Close Binaries, in Proc. 11th Cambridge Workshop on"Cool Stars, Stellar Systems and the Sun", R.J. Garcia Lopez, R. Rebolo, M. R.Zapatero Osorio (Eds.), ASP Conf. Series, vol. 223, (2000) p. 1456

- 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, Proc. 11th Cambridge Workshop "Cool Stars, Stellar Systems, and the Sun", R. J. Garcì a Lòpez, R. Rebolo, M. R. Zapatero Osorio (Eds.); ASP Conf. Ser., vol. 223 (2000) 691

- Lanzafame G., Maravigna F., Belvedere G.
  The influence of the stellar mass ration spiral shocks in accretion disks around compact objects,
  in Proc. "Pacific rim conference on stellar astrophysics", Hong Kong 3-6 Aug. 1999, K. S. Cheng et al. eds.,(2000) 399

- Leto G., Pagano I., Linsky J. L., Rodonò M., Umana G.
  VLA observations of dMe stars,
  Proc. 11th Cambridge Workshop on "Cool Stars, Stellar Systems and the Sun", R. J. Garcia Lopez, R. Rebolo, M. R. Zapatero Osorio (Eds.), ASP Conf. Series, vol. 223 (2000) 1003

- Marino G., Rodonò M., Leto G., Cutispoto G.
  The starspot filling factor of II Peg: what does indicate UBV and JHK photometry?, in Stellar clusters and associations: convection, rotation and dynamos,
  Proc. 2nd "Three-islands Euroconference", R. Pallavicini G. Micela, S.Sciortino (Eds.), Am. Soc. Pacific Conf. Ser., v. 198 (2000) 471

- Pallavicini R., ..… Bonanno G., Bruno P., Cosentino R., Scuderi S., Catalano S., Rodonò M., Caldara P., Damiani, F., Comari M., Monai, S.; Passaretta, F.
  Design study of an adaptive optics visual echelle spectrograph and imager for the VLT,
  in Proc. of the meeting Astronomical telescopes and instrumentation 2000, Masanori Iye; Alan F. Moorwood; Eds Proc. SPIE Vol. 4008 (2000) 167

- Pellegriti M.G., Aliotta M., Cherubini S., Lattuada M., Miljanic D., Pizzone R.G., Romano S. Soic N., Spitaleri C., Zadro M., Zappala' R.A.
  Study of the Li^7 (p,á)^4 He Reaction at Astrophysical Energies Through the Troian Horse Method,
  in Proc. VI Conferenza CRRNSM (Comitato Regionale Ricerche Nucleari e Struttura della Materia), Palermo 1999, CP 513, Nuclear and Condensed Matter Physics, ed. by A. Messina, 2000 American Institute of Physics, (2000) 298

- Pizzone R.G., Aliotta M., Blagus S., Cherubini S., Figuera P., Lattuada M., Milin M., Miljanic D., Pellegriti M.G., Rendic D., Romano S. Soic N., Spitaleri C., Zadro M., Zappala' R.A.
  Experimental Study of the Li^6 (d,á)^4 He Reaction and Its Astrophysical Implication Via the Trojan Horse Method,
  in Proc. VI Conferenza CRRNSM (Comitato Regionale Ricerche Nucleari e Struttura della Materia), Palermo 1999, CP 513, Nuclear and Condensed Matter Physics, ed. by A. Messina, 2000 American Institute of Physics, (2000) 385

- Rodonò M., Lanza A.F., Becciani U.
  Determination of the light curve parameters of the prototype active binary RS CVn,
  in CNAA-CINECA Numerical Astrophysics Workshop, CINECA, Casalecchio di Reno (BO), 2000

- Aliotta M., Blagus S., Bogovac M., Cherubini S., Figuera P., Lattuada M., ZadroM., Zappala' R.A.
  Indirect investigation of the d+ Li reaction at low energies relevant for nuclear astrophysics,
  in Proceedings of the Cluster99 Conference, Island of Rab, Croatia, (2001) in press

- Amado P.J., Cutispoto G., Lanza A.F., Rodonò M.
  AB Doradus: Long and short term light variations and spot parameters, in Cool Stars, Stellar Systems, and the Sun
  Challenges for the new millennium, Proc. 11th Cambridge Workshop, R.J. Garcia Lopez et al. (Eds.), Am. Soc. Pacific Conf. Series, (2001) in press

- Blanco C.
  Fotometria di asteroidi
  Planetary Science Third Italian Meeting held in Bormio, Italy, January 23-30, 2000, ed. by A. Manara and E. Dotto, (2001) in press

- Blanco C.
  Primi risultati della stazione meteorologica dell'Isola Lachea
  Boll. Acc. Gioenia Sci. Nat., (2001) in press

- 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., (2001) in press

- Pagano I., Rodonò M., Linsky J.L., Neff J.E, Walter F.
  The circumstellar environment of AR Lacertae,
  in Proc. of the Meeting "X ray-astronomy 2000" R. Giacconi et al. (eds), (2001) in press

- Paternò L.
  The Standard Solar Model and the Neutrino Problem: present status and future perspectives,
  II Convegno sulla Ricerca Solare Italiana L'Aquila, 3 - 5 Luglio 2000, Mem. Soc. Astr. Ital., (2001) in press

- Spadaro S., Lanza Lanzafame A.C., Antiochos S. K., O'Mullane M. G.
  EUV line emission during the dynamic formation of prominence condensation,
  Mem. Soc. Astr. Ital., (2001) in press

- Scuderi S., Bonanno G., Catalano S., Lanzafame, A.C., Citterio O., Conconi P., Pareschi G.
  Feasibility study of a camera for the UV Italian Sky Surveyor (UVISS) on the International Space Station,
  SPIE 45th Annual Meeting Proceedings, Volume 4139, (2001) in press

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

- Zuccarello F., Contarino L., Romano P., Ternullo M., Zappalà R.A.
  The Solar patrol at Catania Astrophysical Observatory,
  in First SOLSPA-EUROCONFERENCE JOSO Meetings Data Handling in Solar and Geophysical Research, Santa Cruz de Tenerife, (2001) in press

- Catalano S., Frasca A., Marilli E., Marino G., Rodonò M.
  The behaviour of spots and plages in magnetically active stars,
  Lectures delivered at the workshop on Stellar activity and variability 21-23 January 2000, Canakkale University, Turkey, Rapporti interni e tecnici Osservatorio. Astrofisico Catania. 2, 2000

- Lanzafame A.C.
  Active late-type stars variability and models from high resolution spectra,
  in Proceedings of the workshop on "SARG at TNG: Perspectives for the year 2000", Gratton R.G. and Claudi R.U.(Eds.), (2000) 87

- Paternò L.
  Commento all'articolo Principio antropico e leggende metropolitane di Vittorio Castellani e Scilla Degl'innocenti,
  Giornale d'Astronomia 2, (2000) 2.

- 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) in press