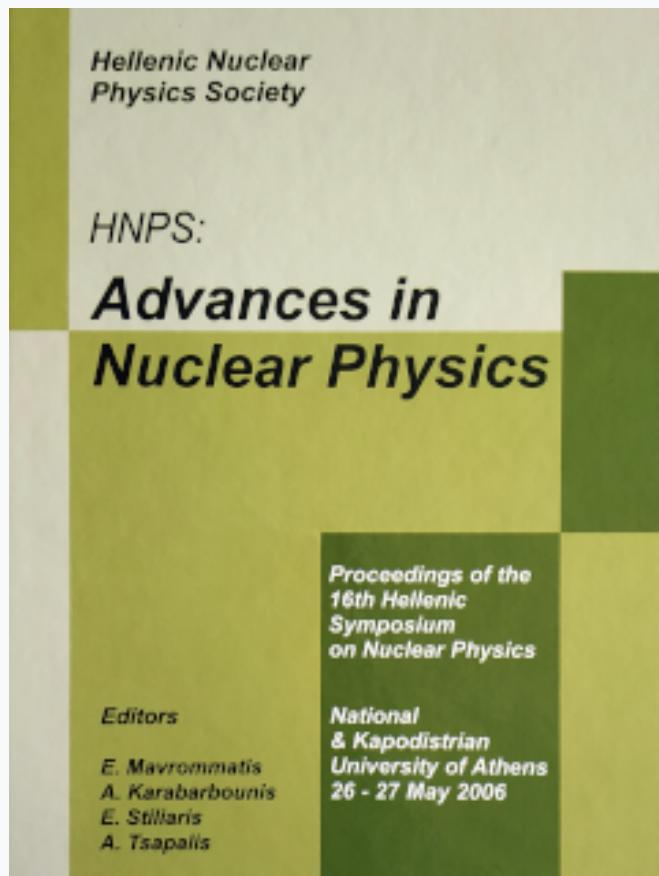


## HNPS Advances in Nuclear Physics

Vol 15 (2006)

HNPS2006



### Editorial Comments and Symposium Info

/ Editorial Comments

doi: [10.12681/hnps.2605](https://doi.org/10.12681/hnps.2605)

### To cite this article:

Editorial Comments, /. (2020). Editorial Comments and Symposium Info. *HNPS Advances in Nuclear Physics*, 15, i-x.  
<https://doi.org/10.12681/hnps.2605>

HELLENIC NUCLEAR PHYSICS SOCIETY

**PROCEEDINGS**

of the

**16<sup>th</sup> HELLENIC SYMPOSIUM**

on

**NUCLEAR PHYSICS**

Physics Department

NATIONAL AND KAPODISTRIAN UNIVERSITY OF  
ATHENS

26 & 27 MAY 2006

## SPONSORS

- National and Kapodistrian University of Athens
- Ministry of Education and Religious Affairs
- Hellenic Nuclear Physics Society
- Leader Books

## HELLENIC NUCLEAR PHYSICS SOCIETY Governing Board

- S. Harissopoulos (President)
- R. Vlastou (Vice President)
- D. Bonatsos (Secretary)
- E. Mavrommatis
- G. Lalazissis

## ORGANIZING COMMITTEE

- E. Mavrommatis
- A. Karabarounis
- N. Sparveris
- E. Stiliaris
- A. Tsapalis

## EDITORS

- E. Mavrommatis
- A. Karabarounis
- E. Stiliaris
- A. Tsapalis

## PREFACE

This volume contains the Proceedings of the 16<sup>th</sup> Hellenic Symposium on Nuclear Physics which took place at the Physics Department of the National and Kapodistrian University of Athens on May 26 and 27, 2006. It was organized under the auspices of the Physics Department and the Hellenic Nuclear Physics Society (HNPS).

The Symposium belongs to the series of the Hellenic Nuclear Physics Symposia sponsored by HNPS that started in 1990 at Thessaloniki and are held every year at different Hellenic Academic and Research Institutions with activity in Nuclear Physics. The aims of this series of Symposia are mainly:

- Presentation of the research activities mainly of the Greek Nuclear Physics Community and dissemination of information
- Creation of new and warming up of existing collaborations
- Promotion of new scientists by giving them the opportunity to present their work
- Coordination of the efforts of the Community of Nuclear Physicists in Greece and abroad and improvement of the undergraduate and graduate education of Nuclear Physics in Greece

The 16<sup>th</sup> Hellenic Symposium on Nuclear Physics was attended by more than 80 participants active within theory, experiment and applications. There have been few foreign speakers from abroad as well as some Greek nuclear physicists working abroad. There has been a significant participation of young colleagues at M.Sc and Ph.D levels and for the first time even a small number of undergraduate students. There have been 36 talks and 9 posters covering different topics from Hadron Physics, Nuclear Structure and Dynamics, Phases of Nuclear Matter, Nuclei in the Universe, Fundamental Interactions, as well as Nuclear Physics Applications. This volume includes the texts of the talks and

posters arranged according to the order in which they were presented (please see the program of the Symposium).

The organization of the Symposium was made possible by the support of the Division of Nuclear and Particle Physics, the Department of Physics and the Research Committee of the University of Athens. Financial support has also been offered by the Ministry of Education, as well as the Hellenic Nuclear Physics Society. We would like to warmly thank them all. Thanks are also due to the students and technical staff for their support. Finally, we would like to thank all participants for a truly interesting meeting. Once more it has become evident that the Nuclear Physics Community in Greece is characterized by devotion in education, enthusiasm, hard work and initiative in research, integrity and capacity for collaboration. It works for the advancement of knowledge and culture, for the improvement of the living conditions, for peace.

Athens, 2007

E. Mavrommatis

A. Karabarounis

E. Stiliaris

A. Tsapalis

# CONTENTS

## PART I: ORAL PRESENTATIONS

### Session I

<b>The Pion Cloud and the Shape of Hadrons</b> <i>C.N. Papanicolas</i>	1
<b>Parity-Violating Electron Scattering</b> <i>S. Kowalski</i>	2
<b>The Quark-Meson Model and the Phase Diagram of QCD</b> <i>N. Tetradis</i>	15
<b>Measurements of the Quadrupole Strengths in the <math>N \rightarrow \Delta</math> Transition at Mainz and Bates</b> <i>N. Sparveris</i>	23
<b>Nucleon Electromagnetic Structure from Lattice QCD</b> <i>A. Tsapalis et al.</i>	31

### Session II

<b>Nuclear Energy Density Functional Constrained by Low-Energy QCD</b> <i>D. Vretenar</i>	39
<b>Relativistic Hartree Bogoliubov Model with Density Dependent Meson-Nucleon Couplings</b> <i>G. Lalazissis et al.</i>	49
<b>Distribution of Maxima of the Antisymmetrized Wave Function for the Nucleons of a Closed Shell and for the Nucleons of All Closed-Shells in a Nucleus</b> <i>G. Anagnostatos</i>	57
<b>Nuclear Response using Correlated Realistic Interactions: First-Order Random Phase Approximation and Beyond</b> <i>P. Papakonstantinou et al.</i>	67
<b>Decay Widths of Isoscalar Giant Monopole Resonances: Regular and Chaotic Dynamics</b> <i>P. Papachristou et al.</i>	74

### Session III

#### **First Observation of Muon Neutrino Disappearance in the MINOS Experiment**

*G. Tzanakos*

82

#### **Sequential Binary Decay of Light Nuclear Systems: An Assessment of Statistical Model Codes**

*N. Nicolis*

83

#### **Differential Cross Section Measurements of the $^{12}\text{C}(\text{d},\text{p}_{1,2,3})^{13}\text{C}$ Reaction, in the Energy Range $E_{\text{d,lab}} = 900\text{-}2000 \text{ keV}$ , Suitable for NRA**

*M. Kokkoris et al.*

91

#### **Study of the $^{191}\text{Ir}(\text{n},2\text{n})^{190}\text{Ir}$ Reaction Cross Section**

*N. Patronis et al.*

97

#### **Statistical Model Calculations of $^{72,73}\text{Ge}(\text{n},\text{p})$ and $^{72,74}\text{Ge}(\text{n},\text{a})$ Reactions on Natural Ge**

*S. Galanopoulos et al.*

104

#### **A $4\text{n}$ $\gamma$ -Summing Method for Cross Section Measurements of Capture Reactions**

*A. Spyrou et al.*

111

### Session IV

#### **Connecting the $X(5)\text{-}\beta^2$ , $X(5)\text{-}\beta^4$ , and $X(3)$ Models to the Shape/Phase Transition Region of the Interacting Boson Model**

*E.A. McCutchan, D. Bonatsos and N.V. Zamfir*

118

#### **Nuclear Symmetry Energy Effects on Neutron Star Properties**

*Ch. Moustakidis et al.*

128

#### **Nuclear Phase Transitions Near the Critical Points: A Study with the Relativistic Hartree-Bogoliubov Model, the Interacting Boson Model and the Boson Coherent-State Framework**

*R. Fossion*

136

#### **Probing the $T_z\text{=-}3/2$ Nuclei via Magnetic Moment Measurements**

*T.J. Mertzimekis*

144

<b>Parameter-Free Solution of the Bohr Hamiltonian for Actinides in the Octupole Mode</b> <i>D. Lenis and D. Bonatsos</i>	149
<b>X(3): An Exactly Separable <math>\gamma</math>-Rigid Version of the X(5) Critical Point Symmetry</b> <i>D. Bonatsos, D. Lenis, D. Petrellis et al.</i>	157
 <b><u>Session V</u></b>	
<b>Current Trends in the Endorsement and Quality Assurance of Contemporary Radiotherapy Applications</b> <i>P. Karaikos et al.</i>	165
<b>Position and Energy Resolution Study of a <math>\gamma</math>-Camera based on a Position Sensitive PMT</b> <i>A. Polychronopoulou et al.</i>	172
<b>The Expansion of TRIAC to TRIACII Code for Track Measurements from SSNT Detectors</b> <i>D. Patiris et al.</i>	180
<b>Study of the (n,2n) Reaction Cross Section on <math>^{174,176}\text{Hf}</math> Isotopes</b> <i>M. Serris et al.</i>	188
<b>Constraints on EOS from Finite Nuclei, Heavy Ion Collisions and Neutron Stars</b> <i>Th. Gaitanos et al.</i>	196
<b>Particle Production in Heavy Ion Collisions at Intermediate Energies</b> <i>V. Prassa et al.</i>	202
<b>A Global Model for <math>\beta^-</math> Decay Half-Lives using Neural Networks</b> <i>N. Costiris et al.</i>	210

## **Session VI**

<b>Critical QCD Phenomena in Relativistic Nuclear Collisions</b> <i>N.G. Antoniou</i>	218
<b>CASTOR: A Calorimeter for Search of "Strangelets" at the CMS Experiment at CERN</b> <i>X.A. Aslanoglou</i>	219

<b>Bound State Effects in Transverse Momentum Parton Distributions</b> <i>X.N. Maintas et al.</i>	225
<b>The Critical Point of Bootstrap and Lattice QCD</b> <i>N.G. Antoniou, F.K. Diakonos and A.S. Kapoyannis</i>	233
<b>Evolution of Critical Correlations at the QCD Phase Transition</b> <i>E.N. Saridakis et al.</i>	241
<b>Cross Section Calculations for Neutrino-Nucleus Reactions at Low and Intermediate Energies</b> <i>V.Ch. Chasioti et al.</i>	249
<b>Detection Rates of Cold Dark Matter Candidates by using Deformed Hartree-Fock Method</b> <i>T.S. Kosmas and R. Sahu</i>	257

## PART II: POSTER PRESENTATIONS

<b>Proton Drip Line Evaluation by Complementing the Finite Range Droplet Model with Neural Networks</b> <i>S. Athanassopoulos et al.</i>	258
<b>The Use of Nuclear Techniques in Environmental Research: <math>^{137}\text{Cs}</math> Determined by Gamma Spectrometry, as a Tracer Tool in Marine Processes</b> <i>H. Florou et al.</i>	262
<b>Spin-Spin Interactions of Electrons and also of Nucleons Create Atomic, Molecular and Nuclear Structures</b> <i>L.A. Kalambos</i>	263
<b>Feasibility Study for the Usage of Antiprotons and Other Heavy Particles in Therapeutic and Diagnostic Applications</b> <i>I. Kantemiris et al.</i>	264
<b>Nuclear <math>\beta^+</math>/EC Decay Half-Lives Calculated with Neural Networks</b> <i>I. Kerasovitis et al.</i>	268
<b>Application of Ion Beam Analysis for the Characterization of SiC- and DLC-Thin Films</b> <i>F. Noli, P. Misaelides et al.</i>	269

<b>Identification of Unknown Nuclear Material</b> <i>J.G. Fantidis, G.E. Nicolaou and F.N. Tsagas</i>	273
<b>Trace Elements and Natural Radionuclides in the Marine Sediments of Psyttalia-Keratsini Strait (Saronikos Gulf), Greece</b> <i>A. Moustakli, G. Papatheodorou and H. Papaefthymiou</i>	277
<b>Radiological Impact Assessment in the Wide Area of the Metallic and Thermometallic Springs in the Island of Ikaria</b> <i>G. Trabidou and H. Florou</i>	278
<b>Symposium Programme</b>	281
<b>List of Participants</b>	285
<b>History of the Panhellenic Symposium on Nuclear Physics</b>	289

