

## Annual Symposium of the Hellenic Nuclear Physics Society

Τόμ. 16 (2008)

HNPS2008



### Editorial Comments and Symposium Info

/ Editorial Comments

doi: [10.12681/hnps.2572](https://doi.org/10.12681/hnps.2572)

### Βιβλιογραφική αναφορά:

Editorial Comments, /. (2020). Editorial Comments and Symposium Info. *Annual Symposium of the Hellenic Nuclear Physics Society*, 16, i-viii. <https://doi.org/10.12681/hnps.2572>

**HELLENIC NUCLEAR PHYSICS SOCIETY**

**PROCEEDINGS**

of the

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

**on**

**NUCLEAR PHYSICS**



DEPARTMENT OF PHYSICS  
THE UNIVERSITY OF IOANNINA

30 & 31 MAY 2008

# **HELLENIC NUCLEAR PHYSICS SOCIETY**

## **GOVERNING BOARD**

- A. PAKOU (PRESIDENT)
- G. A. LALAZISSIS (VICE PRESIDENT)
- D. BONATSOS (SECRETARY)
- S. STYLIARIS (TREASURER)
- C. T. PAPADOPOULOS

## **ORGANIZING COMMITTEE**

- A. PAKOU (CHAIR)
- N. G. NICOLIS
- G. PANTIS
- T. J. KOSMAS
- K. G. IOANNIDES
- X. ASLANOGLOU

## **SPONSORS**

- THE UNIVERSITY OF IOANNINA
- HELLENIC NUCLEAR PHYSICS SOCIETY

## **EDITORS**

- A. PAKOU
- T. J. KOSMAS
- N. G. NICOLIS

## **PREFACE**

This volume contains the Proceedings of the 17<sup>th</sup> Hellenic Symposium on Nuclear Physics, held at The University of Ioannina on May 30 and 31, 2008. It was organized by the Physics Department of the University of Ioannina under the auspices of the Hellenic Nuclear Physics Society (HNPS), sponsored by the University and HNPS.

It belongs to a series of Symposia, started at Thessaloniki in 1990 and held every year at different Academic and Research Environments.

These Symposia aim

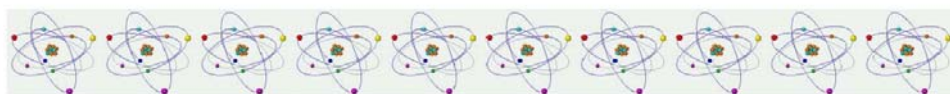
- To confirm the research activities of the nuclear physicists in Greece and spread them to Greek and International fora.
- To strengthen the collaborations between the various Institutions and create a productive competition.
- To support the training of the postgraduate students by giving them the opportunity to present their work as well as to disseminate new scientific information.
- To attract new researchers in Nuclear Physics from the undergraduate students

The 17<sup>th</sup> Hellenic Symposium was attended by more than 40 participants active in theory as well as in Experiment, in Fundamental Research and in Applications with 25 talks and 10 poster presentations. This volume includes articles relevant to these talks and posters according to the order with which were presented.

The importance given from our University, on the aim of such symposia, was indicated by the presence in the welcoming remarks of the Rector of the University, Prof. Ioannis P. Gerothanassis and the Chairman of the Physics Department, Prof. Kostas Kosmidis. We warmly thank them for that and the financial support provided by the Rector's office. We also warmly thank HNPS for the financial support and the continuous interest for the best organization of this Symposium.

Ioannina, September 2008

Athena Pakou  
Theocharis J. Kosmas  
Nikolaos G. Nicolis



## **17<sup>ο</sup> ΣΥΜΠΟΣΙΟ ΕΛΛΗΝΙΚΗΣ ΕΤΑΙΡΕΙΑΣ ΠΥΡΗΝΙΚΗΣ ΦΥΣΙΚΗΣ**



**ΠΑΝΕΠΙΣΤΗΜΙΟ ΙΩΑΝΝΙΝΩΝ, ΤΜΗΜΑ ΦΥΣΙΚΗΣ  
ΙΩΑΝΝΙΝΑ, 30-31 ΜΑΪΟΥ, 2008**

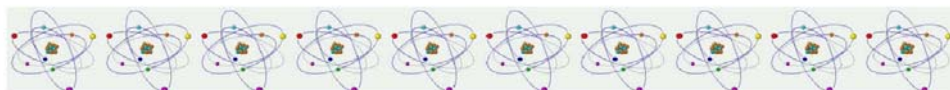


### **ΟΡΓΑΝΩΤΙΚΗ ΕΠΙΤΡΟΠΗ**

- Α. Πάκου (Chair)
- Ν.Γ. Νικολής
- Γ. Παντής
- Θ. Κοσμάς
- Κ.Γ. Ιωαννίδης
- Ξ. Ασλάνογλου

**ΛΙΘΟΥΣΑ ΣΕΜΙΝΑΡΙΩΝ  
ΚΤΙΡΙΟ ΠΛΗΡΟΦΟΡΙΚΗΣ  
(ΙΣΟΓΕΙΟ)**

**Πληροφορίες: [hmps@cc.uoi.gr](mailto:hmps@cc.uoi.gr)**



# Contents

## Oral Presentations

<i>What can we learn from the Interacting Boson Model in the limit of large boson numbers?</i> D. Bonatsos <i>et al.</i>	1
<i>Microscopic description of nuclear quantum phase transitions</i> G. Lalazissis <i>et al.</i>	9
<i>A review on recent developments in deuteron induced reactions enhancing NRA capabilities</i> M. Kokkoris <i>et al.</i>	17
<i>Novel radiation sources using relativistic electrons-Application</i> A. Karabarbounis <i>et al.</i>	24
<i>A large volume (<math>1\text{m}^3</math>) spherical proportional counter for atmospheric neutron measurements</i> I. Savvidis <i>et al.</i>	33
<i>A small field, high resolution <math>\gamma</math>-camera system dedicated to SPECT imaging</i> G. Thanasas <i>et al.</i>	43
<i>Dose measurments around spallation neutron sources</i> M. Fragopoulou <i>et al.</i>	51
<i>Nucleosynthesis by accelerated particles in a bipolar Supernova explosion</i> G. Vernardos <i>et al.</i>	61
<i>Coherent and Incoherent Channels of Neutrino-Nucleus Reactions</i> T. S. Kosmas <i>et al.</i>	69
<i>Revisited solar neutrino fluxes using recent S-factor data from pp-chain reactions</i> G. Karathanou <i>et al.</i>	77
<i>Using folding method for studying the nuclear response to Supernova neutrino spectra</i> V. Tsakstara <i>et al.</i>	85
<i>Neutral current neutrino-nucleus reactions cross sections for stable Mo isotopes</i>	

K. Balasi <i>et al.</i>	91
<i>Stellar Nucleosynthesis: The Neutrino energy-spectra and their detection by terrestrial experiments</i>	
K. Kosta <i>et al.</i>	99
<i>A renormalized HVT approach for a class of central potential wells</i>	
C. A. Efthimiou <i>et al.</i>	100
<i>A new <math>\Lambda</math>-nucleus potential for the <math>\Lambda</math>-particle energies in hypernuclei</i>	
C. A. Efthimiou <i>et al.</i>	107
<i>Exactly separable version of the Bohr Hamiltonian with the Davidson potential</i>	
D. Petrelis <i>et al.</i>	113
<i>Probing the nuclear equation of state with peripheral heavy ion collisions at Fermi Energies</i>	
G. A. Souliotis	121
<i>Equation of state for <math>\beta</math>-stable hot nuclear matter</i>	
C. Moustakidis	130
<i>CASTOR: A detector for strange matter of the CMS experiment at CERN</i>	
X. Aslanoglou <i>et al.</i>	138
<i>Search for exotic nuclear breakup configurations in Au+Au collisions.</i>	
N. G. Nicolis <i>et al.</i>	145
<i>A study of the <math>N=28</math> neutron shell via g-factor measurements in neutron-rich Cl isotopes</i>	
T. J. Mertzimekis <i>et al.</i>	153
<i>Isomeric cross section study of neutron induced reactions on Ge</i>	
R. Vlastou <i>et al.</i>	158
<i><math>^{234}\text{U}(n,f)</math> cross sections with the FIC detector at CERN (<math>n_{\text{TOF}}</math>)</i>	
D. Karadimos <i>et al.</i>	164
<i>Strong transfer channels for reactions with weakly bound projectiles at near and sub-barrier energies and implications to fusion</i>	
A. Pakou <i>et al.</i>	173
<i>Applications of nuclear technology in environmental studies</i>	
H. Florou	181

## Poster Session

<i>Radiological impact assessment in insular areas using in situ and laboratory nuclear techniques</i> H. Florou <i>et al.</i>	182
<i>A comparative study of Cesium-137 profiles in two separated areas of Greece during the period 2005-2007</i> N. Evangeliou <i>et al.</i>	183
<i>Naturally occurring radioactive material releases from a phosphogypsum disposal area in Greece</i> V. Koukoulou <i>et al.</i>	184
<i><math>\gamma</math>-spectrometry intercomparison exercise for GAEC's collaborating laboratories network</i> V. Koukoulou <i>et al.</i>	185
<i>Occupational and residential radon exposure: a study in North-Western Greece</i> D. Patiris <i>et al.</i>	186
<i>The new external ion-beam station at the Demokritos Tandem 5.5 MV accelerator: A unique analytical tool in the fields of cultural heritage and environmental science</i> D. Sokaras <i>et al.</i>	191
<i>X-ray fluorescence enhancement induced by photo-electrons secondary excitation</i> D. Sokaras <i>et al.</i>	201
<i>Development of a portable micro-XRF spectrometer and its application for the characterization of ancient and historical metal alloys</i> V. Kantarelou <i>et al.</i>	202
<i>Optical properties of continuous and pixelated scintillation crystals</i> M. Mikeli <i>et al.</i>	211
<i>Microscopic study of <math>^1S_0</math> superfluidity in neutron matter</i> G. Pavlou <i>et al.</i>	221
<i>Statistical global modeling of <math>\beta^-</math>-decay halflives systematics using multilayer feedforward neural networks and support vector machines</i> N. Costiris <i>et al.</i>	223
<i>Study of the <math>^{191}\text{Ir}(n,2n)^{190}\text{Ir}</math> reaction cross section</i> C. T. Papadopoulos <i>et al.</i>	231



<i>Covariant density functional NL3, ten years after</i> S. Karatzikos <i>et al.</i>	232
<i>Barrier curvatures and positions for weakly and strongly bound nuclei</i> K. Zerva and A. Pakou	238