

11th European Summer School on Experimental Nuclear Astrophysics 2022

EPJ Web of Conferences Volume 275 (2023)

Catania, Italy
12 – 19 June 2022

Editors:

**L. Lamia
R.G. Pizzone**

**G.G. Rapisarda
M.L. Sergi**

ISBN: 978-1-7138-7049-4

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

This work is licensed under a Creative Commons Attribution 4.0 International License. License details:
<http://creativecommons.org/licenses/by/4.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2023)

For additional information, please contact EDP Sciences – Web of Conferences at the address below.

EDP Sciences – Web of Conferences
17, Avenue du Hoggar
Parc d'Activité de Courtabœuf
BP 112
F-91944 Les Ulis Cedex A
France

Phone: +33 (0) 1 69 18 75 75

Fax: +33 (0) 1 69 28 84 91

contact-edps@webofconferences.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Transfer Reactions in Nuclear Astrophysics..... <i>Adsley Philip</i>	1
Nuclear Astrophysics Studies with γ -Ray Beams: What Do We Expect to Learn from Them? <i>Balabanski Dimiter L.</i>	7
Big Bang Nucleosynthesis as a Probe of New Physics <i>Bertulani Carlos A., Hall Francis W., Santoyo Benjamin I.</i>	14
Recoil Mass Separators for Nuclear Astrophysics: The Role of ERNA..... <i>Buompane Raffaele, Porzio Giuseppe, Santonastaso Claudio</i>	23
Magnetic and Non-Magnetic AGB Mixing for S-Processing..... <i>Busso Maurizio</i>	29
Neutron Captures in Stellar Nucleosynthesis <i>Cristallo Sergio</i>	35
Influence of Crystal Structures on Electron Screening..... <i>Cvetinoviæ Aleksandra, Djeordjia Dijana, Guardo Giovanni Luca, Kelemen Mitja, La Cognata Marco, Lamia Livio, Markelj Sabina, Pizzone Rosario Gianluca, Schwarz-Selinger Thomas, Tišma Isabela, Vencelj Matjaž, Vesia Jelena, Lipoglavšek Matej</i>	40
ANC Method: Experimental Approach and Recent Results..... <i>D'Agata G., Kilic A.I., Burjan V., Cassisa A., Mrázek J., Glagolev V.</i>	46
Nuclear Astrophysics Activities at the n_TOF Facility at CERN <i>Massimi Cristian</i>	52
Radioactive Ion Beams: Production and Experiments at INFN-LNL <i>Mazzocco Marco</i>	58
Basic Stellar Physics..... <i>Palmerini S.</i>	63
Investigation of a Light Dark Boson Existence: The New JEDI Project..... <i>Bastin Beyhan, Kiener Jürgen, Deloncle Isabelle, Coc Alain, Pospelov Maxim, Mrazek Jaromir, Lamia Livio, Ackermann Dieter, Adsley Philip, Bacri Charles-Olivier, Bourçois Jérôme, Burjan Vaclav, Cassisa Anastasia, D'agata Giuseppe, De France Gilles, Di Pietri Alessia, Demane Yasmine, De Oliveira François, Donaldson Lindsay, Donzaud Corinne, Ducret Jean-Eric, Hamadache Clarisse, Hammache Fairouz, Jones Pete, La Cognata Marco, Laviron Adrien, Lewitowicz Marek, Malatji Kgashane, Massara Antonio, Pitrou Cyril, Pizzone Rosario Gianluca, Guardo Giovanni Luca, P oszajczak Marek, Rapisarda Giuseppe, Rebeiro Bernadette, Roussère Brigitte, Santonocito Domenico, de Séréville Nicolas, Sergi Maria Letizia, Simeckova Eva, Sorlin Olivier, Stodel Christelle, Tatischeff Vincent, Thomas Jean-Charles, Tumino Aurora</i>	69
Trojan Horse Method: A General Introduction..... <i>Romano Stefano</i>	75
The PANDORA Project: A Setup for In-Plasma α -Decay Studies in Nuclei of Astrophysical Interest <i>Mascali David, Santonocito Domenico</i>	82

RIB Induced Reactions: Studying Astrophysical Reactions with Low-Energy RI Beam at CRIB.....	88
<i>Yamaguchi H., Hayakawa S., Ma N.R., Shimizu H., Okawa K., Zhang Q., Yang L., Kahl D., La Cognata M., Lamia L., Abe K., Beliuskina O., Cha S.M., Chae K.Y., Cherubini S., Figuera P., Ge Z., Gulino M., Hu J., Inoue A., Iwasa N., Kim A., Kim D., Kiss G., Kubono S., La Commara M., Lattuada M., Lee E.J., Moon J.Y., Palmerini S., Parascandolo C., Park S.Y., Phong V.H., Pierroutsakou D., Pizzone R.G., Rapisarda G.G., Romano S., Spitaleri C., Tang X.D., Trippella O., Tumino A., Zhang N.T., Lam Y.H., Heger A., Jacobs A.M., Xu S.W., Ma S.B., Ru L.H., Liu E.Q., Liu T., Hamill C.B., Murphy A. St J., Su J., Fang X., Kwag M.S., Duy N.N., Uyen N.K., Kim D.H., Liang J., Psaltis A., Sferrazza M., Johnston Z., Li Y.Y.</i>	
Overview of Numerical Simulations for Calculating In-Plasma β -Decay Rates in the Framework of PANDORA Project.....	93
<i>Mishra Bharat</i>	
Study of (α, n) Reactions to Determine the α -Optical Potential for γ -Process.....	97
<i>Basak Dipali, Basu Chinmay</i>	
Experimental Study of $^{37}\text{Cl}(\alpha, n)^{40}\text{K}$ Reaction in Order to Constrain the Reaction Rate of Destruction of ^{40}K in Stars.....	100
<i>Dimitrakopoulos Nikolaos, Perdikakis Georgios, Tsintari Pelagia, Brune Carl R., Massey Thomas N., Meisel Zach, Voinov Alexander, Ingram David C., Gastis Panos, Jones-Alberty Yenuel, Subedi Shiv K., Warren Justin, Brandenburg Kristyn H., Singh Nisha, Ulbrich Lauren P.</i>	
The Challenging Direct Measurement of the 65 keV Resonance Strength of the $^{17}\text{O}(p, \gamma)^{18}\text{F}$ Reaction at LUNA.....	104
<i>Gesue Riccardo Maria</i>	
Experimental Studies of the $^{46}\text{Mn} \beta^+$ -Decay Channel and Spectroscopy of ^{46}Cr at LISE-GANIL.....	108
<i>Godos-Valencia David, Acosta Luis, Ascher Pauline, Blank Bertram, Giovinazzo Jerome, de Oliveira Santos Francois, Fougères Chloé, Sánchez-Benítez Angel Miguel</i>	
Astrophysical S Factor and Reaction Rate of $^{92,94}\text{Mo}(p, \gamma)$ Relevant to the P-Process.....	113
<i>Hingu Akash, Prajapati P.M., Mukherjee S., Pizzone R.G., Katovsky K.</i>	
Nuclear Level Densities and $\tilde{\alpha}$ -Ray Strength Functions of $^{120,124}\text{Sn}$ and Their Application in Astrophysics.....	116
<i>Markova Maria, Larsen Ann-Cecilie, Garrote Bello Frank Leonel</i>	
Laboratory Magnetoplasmas as an Ideal Experimental Environment for Nuclear Astrophysics β -Decay Studies.....	120
<i>Naselli Eugenia</i>	
Direct Measurement of the $^{26}\text{Si}(\alpha, p)^{29}\text{P}$ Reaction at CRIB for the Nucleosynthesis in the X-Ray Bursts.....	125
<i>Okawa Kodai, Kim Minju, Chae Kyungyuk, Hayakawa Seiya, Adachi Satoshi, Cha Soomi, Chillery Thomas William, Furuno Tatsuya, Gu Gyungmo, Hanai Shutaro, Imai Nobuaki, Kahl David, Kawabata Takahiro, Kim Chanhee, Kim Dahee, Kim Sohyun, Kubono Shigeru, Kwag Minsik, Li Jiatai, Ma Nanru, Michimasa Shin'ichiro, Nguyen Kim Uyen, Nguyen Ngoc Duy, Sakanashi Kohsuke, Shimizu Hideki, Sirbu Oana, Yamaguchi Hidetoshi, Yokoyama Rin, Zhang Qian</i>	

The $^{12}\text{C} + ^{16}\text{O}$ Fusion Reaction in Carbon Burning: Study at Energies of Astrophysical Interest Using the Trojan Horse Method	128
<i>Oliva A.A., Tumino A., Soic N., Prajapati M.P., Acosta L., Alba R., Barba F., Cherubini S., D'Agata G., Dell'Aquila D., Di Pietro A., Fernandez P.J., Figuera P., Galaviz Redondo D., Guardo L., Gulino M., Hammache F., Jelavic Malenica D., Kiliç A.I., La Cognata M., La Commara M., Lamia L., Lattuada D., Maiolino C., Manicò G., Mazzocco M., Milin M., Nanru Ma, Nurmukhanbetova A., Nurkic D., Palmerini S., Parascandolo T., Pierroutsakou D., Pizzone R.G., Popocovski R., Rapisarda G.G., Romano S., Santonocito D., Sergi M.L., Shotter A., Spartà R., Spiridon A., Trache L., Vukman N., Yamaguchi H.</i>	
Sub-Coulomb Barrier Penetration for a ^6Li with a Clustered and Deformed Ground-State	132
<i>Perrotta Salvatore Simone, Fortunato Lorenzo, Lay José Antonio, Colonna Maria</i>	
On the Impact of Compact Binary Merger Ejecta Opacity on Kilonova Transient Signals	135
<i>Pidatella Angelo</i>	
Indirect Measurement of the $(n,\gamma)^{127}\text{Sb}$ Cross Section	139
<i>Pogliano Francesco, Larsen Ann-Cecilie, Bello Garrote Frank Leonel, Møller Bjørøen Marianne, Kvalheim Eriksen Thomas, Gjestvang Dorthea, Görge Andreas, Guttormsen Magne, Li Kevin Ching Wei, Markova Maria, Matthews Eric Francis, Paulsen Wanja, Gaard Pedersen Line, Siem Sunniva, Storebakken Tellef, Gabor Tornyi Tamás, Ersland Vevik Julian</i>	
$^{13}\text{C}(\alpha,n)^{16}\text{O}$: The Source of Neutrons for the S-Process Main Component	142
<i>Prajapati P.M., Qureshi Mahin, Hingu A., Pizzone R.G., La Cognata M., Suryanarayna S.V., Shet Sachin, Mukherjee S.</i>	
Study for the Long-Lived Gamma Background Due to Neutron Emitting Calibration Reactions	146
<i>Bar Tanmoy, Basak Dipali, Saha Sukhendu, Sahoo Lalit Kumar, Basu Chinmay</i>	
First (p,n) Reaction Measurement in Inverse Kinematics with SECAR.....	150
<i>Tsintari Pelagia, Berg Georg, Blackmon Jeff, Chipps Kelly, Couder Manoel, Deibel Catherine, Dimitrakopoulos Nikolaos, Garg Ruchi, Greife Uwe, Hermansen Kirby, Hood Ashley, Jain Rahul, Maher Cavan, Marshall Caleb, Meisel Zach, Miskovich Sara, Montes Fernando, Perdikakis Georgios, Pereira Jorge, Ruland Thomas, Schatz Hendrik, Setoodehnia Kiana, Smith Michael, Wagner Louis, Zegers Remco G.T.</i>	

Author Index