Nuclear astrophysics plays a key role for the understanding of the energy production in stars, the stellar evolution and the concurrent synthesis of the elements and their isotopes. It is also a key to explain the ashes of the early universe, to determine the age of the elements and thus the age of the universe, to predict the neutrino luminosity of the Sun and supernovae, etc. In this field nuclear reactions represent the “bone structure” for the above aspects, whose rates need to be determined in the laboratory. Although impressive progress has been made over the past decades, which was rewarded by Nobel prizes, there remain major problems, which challenge the basis of the present understanding.

We have the pleasure to announce the fifth European summer school on experimental nuclear astrophysics, devoted to the education of young researchers. The school will deal with various aspects of primordial and stellar nucleosynthesis, including novel experimental approaches, indirect methods, and radioactive ion beams. Furthermore, we plan to have lectures on complementary subjects of astrophysics such as dark matter and cosmic rays.

The fifth edition should be seen in the intention of the organizers as a cornerstone for young scientists formation in the field of nuclear astrophysics as well as the climax of the research activity in this decade. The previous editions of the school took place in 2001, 2003, 2005, 2007. In each edition and, of course, in the fifth one, particular attention will be devoted to the participation of young students of less favoured countries especially to the ones coming from the southern coast of the Mediterranean Sea.

The 8 days of the school include one day for arrival (20.09.09) and one day for departure (27.09.09). In the remaining 6 days, there will be lectures every morning, while the afternoon will be scheduled both for lectures and seminars as well as young researcher contributions. We expect that the participants arrive in Santa Tecla on 20.09.09, where a registration desk will be set-up. In the evening a welcome cocktail will take place, just before dinner.

The school takes place at the Santa Tecla Hotel, about 15 km north-east of Catania. Catania has an international airport with connections to Rome and other European airports. Santa Tecla is located directly on the Mediterranean sea, in a comfortable and spectacular environment. The hotel has a large lecture hall and many smaller sites for discussions and informal meetings. At the time of the school the weather is ideal in Sicily (around 25° C).
With this **third and final announcement** we would like to give you some further information concerning the organization of the school and the final list of participants.

The school is supported by the INFN-LNS, GSI, EMMI, University of Catania (PHD course in Nuclear and Particle Astrophysics), Provincia di Catania. 
School Registration as well as hotel booking is available at the school website http://agenda.ct.infn.it/conferenceDisplay.py?confId=169
School lectures will be published on AIP conference proceedings series.

**Scientific committee:** C. Rolfs (Director, Bochum), C. Spitaleri (Director, Catania), M. Busso (Perugia), A. Coc (Orsay), P. Corvisiero (Genova), M. El Eid (Beirut), F. Kappeler (Karlsruhe), T. Kajino (Kajino), S. Kubono (Tokyo), K.L. Kratz (Mainz), J. José (Barcelona), T. Motobayashi (Riken), A. Mukhamedzhanov (TAMU), O. Straniero (Teramo), F. Terrasi (Napoli), R. Tribble (TAMU), M. Wiescher (Notre Dame).

**Local Organizing Committee:** R.G. Pizzone (chairman), G. Agnello, A. Caciolli, A. Di Leva, M. La Cognata, L. Lamia, S. Palmerini, S. Marrone, V. Potenza

### Program

**Sunday 20.09.09**
Arrival of participants, lecturers and observers at St. Tecla

16:00 – 20.00 Registration
20:00 Welcome Cocktail and Dinner

**Monday 21.09.09**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td>7:00-7:45</td>
<td>Breakfast</td>
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<tr>
<td>8:00</td>
<td>Transfer to Catania LNS</td>
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<tr>
<td>9:00</td>
<td>Welcome address by Authorities;</td>
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<tr>
<td>10:30</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 - 12:45</td>
<td>Introduction to Nuclear Astrophysics</td>
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<tr>
<td>13:00</td>
<td>lunch @ LNS</td>
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<tr>
<td>14:00</td>
<td>visit of LNS</td>
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<tr>
<td>15:30</td>
<td>transfer to Santa Tecla</td>
</tr>
</tbody>
</table>

**Session I Chair:**

**Session II Chair:**

16:30-18:15 Experimental approaches for nuclear astrophysics measurements  **Fulton**

18:15-20.00 Stellar Nucleosynthesis in massive stars **El Eid**

20:30 Dinner

**Tuesday 22.09.09**

7:00-8:00 Breakfast

**Session III Chair:**

8:30-10:15 Theory of Coulomb excitation of exotic beams **Bertulani**

10:15- 10:45 Coffee break
10:45-12:15  Reactions with high-energy radioactive beams for Astrophysics Aumann
12:15-13:30 **Contribution by young researchers**

**Session IV Chair**
15:00-16:45  TBA  Kubono
16:45-17:00  Coffee break
17:00-18:45  Stellar Evolution  Chiosi
18:45-19:45  TBA Imbriani
20:00  Dinner

**Wednesday 23.09.09**

7:00-8:00  Breakfast

**Session V Chair**
8:30-10:15  Big-bang cosmology and nucleosynthesis Kiener
10:15 – 11.15  TBA Motobayashi
11:15-11:30  Coffee Break
11:30-13:15  Nuclear reactions as indirect techniques in nuclear astrophysics Mukhamedzhanov

14:00  Lunch in hotel
15:00  Departure for LNS

**Special Session**
15:30  TBA Tribble
16:30  TBA Langanke
17:30  departure to Catania Downtown, visit to Catania Museums and free Dinner
(bus at 23:30 to S. Tecla)

**Thursday 24.09.09**

7:00-8:00  Breakfast

**Session VI Chair**
8:30-10:15  Big-bang cosmology and nucleosynthesis Kajino
10:15-10:30  Coffee break
10:30-12:15  Resonance scattering and alpha-transfer reactions for nuclear astrophysics Rogachev
12:15-13:15  Elementary Ion Optics with Applications to Spectrometers Davids
13:30  Lunch in hotel

**Session VII Chair**
15:00-16:45  R-matrix Methods with an application to 12C(a,g)16O Brune
16:45-17:15  Coffee Break
17:15-19:00  Stardust in Primitive Solar Material Hoppe
20:30  Dinner

**Friday 25.09.09**

7:00_8:00  Breakfast

**Session VIII Chair**
8:30-10:15  TBA Harissopoulos
10:15-10:30  Coffee break
10:30-12:15  Decay spectroscopy for H-burning in novae and XRB Trache
AGB star evolution and nucleosynthesis Dominguez

13:30 Lunch in hotel

Session IX Chair
15:00 – 16:45 TBA Martinez Pinedo
16:45 - 17:45 The C12-C12 quest Strieder
17:45 – 18:00 Coffee Break
18:00 -19:30 contributions by young researchers
20:00 dinner

Saturday 26.09.09
7:00-8:00 Breakfast
8:00 Excursion to Etna

Session X
17:30 – 18:30 The classical r-process revisited Kratz
18:45-19:45 Contribution by young researcher

20:30 Farewell Dinner and conclusion of the school

Sunday 27.09.09
7:00-8:30 Breakfast and Departure

General Information

The school takes place at the Santa Tecla Palace Hotel, about 15 km north-east of Catania. Catania has an international airport with connections to Rome, Milan and other European airports. Santa Tecla is located directly on the Mediterranean sea, in a comfortable and spectacular environment. The hotel has a large lecture hall and many smaller sites for discussions and informal meetings. At the time of the school the weather is ideal in Sicily (around 25°C). In the hotel it will be possible to access the seaside (depending on weather conditions) and a swimming pool. Hotel sport facilities will be at the guests’ disposal. The hotel is in the “Timpa” area, a green protected area specific for its volcanic soil and vegetation. Close to the hotel the small touristic village of Santa Tecla can be reached with a short walk, and inside it small shops and pubs are present. Around 5 km from the school location it will be possible to reach Acireale, nice town (50000 inhabitants) with a beautiful baroque center.

People remaining in Catania after or before the school must provide independently to room reservation in hotels. A very cheap accommodation in Catania downtown is the youth hostel http://www.agorahostel.com/main/Home.htm. Moreover the Travel Agent Shougun will have a desk at the conference site during the school to provide its services to students and lecturers.

Transportation: there will be a free shuttle bus from/to the airport to/from the hotel on arrival day as well as for departure in connection with flight. In order to organize this service we warmly invite the participants to provide us all details concerning their arrival and departure flights. The meeting point will be in the arrival hall of Catania airport where members of the organizing committee will welcome the lecturers and participants to the school. We cannot grant any transportation for people arriving in different days.

Santa Tecla is not easily reachable from Catania airport and we strongly recommend to use the school buses. However the easiest way to reach Santa Tecla Palace hotel on your own is by taxi (around 50€). In alternative bus run from Catania airport to Catania station and from there it is
possible to take trains or buses to Acireale station. From there it is recommended to reach the Santa Tecla Palace Hotel by taxi. In any case, do not hesitate to contact us at the desk of the Santa Tecla Palace Hotel (Dr. Rosario Gianluca Pizzone, 095-76.34.015, http://www.hotelsantatecla.it/).

The organization will provide a shuttle service on 20.09 from airport to Santa Tecla. The departure times from Airport is: 12:30, 15:30, 17:00, 19:00.

EXCURSION
Saturday morning is devoted to the school excursion on the Etna vulcano. Please take into account that the Etna is 10000 feet (3350 m) high mountain and weather conditions can be tough. Please wear adequate clothes for the excursion.