



"I tetti di Genova" ("The roofs of Genova") by L. Luzzati

# HADRON 2023

20<sup>th</sup> International  
Conference on Hadron Spectroscopy  
and Structure

5-9 June | 2023 | Genova | Italy | 

Raffaella De Vita, Mikhail Osipenko,  
Elena Santopinto

Istituto Nazionale di Fisica Nucleare  
Sezione di Genova



CASA LUZZATI



# HADRON 2023

This series of conferences started in 1985 in Maryland, USA

It brings together experimentalists and theorists every other year to review the status and progress in hadron spectroscopy, structure, and related topics and to exchange ideas for future explorations

## HADRON2023:

- 296 participants
- 263 parallel session talks

HADRON2021, XIX, Mexico City, Mexico

HADRON2019, XVIII, Guilin, China

HADRON2017, XVII Salamanca, Spain

HADRON2015, XVI Jlab, Newport News, VA, USA

HADRON2013, XV, Nara, Japan

HADRON2011, XIV, Munich, Germany

HADRON2009, XIII, Florida State University, USA

HADRON2007, XII Laboratori Nazionali di Frascati, Italy

HADRON2005, XI Rio de Janeiro, Brazil

HADRON2003, X Aschaffenburg, Germany

HADRPN 2001, IX, Protvino, Russian Federation

HADRON 1999, VIII, Beijing, China.

HADRON 1997, VII Upton, NY, United States

HADRON 1995, VI Manchester, United Kingdom.

HADRON 1993, V, Como, Italy

HADRON 1991, IV, College Park, MD, USA

HADRON 1989, III, Ajaccio, Corsica, France

HADRON 1987, II, Tsukuba, Japan,

HADRON 1985, I, College Park, MD, USA



# HADRON 2023



## Conference Chairs

Raffaella De Vita (INFN-Genova)  
Mikhail Osipenko (INFN-Genova)  
Elena Santopinto (INFN-Genova)

## Local Organizing Committee

Marco Battaglieri (INFN-Genova)  
Roberta Cardinale (Università di Genova e INFN)  
Sergio Di Domizio (Università di Genova e INFN)  
Fabrizio Ferro (INFN-Genova)  
Mauro Giovannini (Università di Genova e INFN)  
Simone Marzani (Università di Genova e INFN)  
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Paolo Saracco (INFN)  
Carlo Schiavi (Università di Genova e INFN)  
Mauro Taiuti (Università di Genova e INFN)  
Silvano Tosi (Università di Genova e INFN)

## Conference Secretariat

Mariachiara Lupi

## Technical Support

Mirko Corosu (INFN-Genova)  
Giacomo Ottonello (INFN-Genova)

## International Advisory Committee

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Mikihiko Nakao (KEK)  
Eulogio Oset (IFIC)  
Stephan Paul (TUM)  
Klaus Peters (GSI)  
Craig Roberts (Nanjing)  
Pablo Roig (CINESTAV, IPN)  
Xiao-Yan Shen (CAS-IHEP)  
Adam Szczepaniak (Indiana University/JLab)  
Hirokazu Tamura (J-PARC)  
Ulrike Thoma (Bonn)  
Anthony Thomas (Adelaide)  
Ulrich Wiedner (Bochum)  
Hartmut Wittig (Mainz)  
Bing-Song Zou (CAS-ITP)

# HADRON 2023

## Scientific Program

The scientific program includes the latest developments in the following topics:

### Analysis tools

Conveners: Mikhail Mikhasenko, Ryan Mitchell, Fabrizio Parodi, César Fernández-Ramírez

### Exotic hadrons and candidates

Conveners: Alessandro Giachino, Nicola Neri, Alessandro Pilloni, Elena Santopinto, Stefano Spataro, Silvano Tosi

### Hadrons and physics beyond the standard model

Conveners: Achim Denig, Sergio Di Domizio, Luca Gironi, Jenni Kotila, Pablo Roig

### Hadron decays, production and interactions

Conveners: Pietro Colangelo, Marco Pappagallo, Alexis Pompili, Carlo Schiavi, Hartmut Wittig

### Hadrons in hot and nuclear environment

Conveners: Angela Badalà, Andrea Beraudo, Enrico Robutti, Laura Tolos

### Heavy baryon spectroscopy

Conveners: David Rodriguez Entem, Fabrizio Ferro, Hugo Garcia Tecocoatzi, Atsushi Hosaka, Umberto Tamponi

### Heavy meson spectroscopy

Conveners: Roberta Cardinale, Gianluigi Cibinetto, Stephen Godfrey, Eric Swanson, Antonio Vairo

### Hypernuclei and kaonic atoms

Conveners: Stefano Bianco, Alessandro Feliciello, Emiko Hiyama, Satoshi N. Nakamura

### Light baryon spectroscopy

Conveners: David Ireland, Maxim Mai, Marco Ripani, Craig Roberts, Ulrike Thoma

### Light meson spectroscopy

Conveners: Marco Battaglieri, Bruno El-Bennich, Juan Nieves, Stephan Paul

### QCD and hadron structure

Conveners: Andrea Bressan, Volker Burkert, Simone Marzani, Silvia Niccolai

### New facilities

Conveners: Umberto D'Alesio, Pasquale Di Nezza, Jan Friedrich, Beijiang Liu, Mikhail Osipenko



Monday, June 5	Tuesday, June 6	Wednesday, June 7	Thursday, June 8	Friday, June 9
<p><i>Registration (08:00 – 09:00) – San Salvatore Auditorium</i></p> <p><b>Plenary Session 1 – San Salvatore Auditorium</b></p> <p>09:00 Welcome</p> <p>09:30 Exotic states in heavy quark systems</p> <p>10:00 Survey of hadronic molecules</p> <p><i>Coffee break (10:30 – 11:00) – DAD Cloister</i></p> <p><b>Plenary Session 2 – San Salvatore Auditorium</b></p> <p>11:00 Hadrons in heavy-ion collision at ALICE</p> <p>11:30 Highlights from RHIC</p> <p>12:00 Results on quark gluon plasma by ATLAS and CMS</p> <p><i>Lunch (12:30 – 14:00) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>14:00 Exotic hadrons and candidates</p> <p>14:00 Hadrons and physics beyond the Standard Model</p> <p>16:00 Hadron decays, production and interaction</p> <p>16:00 Hadrons in hot and nuclear environment</p> <p>Light meson spectroscopy</p> <p><i>Coffee break (16:00 – 16:30) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>16:30 Analysis tools</p> <p>16:30 Exotic hadrons and candidates</p> <p>16:30 Hadrons and physics beyond the Standard Model</p> <p>18:30 Hadrons in hot and nuclear environment</p> <p>Light baryon spectroscopy</p> <p>New facilities</p>	<p><b>Plenary Session 3 – San Salvatore Auditorium</b></p> <p>09:00 Light baryon spectroscopy</p> <p>09:30 Recent results on timelike baryon electromagnetic form factors</p> <p>10:00 Understanding the nature of baryon resonances</p> <p><i>Coffee break (10:30 – 11:00) – DAD Cloister</i></p> <p><b>Plenary Session 4 – San Salvatore Auditorium</b></p> <p>11:00 Effective field theories for hadron spectroscopy</p> <p>11:30 Resonant hadron systems from EFT, LQCD and phenomenology</p> <p>12:00 JPAC's role in hadron spectroscopy analysis</p> <p><i>Lunch (12:30 – 14:00) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>14:00 Exotic hadrons and candidates</p> <p>14:00 Hadrons and physics beyond the Standard Model</p> <p>16:00 Hadron decays, production and interaction</p> <p>16:00 Heavy meson spectroscopy</p> <p>16:00 Hypernuclei and kaonic atoms</p> <p>Light meson spectroscopy</p> <p>QCD and hadron structure</p> <p><i>Coffee break (16:00 – 16:30) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>16:30 Exotic hadrons and candidates</p> <p>16:30 Hadrons and physics beyond the Standard Model</p> <p>18:30 Hadron decays, production and interaction</p> <p>18:30 Heavy meson spectroscopy</p> <p>18:30 Hypernuclei and kaonic atoms</p> <p>Light baryon spectroscopy</p> <p>New facilities</p>	<p><b>Plenary Session 5 – San Salvatore Auditorium</b></p> <p>09:00 Hadron spectroscopy at ATLAS and CMS</p> <p>09:30 Results on decays and CP violation from LHCb</p> <p>10:00 Recent highlights from Belle II</p> <p><i>Coffee break (10:30 – 11:00) – DAD Cloister</i></p> <p><b>Plenary Session 6 – San Salvatore Auditorium</b></p> <p>11:00 Spectroscopy of hadrons with heavy quarks from lattice QCD</p> <p>11:30 Heavy hadron spectroscopy: exotic hadrons as molecular states near threshold</p> <p>12:00 Multiquark hadrons</p> <p><i>Lunch (12:30 – 14:00) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>14:00 Analysis Tools</p> <p>14:00 Exotic hadrons and candidates</p> <p>14:00 Hadrons and physics beyond the Standard Model</p> <p>16:00 Hadron decays, production and interaction</p> <p>16:00 Hadrons in hot and nuclear environment</p> <p>Heavy baryon spectroscopy</p> <p>QCD and hadron structure</p> <p><i>Coffee break (16:00 – 16:30) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>16:30 Hadrons and physics beyond the Standard Model</p> <p>16:30 Hadron decays, production and interaction</p> <p>18:30 Heavy baryon spectroscopy</p> <p>18:30 Heavy meson spectroscopy</p> <p>18:30 Hypernuclei and kaonic atoms</p> <p>Light meson spectroscopy</p> <p>New facilities</p> <p><i>Guided tour of the historical center (18:30 – 20:30)</i></p>	<p><b>Plenary Session 7 – San Salvatore Auditorium</b></p> <p>09:00 Recent insights in PDFs from global analyses</p> <p>09:30 Experimental studies of Generalized Parton Distributions</p> <p>10:00 New opportunities with Jefferson Lab at 22 GeV</p> <p><i>Coffee break (10:30 – 11:00) – DAD Cloister</i></p> <p><b>Plenary Session 8 – San Salvatore Auditorium</b></p> <p>11:00 Overview of J-Parc physics</p> <p>11:30 Recent experimental achievements and perspectives on strangeness nuclear physics</p> <p>12:00 Simon Eidelman Prize: introduction</p> <p>12:15 Simon Eidelman Prize presentation</p> <p><i>Lunch (12:45 – 14:00) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>14:00 Analysis Tools</p> <p>14:00 Exotic hadrons and candidates</p> <p>14:00 Hadrons and physics beyond the Standard Model</p> <p>16:00 Hadron decays, production and interaction</p> <p>16:00 Hadrons in hot and nuclear environment</p> <p>Light meson spectroscopy</p> <p>QCD and hadron structure</p> <p><i>Coffee break (16:00 – 16:30) – DAD Cloister</i></p> <p><b>Parallel Sessions – DAD</b></p> <p>16:30 Analysis Tools</p> <p>16:30 Exotic hadrons and candidates</p> <p>18:30 Hadron decays, production and interaction</p> <p>18:30 Hypernuclei and kaonic atoms</p> <p>Light baryon spectroscopy</p> <p>New facilities</p> <p>QCD and hadron structure</p> <p><i>Social dinner (20:00 – 22:30) – Villa del Principe</i></p>	<p><b>Parallel Sessions – DAD</b></p> <p>09:00 Exotic hadrons and candidates</p> <p>09:00 Hadrons and physics beyond the Standard Model</p> <p>11:00 Hadron decays, production and interaction</p> <p>11:00 Heavy meson spectroscopy</p> <p>11:00 Hadrons in hot and nuclear environment</p> <p>Light meson spectroscopy</p> <p>QCD and hadron structure</p> <p><i>Coffee break (11:00 – 11:30) – DAD Cloister</i></p> <p><b>Plenary Session 9 – San Salvatore Auditorium</b></p> <p>11:30 Recent results from BESIII</p> <p>12:00 Overview of anomalies in meson decays and of their theoretical interpretations</p> <p><i>Lunch (12:30 – 14:00) – DAD Cloister</i></p> <p><b>Plenary Session 10 – San Salvatore Auditorium</b></p> <p>14:00 From COMPASS to AMBER: from the proton spin crisis to the hadron mass puzzle</p> <p>14:30 The Electron-Ion Collider and the ePIC experiment</p> <p>15:00 Closeout</p> <p><i>Adjourn (16:00)</i></p>

All sessions will be hosted in the buildings of the Department of Architecture and Design (DAD). Plenary sessions will be in the San Salvatore Auditorium and the parallel sessions in the main DAD complex.

# HADRON 2023

## Simon Eidelman Prize

In memory of our beloved colleague Simon Eidelman (1948-2021), a prize will be awarded to a young researcher (<8 years experience after Ph.D.) for contributions to experimental hadron physics, including theory developments that led to significant experimental progress



## Thursday, June 8

### Plenary Session 7 – San Salvatore Auditorium

09:00	Recent insights in PDFs from global analyses	Pavel Nadolsky (Southern Methodist University)
09:30	Experimental studies of Generalized Parton Distributions	Maxime Defurne (CEA)
10:00	New opportunities with Jefferson Lab at 22 GeV	Patrizia Rossi (Jefferson Lab)

*Coffee break (10:30 – 11:00) – DAD Cloister*

### Plenary Session 8 – San Salvatore Auditorium

11:00	Overview of J-Parc physics	Hiroyuki Noumi (Osaka University)
11:30	Recent experimental achievements and perspectives on strangeness nuclear physics	Hirokazu Tamura (Tohoku University)
12:00	Simon Eidelman Prize: introduction	Tim Gershon (University of Warwick)
12:15	Simon Eidelman Prize presentation	Prize winner

**The winner will be announced on Thursday**





## Awards for best presentations in the parallel sessions

- Reserved to students and post-docs with less than 3 years of research since their PhD
- Judges selected among experts in each track
- The award consists of a certificate and a token
- Winners will be announced on Friday in the closeout

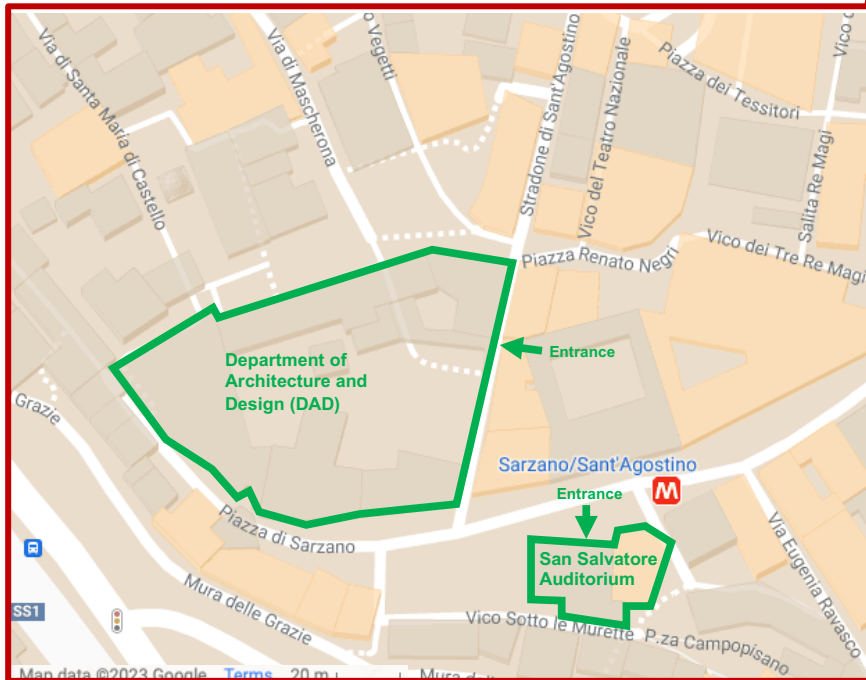
- Located on the hill of "Castello", in the oldest part of the Genoese historical center, facing into the natural bay of the pre-Roman port
- Location of the first historical settlements of Genoa and witness of numerous transformations from the high-medieval period to the present day
- Situated on the ruins of an ancient monastery and around the late-medieval nucleus of the bishop's palace, the new school, strongly supported by Dean Edoardo Benvenuto, is based on a design originally for the School of Humanities
  - The overall plan is by the architect Ignazio Gardella, who situated the block of his building on the foundations of the old churches (1987-1990)
  - The new building was placed alongside the recovery and renovation of the oldest buildings of the Monastery of San Silvestro (1989-1992), following the design of the engineer Luciano Grossi Bianchi
- The church of the Santissimo Salvatore, known as San Salvatore, is a former religious building, located in Piazza Sarzano, in the Molo district
  - Deconsecrated after the serious damage caused by the Second World War
  - Completely renovated to house the great hall of the architecture faculty of the University of Genoa





# HADRON 2023

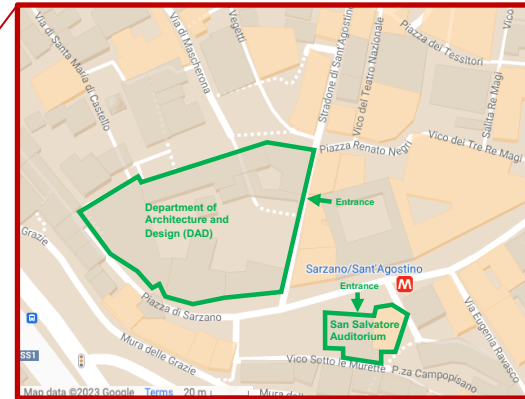
## Department of Architecture and Design (DAD) & San Salvatore Auditorium



### HADRON2023 Conference Venue

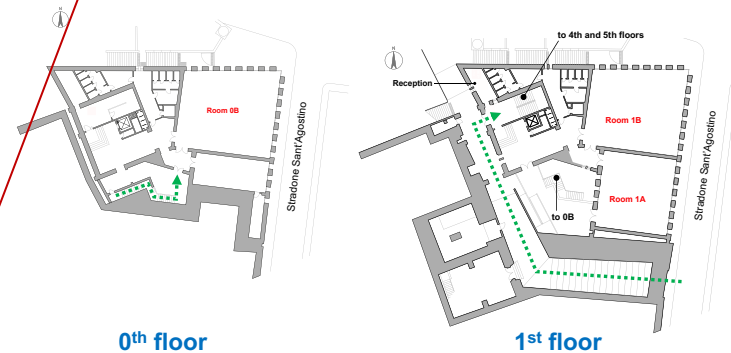
The conference is hosted in the buildings of the Facoltà di Architettura dell'Università di Genova:

- all plenary sessions will be in the San Salvatore Auditorium, piazza di Sarzano 9, 16128 Genova,
- all other sessions, including coffee breaks and lunches will be in the complex of the Department of Architecture and Design (DAD), Stradone di Sant'Agostino 37, 16123 Genova.



Within the DAD complex:

- parallel sessions will be in Room 0B, 1A, 1B, 4H, 5H, 5L, and Benvenuto,
- the conference secretariat and registration desk will be in Room 4D
- coffee breaks and lunches will be served in the 4th-floor cloister.



# HADRON2023

## Social Events

### Tour of the historical center

A guided tour of the historical center is planned for Wednesday, June 7, from 6:10-6:30 to 8:00 pm

- The tour will start from the conference venue after the afternoon sessions end
- Choice between two itineraries:
  - one lighter for those who prefer a shorter walking distance
  - one more intensive for those who like to walk
  - the choice can be made at the registration desk

### Conference dinner

The conference dinner will be held at [Villa del Principe](#), on Thursday, June 8 at 8pm







Photography is taking place at this event

If you don't want to be included, please let a member of the organizing team know

The material will be used to advertise the event and for outreach activities of INFN and the University of Genova



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## Welcome to Genova!