



XIII International Conference on New Frontiers in Physics

26 Aug - 4 Sep 2024, OAC, Kolymbari, Crete, Greece

Welcome to the 13th International Conference on New Frontiers in Physics !



13th International Conference on New Frontiers in Physics

New Frontiers in Physics ICNFP 2024

August 26 to September 5, 2024 / Kolymbari, Crete, Greece

<https://indico.cern.ch/e/icnfp2024>

Main topics of the Conference

High Energy Particle Physics

Heavy Ion Physics,
Critical phenomena

Quantum Physics,
Quantum Optics,
Quantum Information

Cosmology, Astrophysics, Gravity,
Mathematical physics

International Advisory Committee

Charalampos Anastasiou	Rachid Nouicer
Ignatios Antoniadis	Monica Pepe-Altarelli
William Brooks	Gerassimos Petratos
Jie Gao	Willibald Plessas
Marco Genovese	Luciano Rezzolla
Rohini Godbole	Peter Senger
Dmitry Gorbunov	Boris Sharkov
Sigurd Hofmann	Eduard Shuryak
Mina Katramatou	Paris Sphicas
Dmitri Kharzeev	Leo Stodolsky
Boris Kopeliovich	Horst Stoecker
Shahn Majid	Emmanuel Tsesmelis
Victor Matveev	Arkady Vainshtein
Igor Mishustin	Gabriele Veneziano
Viatcheslav Mukhanov	Valentin Zakharov

Organizing Committee

Vipul Bairathi	Katerina Karkala-Zormpa
David Blaschke	Ioannis Mountogiannakis
Larissa Bravina (co-chair)	Istvan Papp
Eliahu Cohen (co-chair)	Michael Schernau
Laszlo Pal Csernai	Oleksandr Vitiuk
Maxime Gouzevitch	Evgeny Zabrodin
Sonia Kabana (co-chair)	Elisaveta Zherebtsova
Antonis Kalogerakis	

175 talks and 5 posters





International Advisory Committee

Charalampos Anastasiou (ETH Zurich, Switzerland)

Ignatios Antoniadis (LPTHE-CNRS and Sorbonne University, Paris, France, and AEC, University of Bern, Switzerland)

William Brooks (Federico Santa Maria University, Valparaiso, Chile)

Jie Gao (IHEP, Beijing, China)

Marco Genovese (INRIM, Torino, Italy)

Rohini Godbole (Indian Institute of Science, Bangalore, India)

Dmitry Gorbunov (IUPAP)

Sigurd Hofmann (GSI, Darmstadt, Germany)

Mina Katramatou (Kent State University, Ohio, USA)

Dmitri Kharzeev (Brookhaven National Lab and University of Stony Brook, USA)

Boris Kopeliovich (Federico Santa Maria University, Valparaiso, Chile)

Shahn Majid (Queen Mary, University of London, UK)

Victor Matveev (IUPAP)

Igor Mishustin (FIAS, Goethe University of Frankfurt, Germany)

Viatcheslav Mukhanov (University of Munich, Germany)

Rachid Nouicer (Brookhaven National Lab, Upton, New York, USA)

Monica Pepe-Altarelli (CERN, Switzerland)

Gerassimos Petratos (Kent State University, Ohio, USA)

Willibald Plessas (University of Graz, Austria)

Luciano Rezzolla (Goethe University of Frankfurt, Frankfurt, Germany)

Peter Senger (GSI, Darmstadt, Germany)

Boris Sharkov (IUPAP)

Eduard Shuryak (Stony Brook University, USA)

Paris Sphicas (CERN, Geneva, Switzerland, and University of Athens, Athens, Greece)

Leo Stodolsky (Max Planck Institute, Munich, Germany)

Horst Stoecker (Goethe University of Frankfurt, FIAS, Germany)

Emmanuel Tsesmelis (CERN, Geneva, Switzerland and University of Oxford, UK)

Arkady Vainshtein (University of Minnesota, USA)

Gabriele Veneziano (College de France, Paris, France)

Valentin Ivanovitch Zakharov (MPI, Munich, Germany)



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Vipul Bairathi (Instituto de Alta Investigación, Universidad de Tarapacá, Arica, Chile)

David Blaschke (University of Wroclaw, Poland)

Larissa Bravina (University of Oslo, Oslo, Norway) **(Co-Chair)**

Eliahu Cohen (Bar-Ilan University, Ramat-Gan, Israel) **(Co-Chair)**

Laszlo Pal Csernai (University of Bergen, Bergen, Norway)

Maxime Gouzevitch (CNRS, IPNL, Lyon, France)

Sonia Kabana (Instituto de Alta Investigación, Universidad de Tarapacá, Arica, Chile) **(Co-Chair)**

Antonis Kalogerakis (OAC, Kolymbari, Greece)

Katerina Karkala-Zormpa (OAC, Kolymbari, Greece)

Ioannis Mountogiannakis (OAC, Kolymbari, Greece)

Istvan Papp (Wigner RCP, Hungary)

Michael Schernau (University of California at Irvine, USA)

Oleksandr Vitiuk (University of Wroclaw, Poland)

Evgeny Zabrodin (University of Oslo, Oslo, Norway)

Elizaveta Zhrebtsova (University of Wroclaw, Poland)

+ organizers of workshops and special session



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Main topics

High Energy Particle Physics

A 

Searches for new particles and new phenomena (Higgs boson, SUSY, top quarks, extra dimensions, flavour physics, precision electroweak measurements and others), hadron physics, and neutrino physics.

Heavy Ion Collisions and Critical Phenomena

B 

The properties of QCD matter under extreme conditions and the QCD phase diagram. Branching out to neighbouring disciplines: Superconductivity, Neutron Stars, Quark Stars, Exotics.

Quantum Physics, Quantum Optics and Quantum Information

C 

Quantum Optics, Quantum Information, Foundations of Quantum Mechanics, Quantum information; Entanglement and the Universe: Black Holes and Cosmology, Quantum Non-Localities, Cold Atoms.

Cosmology, Astrophysics, Gravity, Mathematical Physics

D 

Cosmic Microwave Background, Dark Energy, Gravitational waves, Dark Matter, Astroparticle Physics, Quantum Gravity, String Theory, Non-Commutative Geometry, Holography.



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Workshops, special sessions and a school on Machine Learning

Workshop on Laser Fusion, a spin-off from heavy-ion collisions

Convener: Prof. Laszlo Pal Csernai, University of Bergen, Norway (laszlo@csernai.no)

Dates: September 2-4, 2024

Workshop on " Half a Century of QCD "

28-30 August 2024.

Convenor: Prof. Willibald Plessas, University of Graz, Austria.

Workshop on Astro-Cosmo-Gravity

Convenor: Dr. Armen Sedrakian, Frankfurt Institute for Advanced Studies, J W Goethe University of Frankfurt, Germany

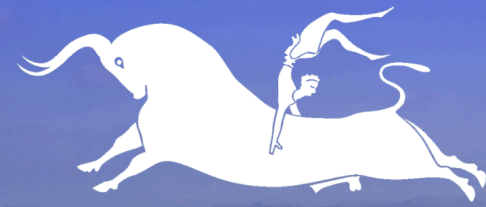
Special session on Machine Learning

Convenors: Pietro Vischia, Universidad de Oviedo and ICTEA and Tommaso Dorigo, INFN, Sezione di Padova.

School on Machine Learning

Convenor: Pietro Vischia, Universidad de Oviedo and ICTEA.

Workshop on Instruments and Methods



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28 August 2024, Wednesday

18:30-20:00 Visit to the Monastery Gonia and to its Museum with paintings (with guide).

29 August 2024, Thursday

19:00-20:00 Opera Gala Concert, OAC, Kalliopi Petrou (soprano), Tommaso Dorigo (Piano). The program can be found [here](#).

30 August 2024, Friday

Excursion to Chania 15:00-23:00

For the detailed program please consult the [Conference excursions](#) page

31 August 2024, Saturday

Free day

This free day is expected to give a chance to participants to meet and discuss and develop new contacts and collaborations in a relaxing environment.

1 September 2024, Sunday

Conference Excursion

For a detailed program please consult the [Conference excursions](#) page

3 September 2024, Tuesday

18:30-20:00 Poster session and wine tasting

20:00-23:30 Conference Dinner, Cretan night with live music and dance in OAC



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Excursion to Chania

The excursion to Chania will take place on **Friday, August 30, 2024.**

Please take with you:

- Passport
- Certificate of vaccination for COVID-19 (if you have one)
- Hat, sun creme and sunglasses
- Comfortable walking shoes



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Excursion to Chania old town

15:00	Departure from OAC with bus to Chania
16:15- 17:15	Meet the guide in the Orthodox Cathedral of Chania for visiting the cathedral, the old town and port, the castle and the Phare of Chania (ca. 1 hour)
17:15- 18:15	Free time for shopping and walk around in the old town
	Meet the guide in the Synagogue of Chania for:
18:15- 19:15	<ul style="list-style-type: none">• 18:15 Visit of the synagogue Etz Hayyim and a short historic talk about the history of Jews in Greece by Anja Zuckmantel and visit to the mini Museum of the synagogue.• 18:35 Visit of the Jewish quarter "Evraiki" of the old town of Chania with a guide (Anja Zuckmantel) (20')• 19:00-19:15 Performance of Kalliopi Petrou (soprano) and Tommaso Dorigo (flute) in the Synagogue of Chania.
19:15- 22:30	Free time (participants are free to choose their dinner place and pay their dinner at their own)
22:45	Bus departure from Chania to hotels and OAC.



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Main Conference excursion

The conference excursion will take place on **Sunday, September 1 , 2024.**

Please take with you:

- Passport
- Certificate of vaccination for COVID-19 (if you have one)
- Hat, sun creme and sunglasses
- Comfortable walking shoes
- Swimming suit, towel for sea (for Falassarna beach and for Knossos excursion because we plan to stop at a nice beach in the way back)

There are 3 options for conference excursion:

- Cretan Monasteries
- Falassarna beach
- Palace of Knossos and Heraklion Archaeological museum.



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Excursion to Cretan Monasteries

5:50	Departure from OAC (first bus)
6:50	Metamorphosis Monastery: Christian Orthodox service
8:00	Departure from OAC (second bus)
9:00	Metamorphosis Monastery: Excursion and Breakfast
10:30	Walk Excursion to Agia Kyriaki Monastery
12:30	Excursion and Lunch in Chrysopigi Monastery
15:00	Agia Triada Monastery Excursion
16:30	Venizelos Graves
18:00	Arrival to OAC



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Excursion to Falassarna beach

10:30	Departure from OAC
11:10	Arrival at Falassarna beach
13:00	Arrival at Taverna at Falassarna Beach, Lunch
17:00	Departure from Falassarna beach
18:00	Arrival to OAC



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Excursion to the Palace of Knossos and Heraklion Archaeological Museum

6:30	Departure from OAC
9:30	Arrival to Knossos
11:00	Departure from Knossos
11:30	Arrival at the Heraklion Archaeological Museum
13:30	Departure from the Heraklion Archaeological Museum
13:45	Arrival at Taverna, Lunch
15:30	Departure from Taverna
16:30	Swimming in a beach on the way back 30 min (one bus)
18:30/19:00	Arrival to OAC (first bus/second bus)

Kalliopi Petrou graduated as a Soprano in Athens, where she also attended courses in Composition and Theatre. In Venice, she obtained two Masters degrees in Singing and Chamber Music. With over twenty years of experience, she has performed as both a solo singer and chorister, covering a diverse repertoire from baroque to contemporary, and from sacred to profane music. Her performances have taken her to prestigious festivals across 27 EU cities, as well as to various US cities (including NY City, Philadelphia and Los Angeles), Russia (Moscow), the UK (London), Australia (Sydney), South America (Chile and Argentina), Israel, Taiwan, Armenia and Singapore. She is a certified Hatha Yoga teacher and in addition to her performing career, she also teaches music, singing, and yoga .

Tommaso Dorigo graduated in Antique Instruments at the conservatory of Venice in 1982, where he then also studied Composition. While he later pursued a career as a particle physicist, playing the piano has remained an enduring passion.



ICNFP 2024



Kalliopi Petrou
Soprano

Tommaso Dorigo
Piano



Lyrical Gala

OAC Auditorium
Kolymbari
August 29th 2024, 7pm



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Program

Charles Gounod (1818-1893)

Aria of Juliet: *Je veux vivre*,
from the opera "Roméo et Juliette"

Vincenzo Bellini (1801-1835)

Aria of Giulietta: *Eccomi in lieta vesta...Oh quante volte*,
from the opera "I Capuleti e i Montecchi"

Robert Schumann (1810-1856):

Kinderszenen, op. 15:
n.1, *Von fremden Landern und Menschen*;
n.5, *Furchtenmachen*

Vincenzo Bellini (1801-1835)

Aria of Norma: *Casta Diva*,
from the opera "Norma"

Giochino Rossini (1792-1868)

Aria of Rosina : *Una voce poco fa*,
from the opera "Il barbiere di Siviglia"

Robert Schumann (1810-1856):

Kinderszenen, op. 15: n. 7, *Traumerei*;
Kreisleriana: op. 16 n.1

Giochino Rossini (1792-1868)

Aria of Fiorilla : *Non si dà follia maggiore*,
from the opera "Il Turco in Italia"

Giacomo Puccini (1858-1924)

Musetta's Waltz : *Quando me'n vo'*,
from the opera "La Bohème"

Fredrik Chopin (1810-1849)

Prelude op.28 n.4;
Etude op. 10 n.3, «*Tristesse*»

Kurt Weill (1900–1950)

(From the cycle *trois chansons*-three songs)
Je ne t'aime pas, poem by Maurice Magre
Youkali, poem by Roger Fernay



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Enjoy the conference !

