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# Welcome to ECT\*

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Bira van Kolck  
Incoming Director



**ECT\***  
EUROPEAN CENTRE  
FOR THEORETICAL STUDIES  
IN NUCLEAR PHYSICS AND RELATED AREAS

# ECT\* mission

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- ✓ to be a Centre at the frontline of research in theoretical nuclear physics
- ✓ to promote active contact between theory and experiment, and related areas
- ✓ to further the training of young researchers
- institutional member of ESF's Expert Committee NuPECC (Nuclear Physics European Collaboration Committee)
- community-driven, bottom-up approach
- established in 1993



# 30-year anniversary

Aula Grande - Fondazione Bruno Kessler  
Via Santa Croce 77 - Trento

**LAURA FABBIETTI**

## **IL LUNGO VIAGGIO DEGLI ANTINUCLEI**

Gli antinuclei sono immagini speculari dei normali nuclei atomici, con la stessa massa ma carica opposta. Non esistono fonti naturali di antinuclei sulla Terra, ma possono essere prodotti in laboratorio presso grandi acceleratori di particelle. Gli antinuclei vengono cercati anche nello spazio, perché potrebbero essere la chiave di uno dei più grandi misteri della fisica: la materia oscura. La materia oscura è onnipresente e rappresenta cinque volte la massa di tutta la materia che possiamo osservare sotto forma di stelle nel cielo, pianeti e tutto il gas intermedio nelle



<https://www.youtube.com/watch?v=out6yNhc8F8>



30 anni di ECT\* - INTERVISTA al Direttore Gert AARTS



FBK - Fondazione Bruno Kessler  
2.9K subscribers

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<https://www.youtube.com/watch?v=GEVv1T2Xku0>



30 anni di ECT\* - INTERVISTA a Laura FABBIETTI



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## 2024 PROGRAMME OF ACTIVITIES

<b>FEBRUARY</b> 5-9.2	<b>alpha_S(2024):</b> Workshop on Precision Measurements of the Strong Coupling Constant D. D'ENTERRIA (CEBN), S. KLUTH (MPP), G. ZANDERIGHI (MPP)	<b>17-21.6</b>	<b>Towards a Consistent Approach for Nuclear Structure and Reaction: Microscopic Optical Potentials</b> C. BARBIERI (University of Milan), C. ELSTER (Ohio University), C. HEBBORN (FRIB), A. OBERTELLI (TU Darmstadt)
<b>12-16.2</b>	<b>New Jet Quenching Tools to Explore Equilibrium and Non-Equilibrium Dynamics in Heavy-Ion Collisions</b> A. SADDQYEV (LIP), C. ANDRES (LIP), J. BARATA (BNL), C. SALDADO (IGFAE)	<b>JULY</b> 1-5.7	<b>New Opportunities and Challenges in Nuclear Physics with High Power Lasers</b> C. J. YANG (ELI-NP), K. SPOHR (ELI-NP), P. TOMOSSINI (ELI-NP), Y. FUKADA (Kansai Photon Science Institute), V. HORNY (ELI-NP), L. GIZZI (INO), D. DOMENICO (ELI-NP)
<b>26.2-1.2</b>	<b>Inaugural Workshop on Nuclear Astrochemistry</b> N. MASON (University of Kent), D. BEHMERER (HZDR), E. MASHA (HZDR), D. MIFSUO (atomk)	<b>8-12.7</b>	<b>Synergies between LHC and EIC for Quarkonium Physics</b> F. CELIBERTO (Universidad de Alcalá), C. VAN HULSE (Universidad de Alcalá), J.P. LANSBERG (CNRS), D. KIKOLA (Warsaw University of Technology), D. BOER (University of Groningen), E. GONZALES-FERREIRO (IGFAE), C. FLORE (University of Turin)
<b>MARCH</b> 04-08.2	<b>EDMs: Complementary Experiments and Theory Connections</b> S. DEGENKOLB (Heidelberg University), P. SCHMIDT-WELLENBURG (Paul Scherrer Institute), G. PIGNOL (LPS), J. DE VRIES (University of Amsterdam), R. BERGER (Philippe-Universität Marburg)	<b>15.7-2.8</b>	<b>DTP/TALENT: Training in Advanced Low Energy Nuclear Theory: Nuclear Theory for Astrophysics</b> A. ARCONES (TU Darmstadt & GSI), B. GIACOMAZZO (University of Milano-Bicocca), J. PIEKAREWICZ (Florida State University)
<b>APRIL</b> 15-19.4	<b>Bridging Scales: At the Crossroads among Renormalisation Group, Multi-Scale Modelling, and Deep Learning</b> F. MENICCHETTI (University of Trento), F. PEDERIVA (University of Trento), R. POTESTIO (University of Trento), A. ROGGERO (University of Trento)	<b>AUGUST</b> 5-9.8	<b>Towards Improved Hadron Tomography with Hard Exclusive Reactions</b> M. VIRGINIO (University of Jyväskylä), M. MANNAN (University of Jyväskylä), J. HAN (NCBJ)
<b>22-26.4</b>	<b>The Physics of Strongly Interacting Matter: Neutron Stars, Cold Atomic Gases and Related Systems</b> A. SCHWENK (TU Darmstadt), F. FERLAJNO (University of Innsbruck), C. PETHICK (Niels Bohr Institute), A. WATTS (University of Amsterdam)	<b>19-23.8</b>	<b>The Nuclear Interaction: Post-Modern Developments</b> R. TIMMERMANS (University of Groningen), J. McGOVERN (University of Manchester), M. PIARULLI (Washington University), U. VAN HOLCK (Jülich Ossy)
<b>MAY</b> 7-10.5	<b>Quantum Science Generation 2024</b> D. DE BERNARDIS (INO-CNR), V. PANIZZA (University of Trento), L. VESPUCCI (University of Trento), A. BALDAZZI (University of Trento), V. AMITRANO (University of Trento), C. BENAVIDES-RIVEROS (INO-CNR), A. BERTI (INO-CNR), A. NARDIN (University of Trento)	<b>SEPTEMBER</b> 9-13.9	<b>New Developments in Studies of the QCD Phase Diagram</b> H. DING (Central China Normal University), F. KARSCH (University of Bielefeld), M.P. LOMBARDO (INFN Florence), P. PETRECKZY (BNL)
<b>13-17.5</b>	<b>SPICE: Strange Hadrons as a Precision Tool for Strongly Interacting Systems</b> J. POCHODZALLA (University of Mainz), C. CURCEANU (INFN-LNF), B. DOENIGUS (University of Frankfurt), L. FABBETTI (TU Munich), S. NAKAMURA (University of Tokyo), F. SAKUMA (RIKEN), I. VIDANA (INFN Catania)	<b>16-20.9</b>	<b>Spin and Quantum Features of QCD Plasma</b> F. BECATTINI (University and INFN Florence), X. HUANG (Fudan University), D. RISCHE (Goethe University Frankfurt), Y. YIN (CAS)
<b>20-24.5</b>	<b>Beyond-Elronal Methods in High-Energy Scattering</b> J. JALLIAN-MARIAN (Baruch College), A. CZAJKA (NCBJ), Y. KOVCHEGOV (Ohio State University)	<b>30.9-4.10</b>	<b>KAMPPI - Kaonic, Antiprotonic, Muonic, Pionic and "onia" exotic Atoms: Interchanging Knowledge</b> A. SCORDO (INFN Frascati), P. INDELICATO (Laboratoire Kastler Brossel), J. OBERTOVA (Czech Technical University, Prague), C. CURCEANU (INFN-LNF), A. KNECHT (PSI), M. SKURZOK (Jagiellonian University of Krakow), T. HASHIMOTO (JAEA)
<b>27-31.5</b>	<b>Machine Learning and the Renormalization Group</b> J. URBAN (MIT), D. HACKETT (Fermilab), A. HASENFRAZT (University of Colorado Boulder), J. PAWLOWSKI (Heidelberg University), B. LUICINI (Swansea University)	<b>OCTOBER</b> 14-25.10	<b>Measuring Neutrino Interactions for Next-Generation Oscillation Experiments</b> S. DOLAN (CERN), C. WILKINSON (LBNL), C. WRET (University of Oxford), L. PICKERING (Rutherford Appleton Laboratory)
<b>JUNE</b> 3-7.6	<b>A Modern Odyssey: Quantum Gravity meets Quantum Collapse at Atomic and Nuclear Physics Energy Scales in the Cosmic Silence</b> C. CURCEANU (INFN-LNF), A. BASSI (University and INFN Trieste), L. BAUDIS (University of Zurich), A. MARCHIANO (Fudan University China), K. PISCICCHIA (CREP & Centro Ricerche Enrico Fermi), L. DIOSI (Wigner, University of Budapest)	<b>NOVEMBER</b> 4-8.11	<b>Universal Themes in Bose-Einstein Condensation</b> J. CARUSOTTO (INO-CNR BEC Centre), T. GIAMARCHI (University of Geneva), G. FERRARI (University of Trento), D. SNOKE (University of Pittsburgh), P. LITTLEWOOD (University of Chicago), F. M. MARCHETTI (UAM), N. PROUKAKIS (University of Newcastle)
<b>10-14.6</b>	<b>Diffraction and Gluon Saturation at the LHC and the EIC</b> C. ROYON (University of Kansas), M. HENTSCHINSKI (Universidad de las Americas Puebla), A. SABIO VERA (Universidad Autonoma de Madrid), S. SCHLICHTING (University of Bielefeld), A. DESHPANDE (Stony Brook University)	<b>DECEMBER</b> 02-06.12	<b>Penetrating Probes of Hot High-<math>\mu_B</math> matter: Theory Meets Experiment</b> E. SCOMPARIN (INFN Turin), T. GALATYUK (TU Darmstadt), M.P. Lombardo (INFN Florence), R. RAPP (Texas A&M University), G. USAI (University Cagliari)

The ECT\* is part of the Fondazione Bruno Kessler. The Centre is funded by the Autonomous Province of Trento, funding agencies of EU Member and Associated states, and by INFN-TIFPA and has the support of the Department of Physics of the University of Trento. The Interim Director of ECT\* is Prof. Gert Aarts (ECT\* and Swansea University).

For information: [staff@ectstaff.eu](mailto:staff@ectstaff.eu) | [www.ectstar.eu](http://www.ectstar.eu)

# 2024 Activities

full program:

23 workshops from February to December  
selected by Scientific Board

## Doctoral Training Program/TALENT School:

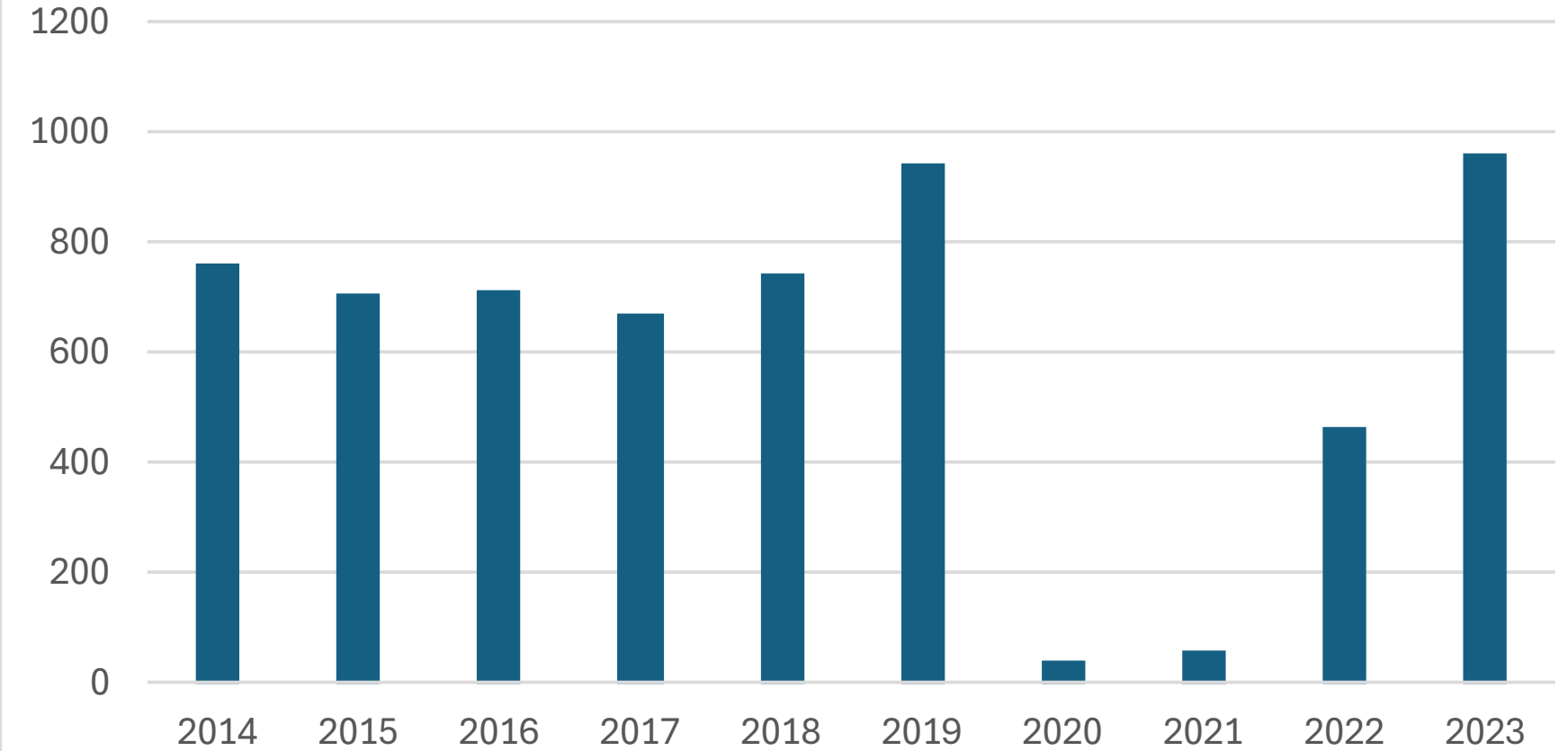
Nuclear Theory for Astrophysics

(A. Arcones, B. Giacomazzo, J. Piekarewicz)

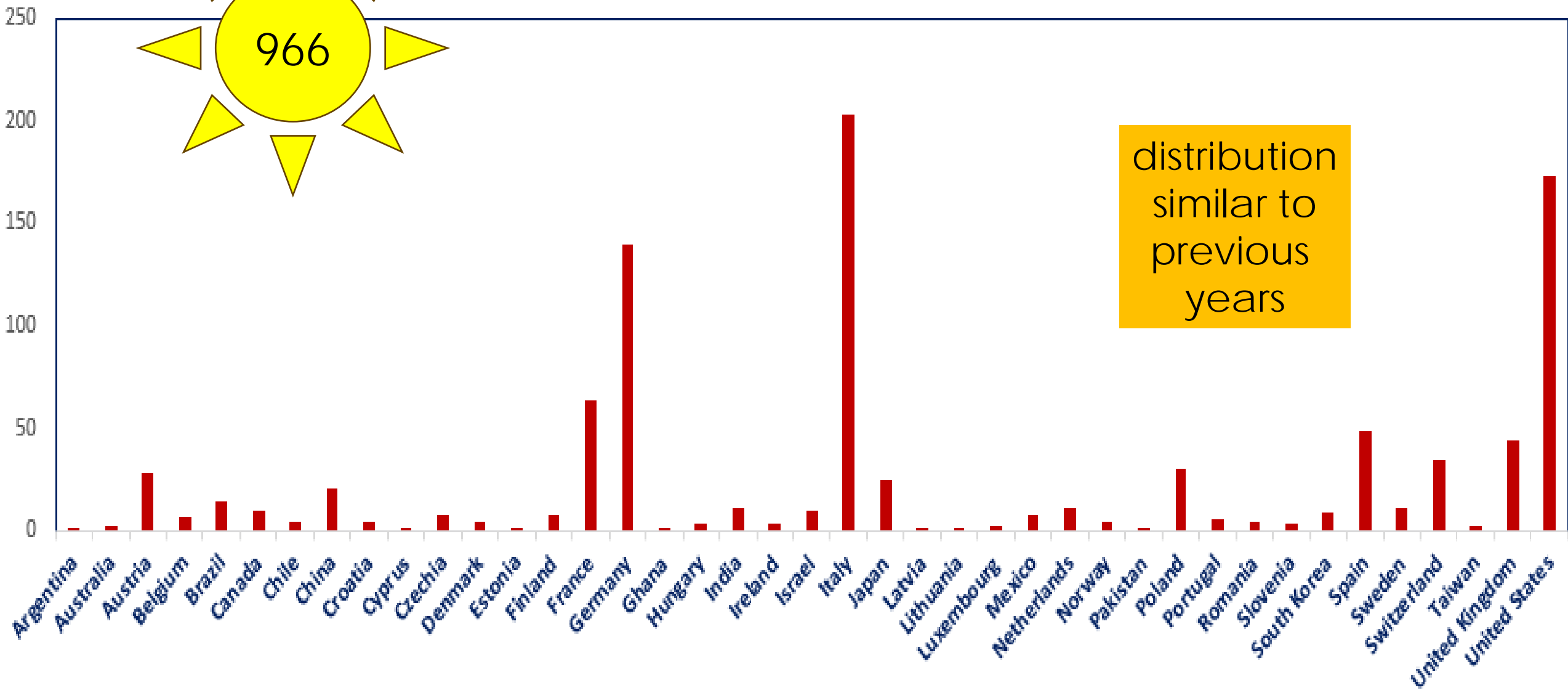
# All areas of nuclear physics and more

- QCD & hadronic physics:  
strong coupling running, hard reactions, strangeness, quarkonia, exotic states
- hot and dense QCD:  
jet quenching, gluon saturation, phase diagram, spin physics
- nuclear structure and reactions:  
nuclear forces, optical potentials, laser probes
- nuclear astrophysics:  
neutron stars, astrochemistry
- symmetries & fundamental interactions:  
electric dipole moments, neutrino interactions
- related areas:  
cold atoms, quantum gravity, quantum computing, machine learning

# ECT\* IN-PERSON PARTICIPANTS



## Participants workshops and DTP 2023



# CALL FOR 2025 PROJECT PROPOSALS

We welcome proposals for projects to take place at ECT\* in 2025. Projects can be **workshops** or **collaboration meetings**. Other formats can be proposed and will be evaluated by the Board on a case-by-case basis. **Decisions on approvals will be made at the Scientific Board meetings in May and October.** Proposals submitted before the May meeting may be approved in May or in October, depending on the quality of the proposal and the number of applications received.

The topics of the planned activities should be in line with the main scientific interests of ECT\*, i.e. Nuclear Physics in a broad sense (see Research). This involves low-energy Nuclear Physics and Nuclear Structure, Quantum Chromodynamics, Hadron Physics, Physics of Matter under Extreme Conditions, Ultra-Relativistic Heavy-Ion Collisions. Related areas of research include topics in Astrophysics, Particle Physics, Condensed Matter Physics and Many-Body Theory, Methods of Field Theory, Physics of Ultra-Cold Atomic Gases, Machine Learning and Quantum Information/Technology.

The Scientific Board encourages Organizing Committees to reflect **diversity** and consist of a combination of Established and Early-Career researchers.

**Deadline** for proposals to be discussed at the October Board meeting **September 02, 2024.**

Applications can be submitted [here](#)

<https://www.ectstar.eu/activities/workshops/call-for-2025-project-proposals/>



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# ECT\* Scientific Board

Almudena Arcones | TU Darmstadt (D)

David Kaplan | University of Washington (USA)

Denis Lacroix | CNRS/IN2P3 (F)

Marek Lewitowicz | NuPECC/GANIL (F)

Alexandre Obertelli | TU Darmstadt (D)

Assumpta Parreño Garcia | University of Barcelona (E)

Barbara Pasquini | University of Pavia (I)

Vittorio Somà | CEA Saclay (F)

Urs Wiedemann, Board Chair | CERN-TH (CH)

Ex officio: Albino Perego | University of Trento (I)

- three-year terms
- membership suggested by ECT\* associates

Registration at  
<https://www.ectstar.eu/about-us/ect-associates/>



# Local Researchers

## ECT\* - Senior Researchers



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# What we do

Lepton & baryon numbers,  
time reversal, ...

Fundamental  
symmetries

Quantum  
Chromodynamics

Gluon saturation,  
hadron structure, ...

Nuclear structure  
and reactions

Effective field theories,  
halo nuclei ...

Nuclear  
astrophysics

Neutron stars, astrophysical plasmas, ...

Machine learning, transport Monte Carlo, quantum gases, ...

Computational  
physics

Quantum  
information

Simulations on qcomputers, ...

# VISITING PROGRAM

ECT\* offers an exciting research environment, with a strong group of local researchers and lively workshops on a variety of topics. We also welcome visitors who can further enhance European and local research efforts. Visitors are selected on the basis of academic excellence and their expected contribution to ECT\*.

## Short- and medium-term visitors

ECT\* intends to support local expenses for a few visitors. For visits of one or two weeks, hotel and meals can be supported. Longer stays might be accommodated albeit with reduced support.

If you are interested, please fill in this [form](#).

## Call “Visiting in Trentino 2024” of the Province of Trento

In 2024, the Province of Trento is offering significant support for visits of 6 to 9 months by scientists who will strengthen its research centers in various fields, including physics.

For more information, click [here](#)

Passed

## Call for expressions of interest for Marie Skłodowska Curie Individual Fellowships 2024

For more information, click [here](#)

### ACTIVITIES@ECT\*

[Workshops](#)

[Doctoral Training Program](#)

[TALENT SCHOOL](#)

[Seminars and Colloquia](#)

[Visiting Program](#)

[ECT\\* Code of Conduct](#)



# Staff

## Staff



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Staff

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## Staff Collaborator



PASQUALE POLIGAMIA

Staff Collaborator

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Your coordinator

# Funding

- unit of Fondazione Bruno Kessler (FBK)
- institutional support from national funding agencies
- EU/Horizon funding: ECT\* is recognized as a transnational access facility by NuPECC, similar to experimental labs
- individual projects, e.g. Marie Curie



Funding agencies and supporting institutions:



Additional contributors:



Bundesministerium für Bildung und Forschung

# Funding

European network

Local support



Projects





Theory Alliance  
FACILITY FOR RARE ISOTOPE BEAMS

- this workshop is supported by FRIB Theory Alliance
- please acknowledge this in any publications that are initiated, developed or completed during this meeting



A venue for WORKshops:  
intense  
scientific exchange  
for the progress of  
nuclear theory  
and related areas

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# ECT\* CODE OF CONDUCT

ECT\* is committed to making its activities productive and enjoyable for everyone. Creating a supportive professional environment where open and frank discussion of ideas can take place, where everyone is treated with courtesy and respect, and in which diversity and inclusion are valued is the responsibility of all those involved. We will not tolerate harassment of participants or others involved in ECT\* in any form. For the entire duration of an ECT\* activity and in other professional interactions with colleagues you agree to follow these guidelines:

Behave professionally in personal interactions as well as in any other form of communication including social media. Harassment and sexist, racist, or exclusionary comments or jokes are not appropriate. Harassment includes sustained disruption of talks or other events, inappropriate physical contact, sexual attention or innuendo, deliberate intimidation, stalking, and photography or recording of an individual without consent. It also includes, but is not limited to, offensive comments related to gender identity, sexual orientation, disability, physical appearance, body size, race, nationality, or the religion or non-religion of participants.

Be kind to others. Do not insult or put down attendees or other individuals associated with ECT\*. Scientific discussion and criticism are vital and should be conducted in this spirit.

All communication should be appropriate for a professional audience including people of many different backgrounds. If participants wish to share photos of a speaker on social media, we strongly recommend that they first obtain the speaker's permission. Participants may share the contents of talks/slides via social media unless speakers have asked that specific details/slides should not be shared.

Should a participant be asked to stop any inappropriate behaviour, they are expected to comply immediately. In serious cases, they may be asked to leave the activity at the sole discretion of the organizers and the ECT\* Director. They may also be banned from participation in future activities.

Should a participant witness events of bullying, harassment or aggression, we recommend that they approach the affected person and show support. The witness may also suggest that the inappropriate behaviour be reported and offer to facilitate that reporting if requested.

Participants can report any violation of these guidelines to the activity organizers, ECT\* staff or the ECT\* Director. Such reports will be treated confidentially.

Thank you for helping to make ECT\* welcoming to all.

The ECT\* Director



A venue for WORKshops:  
intense  
scientific exchange  
for the progress of  
nuclear theory  
and related areas

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Enjoy the  
meeting!

