



European Centre for Theoretical Studies in Nuclear Physics and Related Areas

**A SHORT
OVERVIEW**



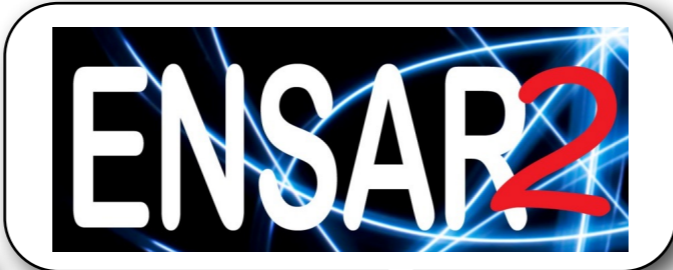


Established in 1993 ...
... unique in **Europe**



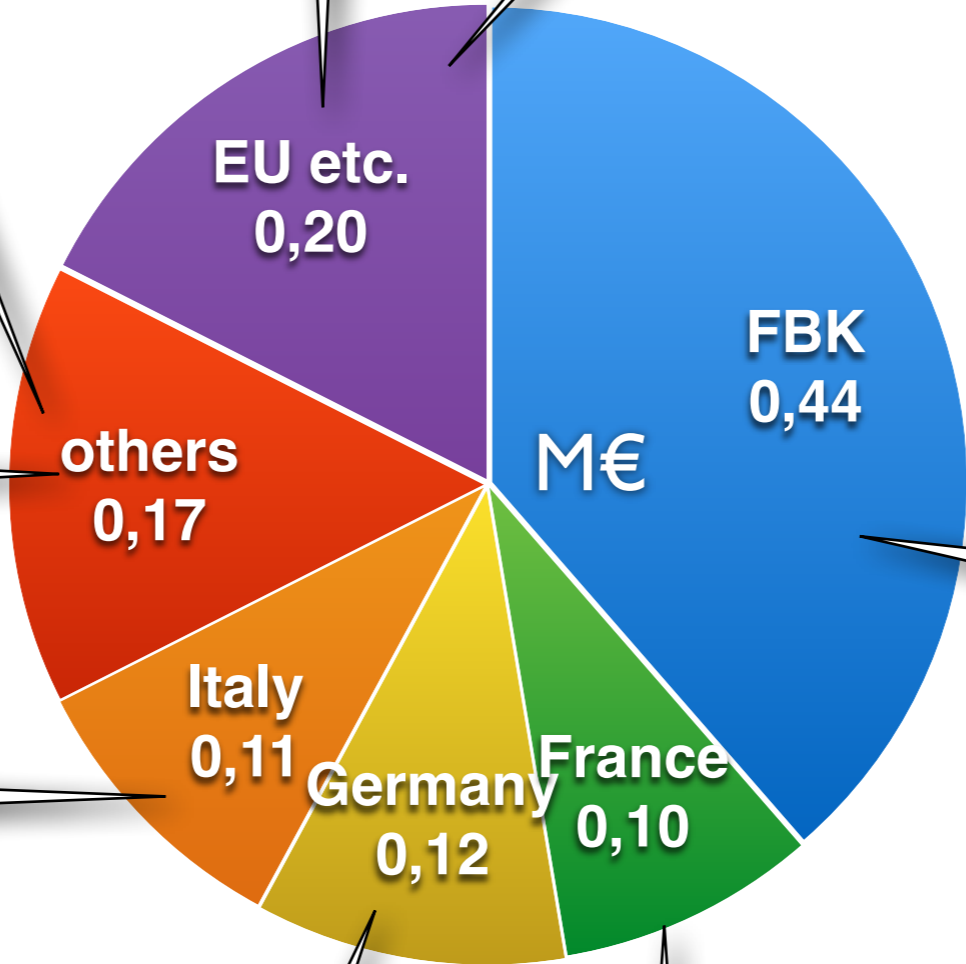
- “Bottom-up” realisation supported by large community (ECT* **Associates** → International **Scientific Board**)
- Large influx of international visitors (~ 700 per year)
- Strong local support by the Autonomous Province of Trento (**PAT**) through the Fondazione Bruno Kessler (**FBK**) (since 2008)
- Multinational Memorandum of Understanding funding agencies of European countries + **EU** Projects





Annual Running Budget 2019

total: 1.13 M€



Self-supported activities

Belgium, Croatia, Czech Republic, Finland, Hungary, the Netherlands, Poland, Romania, Dubna, Switzerland, UK, USA + others





The ECT* Mission

(as stipulated in the 2008 Statutes)

- 1. To be a center of frontline research in theoretical nuclear physics**
- 2. To promote active contacts between theory and experiments, and to related areas of research**
- 3. To further the training of young researchers**



The ECT* Mission

**I. To be a center of frontline research
in theoretical nuclear physics**

from **QCD** to hadrons,
nuclei and **strongly
interacting matter**
under extreme conditions



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8 researchers + director
2 senior researchers
4 junior postdocs
2 ECT*/TIFPA postdocs



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ECT*

-





The ECT* Mission

I. To be a center of frontline research
in theoretical nuclear physics

material science
electron spectroscopy
biomolecular systems

3 senior researchers
2 postdocs

+

ECT* - **LISC** 
Laboratorio Interdisciplinare di Scienza Computazionale



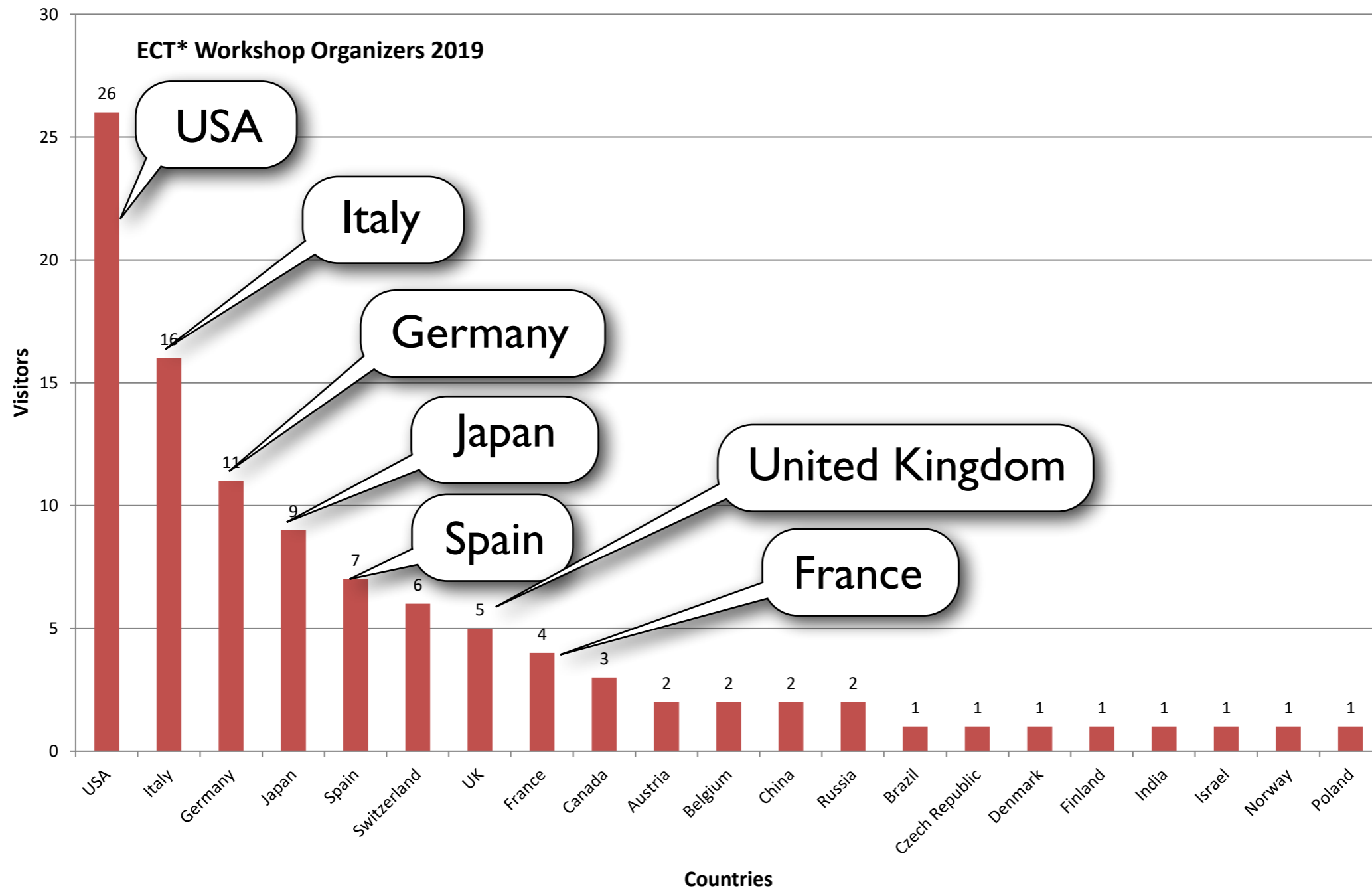
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2. To promote active contacts between **theory and experiments,** and to **related areas of research**

**extensive workshop - and
visitor program
20 workshops per year**



ECT* workshop organizers 2019





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Doctoral Training Programs & Schools

2013 - 2019



- 2013: Neutron-rich matter: Constraints from nuclear astrophysics
- 2014: Heavy-ion collisions: Exploring nuclear matter under extreme conditions
TALENT: Density functional theory and self-consistent methods
- 2015: Computational nuclear physics: Hadrons, nuclei and dense matter
TALENT: Few-body methods and nuclear reactions
- 2016: Nuclear, neutrino and relativistic astrophysics
- 2017: Microscopic theories of nuclear structure, dynamics and electroweak currents
TALENT: Theory of exploring nuclear structure experiments
- 2018: QCD under extreme conditions
- 2019: Effective field theory techniques
TALENT: From quarks and gluons to nuclear forces and structure



Scientific Activities 2020



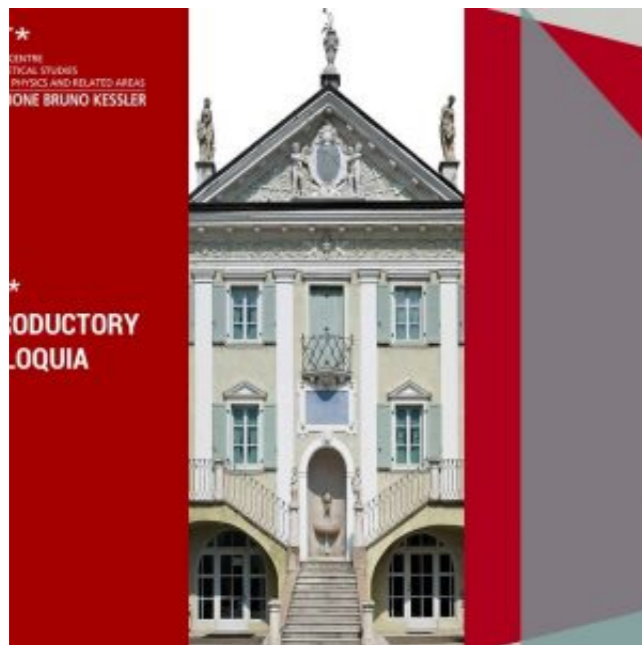
ECT* Scientific Events 2020



19 accepted workshops

because of Covid-19 all workshops after Feb. 14 were shifted to 2021 or run remotely (2 workshops)

for each deferred workshop an **introductory colloquium** was initiated to promote the **science case** to a wider audience. The recordings are available on the **ECT* YouTube channel**



2° COLLOQUIUM | HEAVY-FLAVOR TRANSPORT IN THE QUARK-GLUON PLASMA

Colloquium by Ralf Rapp

[Video](#)

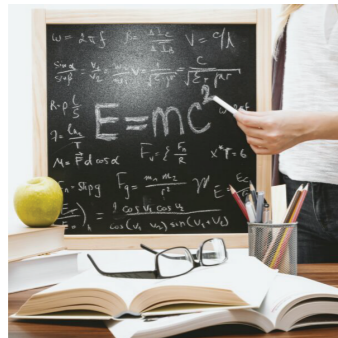


Training Programs 2020



DOCTORAL TRAINING PROGRAM

The ECT* Doctoral Training Program is intended for advanced doctoral students to substantially improve their background and research experience, as well as their professional and communicative skills, at an internationally competitive level. [MORE INFO](#)



06 July 2020 — 31 July 2020

HIGH-ENERGY AND NUCLEAR PHYSICS WITHIN QUANTUM TECHNOLOGIES

POSTPONED TO 2021 | The purpose of this school is to bring together experts and leaders in quantum information and high-energy physics to train a new generation of researchers in the state-of-the-art methods, applications, and open problems in both fields.

[More info](#)

deferred to 2021



Training Programs 2020



TALENT @ ECT*

The TALENT initiative, Training in Advanced Low Energy Nuclear Theory, aims at providing advanced and comprehensive training to graduate students and young researchers in all aspects of low-energy nuclear theory. TALENT offers intensive three-week courses on a rotating set of topics. General information on TALENT and past courses can be found at <http://www.nucleartalent.org>.



22 June 2020 — 03 July 2020

VIRTUAL

TALENT SCHOOL "SPECIAL EDITION 2020"

A 2020 "special edition" of the TALENT School on Machine learning will be held from 22 June 2020 to 03 July 2020 as a "remote" course.

[More info](#)

deferred to 2021

but **one-line course** with over 120 participants



The future of ECT*



- Due to **substantial budget cuts** by the Province of Trento, the FBK is reconsidering its scientific portfolio and possible restructuring measures of its research program.
- In this context, the role of **ECT*** in a new FBK research environment is being **scrutinised** at present. In this context also the future relationship with UniTN is discussed.
- To shape the future of ECT* in Trento **two task force committees**, one lead by the FBK with members from UniTN and INFN and one involving members of the ECT* Scientific Board, have been established.
- The **ECT* task force** has prepared **several documents** that were submitted to the FBK, UniTN and INFN, **proposing measures** to embed the scientific activities of ECT* in the local research environment in a way that is beneficial to all sides.
- The details, which involve **potential collaborations with other FBK centers** especially in areas of **Quantum Information Science** as well as **teaching** and **joint supervision** opportunities at UniTN for the ECT* senior researchers, are currently being worked out.
- After the **ECT* director position** has been advertised internationally, a candidate was identified. In the near future the position will be shared between the Department of Physics of UniTN and ECT*. Negotiations with the candidate are underway.



**European Centre for
Theoretical Studies**
in Nuclear Physics
and Related Areas

Thanks for your attention





Research @ ECT*



Senior Researchers

Daniele **Binosi** (SRA - Italy)

Dionysis **Triantafyllopoulos** (SRA - Greece)

Constantinos **Constantinou** (ECT*/TIFPA) (PD - US)

Gauge Field Theories, QCD

QCD, Collider Physics

Neutron-star Mergers

Junior Postdocs

Francesco **Celiberto** (PD - Italy)

Hilla **De-Leon** (ECT*/TIFPA) (PD - Israel)

Minghui **Ding** (PD - China)

Saga **Säppi** (PD - Finland)

Shu-yi **Wei** (PD - China)

TMD's, small x-physics

nuclear few-body theory

Hadron physics, Meson structure functions

EoS at high density, PQCD

Heavy-ion Collisions, small x-physics



INSTITUTE for **N**UCLEAR **T**HEORY



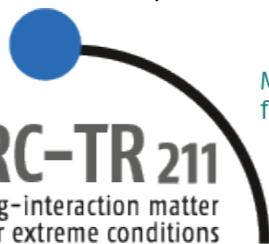
Theory Alliance
FACILITY FOR RARE ISOTOPE BEAMS

USA



JINR Dubna

Russia



CRC-TR 211
Strong-interaction matter
under extreme conditions

Germany



ITP

Chinese Academy of Sciences

INTERNATIONAL COOPERATIONS






TECHNISCHE UNIVERSITÄT DARMSTADT



Japan Atomic Energy Agency
Sector of Nuclear Science Research
Advanced Science Research Center



National Astronomical Observatory of Japan

Japan



APCTP
Asia Pacific Center for Theoretical Physics

China

Korea