



**TA6: Transnational Access ECT\***

**Gert Aarts (ECT\* and Swansea University)**

**STRONG-2020 ANNUAL MEETING (2022)**

*This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093*



# ECT\* mission

- ✓ to be a Centre at the frontline of research in theoretical nuclear physics
  - ✓ to promote active contacts between theory and experiments, and to related areas of research
  - ✓ to further the training of young researchers
- 
- established in 1993
  - Institutional member of ESF-Expert Committee NuPECC (Nuclear Physics European Collaboration Committee)

# Scientific Board

selected based on  
recommendations  
by the community

[Almudena Arcones](#) | TU Darmstadt (D)

[Constantia Alexandrou](#) | The Cyprus Institute (CY)

[Carlo Barbieri](#) | University of Milan (I)

[Anna Corsi](#) | IRFU/DPhN (F)

[David Kaplan](#) | University of Washington (USA)

[Denis Lacroix](#) | CNRS/IN2P3 (F)

[Marek Lewitowicz](#) | NuPECC/GANIL (F)

[Barbara Pasquini](#) | University of Pavia (I)

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

Ex officio: [Sandro Stringari](#) | University of Trento (I)

all participants at  
ECT\* activities are  
invited to join as  
ECT\* associate

Scientific Board is  
User Selection panel  
for STRONG2020

# 2021 Annual report

available on the ECT\* website



# Local Researchers (October 2022)

## ECT\* - Senior Researchers



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## ECT\* Postdocs



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**ACHILLE FIORE**  
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**ALEX GNECH**  
ECT\* Postdoc  
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**TOMMASO MORRESI**  
ECT\* Postdoc  
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**ZHAO-QIAN YAO**  
ECT\* Postdoc  
[VIEW PROFILE](#)

## ECT\* Fellows



**BORYS HRYNIUK**  
ECT\* Fellow  
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## ECT\* PhD students



**LUIS BENJAMÍN RODRÍGUEZ AGUI**  
ECT\* PhD student  
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**LUCA VESPUCCI**  
ECT\* PhD student  
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# Visitor programme (post pandemic)

people are visiting ECT\* for a few days or longer again

- Jean-Paul Blaizot (2 weeks)
- Paul Hoyer (3 weeks)
- Gordon Baym (1 week)

## 2022 PROGRAMME OF ACTIVITIES

<p><b>JANUARY</b> 31.1-4.2 <b>Alpha<sub>S</sub> (2022): Workshop on Precision Measurements of the Strong Coupling Constant</b> D. ENTERRIA (CERN), S. KLUTH (MPP), G. ZANDERIGHI (MPP)</p> <p><b>APRIL</b> 11-15.4 <b>Nuclear Physics from Atomic Spectroscopy (ONLINE)</b> L. PLATTER (University of Tennessee), R. GARCIA RUIZ (Massachusetts Institute of Technology), C. JI (Central China Normal University), S. PASTORE (Washington University)</p> <p><b>MAY</b> 2-20.5 <b>ECT* DOCTORAL TRAINING PROGRAM: Hadron Physics with Functional Methods</b> R. ALKOFER (University of Graz), G. EICHMANN (LIP Lisboa), M. HUBER (Giessen University)</p> <p>23-27.5 <b>Gauge Topology, Flux Tubes and Holographic Models: The Intricate Dynamics of QCD in Vacuum and Extreme Environments*</b> E. SHURYAK (Stony Brook University), M. D'ELIA (University of Pisa), J. GREENSITTE (San Francisco State University), E. KIRITSIS (University of Crete), I. ZAHED (Stony Brook University)</p> <p><b>JUNE</b> 6-10.6 <b>Connections Between Cold Atoms and Nuclear Matter: From Low to High Energies</b> C. SA DE MELO (Georgia Institute of Technology), A. GEZERLIS (University of Guelph)</p> <p>13-17.6 <b>Jet Quenching in the Quark-Gluon Plasma*</b> J. MULLIGAN (UC Berkeley), Y. J. LEE (MIT), K. TYWONIK (University of Bergen), L. CUNQUEIRO (Escola Politécnica), S. CAO (Shandong University)</p> <p>20-24.6 <b>Neutron Stars as Multi-Messenger Laboratories for Dense Matter*</b> L. TEWIS (LANL, Los Alamos), E. GIACOMOZZO (University of Milano), S. GUILLOT (CNRS Toulouse), J. MARGUERON (IPN Lyon), S. NISSANKE (University of Amsterdam)</p> <p>27.6-1.7 <b>Saturation and Diffraction at the LHC and the EIC</b> C. ROYON (Kansas University), A. SABIO-VERA (Universidad Autónoma de Madrid), S. SCHLICHTING (University of Bielefeld), A. DESHPANDE (Stony Brook University), G. SOYEZ (JHEP, Saclay), M. HENTSCHINSKI (Universidad de Las Americas Puebla)</p> <p><b>JULY</b> 4-8.7 <b>Nuclear Physics at the Edge of Stability*</b> G. HUPIN (JLab), O. SORLIN (GANIL), A. GADE (MSU), L. PLATTER (UTK)</p> <p>11-15.7 <b>Advances on Giant Nuclear Monopole Excitations and Applications to Multi-messenger Astrophysics*</b> Y. BLUMENFELD (JLab), G. COLO' (University of Milano and INFN), U. GARG (University of Notre Dame), E. KHAN (JLab), M. VANDEBROUCK (DPN, CEA Saclay)</p> <p>18-22.7 <b>Radiative Corrections from Medium to High Energy Experiments*</b> E. CLINE (Stony Brook University), A. AFANASIEV (George Washington University), S. BARKANOVA (Memorial University of Newfoundland), J. BERNAUER (Stony Brook University), R. GILMAN (Rutgers University), H. SPIESBERGER (Johannes Gutenberg University of Mainz)</p> <p>25-29.7 <b>Nuclear and Atomic Transitions as Laboratories for High Precision Tests of Quantum Gravity Inspired Models</b> A. MARCIANO (Fudan University), S. ALEXANDER (Brown University, Providence), E. BARBERIO (Melbourne University), C. CURCEANU (INFN), K. PISCICCHIA (Centro Fermi, Roma), N. YUNES (University of Illinois at Urbana-Champaign)</p>	<p><b>AUGUST</b> 1-5.8 <b>Neutron Electric Dipole Moment: from Theory to Experiment*</b> A. ATHENODOROU (Pisa University), D. GIATAGANAS (National and Kapodistrian University of Athens), B. LUCINI (Swansea University), E. RINALDI (Aridur Inc., Tokyo), K. CRANMER (New York University), C. ALEXANDROU (University of Cyprus)</p> <p>29.8-2.9 <b>LFQ25: Strong Interactions from QCD to New Strong Dynamics at LHC and Future Colliders*</b> G. GORCELLA (INFN-INFN), S. DE CURTIS (INFN Florence), S. MORETTI (University of Southampton), G. PANCHERI (INF-INFN), R. TENCHINI (INFN Pisa), M. VOS (IFIC Valencia)</p> <p><b>SEPTEMBER</b> 5-9.9 <b>From Hadrons to Therapy: Fundamental Physics Driving New Medical Advances</b> P. DE VERA GOMIS (Universidad de Murcia), M. DURANTE (GSI), C. HOEHR (TRIUMF), K. PARODI (Ludwig-Maximilians-Universität München), V. CONTE (LNL-INFN), J. KOHANOFF (Universidad Politécnica de Madrid), M. SCHWARZ (APSS, Trento), R. GARCIA-MOLINA (Universidad de Murcia)</p> <p>12-16.9 <b>Revealing Emergent Mass through Studies of Hadron Spectra and Structure*</b> D. BINOSI (ECT*), H. W. LIN (Michigan State University), T. HORN (Catholic University of America), C. ROBERTS (Nanjing University)</p> <p>26-30.9 <b>Opportunities with JLAB Energy and Luminosity Upgrade</b> H. AVAGYAN (Jefferson Lab), J. ARRINGTON (JLab), A. BACCINETTA (Pavia University), O. HEN (MIT), X. JI (UMD), K. JOO (UConn), X. ZHENG (UVA)</p> <p><b>OCTOBER</b> 3-14.10 <b>Reduced Density-Matrix Functional Theory: Improving its foundation and extending its scope</b> C. L. BENAVIDES-RIVEROS (Max-Planck Institute for Complex Systems), E. K. U. GROSS (Hebrew University) and C. SCHILLING (LMU, Munich)</p> <p>17-21.10 <b>EXOTIC: EXOTIC Atoms Meet Nuclear COLLisions for a New Frontier Precision Era in Low-Energy Strangeness Nuclear Physics*</b> O. VAZQUEZ DOCE (INF-INFN), C. CURCEANU (INF-INFN), A. RAMOS (Universitat de Barcelona), J. ZMESKAL (SMI-Vienna), J. MARES (Czech Academy of Sciences)</p> <p>24-28.10 <b>Giant and Soft Modes of Excitation in Nuclear Structure and Astrophysics*</b> E. LITVINOVA (Western Michigan University), R. BROGLIA (Niels Bohr Institute), H. LENSKE (Justus-Liebig-Universität, Giessen)</p> <p><b>NOVEMBER</b> 7-11.11 <b>Tomography of Light Nuclei at an EIC*</b> A. FREESE (University of Washington), W. COSYN (Ghent University &amp; Florida International University), L. CLOET (ANL), P. SHANAHAN (MIT)</p> <p><b>DECEMBER</b> 12-16.12 <b>Key Reactions in Nuclear Astrophysics*</b> A. TUMINO (University of Enna "Kore" &amp; INFN-LNS, Catania), J. JOSÉ (Technical University of Catalonia), C. BERTULANI (Texas A&amp;M University-Commerce), R. DIEHL (MPI Munich), L. TRACHE (IFIN-HH Bucuresti-Magurele, Romania)</p>
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\*STRONG-2020 supported workshop

All workshops will run in hybrid mode, provided that the pandemic situation permits this.

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

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# 2022 Activities

full programme:  
meetings in January and in April  
then almost continuously from May to  
October with 3-week break in August

**DTP:** hadron physics with functional methods  
3 weeks in May

# STRONG2020 supported activities (2019)

- Light Clusters in Nuclei and Nuclear Matter: Nuclear Structure and Decay, Heavy Ion Collisions and Astrophysics 2-6 Sept 2019
- LFC19: Strong Dynamics for Physics Within and Beyond the Standard Model at LHC and Future Colliders 9-13 Sept 2019
- Diquark Correlations in Hadron Physics: Origin, Impact and Evidence 23-27 Sept 2019
- Universal Physics in Many-Body Quantum Systems – From Atoms to Quarks 7-11 Oct 2019
- STRANEX: Recent Progress and Perspectives in Strange Exotic Atoms Studies and Related Topics 21-25 Oct 2019
- JPAC Collaboration Meeting 18-20 Dec 2019



# STRONG2020 supported activities (2020/21)

- Spin and Hydrodynamics in Relativistic Nuclear Collisions (online) 5-16 Oct 2020
- Mass in the Standard Model and Consequences of its Emergence (online) 19-23 Apr 2021
- Heavy-Flavour Transport in QCD Matter (online) 26-30 Apr 2021
- Heavy-Ions and New Physics (online) 20-21 May 2021
- STRANU: Hot Topics in STRANgeness NUClear and Atomic Physics (online) 24-28 May
- Saturation and Diffraction at the LHC and the EIC (online) 29 Jun-1 Jul 2021
- Relativistic Fermions in Flatland: Theory and Application (online) 5-9 Jul 2021
- Machine Learning from High Energy Physics: On and Off the Lattice (**hybrid**) 27 Sept-1 Oct 2021
- Exploring High MuB-Matter with Rare Probes (**hybrid**) 11-15 Oct 2021
- Quark-Gluon Plasma Characterisation with Heavy Flavour Probes (**hybrid**) 15-18 Nov 2021

# STRONG2020 supported activities (2022)

- Gauge Topology, Flux Tubes and Holographic Models: the intricate dynamics of QCD in vacuum and extreme environments (hybrid) 23-27 May 2022
- Jet quenching in the quark-gluon plasma (hybrid) 13-17 Jun 2022
- Neutron stars as multi-messenger laboratories for dense matter (hybrid) 20-24 Jun 2022
- Nuclear physics at the edge of stability (hybrid) 4-8 Jul 2022
- Advances on Giant Nuclear Monopole Excitations and Applications to Multi-messenger Astrophysics (hybrid) 11-15 Jul 2022
- Radiative Corrections from medium to high energy experiments (hybrid) 18-22 Jul 2022
- Neutron Electric Dipole Moment: from theory to experiment (hybrid) 1-5 Aug 2022

# STRONG2020 supported activities (2022)

- LFC22: Strong interactions from QCD to new strong dynamics at LHC and Future Colliders (hybrid) 29 Aug-2 Sept 2022
- Revealing emergent mass through studies of hadron spectra and structure (hybrid) 12-16 Sept 2022
- Giant and soft modes of excitation in nuclear structure and astrophysics (hybrid) 24-28 Oct 2022
- Tomography of light nuclei at an EIC (online) 7-11 Nov 2022
- Key Reactions in Nuclear Astrophysics (hybrid) 12-16 Dec 2022

programme for 2023 in preparation

# DTP 2022



## Hadron Physics with Functional Methods

Doctoral Training Programme 2022

Trento, 2-20 May 2022

### LECTURERS AND TOPICS

*Ian Cloet*, Argonne National Laboratory  
Hadron structure at the EIC

*Christian S. Fischer*, Giessen University  
Functional methods

*Astrid N. Hiller Blin*, Thomas Jefferson  
National Accelerator Facility  
Amplitude analysis and  
electroproduction experiments

*Pieter Maris*, Iowa State University  
Dyson-Schwinger and Bethe-Salpeter  
equations

*Jan M. Pawłowski*, University of  
Heidelberg  
Functional renormalization group

*Elena Santopinto*, INFN Sezione  
di Genova  
Quark models

*Alessandro Pilloni*, INFN Sezione  
di Roma  
Exotic hadron spectroscopy

### PROGRAMME COORDINATORS

*Reinhard Alkofer*, University of Graz  
*Gernot Eichmann*, LIP Lisboa  
*Markus Huber*, Giessen University

### STUDENT COORDINATOR AND ADVISOR

*Markus Huber*, Giessen University

### APPLICATIONS

Applications for the ECT\* Doctoral Training Programme should be made electronically through the ECT\* web page. It should include: a curriculum vitae, a 1-page description of academic and scientific achievements, a short letter expressing the applicants' personal motivation for participating in the Programme.

In addition, a reference letter from the candidate's supervisor should be sent to Barbara Gazzoli (gazzoli@ectstar.eu)

for the attention of Professor  
Gert Aarts - Director of ECT\*.  
For further details see [www.ectstar.eu](http://www.ectstar.eu)

Registrations will be available from December 6, 2021 until February 28, 2022

# DTP 2022 (2-20 May 2022)



- 23 participants
- in person only (!)
- 25 lectures in total, including lectures on numerical techniques
- students gave 25-minute presentations on their research projects
- participants worked in groups of 2-5 persons on research project

# STRONG2020

- essential to support ECT\* activities
- extension beyond Nov 2023 useful to further plan support for workshops
- non-negligible part of budget remaining



Following

## ECT\*\_Trento

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