



# ECT\*



## EUROPEAN CENTRE FOR THEORETICAL STUDIES IN NUCLEAR PHYSICS AND RELATED AREAS

TRENTO, ITALY

Institutional Member of the European Expert Committee NUPECC



Theory Alliance  
FACILITY FOR RARE ISOTOPE BEAMS



Castello di Trento ("Trint"), watercolor 19.8 x 27.7, painted by A. Dürer on his way back from Venice (1495). British Museum,

### Atomic nuclei as laboratories for BSM physics

Trento, April 15-19, 2019

#### Abstract

High-precision measurements of low energy processes provide powerful tools to explore fundamental symmetries and to search for new physics beyond the standard model (BSM). While large colliders explore the energy frontier, high-precision experiments of nuclear, atomic and molecular properties offer a complementary approach. The interpretation of these modern experiments requires a truly interdisciplinary research, with a joint effort between experimentalists and theorists from particle, nuclear, atomic and quantum chemistry. Accurate calculations with quantifiable uncertainty are imperative to disentangle the fundamental physics observables from measurements of nuclear, atomic and molecular properties. This workshop will be focused on the recent theoretical and experimental progress related to the use of low energy probes in the studies of fundamental symmetries and the search of new physics BSM. A special emphasis will be given to the modern development on nuclear theory and their relevance in studies of fundamental symmetries, neutrino physics and dark matter search..

#### Keynote speakers

Lorenzo Andreoli (*Uni of Trento, Italy*), Henrique Araujo (*Imperial College London, UK*), Robert Berger (*Uni of Marburg, Germany*), Joe Carlson (*LANL, USA*), Jon Engel (*Uni of North Carolina, USA*), Alfredo Galindo-Uribarri (*ORNL, US*), Carlo Giunti (*INFN Torino, Italy*), Evan Grohs (*LANL, USA*), Gaute Hagen (*ORNL, USA*), Yoshinari Hayato (*ICRR/Uni of Tokyo, Japan*), Takeyasu Ito (*LANL, USA*), Jonathon Jordan (*Uni of Michigan, USA*), Pierre Lasorak (*Uni of Sussex, UK*), Stephan Malbrunot-Ettenauer (*CERN, Switzerland*), Juliette Mammei (*Uni of Manitoba, Canada*), Dan Melconian (*Texas A&M Uni, USA*), Emanuele Mereghetti (*LANL, USA*), Saori Pastore (*LANL, USA*), Florian Piegsa (*Uni of Bern, Switzerland*), Grayson Rich (*Uni of Chicago, USA*), Ruben Saakyan (*University College London, UK*)

#### Organizers

Ronald Fernando Garcia Ruiz (CERN), Jason Holt (TRIUMF - Vancouver),  
Teppei Katori (Queen Mary University of London) [t.katori@qmul.ac.uk](mailto:t.katori@qmul.ac.uk)  
Vincenzo Cirigliano (Los Alamos National Laboratory), Stefano Gandolfi (Los Alamos National Laboratory)

**Director of the ECT\*:** Professor Jochen Wambach (ECT\*)

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