EDMs: complementary experiments and theory connections

Report of Contributions

https://indico.ectstar.eu/e/199

Contribution ID: **1** Type: **not specified**

Registration

Monday, 4 March 2024 08:00 (1 hour)

Contribution ID: **2** Type: **not specified**

Welcome

Monday, 4 March 2024 09:00 (30 minutes)

Primary author: VAN KOLCK, Ubirajara (IJCLab Orsay & University of Arizona)

Presenters: DEGENKOLB, Skyler (Universität Heidelberg); VAN KOLCK, Ubirajara (IJCLab Orsay & University of Arizona)

Contribution ID: **3** Type: **not specified**

Global analysis of CP-violation in atoms, molecules and role of medium-heavy systems

Monday, 4 March 2024 09:30 (45 minutes)

Presenter: GAUL, Konstantin (Philipps-University Marburg)

Contribution ID: **4** Type: **not specified**

Nonperturbative physics, chiral symmetry and EDM observables

Monday, 4 March 2024 10:45 (45 minutes)

Presenter: POSPELOV, Maxim (University of Minnnesota)

Contribution ID: **5** Type: **not specified**

SMEFT and Global Analysis

Monday, 4 March 2024 14:00 (45 minutes)

Presenter: PLEHN, Tilman (Heidelberg University)

Contribution ID: **6** Type: **not specified**

Electron EDM measurements with molecules: current status and future perspectives

Monday, 4 March 2024 14:45 (45 minutes)

Presenter: TARBUTT, Michael (Imperial College London)

Contribution ID: **7** Type: **not specified**

Toward a measurement of nuclear Magnetic Quadrupole Moment (nMQM) using quantum logically controlled molecular ions

Monday, 4 March 2024 16:15 (45 minutes)

Presenter: ZHOU, Yan (University of Nevada, Las Vegas)

Contribution ID: **8** Type: **not specified**

Searching for the EDM of 199Hg with ultracold atoms

Tuesday, 5 March 2024 09:00 (45 minutes)

Presenter: STELLMER, Simon

Contribution ID: **9** Type: **not specified**

Effective interactions for mean-field and beyond-mean-field calculations

Tuesday, 5 March 2024 09:45 (45 minutes)

Presenter: BENNACEUR, Karim (Université Claude Bernard Lyon 1, IP2I)

Contribution ID: **10** Type: **not specified**

An update on lattice QCD results on the EDM (CANCELLED)

Tuesday, 5 March 2024 11:00 (45 minutes)

Presenter: SHINDLER, Andrea (Michigan State University, East Lansing/US)

Contribution ID: **11** Type: **not specified**

Proof of principle experiment for dipole moments of charm baryons at LHC

Tuesday, 5 March 2024 14:00 (45 minutes)

Presenter: CESARE, Sara (INFN Milano)

Contribution ID: **12** Type: **not specified**

The role of theory uncertainties in global analysis of EDMs

Tuesday, 5 March 2024 14:45 (45 minutes)

Presenter: ELMER, Nina (Heidelberg University)

Contribution ID: **13** Type: **not specified**

The RAdium-Fluride Ion Catcher Instrument - A path towards offline eEDM experiments with RaF

Tuesday, 5 March 2024 16:15 (45 minutes)

Molecules have proven to be powerful laboratories to explore unknown aspects of the fundamental forces of nature and to search for physics beyond the standard model. By choosing molecules containing radioactive isotopes with different spins and nuclear deformation one can explore aspects of the strong and weak forces even further and reach unparalleled enhancement of symmetry-violating properties. Among many others, Radium-monofluoride (RaF) has been proposed as a potent candidate. However, the production of radioactive molecules in general has proven to be challenging and availability of molecular radioactive ion beams has been identified as a bottleneck for future research. Particularly as suitable radioactive partner species have to be produced at large scale online beam facilities, preventing decentralized experiments at universities or smaller laboratories.

In this contribution we will introduce the RAdium-Fluride Ion Catcher Instrument (RAFICI) which will allows the production of 224RaF ions by harvesting 224Ra ions from the nuclear decay of a 228Th sample within a gas filled stopping cell. The scheme was successfully tested at the FRS Ion Catcher at GSI and first offline production of 224RaF ions could be shown via gas phase reactions of the nuclear recoil daughters with SF6 inside an RFQ ion trap. Further, several other radioactive molecules, such as 216PoF and 212PbF, 212PoOH were produced and could be studied. The envisioned RAFICI device, currently under development at the University of Edinburgh, will offer experiments with radioactive molecules to be performed in low background / low noise environments away from large radioactive beam facilities.

Presenter: REITER, Moritz Pascal (University of Edinburgh)

Contribution ID: **14** Type: **not specified**

An experimental overview of the neutron EDM

Wednesday, 6 March 2024 09:00 (45 minutes)

Presenter: SVIRINA, Kseniia (Institut Laue-Langevin, Universität Heidelberg)

Contribution ID: **15** Type: **not specified**

Nuclear EFTs

Wednesday, 6 March 2024 09:45 (45 minutes)

Presenter: VAN KOLCK, Ubirajara (IJCLab Orsay & University of Arizona)

Contribution ID: **16** Type: **not specified**

Toward an improved measurement of the 129Xe EDM

Wednesday, 6 March 2024 11:00 (45 minutes)

Presenter: ALLMENDINGER, Fabian (Physikalisches Institut, Uni Heidelberg)

Contribution ID: **17** Type: **not specified**

Calculation of the Nuclear Schiff moment from DFT

Wednesday, 6 March 2024 14:00 (45 minutes)

Presenter: KORTELAINEN, Markus (University of Jyväskylä)

Contribution ID: **18** Type: **not specified**

Measurement of the electric dipole moment of 171Yb atoms in an optical dipole trap

Wednesday, 6 March 2024 14:45 (45 minutes)

Presenter: XIA, Tian

Contribution ID: **19** Type: **not specified**

New Physics in the muon dipole moments

Wednesday, 6 March 2024 16:15 (45 minutes)

Presenter: CRIVELLIN, Andreas (UZH & PSI)

Contribution ID: **20** Type: **not specified**

Toward an improved measurement of the muon EDM

Thursday, 7 March 2024 09:00 (45 minutes)

Presenter: SANZ-BECERRA, Diego (Paul Scherrer Institut)

Contribution ID: **21** Type: **not specified**

Spectroscopy of radioactive molecules relevant to EDM research

Thursday, 7 March 2024 11:00 (45 minutes)

Presenter: ATHANASAKIS-KAKLAMANAKIS, Michail (Imperial College London)

Contribution ID: **22** Type: **not specified**

Radioactive molecules studies at ISOLDE-CERN

Thursday, 7 March 2024 09:45 (45 minutes)

Presenter: NEYENS, Gerda (KU Leuven)

Contribution ID: **23** Type: **not specified**

The PHYDES activity: BaF in para-hydrogen for EDM studies

Thursday, 7 March 2024 14:00 (45 minutes)

Presenter: GUARISE, Marco (University of Ferrara and INFN Ferrara)

Contribution ID: **24** Type: **not specified**

Probing the electron-EDM using slow and trapped molecules

Thursday, 7 March 2024 14:45 (45 minutes)

Presenter: HOEKSTRA, Steven (University of Groningen and Nikhef, The Netherlands)

Contribution ID: **25** Type: **not specified**

Measurement of dipole moments of Lambda baryon at LHCb

Thursday, 7 March 2024 16:15 (45 minutes)

Presenter: TONANI, Giorgia (University of Milano)

Contribution ID: **26** Type: **not specified**

Table top nuclear facility for molecular spectroscopy

Friday, 8 March 2024 09:00 (45 minutes)

Presenter: FLANAGAN, Kieran (University of Manchester)

Contribution ID: **27** Type: **not specified**

The n2EDM experiment at PSI

Friday, 8 March 2024 09:45 (45 minutes)

Presenter: MULLAN, Patrick (ETH Zürich)

Contribution ID: **28** Type: **not specified**

New facilities and neutron production, opportunities

Friday, 8 March 2024 11:00 (45 minutes)

Presenters: DEGENKOLB, Skyler (Universität Heidelberg); SANTORO, Valentina (ESS, Lund University)