

New Opportunities for Fundamental Physics Research with Radioactive Molecules

Virtual Meeting

June 28 - July 2, 2021

Preliminary Program Schedule
All times are in Eastern Daylight time (EDT)

MONDAY
28 June

9:00 – 9:35	Intro
9:35 – 10:10	Flambaum, Victor Enhanced Effects of Violation of Parity and Time Reversal Invariance in Molecules
10:10 – 10:45	Cirigliano, Vincenzo Electric Dipole Moments as a Probe of New Physics
10:45 – 11:20	DeVries, Jordy CP-Violating Moments in (chiral) Effective Field Theory
11:20 – 11:35	Break
11:35 – 12:10	Reece, Matt EDM Experiments vs TeV-Scale New Physics
12:10 - 12:45	Singh, Jadeep Prospects of Using Pear Shaped Nuclei in Cryogenic Solids for Tests of Time-Reversal Symmetry
12:45 - 14:00	Lunch
14:00 - 14:35	Jayich, Andrew Prospects for Radium Molecules to Search for New Physics
14:35 - 15:10	Caldwell, Luke Measuring the Electric Dipole Moment of the Electron with Molecular Ions
15:10 – 15:25	Break
15:25 - 16:00	Tarbutt, Michael Laser Cooled Molecules and Their Applications to Fundamental Physics
16:00 - 16:35	Doyle, John Laser Cooling of Molecules for Fundamental Physics: Dark Matter and PeV Probes
16:35 - 17:10	Hutzler/Augenbraun Searching for New Fundamental Physics with Polyatomic Molecules

TUESDAY

29 June

9:00 – 9:35	Ramsey-Musolf, Michael Atomic and Molecular Tests of Fundamental Symmetries: The standard model and beyond?
9:35 – 10:10	Dobaczewski, Jacek Electromagnetic Moments in Nuclei within Nuclear DFT
10:10 – 10:45	Engel, Jonathan Schiff Moments in Radioactive Isotopes
10:45 – 11:20	Butler, Peter Studies of Heavy Pear Shaped Nuclei at ISOLDE
11:20 – 11:35	Break
11:35 – 12:10	Nazarewicz, Wittek Nuclear Charge Densities in Spherical and Deformed Nuclei
12:10 - 12:45	Budker, Dmitry New Approaches to Molecular Parity Violation and the Gamma Factory
12:45 - 14:00	Lunch
14:00 - 14:35	Haxton, Wick Edms of Unstable Nuclei: The Strange Case of ^{229}Pa
14:35 - 15:10	Holt, Jason Ab Initio Atomic and Nuclear Theory for Fundamental Symmetries Studies
15:10 – 15:25	Break
15:25 - 16:00	Navratil, Petr NCSM Calculations of Parity-and Time-Reversal Violating Nuclear Properties
16:00 - 16:35	Miyagi, Takayuki Parity Violation in Atomic Nuclei
16:35 - 17:10	Discussions

WEDNESDAY

30 June

9:00 – 9:35	Discussions
9:35 – 10:10	Isaev, Timur Electronic Structure of Laser Coolable Molecular Ions
10:10 – 10:45	Borschevsky, Anastasia Electronic Structure Theory of Exotic Atoms and Molecules
10:45 – 11:20	Fleig, Timo Theoretical Aspects of Alkali-Radium Heteronuclear Diatomic Molecules for New Physics Searches
11:20 – 11:35	Break
11:35 – 12:10	DeMille, David Opportunities for Next-Generation EDM Experiments with Assembled Radioactive Molecules
12:10 - 12:45	Breier, Alexander Radioactive Molecules in Space
12:45 - 14:00	Lunch
14:00 - 14:35	Rothe, Sebastian Infrastructure for the Development of Radioactive Molecular Ion Beams at CERN-ISOLDE
14:35 - 15:10	Wilkins, Shane Tools to Study Radioactive Molecules at ISOLDE-CERN
15:10 – 15:25	Break
15:25 - 16:00	Udrescu, Silviu-Marian Spectroscopy of RaF Molecules for Fundamental Physics
16:00 - 16:35	Gottberg, Alexander Production of Radioactive Molecules at ISOL Facilities
16:35 - 17:10	Severin, Gregory Actinides at FRIB

THURSDAY 1 July	
9:00 – 9:35	Skripnikov, Leonid Use of Heavy-Atom Molecules to Search for New Physics and Study of Nuclei Properties
9:35 – 10:10	Gaul, Konstantin Fundamental Physics with Molecules
10:10 – 10:45	Kotochigova, Svetlana Creating Molecules with Unstable Isotopes
10:45 – 11:20	Field, Robert Ramped Pulsed Field Ionization Detected Rydberg Spectroscopy
11:20 – 11:35	Break
11:35 – 12:10	Krems, Roman Enhancing Scattering Theory with Machine Learning
12:10 - 12:45	Safronova, Marianna Clock with Radioactive Species for New Physics Searches
12:45 - 14:00	Lunch
14:00 - 14:35	Arvantaki, Asimina The Piezoaxionic Effect
14:35 - 15:10	Hamilton, Paul The HUNTER Experiment: Searching for Sterile Neutrinos in Laser Trapped ^{131}Cs
15:10 – 15:25	Break
15:25 - 16:00	Von der Wense, Lars Prospects for Constraining Temporal Variations of Fundamental Constants with a ^{229}Th -based Nuclear Frequency Standard
16:00 - 16:35	Zhang, Chuankun Toward Direct VUV Frequency Comb Spectroscopy of the $^{229\text{m}}\text{Th}$ Nuclear State
16:35 - 17:10	Discussions

FRIDAY
2 JULY

9:00 – 9:35	Prasanna, V.S. Role of Relativistic Many-Body Theory for Electron Electric Dipole Moment Searches in Radioactive Molecules
9:35 – 10:10	Karthein, Jonas Towards Measurements of Symmetry-Violating Nuclear Properties Using Single Molecular Ions in a Penning Trap
10:10 – 10:45	Shin, Inouye Measurement of the Variation of Electron-to-Proton Mass Ratio Using Ultracold Molecules Produced from Laser Cooled Atoms
10:45 – 11:20	Stadnik, Yevgeny Opportunities for Radioactive Molecules in Tests of Fundamental Symmetries and Searches for Variations of the Fundamental Constants
11:20 – 11:35	Break
11:35 – 12:10	Vutha, Amar Using Hyperfine Clock Transitions for EDM Measurements
12:10 - 12:45	Gabrielse, Gerald The ACME Electron EDM Experiment
12:45 - 14:00	Lunch
14:00 - 14:35	Panel discussion
14:35 - 15:10	Panel discussion
15:10 – 15:25	Break
15:25 - 16:00	Panel discussion
16:00 - 16:35	Panel discussion
16:35 - 17:10	Summary talk