CRC 1227
Designed Quantum States of Matter

GUEST LECTURE

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(Guest of Prof. Dr. Piet O. Schmidt)

Physikalisch Technische Bundesanstalt
Bundesallee 100, 38116 Braunschweig
Raumzellenbau 11 (RZB 11), Room 113

Tuesday, 14 January 2020, 11:00 am

"Specifically tailored molecules as sensitive probes for fundamental physics"

Fundamental symmetries and fundamental interactions can be tested spectroscopically with favourably chosen molecular systems (see e.g. Refs. 1-5). In this talk I will provide an overview of latest activities in
molecular approaches to physics within and beyond the standard model and discuss challenges and opportunities that spectroscopy of specifically tailored molecules present. I plan to cover laser cooling of molecules, measurements of nuclear anapole moments and energy differences between enantiomers as well as detection of parity-and-timereversal-odd moments such as electric dipole moments of the electron, proton and neutron or nuclear magnetic quadrupole moments.

[1] Berger, Stohner, Parity violation, WIREs Comput. Mol. Sci., 2019, 9, e1396.
[2] Isaev Berger, Towards ultracold chiral molecules, Chimia, 2018, 72, 375-378.
[3] Gaul, Marquardt, Isaev, Berger, Systematic study of relativistic and chemical enhancements of P,T-odd effects in polar diatomic radicals, Phys. Rev. A., 2019, 99, 032509.
[4] Gaul, Berger, Ab initio study of parity and time-reversal violation in laser-coolable triatomic molecules, Phys. Rev. A. (accepted); arXiv:1811.05749.
[5] Guerlebeck et al., BOOST - A Satellite Mission to Test Lorentz Invariance Using High-Performance Optical Frequency References, Phys. Rev. D, 2018, 97, 124051.

All DQ-mat members and all interested
are cordially invited to attend.