

High-precision measurements and searches for New Physics

766. WE-Heraeus-Seminar

May 9 -13, 2022

**Hybrid at the Physikzentrum Bad
Honnef/Germany**

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, May 8, 2022

17:00 – 21:00	Registration	
from 18:30	<i>BUFFET SUPPER / Informal get together</i>	
20:00 – 21:00	Welcome lecture Dmitry Budker	Hunting elephants in a room: new ways to search for dark matter and other adventures

Monday, May 9, 2022

07:30	BREAKFAST	
08:45 – 09:00	Scientific organizers	Opening and welcome
09:00 – 09:45	Marianna Safronova	Searches for new physics with quantum sensors in the laboratory and in space
09:45 – 10:30	Jun Ye	Quantum system engineering and sensing for fundamental physics
10:30 – 11:00	COFFEE BREAK	
11:00 – 11:45	Jörg Jaeckel	News on Sub-eV Feebly Interacting Particles
11:45 – 12:30	Dionysios Antypas	Precision experiments in search for new physics
12:30	Conference Photo (in the foyer of the lecture hall)	
12:40	LUNCH	

Program

Monday, May 9, 2022

14:00 – 14:45	Tanya Zelevinsky	Lattice clock based on molecular vibrations
14:45 – 15:30	Robert Berger	Probing violations of fundamental symmetries with polyatomic molecules
15:30 – 16:00	COFFEE BREAK	
16:00 – 16:45	Mikhail G. Kozlov (online)	Antisymmetric J-Coupling Experiment in a TIF Molecular Beam
16:45 – 17:30	Zheng-Tian Lu (online)	Measurement of the Electric Dipole Moment of ^{171}Yb Atoms in an Optical Dipole Trap
17:30 – 19:00	Poster session 1	
19:00	DINNER	

Program

Tuesday, May 10, 2022

08:00	BREAKFAST	
09:00 – 09:45	Piet O. Schmidt	Highly Charged Ion Optical Clocks to Test Fundamental Physics
09:45 – 10:30	José Crespo López-Urrutia	Extreme-ultraviolet frequency combs and highly charged ions
10:30 – 11:00	COFFEE BREAK	
11:00 – 11:45	Sergey Eliseev	Ultra-precise mass-ratio spectrometry with PENTATRAP for various aspects of fundamental physics
11:45 – 12:30	Randalf Pohl	Charge radii of the lightest nuclei
12:30	LUNCH	
14:00 – 14:45	Elina Fuchs	Searching for light Dark Sectors with isotope shifts
14:45 – 15:30	Deniz Aybas	Searches for the ultralight bosonic dark matter
15:30 – 16:15	Roe Ozeri (online)	Quantum Information Techniques in searches of physics beyond the standard model and the detection of ultra-cold collisions

Program

Tuesday, May 10, 2022

16:15 – 16:50 COFFEE BREAK

Progress reports

16:50 – 17:10 Abhishek Banerjee **Complementarity between equivalence principle tests and precision tests**

17:10 – 17:30 Melina Filzinger **New prospects for tests of local Lorentz invariance via microwave spectroscopy of the $^{171}\text{Yb}^+$ F-state**

17:30 – 17:50 Madeline Bernstein **Precision measurement of the fine-structure constant**

17:50 – 18:10 Annabelle Kaiser **High-precision g-factor measurements of $^3\text{He}^+$ and $^3\text{He}^{2+}$**

18:10 – 18:30 Anna Viatkina **Nuclear polarization effects in atoms and ions**

18:30 – 18:50 Stergiani Marina Vogiatzi **Muonic atom spectroscopy with radioactive targets**

18:50 – 19:10 Felix Kröger (online) **High-Resolution Microcalorimeter Measurement of X-Ray Transitions in He-like Uranium at CRYRING@ESR**

19:20 DINNER

Program

Wednesday, May 11, 2022

08:00	BREAKFAST	
09:00 – 09:45	Eberhard Widmann	In-beam hyperfine spectroscopy of (anti-)hydrogen
09:45 – 10:30	Masaki Hori	Laser spectroscopy of antiprotonic helium and pionic helium atoms
10:30 – 11:00	COFFEE BREAK	
11:00 – 11:45	Eve V. Stenson	Matter-antimatter pair plasmas: a new frontier in plasma physics
11:45 – 12:30	Ariel Zhitnitsky	Axion Quark Nuggets and Matter-Antimatter asymmetry as two sides of the same coin: theory, observations and future experimental searches
12:30	LUNCH	
14:00 – 17:30	Excursion (leisurely hike in the vicinity)	
17:30 – 19:00	Poster session 2	
19:00	DINNER	
20:00 – 21:00	Evening lecture Fabiola Gianotti	Physics beyond the Standard Model at highest energies

Program

Thursday, May 12, 2022

08:00	<i>BREAKFAST</i>	
09:00 – 09:45	Hans Stroeher	Storage Rings: From Hadron Physics to Precision Measurements
09:45 – 10:30	Yuri Litvinov	Precision Experiments at the Intersection of Atomic, Nuclear and Astro-Physics
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 11:45	Yannis Semertzidis	The hybrid-symmetric storage ring lattice for a high sensitivity proton EDM experiment
11:45 – 12:30	Magdalena Kowalska (online)	Precision studies with polarised unstable nuclei
12:30	<i>LUNCH</i>	
14:00 – 16:00	Helmholtz Prize Ceremony	
	Joachim Ullrich	High-Precision Measurements and Searches for New Physics
16:00	RECEPTION	
17:45	Start to the shipping pier (about 20 minutes walk)	
19:00	JOINT DINNER on board cruising by the boat “MS Moby Dick” on the river Rhine	

Program

Friday, May 13, 2022

08:00	BREAKFAST	
09:00 – 09:45	Anna Soter (online)	Low energy particle physics experiments at PSI in the lepton sector
09:45 – 10:30	Ferdinand Schmidt-Kaler	Searching for new physics with cold trapped ions
10:30 – 11:00	COFFEE BREAK	
11:00 – 11:45	Andrew Geraci (online)	Searching for fifth forces, non- Newtonian gravity, and dark matter with AMO-based sensors
11:45 – 12:30	Joel Bergé (online)	MICROSCOPE and the search for a fifth force
12:30 – 12:45	Scientific organizers	Poster awards, summary and closing remarks
12:45	LUNCH	

End of the seminar and FAREWELL COFFEE / Departure

Please note that there will be **no** dinner at the Physikzentrum on Friday evening for participants leaving the next morning.