

Precision Atomic Physics Experiments to Probe for New Physics

817. WE-Heraeus-Seminar

23 – 27 September 2024

at the Physikzentrum Bad Honnef, Germany

**WILHELM UND ELSE
HERAEUS-STIFTUNG**



Program

Sunday, 22 September 2024

17:00 – 20:00 Registration

18:00 *BUFFET SUPPER, discussions and informal get-together*

Monday, 23 September 2024

08:00 *BREAKFAST*

09:30 – 09:45 Tanja Mehlstäubler
Piet O. Schmidt

Welcome and Introduction

09:45 – 10:30 Julian Berengut

Isotope shift theory for new physics searches

10:30 – 11:00 *COFFEE BREAK*

11:00 – 11:45 Elina Fuchs

New boson searches with isotope shifts

11:45 – 12:30 Joonseok Hur

Probing new physics with isotope-shift spectroscopy of trapped ions

12:30 – 12:40 **Conference photo**

12:40 *LUNCH*

Program

Monday, 23 September 2024

14:00 – 14:45	Yoshiro Takahashi	Quantum sensor for new physics with ultracold ytterbium atoms
14:45 – 15:30	Gilad Perez	New era in dark matter searches, the dawn of the (nuclear) clocks
15:30 – 16:15	Sergei Eliseev	PENTATRAP and the search for the fifth force
16:15 – 16:45	<i>COFFEE BREAK</i>	
16:45 – 19:00	Discussion Round	
19:00	<i>DINNER</i>	

Program

Tuesday, 24 September 2024

08:00	<i>BREAKFAST</i>	
09:00 – 09:45	Marianna Safronova	Novel clocks, bosonovae, and mulimessenger
09:45 – 10:30	Melina Filzinger	Improved limits on the coupling of ultralight bosonic dark matter to photons from optical atomic clock comparisons
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 11:45	Eric Cornell	Precision measurements are having a moment: recent results in g-2 and electric dipoles of leptons
11:45 – 12:30	Sven Sturm	Precision tests of QED and CPT with penning traps
12:30	<i>LUNCH</i>	
14:00 – 14:45	Stefan Ulmer	Testing fundamental symmetries with antiproton spins
14:45 – 15:30	Alessandro Spallicci	Phenomenology, observations and experiments of extended theories of electro-magnetism
15:30 – 16:15	Poster Flashes	
16:15 – 16:45	<i>COFFEE BREAK</i>	
16:45 – 19:00	Poster session I	
19:00	<i>DINNER</i>	

Program

Wednesday, 25 September 2024

08:00 *BREAKFAST*

09:00 – 09:45 Peter Wolf **Experiments and proposals to search
for ultralight dark matter**

09:45 – 10:30 Hans Hepach **Measurement of gravitational coupling
between micrometer-sized masses**

10:30 – 11:00 *COFFEE BREAK*

11:00 – 11:45 Christian Panda **Matter-wave interferometry with atoms
held in an optical lattice for one minute**

11:45 – 12:30 Agnes Fienga **Tests of alternative theories of
gravitation with planetary orbitography**

12:30 *LUNCH*

14:00 – 19:00 **Excursion**

19:00 *HERAEUS DINNER*
(social event with cold & warm buffet with complimentary drinks)

Program

Thursday, 26 September 2024

08:00	<i>BREAKFAST</i>	
09:00 – 09:45	Maria Archidiacono	Constraining neutrino physics with cosmology
09:45 – 10:30	Diego Blas	Detecting (high frequency) gravitational waves in the lab
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 11:45	Alexey Elykov	Search for new physics in electronic recoil data from XENONnT
11:45 – 12:30	Meike List	The MICROSCOPE mission: A space test of the weak equivalence principle
12:30	<i>LUNCH</i>	
14:00 – 14:45	Jens Gundlach	Gravitational experiments to test fundamental physics
14:45 – 15:30	Riccardo March	Lunar laser ranging constraints on nonminimally coupled gravity with a chameleon mechanism
15:30 – 16:15	Poster Flashes	
16:15 – 16:45	<i>COFFEE BREAK</i>	
16:45 – 19:00	Poster session II	
19:00	<i>DINNER</i>	

Program

Friday, 27 September 2024

08:00 *BREAKFAST*

09:00 – 09:45 Michael Tobar **Precision experiments to probe new physics using phonons, photons and spins**

09:45 – 10:30 Dima Budker **CASPEr, WRESL, GNOME, SAPPHIRE, Chang-E, ... --- many ways to search for ultralight dark matter**

10:30 – 11:00 *COFFEE BREAK*

11:00 – 11:45 Dong Sheng **Search for spin-dependent gravitational interactions at the Earth range**

11:45 – 12:30 Tanja Mehlstäubler
Piet O. Schmidt **Closing words and Poster Awards**

12:30 *LUNCH*

End of the seminar and departure

NO DINNER for participants leaving on Saturday; however, a self-service breakfast will be provided on Saturday morning