Time and Clocks

781. WE-Heraeus-Seminar

27 Feb - 03 Mar 2023
at the Physikzentrum Bad Honnef/Germany

The WE-Heraeus Foundation supports research and education in science, especially in physics.
The Foundation is Germany's most important private institution funding physics.

WILHELM UND ELSE
HERAEUS-STIFTUNG

Program

Sunday, 26 February 2023

17:00 – 21:00	**Registration**	
From 18:30	*BUFFETT SUPPER / Informal get together*	

Monday, 27 February 2023

08:00 – 08:45	*BREAKFAST*	
08:45 – 09:00	Organizers	**Welcome words**
09:00 – 10:00	Tanja Mehlstäubler	**Time in multi-ion systems**
10:00 – 11:00	Piet Schmidt	**Quantum engineering optical clocks**
11:00 – 11:30	*COFFEE BREAK*	
11:30 – 12:30	Emily Adlam	**Is There Causation in Fundamental Physics? New Insights from Process Matrices and Quantum Causal Modelling**
12:30 – 12:40	**Conference photo**	
12:40 – 14:00	*LUNCH*	

Program

Monday, 27 February 2023

14:00 – 15:00	Klaus Fredenhagen	**Time in quantum physics**
15:00 – 16:00	Julian Barbour	**Complexity as time**
16:00 – 16:30	*COFFEE BREAK*	
16:30 – 17:30	Carlo Rovelli (online)	**Quantum mechanics can be extended to general relativistic temporality**
17:30 – 17:45	Stefan Jorda (online)	**About the Wilhelm and Else Heraeus Foundation**
17:45 – 18:45	**Discussion Clocks**	
19:00	*HERAEUS DINNER at the Physikzentrum* *(cold and warm buffet, with complimentary drinks)*	

Program

Tuesday, 28 February 2023

08:00 – 09:00	*BREAKFAST*	
09:00 – 10:00	Claus Kiefer	**Origin of irreversibility in the Universe**
10:00 – 11:00	Martin Bojowald	**Time and clocks in extreme quantum regimes**
11:00 – 11:30	*COFFEE BREAK*	
11:30 – 12:30	Reinhard Werner	**Time observables in quantum mechanics**
12:30 – 14:00	*LUNCH*	
14:00 – 15:00	Fay Dowker	**Causal Set Quantum Gravity and the Hard Problem of Consciousness**
15:00 – 15:30	Sebastian Ulbricht	**Theoretical investigation of a cavity-clock operating in Earth's gravity**
15:30 – 16:00	**Poster-Flash-Talk Session**	
16:00 – 16:30	*COFFEE BREAK*	
16:30 – 18:30	**Poster Session**	
18:45 – 20:00	*DINNER*	
20:00	**Poster Session continued**	

Program

Wednesday, 1 March 2023

08:00 – 09:00	*BREAKFAST*	
09:00 – 10:00	Gérard Petit	**Atomic time, clocks, and clock comparisons in relativistic spacetime**
10:00 – 11:00	Sergei Klioner	**Time and Relativistic Reference Systems**
11:00 – 11:30	*COFFEE BREAK*	
11:30 – 12:30	Philip Schwartz	**Time in Newtonian physics from a spacetime perspective**
12:30 – 14:00	*LUNCH*	
14:00 – 18:30	**Excursion**	
18:45	*DINNER*	
20:00	**Evening Lecture** Claus Lämmerzahl	**The Unit(y) of Time**

Program

Thursday, 2 March 2023

08:00 – 09:00	*BREAKFAST*	
09:00 – 10:00	Eva Hackmann	**Time and Rotation**
10:00 – 11:00	Kristina Giesel	**Geometrical and matter clocks in quantum gravity models**
11:00 – 11:30	*COFFEE BREAK*	
11:30 – 12:30	**Networking / Discussion**	
12:30 – 14:00	*LUNCH*	
14:00 – 15:00	Volker Perlick	**Experimental characterisation of standard clocks**
15:00 – 16:00	Dennis Raetzel	**Geometry of physical dispersion relations**
16:00 – 16:30	*COFFEE BREAK*	
16:30 – 17:00	Ali Lezeik	**Quantum Clock Interferometry**
17:00 – 17:30	Akbar Shabanloui	**Application of optical clocks for unification of height systems and determination of temporal variations in the Earth's gravity field**
18:45	*DINNER*	
20:00	**Discussion**	

Program

Friday, 3 March 2023

08:00 – 09:00	*BREAKFAST*	
09:00 – 10:00	Philipp Hoehn	**Relational observables and microcausality in gravity**
10:00 – 11:00	Alexander R. H. Smith	**The Page-Wootters formalism and quantum time dilation**
11:00 – 11:30	*COFFEE BREAK*	
11:30 – 12:30	Manuel Hohmann	**How to (not) break local Lorentz invariance in gravity theory**
12:30 – 12:40	Organizers	**Poster Award and Closing Remarks**
12:40 – 14:00	*LUNCH*	

End of seminar and departure