

# Quantum Computing and Simulation in the NISQ Era

**804. WE-Heraeus-Seminar**

**14 Jan - 18 Jan 2024**

**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 (CET)

**Sunday, 14 January 2024**

17:00 – 21:00    **Registration**  
From 18:00    *BUFFET SUPPER*

**Monday, 15 January 2024**

07:30	<i>BREAKFAST</i>	
08:30 – 08:45	Scientific Organizers	<b>Welcome and opening</b>
08:45 – 09:00	Stefan Jorda	<b>About the Wilhelm and Else Heraeus Foundation</b>
09:00 – 10:00	Jens Eisert	<b>What can we do with NISQ devices?</b>
10:00 – 10:30	<i>COFFEE BREAK</i>	
10:30 – 10:45	<b>Posterflash I (Aasen - Heunisch)</b>	
10:45 – 11:45	Andreas Wallraff	<b>Loophole-free Bell Inequality Violation with Superconducting Circuits*</b>
12:00	<i>LUNCH</i>	
13:30 – 14:30	Rainer Blatt	<b>Quantum Computation and Quantum Simulation With Strings of Trapped Ca<sup>+</sup> Ions</b>
14:30 – 15:00	Cristian Tabares	<b>Analog variational quantum simulators with tunable long-range interactions</b>

# Program (CET)

## Monday, 15 January 2024

15:00 – 15:30	<i>COFFEE BREAK</i>	
15:30 – 18:30	<b>Hackathon &amp; Discussion Time</b>	
18:30 – 20:00	<i>DINNER</i>	
20:00 – 21:00	Ignacio Godoy-Descazeaux	<b>Empowering Europe to become Quantum Ready: An insight into the European Quantum Readiness Center</b>

## Tuesday, 16 January 2024

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Wolfram Pernice	<b>Photonic in-memory computing</b>
09:30 – 10:30	Philip Walther	<b>Progress in photonic quantum machine learning, and quantum control enabling time-reversal operations</b>
10:30 – 11:00	<i>COFFEE BREAK</i>	
11:00 – 11:15	<b>Posterflash II (Hickmann - Rupprecht)</b>	
11:15 – 12:15	Michael Fellner	<b>Enhancing NISQ algorithm efficiency with the Parity Architecture</b>
12:15 – 12:30	<b>Conference photo</b>	
12:30	<i>LUNCH</i>	
14:00 – 18:30	<b>Excursion</b>	
18:30	<i>DINNER</i>	

# Program (CET)

Wednesday, 17 January 2024

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Sabrina Maniscalco	<b>Scalable tensor-network error mitigation for near-term quantum computing</b>
09:30 – 10:15	Christophe Vuillot	<b>Robust sparse IQP sampling in constant depth</b>
10:15 – 10:45	<i>COFFEE BREAK</i>	
10:45 – 11:00	<b>Posterflash III (Saenz - Zhuang)</b>	
11:00 – 11:45	Manuel Rispler	<b>Fault-tolerant Quantum Computation in the NISQ era</b>
11:45 – 12:15	Marco Schumann	<b>Emergence of noise-induced barren plateaus in arbitrary layered noise models</b>
12:15	<i>LUNCH</i>	
13:30 – 14:00	Michael Förtsch	<b>Prospects of photonic processors for near-term applications in the industry</b>
14:00 – 14:30	Inés de Vega	<b>Quantum computing advances and challenges in the NISQ utility era</b>
14:30 – 15:00	Thomas O'Brien	<b>State-based quantum error mitigation</b>
15:00 – 15:30	Davide Dreon	<b>The Development of Neutral Atom Quantum Computing</b>
15:30 – 16:00	<i>COFFEE BREAK</i>	
16:00 – 17:00	<b>Panel discussion</b>	
17:00 – 18:30	<b>Poster Session</b>	
18:30 – 20:00	<i>HERAEUS DINNER</i> (social event with cold & warm buffet and complimentary drinks)	

# Program (CET)

Thursday, 18 January 2024

07:30	<i>BREAKFAST</i>	
08:30 – 09:30	Sabine Wölk	<b>A hybrid quantum classical learning agent</b>
09:30 – 10:15	Eliška Greplová	<b>Exploring artificial intelligence for engineered quantum matter</b>
10:15 – 10:45	<i>COFFEE BREAK</i>	
10:45 – 11:15	Ellen Sarauer	<b>Quantum Machine Learning-based Microphysics Parameterization for Earth System Models</b>
11:15 – 12:00	Xin Zhang	<b>Quantum simulation with gate defined semiconductor quantum dots</b>
12:00 – 12:15	Scientific organizers	<b>Poster Prize Awards &amp; Closing Remarks</b>
12:15 – 14:00	<i>LUNCH</i>	

***End of the seminar and departure***