Workshop on Ultracold Quantum Gases and Numerical Simulations

Schedule

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<td>13:00 – 13:10</td>
<td>Welcome</td>
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<td>13:10 – 14:00</td>
<td>Sven Herrmann</td>
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<td>14:00 – 15:00</td>
<td>Hauke Müntinga</td>
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<td>15:00 – 15:30</td>
<td>Axel Pelster</td>
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<td>15:30 – 16:30</td>
<td>Abel Camacho</td>
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<td>16:30 – 17:30</td>
<td>Naceur Gaaloul</td>
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<td>17:30 – 18:15</td>
<td>Ertan Göklü</td>
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<td>18:15 – 20:00</td>
<td>Poster session + BBQ</td>
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<td>10:00 – 10:30</td>
<td>Albert Roura</td>
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<td>10:30 – 11:30</td>
<td>Reinhold Walser</td>
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<td>11:30 – 12:30</td>
<td>lunch</td>
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<td>12:30 – 13:00</td>
<td>Hannes Uecker</td>
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<td>13:00 – 13:45</td>
<td>Antun Balaz</td>
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<td>15:00 – 16:00</td>
<td>Lab tour</td>
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Talks

Tuesday

1. **Ertan Göklü**: “An overview over the ATUS activities”
2. **Naceur Gaaloul**: “Precision atom interferometry with degenerate gases”
3. **Hauke Müntinga**: “Matterwave interferometry in the drop tower”
4. **Abel Camacho**: “Superfluidity in a Bose-Einstein condensate and the role of gravity in the context of Landau’s criterion”
5. **Axel Pelster**: “Perturbative and Non-Perturbative Methods for Tackling the Dirty Boson Problem”

Wednesday

1. **Sven Herrmann**: “PRIMUS, another pathfinder drop tower project”
2. **Albert Roura**: “Long-time atom interferometry with ultracold gases”
3. **Reinhold Walser**: “Matter wave optics and what it takes to simulate partial coherent waves”
4. **Hannes Uecker**: “BEC with pde2path”
5. **Antun Balaz**: “Faraday waves in collisionally inhomogeneous Bose-Einstein condensates”

Posters

1. **Wolfgang Zeller**: “Density profiles and contrast in open atom interferometers”
3. **Matthias Meister**: “Analytic study of the expansion dynamics of multi-species Bose-Einstein condensates”
4. **Stephan Kleinert**: “Representation-free description of matter-wave interferometry”
5. Želimir Marojević: “Multiple Solutions of the Time Independent Gross-Pitaevskii Equation”


7. Axel Pelster: “Crossover from Adiabatic to Sudden Quench Dynamics for Time-of-Flight Imaging Measurements in BECs”


10. Abel Camacho: tba

11. Roman Nolte: “Molecular Dynamics of Trapped Cold Gases on GPUs”

12. Luis Fernando Barragán: “Matter Interferometry with Gaussian States”


Workshop venue

ZARM
Universität Bremen
Am Fallturm
28359 Bremen

Organizer

Ertan Göklü
Space Science group
goeklue@zarm.uni-bremen.de
Tel (office): 0421 218-57944
Tel (mobile): 0160 96842557

The workshop will take place in the conference room 1730. If needed, on both days you can have access to the small meeting room 1040 where you can work without getting distracted.

How to reach ZARM

From the city center

By train  The central station is located right in the heart of the city center and ZARM can be easily reached by taxi and tram. If you take the exit City you will find a tram station right in front of the of the central railway station. Please take line 6 direction Universität and after 10 minutes you will reach ZARM.

Please get off the tram at Klagenfurterstraße, and you will spot the drop tower around 200 m ahead of you.

Taxi stands are located at both exits of the central railway station. By taxi, you will reach ZARM in 10 - 15 minutes, and the fare is about 14.00 EUR. The German word for drop tower is ”Fallturm”, a building and address most taxi drivers will be familiar with.

By plane  Bremen can easily be reached by plane. The City Airport Bremen is only a few minutes away from the City Center and the campus of the University of Bremen. You will find a taxi stand and a tram station right in front of the exit of the airport.

Take tram line 6 direction Universität and after only 30 minutes you will reach the campus. Please get off the tram at Klagenfurterstraße and you will see ZARM’s drop tower around 200 m ahead of you.

By taxi, you will reach ZARM in 15-20 minutes, and the tour fee is about 25.00 EUR.

From the hotel “Horner Eiche”

By bus  At the station Kopernikusstraße take the line 31 direction Nedderland and get off at Linzer Straße. From there it is a 5 minutes walk to reach ZARM.

Alternatively, you can take the line 670 (direction Bremen HBF) or 630 (also direction Bremen HBF) and get off at Universität/NW 1. From there it is a walk of roughly 10 minutes to arrive at ZARM.
How to reach the hotel “Horner Eiche”

The earliest check-in is at 14:00 h and the latest check-out at 11:30 h. If your arrival is later than 18:00 h please let them know beforehand.

Hotel Horner Eiche  
Im Hollergrund 1  
28359 Bremen  
Tel.: (0421) 27 82 0

By tram from the central station  At the central station take the line 4 direction Borgfeld and get off at Kopernikusstraße. Change to the left side of the street “Lilienthaler Heerstraße” with respect to the travelling direction of the tram. Walk towards the large crossing where Lilienthaler Heerstraße and Autobahnzubringer Horn-Lehe intersect. Now cross the street Autobahnzubringer Horn-Lehe and turn left. Walk 100 m straight ahead until you reach the hotel which is located at “Im Hollergrund 1”.

![Map of the area around Hotel Horner Eiche](image-url)
List of participants

Abel Camacho, Universidad Autónoma Metropolitana, Iztapalapa, Physics Department, México, DF
Albert Roura, Universität Ulm, Institut für Quantenphysik
Antun Balaz, Institute of Physics, Belgrade
Axel Pelster, TU Kaiserslautern, Theory of condensed matter and many body systems
Claus Lämmerzahl, ZARM, Universität Bremen
Enno Giese, Universität Ulm, Institut für Quantenphysik
Ernst Rasel, Leibniz Universität Hannover, Atom Optics and Quantum Sensors
Ertan Göklü, ZARM, Universität Bremen, Experimental Gravitation and Quantum Optics
Hauke Müntinga, ZARM, Universität Bremen, Experimental Gravitation and Quantum Optics
Hannes Uecker, Carl von Ossietzky Universität Oldenburg, Institut für Mathematik
Holger Ahlers, Leibniz Universität Hannover, Atom Optics and Quantum Sensors
Katerine Possot, Leibniz Universität Hannover, Atom Optics and Quantum Sensors
Naceur Gaaloul, Leibniz Universität Hannover, Atom Optics and Quantum Sensors
Luis Fernando Barragán Gil, TU Darmstadt, Theoretische Quantendynamik
Oliver Gabel, TU Darmstadt, Theoretische Quantendynamik
Rainer Forke, Deutsches Zentrum für Luft- und Raumfahrt (DLR) Raumfahrtmanagement
Reinhold Walser, TU Darmstadt, Theoretische Quantendynamik
Roman Nolte, TU Darmstadt, Theoretische Quantendynamik
Stephan Kleinert, Universität Ulm, Institut für Quantenphysik
Sven Herrmann, ZARM, Universität Bremen, Experimental Gravitation and Quantum Optics
Tammo Sternke, ZARM, Universität Bremen, Experimental Gravitation and Quantum Optics
Vladimir Veljic, Institute of Physics, Belgrade
Wolfgang Schleich, Universität Ulm, Institut für Quantenphysik
Wolfgang Zeller, Universität Ulm, Institut für Quantenphysik
Želimir Marojević, ZARM, Universität Bremen, Experimental Gravitation and Quantum Optics