# The QCD Phase Transition

## 786. WE-Heraeus-Seminar

03 – 05 April 2023

hybrid

at the Physikzentrum Bad Honnef, Germany

WILHELM UND ELSE
HERAEUS-STIFTUNG

# Program

## Sunday, 02 April 2023

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|---|---|---|
| 17:00 – 20:00 | Registration | |
| 18:00 | *BUFFET SUPPER and informal get-together* | |

## Monday, 03 April 2023

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|---|---|---|
| 08:00 | *BREAKFAST* | |
| 09:00 | Scientific organizers | **Welcome words** |
| **Session I: QCD phase diagram** | | |
| 09:15 – 10:00 | Kenji Fukushima | **QCD phases from academism to pragmatism** |
| 10:00 – 10:30 | Christian Schmidt | **Zeros of the QCD partition function and the QCD phase diagram** |
| 10:30 – 11 :00 | Owe Philipsen | **The nature of the QCD chiral transition with 2+1 and many flavours** |
| 11:00 – 11:30 | *COFFEE BREAK* | |
| 11:30 – 12:00 | Maria-Paola Lombardo *(via Zoom)* | **Scaling window and topology in QCD** |
| 12:00 – 12:30 | Heng Tong Ding *(via Zoom)* | **Charge fluctuations in strong magnetic fields** |
| 12:30 – 13:00 | Nu Xu | **Study of the QCD phase structure in high-energy nuclear collisions** |
| 13:00 – 13:10 | **Conference Photo** (in the front of the lecture hall) | |

# Program

## Monday, 03 April 2023

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|---|---|---|
| 13:15 – 14:30 | *LUNCH* | |

**Session II: Fluctuations**

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|---|---|---|
| 14:30 – 15:15 | Toshihiro Nonaka | **Methods and results on conserved charge fluctuations from RHIC-BES and FXT** |
| 15:15 – 16:00 | Anar Rustamov | **Probing the QCD matter with fluctuations and correlations of particle multiplicities** |
| 16:15 – 16:45 | *COFFEE BREAK* | |
| 16:45 – 17:30 | Jana N. Guenther | **The equation of state from lattice QCD** |
| 17:30 – 18:00 | Tom Reichert | **Particle number fluctuations from relativistic transport simulations** |
| 18:00 – 18:30 | Pok Man Lo | **Insights of QCD phase structure from hadron spectroscopy and resonance gas model** |
| 18:30 – 18:45 | Stefan Jorda | **About the WE-Heraeus-Foundation** |
| 19:00 | *DINNER* | |

# Program

## Tuesday, 04 April 2023

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|---|---|---|
| 08:00 | *BREAKFAST* | |
| **Session III: Heavy Quarks** | | |
| 09:00 – 09:45 | Johanna Stachel | **Experimental test of quark deconfinement - hadrons with charm quarks** |
| 09:45 – 10:15 | Laura Tolos | **Heavy flavor in a hot bath** |
| 10:15 – 10:45 | Nora Brambilla | **Regeneration of bottomonia in an open quantum system approach** |
| 10:45 – 11:15 | *COFFEE BREAK* | |
| 11:15 – 11:45 | Sajid Ali | **Quarkonium in the QGP from Nf=2+1 lattice QCD** |
| 11:45 – 12:15 | Anton Andronic | **The statistical hadronization model for heavy quarks and the QCD phase boundary** |
| 12:15 – 12:45 | Sipaz Sharma | **Charm fluctuations as a probe for deconfinement from lattice QCD** |
| 12:45 – 14:00 | *LUNCH* | |
| **Session IV: Transport** | | |
| 14:00 – 14:45 | Derek Teaney | **Dynamics of the chiral phase transition** |
| 14:45 – 15:15 | Stefan Floerchinger | **Fluid description for high-energy nuclear collisions starting before the collisions** |
| 15:15 – 15:45 | Peter Petreczky | **Heavy flavor probes of hot matter and lattice QCD** |

# Program

## Tuesday, 04 April 2023

16:45 – 16:15 *COFFEE BREAK*

**Session V: Equitation of state**

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|---|---|---|
| 16:15 – 16:45 | Tetyana Galatyuk | **Electromagnetic probes of QCD matter: experimental overview** |
| 16:45 – 17:15 | Jishnu Goswami | **Isentropic Equation of state and speed of sound of (2+1)- flavor QCD** |
| 17:15 – 17:45 | Wolfram Weise | **Sound velocity and equation of state in neutron star matter** |
| 17:45 – 18:15 | Violetta Sagun | **Constraining the properties of strongly interacting matter with the multi-messenger observations of compact stars** |

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

# Program

## Wednesday, 05 April 2023

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| 08:00 | *BREAKFAST* | |

**Session VI: Signals for chiral symmetry restoration**

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|---|---|---|
| 09:00 – 09:45 | Chihiro Sasaki | **Parity doubling in QCD matter** |
| 09:45 – 10:15 | Lijuan Ruan | **Probe chiral symmetry restoration: experimental observables** |
| 10:15 – 10:45 | Tobias Fischer | **Astrophysical simulations of compact stellar objects probing the QCD phase transition in dense matter** |
| 10:45 – 11:15 | *COFFEE BREAK* | |
| 11:15 – 12:45 | **Poster session** | |
| 12:45 – 14:00 | *LUNCH* | |

**Session VII: Continued**

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|---|---|---|
| 14:00 – 14:30 | Ralf-Arno Tripolt | **Vector and axial-vector mesons in nuclear matter** |
| 14:30 – 15:00 | Jon-Ivar Skullerud | **Chiral symmetry signals from the meson and baryon spectrum** |
| 15:00 – 15:30 | Michal Marczenko | **Reaching percolation and conformal limits in neutron stars** |
| 15:30 | *FAREWELL COFFEE* | |

End of the seminar and departure

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