

## Anar Rustamov

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🎂 16 April 1977

🎓 Dr. rer. nat., TU Darmstadt, 2006  
Dr. of Physics, Habilitation, Baku, Azerbaijan, 2018  
Habilitation, Goethe-Universität Frankfurt, 2024



### \* — **Interests**

Heavy-Ion Phenomenology, Nuclear Interactions, Scientific Computing, Monte Carlo Methods, Fuzzy Logic, Artificial Intelligence

### \* — **Employment history**

- 2017 — GSI Helmholtzzentrum für Schwerionenforschung  
Senior scientist (ALICE, HADES, CBM)
- 2017 — 2017 Ruprecht-Karls-Universität Heidelberg  
Visiting EMMI professor (ALICE, Phenomenology)
- 2015 — 2017 Frankfurt Institute for Advanced Studies  
Scientific researcher (ALICE, computing, phenomenology)
- 2011 — 2015 Goethe-Universität Frankfurt  
Postdoctoral researcher (NA49, N61/SHINE)
- 2006 — 2011 GSI Helmholtzzentrum für Schwerionenforschung  
Postdoctoral Researcher (HADES)
- 2003 — 2006 Technische Universität Darmstadt  
PhD student (HADES)
- 2002 — 2003 GSI Helmholtzzentrum für Schwerionenforschung  
Guest scientist (HADES)
- 2000 — 2002 Joint Institute for Nuclear Research, Dubna, Russia  
Junior Scientific researcher

### \* — **Education**

- 2003 — 2006 Technische Universität Darmstadt  
PhD  
“Exclusive  $\eta$  meson reconstruction in p-p collisions at 2.2 GeV with the HADES Spectrometer and high resolution Tracking”  
Supervisor: Prof. Dr. Peter Braun-Munzinger  
Second Referee: Prof. Dr. Jochen Wambach
- 1998 — 2000 Baku State University, Baku, Azerbaijan  
Master degree, Theoretical and Mathematical Physics

1994 – 1998 Baku State University, Baku, Azerbaijan  
Bachelor degree, Physics

✱ — **Proposed methods**

- ✧ A novel technique for analyzing experimental data in the case of incomplete particle identification  
Used in ALICE, NA49, NA61/SHINE and HADES experiments  
[PRC 110 \(2024\) 6, 064910](#)  
[NIM A 946 \(2019\) 162622](#)  
[PRC 86 \(2012\) 044906](#)
- ✧ Innovative tools for confronting experimental results with theoretical predictions  
Used in ALICE, STAR and HADES experiments  
[Nucl. Phys. A 1050 \(2024\) 122924](#)  
[Nucl. Phys. A 1034 \(2023\) 122641](#)  
[Nucl. Phys. A 960 \(2017\) 114-130](#)
- ✧ The procedure for calculating baselines for experimental measurements  
Used in ALICE, STAR and HADES experiments.  
[JHEP 08 \(2024\) 113](#)  
[Nucl. Phys. A 1008 \(2021\) 122141](#)  
[Nucl. Phys. A 982 \(2019\) 307-310](#)

✱ — **Invited contributions**

- ✧ Section 7 of the book on “50 Years of Quantum Chromodynamics”,  
[Eur. Phys. J. C 83 \(2023\) 1125.](#)
- ✧ “On the Phase Diagram of QCD”, Annual Review of Nuclear and Particle Science, under preparation.

✱ — **Publications**

✧ **All Publications:** <https://web-docs.gsi.de/~rustamov/publications.html>

✧ **Selected 5 publications on phenomenology/theory**

1. [A. Rustamov](#), “Fuzzy logic for reconstructing arbitrary moments of multiplicity distributions”  
[Phys. Rev. C 110 \(2024\) 6, 064910.](#)
2. [P. Braun-Munzinger](#), [K. Redlich](#), [A. Rustamov](#), [J. Stachel](#), “The imprint of conservation laws on correlated particle production”, [JHEP 08 \(2024\) 113.](#)
3. [R. Holzmann](#), [V. Koch](#), [A. Rustamov](#), [J. Stroth](#), “Controlling volume fluctuations for studies of critical phenomena in nuclear collisions”, [Nucl. Phys. A 1050 \(2024\) 122924.](#)
4. [P. Braun-Munzinger](#), [B. Friman](#), [K. Redlich](#), [A. Rustamov](#), [J. Stachel](#), “Establishing a non-critical baseline for fluctuation measurements”, [Nucl. Phys. A 1008 \(2021\) 122141](#)
5. [P. Braun-Munzinger](#), [A. Rustamov](#), [J. Stachel](#), “Bridging the gap between event-by-event fluctuation measurements and theory predictions in relativistic nuclear collisions”, [Nucl. Phys. A 960 \(2017\) 114-130.](#)

✧ **Selected 5 publications for experiments (principal author)**

1. [ALICE Collaboration](#): “Probing Strangeness Hadronization with Event-by-Event Production of Multistrange Hadrons”, [Phys.Rev.Lett. 134 \(2025\) 2, 022303.](#)
2. [ALICE Collaboration](#): “Closing in on critical net-baryon fluctuations at LHC energies: Cumulants up to third order in Pb-Pb collisions”, [Phys. Lett. B 844 \(2023\) 137545.](#)

## Curriculum Vitae

3. ALICE Collaboration: "Global baryon number conservation encoded in net-proton fluctuations measured in Pb-Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV", Phys. Lett. B 807 (2020) 135564.
4. NA49 Collaboration: "Phase-space dependence of particle-ratio fluctuations in Pb + Pb collisions from 20 A to 158 A GeV beam energy", Phys.Rev.C 89 (2014) 5, 054902.
5. HADES Collaboration: "Inclusive dielectron spectra in p+p collisions at 3.5 GeV", Eur. Phys. J. A 48 (2012) 64

\* — **Talks:** <https://web-docs.gsi.de/~rustamov/talks.html>

### \* — **Computer skills**

- C++, Fortran, Python, CERN-ROOT
- Algorithms and Data structures, Monte Carlo Simulations
- Analysis of experimental Data (ALICE, HADES, NA49, NA61)

### \* — **Languages**

- |                    |           |
|--------------------|-----------|
| ➤ Azerbaijan       | Native    |
| ➤ Turkish, Russian | As native |
| ➤ English          | Fluent    |
| ➤ German           | Advanced  |