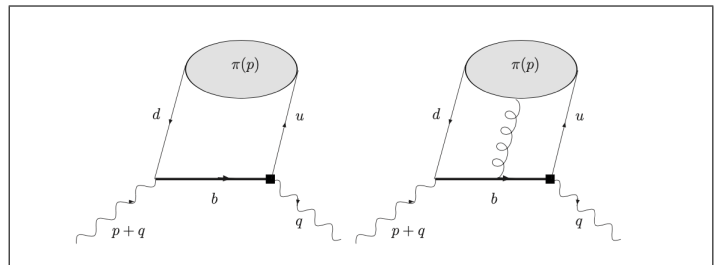
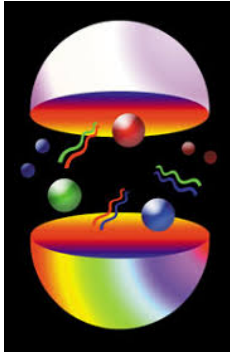


Winter term 2025/26

QCD Sum Rules for Flavor Physics (block course)

Prof. Dr. Alexander Khodjamirian



Topics:

1. Heavy flavored hadrons, currents and hadronic matrix elements
2. Vacuum correlator of heavy-light currents, operator-product expansion
3. Dispersion relations for correlators, quark-hadron duality
4. QCD sum rules for B -meson and D -meson decay constants
5. Vacuum-to-hadron correlators, OPE near the light-cone, light-cone distribution amplitudes
6. QCD Light-cone sum rules, calculation of the $B \rightarrow \pi$ form factors
7. Light-cone sum rules with heavy-hadron distribution amplitudes

**Lectures: Monday 09.02.2026 - Friday 13.02.26,
Monday 16.02.2026 and Tuesday 17.02.2026;
at 10:15-11:45 in room B127,**

with video transmission to Uni. Bonn and TU Dortmund (CmF)

The lectures are oriented to MSc. and PhD students interested in particle physics

Contact via email: khodjamirian@physik.uni-siegen.de

Literature

- M. A. Shifman, “Snapshots of hadrons or the story of how the vacuum medium determines the properties of the classical mesons which are produced, live and die in the QCD vacuum,” *Prog. Theor. Phys. Suppl.* **131** (1998), 1-71 [arXiv:hep-ph/9802214 [hep-ph]].
- P. Colangelo and A. Khodjamirian, “QCD sum rules, a modern perspective,” in [arXiv:hep-ph/0010175 [hep-ph]]. in ‘At The Frontier of Particle Physics’, ed. M. Shifman, pp. 1495-1576 (2001)
- V.M. Braun, Light cone sum rules. In: 4th International Workshop on Progress in Heavy Quark Physics, pp. 105–118 (1997), hep-ph/9801222
- A. Khodjamirian, “Hadron Form Factors: From Basic Phenomenology to QCD Sum Rules,” CRC Press, Taylor & Francis Group, 2020
- A. Khodjamirian, B. Melić and Y. M. Wang, “A guide to the QCD light-cone sum rule for b -quark decays,” doi:10.1140/epjs/s11734-023-01046-6 [arXiv:2311.08700 [hep-ph]].