



Announcement

Asymptotic Methods in Physics

PD Dr. Maxim A. Efremov

Content

The aim of this special lecture series is to provide students with a Bachelor or Master degree with advanced mathematical tools to solve different problems faced by physicists, engineers, and applied mathematicians. Each method is illustrated by both well-known and completely new examples of physics problems appeared within classical and quantum mechanics.

Methods include but are not limited to

- (i) approximate solutions of transcendental equations,
- (ii) asymptotic calculus for integrals and sums,
- (iii) the saddle-point and contour integration methods,
- (iv) the WKB method and its generalizations for differential equations of different types,
- (v) the methods of averaging.

Literature

- Additional N.G. de Bruijn, *Asymptotic methods in analysis* (Dover, 2010)
- C.M. Bender and S.A. Orszag, *Advanced asymptotic methods for scientists and engineers: asymptotic methods and perturbation theory* (Springer, 1999)
- A.H. Nayfeh, *Perturbation methods* (Wiley, 2007)
- E.J. Hinch, *Perturbation methods* (Cambridge University Press, 1995)

information

Lecture (2 hours per week) and tutorial (1 hour per week)

Assessment

Written or oral examination (4 CP)

Lecturer

PD Dr. Maxim A. Efremov, Institute of Quantum Technologies, German Aerospace Center (DLR)