



FOUNDATIONS

Special Relativity

FOUNDATIONS is a series of short courses focusing on fundamental concepts of modern physics. Without unnecessary divagations, and historical digressions we present a basic understanding of the currently accepted description of the physical world. Each course is divided into fifteen lessons leading participants from foundations to final consequences of the chosen subject.

During the course „Special Relativity” I shall discuss foundations of Einstein’s Special Theory of Relativity, its counterintuitive consequences and predictions. The outline of the course is the following:

1. Introduction and basic concepts
2. The absolute time, Galilean transformation and its consequences
3. Speed of light, Lorentz transformation and its non-relativistic limit
4. Transformation of velocities and accelerations
5. Relativity of simultaneity
6. Time dilatation
7. Length contraction
8. Time synchronisation and the twin paradox
9. Typical paradoxes of Einstein’s theory of relativity
10. The Minkowski spacetime
11. Relativistic dynamics
12. Relativistic collisions
13. What does $E=mc^2$ really mean?
14. Why does the special relativity need to be generalised?
15. Summary

The course „Foundations: Special Relativity” starts at
10:00 AM on March 3, Sala A (IF PAN).

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