

The Physics Experiments of Robert Wichard Pohl (1884–1976)

For decades, Robert Wichard Pohl taught his famous lectures of introductory physics in the old lecture hall of the Physics Institute at Goettingen University. These lectures became the foundation for three volumes entitled „Introduction into Physics“. Now, using Professor Pohl's original instruments in the same lecture hall in which he taught, this set of videos captures his extraordinary ingenuity and once more brings to life Pohl's great experimental skills.



Conservation of linear momentum

Video title: Conservation of linear momentum

Signature: C 14823

Series title: The Physics Experiments of Robert Wichard Pohl (1884-1976)

Abstract: To demonstrate the law of the conservation of momentum, which states that in every closed system the sum of the individual momenta stays constant, although they can be exchanged. Three examples will be shown.

Source: Pohls Einführung in die Physik - Mechanik, Akustik und Wärmelehre. Lüders, Klaus; Pohl, Robert Otto (Hrsg.) 19. Aufl., 2005, Springer Berlin Heidelberg New York; p. 53, 54

Key words: Mechanics, momentum, conservation of momentum

Goal of the experiment: To demonstrate the law of the conservation of momentum, which states that in every closed system the sum of the individual momenta stays constant, although they can be exchanged. Three examples will be shown.

Experimental setup: A man and a long flat cart form the closed system, i.e. only the forces between the two are being considered.

Experiment: 1. The cart is initially at rest on the floor in the middle of the lecture hall. The man runs towards the cart, runs along its length, and back onto the floor, without changing his velocity and momentum. The cart remains at rest: No momentum is exchanged.

2. The man runs again to the cart, but now he stops on it. Cart and man together move to the side: Some momentum has been transferred within the system.

3. The man starts from rest on top of the cart. The man moves to the right, the cart to the left. The two momenta are equal in magnitude, and opposite in direction.

In all three cases, the total momentum of the closed system remains constant. Note that the conservation of momentum is also demonstrated in the experiments C 14822 and C 14824.

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