

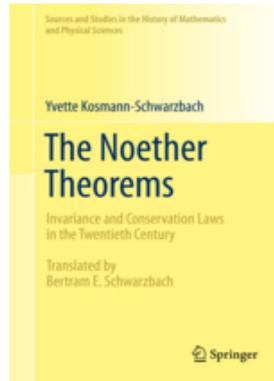
Yvette Kosmann-Schwarzbach

The Noether Theorems

Invariance and Conservation Laws in the Twentieth Century

Series: Sources and Studies in the History of Mathematics and Physical Sciences

The corrected printing of the first edition (2011) is being published on the occasion of the centenary of Noether's article, *Invariante Variationsprobleme*, 1918



This book is an exposition of a fundamental text containing two theorems and their converses which establish the relation between symmetries and conservation laws for variational problems. These theorems had a surprising history and finally acquired an immense influence on the development of modern theoretical physics.

Part I presents Emmy Noether's article of 1918, "Invariant variational problems," in an English translation of the original German.

Part II presents the history of the inception and reception of Noether's article, including an overview of the developments in the theory of invariants in the nineteenth century, the circumstances of the composition of her work, and the mathematical analysis of her 13-page article, followed by an extensive review of its reception by her contemporaries, the acknowledgments – or lack thereof – in the writings of Felix Klein, David Hilbert, Hermann Weyl and Einstein himself, the transmission and rediscoveries of her ideas and results in the publications in mathematics, mechanics and physics from 1920 to the present, with an emphasis on the genuine generalizations that have been discovered since 1970.

Key features include:

- an English translation of Noether's article
- an analysis of its contents in modern terms
- the curious history of its inception, reception and diffusion
- a sketch of the mathematical developments of Noether's results since 1970

Praise for this book

Kosmann-Schwarzbach's book, skillfully translated from the 2004 French original, is an in-depth study of the strange history of Noether's Two Theorems [...] It makes for a fascinating and lively read, as well as being copiously documented and referenced throughout. [...] All in all, Kosmann-Schwarzbach's book is a valuable and important contribution to the historical and mathematical literature – well worth owning to savor and reference.

Peter J. Olver (Bull. AMS, 50(1), 2013, 161–167)

The book under review does a splendid job in collecting and carefully presenting a huge range of material on the strange story of the belated reception of Emmy Noether's symmetry investigations in variational problems and their further development.

Erhard Scholz (Eur. Math. Soc. Newsl. 82 (2011), 56–58)



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