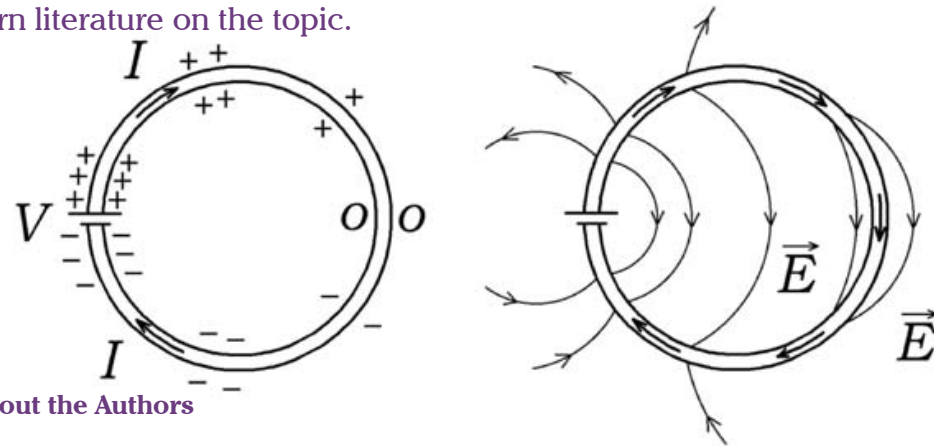


*The Electric Force of a Current* analyzes the electric force between a charge and a circuit carrying a steady current when they are at rest relative to one another. It presents experiments and analytical calculations showing the existence of this force, contrary to the statements of many scientists. The force is proportional to the voltage of the battery connected to the resistive circuit. It also includes calculations of the potential and electric field inside and outside resistive conductors carrying steady currents, and the distribution of charges along the surface of the conductors that generate this field. It contains two appendices that discuss the pioneering and revolutionary works of Wilhelm Weber and Gustav Kirchhoff, and a substantial bibliography of modern literature on the topic.



**About the Authors**

Andre Koch Torres Assis was born in Brazil (1962) and educated at the State University of Campinas – UNICAMP, BS (1983), PhD (1987). He spent the academic year of 1988 in England with a post-doctoral position at the Culham Laboratory (United Kingdom Atomic Energy Authority). He spent one year in 1991-92 as a Visiting Scholar at the Center for Electromagnetics Research of Northeastern University (Boston, USA). From August 2001 to November 2002 he worked at the Institute for the History of Natural Sciences, Hamburg University (Hamburg, Germany) with a research fellowship awarded by the Alexander von Humboldt Foundation of Germany. He is the author of *Weber's Electrodynamics* (1994), *Relational Mechanics* (1999); and (with M. A. Bueno) *Inductance and Force Calculations in Electrical Circuits* (2001). He has been Professor of physics at UNICAMP since 1989, working on the foundations of electromagnetism, gravitation, and cosmology.

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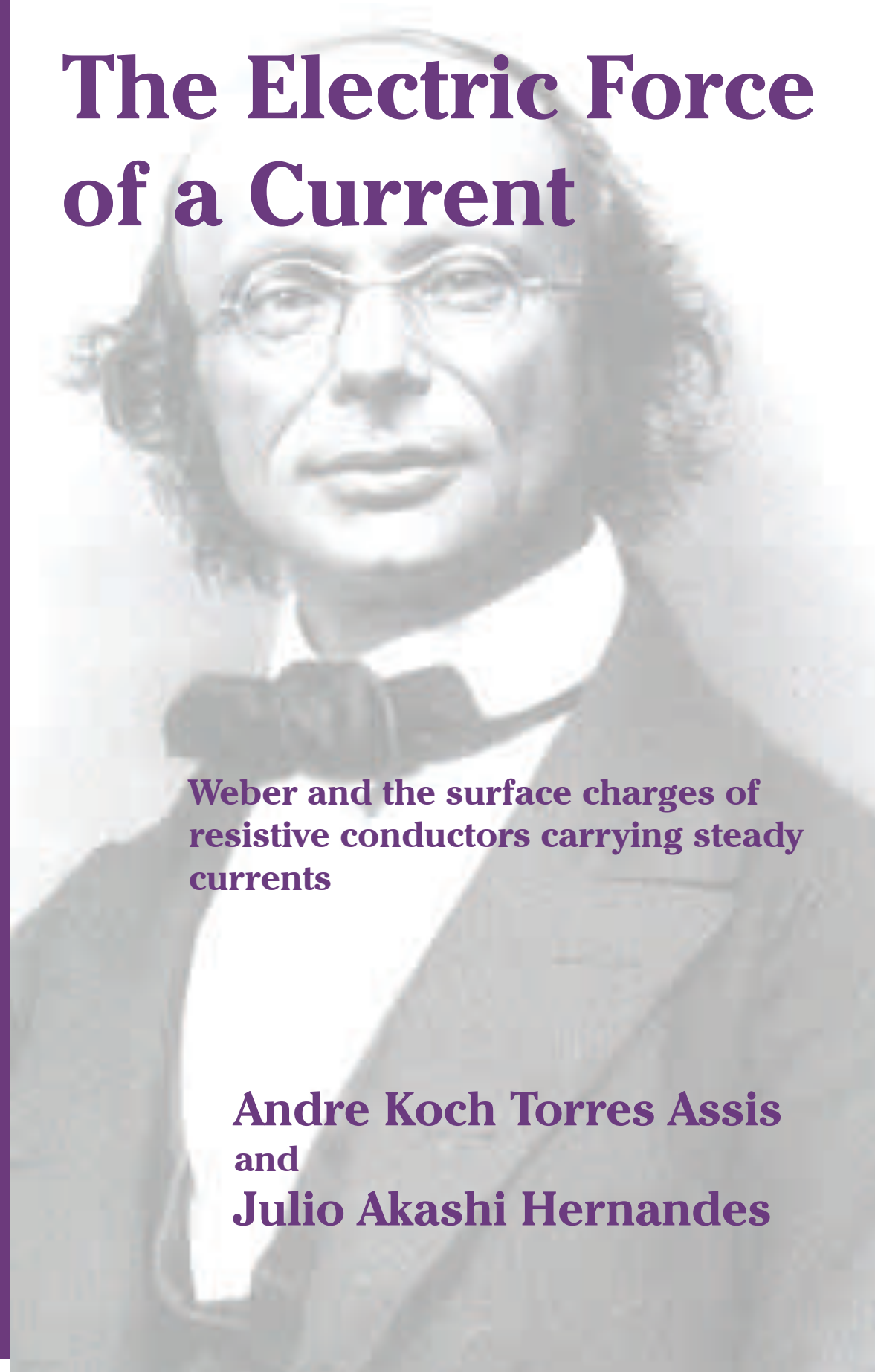


The Electric Force of a Current

Assis/Hernandes

Apeiron

# The Electric Force of a Current



**Weber and the surface charges of resistive conductors carrying steady currents**

**Andre Koch Torres Assis and Julio Akashi Hernandez**