

Omnipresent Physics in Technologies and other Scientific Fields by Prof. Paul Woafu, book supported  
by the American Physical Society

**Omnipresent physics in technologies and  
other scientific fields**  
**from the physics knowledge in secondary/high schools**

by

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## Acknowledgements

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P. WOAFO

## General introduction

Physics is the study of how the universe behaves. Physics is a natural science which involves the study of matter and its motion through space and time, along with related concepts such as energy and force. More broadly, it is the study of nature in an attempt to understand how all types of matter in the universe and the whole universe behave under different conditions and thus comes out with laws.

Because of its nature, Physics is the science discipline which impacts most and far most on the development of technologies and other scientific disciplines.

Indeed, Physics applications impact on our daily lives. It has come to an age where its main subfields have been transformed into engineering fields. Moreover, Physics has continued its omnipresent action and is now shaping applications and scientific thoughts in fields which were considered to be away from physics. These scientific fields include biology, sociology, economics, arts, etc.

However, most people (scientists and non-scientists) are not aware of the strong impact of physics on the technological development and on the development of other scientific fields. This is crucial in parts of the World where the teaching of physics is limited to theoretical foundations with little experiment and proof of applications.

Because of the above, this book with fund for production coming from the American Physical Society through a Public Outreach and Informing the Public grant, aims to put at the disposal of secondary/high school students, journalists and general public some facts on the importance of physics in our daily lives, about the omnipresent action of physics in technologies and other scientific fields, and consequently engage these people into physics and into the promotion and defense of physics. This is a tremendous task as it is not easy to enumerate all the implications of physics in technology and other scientific disciplines. As this will require more than one book and the knowledge of more physics (physics taught at the university level as well as nowadays large number of physics research results) and that of several specialized physicists.

But since our main targets are the secondary/high school students, the book will concentrate on some physics laws taught in secondary/high schools. Specifically, its content includes:

- the presentation of some interesting physics laws/phenomena (classical and modern physics), some historical facts on their discovery and on scientists behind

them, and their applications in technology and a special point on nowadays omnipresent Information and Communication Technologies;

- the breakthrough of physics in other scientific fields (chemistry, biology, astronomy and astrophysics, social sciences and economics).

With this in mind, chapter 1 deals with the classical mechanics laws (Newton's laws of motion and universal gravitation law) and their applications. In chapter 2, the author presents the Ohm's law, Faraday's law and Lenz's law, as well as Snell-Descartes or reflection and refraction laws in optics.

Chapter 3 is concerned with the presentation of two concepts of modern physics taught in secondary/high schools and their use in technology: photoelectric effects and radioactivity.

Chapter 4 focuses on some physics laws used in modern telecommunications technologies. Specifically, information will be given on how physics is used for the technological development of devices for the emission, transmission and reception of messages.

Chapter 5 presents the X-physics or Physics-X disciplines which are disciplines created thanks to the application of physics laws in other scientific fields: chemical physics, medical physics, biological physics, astronomy and astrophysics, econophysics and sociophysics.