JGSP **41** (2016) 97–100

JOURNAL OF
Geometry and Symmetry
in Physics
ISSN 1312-5192

BOOK REVIEW

Electricity and Magnetism for Mathematicians: *A Guided Path From Maxwell's Equations to Yang-Mills*, by Thomas A. Garrity, Cambridge University Press, New York 2015, xiv+282 pp., ISBN 978-1-107-07820-8 Hardback, ISBN 978-1-107-43516-2 Paperback.

A modern mathematical physicist could hardly imagine doing serious studies in the frame of contemporary theoretical and mathematical physics without making substantial use of concepts like vector and tensor fields, differential forms, Stokes theorem on manifolds, Lie derivative and symmetries, Lie (super)groups and Lie (super)algebras and representations, bundles with connection, curvature, Hamiltonian and Poisson structures, Frobenius integrability, and other directions of modern differential geometry. Any physical system has spatial structure and shows definite stability properties, so, it can support its existence and compensate in definite degree the external disturbances through appropriate shape changes and kinematical behavior without losing identity. Shortly speaking, its time existence is a dynamical process being strongly connected with various and continuous internal and external stress-energy-momentum exchange processes. All these processes are real phenomena and any attempt for their description should be based on appropriate mathematical structures. The more than a century intensive interaction between differential geometry and the theoretical and mathematical physics turned out to be exclusively useful, suggestive and creative process. The author of the book under review, clearly underlines that mathematics is not just abstract thinking, and physics is not just working in labs, and the page 6 of his book demonstrates this by the motto

$$Physics \rightarrow Mathematics.$$

It could be said that physics has always stimulated mathematics to develop new branches, and mathematics has always been very responsive and warm-hearted to the needs of physics.

The book under review consists of 21 Chapters, Bibliography and Index.