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BOOK REVIEW

Introduction à la théorie des groupes de Lie réels, by Dominique Paul Chevallier, Ellipses, Paris, 2006, xii + 370pp., ISBN 978-2-7298-3068-7.

As the author himself explains the origin of this book was the to summarize the groups theory and it was written as an introduction for the third cycle (PhD) course devoted to differential geometry and mechanics in Pierre et Marie Curie University. The Lie groups themselves play an important role in several branches of Mathematics, Physics and modern Mechanics, and it appeared that an appropriate development of these course Notes can lead to a very synthetic introductionary book. It seems also that it will be very useful in comparison with other treates in French language devoted to the subject, which often present difficulties in their reading by the students. This theory is based on several branches of Mathematics, principally the Lie algebra theory, topology, topological groups and the differential calculus on manifolds and it can not be approached at relatively elementary level. However only some basic knowledge of these disciplines are required to start with the study of the subject and for approaching some significant results. Definitely, for reading of the book only a standard knowledge at the level of the second cycle is sufficient, except perhaps certain more subtle issues discussed in its Appendices.

Besides, the idea to entering directly into the subject leads to the choice to write the book by assuming that the basic concepts from Lie algebras theory are known. These concepts come into play however very gradually by starting with the most elementary definitions intervening in the *Chapter II* and, if it is necessary, can in all cases be acquired in the course of reading the brief report in *Appendix A*.

The subjects developed here are associated with two points of view on the theory of the real Lie groups and this corresponds to the two historical streams in the evolution of the main ideas. On one hand the differential calculus on Lie groups, and the evidence that to each Lie group is attached one Lie algebra that describes the infinitesimal aspects and purely local properties.

On the other side and what is related to their global structure is the possibility to