

Murray, Michael K.

Riemannian geometry and mathematical physics. Vector bundles and gauge theories. (English) [\[Zbl 0849.53021\]](#)

Cranny, Tim (ed.) et al., Instructional workshop on analysis and geometry, Canberra, Australia, January 23 - February 10, 1995. Part II: Geometric analysis. Canberra: Australian National University, Centre for Mathematics and its Applications. Proc. Cent. Math. Appl. Aust. Natl. Univ. 34(pt.2), 165-183 (1996).

The author considers the simplest theory of vector bundles where the vector space is a one-dimensional complex vector space, so-called line bundles. The definitions of line bundle, isomorphism of line bundles, section and transition functions are given in the introduction. In Section 2 the author explains such notions as connection, parallel transport, curvature and holonomy. In Section 3 the Chern classes are considered. The relation between the theory of vector bundles and gauge theories is briefly explained in Section 4.

For the entire collection see [\[Zbl 0844.00020\]](#).

Reviewer: [M.Rahula \(Tartu\)](#)

MSC:

- [53C07](#) Special connections and metrics on vector bundles (Hermit-Einstein, Yang-Mills)
- [53-01](#) Introductory exposition (textbooks, tutorial papers, etc.) pertaining to differential geometry
- [81T13](#) Yang-Mills and other gauge theories in quantum field theory

Keywords:

[line bundles](#); [curvature](#); [holonomy](#); [Chern classes](#); [gauge theories](#)