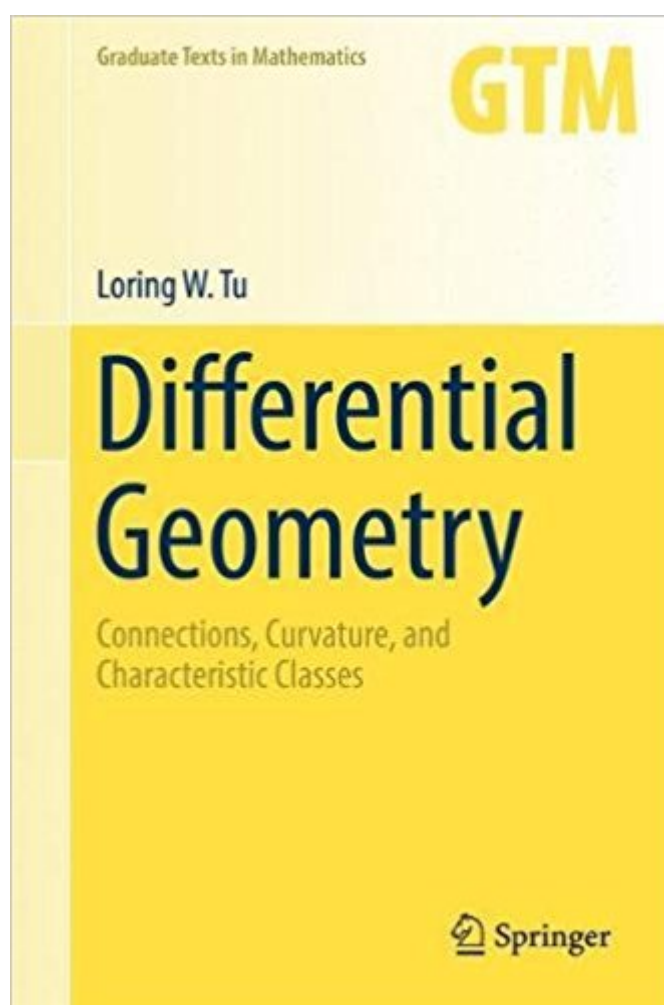**The book was found**

Differential Geometry: Connections, Curvature, And Characteristic Classes (Graduate Texts In Mathematics)

Synopsis

This text presents a graduate-level introduction to differential geometry for mathematics and physics students. The exposition follows the historical development of the concepts of connection and curvature with the goal of explaining the ChernÃ¢ ¬â œWeil theory of characteristic classes on a principal bundle.Ã Â Along the way we encounter some of the high points in the history of differential geometry, for example, Gauss' Theorema Egregium and the GaussÃ¢ ¬â œBonnet theorem. Exercises throughout the book test the readerÃ¢ ¬â„¢s understanding of the material and sometimes illustrate extensions of the theory. Initially, the prerequisites for the reader include a passing familiarity with manifolds. After the first chapter, it becomes necessary to understand and manipulate differential forms. A knowledge ofÃ Â Ã Â de Rham cohomology is required for the last third of the text.Prerequisite material is contained in author's textÃ Â An Introduction to Manifolds, and can be learned in one semester. For the benefit of the reader and to establish common notations, Appendix A recalls the basics of manifold theory. Additionally, in an attempt to make the exposition more self-contained, sections on algebraic constructions such as the tensor product and the exterior power are included.Differential geometry, as its name implies, is the study of geometry using differential calculus. It dates back to Newton and Leibniz in the seventeenth century, but it was not until the nineteenth century, with the work of Gauss on surfaces and Riemann on the curvature tensor, that differential geometry flourished and its modern foundation was laid. Over the past one hundred years, differential geometry has proven indispensable to an understanding of the physical world, in Einstein's general theory of relativity, in the theory of gravitation, in gauge theory, and now in string theory. Differential geometry is also useful in topology, several complex variables, algebraic geometry, complex manifolds, and dynamical systems, among other fields.Ã Â Ã Â The field has even found applications to group theory as in Gromov's work and to probability theory as in Diaconis's work. It is not too far-fetched to argue that differential geometry should be in every mathematician's arsenal.

Book Information

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Customer Reviews

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Loring W. Tu was born in Taipei, Taiwan, and grewÃ Â up in Taiwan, Canada, and the United States. He attended McGill and Princeton asÃ Â an undergraduate, and obtained his Ph.D. from HarvardÃ Â University under the supervision of Phillip A.Ã Â Griffiths. He has taught at the University of Michigan,Ã Â Ann Arbor, and at Johns Hopkins University, andÃ Â is currently Professor of Mathematics at Tufts University. An algebraic geometer by training, he has done researchÃ Â at the interface of algebraic geometry, topology,Ã Â and differential geometry, including Hodge theory,Ã Â degeneracy loci, moduli spaces of vector bundles,Ã Â and equivariant cohomology. He is the coauthorÃ Â with Raoul Bott of Differential Forms in Algebraic Topology and the author of AnÃ Â Introduction to Manifolds.

I purchased this book through Springer, but was so pleased with it that I felt that I needed to write a review on . In my (rather limited, but perhaps that's the point) experience, books on Differential Geometry normally focus on an introduction to Riemannian geometry (do Carmo, Lafontaine, Lee, etc) or were relatively advanced and took the perspective of bundles (Kobayashi & Nomizu, Walschlap, Poor, etc.). There were a few texts that tried to "bridge the gap" so-to-speak, namely the five-volume opus of Spivak and the excellent text of Taubes, but there was a distinct need for a text that could take someone from knowing zero differential geometry, to someone that knows the equivalent of a few good courses in the subject. Thankfully, this text seems to have succeeded.The author has managed, in under 350 pages, to take one from inner products on vector spaces all the way to characteristic classes on principal G-bundles, in such a way that the historical motivation is clear and most geometric viewpoint is taken throughout. I wholeheartedly recommend this book to anyone seeking a good introduction to differential geometry.

Great book and excellent service!

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