

Physics Directed Reading Program

Topology and Geometry in Physics

Keshav Balwant Deoskar
kdeoskar@berkeley.edu

These are some notes from the Physics Directed Reading Program (PDRP) group headed by graduate student Vi Hong. Our group was interested in learning about topology and geometry with applications (primarily) to condensed matter physics.

Note: These notes are very terse and not recommended as a primary source for learning.

Further, please feel free to point out and errors / suggestions if you spot any via email! There's likely to be at least a few.

Contents

1	Review of Topology	2
2	Path Integrals and Fractional Quantization	3
3	Fiber Bundles and Principal G-Bundles	4
4	Connections on Bundles	5
5	Connection 1-forms	6
6	TQFTs I	7
7	TQFTs II	8
8	BRST Quantization	9
9	References	10

1 Review of Topology

2 Path Integrals and Fractional Quantization

3 Fiber Bundles and Principal G-Bundles

4 Connections on Bundles

5 Connection 1-forms

6 TQFTs I

7 TQFTs II

8 BRST Quantization

9 References