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**An Overview of Chern-Simons Theory** SPENCER TAMAGNI, COSTAS EFTHIMIOU, University of Central Florida — In recent years, Chern-Simons gauge theory has become a subject of interest to a large number of physicists due to the desire to understand the physics of nonabelian anyons in certain condensed matter systems. We present here a survey of the most relevant results for understanding braiding statistics (closely related to Wilson loop observables) and the computation of partition functions. What is novel in our presentation is the use of concrete/explicit formulas; we explain how fundamental yet quite abstract properties of topological field theory (namely, the mapping class group representations that are naturally furnished by the Hilbert space—in this case coming from a projective flat connection on a certain vector bundle over the moduli space of algebraic curves) may be understood using known properties of hypergeometric functions and theta functions that may be found in the usual textbooks on special functions. Our hope is that by making the mathematical statements sufficiently concrete, the principles underlying these results can be understood by a broader community of physicists.

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