QFT : relativistic particle physics

- non-relativistic many body
- stat-mech ($\hbar \equiv 0$) $T \neq 0$

1980s Ken Wilson

Why QFT? { calculus, for systems with many interacting, fluctuating degrees of freedom

AdS / CFT

holograph

QFT $\cong$ gravity

Discussion: Monday 4:10-5pm

Homework: weekly, posted by Friday 4pm
due next Friday

Textbook: A. Zee
J. Donoghue
Peskin, Schroeder

Grades: HW ~50%
Midterm Exam ~10%
Final Exam ~30%

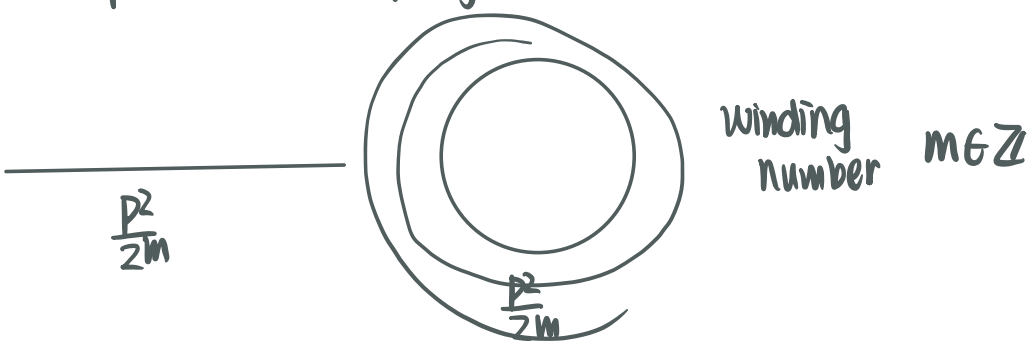
Outline: • QM: $q^a(t)$ re-formulated in path integral language.

$i\hbar \frac{\partial}{\partial t}\psi(\dots) = \hat{H}\psi$ $\quad$ $i\hbar \frac{\partial}{\partial t}|\psi\rangle = \hat{H}|\psi\rangle$

Schrödinger eqn.

- from particles to fields
- free fields, bosonic & fermionic — Feynman diagram
- interactions, $\lambda \ll 1$ { perturbation thy / nonpert physics

- importance of topological invariants



- Renormalization Group
- gauge symmetry