Quantum Mechanics, Brownian Motion, Ergodic Theory

Notes based on lectures for Phys 123 (Statistical Mechanics II)
at Bicol University by Professor John Doe, Spring 2020

Je Sian Keith Herman[1,2]

[1]Bicol University , [2]JSK Inc.

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Contents

1. Introduction 1
1.1. Paper overview 1
2. $e^{\pi i}$ Methods 2
References 2

1. Introduction

Can you then *suppose* that those heroic men performed their famous deeds **without any motive at all**? In a free hour, when our power of choice is untrammeled and when nothing prevents our being able to do what we like best, ***every pleasure is to be welcomed and for every pain avoided***.

- But in certain emergencies and owing to the claims of duty or the obligations of business it will frequently occur that pleasures have to be repudiated and annoyances accepted.
  - Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus.
- Your references to them just now were historically correct, and also showed your kind and friendly feeling towards myself; but all the same I am not to be bribed by your flattery of my family, and you will not find me a less resolute opponent.

1.1. Paper overview

On the other hand, we denounce with righteous indignation and dislike men who are so beguiled and demoralized by the charms of the pleasure of the moment, so blinded by desire, that they cannot foresee the pain and trouble that are bound to ensue; and equal blame belongs to those who fail in their duty through weakness of will, which is the same as saying through shrinking from toil and pain.

> Euler's identity is $e^{\pi i} + 1 = 0$. Do you really believe that they charged an armed enemy, or treated their children, their own flesh and blood, so cruelly, without a thought for their own interest or advantage? Such is Schrödinger's equation in Equation 1:
>
> $$i\hbar\frac{\partial}{\partial t}\Psi(x,t) = \left[-\frac{\hbar^2}{2m}\frac{\partial^2}{\partial x^2} + V(x,t)\right]\Psi(x,t) \quad [1]$$
>
> > But who has any right to find fault with a man who chooses to enjoy a pleasure that has no annoying consequences, or one who avoids a pain that produces no resultant pleasure?

But I must explain to you how all this mistaken idea of reprobating pleasure and extolling pain arose. Increase ease-of-use to where `variable` and `print()` shall be of use.

```python
if a != b:
  print("Hello world!")
else if a == b:
  print("Goodbye world!")
else:
  print("This is a long sentence where I ramble until I get 80 characters here.")
```

Listing 1: Example `python` code printing text.

To take a trivial example, which of us ever undertakes laborious physical exercise, except to obtain some advantage from it? Definition 2.1 has a nice example.

1. On the other hand, we denounce with righteous indignation and dislike men who are so beguiled and demoralized by the charms of the pleasure of the moment, so blinded by desire, that they cannot foresee the pain and trouble that are bound to ensue; and equal blame belongs to those who fail in their duty through weakness of will, which is the same as saying through shrinking from toil and pain.
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2. $e^{\pi i}$ Methods

Stokes' theorem — Definition 2.1

Let Σ be a smooth oriented surface in $\mathbb{R}^3$ with boundary $\partial\Sigma \equiv \Gamma$. If a vector field $\boxed{\boldsymbol{F}(x,y,z)} = \big(F_x(x,y,z), F_y(x,y,z), F_z(x,y,z)\big)$ is defined and has continuous first order partial derivatives in a region containing Σ, then

$$\iint_{\Sigma} (\boldsymbol{\nabla} \times \boldsymbol{F}) \cdot \boldsymbol{\Sigma} = \boxed{\oint_{\partial\Sigma} \boldsymbol{F} \cdot \mathrm{d}\boldsymbol{\Gamma}} \tag{2}$$

Information extracted from a well-known public encyclopedia

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References