

Physics for Pedestrians

Young India Fellowship [Term 1]

Philip Cherian

15th July, 2019

Ashoka University

Introduction

Course and Instructor Information

- **Instructor:** Philip Cherian (philip.cherian@ashoka.edu.in)
- **Teaching Assistants:**
 - Gaurang Garg [YIF'19]
 - Himani Sancheti [YIF'19]
- **Room number:** AC 03 LT 005
- **Schedule:**
 - Two lectures a week of two hours each
 - One discussion session a week to be arranged with the TAs
You are strongly advised to attend all Discussion Sessions.
 - **Office Hours:** A signup sheet will be floated by the TAs.

- Quizzes:
 - Short quiz at the beginning of each week, for **10 marks**.
 - It will comprise questions on the previous week's material, and on the readings for the current week.
 - Best three (out of four) quizzes → 30% of the final grade

Grading

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- **Group Project:**
 - You will be divided into groups of 5 (in the second week)
 - **Options:**
 1. Analyse the physics of a movie using *Tracker Video Analysis*.
 2. Analyse a more practical problem, preferably related to Ashoka. (How often should the solar panels be washed? What's the optimum spacing between corridor lighting?)
 - Assessment: A 3 to 5 page **Project Report** and a **Final Presentation** during Exam Week → **40% of the final grade**

Course Content

“Physics”

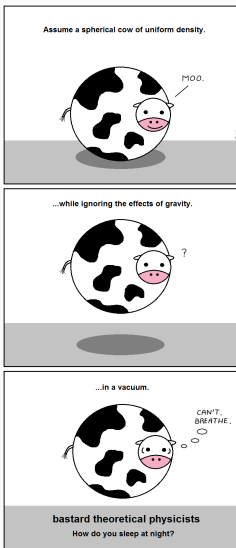
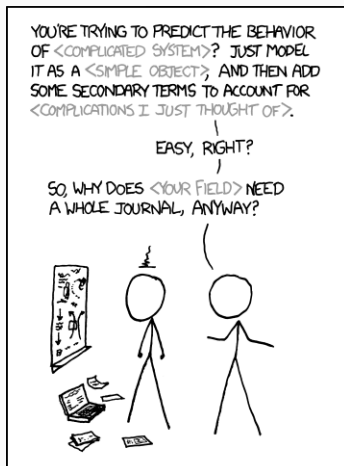


Figure 1: Source:

<https://rpseawright.files.wordpress.com/2013/08/spherical-cow2.png>

“Physics”

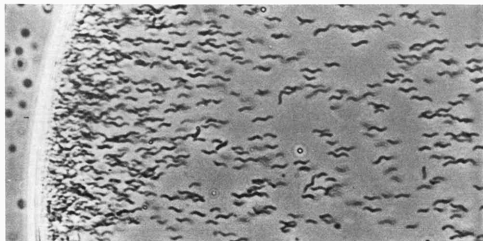


LIBERAL-ARTS MAJORS MAY BE ANNOYING SOMETIMES, BUT THERE'S *NOTHING* MORE OBNOXIOUS THAN A PHYSICIST FIRST ENCOUNTERING A NEW SUBJECT.

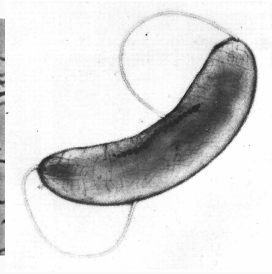
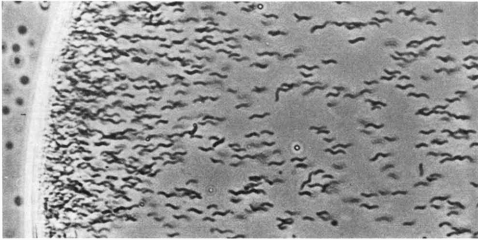
Figure 2: “If you need some help with the math, let me know, but that should be enough to get you started! Huh? No, I don't need to read your thesis, I can imagine roughly what it says”

Source: <https://www.xkcd.com/793/>

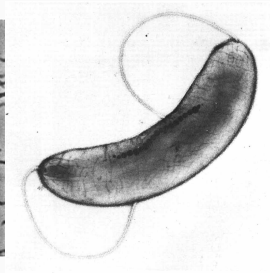
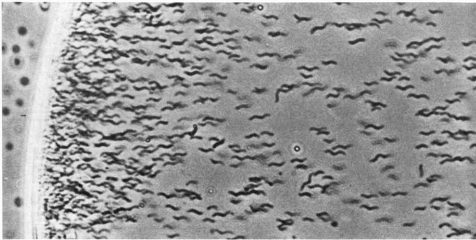
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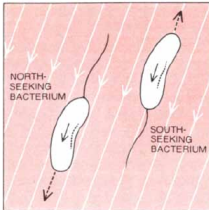
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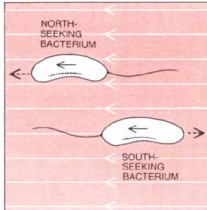
“Physics”



WOODS HOLE, MASS.



FORTALEZA, BRAZIL



CHRISTCHURCH, NEW ZEALAND

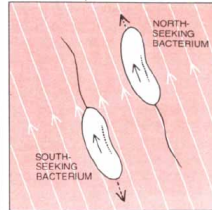


Figure 4: Magnetic Navigation in Bacteria, Blakemore and Frankel, Scientific American (December 1981)

“Pedestrians”

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- A little knowledge of physics and mathematics may be helpful, but too much knowledge is likely to be a hindrance.
- Some advice:
 - Students **with** a science background: **Do not** try to answer questions by remembering what you have heard or learnt.
 - Students **without** a science background: **Dare to be wrong**. No one has ever understood anything by always being right.

“Pedestrians”

*The road to wisdom? Well, it's plain
And simple to express:
Err
and err
and err again,
but less
and less
and less.*

– Piet Hein

A field trip

