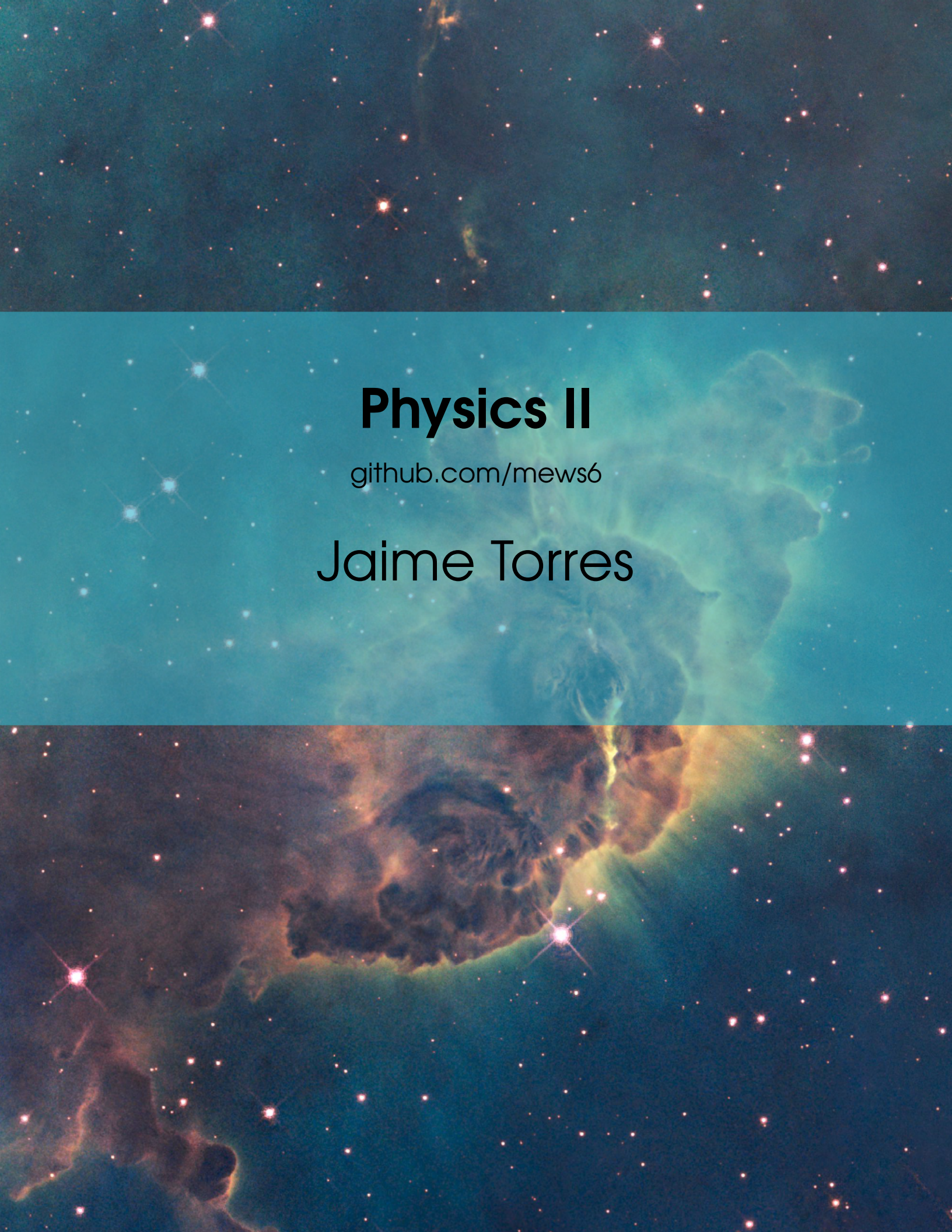

# Physics II

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# Contents

# 1. Introduction

First of all, Welcome! I hope i can explain Physics II in a somewhat friendly way, and i hope that whatever it is you need this text for, you can succeed on it. Sometimes these topics can feel a bit dense (because they are) and even though not the most rigurous of texts, i hope this little guide helps you. Now, before we start with anything, there are a few things i think we should take into account:

**There's a mistake in this book! What do i do?**

Tell me what it is, just let me know and maybe even correct it yourself, i have no reservations on making changes in case it happens to be necessary or otherwise useful.

As a little (final) side note, here's some cool people i took Physics II with, they speak spanish and might not respond, but if you can contact them (and know how to speak spanish), they might help you!

- Daniel Esteban Olaya (de.olaya1318@uniandes.edu.co)
- Paula Giraldo Gallo (pl.giraldo@uniandes.edu.co)

# 2. Fundamentals

The II in 'Physics II' is of course, a signifier of continuity, and you sometimes don't really remember the things that you saw one, or a few semesters ago. So before you start thinking on the concpts unique to Physics II, a few reminders might be on course for this text. This non-comprehensive collection of topics should be a quick reminder of a few concepts. But i urge you to read them on your own.

## 2.1 Newton's Laws

Newton's laws of motion are three basic laws of classical mechanics that describe the relationship between the motion of an object and the forces acting on it.

### 2.1.1 First Law

A body in state of rest, or in uniform motion in a straight line will have an overall summatory of forces equal to 0

$$\sum \vec{F} = 0 \tag{2.1}$$

### 2.1.2 Second Law

A net force that acts over a body makes it accelerate in the same direction as the net force. The magnitude of acceleration is directly proportional to the magnitude of the forces acting over it.

- if a net force acts over a body, this body accelerates
- The direction of acceleration is the same as a net force.

we can assume:

$$\vec{F}_{net} = m\vec{a} \tag{2.2}$$

$$\vec{F} = \frac{d\vec{p}}{dt} \tag{2.3}$$

### 2.1.3 Third Law

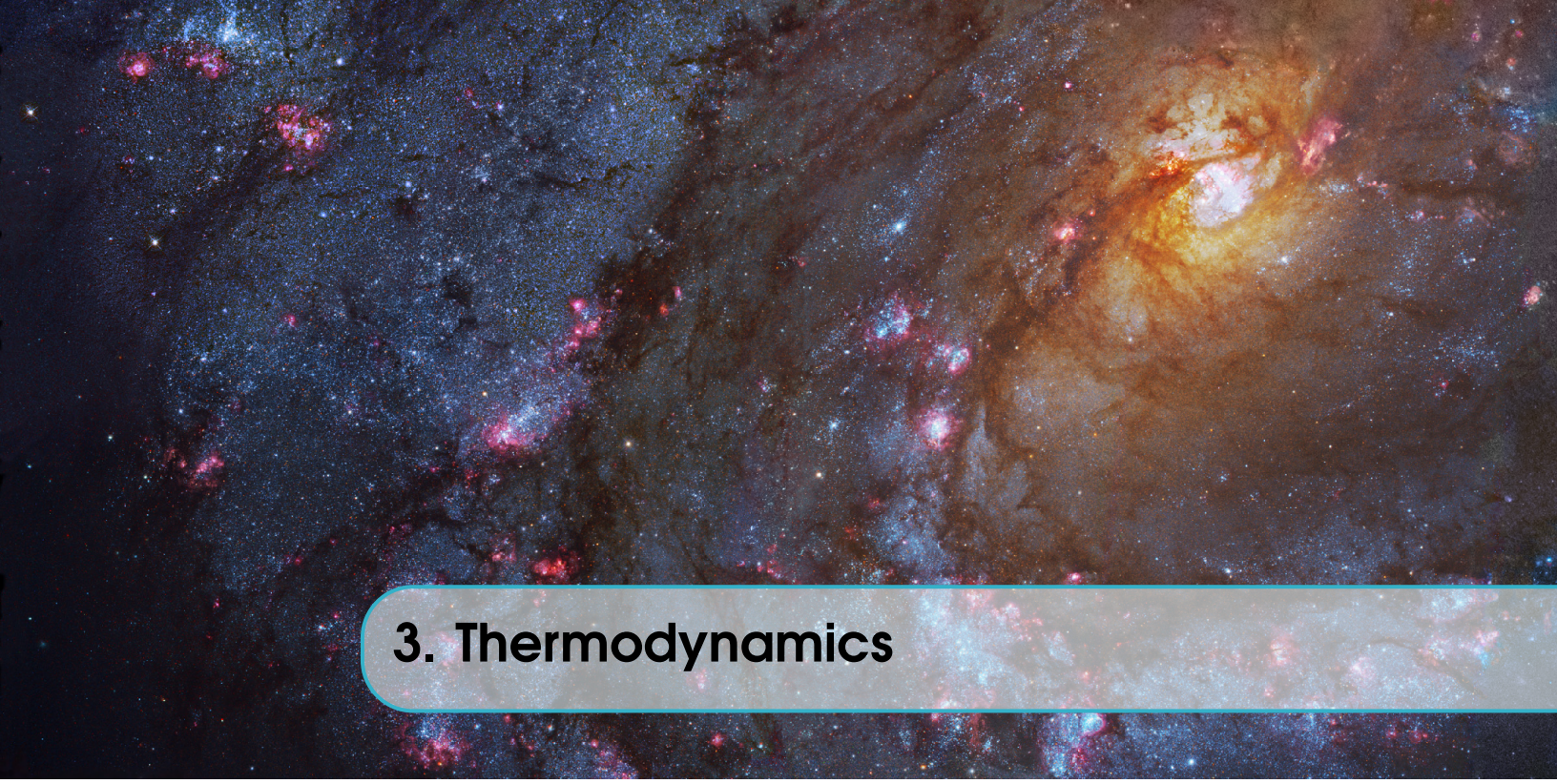
When two bodies interact their forces are always equal in magnitude and opposed in direction. This can be expressed as:

$$\vec{F}AB = -\vec{F}BA \tag{2.4}$$

***Important Equations***

$$\vec{F} = m\vec{a} \tag{2.5}$$

$$\vec{T} = I\vec{\alpha} \tag{2.6}$$



# 3. Thermodynamics

As it is defined of Sears and Zemanzky's University Physics:

"Thermodynamics are the study of energy transformations where there is an intervention between mechanical energy, heat, and other aspects of energy (...)" [You+12]

In this section, we'll be talking about the different ways we can analyze, comprehend and manage such topics.

## 3.1 Temperature and Heat

Although easily interchangeable in common day language, when talking formally, Temperature and Heat are different physical concepts, For once, heat is the

## 3.2 Thermal Dilation

# Bibliography

[You+12] Hugh D. Young et al. *Sears and Zemansky's University Physics: with Modern Physics*. Thirteenth. San Francisco: Pearson Addison-Wesley, 2012. ISBN: 9780321696861 0321696867 9780321696854 0321696859 9780321762184 0321762185 9780321741264 0321741269 9780321696229 0321696220 (cited on page 9).