

# Solid State Physics 2 - 2017-1

Professor: Gabriel Teixeira Landi

## General information

- **Lectures:** Mondays and Wednesdays from 10:00 to 12:00
- **Location:** Room 206, Ala 2.
- **Course website:** [www.fmt.if.usp.br/~gtlandi](http://www.fmt.if.usp.br/~gtlandi)
  - Go to **Lecture Notes** → **Solid state physics 2**
  - All course material will be made available there.

## Contact

- I'm at room 211, Alessandro Volta, Block C.
- Phone: 916776.
- e-mail: [gtlandi@if.usp.br](mailto:gtlandi@if.usp.br)
  - Feel free to come to my office to discuss physics anytime.

## Grading

I don't care. I'm not here to evaluate you. I'm here to discuss physics, because physics is awesome. (Ok, now seriously: grading will be based on problem sets. No exams.)

## Bibliography

In this course I won't follow a specific book. But in the website I will publish some handwritten lecture notes which I think will help you navigate through the course. In each set of notes I will also specify additional references which you may read.

## *Mathematica*

In this day and age, if I give you a  $10 \times 10$  matrix, you *must* be able to diagonalize it in less than 5 minutes. Similarly, if you find yourself stuck at an integral, there is *no excuse*: plug it in the computer and get an answer out of it.

Just like all architects know how to use AutoCAD and all designers know how to use Photoshop, we physicists also need to know how to use a basic **computational toolbox**. This includes basic libraries for integrating functions numerically, solving differential equations, doing eigenstuff, plotting pretty graphs and so on. There are several such platforms so feel free to use whichever you prefer. *But please choose one.* The four most famous are:

- **Scipy/Numpy:** open source (i.e., free); based somewhat on Matlab.
- **Matlab:** very easy to use. USP has licenses, but with a maximum of 500 users.
- **Maple:** honestly, I don't really know what to say about it.
- **Mathematica:** by far my favourite. And USP has unlimited licenses, so you can install it in any computer you want.

A list of softwares available at USP can be found at

<http://cetirp.sti.usp.br/atendimento/licenca-de-software/> To install Mathematica, access

<http://www.cce.usp.br/atendimento/software/mathematicaStudent/>

and follow the instructions. I suggest you sign up on the Wolfram User Portal to get the updates.

Useful sources on how to use Mathematica can be found at

<https://www.wolfram.com/language/elementary-introduction/>