AGA0414 Introduction

Prof. Alessandro Ederoclite

Before we start...

It should not be needed but:

I certainly hope you will not feel the urge to use your mobile during class.

I know you believe you can do two things at the same time but it is highly distracting for me.

In case it's a case of life or death (or I allow it for any specific reason), you can use the mobile.

Before we start...

I would like to know a little about you!

- Name
- Career Status
- Favourite SciFi Character
- Favourite Starship
- Football Team

Alessandro Ederoclite

Professor Doutor

Lt.Cmdr. Worf (Star Trek TNG, DS9)

TARDIS

F.C. Inter (Milan, Italy)

Entry Level Questionnaire

https://forms.gle/oH7RHgodnMsVEYB47

Goals (free translation from Jupiterweb)

Show the students the main observational techniques used in Astronomy and the basic "notions" about instrumentation and data acquisition. Introduce the observational "practice" needed for the development of concepts. Make possible the contact with instrumentation available to Brazilian astronomers.

Understand how observations are carried out. It is relevant, of course, if you go to observe but also if you use data from a project (e.g. SDSS).
It is useful also for theoreticians who will want to test their theories ("It doesn't matter how beautiful your theory is, it doesn't matter how smart you are. If it doesn't agree with experiment, it's wrong", R. Feynmann)

Program (from Jupiterweb)

Telescopes

Properties of CCD detectors

Basic techniques of image reduction

Effect of the atmosphere on astronomical observations (extinction and seeing)

Notions of aperture photometry

Spectroscopy

Radioastronomy

Space satellites

My Program

Coordinate systems

Effect of the atmosphere on astronomical observations (extinction and seeing)

Proposing and planning observations

Telescopes

Properties of CCD detectors

Basic techniques of image reduction

Notions of aperture photometry

Spectroscopy

Astronomy at other wavelengths than optical (incl. Radioastronomy and Space satellites)

Useful References

- Roy & Clarke - "Astronomy; Principles and Practice"

- Kitchin - "Astrophysical Techniques"

- Léna (et al.) - "Observational Astrophysics"

- Howell - "Handbook of CCD Astronomy"

Articles and instrument manuals that I may eventually refer to.

Dates

Lectures are on:

- Tuesdays; 2pm - 4pm
- Thursdays; 2pm - 4pm *(in this room, unless specified otherwise)*

We allow 5 minutes of "courtesy"

My office is D-309 ; email aederocl@iag.usp.br

If the door is open and I am not talking to someone, you are free to enter.

If the door is closed either I am not in the office or I cannot be disturbed.

Dates

I have three observing runs at Observatorio Pico dos Dias which conflict with this course:

- 1st - 4th March
- 13th - 15th April
- 12th - 15th May ** *you are all welcome to join; USP will pay the transportation and I am arranging lodging at OPD with LNA*
- 28th June - 1st July

There will be a J-PAS meeting the week between 1st and 5th June (you are all invited to participate).

Examinations and Grading

There will be three tests:

1. Plan observations (a night and a survey)
2. Reduce photometric data
3. Reduce spectroscopic data

You will have slightly over a week to work on each test.

I will then give you an oral examination (last week of courses)

Grades will depend on the outcome of the tests and the activity in class.

How I compute the marks

$$m = \Sigma_{i=1,2}\ w_i\ m_i + w_o m_o + G$$

w_i weight of test i

m_i mark of test i

w_o weight of oral

m_o mark of oral

G <mark>arbitrary factor (between 0 and 0.5) for participation in class</mark>

How to share notes?

Do you use eDisciplinas?

Do you prefer Google Drive?

I had a very good experience with eDisciplinas last year and I would love to keep using it.

A few quick reminders; Units of Measure

Length

- International System:
  - metre
- Astronomy:
  - Astronomical Unit (~140×10^6 km)
  - Lightyear
  - Parsecs

Mass

- International System:
  - kilogram
- Astronomy:
  - Gram
  - Solar Mass (~2×10^{33} g)

A few quick reminders; Units of Measure

Time

- International System:
  - second
- Astronomy:
  - Second
  - Year
  - Gyr = 10^9 yrs

Energy $E = F * l = (m * a) * l = m * l^2 * t^{-2}$

- International System:
  - $J = kg\ m^2\ s^{-2}$
- Astronomy:
  - erg