PHY 474: Seminar in Modern Physics

Syllabus

Experimental data and theoretical models. Curve Fitting and its Challenges

Course Description

The are four aims in this seminar (1) learn to develop and deliver good presentations. (2) learn to write scientific papers using LaTeX. (3) Learn how to study if a model can explain a given data set, and to extract the parameters of the model from the data set. (4) Review the most common concepts and algorithms normally used to achieve the aim in point 3.

Students participating in the seminar will learn how to efficiently communicate scientific ideas using several media, and they will use modern technologies for creating presentations, writing scientific papers, and for curve fitting to extract parameter from data. Discussions of bad and good presentation or communication techniques will be part of the seminar.

Participants in the seminar will need to present and write papers about two topics to be determined in organizational meetings.

Each seminar will consist in a presentation, a question and answer session, and a discussion about the effectiveness of the techniques used to convey the information. After the presentation a written paper will be completed and handed out to the participants.

Instructor:

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Meetings Days: Tue-Thu, time TBD

Expectations:

Each student will prepare a paper and a presentation on two topics, delivering the following "products" for each topic:

- A handout that closely resembles a standard *Physical Review Letters* paper, and that has been prepared using the LaTeX/RevTeX typesetting system. RevTeX is available from the APS. The handout must contain an introduction with literature overview, figures, equations, and at least 10 references to appropriate articles.
- A presentations consisting of several slides (normally prepared using a computer-based presentation software).
- An oral presentation in a seminar session. The presentation should be practiced with colleagues before presentation in the seminar. The seminar is open to the public.

Additionally the students are required to work on several problems that will then be reviewed at weekly meetings:

- Curve fitting case studies. These will be based on example data sets or on a "bring your own data" approach, and are meant to highlight various issues that can be encountered when fitting a model to data.

Finally, students are expected to attend all the presentation and actively participate in the discussions.

Grades:

All bulleted items in the list of expectations will be counted with equal weight.