PHY 474: Seminar in Modern Physics

Experimental data and theoretical models.
Curve Fitting and its Challenges

Syllabus

Course Description

This seminar course has four aims. (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 extracting physical parameter from data using curve fitting.

The seminar will focus on class discussion with no tight class-plan and contents. Participants in the seminar will prepare two presentations and two papers on 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.

Instructor: **Meetings Days:**   Tue-Wed-Thu, 10:30am

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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* 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 references to appropriate articles.

- Several well designed slides (normally prepared using a computer-based presentation software).

- An oral presentation in a seminar session. The presentation should be well prepared. The seminar is open to the public.

Additionally students will develop several homework assignments that will then be reviewed at weekly meetings. They consist in:

- Curve fitting case studies about curve fitting and modeling of several kinds of data sets. Case studies are meant to highlight various issues that can be encountered when fitting a model to data.

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

Grades:

All bulleted items in the list of expectations will carry equal weight towards the final grade.