

PHYS 359 – Honors Seminar Course, Fall 2017

The Bohr-Einstein Debates and Measurement in Quantum Physics

Instructor: Dr. Vishnu Zutshi (vzutshi@niu.edu)

Lectures: M & W (12:30 pm – 1:45 pm), Faraday Hall, Room: FR237

Office Hours: By appt., Room: FR221

Topics covered:

- Max Planck and the quantum hypothesis
- Rutherford and the nuclear model
- Einstein's magnificent year
- Bohr and the atom
- Wave-particle duality
- Copenhagen and the development quantum mechanics
- Matrix and wave mechanics
- The uncertainty principle
- The 1927 Solvay conference and the double-slit experiment
- The 1930 Solvay conference and the box of light
- EPR paradox
- Spooky action-at-a-distance
- Alternative interpretations of quantum mechanics
- Bell's theorem
- Experiments investigating the foundations of quantum mechanics
- Future outlook

Class participation:

Full attendance at all class meetings is expected. Tardiness or leaving early must be avoided in order for the class to be productive for all. Students are strongly encouraged to participate in class discussion and ask questions during class.

In-class electronic communications:

I ask that you do not take phone calls, text, email, update your status, or tweet during lectures.

Academic Integrity:

Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an

assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university. (NIU UC)

Incomplete grades:

Incompletes will only be given under extraordinary circumstances such as extended illness or call-up to active military duty.

Receiving assistance:

Students are urged to contact me should they have questions concerning course materials and procedures. If you have a disability or any other special circumstance that may have some impact on your course work and for which you may require accommodations, please contact me early in the semester so that arrangements can be made with the Disability Resource Center (DRC)

<http://niu.edu/disability/>