Instructor: Prof. Aleksey Cherman. I prefer to be addressed as Aleksey.

Office: Tate Hall 375-12

Class times and place: Tate Hall 105, 2:30 pm MWF

TAs and sections: All sections meet in B45.
003 Georgios Antoniu T 8:00am-8:50 am.
004 Georgios Antoniu T 9:05am-9:55 am.
005 Yang Yang, T 10:10am-11am.
006 Saumitran Kasturirangan T 11:15 am-12:05 pm
007 Saumitran Kasturirangan T 1:25 pm-2:15 pm

Office Hours: (office hours start from week 2)

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<thead>
<tr>
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<th>Place</th>
<th>Time</th>
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<tbody>
<tr>
<td>Cherman</td>
<td>Tate 375-12</td>
<td>M 11:00am-12:00pm, W 4:00pm-5:00pm or by appointment.</td>
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<tr>
<td>Yang Yang</td>
<td>Tate 201-09</td>
<td>Th 2-3pm</td>
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<tr>
<td>Saumitran Kasturirangan</td>
<td>Tate 301-04</td>
<td>M 1-2 pm, W 4-5 pm</td>
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<tr>
<td>Georgios Antoniu</td>
<td>Tate 301-03</td>
<td>M 4-5 pm, Th 3-4 om</td>
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TA Office Hours: TBA

Quizzes and Final:
Three quizzes are scheduled for Feb 22, March 15, April 19 – all of them are Fridays. Held in Tate 105 during class time.

Final exam: May 11, 6:30 pm-9:30 pm, location TBA.

For all exams you can prepare and use one (8.5 by 11 inch, single-sided) crib sheet, as well as one non-programmable calculator.

Homework:
Homework will count for 25% of the final grade for the course. Each Monday we will post homework problems on the course website. You will need to submit solutions to these problems to your TAs at the beginning of the discussion sections the following Tuesday. We will aim to grade them and return them the following week. Solutions to all problems will be posted on the class website after the problems have been graded. At least one of the problems in each quiz will be similar to one of the homework problems.

Required textbook:
Class website: https://www.physics.umn.edu/classes/phys/2019/spring/Phys%202601.001/index.html

Please visit the class webpage regularly for official announcements regarding lectures, homework, quizzes, and the final exam. I'll post my notes from the lectures online. Most people find it useful to take their own notes during the class anyway, writing things with your own hands helps fix things in memory. Solutions to the quizzes will be posted on the course website after they are graded. You must log in using your University X.500 Username and password.

Open-door policy:
If any difficulties or problems arise in this course that interfere in any way with your learning or optimum performance, please contact the instructor or the TA. We will do our best to deal with problems promptly and effectively.

The class:
This class introduces you to the ideas that have dominated physics over the last century. Quantum physics is everywhere, and it is fascinating. It has some famously brain-bending features, but once you learn the basic concepts of quantum physics and use the appropriate mathematical tools, it's a lot of fun and not especially difficult.

That means, however, that a lot of the material is quite conceptual, and in places it will be more mathematical than your previous classes. Don’t fail behind! Catching up is really hard. The way to stay on track is to participate actively in class, read the textbook before and after lectures, talk to other students, and most importantly, to do as many problems as you can! Doing problems is vital to making sure you know what’s going on. If you have questions, don’t hesitate to ask me or the TAs during class, after class (schedule permitting), or during office hours. Don’t be shy – if something’s confusing you, odds are other people are confused too.

Tentative Schedule:
We’ll adjust the schedule as necessary. We won’t cover everything in the book – it has way more than can be covered in one semester! You’ll only be quizzed on topics which were explained in class (in the lecture notes) and discussion and homework problems.

<table>
<thead>
<tr>
<th>Week 1 – 1/21 to 1/25</th>
<th>Chapter 1 – Blackbody radiation, UV catastrophe, quantization</th>
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<tr>
<td>Week 2 – 1/28 to 2/1</td>
<td>Chapter 2 – Waves are particles (photons)</td>
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<tr>
<td>Week 3 – 2/4 to 2/8</td>
<td>Chapter 3 – Particles are waves (de Broglie principle)</td>
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<td>Week 4 – 2/11 to 2/15</td>
<td>Chapter 4 – Bohr model of the atom</td>
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<td>Week 5 – 2/18 to 2/22</td>
<td>Chapter 5 – Schrodinger equation, wavefunctions, and eigenstates – basic ideas; Quiz Feb 22.</td>
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<td>Week 6 – 2/25 to 3/1</td>
<td>Chapter 6 – Solutions of time-independent schrodinger equation - quantum tunneling and all that.</td>
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<td>Week 7 – 3/4 to 3/8</td>
<td>Chapter 7 – One electron atoms</td>
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<td>Week 8 – 3/11 to 3/15</td>
<td>Chapter 8 – Quantum spin, magnetic moments, and transition rates; Quiz March 15.</td>
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<td>Week 9 – 3/18 to 3/22</td>
<td>SPRING BREAK</td>
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<td>Week 10 – 3/25 to 3/29</td>
<td>Chapter 8 - Quantum spin, magnetic moments, and transition rates</td>
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<td>Week 11 – 4/1 to 4/5</td>
<td>Chapter 9 – Multielectron atoms</td>
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<td>Week 12 – 4/8 to 4/12</td>
<td>Chapter 9, 10 – Atoms and optical excitations</td>
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<td>Week 13 – 4/15 to 4/19</td>
<td>Chapter 10,11 – Quantum statistics; Quiz April 19</td>
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<td>Week 14 – 4/22 to 4/26</td>
<td>Chapter 12 – Rotational Spectra</td>
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Quiz / Final make-up:
As specified by University policy, make-ups for in-class quizzes will be given only in the event of conflicts with scheduled activities of official University organizations, religious holidays, and verifiable illnesses as prescribed by University regulations. A make-up final exam will be given for students with conflicts of these types, or for students that have three final examinations in a 16-hour period. Requests for make-ups for reasons other than those specified by University policy cannot be honored.

Responsibilities:
The University of Minnesota assumes that all students enroll in its programs with a serious learning purpose and expects them to be responsible individuals who demand of themselves high standards of honesty and personal conduct. All students are expected to behave at all times with respect and courtesy toward their fellow students and instructors, and are expected to have the highest standards of honesty and integrity in their academic performance. Any behavior which disrupts the classroom learning environment or any attempt to present work that the student has not actually prepared as their own work, or to pass an examination by improper means, is regarded as a serious offense which may result in the expulsion of the student from the University. The minimum penalty for such an offense is a failing grade for this course. Aiding and abetting the above behavior is also considered a serious offense resulting in equally severe penalties.

Grade:
The grade for the course will be determined the following way.
(a) Homework 25%
(b) Quizzes 15% (but see below)
(c) Total grade determined as maximum of the following three possibilities:
   a. Homework 25%, all 3 quizzes 15%, Final 30%
   b. Homework 25%, 2 best quizzes 15%, Final 45%
   c. Homework 25%, 1 best quiz 15%, Final 60%

This way if you have bad luck on a single quiz there’s a way to make up for it.

Letter grades will be assigned according to the approximate scale A, A- (83-100) , B+,B, B- (68-82), C+,C, C- (50-67), D+,D, (40-49), F (below). The exact boundaries will be determined later.

Departmental Policies for Athletes:
Athletes must provide their official University of Minnesota athletic letter containing the approved competition schedule to their instructor and the staff in office 148. Away exams will be arranged with the athletic adviser traveling with the team. Accommodations will be made for official university sports only (i.e. no accommodations will be made for intramurals, club sports, etc.)

Disability Services:
If you have accommodations for this course, please provide the staff in office 148 with a copy of your accommodation letter for the current semester. Exams will be arranged according to accommodations and sent to the testing center for administration.

Student Conduct Code:
The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.
As a student at the University you are expected to adhere to Board of Regents Policy: Student Conduct Code. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means “engaging in behavior that substantially or repeatedly interrupts either the instructor’s ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities.”

Scholastic Dishonesty:
You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis.

(Student Conduct Code: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Student_Conduct_Code.pdf)

If it is determined that a student has cheated, he or she may be given an “F” or an “N” for the course, and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: http://www1.umn.edu/oscai/integrity/student/index.html. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class—e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Disability Accommodations:
The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations. If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course. For more information, please see the DS website, https://diversity.umn.edu/disability/.

Use of Personal Electronic Devices in the Classroom:
Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Makeup Work for Legitimate Absences:
Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html.
Appropriate Student Use of Class Notes and Course Materials:
Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the class-room community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Grading and Transcripts:
Please see http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html.

Sexual Harassment:
“Sexual harassment” means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: http://regents.umn.edu/sites/regents.umn.edu/files/policies/SexHarassment.pdf.

Equity, Diversity, Equal Opportunity, and Affirmative Action:
The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/regents.umn.edu/files/policies/Equity_Diversity_EO_AA.pdf.

Mental Health and Stress Management:
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: http://www.mentalhealth.umn.edu.