

Fizički fakultet Univerziteta u Beogradu: Doktorske studije  
Smer: Fizika Atoma i Molekula

Univerziteti sa sličnim programom:

1. Université Catholique de Louvain, Louvain-La-Neuve, Belgium  
Département de Physique

**Programme d'études 2005-06**

**FYQU - Ecole doctorale en physique quantique et structure de la matière**

<http://www.phys.ucl.ac.be/FYQU.html>

*(c) Physique atomique et moléculaire, optique*

o PHYS 2700, Physique des interactions laser-atomes-molécules : méthodes expérimentales (45h), P. Defrance, X. Urbain

Trois parties, dont deux sont données chaque année, en alternance :

- A. Méthodes expérimentales de l'interaction laser-matière (22,5h)
- B. Optique corpusculaire (22,5h)
- C. Méthodes expérimentales (22,5h)

o PHYS 2750, Physique des interactions laser-atomes-molécules : méthodes théoriques (45h), A. Fayt, D. Fussen, B. Piroux

Trois parties, dont deux sont données chaque année, en alternance :

- A. Interaction laser-matière (22,5h)
- B. Spectroscopie atomique et moléculaire (22,5h)
- C. Théorie des collisions atomiques (22,5h)

o PHYS 3205, Séminaire de physique des interactions laser-atomes-molécules (15h), P. Defrance

. H. Bachau (Univ. de Bordeaux I, France), Dynamique électronique à l'échelle attoseconde

**. D. Belic** (Univ. Beograd, Yougoslavia), Physique des collisions moléculaires

. D. Houde (Univ. de Sherbrooke, Canada), Applications biologiques et radiologiques des lasers femto

. T. Kereselidze (U. Tbilissi, Georgie), Mécanismes d'ionisation double

. I. Kiyan (Univ. Freiburg, Allemagne), Ions négatifs en champ laser intense

. L.B. Madsen (Univ. of Aarhus, Danemark), Ionisation multiphotonique des molécules

. P. Mounaix (Univ. de Bordeaux), Génération optique de faisceaux terahertz. Application à la spectroscopie et l'imagerie.

2. University of Heidelberg Faculty of Physics and Astronomy  
Graduate School in Atomic, Molecular and Quantum Physics  
<http://www.mpi-hd.mpg.de/ato/amo/>  
Framework of Master, Diploma and Graduate Studies in the field of  
Atomic, Molecular and Optical (AMO) Physics at the University of  
Heidelberg and nearby Research Institutes.

This program is addressed to students doing a doctoral thesis or diploma thesis and those in the master course with special interest to do research in the area of AMO Physics. *The course program can also be used by diploma students for the "Physikalisches Wahlfach".*

Main elements of the Graduate School:

- A course program of [basic lectures](#) intended for students specializing in AMO Physics
- A course program of [advanced lectures](#)
- A [student seminar series](#) covering recent research topics
- [Research seminars and colloquia](#) at the AMO Research Groups in and around Heidelberg
- [Compact courses](#)
- [Guest lecture series](#) covering the main subjects of the research groups at Heidelberg

3. **City University of New York (CUNY)**  
**Queens College Department of Physics**  
<http://www.physics.qc.edu/phdprogram.htm>

Ph.D. Program

**Queens College Department of Physics is one of four senior colleges in the City University of New York (CUNY) Ph.D. Physics consortium. The Graduate School of the University is the Ph.D. degree granting institution. The Ph.D. program is organized around the collective strength of the four colleges and the 90 CUNY wide faculty. There are currently over 90 students in the program. The doctoral program has earned high marks in the latest national ranking.**

The graduate courses are offered at the Graduate School currently located on 34th Street and Fifth Avenue. The research laboratories are located at the individual colleges. The Ph.D. Program is centrally administered and coordinated by the Graduate School.

### **Degree Requirements**

Students must complete 60 credits with a minimum overall B average, of which at least 30 credits must be taken at CUNY. Candidates must pass the first qualifying examination which is given in four parts; analytical mechanics, electromagnetic theory, quantum mechanics and general physics. A second examination must be taken in their prospective field of research. After a thesis proposal is approved, the students perform research, write the thesis and defend it. There are no foreign language requirements.

### **Courses**

The following U600-level courses are given at Queens College, 45 hours per semester and 3 credits.

Phys. U601 Introduction to Mathematic Physics  
 Phys. U611 Analytical Mechanics  
 Phys. U615 Electromagnetic Theory  
 Phys. U621 Electronics  
 Phys. U625 Introduction to Quantum Mechanics  
 Phys. U626 Atomic Physics and Quantum Mechanics  
 Phys. U635-636 Introduction to Modern Physics, I, II  
 Phys. U641 Statistical Physics  
 Phys. U645 Solid State Physics  
 Phys. U657 Introduction to Astrophysics  
 Phys. U671-672 Modern Physics Laboratory

The following U700-level and U800-level courses are given at the Graduate School of CUNY. Unless otherwise stated, all courses are 45 hours plus conferences per semester and 4 credits.

Phys. U701-702 Mathematical Methods in Physics, Each 60 hours  
 Phys. U711 Analytical Dynamics, 60 hours  
 Phys. U715-716 Electromagnetic Theory, Each 60 hours  
 Phys. U725-726 Quantum Mechanics, Each 60 hours  
 Phys. U730 Atomic Physics  
 Phys. U732 Optics  
 Phys. U734 Introduction to Relativity  
 Phys. U735 Nuclear Physics  
 Phys. U736 Particle Physics  
 Phys. U741 Statistical Mechanics  
 Phys. U743-744 Geophysical Hydrodynamics  
 Phys. U745 Solid State Physics  
 Phys. U748-749 Theory of Relativity and Gravitation  
 Phys. U750-751 Plasma Physics  
 Phys. U757 Astrophysics  
 Phys. U758 Galactic Physics, I (Theoretical Aspects)  
 Phys. U759 Galactic Physics, II (Observational Aspects)  
 Phys. U760 Cosmology  
 Phys. U771-773 Graduate Physics Laboratory  
 Phys. U812 Continuum Mechanics  
 Phys. U825-826 Advanced Quantum Theory  
 Phys. U835-836 Theoretical Nuclear Physics  
 Phys. U845-846 Theoretical Solid State Physics  
 Phys. U847 Stellar Physics  
 Phys. U848 Stellar Evolution  
 Phys. U849 Advanced Theory of Gravitation  
 Phys. U851-859 Selected Topics in Advanced Physics, Each up to 45 hours plus conferences, up to 4 credits

Phys. U900 Dissertation Supervision, 1 credit

### **Research Specialties**

Doctoral research in experimental and theoretical physics takes place mainly at the four senior colleges in the program. Research opportunities are also available at some other colleges of the university. Students are free to choose a thesis mentor from the wide diversity of the doctoral faculty research interest at CUNY.