**070200物理学2025级全日制国际直博生（留学生）培养方案**

**2025 Full-time PhD Program for Physics （International direct-entry Ph.D. students）**

**一、基本信息 Basic Information**

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| 院系名称  School | (426)李政道研究所Tsung-Dao Lee Institute | | | | | |
| 适用专业  Major | 物理学Physics/天文学Astronomy | | | 标准学制  Duration | 5年5 Years | |
| 学习形式  Study Mode | 全日制 Full time | | | | | |
| 项目类型  Program Type | 学术型Academic | | | | | |
| 培养层次  Program Level | 直博生 Doctoral after Bachelor's | | | | | |
| 最低学分  Min Credit | 27 | 最低GPA学分  Min GPA Credit | 9 | 最低GPA  Min GPA | | 2.7 |

**二、学科简介 Introduction**

上海交通大学物理学科始建于1906年，近年来发展迅速，学科水平不断提升。在全国第四轮一级学科评估中进入A档，2019年入选上海市高峰高原学科，2020年QS学科国际排名首次进入前50名。物理学科现拥有理论物理、粒子物理与核物理、凝聚态物理（国家重点学科）、光学（国家重点学科）、原子分子物理、激光等离子体物理（国防特色学科）、计算物理及软凝聚态物理等学科方向，是国内物理学科专业门类最为齐全的物理院系之一。近年来本学科引进和培养了一大批国内外知名专家学者，形成了一支极具竞争力的高水平师资队伍。本学科坚持以“立德树人、教书育人”为中心，以“培养拔尖创新人才”为宗旨，以“创新性、多元化和国际化”为驱动，全面提升学生的社会责任感、创新精神、实践能力、人文情怀和全球视野，致力于培养德才兼备、数理基础扎实并具备服务国家重大战略需求能力的高水平创新型人才。研究生培养重点推进培养过程中的质控建设，实行严格的博士资格考试和分流淘汰机制；实施致远荣誉博士计划，引导学生潜心高水平的前沿研究，极大提升科研创新水平；多渠道加强和支持学生国际学术交流，拓展国际化视野。

天文学学科博士点依托上海交通大学物理与天文学院天文系（2017年4月成立，前身为 2012 年成立的天文与天体物理研究中心），吸引了一批具有国际视野的优秀天文学家相继加盟。本学科现有专职教学科研人员 14 名，其中中国科学院院士 1 名、教育部“长江学者”特聘教授 1 名、国家杰出青年基金获得者 5 名、基金委优秀青年基金获得者 3 人,科技部 973 项目首席 科学家 2 名、入选国家“万人计划”3 名。主持了科技部 973 项目、基金委重大项目、创新研究 群体等重大课题。 本学科目前拥有观测宇宙学、多波段观测、引力理论、星系形成等多个研究方向。自 2012 年成立以来，天文学科承担的科研项目共计 60 余项，项目连续增长，科研经费到账总金额已 达上亿元。其中 973 项目 1 项、国家自然科学基金委创新研究群体 1 项、重点项目 5 项；其他省部级项目 30 余项。这些平台资源极大地推动 了一流人才队伍建设和创新性人才的培养，有效促进了天文系和天文学科建设，支持天文学科不断产生有国际影响的重要成果。

李政道研究所于2016年11月成立。经过六年的建设，随着位于上海张江科学城核心位置的研究所大楼于2021年11月正式启用，李所进入了快速发展阶段。目前李所已经形成了天文与天体物理、粒子与核物理、量子基础科学三大研究方向，聚集了由一批国内外学术大师领衔的顶尖研究团队，吸引了一大批具有科技创新活力的青年才俊，开展了与自然界最根本的科学问题之一——物质起源与演化的规律探索相关的多个前沿领域原创性基础研究。同时，注重发挥大科学研究范式的优势，重点建设了位于上海张江的李所大楼的实验室天体物理实验平台、拓扑量子计算实验平台与大规模超算平台和分别位于四川锦屏的PandaX暗物质与中微子实验装置、位于青海冷湖的JUST光谱巡天望远镜和位于海南南海的TRIDENT中微子望远镜等三个前进观测基地等大型基础研究设施。至此，李所圆满完成建设期的主要任务，进入了崭新的发展阶段。建设有重要学术影响力的世界一流基础科学中心，在根本性科学问题的探索上做出重要贡献是李政道研究所的初心与使命。

在这个关键的发展阶段，教育部启动的数理化生国家高层次人才培养中心将会为李政道研究所注入新的动力。本培养中心将依托李政道研究所建设实体机构，通过联合上海交通大学物理与天文学院等相关学院，实施中心主任负责制，对标世界一流水平，通过对高层次人才培养理念和方式方法的全方位深度改革，全力推进国家高层次人才培养工作，并设立李政道博士生培养委员会、李政道博士生事务委员会等，负责中心的建设规划、岗位设置、学生选拔和培养方案，国际合作交流、成果评价等不同层次的具体工作。

The discipline of Physics in Shanghai Jiaotong University was founded in 1906. In recent years, it has developed rapidly and the level of discipline is constantly improving. In the fourth round of national first level discipline evaluation, it got the rank A. And in 2019, it was selected into program of “Shanghai peak and plateau disciplines”. In QS world University Ranking by subject 2020: Physics & Astronomy, it is in the top 50. The discipline now has several sub-disciplines including theoretical physics, particle and nuclear physics, condensed matter physics (national key discipline), optics (national key discipline), atomic and molecular physics, laser plasma physics (national defense characteristic discipline), computational physics and soft condensed matter physics. It is one of the few physics departments that have nearly complete sub-disciplines of Physics in China. In recent years, many existing well-known experts together with newly joined famous members form a highly competitive and high-level faculty team. The discipline adheres to the "fostering integrity and promoting rounded development of people "as the core, the "cultivation of top-notch innovative talents" as the purpose, and "innovation, diversification and internationalization" as the driving force to comprehensively improve students' social responsibility, innovative spirit, practical ability, humanistic feelings and global perspective, and is committed to train innovative student with both political integrity and ability, solid mathematical and physical foundation and ability to serve the major strategic needs of the country. Postgraduate training emphasizes the quality control during the training process; executing doctoral qualification examination; implementing the Zhiyuan honorary doctor program to guide students to concentrate on important frontier researches; strengthening and supporting international academic exchanges of students through multiple channels to expand international vision.

The doctoral program of Astronomy is based on the Department of Astronomy of the School of Physics and Astronomy of Shanghai Jiao Tong University (established in April 2017, formerly known as the Astronomical and Astrophysics Research Center established in 2012), attracting a group of outstanding astronomers with international vision to join. There are 14 full-time teaching and research personnel in the discipline, including one academician of the Chinese Academy of Sciences, one distinguished professor of the Yangtze River Scholars of the Ministry of Education, five National Outstanding Youth Fund winners, three awardee of the Fund for Outstanding Youth of NSFC, two chief scientists of the 973 project of the Ministry of Science and Technology, and three awardees of the Leading Talents of the 10000 Talents Program. Our faculty members have led a number of national key research programs, including the 973 project, key projects of NSFC, and one of the Innovative Research Groups of NSFC. The discipline currently has many research directions such as observational cosmology, multi-band observation, gravitational theory, and galaxy formation. Since 2012, a total of more than 60 research projects have been undertaken in the department, and the project number keeps growing. The total amount of research funding in the last eight years has reached more than a hundred million yuan. These include one 973 project, one Innovation Research Group of the National Natural Science Foundation of China, and five key projects of NSFC; and more than thirty provincial and ministerial projects. These platform resources have greatly promoted the construction of the first-class talents’ team and the cultivation of innovative talents, as well as the construction of the department and the astronomy discipline, providing support for our department to continuously produce important results with international influence.

Tsung-Dao Lee Institute (TDLI) was established in November 2016. After six years of construction, with the official opening of the Institute's building in November 2021 at the heart of Shanghai Zhangjiang Science City, TDLI has entered a phase of rapid development. At present, TDLI has formed three major research directions: astronomy and astrophysics, particle and nuclear physics, and quantum basic science, gathered top research teams led by a number of domestic and international academic masters, attracted a large number of young talents with scientific and technological innovation vitality, and carried out research related to one of the most fundamental scientific problems in nature - the origin and evolution of matter. It has carried out original basic research in a number of frontier fields related to the exploration of the laws of the origin and evolution of matter, one of the most fundamental scientific problems in nature. At the same time, focusing on the advantages of the large scientific research paradigm, we have built three large forward observation bases, including the Laboratory Astrophysics Experimental Platform, Topological Quantum Computing Experimental Platform and Large Scale Supercomputing Platform in the Building at Zhangjiang, Shanghai, and the PandaX Dark Matter and Neutrino Experimental Facility located in Jinping, Sichuan Province, the JUST Spectroscopic Survey Telescope located in Cold Lake, Qinghai Province, and the TRIDENT Neutrino JUST Spectroscopic Survey Telescope in Cold Lake, Qinghai and TRIDENT Neutrino Telescope in South China Sea, Hainan. Thus, the Institute has successfully completed the main tasks of the construction period and entered a new stage of development. It is the original intention and mission of TDLI to build a world-class basic science centre with significant academic influence and to make important contributions to the exploration of fundamental scientific issues.

At this critical stage of development, the National Training Center for High-level Talents in Mathematics, Physics, Chemistry and Biology, initiated by the Ministry of Education of China, will inject new impetus into TDLI. The Centre will rely on TDLI to build a physical institution, implement the responsibility system of the Director of the Centre by joining hands with the School of Physics and Astronomy of Shanghai Jiao Tong University and other related colleges, benchmarking the world's first-class level, and pushing forward the cultivation of national high-level talents through the all-round in-depth reform of high-level talent cultivation concepts and methods, and setting up a special Academic Committee, Cultivation Committee, Cultivation Evaluation Committee, etc., responsible for the construction planning and planning of the Centre. It has also set up special academic committee, training affairs committee, training evaluation committee, etc., which are responsible for the construction planning, student selection and training programme, international cooperation and exchange, evaluation of achievements and other specific work at different levels.

**三、培养目标 Program Objective**

恪守学术道德规范，崇尚科学精神，对学术研究，特别是对物理学的基础和应用基础研究有浓厚兴趣，具备良好的学术潜力。在科研选题、研究方法和创新能力等方面经过系统训练，具有独立从事物理学及相关领域或跨学科创新性科学研究工作和相关领域实际工作的能力。

通过进行课程学习和文献阅读及科学研究等，对本学科相关领域的学术研究前沿动态把握准确，具有坚实的基础理论、宽广的相关知识背景、系统深入的专业知识及相应的实验技能和方法，对获取的知识和研究方法能够透彻理解并灵活应用。能够发现并提出有价值的科学问题，并针对问题独立设计合理的研究方案，对研究所取得的数据进行恰当的处理和分析，并形成结论及发表研究成果。

具备一定的学术鉴别能力和学术创新能力，以及良好的团队合作能力。掌握一门外国语，能够熟练阅读本学科相关领域的外文资料，并具有较强的科研论文写作能力和进行国际学术交流的能力。

Abide by academic ethics and uphold the spirit of science, students have strong interests in academic research, especially in the fundermental and applied basic research of physics, and has good academic potential. After systematic training in scientific research topics, research methods and innovation ability, students have the ability to independently engage in innovative scientific researches and practical work in physics and related fields or interdisciplinary fields.

Through the course study, literature reading and scientific research, student can accurately grasp the academic research frontier in the related fields of this discipline. Students should have solid knowledge on basic theory, broad background knowledge, systematic and in-depth professional knowledge and corresponding experimental skills. Students can thoroughly understand and flexibly apply the acquired knowledge and research methods. Students should have the ability to find or raise valuabe scientific problems and design reasonable strategy to solve the problems independently. Students can analyze the research results and scientific findings, then write a research article for publication.

Students should have certain academic identification ability and academic innovation ability, as well as good team cooperation ability. Students can master a foreign language, be able to read literatures in foreign language in related subject, and have strong ability of writing research papers and international academic exchanges.

**四、培养方式及学习年限 Training Mode and Study Duration**

本项目采用全日制学习、导师制培养模式；直博生的基本学习年限为5年，最长学习年限（含休学）一般不超过7年。

This program adopts the full-time learning and instructor-responsible mode; Basically, 5 years are required for regular academic doctor program. The maximum length of non-oriented regular doctor program (including suspension) can not exceed 7 years, usually.

**五、课程学习要求 Course Requirement**

**须修读完成总学分不少于30，最低GPA学分12，最低GPA 2.7 。课程分为公共基础课，专业基础课，专业前沿课以及专业选修课。课程学习原则上要求在第一学年内完成。各类课程具体要求如下：**

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| --- | --- | --- | --- | --- |
| 课程类别  Course Type | 学分要求  Min Credits | 门数要求  Min Courses | GPA 学分要求  Min GPA Credit | 备注  Note |
| 公共基础课 General Courses | 10 | 4 | 4 | 必修《学术英语》（2学分）、《中国文化概论》（2学分）、《学术写作规范与伦理》（2学分）、《汉语》（4学分） |
| 专业基础课 Program Core Courses | 8 | 2 | 8 | 至少选修2门物理或天体物理专业基础课程 （8学分） |
| 专业前沿课 Program Frontier Courses | 3.5 | 3 | 0 | 除《学术报告会》、《实验室安全教育》（0.5学分）课程必修外，选修1门课程 |
| 专业选修课 Program Elective Courses | 9 | 3 | 0 | 必选本专业方向课程2门，非本专业方向课程1门（也可以从专业基础课中选） |

**六、培养过程要求 Training Requirement**

博士生第一学年学习基础课期间不确定导师，待第一学年末时，经师生互选确定导师。第一学年须参与至少两个不同课题组的学习，每个课题组学习时间不少于2个月，并提交由实验室或课题组负责人认可和评价的学习报告。资格考试一般在第二学年秋季学期开始时进行，通过者方可进入博士学位论文开题环节，未通过者可以申请参加第二次资格考试，重考仍未通过者，由李政道博士生事务委员会基于学业考核作出“转为硕士生培养”的建议，由学位评定委员会审议同意后进行分流。

通过资格考试的直博生，应在第二学年内进行博士学位论文开题，首次学位论文开题未通过的，可在下一学期再次申请开题，再次论文开题仍未通过者，由李政道博士生事务委员会基于学业考核作出“转为硕士生培养”的建议，由学位评定委员会审议同意后进行分流。

开题通过后的直博生应参加学科组织的年度考核，年度考核未通过者由李政道博士生事务委员会基于学业考核作出“转为硕士生培养”或“结业”的建议，由学位评定委员会审议同意后进行分流。

博士研究生应具备学术交流的能力，在读期间必须在高水平国际学术会议上作学术交流至少1次。交流形式、会议层次等具体要求详见《上海交通大学关于博士研究生参加学术交流的规定》。

In the first academic year, the supervisor is uncertain. At the end of the first academic year, the supervisor is determined by mutual selection of teachers and students. During the first academic year, Doctoral candidates are required to engage in study activities with at least two different research groups during their first academic year, spending a minimum of two months in each group, and to submit a study report that has been acknowledged and assessed by the laboratory or research group leader. The qualification examination is usually conducted in the autumn semester of the second academic year. Only those who pass the examination can begin the thesis proposal session of doctoral dissertations. Those who fail to pass the qualification examination can apply for the second chance of examination. Graduate Student Affairs Committee of the Tsung-Tao Lee Institute will file the suggestion of "change to the training of master's degree" to the academic degree evaluation Committee of the school for students who fail in examination twice. Those students will change to master after the approval by the the academic degree evaluation Committee.

Students passed the qualification examination should begin the thesis proposal of their doctoral dissertations within the second academic year. Those who fail to pass the thesis proposal can apply for thesis proposal again in the next semester. Graduate Student Affairs Committee of the Tsung-Tao Lee Institute will file the suggestion of "change to the training of master's degree" to the academic degree evaluation Committee of the school for students who fail twice Those students will change to master after the approval by the the academic degree evaluation Committee.

Students passed thesis proposal should participate in the annual assessment organized by the sub-discipline. Those who fail to pass the annual assessment will be advised to " change to the training of master's degree".

Doctoral students should have the ability of academic exchange. During their study, they must make academic exchange at a high-level international academic conference at least once. See regulations of Shanghai Jiaotong University on doctoral students participating in academic exchanges for specific requirements such as communication form and conference level.

**七、学术成果要求 Requirement on Academic Achievements**

博士学位论文相关创新成果应在本学科领域体现一流水平、具有创造性；成果应为学位申请人攻读博士学位期间独立完成，并以学位论文的形式完整呈现。成果的创新性是评价学位论文水平的重要参考，可通过高水平的学术期刊论文、尖端仪器设备研制等多种形式呈现。具体要求按 “物理与天文学院博士学位论文创新性成果认定细则”（2023年修订版）执行。

The relevant innovative achievements of doctoral dissertation should reflect the first-class level and originality in the field of the discipline; The results shall be completed independently by the degree applicant during his doctoral degree study and presented in the form of a dissertation. The innovation of achievements is an important reference for evaluating the level of dissertation, which can be presented in some forms, such as high-level academic journal papers, cutting-edge instrument and equipment development and so on. The specific requirements shall be implemented in accordance with the "detailed rules for the identification of innovative achievements of doctoral dissertations of the School of Physics and Astronomy, Shanghai Jiao Tong University"（Revised version 2023）.

**八、学位论文 Thesis/Dissertation Work**

博士生的学位论文是博士生在导师或导师组集体指导下，独立完成的、系统完整的学术研究工作的总结，应在科学上或专门技术上作出创造性的学术成果，能反映出博士生已经掌握了坚实宽广的基础理论和系统深入的专门知识，具备了独立从事科学研究工作的能力。博士学位论文应包括文献综述、选题意义、研究内容、研究方法、研究结果、讨论与结论等内容。

博士学位论文的撰写应符合学校关于学位论文的规范性和质量的要求，并按照学校规定的格式打印，具体要求请参阅《上海交通大学博士、硕士学位论文撰写指南》。论文要求以英文撰写，并参与国际专家评审和国际答辩。

博士学位论文评审一般于答辩前三个月进行，关于学位论文预答辩、论文评审、答辩的具体要求请参阅《上海交通大学关于申请授予学位的规定(试行)》。

Doctoral dissertation is the summary of systematic and complete academic research work independently completed by doctoral students under the guidance of a supervisor or a group of superviors. It should make creative academic achievements in science or special technology. It can reflect that doctoral students have mastered solid and broad basic theory and systematic and in-depth expertise, and have the ability to independently engage in scientific research. The doctoral dissertation should include literature review, significance of research topic, research content, research methods, research results, discussion and conclusion.

The dissertation for doctoral degree shall comply with the requirements of the university on the standardisation and quality of the dissertation and be printed in accordance with the format stipulated by the university, please refer to the Guidelines for Writing Doctoral and Master's Degree Dissertations of Shanghai Jiao Tong University for the specific requirements. The dissertation should be written in English and participate in the international review and international defense.

The evaluation of doctoral dissertations is generally conducted three months before the oral defense. For the detailed requirements of pre-defense, thesis review and defense, please refer to“Regulations of Shanghai Jiao Tong University on Applying for Degree Awarding (Trial)”.

**九、课程设置 Courses**

详见下页 Please refer to the next page.

撰稿人签字： 日 期：

校稿人签字： 日 期：

审核人签字： 日 期：

主管院长签字： 院系公章 日期：

说明：

1. 培养方案制定完成并经院系学位委员会审核通过后，全日制请将本表格电子版(word)发送至SherryLi327@sjtu.edu.cn，非全日制请将本表格电子版(word)发送至jshen@sjtu.edu.cn；
2. 请在新研究生教育管理信息系统完成新培养方案的申请，并在审核通过后将本表格的纸质版（签字盖章）送交研究生院存档。

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| 课程类别  Category | 课程代码  Course Code | 课程名称 Course Name | | 学分  Credit | 授课语言  Language\* | 开课学期  Semester | 可以计算GPA | 必须计算GPA | 备注 Note |
| 中文Chinese | English 英文 |
| PHY6009 | 学术写作、规范与伦理 | Scientific Writing, Integrity and Ethics | 2 | 英文 in English | 春季 Spring | 否Yes | 否No | 必修 Compulsory |
| FL6001 | 学术英语 | English for Academic Purposes | 2 | 英文 in English | 春秋季 Spring&Fall | 是 Yes | 是 Yes | 必修 Compulsory |
| CHN6207 | 汉语 | Chinese | 4 | 中文 in Chinese | 春/秋 Fall/Spring | 否 No | 否 No | 必修 Compulsory |
| CHN0916 | 中国文化概论 | Introduction to Chinese culture | 2 | 中/英文Chinese/English | 春/秋 Fall/Spring | 是 Yes | 是 Yes | 必修 Compulsory |
| 专业基础课  Program Core Courses | PHY6006 | 高等电动力学（顾威） | Advanced Electrodynamics | 4 | 英文 in English | 秋季 Fall | 是 Yes | 是 Yes | 至少选两门（Must take two courses of them） |
| PHY6004 | 高等统计物理(Matteo Baggioli） | Advanced Statistical Physics | 4 | 英文 in English | 春季 Spring | 是 Yes | 是 Yes |
| PHY6007H | 高等量子力学（Antonio Garcia） | Advanced Quantum Mechanics | 4 | 英文 in English | 秋季 Fall | 是 Yes | 是 Yes |
| PHY6008H | 物理学中的群论 （Yuichiro Nakai） | Group Theory In Physics | 4 | 英文 in English | 秋季 Fall | 是 Yes | 是 Yes |
| ASTR6006H | 天体物理中的辐射机制（谭先瑜，Gwenael Thibaud Giacinti） | Radiative Processes in Astrophysics | 4 | 英文 in English | 秋季 Fall | 是 Yes | 是 Yes |
| ASTR6008 | 天体物理中的流体动力学（Yosuke Mizuno） 与**“星系动力学”二选一** | Fluid Dynamics in Astrophysics | 4 | 英文 in English | 春季 Spring | 是 Yes | 是 Yes |
| ASTR6004H | 星系动力学（沈俊太、李兆聿）**与“天体物理中的流体动力学”二选一** | Galactic Dynamics | 4 | 中文 in Chinese | 秋季 Fall | 是 Yes | 是 Yes |
| ASTR6007H | 物理宇宙学（张骏） | Physical Cosmology | 4 | 英文 in English | 春季 Spring | 是 Yes | 是 Yes |
| 专业前沿课  Program Frontier Courses | GE6011 | 学术报告会 | Academic Lectures | 1 | 英文 in English | 春秋季 Spring&Fall | 否No | 否No | 必修 Compulsory |
| GE6003 | 实验室安全教育 | Laboratory Safety Education | 0.5 | 中文 in Chinese | 春季 Spring | 否No | 否No | 必修 Compulsory |
| PHY8513 | 粒子物理前沿选讲 | Frontiers of Particle Physics | 3 | 英文 in English | 秋季 Fall | 否No | 否No | 选修1门课程，至少2学分 |
| PHY9310H | 凝聚态物理前沿课题介绍 | Introduction to Current Topics in Condensed Matter Physics | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| PHY9212H | 量子与原子光学前沿 | Quantum and Atom Optics | 3 | 英文 in English | 秋季 Fall | 否No | 否No |
| ASTR8103 | 现代物理与天文专题（天文类）：恒星和星系 | Topics in Modern Physics and Astronomy (Astronomy)：Stars and Galaxies | 0.5 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| ASTR8203 | 现代物理与天文专题（天文类）：宇宙学 | Topics in Modern Physics and Astronomy (Astronomy)：Cosmology | 0.5 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| ASTR8306 | 现代物理与天文专题（天文类）：计算机中的宇宙 | Lectures in Modern Physics and Astronomy--Astronomy Series: The Universe in computers | 0.5 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| ASTR8404 | 现代物理与天文专题（天文类）：天文观测 | Topics in Modern Physics and Astronomy (Astronomy)：Astronomical Observations | 0.5 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| 专业选修课  Program Elective Courses | PHY6502 | 粒子物理与核物理基础 | Fundamentals of Particle Physics and Nuclear Physics | 4 | 英文 in English | 秋季 Fall | 否No | 否No | 粒子物理与核物理 |
| PHY8503 | 原子核理论 | Theoretical Nuclear Physics | 3 | 英文 in English | 秋季 Fall | 否No | 否No |
| PHY8504 | 粒子物理与核物理实验方法 | Introduction to particle and nuclear experimental methods | 4 | 英文 in English | 春季 Spring | 否No | 否No |
| PHY9507H | 规范场论 | Gauge Field Theory | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| PHY8508 | 核电子学 | Nuclear Electronics | 3 | 英文 in English | 秋季 Fall | 否No | 否No |
| PHY6501 | 量子场论基础 | Fundamentals of Quantum Field Theory | 4 | 英文 in English | 秋季 Fall | 否No | 否No |
| PHY8108 | 物理学的数学和数值方法（蔡子）AI+课程 | Mathematical and Numerical Methods in Physics | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| ASTR8105 | 粒子天体物理 | Particle Astrophysics | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| PHY8303 | 表面与低维物理 | Surface and low dimensional Physics | 3 | 中文 in Chinese | 秋季 Fall | 否No | 否No | 凝聚态物理 |
| PHY6301 | 高等凝聚态物理 | Advanced Condensed Matter Physics | 4 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| PHY6202 | 量子光学 | Quantum Optics | 4 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| PHY8304 | 固体多体理论 | Many Particle Physics in Solids | 3 | 中文 in Chinese | 秋季 Fall | 否No | 否No |
| PHY8305 | 计算材料物理 | Computational Material Physics | 2 | 中文 in Chinese | 秋季 Fall | 否No | 否No |
| PHY8306  删除 | 固体物理实验方法 | Experimental Metheds of Solid State Physics | 4 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| PHY8307 | 材料制备及晶体生长科学 | Materials Fabrication and Science of Crystal Growth | 2 | 中文 in Chinese | 秋季 Fall | 否No | 否No |
| PHY8308 | 固体光谱和光散射 | Solid State Spectroscopy & Light Scattering | 2 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| ASTR6002 | 广义相对论 | General Relativity | 4 | 中文 in Chinese | 春季 Spring | 否No | 否No | 天文与天体物理 |
| ASTR6005 | 恒星结构与演化 | Stellar structure and evolution | 4 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| ASTR8102 | 实测天体物理 | Observational Astrophysics | 4 | 中文 in Chinese | 秋季 Fall | 否No | 否No |
| ASTR6001 | 天体物理宇宙学导论 | Introduction to astrophysics and cosmology | 4 | 中文 in Chinese | 秋季 Fall | 否No | 否No |
| ASTR8405 | 从地球到系外文明 | From Earth to Extraterrestrial Civilization | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| ASTR8105 | 粒子天体物理 | Particle Astrophysics | 3 | 英文 in English | 春季 Spring | 否No | 否No |
| ASTR9303H | 计算天体物理 | Computation Astrophysics | 3 | 中文 in Chinese | 春季 Spring | 否No | 否No |
| PHY6407 | 等离子体物理导论 | Introduction to Plasma Physics | 3 | 中文 in Chinese | 秋季Fall | 否No | 否No | 等离子物理 |
| PHY8408 | 激光聚变高级研修课 | Advanced Research and Study Seminar in Laser Fusion | 3 | 中文 in Chinese | 秋季Fall | 否No | 否No |
| PHY6201 | 非线性光学 | Nonlinear Optics | 4 | 英文 in English | 春季 Spring | 否No | 否No |

ASTR8306现代物理与天文专题（天文类）:计算机中的宇宙，替代原ASTR8304“现代物理与天文专题（天文类）:大规模数值模拟”。