



## Introduction

The Department of Physics and Astronomy has two first-level disciplines of Physics and Astronomy, with the former includes a number of secondary disciplines: Theoretical and Interdisciplinary Physics, Nuclear and Particle Physics, Laser Plasma Physics, Condensed Matter Physics, Optics Science and Engineering, and two post-doctoral research centers of Physics and Optics Science. Condensed Matter Physics and Optics became state key disciplines in 2002 and 2007 respectively. In the 2012 first-level discipline ranking of Ministry of Education, Physics was No. 6, and it was selected in the First Class Disciplines Construction Plans (Class A) of Colleges and Universities in Shanghai in September 2012.

# Department of Physics and Astronomy

Subject Fields	Research Contents
Theoretical and Interdisciplinary Physics	Study on the frontiers of Electron Transport and Superconductivity in the Condensed Matter, Soft Condensed Matter Physics, Complex Physics Systems, Theoretical Biophysics, Statistical Physics, Low-Dimensional Condensed Matter Theory, Quantum Field Theory and Phase Transition Theory.
Nuclear and Particle Physics	Study on the frontiers of Particle and Nuclear Physics Theory and Experiment, including Neutrino, Nuclear Structure, Quantum Chromodynamics and Dark Matter.
Laser Plasma Physics	Study on the frontiers of Physics and key technology of High Energy Density Matter, including Novel Particle Acceleration and Radiation Sources, Novel Laser Fusion, Laboratory Simulation of Astrophysical Phenomena, and Ultrafast Dynamics of Physical Structure.
Condensed Matter Physics	Study on the frontiers of Topological Insulators and Topological Superconductors, High-temperature Superconductivity, Semiconductor Physics, Surface and Interface Physics, Soft Matter Physics, Condensed Matter Spectroscopy, Computational Condensed Matter Physics, Optoelectronic Device Physics, and Solar and Energy Physics.
Optics Science and Engineering	Study on the frontiers of Optical Physics, including Nonlinear Optics, Nano-photonics and Quantum Optics, and on the application of Optical Fiber, Optical Waveguide, Optical Instruments and Solar Cell.
Astronomy and Astrophysics	The research interests mainly focus on the formation and evolution of stars, galaxies, galaxy clusters and large scale structure of the universe. Study on the experiment, observation and simulation of astronomy and astrophysics at multi-wavebands from radio, infrared, optical, to X-ray and Gamma-ray, including the physical properties and spatial distribution of baryons and dark matter particles, black hole and its impact on the galaxy activity, supernova and Gamma-ray burst, the first stars and the re-ionization of the universe, etc.



# Achievements

In the last five years, the Department of Physics and Astronomy is in charge of 509 projects, of which 58 key projects' grants are over 1 million RMB, including 2 innovative research groups of National Natural Science Foundation of China (NSFC), 1 key scientific instrument and equipment development project of NSFC, 10 key programs of NSFC, 4 major research plans of NSFC, 2 special funds of NSFC, 4 distinguished young scholar funds, 3 excellent young scholar funds of NSFC, 21 national key basic research projects (973 Project) of Ministry of Science and Technology (MOST) and of which 5 are chief scientist projects, 1 youth 973 Project of MOST, 1 national high technology research and development project (863 Project) of MOST, 1 major research program of MOST and 1 ITER program of MOST. In 2014, the IFSA Collaborative Innovation Center led by the Department of Physics and Astronomy of SJTU, and the Artificial Microstructure and Quantum Control Collaborative Innovation Center led by Nanjing University which the department participates, were successfully certificated.

## Platforms for Scientific Innovation

- > Key Laboratory for Laser Plasma, Ministry of Education
- > Key Laboratory of Artificial Structures and Quantum Control, Ministry of Education
- > National Key Laboratory of Advanced Optical Communication Systems and Networks
- > Shanghai Key Laboratory for Particle Physics and Cosmology
- > IFSA Joint Research Center of Ministry of Education
- > Artificial Microstructure Science and Technology Collaborative Innovation Center
- > Shanghai Center for Complex Physics Research
- > Li Zhengdao Institute



## Renowned Professors

Name	Research Fields
LI Jiaming	Atomic and Molecular Physics
LEI Xiaolin	Semiconductor Electron Transport and Optical Properties
ZHANG Jie	Laser Plasmas
PAN Jianwei	Quantum Physics
WU Xiangping	Cosmology
FAN Dianyuan	Laser Physics
JI Xiangdong	Dark Matter Detection Experiments
CAI Shenou	Theoretical Physics
ZHAO Yumin	Nuclear Structure Theory
SHEN Wenzhong	Solar Photovoltaic Science and Technology
YAO Xin	Crystal Growth and Mechanism
SHENG Zhengming	Laser Plasmas
JIA Jinfeng	Surface Physics
XING Xiangjun	Soft Condensed Matter Theory
KU Wei	Strongly Correlated Materials
ZHANG Weiping	Atomic, Molecular and Optical Physics
HE Xiaogang	Particle Physics Theory
WANG Xijie	Laser Accelerator
LIU Ying	Superconductivity Nano Physics
JING Yipeng	Cosmology
WANG Xiaoqun	Correlated Electron Systems and Quantum Control
QIAN Liejia	Ultrafast Nonlinear Optics
YANG Xiaohu	Astrophysics
ZHANG Pengjie	Cosmology
CHEN Xianfeng	Nonlinear Optics
XU Haiguang	Astronomy and Astrophysics
WANG Bin	Theory of Gravity
QIAN Yongzhong	Neutrino Physics
LI Yijie	Superconducting Materials and Physics
SUN Hong	Material Calculation Physics
SUN Yang	Nuclear Physics
ZHU Kadi	Solidstate Quantum Information and Quantum Computation

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