

判天地之美，析万物之理

聚焦物理学科发展，培育强基物理人才

青岛大学 物理科学学院

滕冰

2020.06.13 山东·青岛

院长寄语

青岛大学物理学院拥有从本科到硕士到博士的多层次人才培养体系，学科专业实力雄厚，教学科研条件先进，人才培养质量持续提高。学院拥有物理学一级学科博士授权点、第四轮学科评估位于全国参评物理学科前40-50%；应用物理学为国家级特色专业、首批国家一流本科专业建设点；同时，拥有国家级实验教学示范中心、省高校强化重点实验室以及高校与产业界对接的省级协同创新中心，形成了完备的产学研协同育人平台。

学院设有应用物理学（理科）、材料物理、光电信息科学与工程、新能源科学与工程（三个工科专业方向），还有物理师范教育专业。聚焦物理学科发展，培育理工交叉融合的强基物理人才。每年为国家基础研究、战略性新兴产业和教育教学领域输送近300名创新创业人才，为经济社会发展做出应有贡献。





目录

一

学院简介

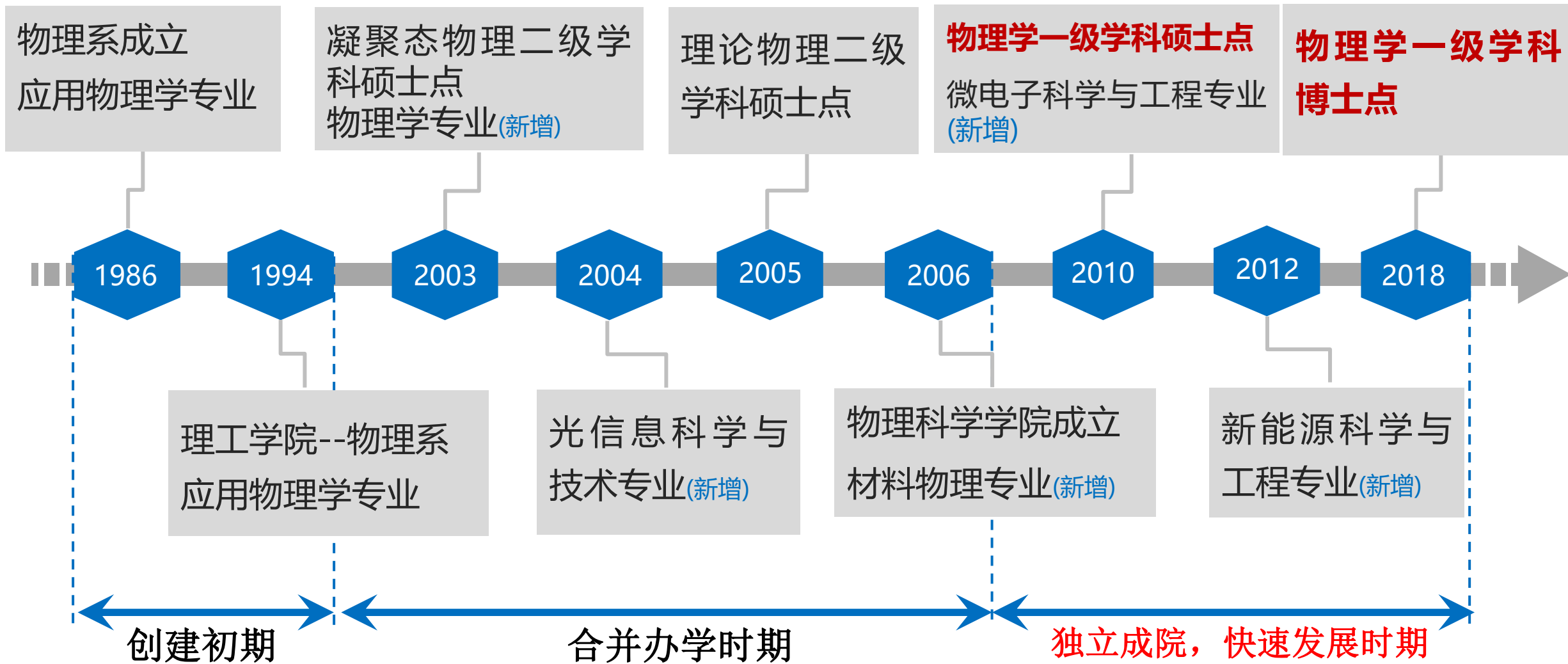
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专业介绍

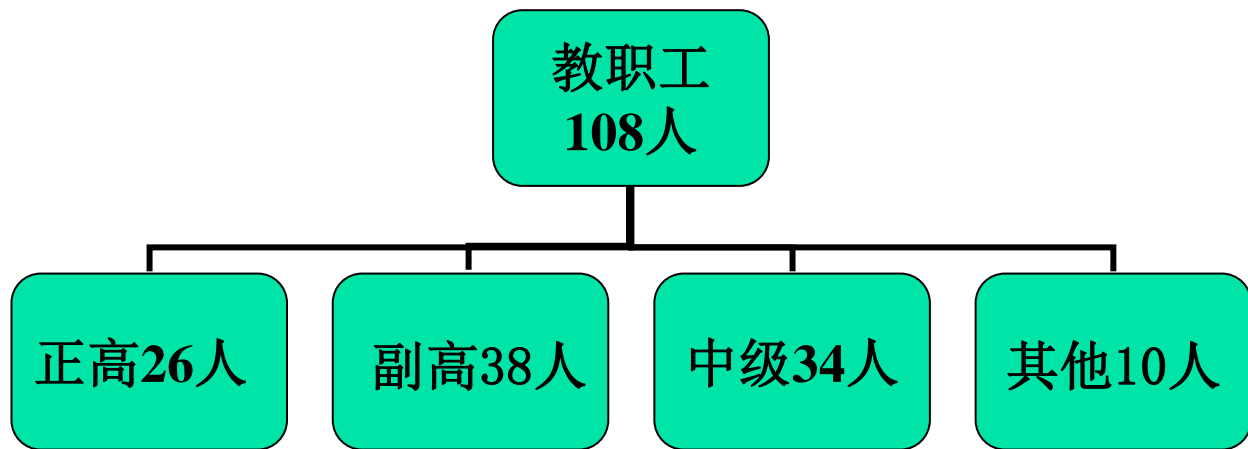
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人才培养

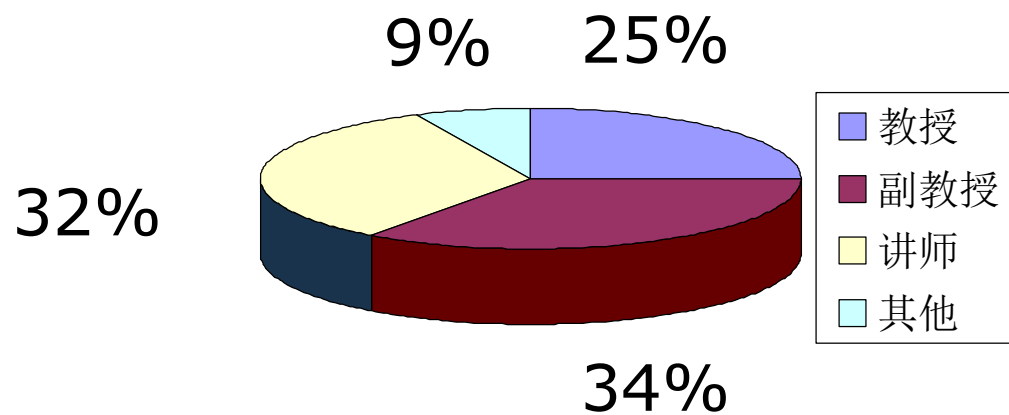
学科专业发展



师资队伍

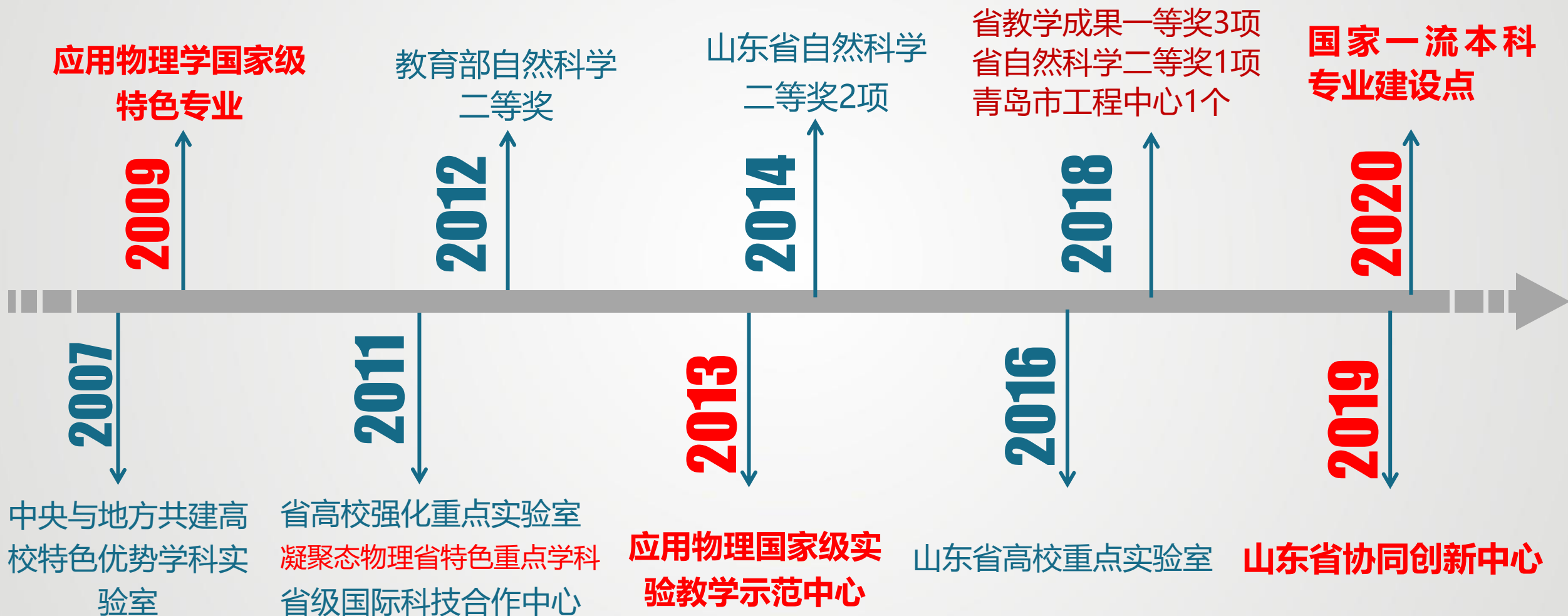


科研为主型**11**人 | 教学科研型**56**人 | 教学为主型**24**

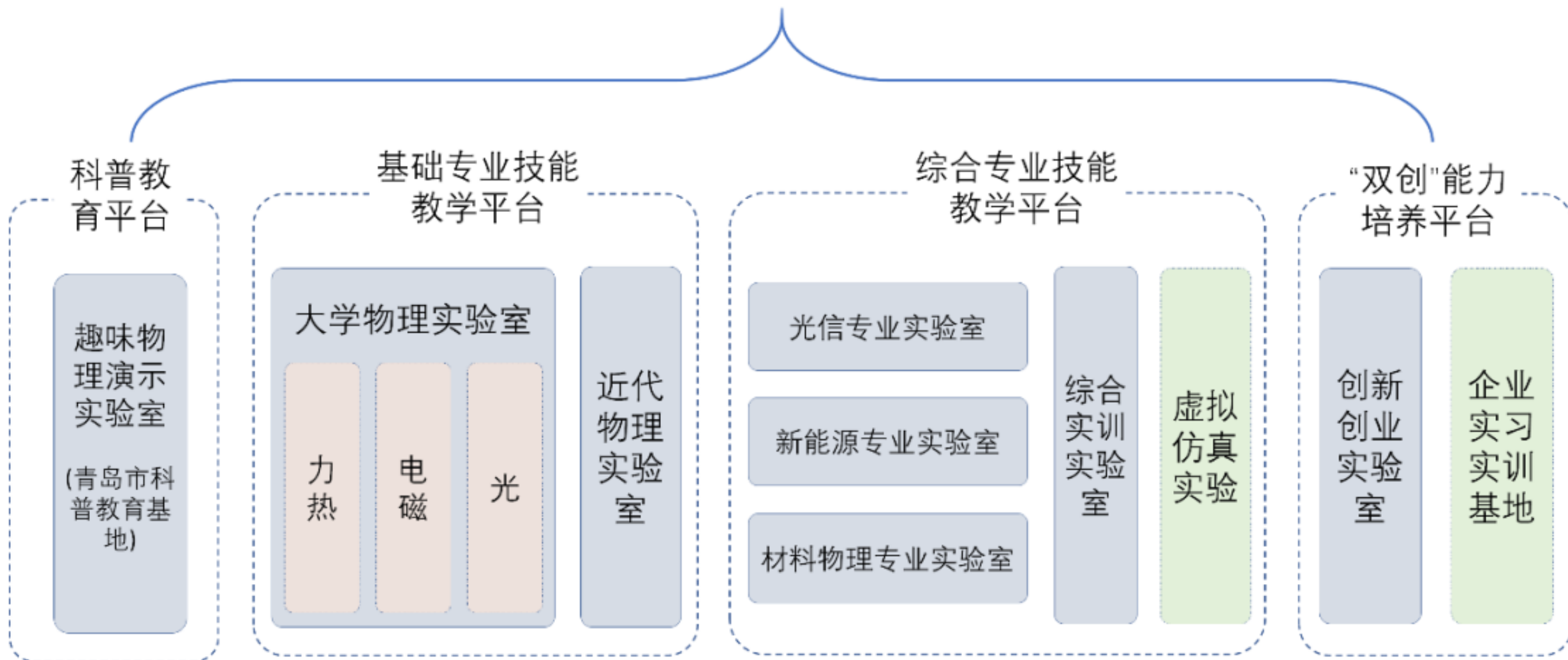


省部级人才称号	国家“百千万人才工程”	1人
	新世纪优秀人才	3人
	中科院“百人计划”	1人
	省突贡中青年专家	2人
	泰山学者	5人
	青年泰山学者	1人
	省杰青	4人
	省优青	2人
	全国模范教师	1人
	山东省教学名师	1人

平台建设&重要成果



应用物理国家级实验教学示范中心



一个中心、四个平台、九个实体实验室

教学实验室： 国家级实验教学示范中心



科研实验室及仪器



PLD脉冲激光沉积系统



激光分子束外延系统



X射线衍射仪



精密阻抗分析仪



PPMS 综合物性测量系统



磁控溅射系统



电化学工作站



微波高温气氛实验炉



铁电测试系统



荧光光谱仪



光学显微镜



紫外可见分光光度计

教学获奖



研究生省级教学成果一等奖 (2018)



本科生省级教学成果一等奖 (2018)



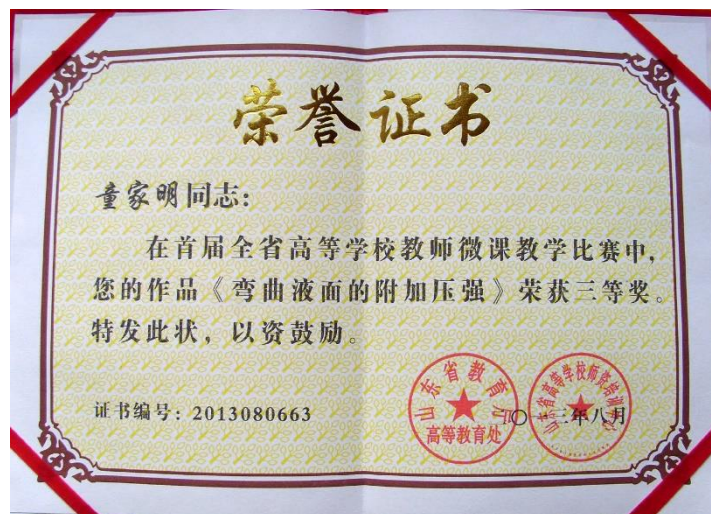
国家教学成果二等奖 (2014)



全国教学比赛二等奖



省级教学比赛三等奖

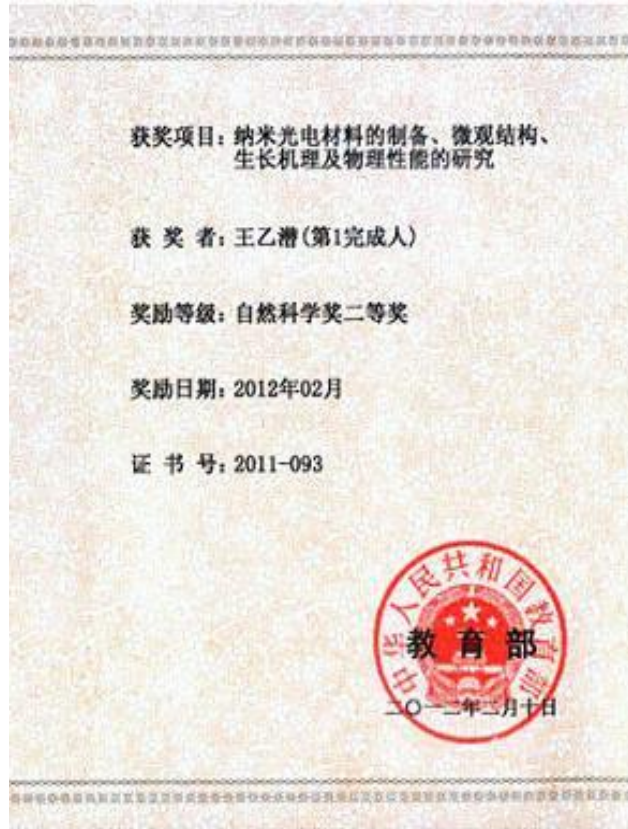


省级教学比赛三等奖



省级教学成果一等奖 (2014)

科研获奖



教育部自然科学二等奖
(2012)



山东省自然科学二等奖
(2014)

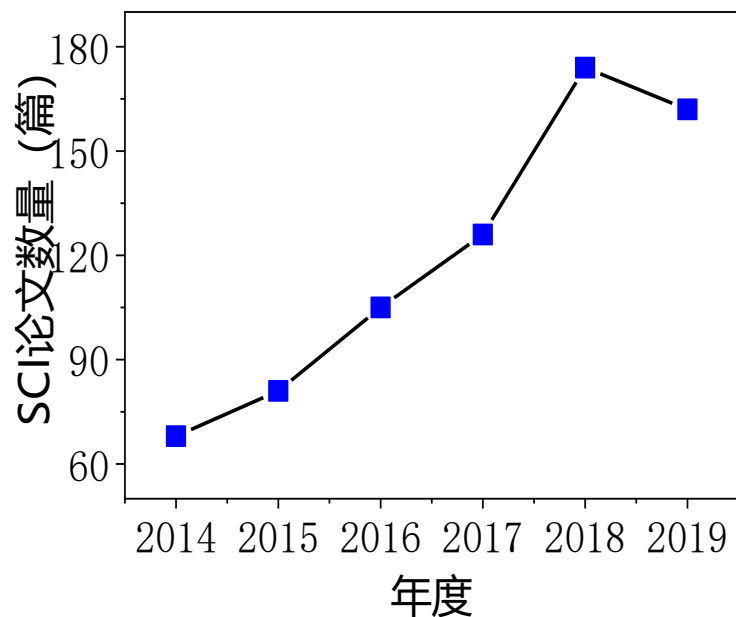


山东省自然科学二等奖
(2014)

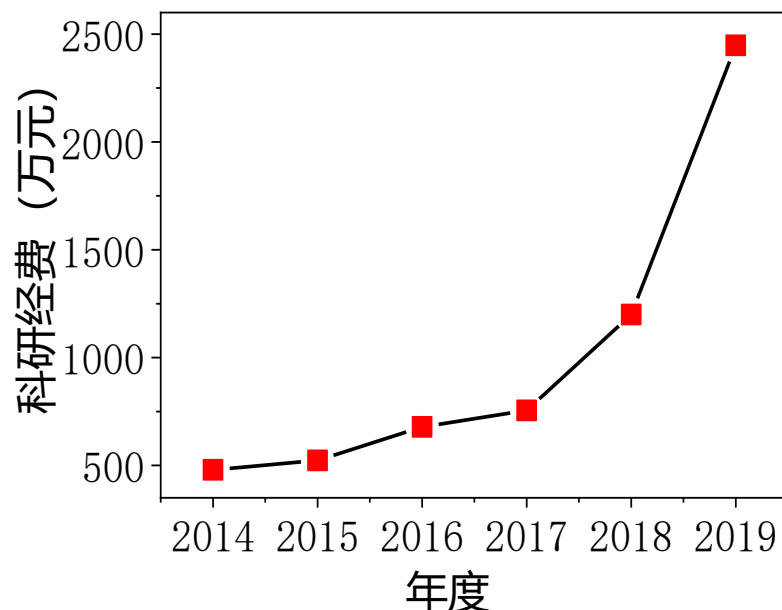


山东省自然科学二等奖
(2018)

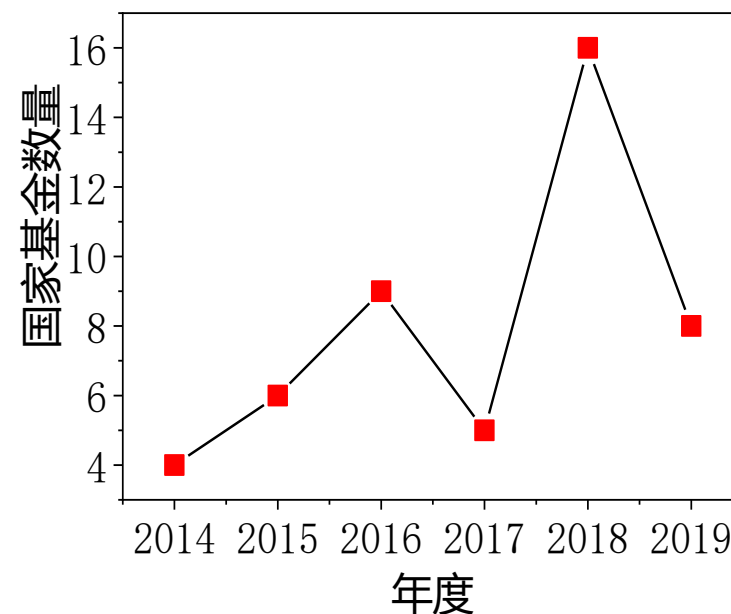
SCI 论文



科研经费



国家自然科学基金



2016-2019年全校综合评价，34个学院名列前茅

★ 第四轮学科评估前40-50%

★ 上榜软科中国最好学科名单

★ USNews 世界大学学科榜723名

代表性论文---物理知名期刊



Ground-State Phase Diagram of a Spin-Orbital-Angular-Momentum Coupled Bose-Einstein Condensate

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By inducing a Raman transition using a pair of Gaussian and Laguerre-Gaussian laser beams, we realize a ⁸⁷Rb condensate whose orbital angular momentum (OAM) and its internal spin states are coupled. By varying the detuning and the coupling strength of the Raman transition, we experimentally map out the ground-state phase diagram of the system for the first time. The transitions between different phases feature a discontinuous jump of the OAM and the spin polarization, and hence are of first order. We demonstrate the hysteresis loop associated with such first-order phase transitions. The role of interatomic interaction is also elucidated. Our work paves the way to explore exotic quantum phases in the spin-orbital-angular-momentum coupled quantum gases.

DOI: 10.1103/PhysRevLett.122.110402

Coupling between a particle's spin and orbital motion is ubiquitous in optics [1], atomic physics, and condensed-matter physics [2,3]. Ultracold atoms with high tunability provide an ideal platform to study the spin-orbit coupling. Spin-linear-momentum (SLM) coupling in quantum gases is achieved by inducing Raman transition in the atom with two counterpropagating laser fields [4–6], in which the linear momentum of the light field can be transferred to the atom. SLM coupling possesses spatial translational symmetry and has a continuous spectrum. A variety of exotic quantum states have been observed in quantum gases with SLM coupling [4–12]. Photons can also carry orbital angular momentum (OAM). For example, the Laguerre-Gaussian (LG) optical field contains a phase factor $e^{i\ell\phi}$, where ϕ is the azimuthal angle and the integer ℓ is the winding number of the optical vortex [13], and carries an OAM of $\ell\hbar$. What happens to atoms if they encounter light carrying OAM is an intriguing question. Recently, several theoretical works proposed another fundamental type of spin-orbit coupling, namely, spin-orbital-angular-momentum (SOAM) coupling, and predicted rich quantum phases in atomic Bose condensates [14–19]. SOAM coupling preserves the rotational symmetry and possesses a discrete spectrum. Thus, atomic condensates subjected to SOAM and to SLM exhibit distinct properties.

In the experiment, we produce a ⁸⁷Rb condensate, with an atom number of $1.2(1) \times 10^5$, in a nearly spherical optical dipole trap with trapping frequency $\omega = 2\pi \times 77.5$ Hz, as in our previous work [24]. As shown in Figs. 1(a) and 1(b), a pair of Raman beams ($l_1 = -2$ and $l_2 = 0$) copropagate along the z direction, suppressing

Fig. 1(a). The relative winding phase of the photons is transferred to the atoms during the Raman transition. Using this method, SOAM has been demonstrated in both dynamically expanding [20,21] and trapped atomic condensates [22,23]. However, up until now, a systematic experimental investigation of the ground-state phase diagram of the system is still lacking. Our current work reports the first experimental observation of the ground-state phase diagram and the associated phase transition in a SOAM coupled condensate. Across the phase boundaries, the vorticity of the atomic wave function and the spin polarization exhibit discontinuous jumps, providing clear evidence that the associated phase transition is of first order. We further demonstrate the hysteresis loop that represents another hallmark of a general first-order phase transition. Under the situation where the single-particle ground state is twofold degenerate, we show that all the atoms condense into one of the degenerate states. This can be attributed to the effect of many-body interaction: if both states are populated, the system has to pay an energy penalty due to the additional quantum exchange interaction.

In the experiment, we produce a ⁸⁷Rb condensate, with an atom number of $1.2(1) \times 10^5$, in a nearly spherical optical dipole trap with trapping frequency $\omega = 2\pi \times 77.5$ Hz, as in our previous work [24]. As shown in Figs. 1(a) and 1(b), a pair of Raman beams ($l_1 = -2$ and $l_2 = 0$) copropagate along the z direction, suppressing

Phys. Rev. Lett.(2019)

Tuning the magnetic properties of La_{0.9}Sr_{0.1}CoO_{3-x} films by oxygen pressure

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In this paper, oxygen-deficient La_{0.9}Sr_{0.1}CoO_{3-x} (LSCO) thin films are prepared by adjusting the oxygen pressure during the deposition. As oxygen vacancies are introduced into the LSCO films, the out-of-plane layers are elongated, as revealed by x-ray diffraction and high-resolution transmission electron microscopy (HRTEM). Multilayer length and axis, oxygen intercalation in the HRTEM images of the oxygen-deficient LSCO films are induced by oxygen vacancy and oxygen vacancy, respectively. Magnetic measurements and first-principles calculations show that the oxygen vacancies suppress the magnetism of the LSCO thin layers. We also demonstrate that doping Sr into LaCO₃ and removing oxygen from LSCO have a similar effect on the magnetic properties, which is consistent with the first-principles results.

DOI: 10.1103/PhysRevB.93.094421

Phys. Rev. B(2016)

1. INTRODUCTION
Transition metal oxides (TMOs) have attracted much attention for their rich physical properties, such as superconductivity, magnetism, and ferroelectricity. In this paper, we study the magnetic properties of Sr-doped LSCO thin layers. The magnetic properties are investigated by using the first-principles calculations and the experimental data. The results show that the magnetism of perovskite oxides is strongly suppressed by the oxygen vacancies. The magnetism of perovskite oxides is strongly suppressed by the oxygen vacancies. The magnetism of perovskite oxides is strongly suppressed by the oxygen vacancies.

II. EXPERIMENTAL DETAILS
Different oxygen-deficient LSCO films were epitaxially

Strongly interacting Sarma superfluid near orbital Feshbach resonances

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We investigate the nature of resonant pairing in a strongly interacting Fermi gas near orbital Feshbach resonances with spin-polarized imbalance in three dimensions, which can be described by a two-band two-channel model. We show that a Sarma superfluid with gapless single-particle excitations is formed in the closed channel at large imbalances. It is shown to be stable against the formation of an intersubband Fulde-Ferrell-Larkin-Oscillatory superfluid and a well-known Anderson-Higgs-Bogoliubov phonon mode and a massive Leggett mode as collective excitations at low momentum. At large momentum, the Leggett mode disperses and the phonon mode becomes damped at very large momentum due to the excitation of the other band. We also study the experimental observation of the Sarma superfluid in the presence of a magnetic field.

I. INTRODUCTION
A Sarma phase, named after the pioneering work by Shiro Fukui and Shiro Sarma, is a superfluid state that is energetically favorable even at the cusp of the BEC-BCS crossover [16–18], the so-called unitary limit. In this respect, heterostructure Fermi-Fermi mixtures of ^{41}K – ^{39}K , ^{41}K – ^{40}K , and ^{40}K – ^{39}K are

Low-momentum dynamic structure factor of a strongly interacting Fermi gas at finite temperature: The Goldstone phonon and its Landau damping

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(Received 22 December 2017; published 16 July 2018)

We develop a microscopic theory of the dynamic structure factor to describe the Bogoliubov-Anderson-Goldstone-phonon mode and its damping rate in a strongly interacting Fermi gas at finite temperature. Based on a density functional approach—the so-called superfluid local density approximation. The accuracy of the theory is quantitatively examined by comparing the theoretical predictions with recent experimental measurements for the local dynamic structure factor of a nearly homogeneous unitary Fermi gas at low temperature [10,11]. We find that the dynamic structure factor is well described by the Bogoliubov-Anderson-Goldstone-phonon mode and its Landau damping rate, without any free parameters. We calculate the dynamic structure factor as a function of temperature and transferred momentum, and determine the temperature evolution of the phonon damping rate, by considering the dominant decay process of the phonon mode via scattering of fermionic quasiparticles. These predictions can be confronted with future Bragg scattering experiments on a unitary Fermi gas near the superfluid transition.

I. INTRODUCTION
The understanding of the density fluctuation spectrum of superfluid ⁴He plays a central role in the early development of condensed-matter physics [1,2]. It is also important to determine the local dynamic structure factor near the trap center [30]. The purpose of this Rapid Communication is to provide a microscopic theory of the dynamic structure factor of a strongly interacting Fermi gas at finite temperature.

Phys. Rev. A (2018)

Dual-mode ferromagnetic resonance in an FeCoB/Ru/FeCoB synthetic antiferromagnet with uniaxial anisotropy

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²Department of Science, Tatung Institute of Technology, Taiwan 65008, China
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(Received 9 December 2017; accepted 21 April 2018; published online 7 May 2018)

Dual-mode ferromagnetic resonance is observed in FeCoB/Ru/FeCoB synthetic antiferromagnets with uniaxial in-plane magnetic anisotropy. The optical mode is present in the (0–100 Oe) magnetic field range, where the top and bottom layer magnetizations are aligned in opposite directions. The strong acoustic mode appears, when the magnetic field exceeds the 300 Oe value, which corresponds to the flop transition in the trilayer. Magnetic field and angular dependencies of resonant frequency are calculated for both optical (low field) and acoustic (high field) modes. The field side of the optical mode is attributed to the uniaxial anisotropy of the top layer. The field side of the acoustic mode is attributed to the uniaxial anisotropy of the bottom layer. The results show that the increase in the magnetic field originates from the difference in the sign of interlayer coupling energy at the parallel and antiparallel configurations of the synthetic antiferromagnet. The dual-mode resonance in the studied trilayer structures provides greater flexibility in the design of microwave devices.

Appl. Phys. Lett. (2018)

Intrinsic oxygen vacancies mediated multi-mechano-responsive piezoluminescence in undoped zinc calcium oxysulfide

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¹College of Physics, Qingdao University, Qingdao 266071, China
²Zhangzhou Key Laboratory of Optoelectronic Materials and Devices, Zhangzhou University, Zhangzhou 361021, China
³First Institute of Oceanography, State Oceanic Administration, Qingdao 266101, China
⁴Industrial Research Institute of Nonwovens and Technical Textiles, College of Textile and Clothing, Qingdao University, Qingdao 266071, China
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Piezoluminescence has achieved enormous advancement in the field of stress sensors, and mechano-driven lightings and displays, however the existing piezoluminescent materials universally need the external doping of luminescent or transition metal ions to create efficient luminescence. Herein, we report a bright piezoluminescence in undoped piezoelectric semiconductor Zn_{0.5}Ca_{0.5}O₂, which is multi-mechano-sensitive to ultrasonic vibration, friction, impact and compression. Our experimental and density functional theory computational investigations indicate that the intrinsic oxygen vacancies of Zn²⁺, Ca²⁺ and O²⁻ are luminescent centers and trap states in multicoloral components of luminescence. In addition to the piezoluminescence, Zn_{0.5}Ca_{0.5}O₂ exhibits piezocatalytic activity in hydrogen peroxide decomposition and photocatalytic activity in methylene blue degradation under visible light irradiation.

Piezoluminescence, a subcategory of mechanoluminescence, is a phenomenon in which piezoelectric materials, such as the well-known piezoelectrics Pb(Zn_{1/3}Ti_{2/3})O₇ and ZnO, emit light under the action of mechanical stress.

Appl. Phys. Lett. (2017)

Hole mobility modulation of solution-processed nickel oxide thin-film transistor based on high-k dielectric

Yu Liu,^{1,2,3,4} Guojia Liu,^{1,2,3,4} Huihui Zhu,^{1,2,3} Binyoungchul Shin,⁵ Elvira Fortunato,⁶ Rodrigo Martins,⁶ and Fukun Shan^{1,2,3,4}
¹College of Physics, Qingdao University, Qingdao 266071, China
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³Lab of New Fiber Materials and Modern Textile, Growing Base for State Key Laboratory, Qingdao University, Qingdao 266071, China
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Solution-processed p-type oxide semiconductor has recently attracted increasing interests for the applications in low-cost optoelectronic devices and low-power consumption complementary metal-oxide-semiconductor circuits. In this work, p-type nickel oxide (NiO_x) thin films were prepared using low-temperature solution process and integrated as the channel layer in thin-film transistor (TFT). The electrical properties of NiO_x TFTs, together with the characteristics of NiO_x thin films, were systematically investigated as a function of annealing temperature. By introducing aqueous high-k dielectric oxide (Al₂O₃) gate dielectric, the electrical performance of NiO_x TFT was improved significantly compared with those based on SiO₂ dielectric. Particularly, the hole mobility (μ_h) was found to be 60 times enhancement, quantitatively from 0.07 to 4.4 cm²/Vs, which is mainly benefited from the high real capacitance of the Al₂O₃ dielectric and high-quality NiO_x/Al₂O₃ interface. This simple solution-based method for producing p-type oxide TFTs is promising for next-generation oxide-based electronic applications. Published by AIP Publishing.

Appl. Phys. Lett. (2016)

Optics Letters

Multi-watt sub-30 ns passively Q-switched Yb:LuPO₄/WS₂ miniature laser operating under high output couplings

XIAODAN DOU, YANJUN MA, MIN ZHU, HONGHAO XU, DEGAO ZHONG, BING TENG, and JUNHAI LIU[†]
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We report on a miniature Yb:LuPO₄ crystal laser at 1.01 μm that is passively Q-switched with a sapphire-based low-loss WS₂ saturable absorber, and that can be operated under very high output couplings (>80%). With 12.6 W of pump power, we achieved an average output power of 4.33 W, a pulse duration of 28.6 ns, and a pulse-to-pulse interval of 1.33 μs. The laser exhibits excellent Q-switching performance of solid-state lasers, as the average output power of 4.33 W is still remains high in the presence of saturable absorbers. The Q-switching performance of solid-state lasers with saturable absorbers is still remains high in the presence of saturable absorbers. The Q-switching performance of solid-state lasers with saturable absorbers is still remains high in the presence of saturable absorbers.

Opt. Lett. (2018)

Passive Q-switching induced by few-layer MoTe₂ in an Yb:YCOB microchip laser

YANJUN MA, KAN TAN, XIAODAN DOU, JUNJIAN YANG, YUHAN LI, WENJUAN HAN, HONGHAO XU, and JUNHAI LI[†]
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Abstract: We report on passive Q-switching action induced by a few-layer MoTe₂ saturable absorber in an Yb:YCa₂(BO₃)₃ (Yb:YCOB) microchip laser. With a sapphire-based few-layer MoTe₂ incorporated into the 4 mm long plane-parallel resonator of the Yb:YCOB microchip laser, efficient stable passively Q-switched operation was achieved under output couplings of 40%–70%, producing, at an input pump power of 5.0 W, an average output power of 1.58 W at a repetition rate of 704 kHz with a slope efficiency of 36%; the pulse energy and peak power were respectively 2.25 μJ and 40.8 W, while the shortest pulse duration obtained was 40 ns.

Passive Q-switching (PQS) is a technique used to generate short, high-power pulses from a laser. In this work, we demonstrate the PQS action induced by a few-layer MoTe₂ saturable absorber in an Yb:YCOB microchip laser. The results show that the MoTe₂ saturable absorber can effectively induce PQS in the Yb:YCOB microchip laser, and the output power and pulse energy are significantly improved compared with the CW operation. The shortest pulse duration obtained is 40 ns, which is much shorter than that of the CW operation.

few-layer semiconducting transition metal dichalcogenides (TMDCs), MX₂ (M = Mo, W, X = S, Se, Te), have been recognized as a promising class of two-dimensional (2D) broadband saturable absorbers for passive mode-locking or Q-switching in fiber, waveguide, and solid-state lasers operating at wavelengths ranging from the visible to mid-infrared [1–9]. As yet,

Opt. Express (2018)

RESEARCH ARTICLE

Slow light effect with high group index and wideband by saddle-like mode in PC-CROW

Yong Wan,¹ Li-Jun Jiang,² Sheng Xu,¹ Meng-Xue Li,¹ Meng-Nan Liu,¹ Cheng-Yi Jiang,¹ Feng Yuan^{1,†}
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²Qingdao No. 2 Middle School of Shandong Province, Qingdao 266071, China
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Slow light with high group index and wideband is achieved in photonic crystal coupled resonator optical waveguide (PC-CROW) structure. The group index is enhanced by the saddle-like mode in the photonic crystal coupled resonator optical waveguide (PC-CROW) structure. The results show that the PC-CROW structure can effectively induce slow light effect, and the group index is significantly improved compared with the CW operation. The shortest pulse duration obtained is 40 ns, which is much shorter than that of the CW operation.

Front. Phys. (2018)

积极开展学术交流

第三届极端条件下的物质与辐射国际会议 2018



泰山学术论坛-战略新兴产业中的重大物理问题 2019



第十届全国高等学校物理实验教学研讨会

2017年7月30日·青岛大学



近五年举办国际会议**3**次，国内会议**15**次，讲座**100**余次。参会**3000**余人，境外**200**余人。

承办国家级大学生竞赛



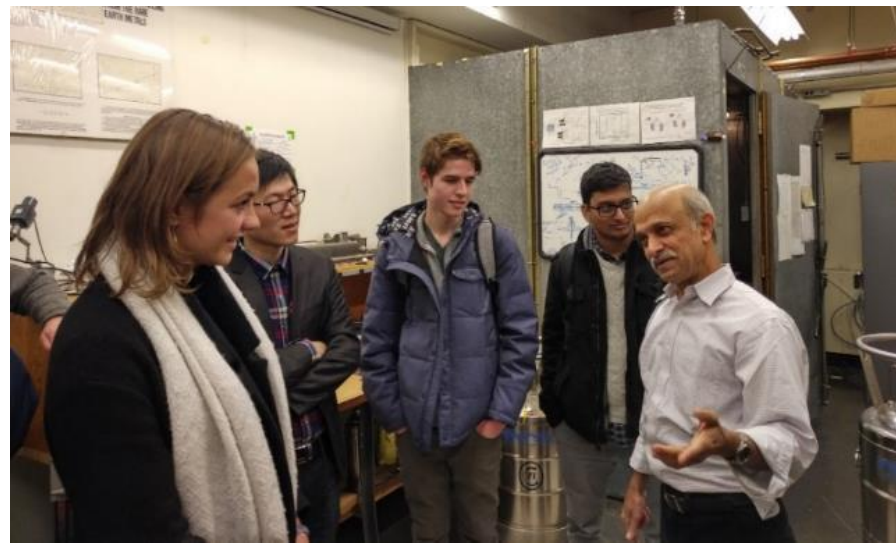
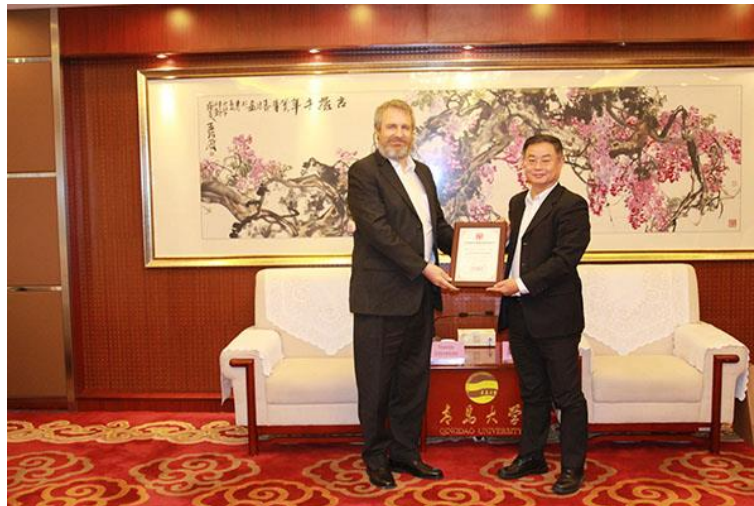
全国物理学术竞赛 2019年8月11-16日



全国光电设计竞赛 2019年8月18-21日

全国155所高校、1500余师生参赛；学院师生志愿者150余人

国际合作





山东省科学技术协会文件

鲁科协发〔2019〕45号

关于表扬山东省2019年全国科普日活动 优秀组织单位和优秀活动的通知

各省级学会，各
为深入贯彻
党的十九大和
弘扬科学精神
部署，科协统
国科普日活
1399项活动，共
动成果17



共接待市民、校友及中小學生等校外人員1000余人



目录

一

学院简介

二

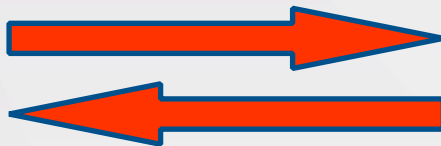
专业介绍

三

考研就业

专业设置

学科方向



应用物理学

光电信息科学与工程

应用物理学 (材料)

新能源科学与工程

凝聚态物理

光学

理论物理

计算物理

物理学

物理学 (师范)

服务物理教育



立足长远规划，谋求可持续发展-----专业/学科设置

“十三五”国家战略性新兴产业发展规划

(国发〔2016〕67号)

山东省“十三五”战略性新兴产业发展规划

(鲁政发〔2017〕7号)

青岛市“十三五”战略性新兴产业发展规划

(青政办发〔2017〕5号)

7大战略性新兴产业发展重点 国家“十三五”



★
光电信息科学与工程 (2004)

★
材料物理
(2006)

★
新能源科学与工程
(2012)

特色
厚
物理
基础

发展 新兴产业

改造 传统产业

★  **新一代信息技术产业**

★  **新能源新材料产业**

★  **高端装备产业**

★  **现代海洋产业**

★  **医养健康产业**

**山东省
新旧动能转换**

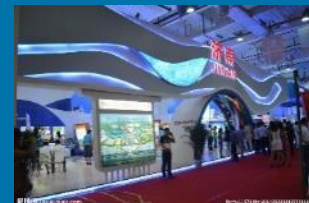
高端化工产业



现代农业产业



文化创意产业



精品旅游产业



现代金融服务



招 生 专 业	本科 (高考必考科目: 物理)	应用物理学 (120人) (设应用物理、材料物理两个方向)
		光电信息科学与工程 (60人)
		新能源科学与工程 (60人)
		物理学 (物理教育) (40人)
	硕士	物理学 (学术硕士)
		材料与化工 (专业硕士)
		学科教学 (物理)
	博士	物理学 (学术博士)
	博士后	材料科学与工程

本-----硕-----博 全阶段培养

应用物理学 — 专业简介

应用物理学专业由1986年成立的物理系沿革而来，2008年被评为“省级特色专业”，2010年被评为“**国家级特色专业**”，2019年入选**国家一流专业建设点**。历经30余载的建设，应用物理专业已具备完善的人才培养体系，研教融合的师资队伍，先进、前沿的教研设施。



1987年
物理系成立

2008年
省级特色
专业

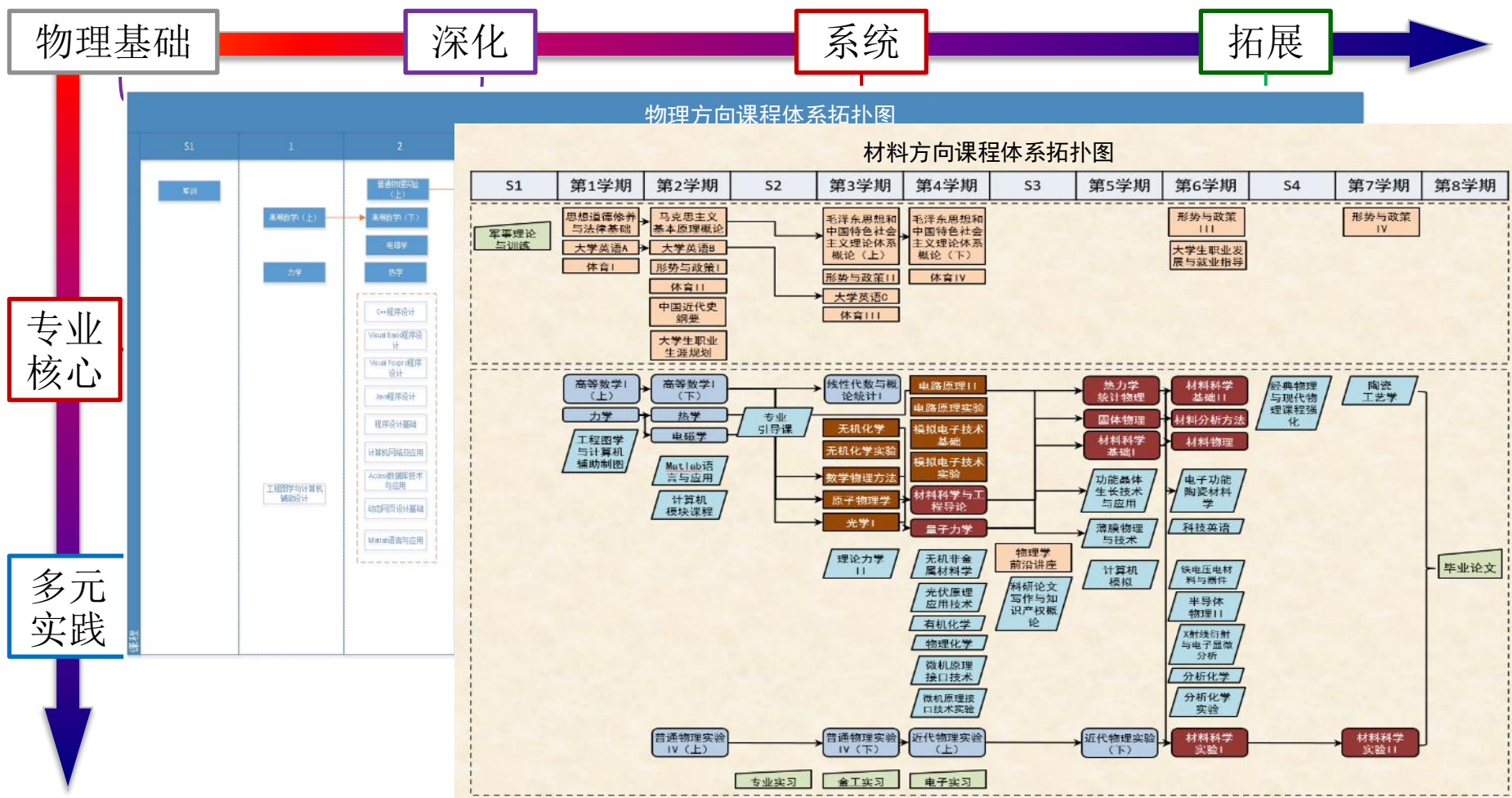


2010年
国家级特
色专业

2019年
国家一流专
业建设点

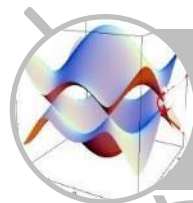
应用物理学—培养方案

应用物理学专业下设**物理**（应用物理方向）和**材料**（材料物理方向）两个培养方向，培养数理基础扎实、良好科学素养和创新意识的专门人才。毕业生掌握理论与计算物理、凝聚态物理、材料科学、纳米技术、电子科学技术等领域的基础知识和研究方法。



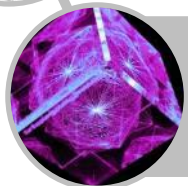
应用物理学—研究方向

近5年，应用物理学专业专任教师在Nature子刊、Physical Review Letters、Advanced Materials等顶级和水平学术期刊发表SCI论文500余篇，获批国家级、省部级科研项目76项，累计经费2792.6万元。



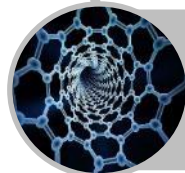
理论物理与计算材料

研究方向：强关联、大分子材料第一性计算，遗传算法，神经网络算法，Tight-Binding算法，冷原子理论，三维光子晶体计算与模拟等。



功能晶体材料

研究方向：有机太赫兹晶体，激光和非线性光学晶体，稀土发光和钙钛矿量子点，电子关联量子材料，及其在通信、雷达、医学成像、激光器，光电探测等的应用。



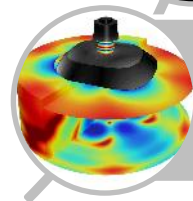
低维纳米材料

研究方向：纳米纤维、石墨烯、纳米复合材料的制备和光电磁性能，低维半导体材料、碳材料，以及在传感器、医学、能源、催化等方面的应用。



功能薄膜与器件

研究方向：外延薄膜与信息存储器件，忆阻器与神经元类脑模拟，柔性可穿戴电子学器件，挠曲电薄膜光电探测器，场效应晶体管等。



先进能源与电光材料

研究方向：太阳能电池、锂电池电极，透明电光陶瓷，弛豫铁电、压电陶瓷，发光多功能陶瓷，高压电无铅陶瓷，微波陶瓷等。

应用物理学—人才培养：就业形势



2016本科毕业生薪资排名，你的专业排上前50了吗？

2017-05-25 13:26

毕业生 / 专业 / 就业

本科专业月收入排名

2016届毕业生数据（前50）



2018最新大学毕业薪酬排行榜，这些专业刚毕业就年薪10万+！

2018-08-02 17:29

毕业生 / 专业 / 大学

2018年中国大学专业薪酬最高的20个专业

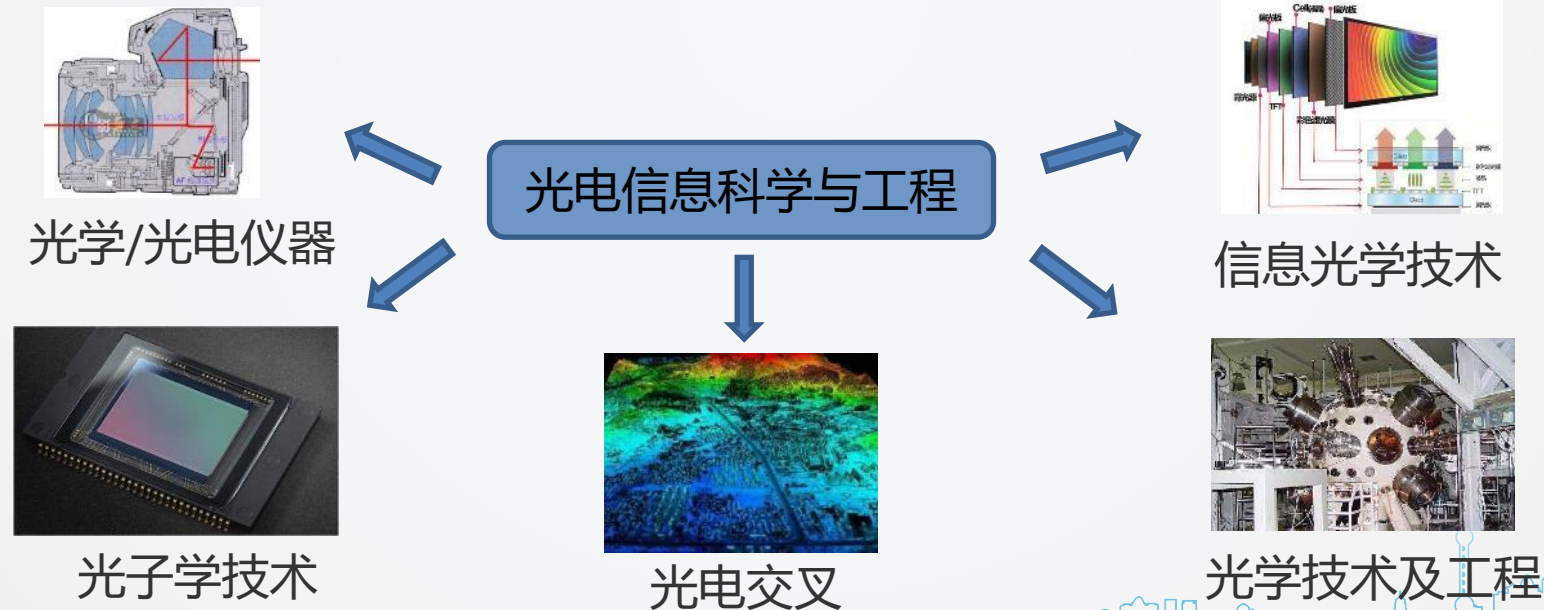
首年薪酬排名	专业名称	学科类型	学历类别	平均月薪 2017届	平均月薪 2015届	平均月薪 2013届
1	软件工程	工学	本科	9001	11522	13711
2	材料物理	工学	本科	8862	10812	12866
3	汽车类综合	工学	本科	8786	11071	13506
4	应用化学	理学	本科	8650	10467	13188
5	生物科学	理学	本科	8622	10347	12520
6	电子信息工程	工学	本科	8476	10256	12513
7	建筑学	工学	本科	8359	10533	13482
8	高分子材料与工程	工学	本科	8109	9730	12357
9	石油工程	工学	本科	8031	9476	11466
10	语言类综合	文学	本科	7519	9173	10916
11	临床医学	医学	本科	7097	8445	10134
12	应用生物科学	农学	本科	6927	8313	9892
13	机器人	工学	本科	6722	7932	9677
14	微电子科学与工程	理学	本科	6656	8254	9987
15	计算机科学与技术	工学	本科	6093	7678	9136
16	土木工程	工学	本科	6087	7426	8911
17	电气工程及其自动化	工学	本科	5975	7230	9182
18	轨道交通	工学	本科	5854	7259	8638
19	机械设计与制造	工学	专科	5731	6763	8183
20	复合材料与工程	工学	本科	5696	7005	8967

(数据来源：薪酬)

http://www.sohu.com/a/244823860_546096

光电信息科学与工程专业

培养目标：该专业培养具有现代科学意识、理论基础扎实、知识面宽、创新实践能力强，可从事光学工程、光通信、电子学、图像与信息处理等技术领域的科学研究，以及相关领域的产品设计与制造、科技开发与应用、运行管理等工作，能够适应当代信息化社会高速发展需要的应用型人才。



专业特色 —— 课堂教学体系

第一学年		第二学年		第三学年		第四学年	
1	2	3	4	5	6	7	8
通识教育类课程 <ul style="list-style-type: none"> · 思政类课程群 · 大学英语课程群 · 军体类课程群 · 人文素质创新创业课程 				专业核心课程 <ul style="list-style-type: none"> 量子力学 应用光学 物理光学 信息光学 激光原理 光纤通信 光电检测 信号与系统 			
物理大类培养课程		专业基础课程 <ul style="list-style-type: none"> · 高等数学课程群 · 电子技术课程群 · 普通物理课程群 				毕业设计	
多元/实践类课程 <p>(如：现代机械制造实训、电子实习、课程设计、科技论文写作及知识产权概论（双语）等)</p>							



光电系概况

学科平台



2019

山东省协同创新中心
(**光通信**, **海洋观测**)

2016

山东省高校重点实验室
(**光子学材料与器件**)

2013

应用物理国家级实验教学示范中心

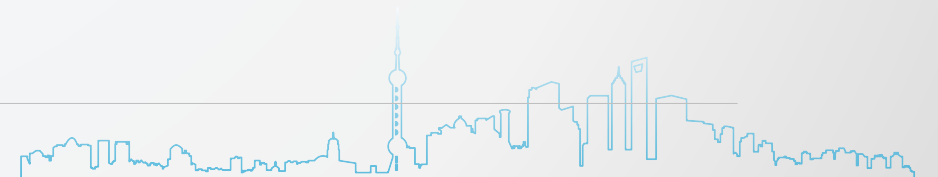
2011

省高校强化重点实验室 (**光子学材料与器件**)
凝聚态物理省特色重点学科 省级国际科技合作中心

2010

应用物理学国家级特色专业

中央与地方共建高校**光电材料与器件**特色
优势学科实验室



专业特色 — 升学与就业

➤ 考研:

近5年平均考研率接近**40%**，名校考入率超过**90%**



考研方向:

- 01 光电测控技术
- 02 光通信与光网络
- 03 基础光子学
- 04 激光科学与工程
- 05 集成光电子器件与微纳制造
- 06 纳米光电子学
- 07 生物医学光子学
- 08 有机光电子学
- 09 太赫兹光电子学
- 10 太赫兹光电子学

➤ 就业:

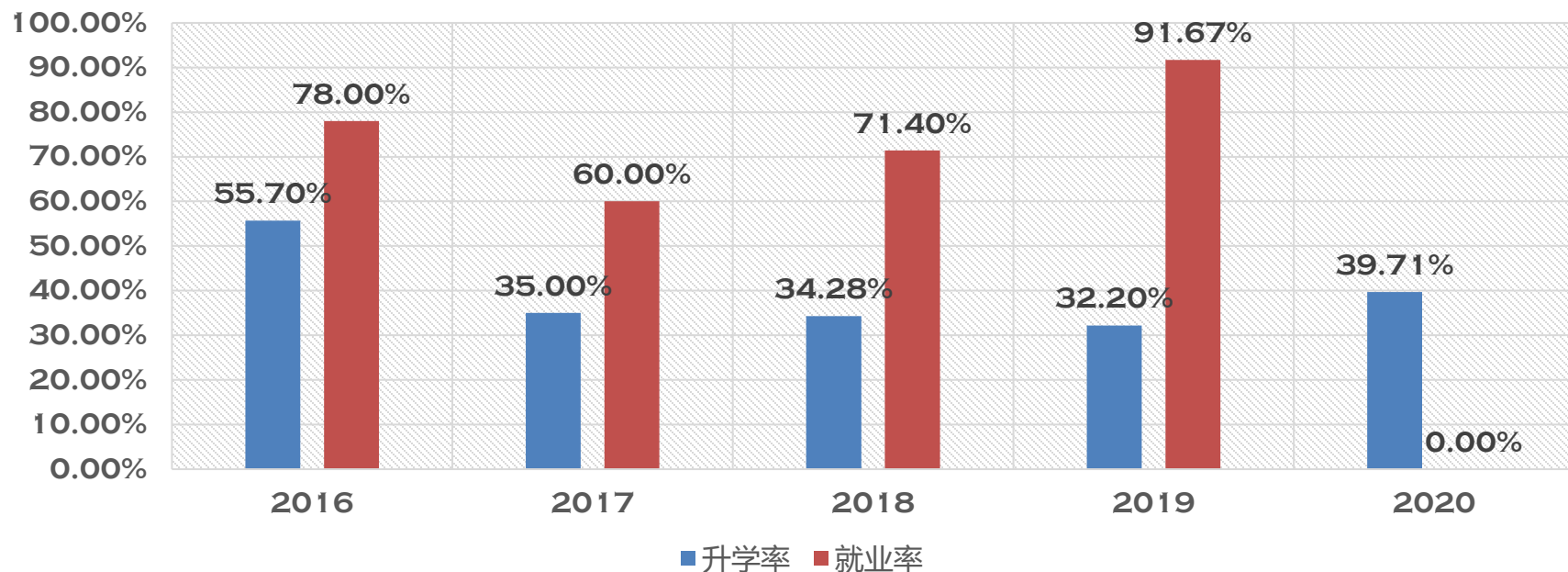
朗讯、华为、中兴通讯、海信、歌尔声学等

Goertek



ZTE

Hisense



新能源科学与工程——专业发展

我校新能源科学与工程专业从2012年开始招收本科学生。根据市场需求并结合物理学院特点，本专业围绕储能材料与器件、太阳能光伏系统、电源自动化管理等方面培养国家紧缺人才。

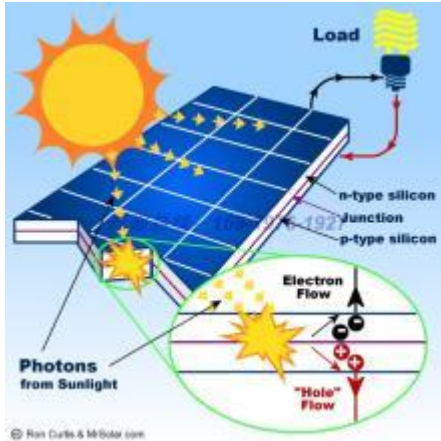
新能源科学与工程包含太阳能、风能、生物质能、地热能、海洋能、核能等，以及新型的能源利用、转化及储存等诸多方向，开设在物理、电气、能动、机电、材料、化学等不同学院。

2018年，新能源产业成为山东省新旧动能转换“**十强产业**”之一。

新能源科学是我国发展的主要战略性新兴产业之一，2011年教育部开始增设专业，近十年间全国已经迅速增加至数百所高校。

新能源科学与工程——培养方向

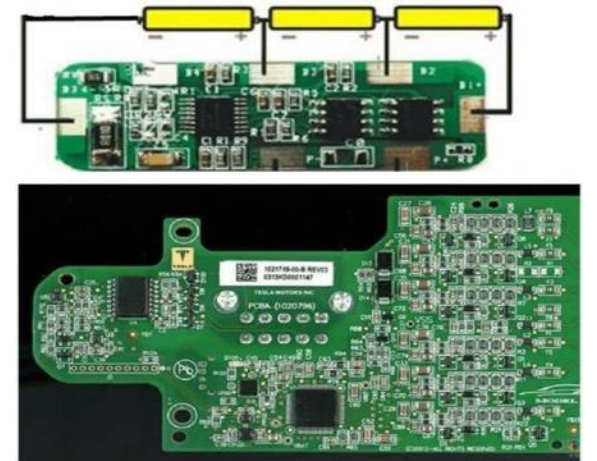
太阳能光伏发电系统



锂离子电池等新型储能技术



电源自动化管理系统



具有扎实物理基础的充满竞争力的新能源领域科学家和工程师

新能源科学与工程——课程设置

专业课程

光伏

光伏原理
固体发光
半导体物理
太阳能理论

储能科学

储能原理
锂离子电池
超级电容
物理化学

电源管理

数字电路
模拟电路
程序语言
电路原理

物理材料类

量子力学
固体物理
材料科学
薄膜物理

基础课程

高等数学、力、热、电、光、原子物理、数理方法等

新能源科学与工程——毕业生去向

■ 考研

- 16年考研率34%； 17年考研率50%； 18年考研率56%。



Build Your Dreams

■ 就业

- 全省规模以上新能源企业达到550家，实现销售收入1520亿元，利税232亿元。
- 新能源企业中，拥有国家级技术中心8个，省级技术中心15个。
- 电力电网系统

CATL
宁德时代



新能源科学与工程——研究生去向

免试保送

姓名	学年	学校
赵雪芹	2020	浙江大学
黄吉东	2020	中国科学院半导体所
蒋昊阳	2020	南开大学
李雪	2019	中国科学院物理所
逯丽莎	2019	中国科学院物理所
杨梦瑶	2018	西安交通大学
滕云雪	2018	同济大学
王鑫	2017	中国科学院青能所
刘亚立	2017	浙江大学
曾冉冉	2016	上海交通大学

储能器件
光伏技术
智能电网
热电材料
催化能源
微电子
物理学
功能材料

2019年新能源专业**10%**的学生进入中国科学院，其中2班考研率44%，1班考研双一流学校占比**100%**，详如下表：

李雪	中科院物理所
王志皓	中科院光机所
李晓	中科院宁波材料技术与工程研究所
吕承谱	中科院大学材料科学与光电技术学院
潘智鹏	半导体研究所
钟雷	电子科技大学材料与能源学院
彭小益	同济大学
林启隆	云南大学
牛群	上海科技大学

物理学（师范教育）

自1978年3月招收第一届物理专科师范生，到现在物理教育系经历了从培养专科生到本科生，再到研究生的发展历程，截至目前已经培养了36届本专科毕业生，五届研究生，为中学输送了2000余名物理教师，我们毕业生在青岛市初中物理教师中的占比达到60%-80%，为青岛基础教育做出了重大贡献。

人才培养目标

人才培养的整体目标为：培养具有良好的教师道德和教师素养，扎实的专业基础和专业技能，热爱教育事业、适应基础教育的新任教师。

校内外教学实践与教学比赛



建设了4所教学实践基地：39中、61中、崂山三中、崂山七中。

在各项教学比赛中成绩优异，先后4次获得省从业技能大赛一等奖，其中4为选手因此被青岛九中、黄岛一中、胶南四中等学校录用。



目录

一

学院简介

二

专业介绍

三

人才培养

产学研校企协同育人



山东大学海洋研究院



青岛青源峰达太赫兹科技有限公司



青岛市光电工程技术研究院



青岛海信电器股份有限公司



青岛众瑞智能仪器有限公司



青岛镭创光电技术有限公司



拔尖创新人才培养

本科生	赵惠 (2016届)	获国家奖学金，校长奖学金等7次。获 全国大学生数学建模大赛二等奖 ， 山东省大学生物理科技创新大赛一等奖 ，“挑战杯”省二等奖等5项。获山东省优秀学生、青岛大学十佳优秀学生等称号。参与发表论文1篇，申请发明专利8项，保送至中科院物理进行硕博连读。
	郭家 (2017届)	获国家奖学金，校长奖学金等8次。获 全国大学生数学建模竞赛二等奖 ， 山东省大学生物理科技创新大赛一等奖 等5项。获山东省优秀学生，青岛大学十佳优秀学生等称号。主持国家级大学生创新项目，参与发表论文1篇，参与申请发明专利1项。保送至中科院物理所进行硕博连读。
	孙力 (2018届)	获青岛大学校长奖学金，青啤育才奖学金等6次。获 国际大学生物理竞赛银奖 ， 全国大学生数学建模竞赛一等奖 ， 美国大学生数学建模竞赛二等奖 等6项。获山东省优秀学生，山东省优秀毕业生等称号。参与发表SCI论文1篇。 与路易斯安那州立大学合作完成科研项目1项 。先后在上海纽约大学，电子科技大学做访问学生，完成科研项目2项。
研究生	陈晓雯 (2016届)	第一作者在Opt Express等期刊发表SCI论文6篇 ，合作发表12篇，总影响因子37，他引116次。获国家奖学金、山东省优秀硕士论文、山东高等学校优秀科研成果一等奖（位次4）。
	刘奥 (2017届)	第一作者在Adv. Mater、Adv Funct Mater等期刊发表SCI论文15篇 ，合作发表16篇，总影响因子超120，授权发明专利2项。获国家奖学金、山东省研究生优秀创新成果二等奖、省十大优秀学生称号。
	席中男 (2018届)	第一作者在Nature Communications、ACS Applied materials& interface、Appl. Phys. Lett. 期刊发表SCI论文3篇 ，合作在Phys. Rev. B, Appl. Phys. Lett.等期刊发表多篇。获国家奖学金。



打造“一二三四五”人才培养体系

一：以立德树人为核心

二：推进专业教育与人格教育两相结合

三：实现全员、全方位、全过程的“三全”育人

四：打造有温度、有温情、有温暖、有温馨的育人环境

五：帮助和引导学生实现成人、成才、成器、成事、成功

了解学科、做好规划

- 思考个人职业生涯
- 思考本科四年学业
- 广泛关注，拓展视野
- 初步坚定考研决心
- 摸索个人学习方法

掌握方法、打好基础

- 夯实专业知识基础
- 学习习惯和方法定型
- 思考专业方向选择

充分备考、选择方向

- 扎实专业知识体系
- 初步确立学校及科目
- 针对性的考试课学习
- 准备备考资料

科学备考、重视面试

- 掌握招生政策及学科特点
- 科学复习备考
- 考前联系学校及导师
- 多环节准备复试
- 根据需要进行调剂

一年级

培养意识、坚定信念

- 学科专业背景教育
- 专业考研就业前景介绍
- 学习方法指导活动
- 学风建设活动
- 职业生涯规划个别指导

二年级

紧抓教学、夯实基础

- 抓好专业基础课程教学
- 督促四六级考试
- 培育创新意识
- 引导了解参加双创及竞赛

三年级

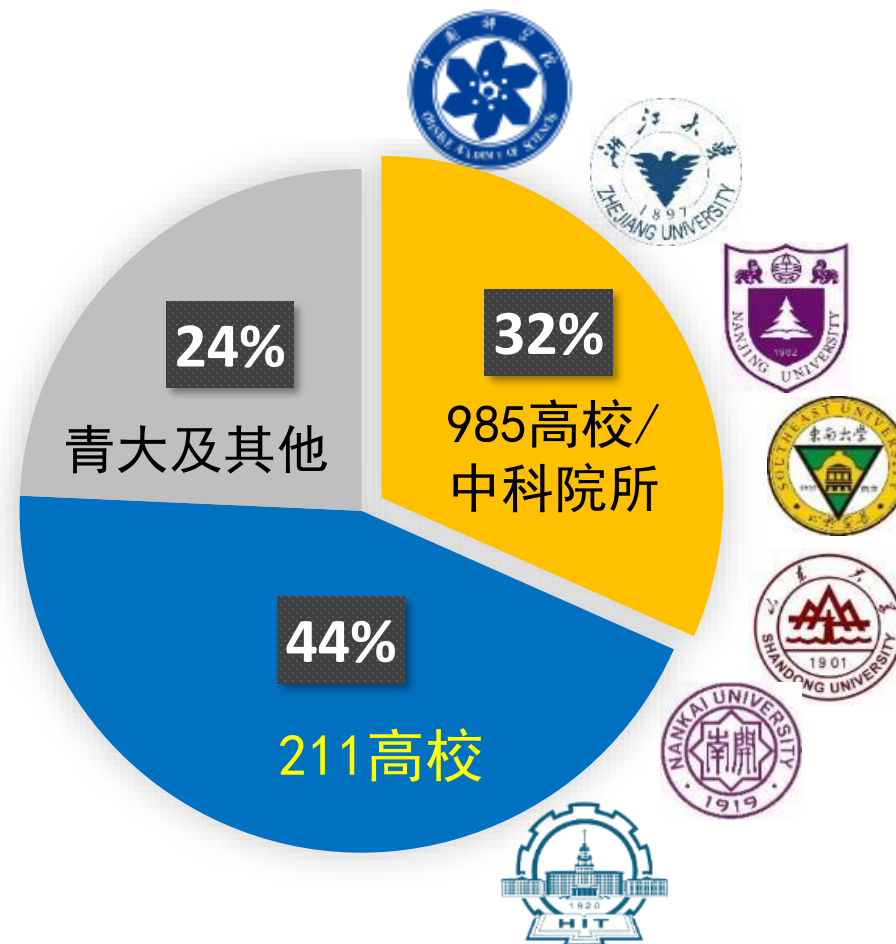
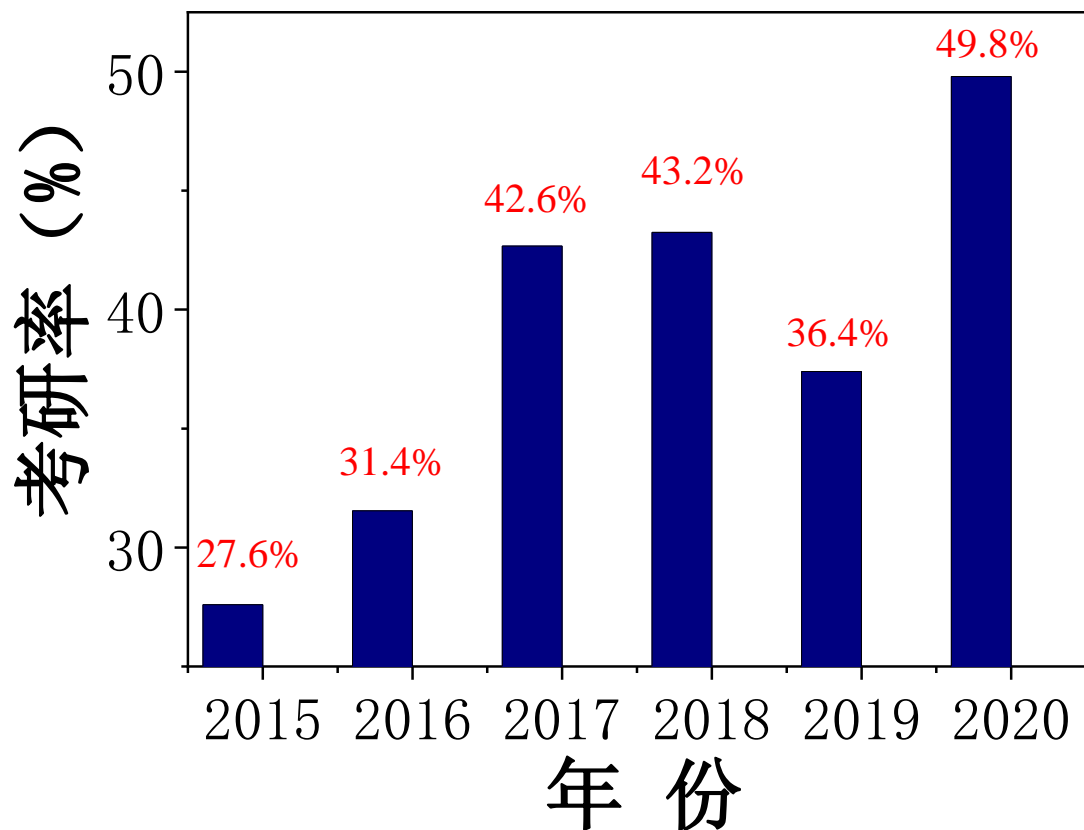
专业教育、素质教育

- 考虑考研需求的专业课程
- 考研专业方向指导
- 专业课课外辅导
- 双创活动及竞赛指导

四年级

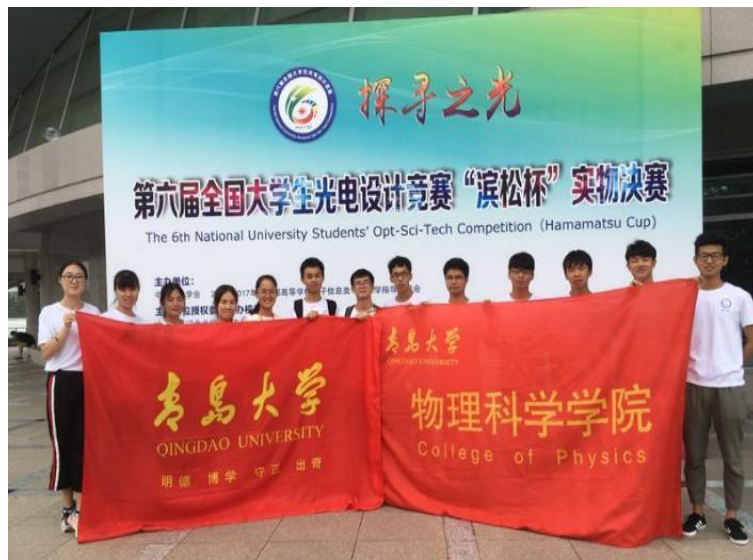
合理排课、综合辅导

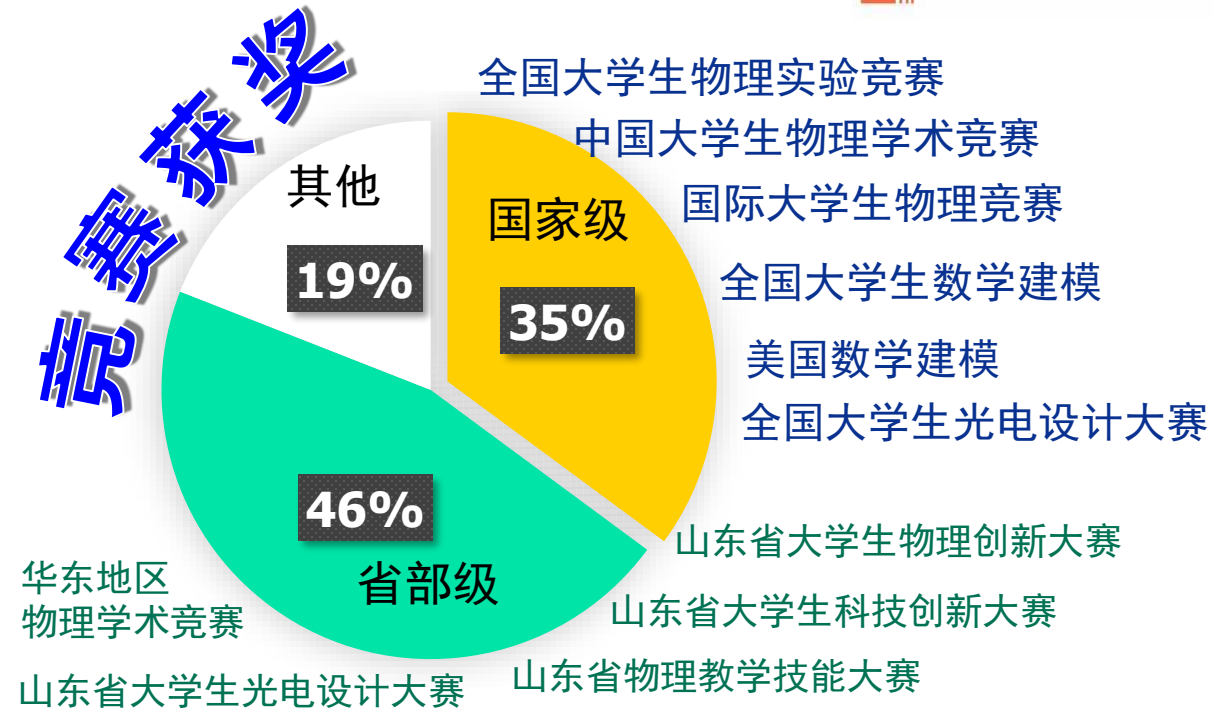
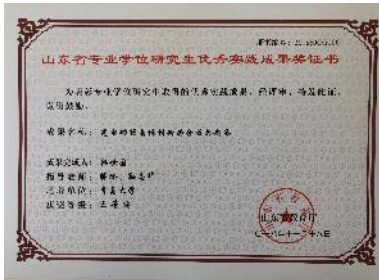
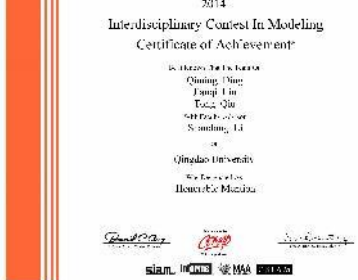
- 考虑考研复习适当排课
- 专业课程考研辅导
- 基于考前激励的心理辅导
- 协助学生联系学校
- 复试专业课指导
- 面试技巧及面试礼仪指导
- 协助学生联系调剂学校



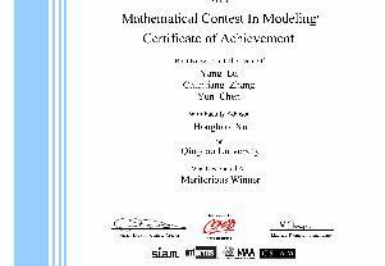
全额或部分奖学金去美国、德国等国外高校攻读学位
保送/考取北京大学、清华大学、浙江大学、南京大学、中科院等高校或科研院所

组织培养学生参加各种竞赛学生获奖





近五年竞赛获奖1100余人次，人均获奖率78%



本科生参与科研项目——提升创新能力，助力考研成功



发文数量

发文占比

发文质量



专业	考研深造人数	班级人数	考研深造率
新能源1班	14	31	45.2%
新能源2班	17	31	54.8%
光电1班	14	36	38.9%
光电2班	14	32	43.8%
材料1班	23	32	71.9%
材料2班	22	30	73.3%
应物1班	18	33	54.5%
应物2班	16	29	55.2%
物理师范	8	39	20.5%
平均值	146	293	49.8%

校友效应 薪火相传



第二届校友理事会（2019）



上海校友理事会（2016）



1988级校友返校



1995级校友返校



1998级校友返校

优秀校友



张海波，1991届
威海市市委书记



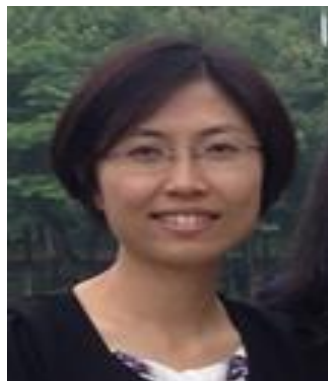
王志明，1992届
电子科技大学教授
国家高层次人才计划
特聘教授



郭霞，1994届
北京工业大学教授
国家长江学者特聘教授



何春雷，1991届
青岛众瑞智能仪器
有限公司总经理



赵清，2001届
北京大学教授、博导
国家优青



栾伟玲，1992届
华东理工大学教授、
研究生院副院长



姜校顺，2004届
江苏省杰青，南
京大学“登峰人
才支持计划”



王垚，1986届，
全国优秀教育工作者；
全国优秀物理教研员；
山东省特级教师。



王书浩，2012届，
清华大学博士，博士
后，透彻影像联合创
始人和技术总监
(CTO)



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博学 明德 守正 出奇

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网址: <http://physics.qdu.edu.cn/> 电话: 0532-85955977



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