

PHYSICS TEACHING 国内统一连续出版物号：

CN31-1033/G4



物理教学

2017.12

● 中国科学技术协会主管 ● 中国物理学会主办 ● 中国科协优秀期刊 ● 中等教育类核心期刊

- 2017 年诺贝尔物理学奖和引力波
- 基于物理课程标准的教学目标设计与案例分析
- 以“学”为中心的物理实验教学策略
- 初中物理核心素养与关键能力的研究及测评实践
- 重视概念建立 发展核心素养
——“匀速圆周运动快慢的描述”教学设计
- 殊途同归求极值，数理双璧相媲美

12



中国物理学会
Chinese Physical Society

物理教学

PHYSICS TEACHING

2017

第39卷 第12期
(总第439期)
月刊(1978年创刊)

主管:中国科学技术协会
主办:中国物理学会
协办:上海市物理学会
编辑出版:《物理教学》编辑部

主编:陈群
副主编:陈树德 胡炳元 徐淀芳
蒋最敏 蔡铁权
编辑部主任:黄燕萍
封面题字:谢稚柳

目
录

● 专 论 ●	2017年诺贝尔物理学奖和引力波	黄燕萍	沈珊雄(2)
● 教学论坛 ●	基于“大中衔接”的超导物理科普教学设计	张燕怡	刘 娜(4)
	基于物理课程标准的教学目标设计与案例分析	张金玉	张艳燕(8)
	两个带电摆球的“平衡定律”	宋辉武	于 冰(12)
	实践物理慢课堂,体验悟理高效率		郭振京(14)
● 物理实验室 ●	两种实验思想在一道计算题中的精彩渗透		倪富昌(17)
	以“学”为中心的物理实验教学策略		张新华(19)
	浅谈基于数字化实验系统的实验教学对提升物理学科核心素养的作用		倪亚清(23)
	对验证动量守恒实验中“小球落点问题”的探讨		周 勇(25)
● 教研巡礼:江苏 ●	物理课堂教学设计的三个基石——以“涡流 电磁阻尼和电磁驱动”教学为例		谭庆仁(27)
	核心素养视角下高中物理课堂教学目标的制定	陈 野	黄开智(29)
	基于物理原始问题的项目式学习在物理教学中的应用		唐晓挺(33)
	“四基”目标下的物理教学策略——以“电流和电流表的使用”教学为例		黄 波(36)
● 初中园地 ●	初中物理核心素养与关键能力的研究及测评实践	叶 兵	孙德生(39)
	DISLab 大气压强测定器		冯伊迪(44)
● 教研员论坛 ●	重视概念建立 发展核心素养——“匀速圆周运动快慢的描述”教学设计		李冈心(46)
● 命题与解题 ●	殊途同归求极值,数理双璧相媲美	魏国强	鲁 湘
	N 维超立方体对角线电阻的简明计算	李永乐	魏 澜(54)
	利用 Excel 巧画物理渐变问题图象		仇园园(57)
	“动体”正碰“静体”后两物体的速度范围		李 军(60)
● 高考与竞赛 ●	新高考改革背景下优化高中物理实验教学的策略研究		孙建忠(62)
	对上海物理等级考(高考)压轴题的分析与思考		顾轩豪(68)
	能力与素养并重,创新与继承共存——基于对一道 2017 年浙江选考试题的评析	陶士金	方 林
	辅助圆在图解法解决动态平衡问题中的应用——由 2017 年高考全国 I 卷的一道试题引发的思考		曹豆豆(72)
● 生活与物理 ●	谈测空气密度的一种简易方法		陈正国(74)
	2017 年《物理教学》总目录		(75)

编辑部地址:上海市中山北路 3663 号
(华东师范大学内)
邮政编码:200062
电话(传真电话):(021)62232813
E-mail:wljx@phy.ecnu.edu.cn
网址:http://wljx.ecnu.edu.cn
排版:南京前锦排版服务有限公司

印刷:江苏省宜兴市德胜印刷有限公司
国内发行:上海市报刊发行局
国外发行:中国国际图书贸易集团有限公司
(北京 399 信箱)
发行方式:公开发行
订购处:全国各地邮局
广告许可证:07017

国际标准连续出版物号
ISSN:1002-0748
报刊代号:4-284
国内统一连续出版物号
CN31-1033/G4
国外刊号:M356
出版日期:2017年12月18日
国内定价:12.00元

Physics Teaching

12

2017

Monthly

(founded in 1978)

Vol. 39, No. 12

(cumulative 439)

Sponsor:

Chinese Physical Society

Editor:

Editorial Board of

Physics Teaching,

Chinese Physical Society

Chief Editor:

Chen Qun

Office:

3663 N. Zhongshan Road

Shanghai 200062

(East China Normal University)

Telephone:

86 - 21 - 62232813

Fax: 86 - 21 - 62232813

Email: wljx@phy.ecnu.edu.cn

http://wljx.ecnu.edu.cn

Distributor:

China International

Book Trading

Corporation (P. O. Box 399,

Beijing)

Code Number:

M356

Date of Publication:

12 - 18 - 2017

Forum

The 2017 Nobel Prize in physics and gravitational wave

..... Huang Yanping, Shen Shanxiang(2)

Teaching Forum

The teaching design of the superconductor based on the link with university and middle school

..... Zhang Yanyi, Liu Na(4)

Design of teaching objectives based on physics curriculum standards and analysis of their cases

..... Zhang Jinyu, ZhangYanyan(8)

Two charged pendulum balls and its law of equilibrium

..... Song Huiwu, Yu Bing(12)

Practice slow physics classroom teaching to experience enlightenment efficiency

..... Guo Zhenjing(14)

Physics Laboratory

Two experiment ideas are well penetrated in a problem

..... Ni Fuchang(17)

Teaching strategies of physics experiments on centering around learning

..... Zhang Xinhua(19)

Discussion of the improvement of physics core quality based on DIS experiments.

..... Ni Yaqing(23)

The discussion of ball dropping problem in the experiment of momentum conservation

..... Zhou Yong(25)

Pilgrimage of Teaching Research: Jiangsu

The three foundations in physics classroom teaching design

..... Tan Qingren(27)

The establishment of classroom teaching objective from the perspective of core

accomplishment

..... Chen Ye, Huang Kaizhi(29)

Application of project-based learning in physics teaching based on original problems

..... Tang Xiaoting(33)

The physics teaching strategies under the "four base" target

..... Huang Bo(36)

Junior Physics

The research of physics core quality and key ability in junior physics and its evaluation

..... Ye Bing, Sun Desheng(39)

The atmospheric pressure tester with DISLab

..... Feng Yidi(44)

Education Inspectors Forum

The teaching design of uniform circular motion description

..... Li Menxin(46)

Questions Assigned and Solved

All roads are equal to the best by using mathematical methods

..... Wei Guoqiang, Lu Xiang, Hou Jianmin(50)

The simple calculation of the resistance on the n-dimensional hypercube diagonal

..... Li Yongle, Wei Lan(54)

Use Excel to draw the images of physics gradient problems

..... Chou Yuanyuan(57)

The speed range of two objects encountered from "moving" to "static"

..... Li Jun(60)

High-Exams and Competition

Study on the Strategy to optimize physics experiment teaching under the background of new reform in high-exams

..... Sun Jianzhong(62)

Analysis of the last problem in the physics grade test and its reflection

..... Gu Xuanhao(68)

Analyze a problem in the 2007 Zhejiang high-exams

..... Tao Sijing, Fang Lin, Xu Xinsheng(70)

Thinking about a problem in 2017 national I high-exams

..... Cao Doudou(72)

Physics in Daily Life

A simple way to measure air density

..... Chen Zhengguo(74)

Total contents of the year 2017 of "Physics Teaching"

..... (75)

ISSN 1002-0748



Physics Teaching

12

2017

Monthly

(founded in 1978)

Vol. 39, No. 12

(cumulative 439)

Sponsor:

Chinese Physical Society

Editor:

Editorial Board of

Physics Teaching,

Chinese Physical Society

Chief Editor:

Chen Qun

Office:

3663 N. Zhongshan Road

Shanghai 200062

(East China Normal University)

Telephone:

86 - 21 - 62232813

Fax: 86 - 21 - 62232813

Email: wljx@phy.ecnu.edu.cn

http://wljx.ecnu.edu.cn

Distributor:

China International

Book Trading

Corporation (P. O. Box 399,

Beijing)

Code Number:

M356

Date of Publication:

12 - 18 - 2017

ISSN 1002-0748



Forum

The 2017 Nobel Prize in physics and gravitational wave

..... Huang Yanping, Shen Shanxiang(2)

Teaching Forum

The teaching design of the superconductor based on the link with university and middle school

..... Zhang Yanyi, Liu Na(4)

Design of teaching objectives based on physics curriculum standards and analysis of their cases

..... Zhang Jinyu, ZhangYanyan(8)

Two charged pendulum balls and its law of equilibrium

..... Song Huiwu, Yu Bing(12)

Practice slow physics classroom teaching to experience enlightenment efficiency

..... Guo Zhenjing(14)

Physics Laboratory

Two experiment ideas are well penetrated in a problem

..... Ni Fuchang(17)

Teaching strategies of physics experiments on centering around learning

..... Zhang Xinhua(19)

Discussion of the improvement of physics core quality based on DIS experiments.

..... Ni Yaqing(23)

The discussion of ball dropping problem in the experiment of momentum conservation

..... Zhou Yong(25)

Pilgrimage of Teaching Research: Jiangsu

The three foundations in physics classroom teaching design

..... Tan Qingren(27)

The establishment of classroom teaching objective from the perspective of core

accomplishment

..... Chen Ye, Huang Kaizhi(29)

Application of project-based learning in physics teaching based on original problems

..... Tang Xiaoting(33)

The physics teaching strategies under the "four base" target

..... Huang Bo(36)

Junior Physics

The research of physics core quality and key ability in junior physics and its evaluation

..... Ye Bing, Sun Desheng(39)

The atmospheric pressure tester with DISLab

..... Feng Yidi(44)

Education Inspectors Forum

The teaching design of uniform circular motion description

..... Li Menxin(46)

Questions Assigned and Solved

All roads are equal to the best by using mathematical methods

..... Wei Guoqiang, Lu Xiang, Hou Jianmin(50)

The simple calculation of the resistance on the n-dimensional hypercube diagonal

..... Li Yongle, Wei Lan(54)

Use Excel to draw the images of physics gradient problems

..... Chou Yuanyuan(57)

The speed range of two objects encountered from "moving" to "static"

..... Li Jun(60)

High-Exams and Competition

Study on the Strategy to optimize physics experiment teaching under the background of new reform in high-exams

..... Sun Jianzhong(62)

Analysis of the last problem in the physics grade test and its reflection

..... Gu Xuanhao(68)

Analyze a problem in the 2007 Zhejiang high-exams

..... Tao Sijing, Fang Lin, Xu Xinsheng(70)

Thinking about a problem in 2017 national I high-exams

..... Cao Doudou(72)

Physics in Daily Life

A simple way to measure air density

..... Chen Zhengguo(74)

Total contents of the year 2017 of "Physics Teaching"

..... (75)