

The List of Winners to 2017 S.-T. Yau High School Sciences Awards

Grand Prize

Tsinghua University High School

Students: Wanrong He

Advisers: Jianjun Zhou, Yungui Zhang

Paper Title: A study of Geometry Lecturing Tool based on GeoGebra Automatic Plotting

Mathematics

Gold Prize

NIS Almaty for Physics and Mathematics

Students: Aknazar Kazhymurat

Advisers: Dauren Aitmukhamet

Paper Title: On a Lower Bound for the Energy Functional for a Certain Family of Lagrangian Tori in CP^2

Silver Prize

Deerfield Academy

Students: Simon Kai Hung Lam

Advisers: Xianfeng David Gu

Paper Title: Geometric Data Analysis Based on Optimal Mass Transportation

Bronze Prize

(1)Ningbo Xiaoshi High School

Students: Zhihe Li

Advisers: Cindy Boyd, David Ochoro

Paper Title: A family of sequences generated by eliminating some prime factors from the sequence of the naturals

(2)Shenzhen Middle School

Students: Minghao Pan

Advisers: Wentao Zhang

Paper Title: Quotients of Hurwitz Primes

(3)Phillips Academy

Students: Kaiying Hou

Advisers: Jayson Lynch

Paper Title: The Hardness of Finding Hamiltonian Cycle in Grids Graphs of Semiregular Tessellations

Honorable Mention

(1)The High School Affiliated to Renmin University of China
Students: Zhongzi Wang
Advisers: Shaoyuan Zheng
Paper Title: Distributions of Points on Non-extensible Closed Curves in R^3 Realizing Maximum Total Energies

(2)The High School Affiliated to Renmin University of China
Students: Bangzheng Li
Paper Title: Some Studies on Quadratic Diophantine Equations

(3)The Affiliated High School of Peking University
Students: Jishi Sun
Advisers: Zhichao Shan
Paper Title: On Branching Process with a Threshold and its Generalization

(4)The Affiliated High School of SCNU
Students: Wensen Wu
Advisers: Jingwei Ge
Paper Title: Evans Triangles and Edwards Curves

(5)The Wellington School, USA
Students: Grace M. Tian
Advisers: Vishal Patil
Paper Title: Linear Upper Bound on the Ribbonlength of Torus Knots and Twist Knots

Physics

Gold Prize

Nanjing Foreign Language School
Students: Jianchao Gen, Yunhao Qian, Yi Fang
Advisers: Jing Du, Zhimin Pan
Paper Title: Chladni Figures: Two-dimensional Plate Vibration Theory, Vibration Mode Measurement and Particle Dynamics

Silver Prize

The High School Affiliated to Renmin University of China
Students: Wenyan Guan, Jiachen Pan
Advisers: Xi Chen, Yongping Zhang
Paper Title: Investigation on Blender Lift Effect

Bronze Prize

(1)Beijing National Day School
Students: Haowei Liang, Xiaochen Yang
Advisers: Zhonghuan Zhang
Paper Title: The Study of Probabilities and Dynamics of Unfair Dice

(2)Beijing No.2 High School

Students: Yiqi Jiang, Zelong Yin, Shuo Huang
Advisers: Dunli, Liao
Paper Title: Study of Kite's 8-Shaped Trajectory

(3)Shandong Experimental High School

Students: Ruiwen Kong

Advisers: Qiao Zhuang, Lei Shi

Paper Title: Experimental Exploration of Echo Manipulation of the Outer Ears in a Rickett's big-footed Bat

Honorable Mention

(1)Fuzhou No.3 High School

Students: Chengxiang Lin, Xinyao Li

Advisers: Lizhen Wei, Jie Lin

Paper Title: Study of a Kind of Unsmooth Resistance-reducing Surface Texture Based on the Boundary Layer Theory

(2)Qingdao No.2 Middle School of Shandong Province

Students: Chenghao Lu, Shiyuan Liu, Junting Lu

Advisers: Peng Li

Paper Title: Investigating Leidenfrost Point under an Airflow Condition

(3)Guangzhou No.6 Middle School

Students: Hongyi Zhan, Xinying Fu, Xiaoyong Gao

Advisers: Bin Qu

Paper Title: Research and Application of Magnetizing Characteristics of Spinel Ferrite Magnetic Fluid

(4)No.2 High School of East China Normal University

Students: Cheng Cheng

Advisers: Zhentang Wang

Paper Title: Experimental and Theoretical Studies on the Generation of the "Sunburst Effect" in Photography with a Dodecagonal Aperture

(5)Nanjing Foreign Language School

Students: Yifan Liu, Qingyuan Liu

Advisers: Zhimin Pan

Paper Title: Real-time Measurement of Three-Dimensional Morphology of Water Wave by a Laser Beam Array

Chemistry

Gold Prize

Nanjing Foreign Language School

Students: Yuncong Zuo, Ran Fang, Zixin Chen

Advisers: Liangliang Xu

Paper Title: Microfluidic-Directed Assembly of Versatile Colloidal Photonic Crystal Supraballs toward Display and Sensing

Silver Prize

Nanjing Foreign Language School

Students: Daniel Bi , Jingyi Liu

Advisers: Zhibing Cao, Jing Chen

Paper Title: Screening and Evaluation of the Risk Factors in Drinking Water based on High Throughput Methods

Bronze Prize

(1)Beijing National Day School

Students: Zhiyi Wang

Advisers: Mingjun Teng, Guanghui Ma

Paper Title: An Effective Chitosan Based Hydrogel that Improves the Efficiency of Intranasal Vaccination

(2)Guangzhou Experimental High School

Students: Zhengnong Huang

Advisers: Zhengyong Hu

Paper Title: Study on Galactomannan-Based Food Packaging Material and its Functionalization

(3)Changchun Jida Middle School Experimental School

Students: Junyi Hao

Advisers: Jinhua LI, Wei Feng

Paper Title: Preparation of Visible Light Responding ZnFe₂O₄/TiO₂ via Biological Templates and Photocatalytic Performance for the Degraded Beta-Cypermethrin Pesticides

Honorable Mention

(1)The High School Affiliated to Renmin University of China

Students: Haoying Yang, Wenhong Cui

Advisers: Bo Wang, Dan Wan

Paper Title: Synthesis and Energy Storage Application of a Highly Bimetal Dispersed Nanomaterial derived from Metal-Organic Frameworks

(2)Beijing National Day School

Students: Haotian Zhao

Advisers: Shiyuan Sun

Paper Title: Synthesis of Enzyme-Metal Organic Framework Composites for Fast Detection of Hydrogen Peroxide

(3)Nanjing Foreign Language School

Students: Yang Yan

Advisers: Wei Zhou, Liangliang

Paper Title: Development and Application of High Performance Intermediate - Low Temperature Solid Oxide Fuel Cell Cathode Materials

(4)The High School Affiliated to Renmin University of China

Students: Wenyan Guan, Shaoxun Liu, Zimeng Yang

Advisers: Zilong Zhao

Paper Title: On Improved and Novel Measurement of the Avogadro Constant

(5)Nanjing Foreign Language School
Students: Jie Ji, Tong Gao, Peirong Xie
Advisers: Henmei Ni, Jing Chen
Paper Title: Development of Multi-Pulsed Drug Delivery System by Mimicking the Spontaneously Self-organized Liesegang Pattern

Biology

Gold Prize

Zhixin High School
Students: Zhan Cha, Musen Lin, Wenkang Lei
Advisers: Rong Qin
Paper Title: Optimized Methodologies Evoked New Mechanism of the Venus Flytrap's Closure

Silver Prize

The High School Attached to Northeast Normal University
Students: Xiangfei Meng
Advisers: Yu Li
Paper Title: Biological Researches on a New Species of Model Organism — Taxonomy, Ontogeny And Molecular Phylogenetic Studies of *Dictyostelium Minimum*

Bronze Prize

(1)Nanjing Foreign Language School
Students: Yifei Yang, Jingyao Gong, Chuanyan Dai
Advisers: Xidong Zhang, Shixia Xu
Paper Title: Feeding on Animals or Plants: Evolution of Enamel-Related Genes and its Relationship with Food Habits in Mammals

(2)The High School Affiliated to Renmin University of China
Students: Shuoqiu Li
Advisers: Li Li
Paper Title: Preliminary Study on Fingertip Photoplethysmography (PPG)

(3)The High School Affiliated to Renmin University of China
Students: Tianyao Liu, Yuan Meng, Haoyu Xu
Advisers: Feng Li
Paper Title: Phytohormone Jasmonates Trigger Polar Signal Transprot and Regulate Insect-trapping Movement in *Drosera*

Honorable Mention

(1)Chongqing Nankai Middle School
Students: Yijin Fang
Advisers: Shengbin Chen
Paper Title: The Protective Effect of Huajiaosu in Combination with Simvastatin on Vascular Functions in Obese Rats and its Mechanism

(2)Shanghai World Foreign Language Academy

Students: Xinling Wan

Advisers: Jilong Liu

Paper Title: Effects of Acivicin and DON on the Formation of Cytoophidia in *Drosophila* Testis

(3)Tsinghua University High School

Students: Jiani Chen

Advisers: Qiong Wu

Paper Title: From Waste to Treasure: Turning Activated Sludge into Bioplastic PHB

(4)Guangdong Experimental High School

Students: Haoran Lu, Luxuan Zhang

Advisers: Qingmei Xie, Yihu Chen

Paper Title: The Secret of Virus and Intestinal Microflora—A Study on the Mechanism of Intestinal Microflora Translocation Post H9N2 AIV-Infection in Mice

Computer

Gold Prize

Tsinghua University High School

Students: Wanrong He

Advisers: Jianjun Zhou, Yungui Zhang

Paper Title: A Study of Geometry Lecturing Tool Based on Geogebra Automatic Plotting

Silver Prize

Zhuhai No.1 High School

Students: Chentian Li

Advisers: Qingsheng Liang

Paper Title: UPP & Its Implementation

Bronze Prize

(1)The Affiliated High School of SCNU

Students: Xuesen Yang

Advisers: Xiao'an Yang

Paper Title: Faster R-CNN over Attention: Shared Bikes Detection in Surveillance Video

(2)Middlesex School

Advisers: Xinkai Fu

Students: Zhengyang Dong

Paper Title: Ensemble Methods of Machine Learning Models for Critical Metal Stock Trend Prediction

(3)No.2 High School of East China Normal University

Students: Haoyu Ma

Advisers: Zhentang Wang

Paper Title: The Design of Low-cost Data Glove and Research on Medium Vocabulary Continuous Gesture Language Recognition

Honorable Mention

(1) Hangzhou Foreign Language School

Students: Yichi Yang, Guangzi Xu

Advisers: Shuiguang Deng, Yifei Xu

Paper Title: Theft of Electricity Detection Based on Supervised Learning

(2) Tsinghua University High School

Students: Yushi Luo

Advisers: Jia Jia, Yihui Ma

Paper Title: Clothing Aesthetics Modeling Based on Deep Learning

(3) Guangdong Experimental High School

Students: Ruilin Zhang

Advisers: Zhiming Dai, Zhengyong Hu

Paper Title: A New Algorithm on Detecting Structural Variations with no Reference Genome

(4) Wuxi Big Bridge Academy

Students: Yifan Zhou

Advisers: Yong Wu

Paper Title: A Behavior Based File Checkpointing Strategy

(5) The High School Affiliated to Renmin University of China

Students: Wenyan Guan

Advisers: Jun Zhu, Hang Su

Paper Title: Chinese Characters Style Transfer Using WGAN