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## Review of Project Applications and Funding in the 2024 NSFC Astronomy Discipline: Postprint

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**Date:** 2025-04-02T00:00:00+00:00

### Abstract

A detailed analysis was conducted on the application and funding status of astronomy discipline projects under the National Natural Science Foundation of China in 2024, categorized by application volume, funding volume, funding ratio, applicant age, gender, host institution, and other dimensions. In conjunction with the new policies of the National Natural Science Foundation of China, the evolving trends in the application and funding of astronomy discipline projects were expounded. Simultaneously, a series of issues encountered during the review process of the 2024 fund projects were thoroughly examined, aiming to provide valuable reference and guidance for applicants of astronomy discipline fund projects in 2025.

### Full Text

#### Preamble

Vol. 43, No. 1

#### March 2025

*Progress in Astronomy* Vol. 43, No. 1 Mar., 2025 doi: 10.3969/j.issn.1000-8349.2025.01.11

## Review of Applications and Funding for the Astronomy Discipline of the National Natural Science Foundation of China in 2024

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**Abstract:** This paper presents a detailed analysis of the application and funding statistics for the astronomy discipline of the National Natural Science Foundation of China (NSFC) in 2024, examining application volumes, funding volumes, funding rates, and the distribution of applicants by age, gender, and supporting institution. In conjunction with new NSFC policies, we elucidate emerging trends in the application and funding of astronomy projects, and conduct an in-depth discussion of various issues encountered during the 2024 review process to provide valuable references for applicants in 2025.

**Keywords:** National Natural Science Foundation of China; astronomy; application; funding

## 1 Introduction

The Department of Astronomy in the Division of Mathematical and Physical Sciences of the National Natural Science Foundation of China (hereinafter referred to as NSFC) primarily receives grant applications in the research areas of astrophysics, fundamental astronomy, and astronomical technology and methods. The application and review process for all types of NSFC programs in 2024 has been largely completed. This review provides a statistical analysis of the projects applied for and funded by the Department of Astronomy, and offers a comprehensive report to the astronomical community on the specific details of the 2024 review process, particularly the various issues encountered during evaluation, with the aim of providing valuable references for the majority of astronomers.

### 2.1 Overall Statistics

During the 2024 centralized application period, the Department of Astronomy received 724 applications for General Program (面上项目), representing an increase of 188 applications (35.1% growth) compared to 2023 (the Division of Mathematical and Physical Sciences grew by 48.7%, and NSFC overall by 48.8%). For Young Scientists Fund (青年科学基金), 454 applications were received, an increase of 52 (12.9% growth) compared to 2023 (Division: 14.6%, NSFC: 11.3%). The Regional Science Fund (地区科学基金) received 76 applications, an increase of 19 (33.3% growth) (Division: 12.2%, NSFC: 13.2%). Key Program (重点项目) applications totaled 79, an increase of 17 (27.4% growth) (Division: 13.1%, NSFC: 4.8%). Applications for the National Science Fund for Distinguished Young Scholars (国家杰出青年基金) numbered 68, a decrease of 1 (-1.4% growth) (Division: 18.9%, NSFC: 15.9%). The Excellent Young Scientists Fund (优秀青年基金) received 76 applications, a decrease of 3 (-3.8% growth) (Division: 9.7%, NSFC: 8.6%). Major Research Instrumentation Projects (重大科研仪器研制项目) received 16 applications (3 department-recommended and 13 free-application), a decrease of 2 from 2023 (6 department-recommended and 12 free-application), representing -11.1% growth (Division: 1.0%, NSFC: 15.1%). In total, the Department of Astronomy processed 1,493 applications in 2024,

an increase of 270 (22.0% growth) compared to 2023 (Division: 25.4%, NSFC: 26.7%). Five applications failed the formal review and were not accepted. For brevity, these programs are hereafter referred to as General, Young, Regional, Key, Distinguished Young, Excellent Young, and Major Instrumentation. This review focuses primarily on the first six categories.

The Department of Astronomy consistently adheres to NSFC' s review principles of relying on experts, promoting democracy, selecting the best for support, and ensuring fairness and reasonableness. We thoroughly implement classified review of proposals and strictly follow all NSFC regulations and rules. When selecting peer review experts, we primarily utilize NSFC' s intelligent assignment system, ensuring that proposals with similar content are reviewed by the same panel of experts whenever possible. We pay attention to combining broad and specialized expertise, consider geographic and age distribution of experts, and strictly avoid conflicts of interest including same-institution relationships, teacher-student relationships, relatives, co-authors, and project collaborators. In program classification and panel review, we consistently prioritize scientific excellence while coordinating balanced development across sub-disciplines, appropriately favoring relatively underdeveloped regions and institutions, and providing appropriate support for female applicants. We encourage research closely integrated with practical problems and support small sub-disciplines.

In 2024, the Department of Astronomy funded 106 General Program projects, 104 Young Scientists Fund projects, 12 Regional Science Fund projects, 13 Key Program projects, 5 Distinguished Young Scholars projects, 8 Excellent Young Scientists projects, and 2 Major Instrumentation projects (1 department-recommended and 1 free-application). Table 1 lists the application numbers, funded numbers, funding rates, and comparisons with 2023 data for these six categories. The funding rate for General Program projects fell to 14.6%, a significant decrease from last year. Funding rates for Young, Regional, and Key programs also decreased to varying degrees, while rates for Distinguished Young and Excellent Young programs remained essentially unchanged [1].

## 2.2 Further Analysis by Program Category

General, Young, and Key programs constitute the main body of astronomy discipline funding, representing the largest application and funding volumes. We conducted further analysis of these three categories to reflect the current state of disciplinary development. Classified by primary application code (A14-A19), the application and funding data for these three categories are summarized in Table 2 and compared with 2023 data. The total number of funded projects in 2024 remained essentially flat compared to 2023, with a similar distribution across research fields.

Classifying applicants and funded investigators (considering only principal investigators when projects involve participants) by age for General, Young, Regional, and Key programs yields the results shown in Table 3 and Table 4 . Applicants

for General and Regional programs are concentrated primarily in the 36–45 age range, accounting for 70% of total applications. For Young programs, the 31–35 age group has the largest number of applicants. These results are consistent with 2023 data. For General, Young, and Regional programs, the average age and age distribution of applicants and funded investigators are essentially consistent. For Key programs, however, the average applicant age is 48.3 years, and the average funded investigator age is 50.9 years, both higher than in 2023.

For General, Young, Regional, and Key programs, Table 5 presents statistics on the gender of applicants and funded investigators. As in previous years, the proportion of females among applicants and funded investigators is significantly lower than males across all program categories. However, the gender ratio is more balanced in Young program applications and funding statistics.

We also identified the top ten supporting institutions by application volume for General and Young programs, which represent the largest annual application volumes. For General programs in 2024, the top ten institutions by application volume were: National Astronomical Observatories of Chinese Academy of Sciences (NAOC), Yunnan Observatories of Chinese Academy of Sciences, Shanghai Astronomical Observatory of Chinese Academy of Sciences, Purple Mountain Observatory of Chinese Academy of Sciences, Nanjing Institute of Astronomical Optics & Technology of Chinese Academy of Sciences, Institute of High Energy Physics of Chinese Academy of Sciences, Sun Yat-sen University, Shandong University, Xinjiang Astronomical Observatory of Chinese Academy of Sciences, and National Time Service Center of Chinese Academy of Sciences. For Young programs in 2024, the top ten institutions were: NAOC, Purple Mountain Observatory, Shanghai Astronomical Observatory, Nanjing Institute of Astronomical Optics & Technology, Nanjing University, University of Science and Technology of China, Xinjiang Astronomical Observatory, Institute of High Energy Physics, National Time Service Center, and Tsinghua University.

Additionally, we counted the number of supporting institutions covered by applications and funding for each program category (institutions that submitted at least one proposal of that type), as shown in Table 6. Notably, General program applications covered 153 institutions in 2024, and Young program applications covered 151 institutions. Among these, 53 institutions successfully obtained at least one General program grant, and 60 institutions received at least one Young program grant. These numbers far exceed levels from a decade ago, demonstrating not only the growing strength of China's astronomical research community but also the vigorous development and prosperity of astronomy research in China [1,2].

In 2024, the Department of Astronomy received 68 Distinguished Young Scholar applications and 76 Excellent Young Scientist applications, representing decreases of 1 and 3 applications respectively compared to 2023. Following peer expert evaluation and discussion and voting at the Division of Mathematical and Physical Sciences meeting, 7 applicants entered the Distinguished Young Scholar panel review stage and 11 entered the Excellent Young Scientist panel

review stage. After expert panel evaluation, 5 applicants received Distinguished Young Scholar funding at 4 million yuan per project, and 8 applicants received Excellent Young Scientist funding at 2 million yuan per project.

Beginning in 2024, NSFC implemented a continuation funding policy for Distinguished Young Scholars. Among the Distinguished Young Scholar projects concluding in 2023, 2 applied for continuation funding. After review by the Division of Mathematical and Physical Sciences, 1 project received continuation funding at 8 million yuan per project.

### 3 Issues in Application and Review

We summarize various issues encountered during the 2024 application and review process, categorized into five types.

#### 3.1 Formal Review Rejections

In 2024, five applications to the Department of Astronomy failed formal review and were not accepted for the following reasons: (1) Applicants or participants violated eligibility restrictions (intermediate professional titles may participate in no more than 2 projects); (2) Recommendation letters for Young programs did not follow the template and lacked the recommender's institution and title information; (3) Two recommendation letters for Young programs were identical except for signatures; (4) The date on the advisor's consent letter for Young programs did not meet requirements (signature date must be after March 20, 2023); (5) Signatures on recommendation letters were screenshot pastes.

#### 3.2 Citation Verification

Citation verification primarily checks the accuracy of applicant publications by comparing author order, journal volume/year, and other information in the proposal with actual published works. In 2024, we identified errors in author order, publication year, journal names, and deletion of some authors. We also found mismatches between representative works listed in proposals and those in attached files, with some proposals having all five publications completely inconsistent. Since verification results are not feedback to applicants, some have repeated these errors for multiple years. Similar issues also existed in the fourth type of formal rejection described above.

#### 3.3 Annotation Checking

For panel-reviewed programs, NSFC requires careful verification of annotations on the five representative works provided by applicants. The main issues identified by the Department of Astronomy in 2024 were: (1) No justification for claiming sole/co-first authorship or sole/co-corresponding authorship; (2) Deletion of multiple other authors, or omission of remaining authors without adding "et al." or "等"; (3) Inaccurate author ranking order, with some applicants

having correct personal ranking but incorrect ordering of other authors, and some applicants who were not first authors deleting preceding authors to make themselves first author; (4) Incorrect journal names despite correct paper titles, volume/year, and page numbers, and incorrect publication months for some representative works; (5) Non-standard journal name abbreviations, or using English names for Chinese journals and Chinese names for English journals; (6) Author mismatches despite correct paper titles, volume/year, and page numbers.

### 3.4 Similarity Checking

To avoid duplicate funding and detect academic misconduct such as plagiarism, NSFC conducts similarity checks on all program applications. According to NSFC requirements, each proposal is matched against all proposals from the past five years (regardless of funding status) to identify overall or section similarity rates exceeding 50%. Proposals with high similarity are flagged and provided to panel experts for discussion of potential duplicate funding or plagiarism issues. If such a project passes panel voting, the expert group must provide detailed written justification.

### 3.5 Proposal Writing Quality

As in previous years, we found that a considerable number of proposals in 2024, while passing formal review, contained blank sections, inconsistent terminology or statements, and numerous typographical errors, indicating that some applicants were not careful or responsible in preparing their proposals.

## 4 2025 Outlook

In 2024, the astronomy discipline (including the Department of Astronomy and the Comprehensive Planning and Strategic Development Office of the Division of Mathematical and Physical Sciences) received a total of 1,630 applications across all program categories, an increase of 302 (22.7% growth) compared to 2023. A total of 285 projects were funded with total funding of 300.18 million yuan (in 2023, 293 projects were funded with total funding of 199.699 million yuan).

In 2025, the Department of Astronomy will continue to prioritize research-oriented projects based on the development patterns of astronomy and the current state of Chinese astronomy. We emphasize research-driven development of technology and instrumentation, advocate for research based on domestic existing and planned observational facilities, and promote innovative academic ideas combining observation and theory, particularly research integrated with China's major science and technology infrastructure projects under construction, as well as studies of new astronomical technologies and methods. We will prioritize support for emerging sub-disciplines in astronomy and encourage interdisciplinary research between astronomy and other fields to gradually form internationally

distinctive and influential research teams, while attaching importance to and supporting international cooperation and exchange.

To maintain a fair and impartial review environment and foster a clean research ecosystem, NSFC continues its special campaign to prevent panel experts from being “lobbied,” which has achieved notable results. In 2025, the Department of Astronomy will continue to implement NSFC’s working principles of “positive guidance, ultimate defense, and serious punishment,” summarize past experiences and practices, strengthen education and publicity, strictly enforce review discipline, and resolutely implement various measures and working mechanisms to prevent and rectify lobbying of review experts.

### References:

- [1] He Cheng, Dong Guoxuan, Yu Haoran. *Progress in Astronomy*, 2024, 42: 160 [2] Liu Qiang, He Cheng, Xu Xiaojie, et al. *Progress in Astronomy*, 2022, 40: 637

*Note: Figure translations are in progress. See original paper for figures.*

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