Guoshoujing Telescope (LAMOST)

Spectral Survey Data Policy

Guoshoujing Telescope (The Large Sky Area Multi-Object Fiber Spectroscopic Telescope, LAMOST) consists of a reflecting Schmidt corrector M_A at the northern end, a spherical primary mirror M_B at the southern end and a focal plane in between. Both the primary mirror and the focal plane are fixed on their ground bases, and the reflecting corrector tracks the motion of celestial objects. Celestial objects are observed around their meridian passages. The light collected is reflected from M_A to M_B, again reflected by M_B and forms image of the observed sky on the focal plane. The light of individual objects is fed into the front ends of optical fibers accurately positioned on the focal plane, and then transferred into the spectrographs fixed in the room underneath, to be dispersed into spectra and recorded on the CCD detectors. The main characteristics of LAMOST are listed below:

Aperture of primary mirror: 6.67m x 6.05m
Aperture of reflecting corrector: 5.72m x 4.40m
Effective aperture in diameter: 3.6m-4.9m
Field of view: 5°
Focal plane: 1.75m
Focal length: 20m
Number of fibers: 4000
Fiber number of each spectrograph: 250
Number of: 16
Spectral ranges::370nm ～ 900nm
Spectral resolution: 1nm ～ 0.25nm
Sky coverage: Declination -10 ° ～ +90°
Limiting magnitude: 20.5m
Exposure time: 1.5h

In the framework of the Guoshoujing telescope organization, the "Science Committee of the Guoshoujing telescope" (hereafter referred to as the Science Committee) has been established. It is responsible for the organization and assessment of the LAMOST Sky Survey Scientific Plan. Under this committee, there are two additional committees：the Collaboration Council (CoCo，headed by the Coordinator General) and the Arbitration Commission (ArCo), which are appointed by the National Astronomical Observatories (NAOC). These committees interface between the scientists and the Guoshoujing telescope organization. The Center for Operation and Development of the Guoshoujing telescope (hereafter Operations Center) is also set up by NAOC. It is in charge of observing, operating and maintaining the telescope. LAMOST Experiment for Galactic Understanding and Exploration (LEGUE) and LAMOST ExtraGAlactic Survey (LEGAS) working groups are established by the Science Committee. They are responsible for proposing LAMOST spectra survey plans and submitting them to the Science Committee. The Database

Administrator is appointed by the Operations Center and is responsible for overseeing scientists' access to the data.

I. LAMOST Data Types and Releases

1. LAMOST Data includes Three Major Types:

Type (I): Raw Data: All original data as well as original provenance information (for example, the observing log files, calibration files, software versions used, etc.), and the batch reduced two-dimensional spectra.

Type (II): 1D Spectral Data: One-dimensional spectra of observed objects, reduced through standardized reduction pipelines. Some provenance information is included with the 1D spectra, including the input catalog information, selection criteria and observing information such as exposure time, observation quality, seeing, weather conditions, and so on).

Type (III): Catalog Data: Objective physical quantities with errors, derived from the spectral data and input catalog. The catalog includes the coordinates, magnitudes, radial velocities, effective temperature, surface gravity, elemental abundances, warning flags and so on.

The detailed definition and format of the "1D Spectral Data" is the responsibility of the Operations Center; the detailed definition and format of the "Catalog Data" are jointly decided by the Science Committee and the Operations Center.

2. Data Releases：

- The Guoshoujing Telescope represents a tremendous national investment in large-scale scientific equipment. According to the international astronomical community conventional practice, Guoshoujing Telescope Survey Data are ultimately opened to the public through "Data Releases".
- To protect the project and the institutional members, as well as personal rights and interests, only individuals who are members of a project that has been approved by the Science Committee may use the Guoshoujing Telescope Survey Data prior to Data Release.
- Data Releases will include only "1D Spectral Data" and" Catalog Data"; while the "Raw Data" will not be publicly released, it will be stored for an indefinite time by the Operations Center.

II. LAMOST Data Usage Policy

1. Released Data Usage Policy:

Publicly released data may be used freely, but should include the following acknowledgment:

Guoshoujing Telescope (the Large Sky Area Multi-Object Fiber Spectroscopic Telescope LAMOST) is a National Major Scientific Project built by the Chinese Academy of Sciences. Funding for the project has been provided by the National Development and Reform Commission. LAMOST is operated and managed by the National Astronomical Observatories, Chinese Academy of Sciences.

- Timing for Data Releases:
  Type (I) data may be released at the discretion of the Science Committee.
  Type (II) data will be released in yearly increments for each observing season, 18 months after each year of data collection.
  Type (III) data will be released 6 months after the corresponding Type II data.

  The Operations Center is responsible for creating the Type (II) and Type (III) data releases in a timely manner, and the quality will be confirmed by the Science Committee. Every effort will be made to release the data on schedule, but the release may be delayed or limited only to ensure the quality of the data release.

2. The Usage Policy for Pre-Release Data:

The data will be supplied to formal project Members and External Collaborators (defined below). Individuals who do not follow the Guoshoujing Telescope (LAMOST) Spectroscopic Survey Data Policy and Publication Policy may have their data usage rights revoked by a decision of the Science Committee.

(1). Definition of Participant Institutes and Individuals:

Individuals who have made significant contributions to the construction of the Guoshoujing Telescope and survey data may be designated as “Builders”, and will have the right to be included in the author list for any survey scientific publication. The Builder list will be provided by the Operations Center, with the contributions and positions of each Builder briefly stated.

Domestic research institutes and universities automatically possess the Participant Institutes qualification. However, the Science Committee will confirm the formal list of Members from each of the Participant Institutes; the above named Member list is maintained by the Coordinator General, and it may be updated at the annual CoCo Regular Meeting.

- The LAMOST foreign participant institutions or individual members can be divided into three types:
  The first kind: Partner Institutions include participant groups or research institutes, which provided significant contributions to the operation of LAMOST, including the provision of a substantial funding or other human and material resources (including hardware, software, observation planning, etc.). Partner Institutions normally have data rights similar to domestic Participant Institutions.
  The second kind: International Participant Institutions include research groups or institutes who have contributed some funds or resources from their own country to LAMOST science project; these groups may negotiate for access to a subset of the LAMOST data for that science project.
  The third kind: External Collaborators are individuals who propose to use LAMOST data in cooperation with project Members. They may include visiting scholars and other individuals who are not employed at a Participant Institution or a Partner Institution.

Partnership agreements and International Participant Institution agreements will be determined by the LAMOST Science Committee, who will negotiate and sign the formal agreement with the National Astronomical Observatories, Chinese Academy of Sciences, declare the bilateral rights and obligations, and determine the formal Member name list.

(2). Timely Notification of Observing Results：

The completion status (including objectives, observing information, storage location, etc.) of the observed data (i.e. one-dimensional spectrum and catalogue data) should be regularly announced to all Members by the Operations Center; special circumstances should be announced immediately when they arise.

(3). The Data Usage Policy for Members:

The LAMOST research projects are divided into two kinds: "key" projects and "general" projects. Correspondingly there are the key project Members and the general project Members.

The key projects use scientific targets from a large area of sky in the survey plan, and are primary science drivers for the survey. The scope of the key projects and the PI are decided by the Science Committee. The membership of the group is proposed by the PI and approved by the Science Committee. The PI is responsible for reporting progress to the Science Committee. There cannot be overlap between the science goals of key projects.

General projects should be proposed to the Collaboration Council by research groups or individuals. The Collaboration Council will then submit the decisions to the Science Committee.

The Data Use Regulations for Key Project Members:

- The Key Project PI will submit a proposal to the Science Committee that includes a description of the science goal and methods, and description of the LAMOST data that will be used for this project. The description of the required data must include sky area coverage, object brightness range, object type (stars or galaxies) and data products (one-dimensional spectrum or catalog data). The Science Committee may approve, reject, or request revisions to the proposal.
- Once a Key Project is approved by the Science Committee, its team members automatically possess rights to access data (type II, III), but the data can only be used for the designated research project. Before the data is publicly released, other individuals cannot use the data to do the same research, unless the key project PI agrees, and notifies the Coordinator General.

The Data Use Regulations for General Project Members:

- A general project can be freely proposed by the Members of domestic Participant Institutions and Partner Institutions. Proposals should be submitted to the Coordinator General, including the science goals, the list of project members, the PI and the expected timeline for completion.
- The Coordinator General will circulate the General Project proposals to the Key Project PIs. The Key Project PIs will be given a deadline for raising objections if the project overlaps

with their Key Project. If there are no objections, then the Coordinator General will approve the project, and the Database Administrator will authorize data access. If the General Project application is rejected, then the applicant(s) can appeal the decision to the Arbitration Commission (ArCo), who will announce the final decision.

- Members of all approved projects are required to fill out an electronic data application form which is submitted to the Database Administrator, and the Database Administrator will then make the data available to the Member.
- Students and postdocs in a Member's research group share the same data access and publication privileges as their research supervisor, but they must obey the Guoshoujing Telescope (LAMOST) Spectral Survey Data Policy and Publication Policy. Other project members must be informed of the plan to include students or postdocs in the research, especially for a doctoral thesis. The project PI will organize the research effort among the team members.

(4). The Data Use Policy for External Collaborators:

External Collaborators must cooperate with the formal Members to apply for a specific set of data for specified science use. The formal Members who wish collaborate with them are required to do the following:

a. Inform the "External Collaborator" of the Guoshoujing Telescope (LAMOST) Data Policy and the Publication Policy. In particular, assure that the data requested may not be shared with anyone who is not a Member of the approved project they are working on.

b. Publicize (via a Membership mailing list) a request for External Collaborator status.

c. Submit an External Collaborator application to the CoCo, explaining the special contribution of the External Collaborator (such as access to telescope and data resources from their own institute, or special expertise, etc.). External Collaborator requests will only be approved if they do not conflict with the interests of the other formal Members of that project. The Coordinator General will make a decision on the application within 4 weeks. Members of other General Projects will not be consulted, even if the projects are similar. Competition between General Projects is encouraged.

d. If the External Collaborator request is not approved by the CoCo, the decision can be appealed to the ArCo.

III. Additional Explanation of the Data Policy

The key point of the "Guoshoujing Telescope (LAMOST) Spectral Survey Data Policy" is to ensure resonable balance of rights and responsibilities for Key Project and the General Project PIs, as well as the allocation of rights and interests of between Members of domestic Participant Institutions and international Members and Collaborators using the LAMOST data.

1. Relevant policies for large astronomical facilities in other countries have been consulted in producing this document. By international convention, the data policy of all large

astronomical telescopes must ensure the rights of the investors. As a federally funded, large-scale scientific project, the Guoshoujing Telescope must serve the needs of the whole Chinese astronomical community; the data obtained should be shared by all astronomical institutes nationwide.

We have referred to similar international projects, such as SDSS, and included corresponding policy of data release in phases and priority in data usage for research groups.

2. Since the Guoshoujing Telescope Spectroscopic Survey Key Projects should be the major sources of Guoshoujing Telescope scientific output, they should possess the highest data use priority. The Key Project team is responsible for completing the scientific goals in a timely manner; they will have 18 months priority for the 1D spectral data. The Catalog Data has an additional 6 months priority access, since the key project team needs additional time to independently extract the necessary physical parameters from the spectral data (such as radial velocities, elemental abundance, etc.).

3. Because the Key Projects and subprojects are extremely important to the scientific productivity of the Guoshoujing Telescope, the Science Committee will carefully consider the PI and team membership and the key project science goals, and will oversee the research progress. The Key Project definitions should be limited in the scope of the data requested, and in the science goals. Key Project team members cannot get data beyond what is required for the science project. The Key Project will be annually reviewed by the Science Committee to ensure the final science output and steady progress.

4. Any Member may apply to be PI of a General Project, but these may not conflict with the Key Project science goals. General Project applications will be publicized internally and approved by the CoCo.

5. All approved applications for Key Projects and General Projects will be archived and made available to all Members.

6. External Collaborators gain access through collaborations with Members of domestic or partner institutions. The authorship of resulting scientific papers should reflect the contributions of the domestic scientists as well as the External Collaborator.

We are unable to foresee all possible circumstances in this data policy. The Science Committee is therefore entitled to modify the policy as necessary to ensure the scientific success of the Guoshoujing Telescope and fair use of the data.