Tianlai Collaboration Agreement
Version I.0
2 November 2026

Overview

The Tianlai Collaboration is an international team organized to reach a variety of scientific goals in the field of observational cosmology. Our primary science goal is to constrain the history of the cosmic expansion, *H(z)*, in order to constrain models for the phenomenon of Dark Energy. Our approach is to exploit recent technical advances in the field of radio astronomy that allow large mapping speed to observe large cosmic volumes and measure the scale of Baryon Acoustic Oscillations across a range of redshift from 0 to 3. Other science programs are made possible by the high mapping speed of Tianlai. Some will be automatically produced as byproducts of our primary science program including: 1) Maps of Milky Way synchrotron emission, including spectral index, spectral curvature, and polarization; 2) the evolution of the mean HI content of galaxies; 3) the first blind half-sky survey for 21-cm and OH maser emission in radio source spectra; and 4) the first multi-year daily record of the flux from every radio source in the northern sky brighter than ~100 mJy. Additional science programs are possible by adding purpose-built back-end digital electronics. We envision such programs as running in parallel with the primary program. Possible projects include: search for and possible interferometric location of fast radio bursts and daily monitoring of as many as 1000 pulsars. The telescope design is optimized for brightness sensitivity rather than angular resolution. In this sense Tianlai serves as a stepping-stone for the SKA, which will have high sensitivity and high angular resolution. The first generation of instruments is the Tianlai Pathfinders, composed of an array of 16, 6-m diameter dishes and 3, 15-m x 40-m cylinder reflectors.

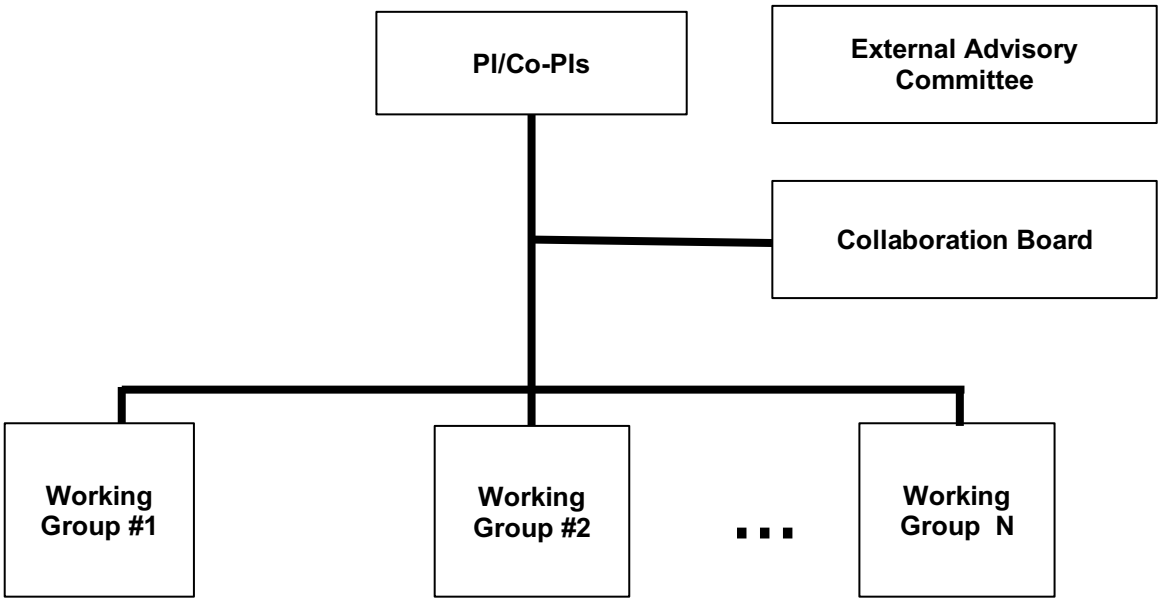
Management

PI/Co-I's

The project is led by the NAOC (National Astronomical Observatories of China), which has the formal responsibility for building and operating the instrument and selecting the Principal Investigator. Scientists from other institutions who solicit financial support from funding agencies in their own countries to contribute to the project act as Co-Investigators on the project.

Collaboration Board

A Collaboration Board will make decisions on all important matters such as funding, schedule, introduction of new members, exit of members, Intellectual Property matters, definition of general specifications and strategy, choice of key personnel, publication policy, changes to this Collaboration Agreement, etc. Important choices are decided on the basis of consensus agreement. If a consensus is not possible, a vote will be taken. Each member of the Board has one vote. The membership will be apportioned by country - China: 4, France: 2, US: 2, Canada: 1. Board membership is determined by the collaboration members from each country. Changes of the composition of the Board (adding countries or changing the number of representatives) will be approved by the Board. The Board will select a Chairperson to organize meetings.



Tianlai *Organizational* Chart

Collaboration Membership

There are several categories of membership in the Tianlai collaboration. These categories reflect the amount of time individuals have committed to developing the instrument. Membership (and level) is determined by the Board, which will maintain a list of members of each type as well as the collaboration email list.

Architects: designers and builders of the Tianlai Pathfinders who have many years invested in the program. Architects have the same data rights as Full Members (see below).

Full Members: will have access to all raw data and reduced data when available.

Associate Members: have access to the data to perform a specific analysis

that might lead to a publication.

Scientists from a number of institutions from China, France, USA and Canada are currently involved in the project.

In China,
- CETC-54 Institute (China Electronic Technology Corporation)
- Institute of Automation, CAS (Chinese Academy of Sciences)
have contributed to the technological R&D effort in China.

In addition,
-Xinjiang Observatory
-Hangzhou Dianzi University
-Peking University
-Sanxia University
are members of the collaboration.

Currently scientists from the following international institutions are actively contributing to Tianlai:

- Brown University, Providence, RI USA
- Carnegie Mellon University (CMU), Pittsburgh, PA USA
- CITA (Canadian Institute for Theoretical Astrophysics), Toronto, Canada
- Fermilab, Chicago, IL USA
- IRFU (CEA), Saclay, France
- IJCLab & Universite Paris-Saclay, Orsay, France
- Observatoire de Paris & CNRS-INSU, France
- University of Wisconsin, Madison, WI USA

Publication and Conference Presentation Policy

The Collaboration Board is responsible for ensuring that the publication policy described here is respected.

Research projects undertaken in the collaboration must be announced to the collaboration through the mailing list specifying the topic, project leader, and known collaborators. These research projects are expected to result in publications. All members of the collaboration must inform the Board if they are writing a technical or scientific article or a conference presentation or are dealing with patent or technical transfer matters related to the project. Publications are to be reviewed within the collaboration at least a month before being submitted to a journal.

The Board will ensure that all members of the collaboration have equal access to

conferences for presenting work performed within the collaboration. The Board will ensure that students and young researchers in the collaboration have priority in presenting work at conferences and through publications.

Any member of the collaboration can request that his/her name be added to the author list of an article. It is the responsibility of the research project leader whether or not to accept this request, depending on the member's contribution to the project. Minimum criteria for authorship include editing, or reading and commenting on, the document.

The default policy for the author list of papers is: first the main authors, then other involved people in alphabetic order. Any disagreement will be resolved through the Collaboration Board, whose decision is final.

Several types of papers are envisioned; the criteria for authorship are different for each:

1) General Papers about the experiment, including early results

2) Specific Papers about a part of the instrument design

3) Specific Papers about an analysis of the data

Authorship must recognize the efforts of the Architects. These efforts often do not result in publishable results. These members will automatically be included as authors on the Type 1, General Papers, and any Type 2 or Type 3 paper they ask to join as an author.

To ensure high-quality publications and agreement within the collaboration, the authors of a paper must make the final draft available to the collaboration for comment for a period of at least 1 week before submission.

Advisory Committee

The Collaboration Board may choose and invite an Advisory Committee to provide guidance to the collaboration from time to time.

Working Groups

The Board may establish working groups to supervise critical scientific and technical aspects of the Tianlai project. Working Group leaders will be determined by the Board. Any member of the Collaboration may join any Working Group. Possible Working Groups are:

1) Site and Instrument

2) Data Processing/Management/Calibration/RFI removal

3) Science and Simulations

Next Steps

The Collaboration members vote on this document.

If approved, the teams from each country select members to be on the Collaboration Board. These teams are small enough that each country can do this by consensus.

The Collaboration Board reviews and edits this document as needed and determines membership level of current collaboration members.