Letter of Intent

Preparation of the BRICS Intelligent Telescope and Data Network

1. Great scientific potential is available to establishing a global optical telescope network among the BRICS countries, complementary to major facilities worldwide, and providing access to the full sky for transient and variable multi-wavelength and multi-messenger phenomena.

2. Such network would constitute the first BRICS-led Research Infrastructure, with significant potential for technological development and training of human resources for the countries of the block, being aligned with the motivation behind the implementation of a BRICS Astronomy Flagship Project, developed since 2019 in the context of the BRICS-STI Astronomy Working Group (BAWG).

3. The shared concept for the infrastructure, namely the BRICS Intelligent Telescope and Data Network (BITDN)[1], is based on an optical telescope network geographically distributed in the BRICS countries, for full and continuous sky coverage, and based primarily on the SiTian telescope design[2]. The network is scalable, targeting a total cost per telescope site of $4M.

4. The Research Infrastructure would be organized as a BRICS-wide Consortium, responsible for the construction of the instrumentation, deployment of the observatory sites, and later exploitation of the scientific data for scientific purposes, with the shared goal of promoting the integration and collaboration between the participating institutions.

5. A required preparatory step towards the realization of the telescope network described above is the installation of prototype instruments on at least three distributed sites, to demonstrate feasibility of the proposal and to validate the cost-performance of the intelligent observatory and data network model.

6. The intelligent telescope network and associated large data survey programs with Rubin telescope and the Square Kilometer Array create a big-data challenge to be addressed by collaborative development among the BRICS partners on data infrastructure software systems, and advanced algorithms for machine learning and artificial intelligence.

7. The execution of this preparatory program has been discussed among the National Astronomical Observatories, Chinese Academy of Sciences (NAOC), responsible for the construction of the SiTian telescopes, and the Brazilian National Laboratory of Astrophysics (LNA) and the South African Astronomical Observatory (SAAO), which are interested in hosting the instrumentation, thus providing a "seed" for the telescope network.

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[1] https://www.bricsastronomy.org/brics-intelligent-telescope-and-data-network/

[2] https://www.scielo.br/j/aabc/a/S786y7FHmf7Vsx3Wwcnkqwr/?lang=en

8. This Letter of Intent serves to formally manifest the interest of the aforementioned institutions in working towards establishing the outlined preparatory program, using their own resources, and with mutual support, on a best-effort basis.

9. It is expected that this Letter of Intent will be superseded by an agreement on the construction and operation of a prototype BRICS Intelligent Data and Telescope Network (BITDN), with sites in Brazil, China and South Africa, to be signed among the institutions on the occasion of BRICS Astronomy Working Group (BAWG) meeting, to take place in Brazil, in September 2025.

10. Additional BRICS partners can join this Program at any time.

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