

## Astronomy:

- answers fundamental questions on the origins of the universe and humanity's place in it.
- can be viewed as a driver of innovation and an important catalyst for scientific and technological development
- empowers human capacity for the realization of a knowledge-based economy for the future

- At the First BRICS Science, Technology and Innovation (STI) Ministerial Meeting held in Cape Town, the following five priority areas were endorsed, to be led by the respective BRICS member countries:
  - Prevention and mitigating of natural disasters – Brazil
  - Water resources and pollution treatment – Russia
  - Geospatial technology and its applications – India
  - New and renewable energy, and energy efficiency – China
  - **Astronomy – South Africa**
- At the second BRICS STI Ministerial Meeting in March 2015 in Brazil, the BRICS member countries signed a Memorandum of Understanding (MoU) on STI cooperation. This MoU makes provision for three governing structures:
  - BRICS STI Ministerial Meeting
  - the BRICS STI Senior Officials Meeting
  - **BRICS STI Working Groups**
- At the Third BRICS STI Ministerial meeting held in October 2015 in Moscow, the Work Plan was adopted and it was agreed that South Africa would host the First BRICS Astronomy Working Group Meeting during December 2015.

- The BRICS astronomy working group is:
  - responsible for promoting cooperation activities in the astronomy priority area, and convenes at least once a year;
  - composed of government officials supported by the focal points on astronomy and experts from BRICS member countries;
  - chaired by the South African Department of Science and Technology, which convenes the meetings and provides secretariat support.
- As the Secretariat, South Africa:
  - develops content for the astronomy working group meetings, ensures consistency and follows-up on action;
  - captures and maintains proceedings of the Working Group;
  - disseminates information to the Astronomy Working Group using various media, including a website.

## ***The BRICS Astronomy Workshop:***

- is held annually ahead of the working group meeting;
- provides a platform for BRICS member countries to engage on policy issues and other matters related to research, development and practice in astronomy, and to explore mechanisms for promoting BRICS cooperation in astronomy.

### Common interest areas within BRICS astronomy:

- Observational
- Theoretical
- Computational studies in cosmology
- Galaxy formation and evolution
- Stellar and compact object
- Astrophysics
- Big data Astronomy

## 2015 Workshop and Working Group Meeting

- The inaugural BRICS Astronomy Working Group Meeting was held in South Africa, Cape Town, on 12 December 2015;
- Workshop focus: policy instruments, innovation, industry developments and opportunities in the BRICS countries;
- Terms of Reference for the Working Group was developed during the Working Group meeting.
- Agreed on drafting a BRICS Framework for Scientific Cooperation in Astronomy

## 2016 Workshop and Working Group Meeting

- The second meeting of the BRICS Astronomy Workshop and Working Group meeting was held in Ekaterinburg, Russia, on 5-8 September 2016;
- Workshop Focus: Astronomical Data and Computation;
- Adopted the Terms of Reference;
- Noted progress on the draft Science Plan and agreed it needed to be complemented by a roadmap.



## 2017 Workshop and Working Group Meeting

- The third BRICS Astronomy Workshop and Working Group meeting was held in Pune, India, on 21-23 September 2017.
- Workshop focus: Astronomy Infrastructure and Instrumentation
- Agreed that BRICS Astronomy activities now under development effectively replaces the proposed roadmap
- Put out a call for four possible programmes or interventions, which may eventually become flagship projects.



## BRICS Astronomy Implementation Guideline:

Short term	Medium term	Long term
<ul style="list-style-type: none"> <li>• Arrange joint seminars</li> <li>• Astronomy workshops and conferences</li> <li>• Facilitate access to host country and other international telescope infrastructures via joint observing proposals</li> <li>• Enhance BRICS participation in existing and new scientific programmes</li> <li>• Facilitate access to computing infrastructures; share hardware and software resources to enhance BRICS Computational Astrophysics</li> <li>• Share data archives</li> <li>• Jointly develop virtual observatory capabilities</li> <li>• Pursue joint supervision of Masters and Doctoral students and joint degrees</li> <li>• Support education and science engagement activities</li> <li>• etc...</li> </ul>	<ul style="list-style-type: none"> <li>• Establish a funded exchange program for students</li> <li>• postdoctoral researchers and faculty; create a BRICS VLBI capability (linked to EVN, AVN, LBA and other relevant networks)</li> <li>• develop a BRICS project on high-performance computing and data processing and visualization for Astronomy</li> <li>• etc...</li> </ul>	<ul style="list-style-type: none"> <li>• Develop a BRICS flagship project such as a joint BRICS instrumentation and telescope project</li> <li>• etc...</li> </ul>