1. Project Overview

Project Name: Earth and Beyond Astro Fair
Objective: To encourage learners to design projects within the themes of astronomy, science, and environmental sciences, fostering scientific curiosity and engagement.
Target Audience: Learners in Grades 8–12 from public and private schools, educators, and the broader community.
Format: A science fair featuring student-led projects, interactive exhibitions, and expert talks.

The **BRICS Astronomy Program, SAAO, and the Johannesburg City Parks and Zoo**, in partnership with **Eskom Expo for Young Scientists**, invite learners to participate in the inaugural **Earth and Beyond Science Fair**. This initiative seeks to uncover the most innovative young minds among school learners. By combining expertise in **astronomy, space sciences, and environmental sciences**, students are encouraged to explore their surroundings and inquire about what lies beyond our atmosphere into outer space. This initiative fosters a science-based understanding of where we come from while inspiring scientific exploration.

The **Astro Fair** is a platform for learners to showcase their research and findings, fostering a community dedicated to deeper astronomy, space sciences, and environmental understanding. Learners will be challenged to identify and address community challenges using **scientific investigation or engineering methodologies** to develop solutions that promote **a sustainable and innovative future while enhancing our understanding of planetary stewardship."**

The **Earth and Beyond Astro Fair** will also serve as a **qualifying event** for learners to participate in the **Expo for Young Scientists Johannesburg Regional Science Fair**. Winning projects from this regional fair will advance to the **annual Expo for Young Scientists International Science Fair (ISF)**, where learners will compete against the best young scientists from across the country and the world.

2. Goals and Expected Outcomes

- Inspire learners to explore science and astronomy through hands-on projects.
- Promote critical thinking, creativity, and scientific problem-solving.
- Provide mentorship opportunities through engagement with scientists and professionals.

- Increase awareness of environmental and space sciences in relation to global challenges.

3. Project Themes

- **Astronomy & Space Science:** Planetary studies, space exploration, astrophysics, engineering, and telescopes.
- **Environmental Sciences:** Climate change, sustainability, biodiversity, and conservation.
- **Science & Innovation:** Robotics, artificial intelligence, data science applications in space and the environment.

Topics

Astronomy:

- Investigating the Impact of Solar Storms on Earth's Communication Systems
- Modeling Exoplanet Detection Using the Transit Method
- Creative Approaches to Managing Space Debris
- Building a DIY Radio Telescope
- Constructing a Scaled Model of the Solar System
- Star types: Stellar classification & evolution (OBAFGKM, HR diagrams etc) (and also maybe where the sun fits in)
- The lives of different stars (stellar evolution & death)
- Use of astronomical data/techniques/equipment (satellite imaging etc) in ecological studies
- Ancient astronomy/astronomers (and their work that is still fundamental to modern astronomy, their lasting impact)
- The effects of climate change and pollution on astronomy (importance of "green living")
- Impact of astronomy on major/mainstream culture throughout history
- Importance of including cultural histories and mythologies of astronomy in its teaching
- Rise in popularity of astronomy and space science on encouraging STEM studies in newer generations (growth in STEM education and career paths)
- Impact of astronomy infrastructure on the communities it is constructed in
- Ideas on reducing the amount of waste produced by space mission planning (i.e. ways to reduce the material waste of testing and research phases before a mission)

Environmental Sciences topics

PLANT SCIENCES (PLA)

- Aquatic Plants
- Botany
- Plant Genetics
- Plant Pathology
- Plant Physiology

ANIMAL SCIENCES (ANI)

- Animal Behaviour
- Animal Genetics
- Animal Physiology
- Aquatic Animals
- Entomology
- Wildlife Management
- Zoology

EARTH SCIENCES (EAR)

- Atmospheric Sciences
- Climate Sciences
- Geography
- Geology
- Limnology
- Oceanography
- Soil Sciences
- Water Sciences

ENVIRONMENTAL STUDIES (EVS)

- Biological Control
- Bioremediation
- Ecology
- Environmental Management
- Sustainability
- Sustainable Development

4. Event Structure

4.1 Project Submission & Participation

- Open call for project proposals from schools.
- Submission deadline: [Insert Date].
- Evaluation criteria: Creativity, scientific method, societal relevance, and presentation.

4.2 Event Day Activities

- **Project Presentations:** Students showcase and present their projects to a panel of judges.
- **Guest Talks & Panels:** Experts from astronomy, environmental sciences, and innovation sectors.
- **Hands-on Workshops:** Interactive activities like telescope observations, AI applications in science, and eco-friendly innovations.
- **Awards & Recognition:** Prizes for best projects in various categories.

5. Timeline & Milestones

Activity	Date
Teacher training	22/02/2025
Virtual teacher's workshop	
Learners workshop	25/03/2025
Learner workshop	26/03/2025
Review and selection of projects	09/04/2025
Follow up session	23/04//2025

Final event execution	06/05/2025
Price giving	13/05/2025