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Innovating Science Outreach in Africa: Scalable Planetarium Models and Astronomy-Based STEM Education for Sustainable Development.

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Abstract

This abstract presents an innovative, Africa-led model that transforms science outreach through scalable digital planetarium systems and astronomy-based STEM education. Led by the African Planetarium Association (APA), where I serve as Chairwoman, in collaboration with the Space Science and Geospatial Institute (SSGI) in Ethiopia, the initiative integrates low-cost projection tools, fisheye lenses, and open-source software such as Stellarium to reach underserved schools and rural communities. The program's core component, Exploring Multiverse through Academic Pedigrees (EMAP), nurtures young talent through school clubs, competitions, and mentorship. EMAP has produced internationally competitive students and raised awareness of astronomy's relevance to local development. Our outreach connects astronomy with software development, climate science, and geospatial tools—empowering youth to create innovative, real-world solutions, such as urban temperature mapping and environmental monitoring. This approach contributes to BRICS BAWG's mission by strengthening south-south scientific cooperation, improving educational equity, and promoting sustainable innovation. It also supports SDGs 4, 9, and 13 by making frontier science accessible and locally impactful. Through this submission, I advocate for broader collaboration with BRICS partners to expand this model, develop shared educational toolkits, and build a resilient, inclusive scientific future for the Global South.