Highlight Talk: Intelligent Telescope Framework

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Preferred type of presentation	Oral
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Abstract

The Intelligent Observatory (IO) program represents a transformative step forward in the field of astronomical research and operations, led by the South African Astronomical Observatory (SAAO). This initiative integrates advanced automation, artificial intelligence (AI), and data science into observatory operations to enhance the efficiency, accessibility, and scientific output of telescopes and facilities. The IO program has already automated the Lesedi 1m telescope, enabling fully robotic observations. These innovations reduce the operational overhead for astronomers, allowing them to focus on scientific discovery. Current efforts include the application of AI to monitor and analyze large telemetry databases, manage technical and observational documentation, and generate human-readable reports, thereby streamlining fault detection and operational planning. In this talk, we will present the technical achievements and challenges of the IO program, including the automation of the SAAO telescopes, the integration of AI technologies, and the production of enhanced data products.