

## **Lunar Laser Ranging Research and Experiment in Yunnan Observatories**

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**Abstract:** Lunar Laser Ranging (LLR) is a magnificent target in the world, representing the peak of single photon detection technology. The significance of LLR comes from its extensive scientific application. The distance and its change between the reflector on the lunar surface and the ground station contain massive information and can be analyzed and applied in many scientific fields and multiple disciplines. In order to carry out research and experiments on LLR, the Yunnan Observatory has developed a common optical path lunar laser ranging system on the base of 1.2-meter telescope, which has 10Hz measurement frequency. After overcoming many technical difficulties, it successfully detected the echo from the Apollo 15 reflector on lunar surface on January 22, 2018. The echo signal of the device is the first to achieve lunar laser ranging in China and the ranging accuracy is less than one meter. The above LLR system and experiment results are minutely described in this paper.