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TEGLIE: Transformer Encoders as strong Gravitational Lens finders In the Kilo DegreE Survey

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In this seminar, I will explore the potential of Transformer Encoders in detecting strong gravitational lenses (SGLs) within wide-area surveys. This study focuses on the Kilo Degree Survey (KiDS) as the primary dataset. Initially, the model was trained on simulated data from the Bologna Lens Challenge, designed to closely mimic actual KiDS observations. Following this, the model was refined through fine-tuning and data augmentation using real KiDS data, which included images of previously identified SGL candidates and non-lens examples. This refinement led to a substantial 70% reduction in false positives, although the precision remained lower than 1%.

This approach resulted in a catalog of 263 SGL candidates, of which 43 are newly discovered high-confidence SGLs. This seminar will highlight the difficulties in detecting rare objects such as gravitational lenses and the challenges to overcome to be ready for the next generation of wide-area surveys.

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