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# Gamma-ray Optics for High-Energy Astrophysics

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Gamma-ray astronomy presents an extraordinary scientific potential for the study of the most powerful sources and the most violent events in the Universe. Those extreme conditions occur generally at the end-points of stellar lives, when the comparatively calm thermal evolution gives way to more violent non-thermal processes.

Present telescopes in nuclear astrophysics make use of inelastic interaction processes based on geometrical optics or quantum optics, i.e. shadowcasting in modulating aperture systems, and particle tracking detectors respectively. After reviewing the above instrument concepts, we focus on recent developments in crystal diffraction optics. For the first time in gamma-ray astronomy, this type of optics permits to concentrate photons from a large collector onto a small detector, dramatically improving the sensitivity of next generation space telescopes.

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