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Strong lensing of gravitational waves - new opportunity of multimessenger astronomy

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We have entered the era of gravitational wave (GW) astronomy with routine detections of GW signals by LIGO-Virgo-KAGRA interferometric detectors. Future perspectives are bright with new generations of GW detectors: Earth based - Einstein Telescope and Cosmic Explorer or space borne - LISA, DECIGO, BBO. Gravitaional waves traveling along null geodesics can undergo strong gravitational lensing like the electromagnetic waves do. Hence, strong lensing of GW is becoming a popular research topic. In my talk I will review the state of the art in this subject, including contributions of our group. I will also present new opportunities opening for the multimessenger astronomy from detections of lensed GW signals.

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