Nobel for Detecting Gravitational Waves

Why in news?

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Rainer Weiss, Barry C. Barish's and Kip Thorne's were jointly awarded the Nobel Prize for physics for their contribution to the LIGO-VIRGO project and its detection of gravitational waves.

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What is project about?

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- **Research -** Laser Interferometer Gravitational Wave Observatory – LIGO was built in the US to detect gravitational waves.
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- In collaboration with Italy based VIRGO observatory, LIGO detected gravitational waves for the first time in 2015.
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- Since then, the LIGO-VIRGO collaboration has detected such signals four times.
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- **Concept -** Gravitational waves are ripples in space.
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- It is caused by cataclysmic events that result in high-energy explosions, such as collision of black holes or neutron stars.
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- When these disturbances reach far-off regions, the signals become weak and require extremely sensitive detectors to sense them.
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- **Significance -** The first detection made in 2015 revealed the merger of two black holes - 1.3 billion years ago.
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- Hence, gravitational wave observations could unravel many more mysteries pertaining to the early days of the universe's existence.

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- Gravitational wave astronomy is hence a science of the near future whereby black holes, neutron stars may be mapped.
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How does the future look?

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- The advantage of having multiple detectors is that the location of the source can be determined more accurately.
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- More observatories are in the pipeline to add to the current 3 of which 2 belongs to LIGO & 1 to VIRGO.
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- The Japanese KAGRA detector is set to go online in 2019 and LIGO India set to join by 2024.
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Source: The Hindu

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