BNS Simulations
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Background
Next Generation GW Astronomy
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Binary Neutron Star Simulations: New Tools and Insights

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GW170817: Welcome to the Multi-messenger Era

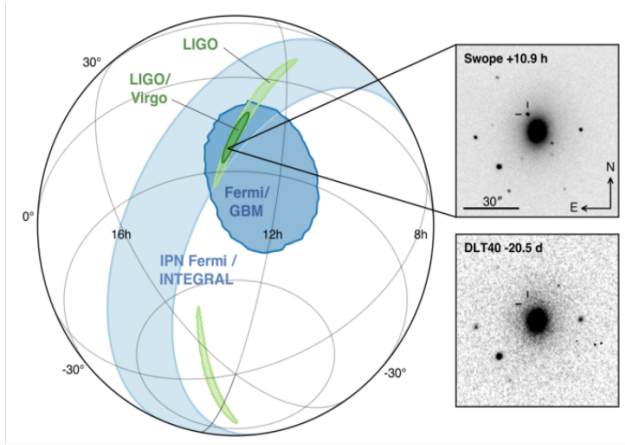
Event

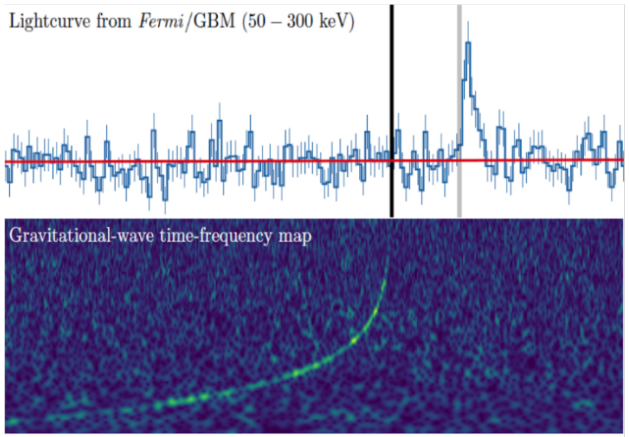
Object: BNS
Total mass: $2.74 M_\odot$
Distance: 40 Mpc
GW Radiation: $0.025 M_\odot$
GW Duration: 100 s
Galaxy: NGC-4993

Science

- short gamma ray burst
- kilonova (optical $\rightarrow$ radio)
- neutrinos (none-found)
- r-process nuclei
- speed of gravity
- EOS constraints
- H_0 constraints

arXiv:1710.05833



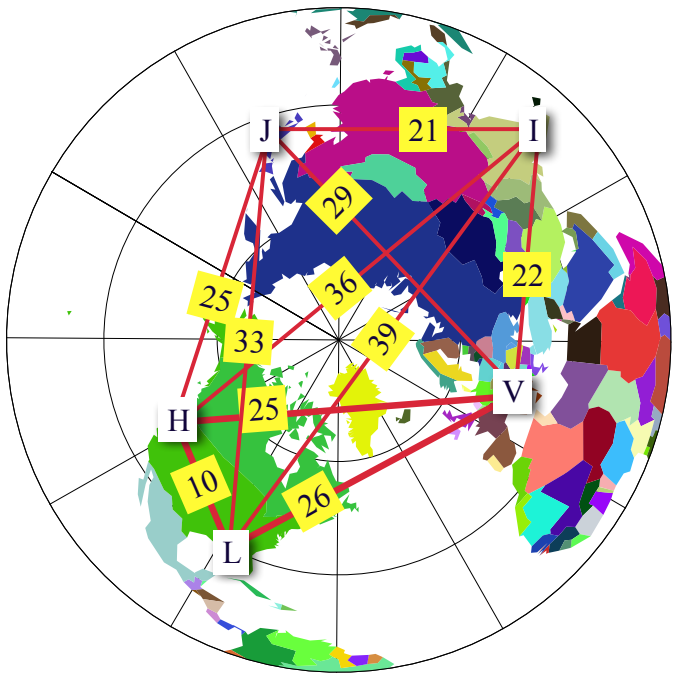


Next-Generation Gravitational Wave Astronomy

Detector network by $\approx$ 2026

- LIGO A+ (Washington State)
- LIGO A+ (Louisiana)
- aVIRGO (Italy)
- GEO-HF (Germany)
- KAGRA (Japan)
- LIGO-India

[Sathyaprakash 2014]



Expected NSNS Detection Rate

More than 10+ NSNS mergers detected per **week**