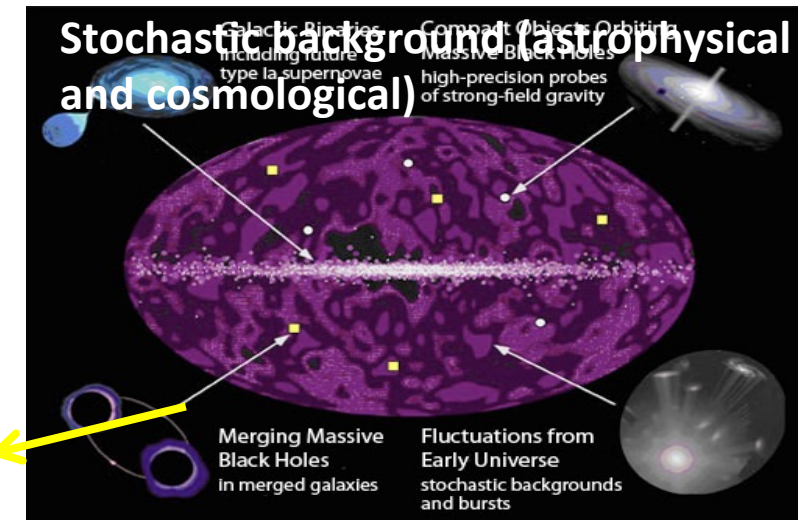
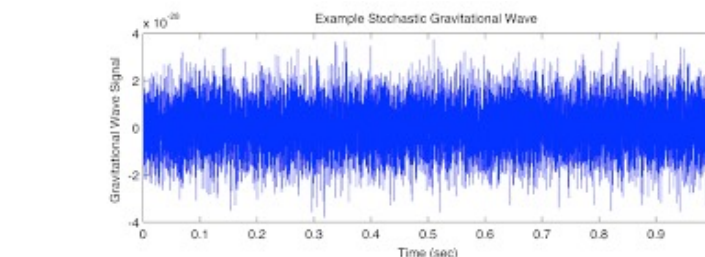
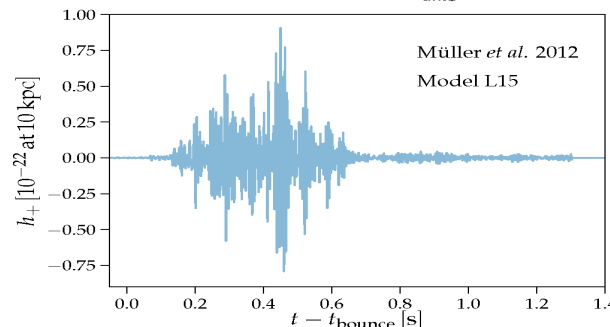
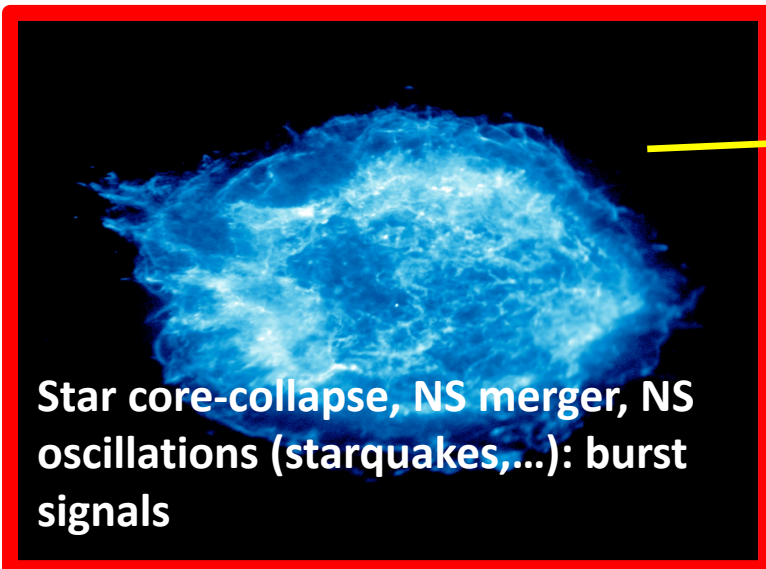
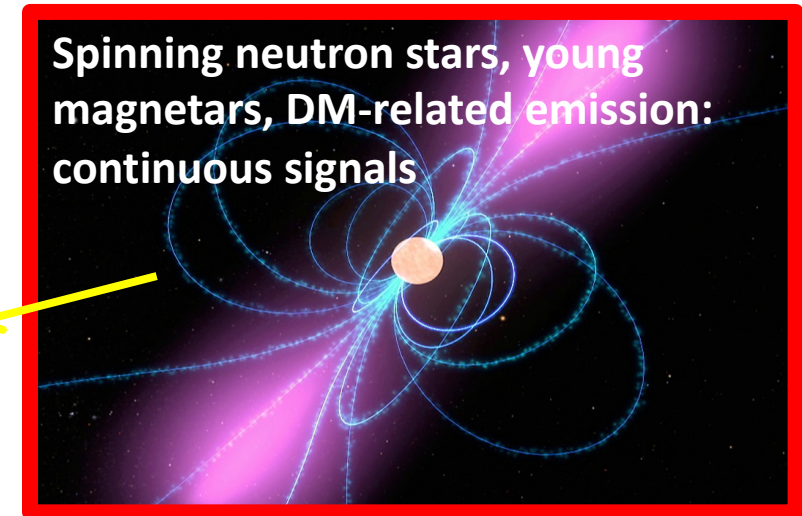
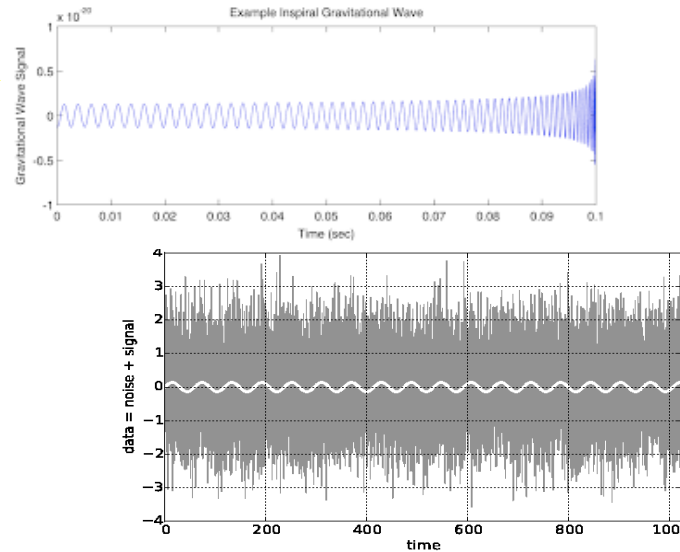
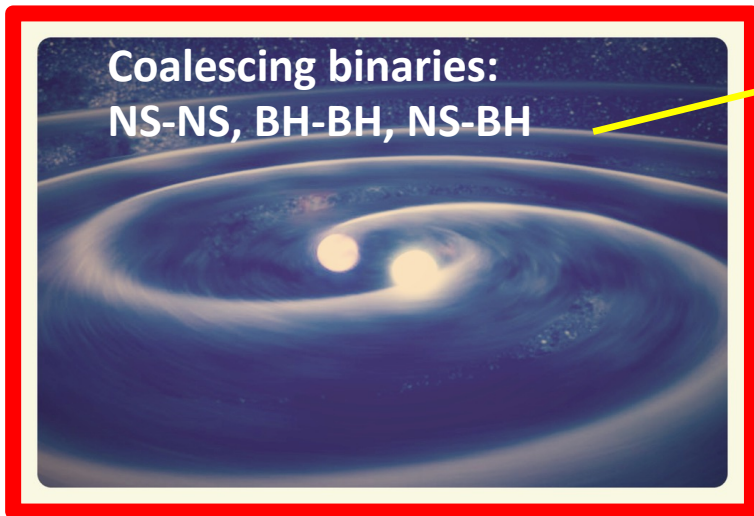


Computing and analysis for gravitational wave searches with LIGO/Virgo/KAGRA data

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Proposal for WP3: development and optimization of algorithms on CPU/GPU for the search of GW signals from various kinds of sources

- The Rome Virgo DA group is involved since many years in the analysis of ITF data for the search of GW signals emitted by different source (short transients, long-transients, continuous)
 - Many analyses require large computing resources (HTC)
 - Some are computationally bound
- The example of LIGO-Virgo O3 analyses (2021): all-sky search for continuous signals, using semi-coherent/pattern recognition techniques
 - One year of data, network of 3 detectors requires $\sim 8E7$ core-hours
 - Analysis completed using – for about two weeks – 180 GPU nodes (4 Nvidia Tesla V100) of the Marconi100 cluster at CINECA + smaller fraction on CNAF CPUs
- The activity we propose in WP3 regards both algorithm optimization and usage of all the available computing resources (both CPU and GPU) for the analysis of data from LIGO-Virgo O4 run (starting in spring 2023). Huge discovery potential.
 - (Additional activity) Application of ML techniques for some class of signals and for noise studies
 - (Additional interest) Porting some algorithms on FPGA
- Request of a 3-years contract for a physicist expert in programming and computing