Gamma-Ray Bursts (GRBs) are the most relativistic objects known so far. Recent observations suggest that GRBs are produced when an ultra-relativistic ejecta (with a Lorentz factor > 100) from an accreting newborn black hole is slowed down. The leading progenitor models for this scenario are massive stellar collapses and compact stellar mergers, and these are expected to be sources of gravitational waves. After a brief review of some general features of GRBs and recent observational/theoretical developments in the field, gravitational radiation from GRB progenitors will be discussed. I will evaluate the orders of magnitude of the strain and frequency of the gravitational waves expected from progenitors, at distances based on occurrence rate estimates.
I will discuss possible correlations between the burst photon luminosity, or the delay between gravitational wave bursts and X-ray flashes, and the polarization degree of the gravitational waves.

Last week, NASA and ESA reported a strong evidence of a supermassive black hole (SMBH) ripping apart a star at the center of a distant galaxy. I will briefly discuss the tidal disruption process of main sequence stars by SMBH in the context of gravitational wave astronomy.

Title: Geodesic Deviation Induced by Gravitational Waves for Large Separation Between the Test Masses in the Coordinates of a Local Observer

The response of laser interferometers to gravitational waves has been calculated in a number of different ways, particularly in the transverse-traceless and the local Lorentz gauges. At first sight, it would appear that these calculations lead to different results when the separation between the test masses becomes comparable to the wavelength of the gravitational wave. The present research focuses on the solution of this discrepancy. We describe the response of free test masses to plane gravitational waves in the coordinate frame of a local observer and show that it acquires contributions from three different effects: displacement of the test masses, gravitational redshift of the light propagating between the masses, and variation of the clock speed of the local observer, all of which are induced by the gravitational wave. Only when taken together do these three effects represent a quantity which is translationally invariant. This translationally-invariant quantity is identical to the response function calculated in the transverse-traceless gauge. Thus, we solve the well-known discrepancy between the transverse-traceless coordinates and the coordinates of the local observer.

Fredrick Jenet

"Radio Pulsars and Gravitational waves: Constraining the properties of the proposed super-massive black hole system in 3C66B" .

Abstract :

Using pulsar timing data, limits are placed on the mass of the supermassive binary black hole (SBBH) system in 3C66B recently proposed by Sudou, Iguchi, Murata, \& Taniguchi (2003). The proposed system will emit gravitational waves detectable in pulsar timing data. Sinceno gravitational waves are detected, it is concluded that the ``chirp mass'' of the SBBH must be less than that adopted by Sudou et al. General features of a gravitational wave detection scheme based on radio pulsar timing are also presented.All of you are invited to attend.

Abstract :
Science outreach tied to an active research field is rich in possibilities and fraught with danger as one strives to find a balance between content and comprehension. I will discuss outreach programs at the Center for Gravitational Wave Physics that inspire interest in science, enhance traditional education efforts, and facilitate cross-discipline communication.

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Science outreach tied to an active research field is rich in possibilities and fraught with danger as one strives to find a balance between content and comprehension. I will discuss outreach programs at the Center for Gravitational Wave Physics that inspire interest in science, enhance traditional education efforts, and facilitate cross-discipline communication.

Abstract :
The laser phase noise is one of the dominant noises for the gravitational wave detector LISA. Since it is impossible to maintain equal distances between the spacecraft, the time-delay interferometry (TDI) techniques are used to eliminate the laser phase noise along with the optical bench noise. We present a rigorous and systematic formalism based on algebraic geometrical methods involving computational commutative algebra, which generates in principle all the data combinations cancelling the laser frequency noise.

Abstract :
Gravitational waves are to gravity as are, e.g., radio waves to electromagnetism. Gravitational waves will be associated with cosmic events, such as the inspiral and coalescence of binary systems of compact objects like neutron stars

and black holes. Just now coming on-line is the first generation of gravitational wave detectors with great enough sensitivity to detect the radiation from cosmic sources like these. We are thus at the cusp of a new era - the era of "gravitational wave astronomy" - where gravitational wave observations will help us learn about the cosmos. In this talk we will discuss the sensitivity of current detectors, like the Laser Interferometer Gravitational Wave Observatory, and coming detectors, like the Laser Interferometer Space Antenna, and how observations with these instruments will be used as astronomical observatories.