distortions, induced by absorption inside the optics, degrade the interferometer performance reducing the quality of the control signals and consequently the duty cycle of the instrument. A dedicated thermal compensation system is currently enganged to monitor and compensate the wavefront distortion with an accuracy of the order of nanometers ensuring a duty cycle of Advanced Virgo during O3 higher than 90%. An overview of the system will be given, along with the main achievements during the pre-O3 interferometer commissioning.

Neutron star universal relations with microscopic equations of state.

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We study neutron star's structure properties such as moments of inertia, tidal deformabilities and quadrupole moments using a set of microscopic equations of state (EoS) obtained within the Brueckner-Hartree-Fock (BHF) approach to nuclear matter. We also consider the BHF EoS including hyperons, as well as hybrid stars with quark matter at high density, modeled in the Dyson-Schwinger theoretical framework. We shall discuss the validity of several universal relations between the various observables and demonstrate that the microscopic EoS are fully compatible with new constraints imposed by the interpretation of the neutron-star merger event GW170817.

Stabilizzazione di un giroscopio laser di grandi dimensioni.

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La grande sensibilità dei giroscopi laser di grandi dimensioni permette loro di misurare con una precisione migliore di 1 (prad/s) la velocità di rotazione del sistema di riferimento ad essi solidale. L'esperimento GINGER (Gyroscopes IN GEneral Relativity), il cui prototipo GINGERino si trova nei Laboratori Nazionali del Gran Sasso (LNGS), mira a sfruttare questa sensibilià per misurare la velocità di rotazione terrestre con una precisione tale da rivelare l'effetto di Lense-Thirring. Per ottenere tale risultato abbiamo implementato sia un sistema di stabilizzazione attiva della geometria della struttura del giroscopio, basato su tecniche interferometriche, sia della potenza del laser.

A new accurate measurement of the dragging of inertial frames a century after the Einstein, Thirring and Lense papers.

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Gravitomagnetism represents one of the most peculiar predictions of Einstein's geometrodynamics and describes the spacetime curvature effects due to mass-currents. Following Einstein, gravitomagnetism is responsible of the so-called dragging of the local inertial frames, whose axes are defined by the orientation of gyroscopes with respect to the distant stars. The orbital plane of an Earth-orbiting satellite is a sort of enormous gyroscope once removed all classical perturbations that arise from the main gravitational and non-gravitational perturbations. We present a new measurement of the dragging effect by using a combination of the right ascensions of the ascending nodes of the orbits of the two LAGEOS satellites and

that of LARES, which results in a measurement, both precise and accurate of the Earth's gravitomagnetic field, with an assessment towards $\approx 1\%$ of the main systematic sources of error. The LARASE Collaboration carries on this project within the Astroparticle Committee (CNS2) of INFN.
