



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3732

Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) The densest stuff in the Universe: probing neutron star matter with gravitational waves

Tuesday 20 June 2023 13:45 (30 minutes)

The multimessenger binary neutron star merger GW170817 and subsequent LIGO-Virgo gravitational-wave discoveries are shedding new light on the ultra-dense matter inside neutron stars. With densities and pressures several times greater than those in atomic nuclei, neutron star cores harbour the most extreme matter in the Universe. Its composition remains an open question: does it consist entirely of hadrons, like neutrons and protons, or does a more exotic state, like quark matter, prevail at the highest densities? I will describe what gravitational-wave observations are revealing about the neutron star interior, and how future-generation observatories will revolutionize our understanding of ultra-dense matter.

Keyword-1

Neutron stars

Keyword-2

Gravitational waves

Keyword-3

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Session Classification: (DTP) T3-4 Hot Topics From Theory Made Accessible | Sujets chauds de la théorie rendus accessibles (DPT)

Track Classification: Symposia Day (Tues. June 20) / Journée de symposiums (mardi, le 20 juin): Symposia Day (DTP - DPT) - Hot Topics From Theory Made Accessible | Les sujets chauds de la théorie rendus accessibles