Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **88** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Prospects for measuring off-axis spins of binary black hole sources with A+/AdV+

Monday 7 June 2021 13:03 (3 minutes)

The mass and spin properties of black hole binaries inferred from their gravitational-wave signatures reveal important clues about how these binaries form. For instance, stellar-mass black holes that evolved together from the same binary star will have spins that are preferentially aligned with their orbital angular momentum. Alternatively, if the black holes formed separately from each other and later became gravitationally bound, then there is no such preference for having aligned spins. Furthermore, it is known that the presence of misaligned spins induces a general relativistic precession of the orbital plane, imprinting unique structure onto the gravitational-wave signal. The fidelity with which gravitational-wave detectors can measure off-axis spins, or equivalently, precession, will therefore have important implications for the use of gravitational waves to study binary black hole formation channels. I will summarize a new study that examines how well the A+/AdV+ detector network will measure off-axis spin components, and report preliminary results comparing spin resolution between the fourth and fifth LIGO-Virgo observing runs using simulated detector noise and multiple sets of simulated signals distributed over the mass-spin parameter space.

Author: KNEE, Alan (University of British Columbia)

Co-authors: Dr MCIVER, Jess (UBC); Dr CABERO, Miriam (UBC)

Presenter: KNEE, Alan (University of British Columbia)

Session Classification: M2-2 Classical and Quantum Gravity II (DTP) / Gravité classique et quantique II (DPT)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)