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## **A 21-solar mass black hole in the X-ray binary system Cygnus X-1**

*Monday, 5 July 2021 10:40 (35 minutes)*

The fate of massive stars is influenced by the mass lost to stellar winds over their lifetimes, which limit the masses of the stellar remnants that they eventually produce. In this talk I will discuss our recent redetermination of the black hole mass in the X-ray binary system Cygnus X-1. At 21 solar masses, our measurement makes this the most massive dynamically-confirmed stellar-mass black hole yet detected without the use of gravitational wave facilities. With the system having been formed in an environment with close to solar metallicity, this measurement challenges existing estimates of wind mass loss rates from massive stars. I will present the new astrometric measurements that resolved the discrepancy between radio and optical parallax values, and outline how this enabled us to refine the measured black hole mass. Finally, I will briefly discuss the implications of this result for massive star evolution.

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