

Citation for the 2018 RAS 'A' Gold Medal: Professor James Hough

The 2018 Gold medal in Astronomy is awarded to Professor James Hough.

Professor James Hough developed many of the key technologies and experimental techniques, over four decades that made the first direct detection of gravitational waves possible. Gravitational waves are a fundamental prediction of the theory of General Relativity.

The discovery of gravitational waves arising from the coalescence of two massive black holes, by the Advanced Laser Interferometer Gravitational Wave Observatory (LIGO), is one of the most important scientific breakthroughs of the past decades. It opened up a new window onto the Universe, revealing details of some of the most extreme events in nature and allowing stringent tests of gravity and General Relativity.

The detection of gravitational waves required extremely precise measurements of tiny signals embedded in a very noisy environment. This was achieved using laser interferometers capable of measuring displacements of less than a thousandth of the diameter of a proton. Professor Hough, working as part of the UK/German GEO600 team, developed sophisticated mirror suspensions that enabled LIGO to reach the sensitivity required for the discovery.

Professor Hough's contributions had a critical impact within LIGO, a collaborative project with over one thousand researchers from more than twenty countries. He is the author of more than 300 journal papers and, throughout his career, has combined academic research and teaching with the promotion of science and education in the United Kingdom and Europe.

For these reasons, Professor Hough is awarded the Royal Astronomical Society's Gold Medal.