



Royal
Astronomical
Society

Professor James Binney - Gold Medal (A)

The 2025 Gold Medal of the Royal Astronomical Society is awarded to Professor James Binney of Oxford University for a lifetime of work on the structure and evolution of galaxies.

Professor Binney is one of the world's most distinguished theoretical astronomers and has made a series of outstanding contributions in the areas of gravitational dynamics and galaxy formation. His work combines great physical insight with rigorous methods for inferring the internal structure of galaxies and stellar systems. He is also an exceptional pedagogue, whose textbooks have been deeply influential – most notably the classic graduate text “Galactic Dynamics”, written with Scott Tremaine, and “Galactic Astronomy” written with Michael Merrifield.

Binney's 1975 thesis derived characteristic sizes and masses of galaxies by considering the cooling of shock-heated proto-galactic gas. This work was hugely influential, and gas cooling remains one of the key ingredients in modern galaxy formation models.

His thesis also showed that elliptical galaxies could be flattened without rotation and Binney went on to show with Sverre Aarseth that they could be triaxial. This work was performed before elliptical galaxy rotation curves had become available, and correctly predicted that ellipticals are mainly pressure-supported, and sometimes triaxial, systems. With Gavin Tabor he pioneered the view that supermassive black holes play a key role in galaxy formation by stabilising hot circumgalactic gas.

Binney has continued to popularise the use of action integrals in galactic dynamics, and is responsible for the algorithms that are now widely used to compute actions. Our current models for the mass distribution of the Milky Way depend on this work, and they are being constantly refined in light of the flood of data from GAIA and ground-based surveys. Binney continues to contribute to these revolutionary developments.

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