



Royal
Astronomical
Society

The 2023 Chapman Medal is awarded to Professor Nicholas Achilleos

Professor Nicholas Achilleos is awarded the Chapman Medal for a series of investigations using numerical modelling of the force balance within planetary magnetospheres that have highlighted the role of hot plasma in determining the structure and dynamics of these systems. The UCL Magnetodisc model for Saturn was developed in close collaboration with his colleagues, Patrick Guio and Chris Arridge, by adapting Caudal's original formulation for Jupiter, and incorporating data from the Cassini spacecraft. By introducing this model, which balances centrifugal stresses, magnetic forces, and plasma pressure in axi-symmetric, rapidly rotating magnetospheres, Professor Achilleos has been able to undertake a series of outstanding studies of the magnetospheres of the outer planets. One excellent example is the work to demonstrate that hot plasma alters the planetary magnetodisc shape significantly, thereby improving the fit of predicted current densities with those derived from Cassini data. Another is the work where Professor Achilleos subsequently found that global changes in hot plasma pressure strongly affect Titan's plasma environment, in addition to the expected cold plasma driving. Professor Achilleos has also encouraged community use of his model to maximise data exploitation and further understanding of force balance within planetary magnetospheres by making selected UCL Magnetodisc Model outputs available through the Europlanet Virtual European Solar and Planetary Access and Planetary Space Weather Services initiatives.

For these reasons Professor Nicholas Achilleos is awarded the Chapman Medal.