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Gravitational potential and X-ray luminosities of early-type galaxies observed with XMM-Newton and Chandra

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We study the dark matter content in early-type galaxies and investigate whether X-ray luminosities of early-type galaxies are determined by the surrounding gravitational potential. We derived gravitational mass profiles of 22 early-type galaxies observed with XMM-Newton and Chandra. Sixteen galaxies show constant or decreasing radial temperature profiles, and their X-ray luminosities are consistent with kinematical energy input from stellar mass loss. The temperature profiles of the other 6 galaxies increase with radius, and their X-ray luminosities are significantly higher. The integrated mass-to-light ratio of each galaxy is constant at that of stars within 0.5–1r_e, and increases with radius. The scatter of the central mass-to-light ratio of galaxies was less in K-band light. At 3r_e, the integrated mass-to-light ratios of galaxies with flat or decreasing temperature profiles are twice the value at 0.5r_e, where the stellar mass dominates, and at 6r_e, these increase to three times the value at 0.5r_e. This feature should reflect common dark and stellar mass distributions in early-type galaxies: Within 3r_e, the mass of dark matter is similar to the stellar mass, while within 6r_e, the former is larger than the latter by two-fold. In contrast, X-ray luminous galaxies have higher gravitational mass in the outer regions than X-ray faint galaxies. We describe these X-ray luminous galaxies as the central objects of large potential structures; the presence or absence of this potential is the main source of the large scatter in the X-ray luminosity.
These results are published in A&A, 501, 157, 2009.

JD1 - Poster Session

Abstract. During the Joint Discussion #1 a significant number of exciting new results were presented in the form of a poster. Below we list the title and authors of the posters.

(*a*) M. D. Suran, *LCDM hydrodynamical cosmological simulations*

(*b*) I. A. Lacerna, *Spatial Correlations of Halo Assembly*

(*c*) P. M de Novais, *Merging pairs of galaxies in the SDSS*

(*d*) R. Salinas, *Kinematics of the field elliptical NGC 7507 – A galaxy with little dark matter?*

(*e*) E. Iodice, *Dark Matter Content in the Polar Disk Galaxy NGC4650A*

(*f*) T. Verdugo, *The whole picture of a galaxy group: Combining Strong Lensing, Weak lensing, Dynamics and N-body simulations in SL2SJ02140-0532*

(*g*) R. Gonzalez, *Galaxy properties within DM halos and Large scale structure*

(*h*) J. A. Magana, *Structure Formation with phi^2 Dark Matter*

(*i*) P. da Cunha Ferreira, *Predicting the length-to-width ratio on gravitational arcs*

(*j*) V. E. Timofeev, *Observation of ionization jerk in the ionization chamber ASK-1*

(*k*) A. D. Ernest, *Gravitational Eigenstates in the Cosmos: The Answer to Dark Matter?*

(*l*) M. A. Dantas, *Current lookback time-redshift bounds on dark energy*

(*m*) G. B. Caminha, *Fraction of arcs in galaxy clusters: redshift evolution and the importance of magnification*

(*n*) A. S. Iribarrem, *Radial statistics of galaxy number counts at high redshifts*

(*o*) R. R. Rosa, s Characterizing Extreme Event Dynamics in Galaxy-Sized Dark Matter Haloes

(*p*) V. A. P. Martin, *Log Slit Spectroscopy and broad-band photometry of the peculiar galaxy ESO 287-G40*

(*q*) D. Bettoni, *The Core Fundamental Plane of low redshift radio galaxies*

(*r*) S. Bryan, *Orbits in Dark Matter Haloes*

(*s*) F. E. M Costa, *Current constraints on dark matter-dark energy interaction*

(*t*) L. Marassi, *Mass Functions in an Homogeneous Dark Energy Model*

(*u*) M. D'Onofrio, *Comparing the FP of early-type galaxies in the V and K bands*

(*v*) E. R. Carrasco *Disentangling the monster. Gemini/GMOS observations of a massive galaxy in the core of Abell 3827*

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(w) E. S. Rykoff, *The Origin and Evolution of Fossil Groups*

(x) G. Caminha, *Cross section for arc formation in the perturbative approach*

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