Обзор «Структуры и компоненты скоплений галактик: наблюдения и модели»

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Clusters of galaxies are the largest gravitationally bounded structures in the Universe dominated by dark matter. We review the observational appearance and physical models of plasma structures in clusters of galaxies. Bubbles of relativistic plasma which are inflated by supermassive black holes of AGNs, cooling and heating of the gas, large scale plasma shocks, cold fronts, non-thermal halos and relics are observed in clusters. These constituents are reflecting both the formation history and the dynamical properties of clusters of galaxies. We discuss X-ray spectroscopy as a tool to study the metal enrichment in clusters and fine spectroscopy of Fe X-ray lines as a powerful diagnostics of both the turbulent plasma motions and the energetics of the non-thermal electron populations. The knowledge of the complex dynamical and feedback processes is necessary to understand the energy and matter balance as well as to constrain the role of the non-thermal components of clusters.

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