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Autore	Einasto Jaan
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Nota di contenuto	Preface; Contents; 1. Prologue; 2. Classical cosmological paradigm; 2.1 Astronomy in the first half of the 20th century; 2.1.1 The nature of spiral nebulae; 2.1.2 The expansion and age of the Universe; 2.1.3 The mean density of matter in the Universe; 2.1.4 The distribution of galaxies; 2.1.5 Structure of the system of stellar populations; 2.1.6 The evolution of stars; 2.2 History of Estonia, my family roots, and Tartu Observatory; 2.2.1 A short history of Estonia; 2.2.2 My roots; 2.2.3 My early life and first steps in astronomy; 2.2.4 Liia 2.2.5 Tartu Observatory after the war, and the building of the new observatory3. Galactic models and dark matter in the solar vicinity; 3.1 Early Galactic models; 3.1.1 Early Galactic models and first hints of the presence of dark matter; 3.1.2 Density of matter in the Solar vicinity; 3.1.3 Galactic models by Parenago, Kuzmin, and Schmidt; 3.2 New Galactic models; 3.2.1 Search for better models; 3.2.2 Generalised exponential model; 3.2.3 Our Galaxy, system of galactic constants; 3.2.4 Mass-to-luminosity ratios of stellar populations; 3.2.5 Evolution of galaxies 3.2.6 Models of galaxies of the local group and M87 mass paradox in galaxies; 3.3 Tartu Observatory in the 1960's; 3.3.1 New observatory;

3.3.2 Philosophical seminars and New Year parties; 3.3.3 Space studies; 4. Global dark matter; 4.1 The discovery of global dark matter; 4.1.1 Galactic coronas; 4.1.2 Clusters and groups of galaxies; 4.1.3 Dynamics and morphology of companion galaxies; 4.1.4 Tallinn and Tbilisi dark matter discussions; 4.2 The confirmation of the presence of global dark matter; 4.2.1 Rotation curves of galaxies; 4.2.2 Mass-to-luminosity ratios of galaxies; 4.2.3 X-ray data 4.2.4 Gravitational lensing 4.3 Dark matter in galaxies; 4.3.1 The density distribution of dark matter; 4.3.2 Distribution of luminous and dark matter in galaxies; 4.3.3 Universal rotation curve of galaxies; 4.3.4 The formation of galaxies; 4.3.5 Modern models of galaxies; 4.4 Tartu Observatory in the 1970's; 4.4.1 Computer revolution; 4.4.2 Life in the Observatory; 5. The cosmic web; 5.1 Early studies of spatial distribution of galaxies; 5.2 The discovery of the cosmic web; 5.2.1 Zeldovich question; 5.2.2 The Tallinn symposium on large scale structure of the Universe 5.2.3 Superclusters, filaments and voids 5.3 Tartu Observatory in the early 1980's; 5.3.1 Southern base of Tartu Observatory; 5.3.2 Studies of ancient astronomy; 6. The nature of dark matter; 6.1 Baryonic dark matter; 6.1.1 Early discussions on the nature of dark matter; 6.1.2 Stellar or gaseous dark coronae; 6.1.3 Nucleosynthesis constraints of baryonic matter; 6.2 Non-baryonic dark matter; 6.2.1 Cosmic microwave background radiation; 6.2.2 Fluctuations of the CMB radiation; 6.2.3 Neutrinos as dark matter candidates; 6.2.4 Cold dark matter; 6.2.5 Dark matter in dwarf galaxies 6.2.6 Missing satellite problem and warm dark matter

Sommario/riassunto

The concepts of dark matter and the cosmic web are some of the most significant developments in cosmology in the past century. They have decisively changed the classical cosmological paradigm, which was first elaborated upon during the first half of the 20th century but ran into serious problems in the second half. Today, they are integral parts of modern cosmology, which explains everything from the Big Bang to inflation to the large scale structure of the Universe. Dark Matter and Cosmic Web Story describes the contributions that led to a paradigm shift from the Eastern point of view. It des
