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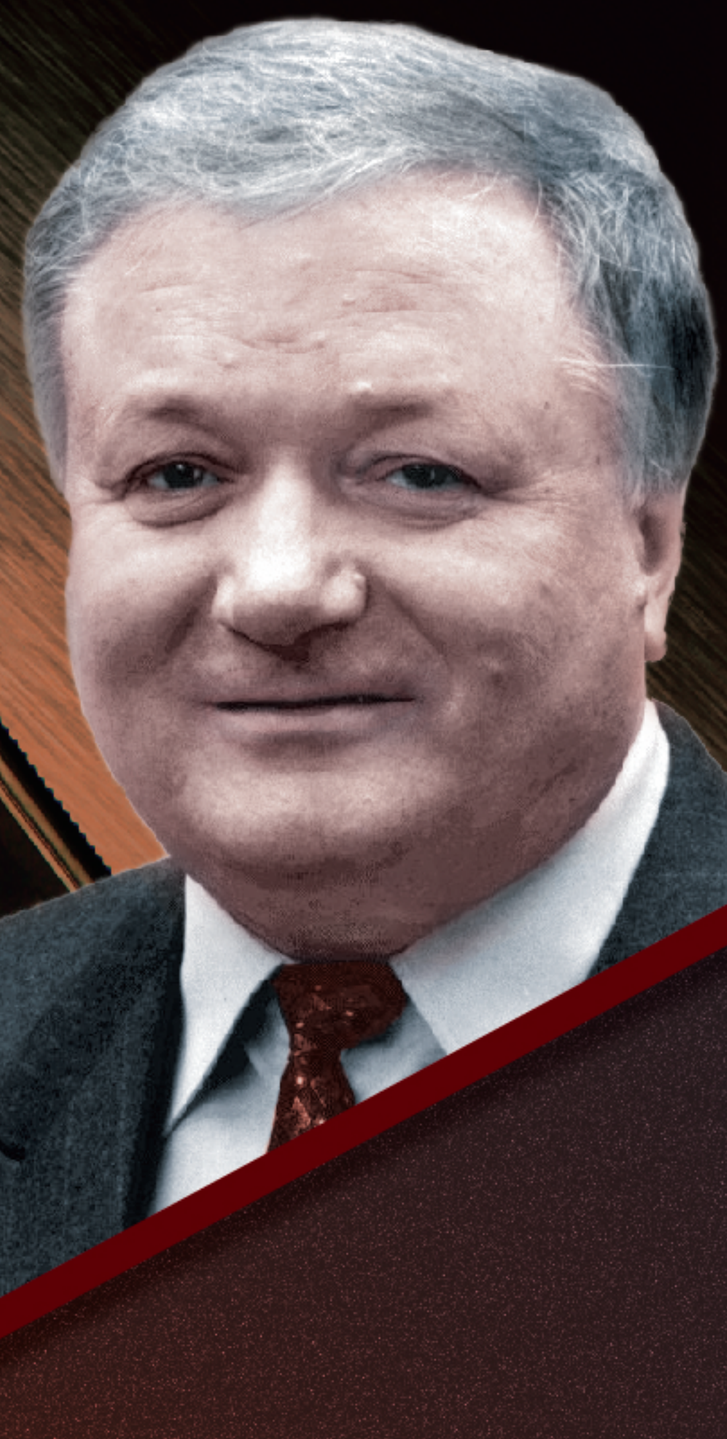

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清华大学高等研究院 科学馆一楼104报告厅

Two important moments in the history of the Universe: last scattering surface and black body photosphere of the Universe

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Last scattering surface and black body photosphere of the Universe are two very important milestones in the history of our Universe. Hydrogen recombination at redshifts z ~ 1100 - 1300 leads to rapid decrease of the optical depth of the Universe due to Thomson scattering. At a result the acoustic peaks in the observed CMB angular distribution are formed in the vicinity of the last scattering surface. The question remains how and at which redshifts the observed practically ideal black body spectrum of CMB was formed. Why we dream that proposed space missions like PIXIE will be able to detect traces of any significant energy release in our Universe at redshifts smaller than 2 million? Why spectral distortions can not originate behind black body photosphere or at redshifts higher that 2 million ?

Rashid Sunyaev was born in Tashkent, Uzbekistan, and educated at the Moscow Institute of Physics and Technology and Moscow University. The head of the High Energy Astrophysics Department of the Russian Academy of Sciences from 1982 to 2002 and chief scientist of the Academy’ s Space Research Institute since 1992, he holds several concurrent positions, including editor-in-chief of Astronomy Letters. He currently divides his time between Moscow and Garching, Germany, where he is managing director of the Max Planck Institute for Astrophysics. He worked for several years with his teacher, Yakov B. Zel’ dovich, in the Moscow Institute of Applied Mathematics, where the two proposed what is known as the Sunyaev-Zel’ dovich effect, an important method for determining absolute distances and hence the Hubble constant from the effect of gas in galaxy clusters on the cosmic microwave background radiation. Sunyaev and N. Shakura developed a model of disk accretion onto black holes, and he has proposed a signature for X-radiation from matter spiraling into a black hole. He has collaborated in important studies of the early universe, including the recombination of hydrogen and the formation of the cosmic microwave background radiation.

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