

THE STUDY OF THE MECHANISM OF CUMULATIVE GENERATION OF STREAMS FOR THE MODEL OF ACTIVE ASTRONOMICAL OBJECT

Kirill A. Halin

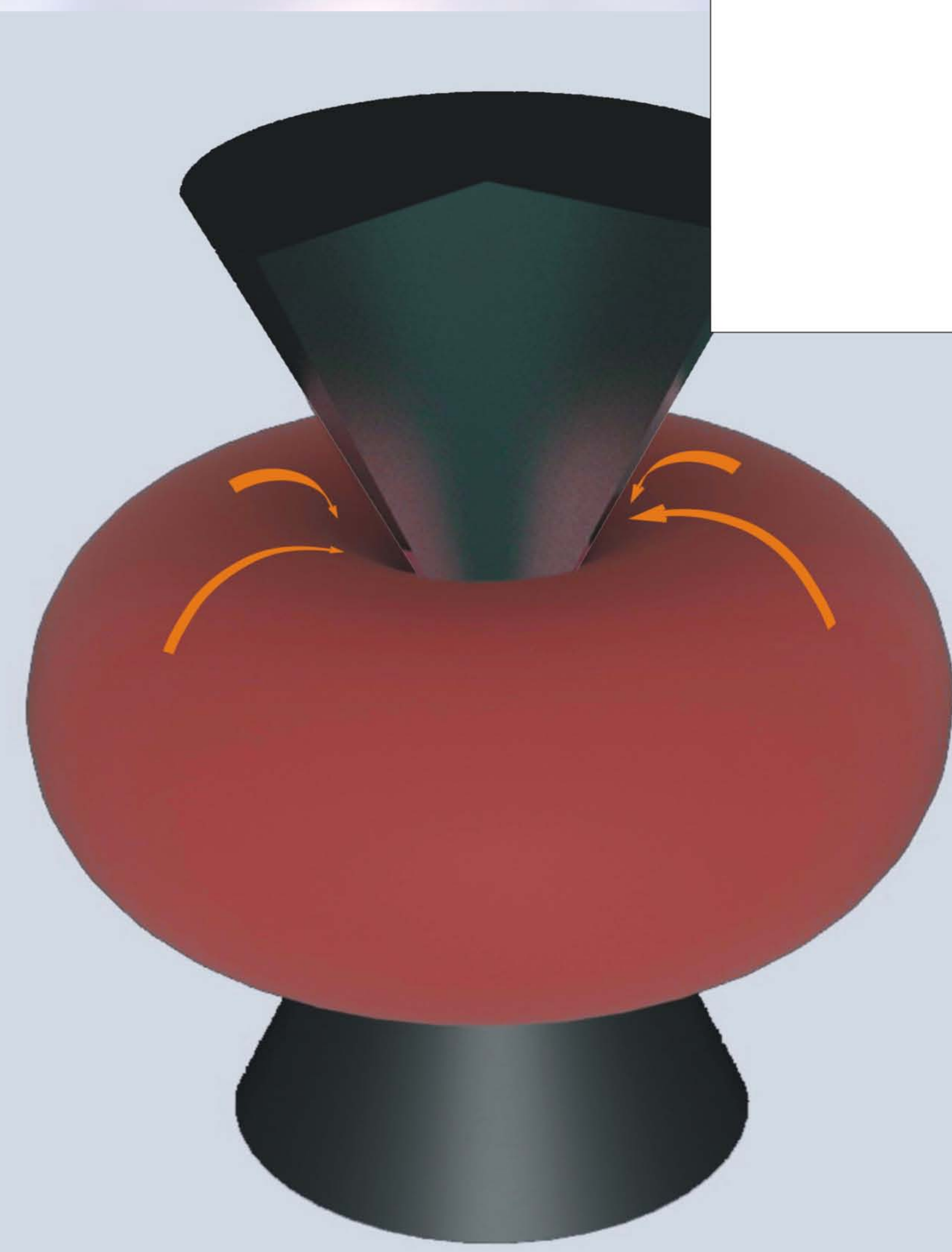
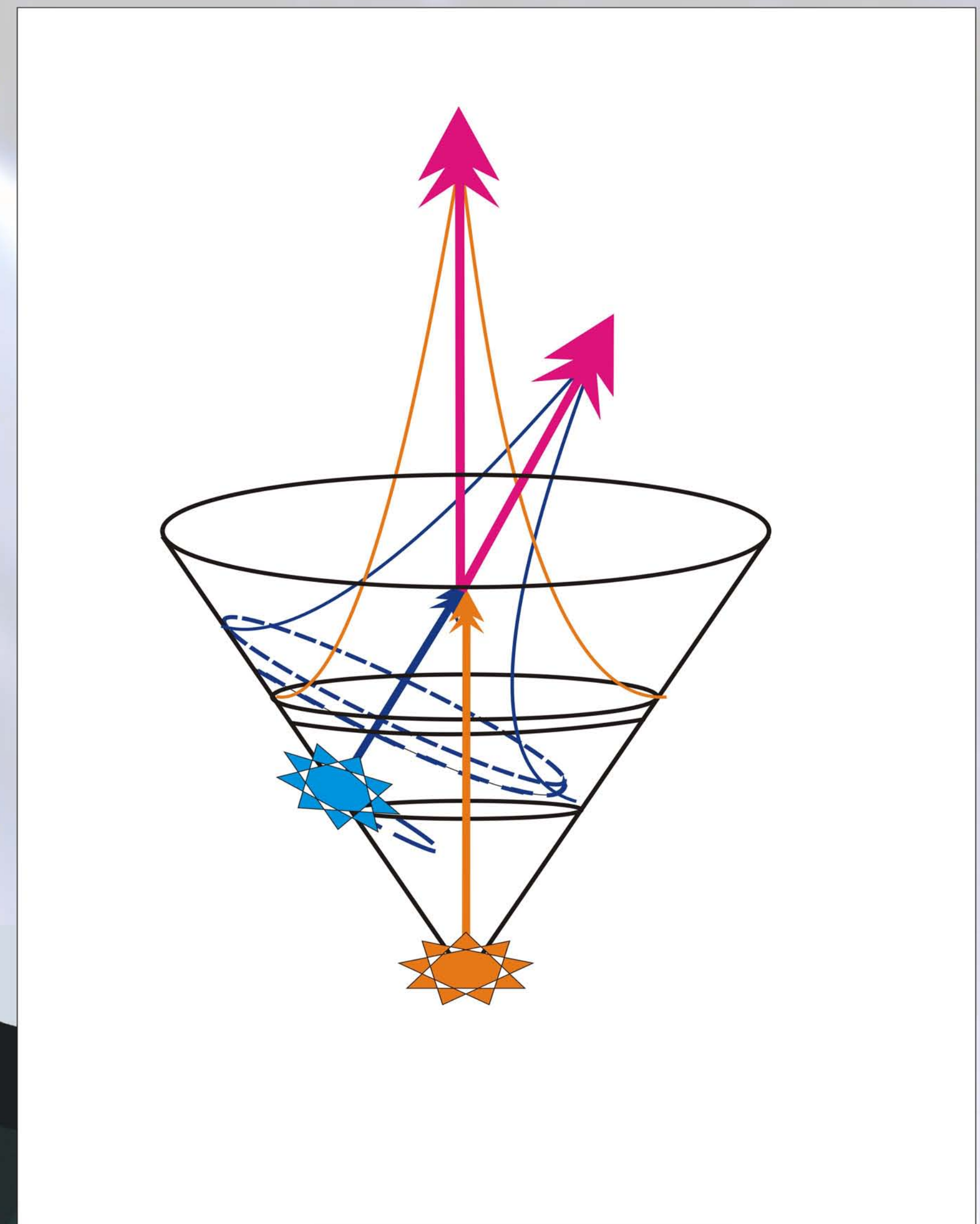
Stavropol State University

Vladimir V. Vitkovskiy

Special Astrophysical Observatory of RAS

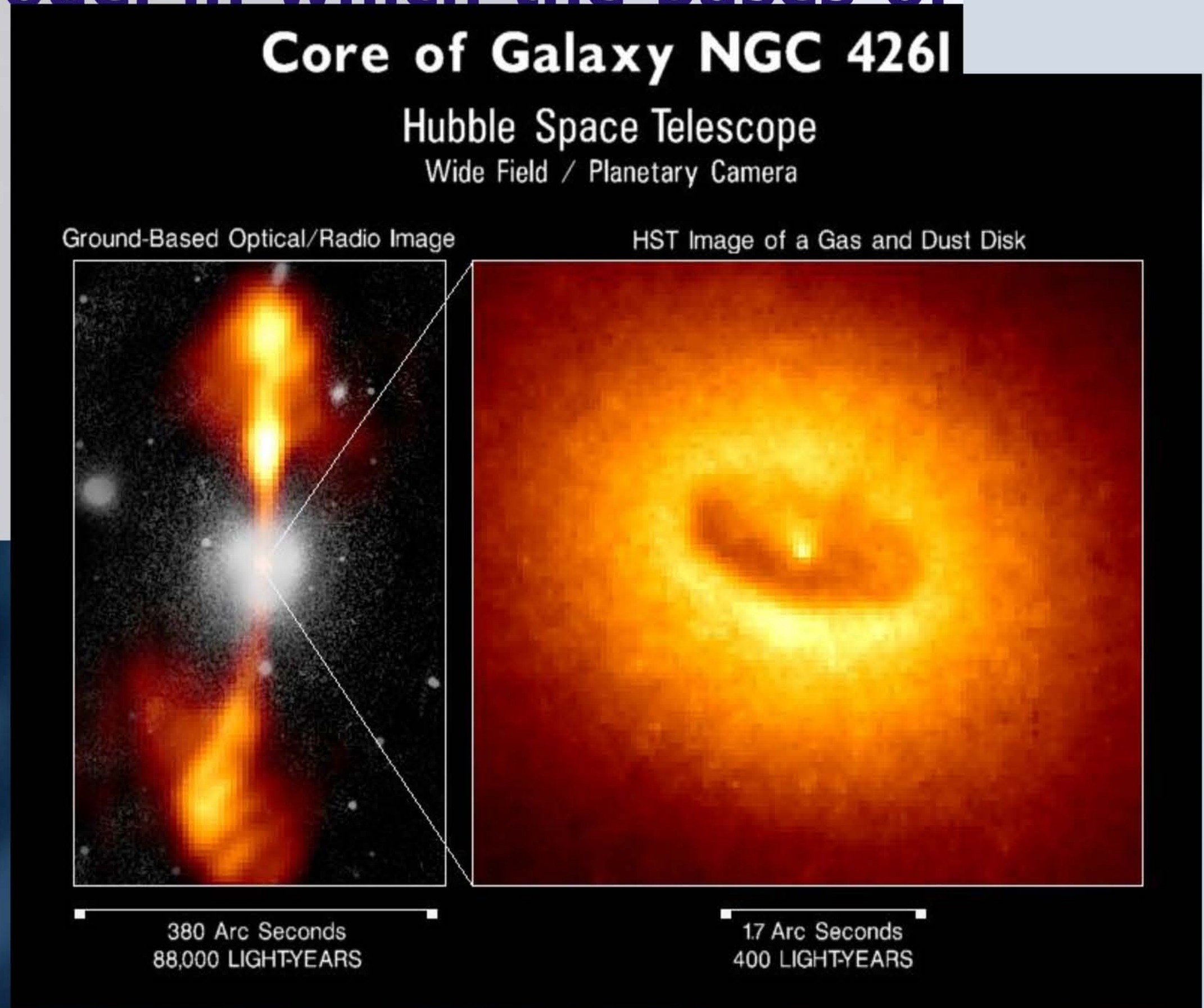
The study introduces research of a purely hydrodynamic model of active astronomical object (V.Vitkovskiy, 2001). It defines the principles of creation on its basis of a mathematical model for carrying out of the numerical experiments promoting studying and understanding of physical processes in active objects of different types. The basic mechanism of activity in the model is the cumulative process arising from the accretion of surrounding substance on the poles of rotating object in a cone-shaped funnel.

In the substance under accretion hydrogen prevails. Falling on a star surface, hydrogen accumulates and heats up to the temperature at which thermonuclear reaction of transformation of hydrogen in helium begins. When the speed of produced warmth of nuclear reaction exceeds the speed of a heat being conducted off, thermal instability develops and the explosion occurs. Such scheme is possible provided there is a gas cloud around a star which density is much more than density of the interstellar environment, or the star is a part of a close double system and the overflowing mechanism operates. However, as the research of an actually unlimited cumulative action shows, this mechanism can characterise the process of accumulation of the substance, necessary for the description of the offered model. Proceeding from the observations carried out in various ranges, it is possible to create a model in which the bases of streams are surrounded by cocoons of hot gas reradiating radiation of internal areas of the channel.

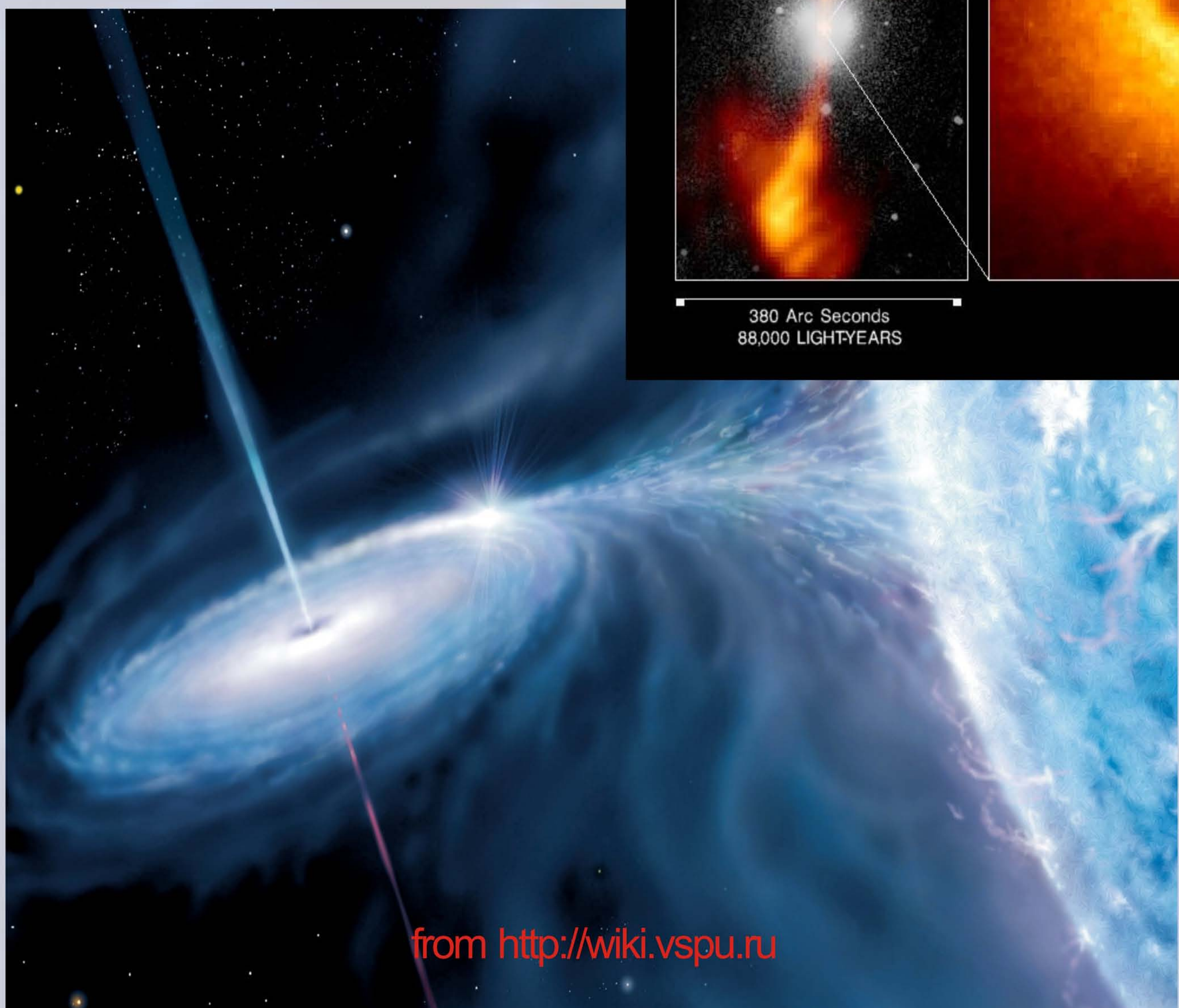


Gas of streams flies on strictly ballistic trajectories (straight lines) on which it has been ejected from the source. The source that is the central area of the accretion disk, participates in

continuous precessional and nutational movement. Gas emission in streams is modulated, it occurs in portions, on average 1 to 3 portions a day. Development of thermal instability in the degenerated substance that falls on the surface of a neutron star as a result of accretion is often considered as a model for flashing x-ray sources (barsters). Accretion on massive objects can explain powerful compact sources of radiation in the centres of active galaxies.



For testing of considered model the results of researches SS433 are used. Streams SS433 move through environment not in earlier created channel as streams with an invariable direction, they constantly reconstruct this channel, changing it towards precessional movement. The stream, interacting with the wind, creates a cocoon and carries away behind itself adjacent areas of a wind. Big gradients of density and speed of intercloudy gas will be observed towards a direction of precessional rotation, it is from this part that gas can flow into a stream.



from <http://wiki.vspu.ru>