I. D. Novikov, *Electrodynamics of black holes and its astrophysical applications.* The existence of black holes in double star systems can be considered a fact established by astrophysical observations. Numerous observational data indicate the probable presence of supermassive black holes in galactic nuclei and quasars. These supermassive black holes must be the cause of the tremendous energy release observed in quasars and galactic nuclei. One of the possible mechanisms of energy release may be electrodynamic processes occurring in the vicinity of black holes which are subject to accretion of magnetized gas. Recently in the USSR and abroad the theory of the electrodynamics of black holes has been under development. If a rotating black hole is placed in an external magnetic field, then in its vicinity there arises an induction electric field produced by the presence of a relativistic gravimagnetic field due to rotation of the black hole. If now in the vicinity there is a rarefied plasma, then electric currents will arise in it. These currents can serve as a specific mechanism which pumps energy of rotation of the black hole into energy of ultrarelativistic particles, energetic γ rays, and so forth. In recent work by N. S. Kardashëv, I. D. Novikov, A. G. Polnarev, and B. E. Shtern[1] a model has been constructed which explains the appearance of the activity of the center of our Galaxy, as the result of the appearance of an

intense beam of energetic γ rays with total energy $\sim 10^{40}$ erg/sec. The beam of γ rays arises as the result of interaction of charged particles accelerated by the induction electric field around the black hole with the thermal radiation of the gas fallling into the black hole. Possibly a similar mechanism may be operating in the nuclei of other galaxies and in quasars.

[1]N. S. Kardashëv, I. D. Novikov, A. G. Plonarev, and B. E. Shtern, Astron. Zh. **60**, 209 (1983) [Sov. Astron. **27**, 119 (1983)].

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