Yu. N. Gnedin's Contribution to the Development of IAA RAS Astrophysical Research

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Abstract. This memorable review describes the outstanding scientist Yuri Nikolaevich Gnedin's astrophysical research work with the IAA RAS Quasar system's RT-32 radio telescopes.

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1 Introduction

Radio astronomy observations were started in the Institute of Applied Astronomy of the Russian Academy of Sciences (IAA RAS) in 2003 as a result of the initiative and proposals made by Yuri Nikolaevich Gnedin a few years after the first Quasar system's RT-32 radio telescope had been put into operation and regular schedule at Svetloe Observatory. RT-32-based astrophysical researches of cosmic gamma-ray bursts (GRB), supernovae (SN), micro-quasars and active galactic nuclei (AGN) were started and scientifically supervised by a group which included Yu. N. Gnedin (Finkelstein et al. 2005).

2 Cosmic Gamma-Ray Bursts

The very first attempt made by IAA RAS RT-32 to detect the radio afterglow from the cosmic gamma-ray burst (GRB 030329) appeared to be so successful and inspiring for that time, that it grew into a project to search for radio emissions from GRB and a possibly related supernovae (SN) (Finkelstein et al. 2004). It resulted in 82 events in the afterglow stage having been studied by 2012; three

of them (GRB 030329, GRB 080319B, GRB 110328A) showed significant radiation in the radio band which reaching a maximum of several dozen millijansky (Kharinov et al. 2010; Kharinov et al. 2010; Gnedin 2013).

3 Compact Astrophysical Objects

Yu. N. Gnedin initiated a number of independent works which were carried out at the IAA RAS, such as radio observations of microquasar SS 433 and several supernovae (Finkelstein et al. 2005); radio observations of intermediate-mass black holes (Finkelstein et al. 2005); and research of SGR 1806+20 magnetar's radio emission (Gnedin 2013; Gnedin et al. 2007).

4 Active Galactic Nuclei

The following celestial objects were investigated in Yuri Nikolaevich's last years (from 2010 to 2018) using IAA RAS radio telescopes regularly under his leadership:

- supermassive black holes (SMBH) in the central regions of AGN with the dominant component being relativistic jets' kinetic energy;
- AGNs with a predominance of water vapor maser radiation;
- SMBH candidates that recoiled due to gravitational waves during the merger of black holes.

The spins of SMBHs were determined in the first group of objects from radio luminosity measurements using RT-32 (Ipatov et al. 2014). The work started but for the second and third groups of astrophysical objects was not completed by Yuri Nikolaevich. It is still being carried out, which shows that Yu. N. Gnedin's ideas are still alive and continue to be developed. Undoubtedly, Yuri Nikolaevich had a significant influence on the formation and development of astrophysical research in IAA RAS.

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