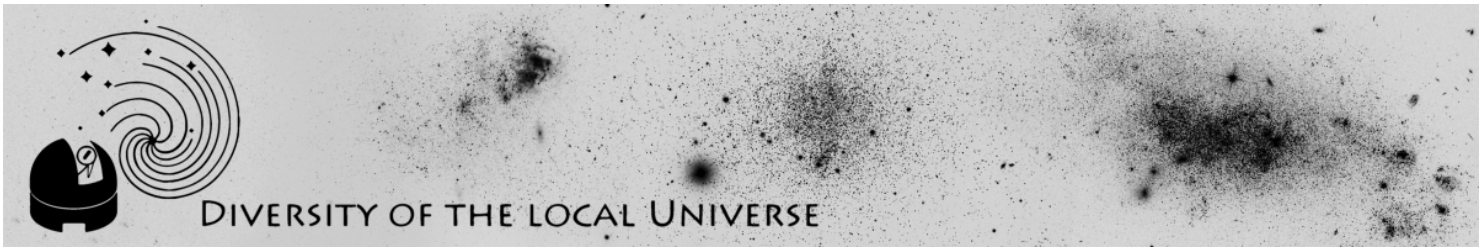

Hα- imaging galaxies in the Local Volume

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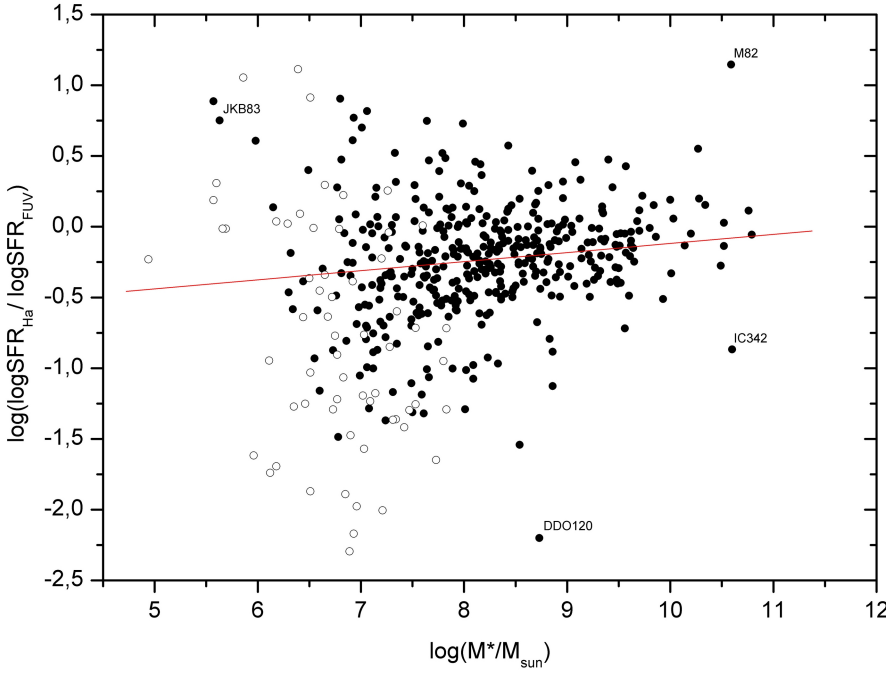
Over the last decade observations of nearby galaxies aimed at determining their SFR from Hα emission flux have been carried out at the SAO RAS. Hα-images for a total of more than 300 nearby galaxies were acquired with the 6m telescope of the SAO RAS within the framework of our Hα-survey program. Our survey, combined with other similar surveys, makes up more than 500-object sample of LV galaxies with measured Hα.

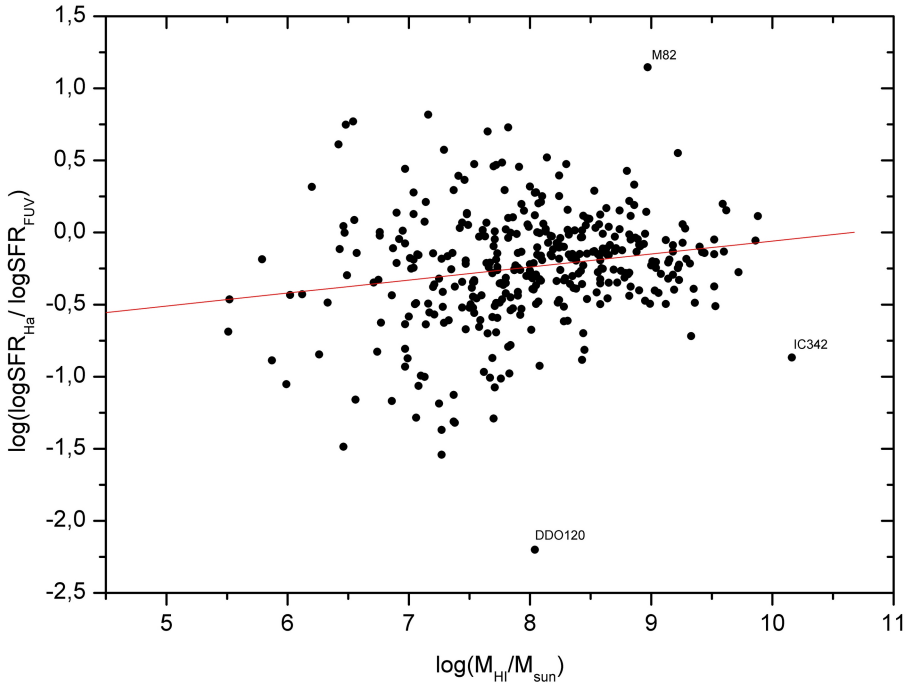
The sample was limited by a two parameter: radial velocity with respect to centroid of the Local Group $V_{LG} < 600$ km/s and a distance $D < 11.0$ Mpc.

Most of these galaxies have their ultraviolet fluxes measured with GALEX space telescope, making it possible to estimate the star-formation rates in galaxies on the time scale of about ~100 Myr.

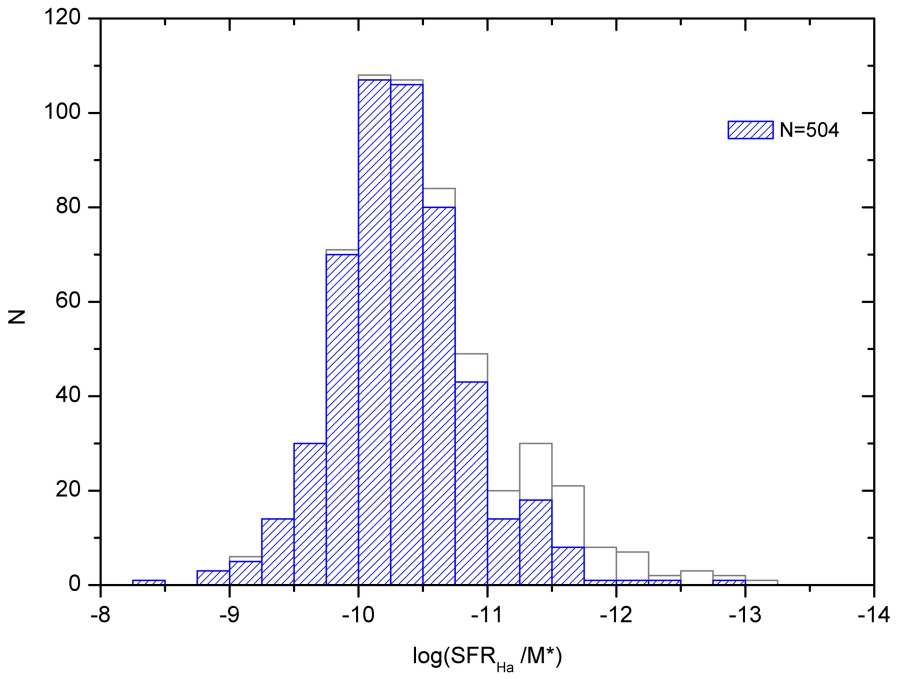
A comparison of the two star-formation rates, SFR (Hα) and SFR (FUV), makes it possible to reveal starburst on ~10–100 Myr long time-scale.

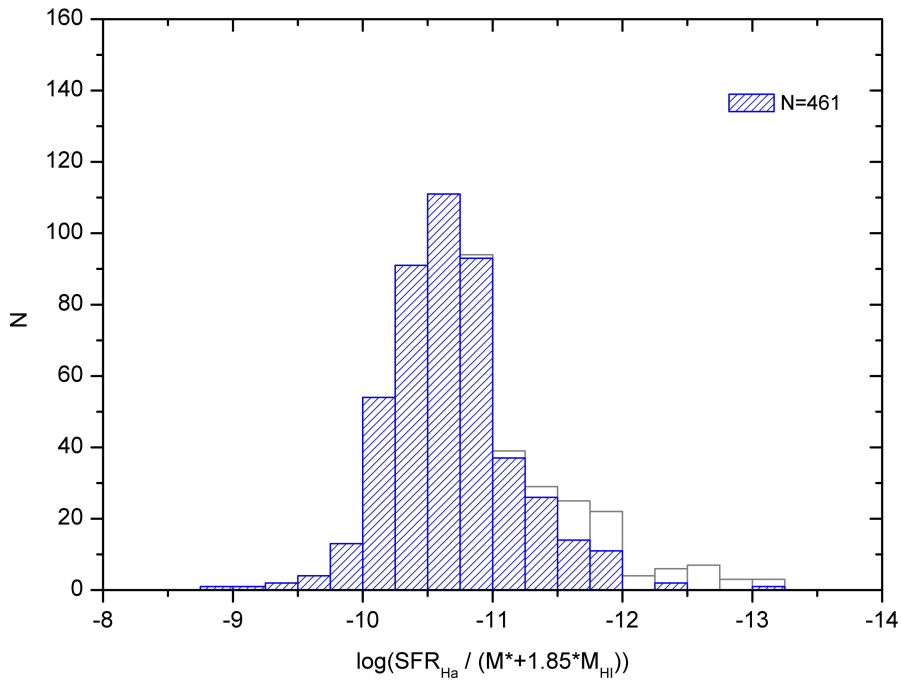


Distribution of the ratio of Hα-to-FUV star formation rates vs. total stellar mass. Galaxies with measured FUV fluxes , but with the upper limit of the flux in Halpha, are marked by open circles.



Ratio of Hα-to-FUV star formation rates vs. total hydrogen mass.





Distribution of sSFR determined from Hα flux; bSFR determined from Hα flux for LV galaxies. Galaxies with an upper limit of the Hα flux are shown without shading.

The distribution of specific star-formation rate per unit baryonic mass, bSFR, for late-type galaxies has a rather well-defined upper limit similar to the Eddington limit for stellar luminosity, which are determined by the presence of hard feedback: a strong burst of star formation in a galaxy exhausts local reserves of neutral gas thereby suppressing further process of the birth of stars.

Conclusion

- The star-formation processes in irregular dwarf galaxies and disks of late-type spiral galaxies have much in common. Most of the Scd-Sc-Sdm galaxies without apparent manifestations of a bulge must have never undergone merging acts over about the last ~10Gyr . Such “virgin” galaxies are characterized by regular, sluggish SFR.
- Dwarf irregular galaxies have about the same average sSFR, but SFR variations among them are the higher the smaller is the baryonic mass of the dwarf.
- The SFR and its variations in late-type galaxies are mostly determined by individual parameters of these galaxies and depend little on external influences.
- The distribution of specific star-formation rate per unit baryonic mass, bSFR, for late-type galaxies has a rather well-defined upper limit -9.5 dex, similar to the Eddington limit for stellar luminosity.
- In the process of the Hα survey we found a number of interesting objects where star formation appears to be caused by external factors, namely, by the inflow of intergalactic gas (NGC4460).

- https://www.sao.ru/lv/lvgdb/

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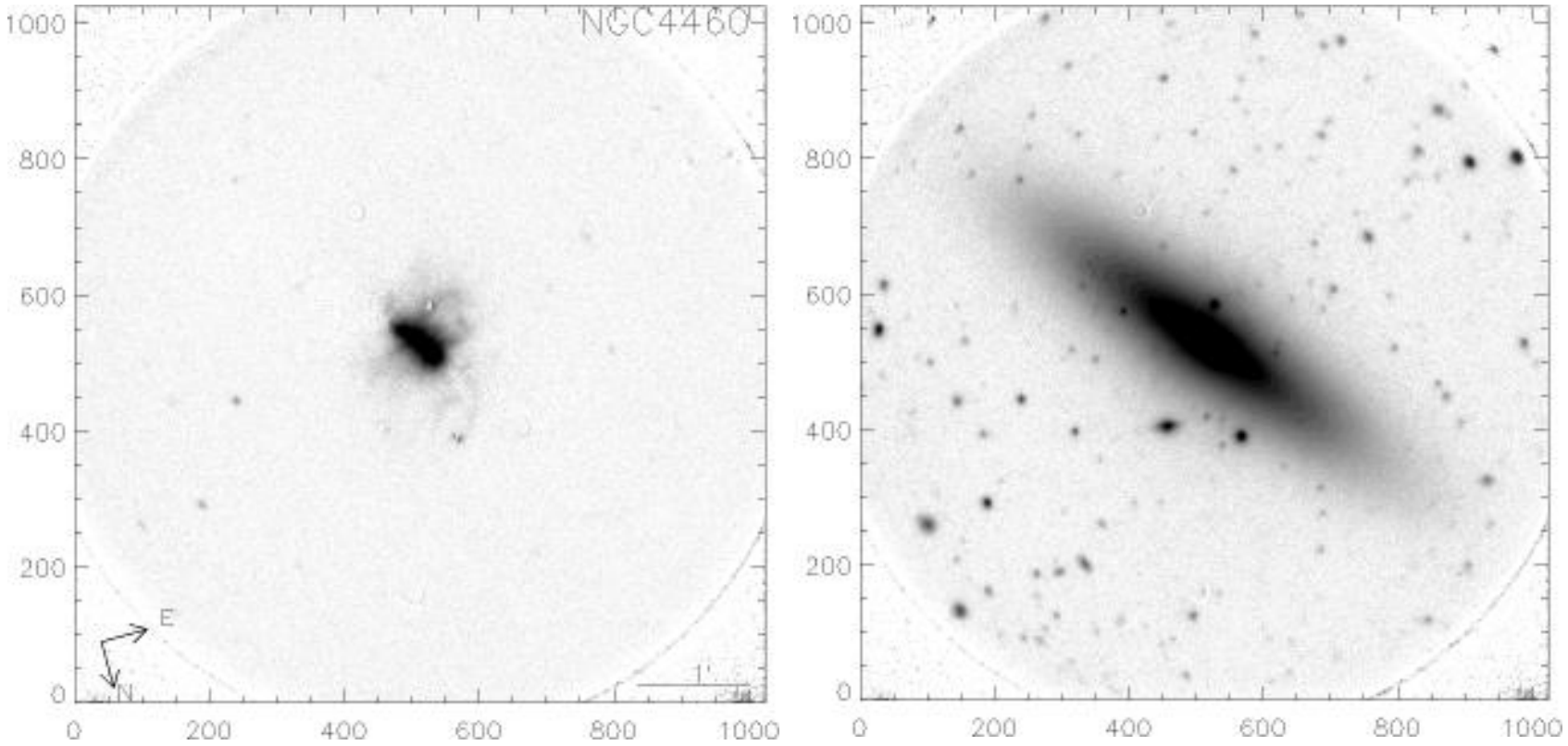

Thank you

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