THE STAR-GALAXY ERA OF BIG HISTORY IN THE LIGHT OF EVOLUTIONARY PRINCIPLES

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The present paper attempts to study similarities at various levels and phases of Big History basing on the star-galaxy era transformations.

Those principles and observations are grouped below into three blocks.
These blocks are defined as follows:

1. Evolution proceeds with constant creation and destruction of objects;
2. Individuality, self-preservation and the struggle for resources;
3. Multilinearity.
Block 1. Evolution Proceeds with Constant Creation and Destruction of Objects

- ‘Evolution is stronger than individual objects’
- Creative destruction
- In every end there is a beginning
Life goes on exactly because organisms are mortal.

Cosmic processes are also accompanied by constant emergence and death of various objects. So we may say: ‘The cosmos is stronger than stars and galaxies’.

In general: ‘Evolution is stronger than individual objects’.
The nature, when creating and destructing various objects, ‘tests’ many versions, some of which turn out to be more effective. For such a situation of selection within constant destruction and creation processes it appears possible to use a rather appropriate notion of *creative destruction* suggested by Joseph Schumpeter.
The material of dead objects becomes building blocks for the formation of new objects.

This allows using the results of long-lasting processes (e.g., the accumulation of heavy elements, genetic or social changes).

This process ensures a field for advancement to new forms.
Block 2. Individuality, Self-preservation and the Struggle for Resources

- Individuality as a way to increase the evolutionary diversity
- Continuity
- Self-preservation
- Origins of the struggle for resources
One could consider stars as the first individual objects in nature.

Those ‘individuals’, being quite similar, have rather different individual fates much depending on circumstances of their birth and various contingencies.

For example, depending on their masses, stars can end their lives in rather different ways.
The stars can be presented as a continuous series from heavier to the lightest ones which become hardly distinguished from big planets.

There is also a continuum of phases in the transformation of cosmic clouds into stars.

The continuum of forms and sizes of objects may be observed at geological, biological, and social levels of evolution.
Self-preservation

- Stars, galaxies, and planets have the quite structured and preserved forms.
- The struggle for self-preservation creates a wide range of interaction between a system and its environment.
- The struggle for self-preservation is the most important source for development.
The struggle for resources among stars and galaxies may proceed through a direct transfer of energy and matter from one body to another, in form of ‘incorporation’, ‘capturing’, that is ‘annexation’ of star clusters by larger groups.

Some astronomers maintain that throughout a few billions of years our galaxy has ‘conquered, robbed, and submitted’ hundreds of small galaxies.
Block 3. Multilinearity

- Main and lateral lines of evolution
- Classical forms and their analogues
- Two parallel forms of existence of cosmic matter
The main and lateral lines of evolution

- At every stage of the evolutionary development one can find the *interaction of a few lines*, in particular the main evolutionary line and a number of lateral ones.

- They allow increasing the diversity, and broadening the range of search opportunities to move to new levels of development.

- Convergence of coexisting lines of development may lead to a qualitative break-through.
The main and lateral lines of evolution may be considered as classical versions and their analogues.

- Various forms of aggregation and specialization of unicellulars can be regarded as analogues of multicellulars.
- Various complex stateless polities can be regarded as state analogues.
Stars and molecular clouds as two parallel forms of existence of cosmic matter

- In this respect we may consider stars and galaxies as the main line of evolution, while giant clouds – as its lateral lines. The former may be denoted as ‘classical forms’, and the latter may be designated as ‘analogues’.

- In fact, those forms transform into each other. Galaxies and stars emerge from giant molecular clouds, whereas stars may transform into gas-dust clouds through explosions and shedding their envelopes.
Conclusion

This diverse and single world

- Our world is immensely diverse and unlimited in its manifestations.
- However, fundamentally it is a single world.
- Studying those fundamentals reveals some new points for our understanding of evolution and Big History; it creates a consolidated field for interdisciplinary research.
Thank you for your attention!