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PFO-CFO Theory of Solar System Formation and Transformation: Foundation, method, explanations, proofs, and predictions

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Rutherford and Soddy were the first (1903) to assume that the thermal and light emission from stars is the result of radiation-chemical reactions (RCRs), and no unequivocal proof of thermonuclear processes in the Sun exist up to now. The PFO-CFO Theory of Solar System Formation and Transformation (the Theory) explains the solar energy and all solar manifestations by the RCRs occurring in the Sun and its vicinities.

It will be shown that Hubble's data prove the multiplicity of star formation periods rather than the linear relationship between the distances to galaxies and the radial velocities of the lasts. The Fridman's solution of the tensor equation is incorrect for intergalactic distances because it doesn't consider the gravitation-field variations with the distance in so large space. Thus, the Big Bang notion has no grounds. The well-known unpublished Einstein's paper of 1931 showed that its author disbelieved the Big Bang theory. Poincaré, Lorentz, Nernst (and others) denied the space emptiness, underlying the Big Bang theory. The results of the Webb Space Telescope (WST) flight and its photos induce deep doubts in this theory.

Our Theory has been developed since 2007. Its fragments were published repeatedly and were presented in 16 reports and lectures at conferences in RF, Armenia, Belgium, France, Germany, Italy, Netherlands, Portugal, Spain, and UK. In the most complete form, the Theory was stated in the presentation of our lecture given in Amsterdam (2019) and in the article of 2017. As the Theory was progressed, it was presented in the article of 2011 and in the conference papers of 2008-2023 (see our ResearchGate pages).

This report summarizes our publications with corrections and additions that consider the available data obtained in the period since the statement of the basic principles of the Theory.

The name of the Theory reflects its central ideas: (1) the cold celestial objects composed of light atoms and molecules are formed by the physical processes of condensation, phisadsorption and absorption, aggregation, etc. and represent **p**hysically **f**ormed **o**bjects (**PFO**), while warm celestial objects composed of heavier molecules are formed by chemical processes and represent **c**hemically **f**ormed **o**bjects (**CFO**); (2) the Sun is the source of all atoms for the Solar System (SS).

When formulating the Theory, we use no models and no equations with fitted constants.

Conclusions of the Theory are consistent with the photos made by the WST.

The Theory not only confirms the Rutherford and Soddy's view that the thermal and light emission from stars is the result of RCRs, but it first explains the mechanism of formation of each known isotope and isotopic anomalies in the SS, causes of each of the nine most catastrophic mass extinctions of terrestrial flora and fauna, fundamental differences between the SS planets, the emergence of protuberances and their composition, temperature changes from sunspots to photosphere and to corona, inexplosibility of the Sun by protuberances, periodicity of solar cycles, compatibility of protuberances with sunspots, acceleration of protuberances in flight and their multi-jet composition, occurrence of protuberances of different shapes, origin of the recent giant protuberances on a small star (red dwarf DG CVn, 2014), etc. The Theory explains the current climate warming and predicts other dangers that the Sun may present to people in the future.

We use an original methodology, based, oddly enough, on the use of data on the radiation-chemical decays of radioactive isotopes, to understand the paths of origin of each isotope in stars and their surroundings and, much more, to understand the chronology of the origin of each isotope in nature, although such a possibility may seem like science fiction. And on top of that, we will present natural evidence of the correctness of our conclusions.