On the Possibility of a Scientific Prognosis of the Weather with the Introduction of Galactic Impacts into Analysis

Nikolai A. Morozov*

In this paper the author gives a preliminary information of his research study concerning cosmic influences on the weather. For this purpose, solar time was converted into sidereal (stellar) time for many thousands of meteorological data taken from the meteorological yearbooks published by meteorological observatories of the world. The resulting more than 200 diagrams identify interesting dependencies indicating a significant influence of the Galactic Centre and some other Galactic sources on the weather.

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Nikolai A. Morozov, 1910

Nikolai A. Morozov (1854–1946) was the first child of a Russian millionaire and his freed female slave (slavery in Russia was abolished only 7 years later in 1861). He was a polymath and also a political figure who, while living in Genève, became the main theorist and one of the leaders of the 1881 Russian Bourgeois Revolution: they dreamed of a parliament, constitution, free capitalism, human rights and "liberté, égalité, fraternité" in the sense of Robespierre and Marat, but ended by the assassination of Alexander II, Emperor of Russia, which was not supported by mass people. After returning to Russia in 1881, Morozov was sentenced to life in solitary confinement in the Schlüsselburg Fortress near St. Petersburg, where he spent the next 24 years of his life (1881–1905) in a solitary confinement cell.

After the royal amnesty in 1905, Morozov devoted himself entirely to continuing the theoretical scientific research he had begun before the jail and then continued while in prison. He was immediately elected Professor of chemistry at the Lesgaft Research Institute in St. Petersburg, and then headed the entire Institute, where he remained Director until his death in 1946. His main research works were in the fields of chemistry, physics, astrophysics, meteorology, linguistics and world history. After the fall of the royal regime in Russia, he was elected to the Russian Academy of Sciences.

Being already an old man, in order to conduct experiments necessary for his scientific work, Morozov flew into the stratosphere in a stratospheric balloon. His original periodic table of chemical elements (an alternative to the generally accepted Mendeleev table) extends to elementary particles. In 1919, he conducted a series of original experiments testing the effects of Special Relativity. "Linguistic spectra" he introduced to identify true authors are now widely used in cryptography.

In December 1942, at the age of 88, Morozov volunteered for military service as a sniper and scored a number of confirmed hits, but was demobilized one month later due to health reasons. He died from pneumonia at the age of 92 in 1946 in his mansion, which he inherited from his father.

The presented paper is a preliminary communication outlining the results of his extensive monograph on this subject (unpublished since he passed away in 1946). The staff of the Astronomy Department of the Lesgaft Research Institute, where he was Director, assisted him over many years in the 1930s in calculations and the construction of hundreds of graphs (necessary for this study) based on data from meteorological yearbooks for the entire history of regular meteorological observations over the past 150 years (until the 1940s). — Editor's remark.

In the first half of the last [19th] century, attempts were made to scientifically process the old folk belief about the connexion between weather changes and the combination of the Sun and Moon, especially with new moons. Indeed, there was much in this belief that deserved attention: due to solar heating, ascending air currents occur, and thanks to them, descending air currents with the formation of cumulus and thunderclouds of local origin, as well as trade winds and non-trade wind air currents, and also cold polar layers that mix air with the warmer layers of the Earth's temperate zones.

Due to the tidal action of the Moon and the Sun, there must inevitably be ebbs and flows not only in the seas, but also in the atmosphere, and the ebbs and flows of the atmosphere due to the attraction of the Sun, running into the lunar ebbs and flows lagging behind them, must, depending on the time of year, cause various cyclones (the main factors of weather instability on the Earth), depending on the geographical place of their origin.

All this seemed so clear that many astronomers and meteorologists, beginning with the famous François Arago, put a lot of effort into testing the aforementioned idea on a huge number of daily records in meteorological observatories throughout the world. But no matter how they combined these records, bringing them into connexion with the combinations of the positions of the Sun and the Moon, they always came to the same thing: 60 percent of the predictions came true, and 40 percent did not, showing that in addition to the Sun and the Moon, some other cosmic factors influence weather changes, since from a natural-scientific point of view no natural phenomenon can be causeless. Many years ago I also studied this subject. At that time, I had the idea that the missing third factor in weather changes could and even should be our entire Galactic cosmos, i.e., the entire set of our disk-shaped cluster of stars and, in particular, the centre of their rotation.

But to clarify such an influence and determine its magnitude, it was necessary to re-calculate the records of all meteorological yearbooks from our usual solar time, according to which they are kept, to sidereal (stellar) time, the day of which is 4 minutes shorter than the solar day. And this re-calculation of hundreds of thousands of meteorological observations, necessary to obtain some specific conclusion, would be such a huge job that the work of hundreds of calculators would be required for more than many years.

Only seven years ago, after much research on this subject, I succeeded in finding a new method of conversion, using which in one evening it is possible to convert from solar time to sidereal time such a number of meteorological records, which by the method that has existed up to now would have required at least a month. And I immediately set to work. Taking from the library of the [Russian] Academy of Sciences and the library of the Pulkovo Observatory the meteorological yearbooks of the Paris, London, Bombay, Batavian on Java, Leningrad, Moscow, Tbilisi, Cape Town and other observatories over the past few years, I personally made several thousand such conversions. Then, having instructed my assistants [from the Astronomy Department], I continued this work, as a result of which the calculation results were presented in the form of more than 200 diagrams.

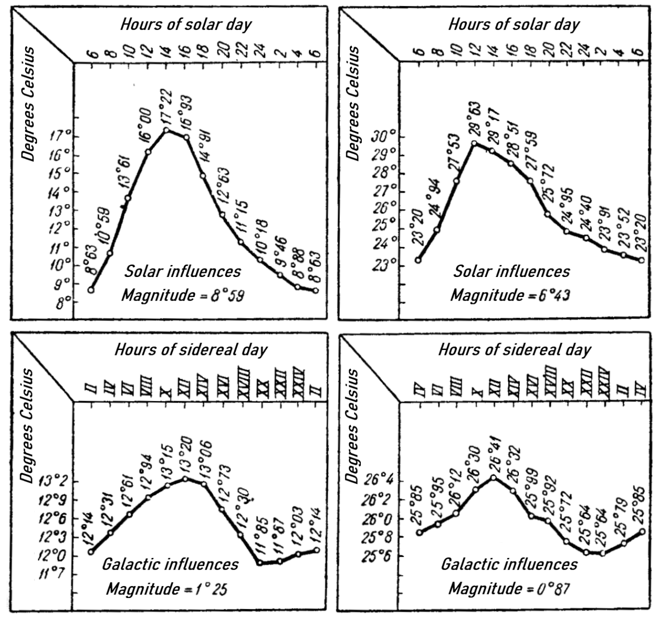
Looking at these diagrams, I immediately found that for the sidereal-daily influences of our entire star cluster, clearly expressed diagrammatic configurations of the same type as the configurations of solar influences, only of a different magnitude, were obtained. Among the hundreds of thousands of data calculated, there was not even a single contradictory case in Europe, Asia, Africa, America, or Australia. All my tables and diagrams testified to the same thing: the influences of our entire star cluster cannot be ignored in any way when forecasting the weather.

It turned out to be possible to determine even the places [on the sky] from which the hitherto missing cosmic influences on the weather originate. All the discovered maxima and minima of the sidereal-daily influences on the air temperature unanimously showed that behind the constellation Argo Navis [now divided into Carina, Puppis and Vela], around the VIII-XI hour of right ascension, there is a gigantic accumulation of high-temperature matter, the radiation of which, like a gigantic furnace invisible at night, increases the air temperature above the horizon of any place during its highest ascent by more than one-seventh of the solar heating (Table I).

As this source rises above the horizon, the relative humidity of the air, i.e., its saturation with water gas, also increases. By designating 100% as the saturation at which water gas begins to be released in the form of fog or rain, we obtain very regular diametric arcs for both solar and Galactic influences (Table II), with the magnitude of the arc of Galactic influence reaching up to half the magnitude of the solar arc in the Earth's temperate climate zones.

Table I: Two examples of [air] temperature increase due to solar diurnal period action and galactic action (sidereal-daily period).

Northern Hemisphere: Tbilisi (42° N), average for 1913.	Southern Hemisphere: Batavia on Java (−7° S), average for 1866–1868.



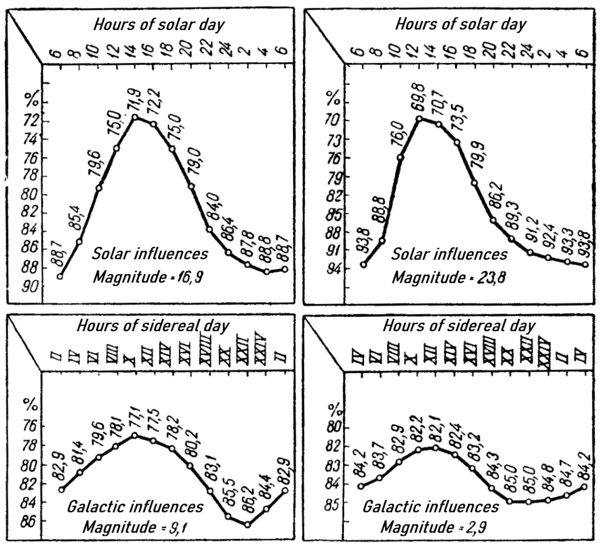
The increase in [air] temperature due to solar action reaches its maximum 2 hours after the Sun passes through the celestial meridian (at 14 solar hours). Similarly, the increase in temperature due to Galactic impact should reach its maximum 2 hours after the X celestial hour passes through the celestial meridian (the Galactic heat emitter is located near the X celestial hour). This Galactic heat emitter is located in the Southern Hemisphere of the sky, since its radiant heat, for example, in Batavia is equal to 1/3 of the solar radiant heat, and in Tbilisi — only 1/6 of the solar.

The rate of evaporation of the water surface (Table III, left) due to the influence of the rays of this Galactic centre reaches one third of the solar influence. This influence increases by the XII sidereal hour similarly to how the solar influence increases by 14 hours of the solar day, i.e., it occurs from the place of intersection of the XII-hour wing of the starry sky with the Milky Way, where there is a cluster of small stars and several "coal sacks" near the constellation Argo Navis.

Directly related to the evaporation rate, absolute humidity (the same Table III, on the right) has in the tropical zone of the Earth (probably due to the residual accumulation of evaporation) a less sharp peak in the curve of solar influence, so that the maximum of water gas remains undiminished from 14 to 20 hours of solar time. As for Galactic influences, their maximum effect on absolute humidity also falls at approximately the XX hour of sidereal time, but its growth and fall

Table II: Two examples of relative humidity changes due to solar influences by hours of the solar day, and two examples of galactic influences by hours of the sidereal day.

Northern Hemisphere: near Moscow (about 55° N), average for 1927. — Southern Hemisphere: Batavia on Java (−7° S), average for 1866–1868.



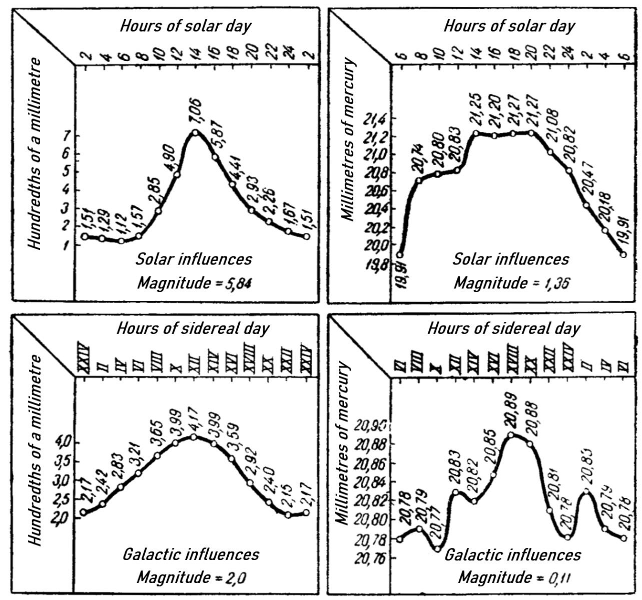
Solar influence reaches its maximum 2 hours after the Sun passes through the local celestial meridian (at about 14 solar hours). Similarly, Galactic influences should also reach their maximum 2 hours after [its source] passes through the meridian of the X sidereal hour, near which the centre of Galactic radiation is located. In Batavia, the magnitude of its influence is 0.12 of the solar influence, and near Moscow — 0.54 of the solar.

occur more smoothly (Table III, on the right).

Assuming that the main maximum of Galactic influence (under the XVIII–XX hours at the end of Table III) is delayed like the solar maximum by 8 hours after its passage through the celestial meridian, we find that the source of Galactic influence is also located [on the celestial sphere] at the X hour of right ascension (XVIII − 8 = X), that is, in the same constellation Argo Navis. The maximum of a smaller magnitude under the II sidereal hour corresponds to the influence from the XVIII sidereal hour, at the intersection of which with the Milky Way there is another huge cluster of small stars and "coal sacks" in the tail of the constellation Scorpio. The third maximum on the same diagram under the XII sidereal hour corresponds, according to the same calculation (XVIII − 8 = X), to the VI sidereal hour on the celestial sphere, where there is nothing special against the background of the Milky Way, but next to it is the giant Orion Nebula with a "coal sack" inside and two main star clusters visible to the naked eye: the Pleiades and the Hyades. However, it is still premature to claim that the secondary maximums (under the II and XVIII sidereal hours on the celestial sphere) are their influence, since on other diagrams that I have studied, simple arc-shaped configurations are also obtained.

Table III: Example of solar and galactic influences on the rate of evaporation of water surfaces and on the amount of water gas in the atmosphere (absolute humidity). Solar-diurnal periods and sidereal-diurnal periods.

Evaporation rate: Tbilisi (42° N), average for 1913. — Absolute humidity: Batavia on Java (−7° S), average for 1866–1868.



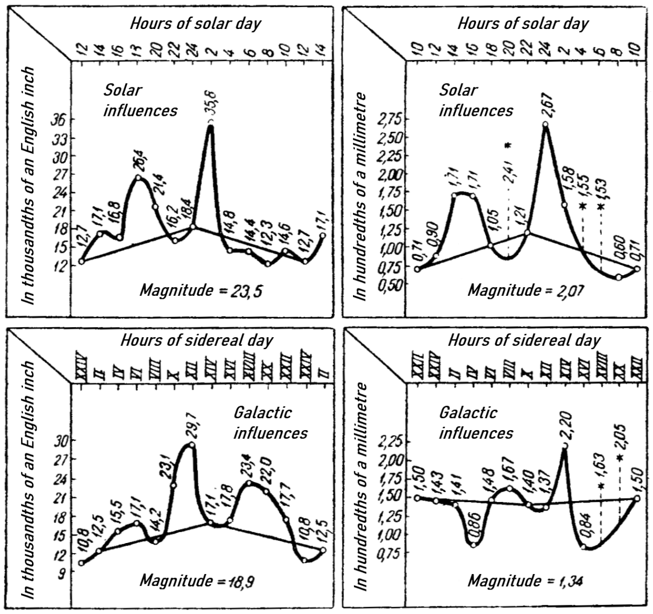
The rate of evaporation due to solar influence reaches its maximum 2 hours after the Sun passes through the celestial meridian (at 12 o'clock solar time), and the rate of evaporation due to galactic influence reaches its maximum 2 hours after the constellation Argo Navis passes through the celestial meridian (at X o'clock stellar time). Absolute humidity reaches its maximum due to solar influence 6–8 hours after the Sun passes through the celestial meridian, and due to galactic influence — VI–VIII hours after the constellation Argo Navis passes through the meridian.

Generally speaking, absolute humidity (i.e., the amount of water gas in the atmosphere at the observation site), expressed through partial pressure, varies in an average annual distribution very capriciously over the course of solar and sidereal days, although when non-periodic deviations are taken into account and eliminated, this dependence retains its arc-shaped form.

And this shows that in addition to the air pressure and its own temperature and speed of motion, as well as the direct impact of the Sun's rays in clear weather, there is another powerful cause. And it can already be expected a priori that the action of electromagnetic forces is involved here, because the artificial induction of rain by scattering electrified dust from airplanes at a sufficient height in the Earth's troposphere clearly shows the influence of this factor on the entire water regime of our atmosphere. For example, Table IV shows the distribution of rainfall due to solar influence and due to Galac-

Table IV: Example of average annual distribution of rainfall (by hours of the day) due to solar influence and Galactic influence.

Batavia on Java (−7° S), average for 1866–1868. | Tbilisi (42° N), average for 1913.



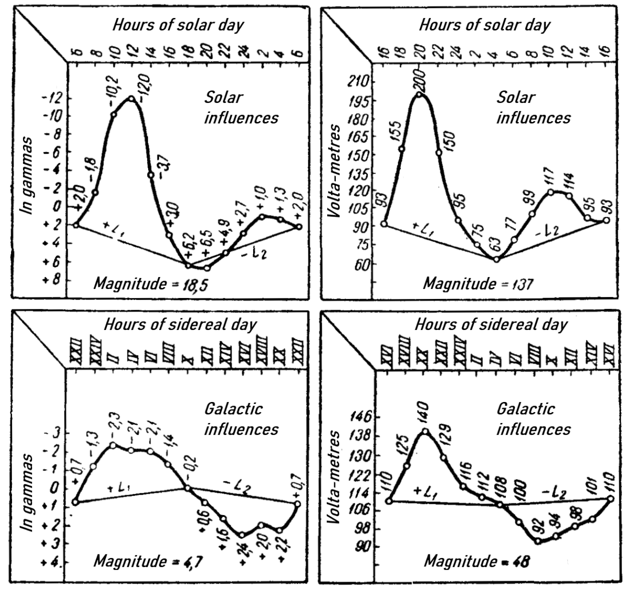
The irregular bends and jumps of these diagrammatic curves, especially — Tbilisi (asterisk) — show that rains depend not only on temperature and barometric pressure drops, but also on the electromagnetic effects of the Sun and the Galactic Centre, and that even more powerful electromagnetic storms than on the Sun permanently occur at this Centre.

tic influences by the hours of the sidereal day. On the left it is given for Batavia on Java (−7° S) and on the right — for Tbilisi in the Caucasus (42° N).

The two main maxima generated after the solar action (at 2 and 24 o'clock in the morning), as well as the evening actions (at 18 and 16 o'clock in the afternoon) show here that the solar actions in Tbilisi are generally the same as in Batavia, although they are delayed by 2 hours compared to Batavia. But why in Tbilisi in 1913 in the 20th, 4th and 6th solar hours the amount of rainfall (they are marked with asterisks) jumped out of the norm so much (see Table IV, upper right), that if I had not excluded them, they would have made the configuration of this diagrammatic curve completely disordered and having nothing in common with Batavia? Why do we see the same thing below in the Galactic influences? Here again we have only one way out: to admit that the distribution of rainfall depends not only on changes in temperature and barometric pressure, but also to a large extent on electromagnetic storms, constantly occurring not only on the Sun, but also on the Galactic Centre now being studied in the constellation Argo Navis. It is even possible that such storms on the Sun are only a resonance of Galactic storms, which must be repeated simultaneously on the Earth, and on

Table V: Examples of solar influences on solar-diurnal variations of the magnetic and electric field strengthes and examples of similar galactic influences on the sidereal-diurnal period.

Magnetic field: Val Joyeux, Paris (about 49° N), average for 1933. | Electric field: Tashkent (about 42° N), average for 1930.



Magnetic Galactic influences from the constellation Argo Navis lag behind solar influences by 8 hours. If they were lagging by 12 hours, this would mean that the magnetic axes of the Sun and the Galactic Centre under study in the constellation Navis Argo are oriented opposite to each other. The lag of 8 hours shows that both of these axes are inclined to each other (as seen from the Earth) at an angle of about 120°.

the Moon, and on all the planets. Otherwise, it would be difficult to imagine why the jumps shown by the stars on our diagrams are repeated not only at midday, when the given horizon is turned toward the Sun, but also at different hours of the day, and why they are distributed in the same way among various sidereal hours. It even turns out that it is as if each stroke of cosmic lightning and protuberances on some Galactic centre is accompanied by multiple echoes on the others. In any case, thunderstorms, constantly accompanied by showers, sufficiently indicate a connexion between these two meteorological manifestations. Therefore, it is appropriate to dedicate a few lines to them in this preliminary message.

In Table V on the right I give an example of solar and Galactic influences on the oscillations of the electric field in Tashkent, and in the same place I give an example of the magnetic influences of the Sun in Val Joyeux near Paris (Table V on the left).

The necessity of brevity of this message of mine enforces me to give here, as an example of the substantiation of my theory, only one example of the most important sidereal-daily influences of the Galaxy, excluding its sidereal-annual influences. But in my working manuscripts, beginning in 1932, when I first began to study this subject systematically, there are hundreds of such re-calculations based on the systematic records of many geophysical and meteorological observatories of the world, and above all, the two Spitsbergen stations (in Horn Sound and Treyrenberg), the Sondakull station in Iceland, the Pavlovsk (now Slutsk) station, the Main Physical Observatory (in Leningrad), Sverdlovsk, Wilhelmshaven, Greenwich, Val Joyeux (near Paris), Budapest, Petrovsko-Razumovskaya (in Moscow), Cheltenham near Washington, Barcelona, Tbilisi, Tashkent, Caesarea in Lebanon, Tucson in Arizona, Beijing, Hong Kong, Alibag near Bombay, and Singapore.

For the Southern Hemisphere, I had at my disposal the records of the observatories at Batavia on Java, on the Island of St. Helena, at Antananarivo in Madagascar, at Buenos Aires, at Christchurch (New Zealand), and on the South Polar Continent [Antarctic] at the observatories at Cape Royds and Cape Evans.

All these observatories are known to every specialist, and their yearbooks that I have indicated are available in the libraries of the [Russian] Academy of Sciences, the Pulkovo Astronomical Observatory, and the Main Physical Observatory (in Leningrad). And all the hundreds of summary recalculations for sidereal time compiled by me and my coworkers from these publications, and all the diagrams constructed from the calculations unanimously show that the influence of the Galaxy on the meteorological and geophysical processes of the Earth is of a regular nature and so great that without introducing them into the calculations one cannot even dream of a scientific forecasting of the weather even for a month ahead.

Here, first of all, a cycle of 521 Julian years is manifested, since only after this period do the previous combinations of the Sun, Moon and Galaxy repeat for each specific place on the globe. Such a long period does not, of course, provide any practical help for [weather] forecasting, since during most of it there were no meteorological records. However, another period of 19 years manifests itself, but only according to this period it turns out that a cyclone that, for example, swept over Leningrad today, will sweep in 19 years later somewhere over Irkutsk, then over Tokyo, then over San Francisco, and so forth and so on. And another cyclone that will come to Leningrad will be the one that was 19 years ago somewhere over London, and 38 years ago near New York, etc.

It is impossible not to mention here also the dendrochronological period of 11.35 years, determined by the alternation of the thickness of tree rings and coinciding with the same period of sunspots, with the proviso that this [dendrochronological] period itself can only be explained by the effect on the Sun (and with it of course on the Earth) of the radiation of some luminary rotating around its axis in 11.35 years. There can be no other rational explanation here, just as there can be no 280-year cycle consisting of almost 25 of the same (exactly 11.35-year) cycles repeating quite regularly on the rings of giant Californian pines Sequoia Gigantea, for example, on the pine "Mark Twain", a section of which is kept in the New York Museum of Natural History (this pine was 1341 years old when it was cut down*).

And this period cannot be explained by anything except the fact that in the Galactic space there is an even more powerful centre rotating around its axis in 280 years (± a few years).

All this shows that for an absolutely accurate weather forecast it is necessary to determine not only the motion of the Moon, the Sun and Galactic centres above the horizon of the observation point, but also which side of their surface the latter are facing the Earth at that moment.

Of great help in using reference points to determine upcoming weather changes in a specific geographic area should be the already existing predictions of solar and lunar eclipses. Adding to them, Galactic influences will undoubtedly eliminate all cases of failure of predictions based on solar and lunar influences alone, but this requires the work of not one person or group of people, but the work of many meteorological institutions using the entire network of meteorological records throughout the globe.

November 4, 1940

*See A. E. Douglass and Waldo S. Glock, *Carnegie Institution of Washington Supplementary Publications*, July 1934, no. 9, and also, in the same place, *News Service Bulletin*, 1937, v. IV, no. 20.