Venus, Unmask!

S/029/60/000/04/016/032
B008/B009

paper succeeded in observing a reflection, which is probably due to the presence of large bodies of water as well as of ice crystals in the clouds enveloping Venus. Large amounts of carbon dioxide and small quantities of oxygen as well as a relatively high temperature suggest that conditions on Venus resemble those having prevailed on the Earth during the Carboniferous. Possibly life on the planet is now commencing, or some as yet unknown forms of life are present on it now. On page 17 A. G. Masevich, Doctor of Physical and Mathematical Sciences, Deputy Chairman of the Astronomical Council of the AS USSR, discusses the question, which of the planets, Venus or Mars, is of greater significance for humanity. In his opinion it would be possible for scientists to discover such conditions to prevail on Venus as would give this planet the top place regarding its significance for mankind. There are 6 figures.

ASSOCIATION: Planetnaya komissiya Astronomicheskogo soveta AN USSR
                (Planetary Commission of the Astronomical Council of AS UkrSSR)

Card 2/2

S/033/60/037/02/009/013
E032/E914

AUTHORS: Barabashov, N. P., Koval', I.K.

TITLE: Some Results of Studies of Contrasts on Mars

PERIODICAL: Astronomicheskiy zhurnal, 1960, Vol 37, Nr 2, pp 301-305
(USSR)

ABSTRACT: It is well-known that the continent-sea contrast K for
Mars has a maximum value in red and a minimum in blue.
According to measurements carried out by the present authors
in 1956, $K = 0.286$ for $\lambda_{max} = 647$ mμ, and $K = 0.07$ for
$\lambda_{max} = 420$ mμ. However, occasionally, the contrast in blue
light reaches 80% of the contrast in red light. Usually,
this is explained by increased transparency of the blue
atmosphere on Mars. If one accepts the explanation that
the true contrast is the same for all wavelengths and the
apparent contrast depends on the state of the Martian at-
mosphere, then one can try and estimate the optical thick-
ness of the Martian atmosphere in blue light from the
corresponding contrast. For this purpose it is assumed

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S/033/60/037/02/009/013
E032/E914

Some Results of Studies of Contrasts on Mars

that K_λ = const and the red contrast is taken to be approximately equal to the true contrast, since the optical thickness of the atmosphere in red light may be taken to be approximately zero. The present paper is concerned with a critical examination of the possibility of an explanation of the variation in K_{blue} by variations in the optical thickness. Fig 1 gives the values of the contrast for red, green and blue rays (curves 1, 2 and 3 respectively) for June, July, August and September, 1956. These data refer to the central regions of the planet. Fig 2 gives the corresponding plot for the ratio K_{blue}/K_{red} for the same observational period. Another characteristic considered is $B = \rho_1(1 - K_{red}/K_{blue})$ where ρ_1 is the albedo of the

Card 2/3 $\checkmark$ C

S/033/60/037/02/009/013
E032/E914

Some Results of Studies of Contrasts on Mars

continent and B the brightness of the atmosphere above
the region investigated. Fig 3 gives B plotted as a
function of time. Fig 4 shows the curves for the southern
polar cap in red and blue light. All these data indicate
that the variations can best be explained by different
energy distributions in the spectrum of each "sea" sep-
arately. The most probable explanation is that the diff-
erences are due to spectral properties of the surface of
the "seas", and that the optical thickness of the Martian
atmosphere in red, green and blue light is small, and
that it is mainly a scattering atmosphere. The fact that
the blue atmosphere of Mars is optically thin is also in-
dicated by the curves for the southern polar cap shown in
Fig 4, which are virtually parallel to each other. There
are 4 figures.

ASSOCIATION: Khar'kovskaya astronomicheskaya observatoriya
Card3/3   (Khar'kov Astronomical Observatory)   VC

SUBMITTED: November 22, 1959.

818h2

Q. /550

S/033/60/037/03/011/027
E032/E314

AUTHORS: Barabashov, N.P. and Garazha, V.I.

TITLE: Some Ideas About Dust and Mist Formations on Mars

ABSTRACT: An attempt is made to explain some of the properties of the mist and fog which frequently appeared on Mars during 1956 and persisted over considerable periods of time, particularly during September and October. Data reported by Barabashov and Koval' (Ref 1) are employed in the analysis. The conclusions drawn from these results are as follows:
1) the Martian surface is covered by very small dust particles whose dimensions do not exceed 0.01 - 0.1 mm.
2) Martian dust clouds apparently consist of even finer particles.
3) The fog which occasionally appears in the Martian atmosphere is transparent to infrared and red radiation but is entirely opaque in the ultraviolet.
4) The dust particles are rarely found in the upper
Card1/2   layers of the Martian atmosphere.

81842

S/033/60/037/03/011/027
E032/E314

Some Ideas About Dust and Mist Formations on Mars

5)   The difference between the albedo of the "continents" and the "seas" has a maximum in the green.

6)   The law of reflection from the Martian surface, or from the low-lying clouds near it, is close to Lambert's law.

7)   The yellow fog appears to consist of particles having the same (or smaller) dimensions than those covering the Martian "continents".

There are 9 figures, 5 tables and 3 Soviet references.

ASSOCIATION: Khar'kovskiy astronomicheskaya observatoriya
               (Khar'kov Astronomical Observatory)

SUBMITTED: January 16, 1960.

Card2/2

BARABASHOV, Nikolay Pavlovich, akademik; ARZUMANOVA, N.A., red.; ROZEN, E.A., tekhn. red.

[Venus] Venera. Moskva, Izd-vo "Sovetskaia Rossiia," 1961. 38 p.
(MIRA 14:10)

1. Akademiya nauk USSR (for Barabashov).
   (Venus (Planet))   (Space flight to Venus)

BRONSHTEN, V.A.; BARABASHOV, N.P., akademik , otv. red.; KOLOKOL'NIKOV, K.A.,
tekhn. red.; GOLUB', S.P., tekhn. red.

[Atlas of drawings of Mars] Atlas risunkov Marsa. Moskva, Izd-vo
Akad. nauk SSSR, 1961. 117 p.
(MIRA 14:8)

1. Akademiya nauk USSR (for Barabashov)
(Mars (Planet))

3,1550

AUTHORS: Barabashov, N. P., Koval', I. K., Chekirda, A. T.

TITLE: Photometric studies of Mars in 1958

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 6, 1962, 63, abstract 6A469 ("Izv. Komis. po fiz. planet". 1961, no. 3, 3-15)

TEXT: The authors present data on distribution of brightness along the intensity equator and central meridian of Mars, obtained on the basis of photographic observations of the planet with light filters. Moreover, the data are given on contrasts between light and dark regions, as well as on brightness variations of the Martian northern and southern polar regions.

Authors' summary

[Abstracter's note: Complete translation]

Card 1/1

38819

S/035/62/000/006/037/064
A001/A101

3,Y500

AUTHOR: Barabashov, N. P.

TITLE: On changes in brightness of lunar formations as a function of
            azimuth and on sections of lunar indicatrices

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 6, 1962, 64,
            abstract 6A480 ("Izv. Komis. po fiz. planet", 1961, no. 3, 31 - 40)

TEXT: The author investigates the dependence of brightness of lunar objects
on the difference in azimuths of incident and reflected beams. The effect of
azimuth difference is shown. Sections of indicatrices for i = 30 and 60° by planes
perpendicular to the incidence plane and passing through the incident beam are
presented. The conclusion is drawn that these investigations confirm still more
the statement on the uniformity of the lunar surface microrelief; moreover,
changes in brightness of lunar seas and continents as a function of changes in
azimuth difference agrees rather well with data for crushed tuff whose grain size
is equal to 2 - 6 mm. There are 5 references.

                                                    Author's summary

[Abstracter's note: Complete translation]

Card 1/1

3,7500

38821
S/035/62/000/006/039/064
A001/A101

AUTHORS: Barabashov, N. P., Yezerskiy, V. I.

TITLE: Spectrophotometric observations of lunar craters

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 6, 1962, 64,
             abstract 6A482 ("Izv. Komis. po fiz. planet", 1961, no. 3, 50 - 55)

TEXT: The authors present the results of spectrophotometric observations
of the Alphons crater and other craters at the Khar'kov Astronomical Observatory
in 1958 - 1959. No anomalies were detected in albedo of individual sections of
the lunar craters, including the central peak of the Alphons crater. There are
6 references.

Authors' summary

[Abstracter's note: Complete translation]

Card 1/1

3.2500 (1080)

32714
S/560/61/000/009/004/009
D045/D114

AUTHOR: Barabashov, N. P.

TITLE: The structure of the Moon's surface and investigations of the first photographs of its far side

SOURCE: Akademiya nauk SSSR. Iskusstvennyye sputniki Zemli. No. 9, Moscow, 1961, 56-61

TEXT: The article deals with the structure of both sides of the Moon. As regards the Moon's visible side, the author quotes several well-known theories on its structure. On comparing terrestrial rock strata with the Moon's surface, only tuffaceous rocks and volcanic ashes resembled lunar strata. Investigations by several Soviet scientists indicated that the degree of pitting on the lunar surface was so high that ordinary Earth rocks, with the exception of highly-porous tuffaceous rocks, bore no resemblance to lunar rock strata. A comparison of various artificial surfaces with lunar observations showed that (1) the greatest similarity is obtained with surfaces covered with parallel cracks and sharp irregularities, and (2) fine dust evenly coated over a uniform surface cannot produce the effects of light reflection

Card 1/4

The structure of the Moon's surface ...

32714
S/560/61/000/009/004/009
D045/D114

observed on the Moon. Judging by investigations of the photometrical uni-
formity of lunar details, it was concluded that, largely the lunar surface
is photometrically homogeneous. However, it can be said that the continents
are, on the average, redder and more porous than the seas. Theoretical
studies and investigations on granulated tuff conducted at the Khar'kovskaya
astronomicheskaya observatoriya (Khar'kov Astronomical Observatory) showed
that the Moon's surface may consist of highly porous tuffaceous rocks, pos-
sibly highly-granulated with grains 1-6 mm in size. N. N. Sytinskaya (Ref.
11: Izv. plan. kom., vyp. 1, KhGU, 81, 1960) proposed that the irregularities
conditioning the lunar microrelief are 1-10 mm in size. Turning to the
structure of the Moon's far side, the author discusses the preliminary re-
sults of studying pictures taken by the Avtomaticheskaya mezhplanetnaya
stantsiya (Automatic Interplanetary Station) (AMS) on October 7, 1959. On
this side of the Moon, there is a predominance of mountainous areas and few
seas like those observed on the other side. A fairly large crater sea, the
"Sea of Moscow", was discovered. It is nearly 300 km in diameter and is
located between latitudes +20° and +30° and longitudes ± 140° and ± 160°.
In the "Sea of Moscow", a bay, called the Bay of Astronauts, was noticed. The

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The structure of the Moon's surface ...

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D045/D114

entire area of the Moon's far side, bordering on the western edge, has an
albedo between the albedo of the mountainous areas and that of the seas of
the visible side. In the southern hemisphere of the Moon, a very large
crater called Tsiolkovskiy is very clearly marked. This crater, more than
100 km in diameter and located at -20° to -30° latitude and +30° longitude,
has an exceptionally dark floor and an extremely bright central peak -
bright enough to suggest that it itself emits light, and possibly luminesces.
A bright band consisting of craters and mountains stretches to the south-east
of the Mare Humboldtianum. This band, broken in places by darker spaces, is
like a mountain range, stretching for almost 2000 km. A very bright band,
similar to a light ray, stretches in the same direction. The results of the
treatment of photo material at the Khar'kov Observatory are as follows: All
details, found in the first stage of treatment, appeared to be completely
genuine; new craters were found and the borders of several seas specified.
The final results of combined treatment by the Gosudarstvennyy astronomiche-
skiy institut im. Shternberga (State Astronomical Institute im. Shternberg),
the Glavnaya astronomicheskaya observatoriya (Main Astronomical Observatory)
in Pulkovo, and the astronomical observatory of the Khar'kovskiy gosudarst-
vennyy universitet (Khar'kov State University) are entered in the "Atlas

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The structure of the Moon's surface ...

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S/560/61/000/009/004/009
D045/D114

obratnoy storony Luny" (Atlas of the Moon's Far Side) (Ref. 17: Izd-vo AN SSSR, 1960). More than 400 details were identified. The following conclusions are drawn: (1) the albedo of many areas of the Moon's far side has a considerably greater reflecting power; (2) the floor of many craters on this side is very dark and similar in darkness to the darker areas of the visible side; (3) preliminary studies show that the porosity of the surface of the Moon's far side is the same as, if not greater than, the visible side, and that the brightness on the surface of the full Moon seen from the AMS is distributed almost in a straight line. The following personalities are mentioned: L. N. Radlova, A. V. Markov, N. S. Orlova, V. I. Garazha, A. T. Chekirda, V. A. Fedorets, V. V. Sharonov, V. A. Yezerskaya, V. I. Yezerskiy, and T. A. Ishutina. There are 19 references: 14 Soviet-bloc and 5 non-Soviet-bloc. The three English-language references are: M. Minnaert, Astroph. J., 93, 403, 1941; J. H. Trexler, Proc. IRE, 46, 286, 1958; J. V. Evans, Proc. Phys. Soc., B70, 1105, 1957.

SUBMITTED: September 15, 1960

Card 4/4

BARABASHOV, N. M.P., akademik

To the nearest planets. Nauka i zhyttia 11 no.6:5-10 Je '61.

(MIRA 14:7)

1. AN USSR (Khar'kov).

(Astronautics)   (Planets)

3,2500

40462
S/035/62/000/009/028/060
A001/A101

AUTHOR: Barabashov, N. P.

TITLE: On the microrelief of the lunar surface

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 9, 1962, 68,
               abstract 9A481 ("Tsirkulyar Astron. observ. Khar'kovsk. unt-t",
               1961, no. 23, 3 - 14)

TEXT: To represent the brightness distribution over the lunar disk, a model
of the surface structure is employed which consists of unevennesses of two orders.
The microrelief of the first order, in which unevenness amounts to several milli-
meters, is superimposed by the microrelief of the second order consisting of very
small particles. On the basis of comparing indicatrices of light reflection by the
lunar surface, obtained from observations, with experimental data and calculations
for various models, a conclusion has been drawn that the best agreement is achieved
with a surface of porous tuff, covered with prismatic terraces whose height is 2.3
times as great as their width and separated from each other by distances equal to
this height.

[Abstracters's note: Complete translation]
Card 1/1   I. Lebedeva

41817
S/835/61/000/024/001/002
E032/E114

AUTHORS: Barabashov, N.P., and Garazha, V.I.

TITLE: On the microstructure of the lunar surface

SOURCE: Khar'kov. Universytet. Astronomichna observatoriya.
Tsirkulyar. no.24, 1961, 3-13.

TEXT: In a previous paper, the first of the present authors
showed that some of the photometric properties of the lunar surface
can be reproduced by assuming that the lunar surface can be
represented by (a) infinitely deep cracks with vertical walls, or
(b) discontinuous prismatic formations whose surfaces are smooth
and reflect light in accordance with Lambert's law. However, these
models do not account for some other photometric properties, for
example, the uniform distribution of luminance along the intensity
equator and the central meridian at full moon, and certain other
effects. A better representation of the light-reflecting properties
of the lunar surface can be obtained by assuming that the faces of
the irregularities consist of porous tuff with its own specific
reflecting properties. It was then concluded that the micro-
structure of the lunar surface consists of two reference surfaces
Card 1/3

On the microstructure of the ...   S/835/61/000/024/001/002
E032/E114

with irregularities of two different orders of magnitude, namely,
second-order irregularities characteristic of the material of which
the rocks forming the lunar surface is made, and first-order
irregularities which are larger pores or bumps (of the order of
millimetres) which are associated with cracks, meteorite impacts,
and so on. In the present work this investigation was continued by
considering the reflecting properties of various geometrical
configurations such as regular arrays of prisms, pyramids and so on.
Detailed numerical calculations showed that all the observed
reflecting properties of the lunar surface can be reproduced with
the aid of a model in which the surface consists of volcanic tuff
which is covered by square cells of side equal to 1 m, wall thick-
ness of 0.20 m, and depth between 1.5 and 2 m. Since the appearance
of square cells can hardly be due to natural causes, the analysis
was extended to cover six-sided cells. It was found that neither
six-sided cells nor circular cells could be made to agree with the
known reflecting properties of the lunar surface, and therefore the
presence of a cell-like structure on the moon is improbable.
The next model to consider was therefore a surface consisting of

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On the microstructure of the ...   S/835/61/000/024/001/002
E032/E114

fragmented tuff with linear dimensions of the individual fragments
of between fractions of a millimetre and a few millimetres.
Special specimens of fragmented tuff were prepared with various
fragment sizes and their reflecting properties were determined in
the laboratory and then compared with lunar data. Such comparisons
showed that fragmented tuff with grain sizes between one and a few
millimetres has reflecting properties which are very close to that
of the lunar surface. Moreover, the fragmented tuff had similar
spectrophotometric and polarisation characteristics. Its thermal
conductivity, density, electrical conductivity and other
characteristics were also similar to those of the lunar surface
material.
There are 11 figures and 9 tables.

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3,/770

41818
s/835/61/000/024/002/002
E032/E114

AUTHORS: Barabashov, N.P., Ivanchenko, V.M., and Chirkova, R.M.

TITLE: Radio observations of the partial solar eclipse of
             February 15, 1961, at the wavelength $\lambda \cong 1.5$ m

SOURCE: Khar'kov. Universytet. Astronomichna observatoriya.
             Tsirkulyar. no.24, 1961, 36-38

TEXT: On February 15, 1961, the Khar'kovskaya astronomiches-
kaya observatoriya (Khar'kov Astronomical Observatory) carried out
radio observations of the solar eclipse in the 1.5 m range. The
aim was to obtain the distribution of radio intensity over the
solar disc and then use it to obtain information about the nature
of solar radio emission. The measurements· were carried out by a
compensation method using a 6 m diameter parabolic mirror. The
high frequency amplifier included the low-noise 6Н14П (6N14P)
tube in a cascade circuit and the five-stage intermediate frequency
amplifier incorporated 6Ж4 (6Zh4) tubes. The intermediate
frequency was 31 Mc/s and the bandwidth was $\Delta f_{0.5}$ = 4 Mc/s.

In the figure, curve II shows the intensity of solar radio emission
as a function of time; curve I shows the ratio of the uneclipsed
Card 1/3 2

Radio observations of the partial...   S/835/61/000/024/002/002
E032/E114

area of the solar disc to the area of the entire disc as a function
of time. Because of unfavourable weather conditions no spectro-
heliographic observations were possible and use was therefore made
of data supplied by M.N. Gnevyshev of the Kislovodskaya Gornaya
stantsiya (Kislovodsk Mountain Station). Inspection of the
emission curve showed that a group of plages and sunspots on the
disc was recorded during the eclipse in the form of a rapid
reduction in the intensity, which confirms an enhanced radio
emission from them. The partial eclipse at Khar'kov began at
10 hours 0.2 minutes, Moscow time. At 10 hours 17 minutes, three
plages were covered. The region of these plages also included
three groups of sunspots. After this the intensity remained
constant until 10 hours 47.3 minutes. The eclipse of a central
plage which did not include sunspots apparently had no effect on
the radio emission. At 11 hours 33.6 minutes, the western active
regions re-appeared and there was a simultaneous increase in the
radio intensity. If the interval between 10 hours 17 minutes and
10 hours 46 minutes is ignored, then the variation in the radio
emission is very similar to curve I.   There is 1 figure.

Card 2/3 2

BARABASHOV, N. P.
(=)

BOBROV, M. S., Astronomical Council, Academy of Sciences USSR /1960/- "Optics and geometry in the matter of Saturn's rings"

PROKOF'EV, Vladimir K., Crimean Astrophysical Laboratory imeni G. A. Steyn /1962/- "On the presence of oxygen in the atmosphere of Venus"

SALOMONOVICH, A. Ye., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR, and KUZ'MIN, Arkadiy D., Radio Astronomy Laboratory, Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR - "Observations of the radioemission of Venus and Jupiter on the wave of 8 mm."

KISLYAKOV, A. G., "Radioemission of Venus on the wave of 4 mm."

SALOMONOVICH, A. Ye., KUZ'MIN, Arkadiy D., BIHINOVA, V. P., and SHAVLOVSKIY, I. V. - "Observations of the radioemission of Venus and Jupiter on the wave of 3.3 cm."

SALOMONOVICH, A. Ye., and KUZ'MIN, A. D. - "Radioemission of Venus on the wave of 9.6 cm."

SALOMONOVICH, A. Ye., and KUZ'MIN, A. D. - "Results of the observations of radioemission of Venus in 1961"

SHARONOV, Vsevolod V., Director, Astronomical Observatory, Leningrad State University /1961 position/- "Probable state of the surface and atmosphere of the planet Mars according to photometric and colorimetric data"

VSEKHSVYATSKIY, Sergey K., Head of the Chair of Astronomy, Kiev State University /1961 position/- "Nature of Saturn's rings and signs of the existence of a ring around Jupiter"

EZERSKIY, V. I., and BARABASHEV, N. P., Director, Kharkov Astronomical Observatory, Kharkov State University /1960 position/- "Optical properties of the atmosphere and surface of Mars according to photometric and spectrophotometric observations carried out at the Kharkov University Observatory"

rt to be submitted for the 11th Intl. Astrophysics Symposium, Belgium,
. of Astrophysica, Cointo-Sclensin, Belgium, 9-11 Jul 1962.

S/035/62/000/010/050/128
A001/A101

AUTHOR: Barabashov, N. P.

TITLE: The nature of the Moon

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 10, 1962, 62,
             abstract 10A434 ("Tr. 3-go s"yezda astron.-geod. o-va, 1960", M.,
             AN SSSR, 1962, 59 - 66).

TEXT: This is a survey article which considers hypotheses of the lunar
surface structure, results of modern studies of physical conditions on the
Moon, microrelief of the surface, homogeneity of the surface on structure and
color, data of radiometric and radioastronomical observations, the back side
of the Moon according to photographs taken from the third Soviet space rocket.
The author considers further investigations of the Moon by the methods of as-
tronautics.

                                                    V. Sh.

[Abstracter's note: Complete translation]
Oard 1/1

S/030/62/000/010/002/007
D204/D307

AUTHOR: Barabashov, N. P., Academician

TITLE: The physical conditions on Mars

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 10, 1962, 18-25

TEXT: The present knowledge of Mars is briefly reviewed. The re-
ported observations of the colors, contours, pole caps, canals,
macro- and microtopography, atmosphere and clouds are summed up.
From those and the author's own studies, it is believed that the
surface of Mars is covered with a material similar to finely di-
vided terrestrial volcanic tuff, limonite, ochre and reddish sand-
stones; this material may be the same over most of the planet, in
various stages of oxidation. The luminance differences between the
Martian seas and continents, and the variations of this difference
with the wavelength at which the comparison is made are described
and discussed. Various views regarding the nature of the seas are
given, concluding that these areas are less level than the conti-
nents and that some vegetation may be present. Composition and

Card 1/2

The physical conditions on Mars   S/030/62/000/010/002/007
                                          D204/D307

pressure of the atmosphere is treated in some detail, and data re-
garding the surface temperatures are quoted. The author's work has
shown the observed polar caps to be slightly reddish and discon-
tinuous. They are believed to be composed of frozen water and thin
clouds. From cloud movements, the author calculated the wind velo-
cities (a few km above the Martian surface) as 15 - 40 km/hr. The
nature of canals and associated seasonal changes are discussed,
the latter being ascribed to vegetation, the existence of which is
considered proved by the ir studies of V. M. Sinton, Regular long-
term observations of the planet by a variety of methods are re-
commended and particularly the studies of the luminance ratios be-
tween light and dark features on Mars (in the region of 0.2 - 5 μ),
the radioemission from Mars (at various wavelengths), and the op-
tical properties of minerals and rocks. There are 2 tables.

ASSOCIATION: AN USSR (AS UkrSSR)

Card 2/2

ACCESSION NR: AR3010373   S/0269/63/000/008/0059/0059

SOURCE: RZh. Astronomiya. Abs. 8.51.424
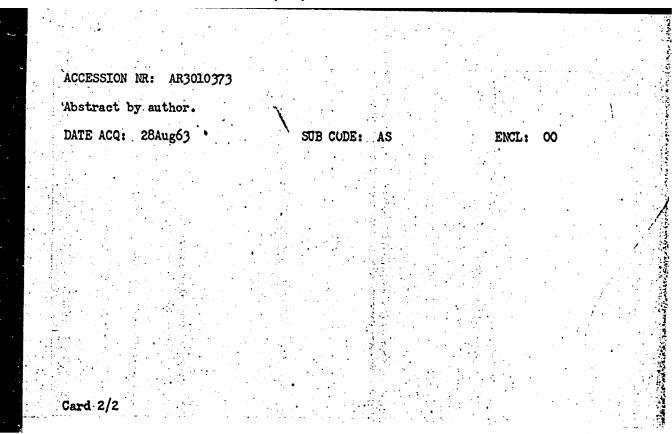
AUTHOR: Barabashov, N. P.

TITLE: On diffusion and true absorption of light in the atmosphere of Mars

CITED SOURCE: Tsirkulyar Astron. observ. Khar'kovsk. un-t, no. 25, 1962, 3-14

TOPIC TAGS: Mars, atmospheric light absorption

TRANSLATION: It is shown that the assumptions of the uniform distribution of brightness over the Martian disc (during the solstice, when i = ε) in the case of absence of an atmosphere, as well as of a high surface albedo and substantial true atmospheric absorption are of low probability. It is shown that in the case of brightness distribution over the hard surface of Mars described by the Lambert law, the true absorption must increase as the wavelength shortens and that the model with low atmospheric thickness and reflection of light from the hard surface by Lambert's law is most probable. Bibliography with ten titles.

Card 1/2

ACCESSION NR: AR3010373

'Abstract by author.

DATE ACQ: 28Aug63   SUB CODE: AS   ENCL: 00

Card 2/2

37396

S/033/62/039/002/010/014
E032/E314

3.2500

AUTHORS: Barabashov, N.P. and Garazha, V.I.

TITLE: On the microstructure of the lunar surface

PERIODICAL: Astronomicheskiy zhurnal, v.39, no. 2, 1962,
               305 - 314

TEXT: N.P. Barabashov and A.T. Chekirda (Ref. 1 - Izv.
Komissii po fizike planet, no. 1, 1960) have reviewed the
photometric characteristics of the lunar surface and have
concluded that the latter is very similar to tuffaceous rocks
in pulverized form. It is therefore of particular interest
to determine the geometrical structure of the surface layers
of the Moon.   It is shown that by assuming that the surface
consists of volcanic tuff with a square-cell honeycomb structure,
all the known properties of the surface can be satisfactorily
interpreted (wall thickness 0.20 m, depth 1.5 - 2 m, where m
is the side of the squares). However, since the appearance
of a square-cell honeycomb on the lunar surface is rather
unlikely, six-sided cells have also been investigated. It is
found that the latter cells lead. to a disagreement with the
Card (1/2)

On the microstructure of S/033/62/039/002/010/014
                                 E032/E314

known characteristics of light-reflection from the lunar surface.
It is concluded from this that first-order irregularities on the
lunar surface can hardly be of the honeycomb type. A more
realistic assumption is that the surface consists of a porous
or pulverized tuff with characteristic linear dimensions
between a fraction of a millimetre and a few millimetres. To
verify this hypothesis the authors have carried out some
laboratory experiments on pulverized tuff with grain dimensions
between 0.01 and 5 mm. A detailed comparison of the results
with the known photometric properties of the Moon suggests that
the best agreement is obtained by assuming that the lunar
surface consists of pulverized tuff with linear grain dimensions
between 1 mm and a few mm. This is said to be consistent with
radar observations. There are 11 figures and 9 tables.

ASSOCIATION: Khar'kovskaya astronomicheskaya observatoriya
                (Khar'kov Astronomical Observatory)

SUBMITTED: June 2, 1961

Card 2/2

3.2500

S/035/62/000/012/016/064
A001/A101

AUTHORS: Barabashov, N. P., Yezerskiy, V. I.

TITLE: Photometric studies of the microrelief of the lunar surface

PERIODICAL: Referativnyy zhurnal, Astronomiya i Geodeziya, no. 12, 1962, 65,
              abstract 12A477 ("Uch. zap. Khar'kovsk. un-t", 1962, v. 122, "Tr.
              Astron. observ.", v. 14, 5 - 78)

TEXT: This is a survey of the basic works described in historical se-
quence, on microrelief of the lunar surface by the photometric method. The ar-
ticle contains also data on this problem obtained by studying polarization and
thermal properties of the lunar surface and its investigation by the radar meth-
od. There are 79 references.

Authors' summary

[Abstracter's note: Complete translation]

Card 1/1

ACCESSION NR: AT4039417   S/2835/62/000/025/0015/0021

AUTHOR: Barabashov, N. P.; Yezerskiy, V. I.; Prishlyak, N. P.

TITLE: Differences in the microrelief of different sectors of the lunar surface

SOURCE: Kharkov. Universitet. Astronomicheskaya observatoriya. Tsirkulyar, no. 25, 1962, 15-21

TOPIC TAGS: astronomy, photometry, lunar surface, lunar microrelief, moon

ABSTRACT: To a considerable degree, the lunar surface possesses photometric uniformi and therefore the microrelief responsible for the character of the reflection is also uniform. Only in individual cases is there an appreciable difference, indicating a differ-ence in microrelief or the presence of slopes. In making a detailed study of the photo-metric characteristics of individual sectors of the lunar surface it is desirable to compar them with averaged data for the lunar surface. Such averaging is possible because, for, a particular value of the phase angle, brightness is a function only of selenographic longi tude. The authors used graphic methods for finding the dependence of B on λ for differe values of α. The brightness of a detail was expressed by its brightness at full moon. The resulting curves of the dependence of brightness on λ for different values of the

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ACCESSION NR: AT4039417

phase angle, when put in graphic form, represent the law of light reflection from the lunar surface as a whole. On the basis of the dependence of B on λ it is possible to compute the relative brightness of the moon for a particular phase angle. The derived curves were used to determine the deviations of brightness of various details from the curves representing the averaged lunar surface, the deviations being expressed by the relative value $\Delta B/B$, where ΔB is the deviation, with sign taken into account, and B is the brightness value from the curve for the corresponding value of λ. The character of the dependence of $\Delta B/B$ of individual details on phase angle was then investigated. A considerable number of details were found for which the value $\Delta B/B$ and the dispersion σ are small and which represent a photometrically averaged moon. The condition

$$\left| \frac{\Delta B}{B} \pm \sigma \right| < 0.15 \quad \text{was}$$

satisfied by 67 of 164 details (about 40%). Of these, 29 were sectors in seas, constituting 54% of the total number of details in the seas. The similar relation for continents and craters was 26% (25 out of 94 details). The above condition was also satisfied by about 50% of the bright rays and bands. There were a number of details for which the value $\overline{\Delta B/B}$ was positive, equal to 0.2-0.3 with a relatively small dispersion; these details are listed in a table; all are craters or continental regions. Another table lists details for which brightness was systematically less and the value $\overline{\Delta B/B}$ had a negative sign with a relatively small dispersion: these details include both continental and sea areas. The authors

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ACCESSION NR: AT4039417

interpret these photometric differences. "In conclusion the authors thank M. K. Kapinus and L. I. Yefimova who performed some of the computations for this study". Orig. art. has: 6 formulas, 2 figures and 4 tables.

ASSOCIATION: Astronomicheskaya observatoriya Khar'kovskogo universiteta (Astronomical Observatory of Khar'kov University)

SUBMITTED: 00   DATE ACQ: 23Jun64   ENCL: 00

SUB CODE: AA   NO REF SOV: 007   OTHER: 002

Card   3/3

ACCESSION NR: AT4039416   S/2835/62/000/025/0003/0014

AUTHOR: Barabashov, N. P.

TITLE: Scattering and true absorption of light in the Martian atmosphere

SOURCE: Kharkov. Universitet. Astronomicheskaya observatoriya. Tsirkulyar, no. 25, 1962, 3-14

TOPIC TAGS: astronomy, Mars, Martian atmosphere, light absorption, light scattering

ABSTRACT: The author demonstrates the improbability of the assumption of a uniform distribution of brightness on the Martian disk, in the case of either the absence of an atmosphere, a high surface albedo or significant true absorption in the atmosphere. It also is demonstrated that, in the case of a brightness distribution on the solid surface of Mars described by the Lambert law, the true absorption would increase with transition to the short wavelengths, so that a model with a low atmospheric optical density and light reflection from the solid surface in accordance with Lambert's law is most probable. There is a basis for believing that the Martian atmosphere, at least in the visible region of the spectrum, possesses mostly scattering properties. The decrease in contrast often observed in the short-wave part of the spectrum can be attributed to the appearance of extreme-

Card 1/2

ACCESSION NR: AT4039416

ly tiny ice particles (1-2 microns in diameter) in the atmosphere, increasing both scattering and possibly absorption. In the long-wave part of the spectrum the contrast also decreases due to dust storms. There is no basis for invoking im-probable hypotheses assuming a high optical density of the Martian atmosphere. It is reasonable to assume that the Martian surface reflects in accordance with a law close to the cosine law and the observed spectral peculiarities of the visible surface of Mars in the indicated region of the spectrum should be attributed to the solid surface of the planet. The author extensively cites his previous studies of this problem. His criticism of Opik's work (Journal of Geophysical Research, v. 65, No. 10, 1960, p. 3057) is detailed and harsh. "In conclusion, the author thanks V. Yarko, laboratory specialist in the Kafedra astronomii khGU (Department of Astronomy, Khar'kov State University), for certain computations made for this study." Orig. art. has: 12 formulas and 15 tables.

ASSOCIATION: Astronomicheskaya observatoriya, Khar'kovskiy Universitet (Astronomical Observatory, Khar'kov State University)

SUBMITTED: 00   DATE ACQ: 23Jun64   ENCL: 00

SUB CODE: AA   NO REF SOV: 006   OTHER: 004

Card 2/2

BARABASHOV, N.P.

Some considerations on the atmosphere and surface structure of
Mars.   Uch.zap.KHGU 122:103-106 '62.
(Mars (Planet))   (MIRA 15:11)

L 19328-63   EWT(1)/FCC(w)/BDS/ES(v)   AFFTC/ESD-3   Pe-4/Po-4   GW

ACCESSION NR: AR3002047   S/0269/63/000/005/0060/0060

SOURCE: RZh. Astronomiya. Otdel'nyy vypusk. Abs. 5.51.495

AUTHOR: Barabashov, N. P.; Yezerskaya, V. A.; Yezerskiy, V. I.

TITLE: The photometric method of studying the relief of the lunar surface

CITED SOURCE: Uchenyye zapiski Khar'kovskogo universitita, v. 122, 1962, Trudy Astronomicheskoy observatorii, v. 14, 107-110

TOPIC TAGS: astronomical photometry, lunar microrelief

TRANSLATION: The authors refine the photometric method for determining the steep-ness of slopes and elevations in the lunar seas (first proposed by van I. Diggelen, Bull. Astron. Inst. Netherl., 1951, 11, No. 423). They explain that this method supplies direct data on slopes provided the photographic strips are taken suf-ficiently close to the equator of intensity and in directions parallel to it. In such measurements it is generally useful to employ large-scale lunar photographs with a resolution of < 1". The authors made measurements of moon photography obtained at a phase angle of 77°.5, with an image diameter of 59 mm. Photometric strips along the Arzachel and Archimedes craters, obtained on the MF-4 automatic

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L 19328-63
ACCESSION NR: AR3002047

microphotometer are shown in the illustrations. In the Arzachel crater
($\varphi = -12^{o}.3$), inclinations of the western and eastern slopes are $6^{o}.8$ and $13^{o}.5$.
In the case of Archimedes ($\varphi = +34^{o}.6$), they are $4^{o}.2$ and $2^{o}.1$. A comparison of
photometric measurements with the results obtained by the shadow method will give
a clue to the feasibility of studying microrelief in various parts of a crater --
a matter of considerable interest. I. Lebedeva

DATE ACQ: 30May63   SUB CODE: AI   ENCL: 00

Card 2/2

BARABASHOV, Nikolay Petrovich; POZHIDAYEVA, M., red.; YELAGIN,A.,
tekhn. red.

Mars. Moskva, Izd-vo "Sovetskaia Rossiia," 1963. 63 p.
(MIRA 17:3)

BARABASHOV, N.P., YEZERSKIY, V.I.

Some results of the Investigations of the Microrelief of the
Lunar Surface by Means of Photometric Method

Report to be submitted for the 4th International Space Science Symposium
(COSPAR) Warsaw, 2-12 June 63

BARABASHOV, N.P.

Dust formations in the atmosphere of Mars and the color of
Martian seas. TSir. Astron. obser. Khar. un. no.26:3-13 '63.
(MIRA 17:5)

ACCESSION NR: AT4044397   S/2835/63/000/026/0014/0019

AUTHOR: Barabashov, N. P. (Academician AN UkrSSR); Akimov, L. A.

TITLE: The structure of the lunar surface

SOURCE: Kharkov, Universitet. Astronomicheskaya observatoriya. Tsirkulyar, no. 26,
1963, 14-19

TOPIC TAGS: astronomy, moon, lunar surface, lunar albedo

ABSTRACT: In previous papers (Astr. zh., Vol. XXXIX, No. 2, 1962; Izvestiya komissii po
fizike planet, No. 3, Izd-vo KhGu, 1961) the author has demonstrated the incorrectness
of the supposition that the lunar surface is covered by a layer of fine dust, since such a
layer does not correspond to the reflectivity of the lunar surface. The best agreement on
the basis of this criterion is with a surface of highly shattered rocks in the form of
pointed structures with a low albedo and also with extraordinarily porous surfaces in
which the width of the pore walls is many times less than the distance between walls. In
these earlier papers, the first attempt was made to compare curves of the dependence of
brightness on the difference between the azimuths (A) of incident and reflected rays for
different but equivalent angles of incidence (i) and reflection (ε) of light from the lunar

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ACCESSION NR: AT4044397

surface, and also the surfaces of models with rough surfaces of shattered volcanic rocks, etc. A new automatic instrument (not described) has now been devised which makes it possible to obtain, directly and conveniently, the dependence of brightness not only on i and $\mathcal{E}$, but also on A. A series of models was used in an effort to determine which materials would correspond best to the lunar surface not only for curves B = f(i,$\mathcal{E}$), but also for curves B = F(i,$\mathcal{E}$, A) for a difference in azimuths from 0° to 180°. The following materials were used: fractured tuff with grain size 2-5 mm; a sponge, colored by dark clay; pulverized tuff with grain size less than 0.7 mm; pulverized tuff, with individual pointed fragments of tuff (4-5 mm in height) on top; volcanic ash; pointed fragments 3-5 mm in height, 4-5 mm apart; fractured tuff with grain size about 5 mm. In all samples the grains and walls were opaque. The values obtained are presented in tables; the data confirm the author's previous conclusions: 1. the lunar surface cannot be covered by dust; 2. the law of relection from the lunar surface differs appreciably from the law of reflection for volcanic ash; 3. the lunar surface does not resemble volcanic slag because at large i = $\mathcal{E}$ it begins to have appreciable mirror properties, especially when there is a difference of azimuths of 180°. Final confirmation

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ACCESSION NR: AT4044397

is obtained that the surface is covered either by an extraordinarily porous spongy layer with very thin but opaque walls separating the individual pores, or by pointed, closely spaced opaque fragments consisting of shattered tuff-like volcanic rocks not having mirror properties. Orig. art. has: 3 figures and 3 tables.

ASSOCIATION: Astronomicheskaya observatoriya Khar'kovskogo Universiteta (Astronom-ical Observatory, Khar'kov University)

SUBMITTED: 00   ENCL: 00

SUB CODE: AA   NO REF SOV: 002   OTHER: 000

Card 3/3

YAKOVKIN, A.A., otv. red.; FEDOROV, Ye.P., red.; AKSENT'YEVA,
        Z.N., red.; BARABASHOV, N.P., red.; BOGORODSKIY, A.F.,
        red.; GORYNYA, A.A., red.; KOVAL', I.K., red.;
        KOLCHINSKIY, I.G., red.; TSESEVICH, V.P., red.;
        KOVALENKO, L.D., red.

        [Figure and motion of the moon] Figura i dvizhenie Luny.
        Kiev, Naukova dumka, 1965. 135 p.   (MIRA 18:7)

        1. Akademiya nauk URSR, Kiev.

L 11529-66   EWT(1)   GW

ACC NR: AR6001133   SOURCE CODE: UR/0269/65/000/009/0055/0055

SOURCE: Ref. zh. Astronomiya, Abs. 9.51.468

AUTHOR: Barabashov, N. P.

TITLE: An unusual formation on Venus

REFERENCED SOURCE: Astron. tsirkulyar, no. 306, okt. 16, 1964, 1-2

TOPIC TAGS: Venus planet, photograph, spectrographic analysis

TRANSLATION: The workers of the Astronomical Observatory of Kharkov State University have detected on photographs of Venus, made with ultraviolet rays, a large dark spot which occupies ~1/3 of the disk of Venus and which is adjacent to the terminator. The spot was observed on 3, 5, 6, and 7 September 1964. It was also traced on spectrograms, beginning with λ 4000. A small dark spot was photographed with ultraviolet rays on 9 March 1964. V. B.

SUB CODE: 03

Card 1/1   UDC: 523.42

ACC NR: AR6020773   SOURCE CODE: UR/0269/66/000/003/0071/0071

AUTHOR: Barabashov, N. P.; Yezerskiy, V. I.

TITLE: Differences in macrorelief of the individual parts of the lunar surface. Part 2.

SOURCE: Ref. zh. Astronomiya, Abs. 3.51.590

REF SOURCE: Vestn. Khar'kovsk. un-ta, no. 4, ser. astron., vyp. 1, 1965, 22-42

TOPIC TAGS: lunar reflectivity, selenography, photometric analysis, lunar temperature

ABSTRACT: Part 1 was given in RZhAstr., 1964, 1.51.539. The law of light reflection for the medium-high microrelief and the smooth spherical Moon was derived on the basis of data given in V. A. Fedorov's catalogue as $B(\alpha, \lambda)$, where B is the medium brightness denoted further as B_m, α is the phase angle, λ is the selenographic longitude. Some small objects (details) had systematic deviations in brightness from the medium. These deviations were expressed as $\Delta B/B_m$. The small objects possessing large porosity had $\Delta B/B_m < 0$, because the shadow effect on the very small roughnesses of the microrelief. They were mostly some parts of the seas. The small objects with $\Delta B/B_m > 0$ had a lower porosity. They were chiefly the craters and continental areas. The presence of slopes was expressed by changes in the sign of $\Delta B/B_m$ with the changing sign of the phase angle α. This was observed in terraces and at the bottom of craters. Calculations

Card 1/2   UDC: 523.36

L 3282-66 / EWT(1)   GS/GW _____   UR/0000/65/000/000/0052/0060

ACCESSION NR: AT5024605

AUTHOR: Barabashov, N. P.

TITLE: Optical properties of the atmosphere of Mars based on photometric observation data

SOURCE: AN UkrSSR. Voprosy astrofiziki; issledovaniye atmosfer Venery i Marsa (Problems in astrophysics; investigation of the atmospheres of Venus and Mars). Kiev, Izd-vo Naukova dumka, 1965, 52-60

TOPIC TAGS: Mars, Martian atmosphere, planetary astronomy, planetary atmosphere, photometric observation

ABSTRACT: An analysis of the results of photometric observations of Mars on the basis of the theory of light scattering in the planetary atmosphere shows that ther is a greater probability of low values of optical thickness in the Martian atmosphere whose scattering properties are mainly in the visible part of the spectrum. True absorption increases in the shortwave part of the spectrum, but the optical thickness of the atmosphere is relatively small in this case, too. Many areas of the maria have a greenish shade. It is recommended that Martian studies be conduct on a larger scale and with greater diversity. Not even sketches based on visual

Card 1/2

L 3282-66

2.

ACCESSION NR: AT5024605

observations should be excluded, since they can provide useful information, especial.
when used in combination with photographic, spectral, polarimetric, and other obser-
vations. Spaceship investigations should yield even more valuable information whic
is difficult, or even impossible, to obtain from the earth's surface. Orig. art.
has: 2 tables.   [JJ]

ASSOCIATION: Astronomicheskaya observatoriya Khar'kovskogo gosudarstvennogo
universiteta (Astronomical Observatory, Khar'kov State University)

55

SUBMITTED: 05Jun65   ENCL: 00   SUB CODE: AA

                                      OTHER: 005   ATD PRESS: 7/10
NO REF SOV: 010

Card 2/2

L 15763-66   EWT(1)   GW

ACC NR: AP6006777   SOURCE CODE: UR/0033/66/043/001/0144/0148

AUTHOR: Barabashov, N. P.; Garazha, V. I.; Dudinov, V. N.   13
                                                                              B

ORG: Kharkov Astronomical Observatory (Khar'kovskaya astronomicheskaya observa-
toriya)

TITLE: Some thoughts on the possibility of correcting planetary photometric cross
sections

SOURCE: Astronomicheskiy zhurnal, v. 43, no. 1, 1966, 144-148

TOPIC TAGS: planetary astronomy, photographic photometry, Mars, Martian disk

ABSTRACT: The method proposed by I. K. Koval' (Astron. tsirkulyar, no. 319, 1,
1965) for correcting the distortions in the brightness distribution of a planetary
disk in photographic photometric investigations is reviewed and evaluated. In an
attempt to correct the distortion in the brightness distribution of the Martian
disk, Koval' first made comparisons against the brightness distribution of a star
and then used the following integral equation for a one-dimensional case:

$$F(t) = \int_{-\infty}^{+\infty} f(x) g(x-t)\, dx.$$

Card 1/2   UDC: 523.40

L 15763-66

0

ACC NR: AP6006777

where F(t) and f(x) are the observed and true brightness distribution of the planetary disk, and g(x) is the measured distribution in the star image. The solution of this equation is considered to be the only appropriate stable one. Decreasing the error in measurements in F(x) decreases the error in determining the unknown function f(x). It is found, however, that the method has limited application, especially in the correction of the brightness of points very close to the limb. [DM]
Orig. art. has: 4 formulas.

SUB CODE: 03/ SUBM DATE: 11Oct65/ ORIG REF: 004/ OTH REF: 007/ ATD PRESS:
4260

Card 2/2 SYW

L 07362-67   FSS-2/EWT(1)   IJP(c)   JGS/GW

ACC NR: AP6033169   SOURCE CODE: UR/0033/66/043/005/1039/1046

AUTHOR: Barabashov, N. P.; Belobrova, O. I.; Yezerskiy, V. I.; Yezerskaya, V. A.

ORG: Kharkov Astronomical Observatory (Khar'kovskaya astronomicheskaya observatoriya)

TITLE: Photometry of the marginal zone of the Moon

SOURCE: Astronomicheskiy zhurnal, v. 43, no. 5, 1966, 1039-1046

TOPIC TAGS: moon, photometry, lunar albedo, lunar landing, lunar surface, lunar optic property

ABSTRACT: Photometric characteristics of the eastern and western marginal zones of the lunar surface were studied by comparison with data for the photometric mean lunar surface. Analysis of published data as well as of original photometric measurements of regions in the eastern and western marginal zones showed the relative brightness of the eastern zone to be generally greater, and that of the western zone to be less than the photometric mean for the lunar surface. This indicates differences in the microrelief structures of the marginal zones—denser material in the outer layer of the eastern marginal zone (including the landing site of the Luna-9 station, $\beta = +7°.08$, $\lambda = -64°.22$) than in the western marginal zone. Heat anomalies of the lunar surface (e.g., less rapid heating of the eastern than of the western zone after the full phase; craters, warmer than surrounding regions, observed at the time of a lunar eclipse),

Card 1/2   UDC: 523.323

L 07362-67

ACC NR: AP6033169

correlated with its photometric characteristics, are cited to support the possibility
of the presence of rock formations in addition to porous material. The lesser
intensity of the meteor stream near the eastern zone of the Moon caused by the Earth's
gravitational field is mentioned as a possible explanation for the observed photometric
and structural characteristics. Orig. art. has: 6 figures, 4 tables, and 2 equations.

SUB CODE: 03/ SUBM DATE: 26Apr66/ ORIG REF: 016/ OTH REF: 008 /
ATD PRESS: 5101

Card   2/2 afs

ACC NR: AR6034903   SOURCE CODE: UR/0269/66/000/008/0061/0062

AUTHOR: Barabashov, N. P.

TITLE: Spectrophotometry of a large dark spot on Venus

SOURCE: Ref. zh. Astronomiya, Abs. 8.51.488

REF SOURCE: Astron. tsirkulyar, no. 353, yanv. 23, 1966, 1-2

TOPIC TAGS: spectrophotometry, astronomic observatory, Venus planet, venusian spot, venusian cloud layer

ABSTRACT: A series of spectrograms of a large dark spot on Venus was obtained between August 30 and September 20, 1964 at the Astronomic Observatory of the Khar'kov State University by means of the AZT-7 telescope using an ASP-9 spectrograph. Their processing, which was carried out by the author and I. L. Belkina, showed that the spot was reddish in color, but changed with time. During the period of highest spot development (Aug. 31—Sept. 3), the violet end of the spectrum showed its maximal degree of weakness. Hence, the conclusion that the occurrence of such spots may alter energy distribution in the spectrum of Venus

Card 1/2   UDC: 523.43

ACC NR: AR6034903

which could explain the discrepency between the results of I. N. Glushneva and
N. A. Kozyrev. No new spectral lines were detected on the spectrum of the spot.
It is assumed that the spot is a huge discontinuity in the upper section of the
venusian cloud layer through which can be seen the redder layers lying below it, or
that it is a cloud of large particles ejected from the surface of Venus or formed in
the cloud layer itself. The fact of the occurrence of such large clouds (20 million
km^2) bears witness to the intense processes covering considerable regions of the
planet. V. Bronshten.

SUB CODE: 03/

Card 2/2

ACC NR: AR6035553   SOURCE CODE: UR/0269/66/000/010/0065/0066

AUTHOR: Barabashov, N. P.; Yezerskaya, V. A.; Yezerskiy, V. I.

TITLE: Photographic photometry of some parts of the Sea of Clouds and Sea of Cognition

SOURCE: Ref. zh. Astronomiya, Abs. 10.51.481

REF SOURCE: Vestn. Khar'kovsk. un-ta, 1965, no. 8, ser. astron., vyp. 2, 12-25

TOPIC TAGS: moon, lunar topography, lunar surface, lunar crater, lunar photometry, lunar photography, photometry/Sea of Clouds, Sea of Cognition

ABSTRACT: The following characteristics are obtained for 31 sectors in the region of the Sea of Clouds and the Sea of Cognition: brightness $B_{obs} - B_m$, where B_m is the brightness of the photometrically averaged lunar surface at corresponding values of the phase angle and selenocentric longitude, reduced (like B_{obs}) to a unit value at $\alpha = 1°.5$; average values of relative declination $\overline{\Delta B / B_m}$ and corresponding values of the mean quadratic deviation σ; values of the relative brightness gradient near zero phase Δ_0, etc. An analysis of the data obtained

UDC: 523.34

ACC NR: AR6035553

shows that the relationship between $\overline{\Delta B/B_m}$ and Δ_c is in good agreement with the theoretical relationship between these parameters, computed from B. Hapke's formula. The measured areas are basically situated in the region of negative $\overline{\Delta B/B_m}$ values and positive Δ_0 values, which corresponds to a somewhat greater degree of irregularity (pitting), and, in accordance with Hapke's theory, corresponds to a somewhat smaller value of the compaction factor as compared with the photometrically obtained average of the lunar surface. It is of interest to note that some of the measured sectors of the Sea of Cognition are available on photographs obtained from close range by Ranger VII. As these photos show, these sectors differ from each other in their distribution of small craters. On the other hand, they do not indicate large deviations according to the law of light reflection. This makes it possible to assume that the observed deviations in the law of reflection of light cannot depend substantially on the presence of such craters and the structural characteristics related to them. A bibliography of 8 titles is included. V. Avramchuk. [Translation of abstract]

SUB CODE: 03/   [SP]

Card 2/2

BARABASHEV, N. P.

"Distribution of Brightness in the Earth's Shadow During the Total Eclipse of the Moon on 7-8 Nov 1938," Astron. Zhur., 16, No.5, 1939

BARABASHEV, N. P. and TIMOSHENKO, I.

"Photographic Photometry of Mars in Red and Blue Rays," Astron. Zhur., 17, No.5, 1940

BARABASHEV, N. P.

Barabashev, N. P. "The moon and planets," in symposium: Astronomiya v SSSR za tridtsat' let, Moscow-Leningrad, 1948, p. 71-82

SO: U-2888, Letopis Zhurnal'nykh Statey No. 1, 1949

BARABASHEV, N. P.

41988. BARABASHEV, N. P., CHEKIRDA, A. T., FEDORETS, V. A.-- Ob osveshchen: osti
zemnoy poverkhosti primym i rassennym solnechnym. Ushen. Zapiski
khar'k. Gos. un-ta im. Gor'kogo, T. XXVIII. Publikatsii Astron.
Observatorii, t. VIII, 1948, S. 21-27

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948

BARABASHEV, N. P.

41987. BARABASHEV, N. P.--SHEKIRDA, A. T.--Fotograficheskaya fotometriya lunnoy poverkhnosti, uchen. Zapiski khar'k gos. un-ta im. Gor'kogo, T. XXVIII Prblikatsii Astron. Observatorii, T. VIII, 1948, S. 29-50

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948

BARABASHEV, N. P.

41986.   BARABASHEV, N. P.--Fotometriya svetlykh i temnykh zon. Yupitera.
         Uchen. Zapiski khar'k. Gos uh-ta im. Gor'kogo, T. XXVIII. Publikatsii
         Astron. Observatorii, T. VIII, 1946 S. 51-64. --Bibliogr: 9 Nazv.

SO: Letopis' Zhurnal'nykh Statey, Vol. 47, 1948

HORDELADZE, Sh.H.; BARABASHOV, M.P., diysnyy chlen.

Chemical composition and transparency of novae envelopes. Dop.AN URSR no.3:18:
183 '51.
(MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Barabashov). 2. Holovna astronomichna
observatoriya Akademiyi nauk Ukrayins'koyi RSR (for Hordeladze).

(Stars, New)

BARABASHEV, N. P.

155T3

USSR/Astronomy - Planets, Physics of   Dec 49
Astrophysics

"All-Union Conference on Planetary Physics,"
V. V. Sharonov, 4 pp

"Priroda" No 12

Conference, held at Khar'kov 21 - 23 May 49,
was presided over by N. P. Barabashev, Dir,
Khar'kov Astr Obs. Reports were heard on sev-
eral aspects of planetary physics. Conference
was held in accordance with resolutions passed
at Dec 48 conference, reported in "Astronomi-
cheskiy Zhurnal" No. 1, 1949, and 'Vestnik Lenin-
gradskogo Universiteta" No 1, 1949.

155T3

BARABASHOV, N.P., diysnyy chlen.

Some results of photometric analysis of photographs of Mars taken in 1933 and 1939 through light filters. Dop.AN URSR no.5:329-336 '51.
(MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR. 2. Kharkivs'kyy derzhavnyy universytet.
(Mars (Planet))

BARABASHEV, N.P.

Bor'ba s idealizmom v oblasti
kosmogonicheskikh i kosmologicheskikh gipotez
(Struggle againt idealism in the field of cosmogonic
and cosmological hypotheses). Khar'kov, Izd-vo
Kharkovskogo universiteta imeni A.M. Gor'kogo, 1952. 120 p.

SO: Monthly List of Russian Accessions, Vol. 6, No. 1, April 1953

BARABASHEV, N. P.

BARABASHEV, N.P.

[Study of physical conditions on the Moon and the planets] Issledo-
vanie fizicheskikh uslovii na Lune i planetakh. Khar'kov, Izd-vo
Khar'kovskogo gos. universiteta, 1952.   270 p.   (MLRA 7:7)

1. Deystvitel'nyy chlen Akademii nauk USSR.
   (Moon--Observations) (Planets--Observations)

BARABASHEV, N.P.; CHEKIRDA, A.T.

    Red-, yellow-, green-, and blue-light spectrophotometry of Mars.
    TSir. Astron.obser. Khar.un. no.9:3-28 My '52.   (MIRA 9:4)
        (Mars (Planet)) (Spectrophotometry)

PA 234T58

BARABASHEV, N.P.

Sep/Oct 52

USSR/Astronomy - Mars

"Investigations of Various Formations on Mars," N. P. Barabashev, Astr Obs, Khar'kov State U

"Astron Zhur" Vol 29, No 5, pp 538-555

During the next favorable aspects of Mars, its sur-face structure, lands and canals, polar caps, etc., will be studied. Author describes results of his 30 years of observations of Martian seas, vegetation, polar caps, atm, etc. For better results more power-ful instruments are needed.

234T58

BARABASHEV, N.P.

Possibility of seing the sun's reflection in Martian "seas".
Tsir.Astron.obser.Khar.un.no.10:3-6   '52.   (MIRA 9:4)
(Mars (Planet))

1. BARABASHEV, N.P.

2. USSR (600)

4. Mars (Planet)

7. Oppositions of Mats. Astron. tsir. no. 126, 1952

9. Monthly List of Russian Accessions, Library of Congress, February 1953. Unclassified.

1. BARABASHEV, N.

2. USSR (600)

4. Astronomical Photography

7. Color photographs of the moon and the planets. Astron. tsir. no. 127, 1952.

9. <u>Monthly</u> <u>List</u> <u>of</u> <u>Russian</u> <u>Accessions</u>, Library of Congress, May   1953. Unclassified.

BARABASHEV, N. P.

Razvitie vzgliadov v oblasti kosmogonii solnechnoi sistemy (Development of theories in the field of the origin of the solar system). Khar'kov, Khar'kovskii univ., 1953. 162 p.

SO: Monthly List of Russian Accessions, Vol. 7, No. 7, Oct. 1954

BARABASHEV, N. P.

The Committee on Stalin Prizes (of the Council of Ministers USSR) in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 20 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Barabashev, N. P.	"Research on Physical Conditions on the Moon and Planets"	Khar'kov State University imeni A. M. Gor'kiy
	"Development of Views on the Cosmogony of the Solar System"	
	"The Struggle Against Idealism in the Field of Cosmogonic and Cosmological Hypotheses"	

SO: W-30604, 7 July 1954

1. BARAFASEV, M. P.

2. USSR (600)

4. Cosmogeny

7. "Fight against idealism in the fields of cosmogonical and cosmological hypotheses."
   Reviewed by A. G. Masevich, Sov. kniga No. 2, 1953.

9. **Monthly List of Russian Accessions**, Library of Congress,   June   1953. Unclassified.

BARABASHEV, N.P., professor.

Color contrasts on the moon's surface. Priroda 42 no.12:88-90 D '53.

(MLRA 6:11)

1. Deystvitel'nyy chlen Akademii nauk Ukrainskoy SSR.   (Moon--Surface)

BARABSHEV, N. P.

BARABASHEV, N.P. predsedatel' planetnoy komissii; SHARONOV, V.V.,
professor;

Some considerations on the organization of photographic, photo-
metric, and colorometric observations of the planet Mars during its
1954 opposition. Astron.tsir. no.143:20-21 N '53.   (MLRA 7:8)

1. Deystvitel'nyy chlen AN USSR (for Barabashev) 2.Zamestitel'
predsedatelya planetnoy komissii (for Sharonov)
      (Mars (Planet)—Opposition, 1954)

BARABASHEV, N.P.;   GORDON, I.M.

Relationship of sunspots and non-uniform solar radio emissions. Dop.
AN URSR no.1:6-8 '54.   (MIRA 8:4)

1. Deystvitel'nyy chlen Akademii nauk USSR (for Barabashev).
2. Astronomichna observatoriya Kharkivs'kogo derzhuniversitetu.
      (Sunspots) (Radio astronomy)

BARABASHEV, N.P.; GORDON, I.M.

Chromospheric eruptions of a special type and their geophysical con-
sequences. Dop. AN URSR no.1:9-12 '54.   (MIRA 8:4)

1. Deystvitel'nyy chlen Akademii nauk USSR (for Barabashev). 2.Astro-
nomichna observatoriya Kharkivs'kogo derzhuniversitetu.
       (Magnetic storms)

BARABASHEV, N. P.

"The Improtance of Studying the Physical Conditions on the Moon and on the Planets for Cosmogony," Uch. zap. Kharkovsk. un-ta, 3, No 55, 1954, pp 5-11

Author considers systematic studies of small lunar areas and spectral and polarized studies of planets of terrestrial and giant types essential for cosmogony. Advocates the necessity of founding a special institute for the study of planets equipped with powerful instruments. (RZhAstr, No 4, 1955)

SO: Sum. No. 568, 6 Jul 55

BARABASHEV N. P.

USSR/Astronomy

Card   : 1/1

Authors   : Barabashev, N. P., Act. Member of Acad. of Sc. Ukr-SSR, Deputy of Supreme Soviet

Title   : Progress in astronomy in the Ukraine

Periodical : Nauka i Zhizn'. 5, 24 - 25, May 1954

Abstract   : The progress in astronomical research in the Ukraine, since its annexation by Czarist Russia, and particularly during the Soviet regime, is described. Illustrations.

Institution : ....

Submitted   : ....

BARABASHEV, N. P. and GORDON, I. M.

"Chromospheric Eruptions of Peculiar Type and the Geophysical Aspects".
Byul. Komis. po Isled. Solntsa AN SSSR, No 10, pp 46-48, 1954.

   Data of Quarterly Bulletin of Solar Activity describing chromo-
spheric eurptions, radioemission, and terrestrial magnetic fields for
assumption that solar emission affecting the earth does not always
exhibit visible flares. Among 35 cases of raido fading chromospheric
eruptions could not be observed in 11 cases. This leads to the con-
clusion that invisible perturbances are affecting the earth as well.
An invisible solar event may be detected by the vanishment of emis-
sive lines, probably due to high electron temperature on the sun and
the ensuing total hydrogne and calcium ionization. (RZhFiz, No 11, 1955)

SO: Sum No 884, 9 Apr 1956

BARABASHEV, N. P.

USSR/Astronomy - Ukrainian astronomers

Card   1/1   : Pub. 36 - 10/36

Authors   : Barabashev, N. P., Act. Mem. Ukr. Ac. Sci.

Title   : Development of astronomy in the Ukraine

Periodical   : Priroda 43/8, 75-81, Aug 1954

Abstract   : . Some history is given of the development of the Ukrainian observator-
                ies and the training of the astronomers at Russian institutions. Num-
                erous astronomers are cited by name and their individual roles are
                briefly outlined. The best equipped observatory is found to be the
                one at Kiev, built since the second World War. Illustrations.

Institution : ...

Submitted   : ...

BARABASHOV, N.P.

PHASE I BOOK EXPLOITATION   334

Barabashov, Nikolay Pavlovich, Active Member Ukrainian S.S.R.
    Academy of Sciences.

O proiskhozhdenii zemli i drugikh nebesnykh tel; kratkiy ocherk
    (Origin of the Earth and Other Celestial Bodies; a Brief
    Study) Moscow, Goskul'tprosvetizdat, 1955. 105 p. 30,000
    copies printed.

Ed.:   Golubkova, V.A.; Tech. Art Ed.: Pergamenshchik, Ye.N.

PURPOSE: The purpose of this book is to show the progress of the
          field of cosmogony, beginning with ancient, naive legends
          and ending with the formation of the materialist hypo-
          thesis presented by Soviet scholars.

COVERAGE: See Table of Contents. There are no personalities and
          no biblographic references.
Card 1/4

Origin of the Earth and Other Celestial Bodies (Cont.)   334

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BARABASHOV, N.P.

BARABASHOV, N.P.

Life in the universe. Znan.sila no.1:6-9 Ja'55.   (MIRA 8:3)

1. Deystvitel'nyy chlen Akademii nauk USSR.
   (Plurality of worlds)

BARABASHOV

USSR/Optics - Photometry. Colorimetry.

K-10

Abs Jour   : Referat Zhur - Fizika, No 3, 1957, 8096

Author   : Barabashov
Title   : Remark on the Determination of the Color of Light-
              Reflecting Surfaces.

Orig Pub   : Dopovidi. AN URSR, 1955, No 4, 344-348

Abstract   : It is shown that it is impossible to employ a general
              color index for the characteristic of the color of a
              white reflecting surface. This leads to incorrect ideas.
              In particular, the apparent single color of the moon's
              surface, observed by several investigators, is ascribed
              to a color criterion that is applied without foundation.
              If the color indices of two light-reflecting surfaces
              turns out to be different, this is evidence that the co-
              lors of these surfaces differ from each other. However,
              this difference does not say anything about the true co-
              lor of the surface. If the color index is the same for

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                              - 132 -

USSR/Optics - Photometry. Colorimetry.   K-10

Abs Jour   : Referat Zhur - Fizika, No 3, 1957, 8096

many objects, it cannot be determined whether the color
of these objects is the same or different, since equal
color indices may correspond to objects that are colored
quite differently. The only correct comparison of color
of two light-reflecting objects will be comparison over
the entire range of the energy distribution curves in
their spectra.

*Oryaniy, chlen AN URSR, 2. Kharkiv's ky
derzhavniy universitet.*

Card 2/2   - 133 -

BARABASHEV, N.P.; CHEKIRDA, A.T.

Color of bright rays from the craters Tycho, Copernicus, and
Kepler. Tsir.Astron.obser. Khar.Un. no.13:3-13 '55.(MLRA 9:4)
                (Moon)

BARABASHOV, Nikolay Pavlovich; GOLUBKOVA, V.A., redaktor; YUSFINA, N.L.,
tekhnicheskiy redaktor

Mars. [Moskva] Goskul'tprosvetizdat, 1956. 12 p.   (MLRA 10:6)

1. Deystvitel'nyy chlen Akademii nauk USSR (for Barabashov)
(Mars (Planet))

BARABASHOV, N.P.; GUROV, K.P., redaktor izdatel'stva; KASHINA, P.S., tekhntcheskiy redaktor

[Instructions for observing Mars] Instruktsiia dlia nabliudenii Marsa. Sost. N.P.Barabashov. Moskva, Izd-vo Akademii nauk SSSR, 1956, 17 p.   (MIRA 10:4)

1. Vsesoyuznoye astronomo-geodezicheskoye obshchestvo.
      (Mars (Planet))

BARABASHOV, N.P.

Determining the color of surfaces reflecting light. TSir.Astron.obser.
Khar.un. no.15:3-7 '56.   (MLRA 10:5)
                    (Color measurement)

BARABASHOV, N.P.; CHEKIRDA, A.T.

Comparing the color and the luminosity ratio of different regions
of the moon's surface with some terrestrial rocks. TSir.Astron.obser.
Khar.un. no.15:9-15 '56.   (MLRA 10:5)
                        (Moon—Surface)

BARABASHOV, N.P.; CHEKIRDA, A.T.

Comparing the color and the luminosity ratio of different regions of the moon's surface with some terrestrial rocks. Astron. zhur. 33 no.4:549-555 Jl - Ag '56.   (MIRA 9:11)

1. Khar'kovskaya astronomicheskaya observatoriya.
   (Moon--Surface)

BARABASHOV, N.P.; KOVAL', I.K.

Differnce in the photographic diameters of Mars photographed in ultraviolet and red light [with summary in English]. Astron.zhur. 33 no.6:890-892 N-D '56.   (MLRA 10:1)

1. Astronomicheskaya observatoriya Khar'kovskogo gosudarstvennogo universiteta.
            (Mars (Planet)--Diameters) (Astronomical photography)

BARABASHOV, N. [P.]

Unusual brightness of some regions on Mars' surface. Astron.tsir.
no.172:2-3 Ag '56.   (MLRA 10:1)
                    (Mars(Planet))