USSR/Physics                                    Jun 1947
        Electrons - Emission
        Doppler Effect

"Emission of an Electron and an Atom Moving Along the
Axis of a Channel in a Dense Medium," V. L. Ginzburg;
I. M. Frank, Corr Mem, Acad Sci, 4 pp

"Dok Akad Nauk SSSR, Nova Ser"  Vol LVI, No 7

Gives mathematical discussion concluding that energy
emission in case of a Doppler effect is determined by
certain formulas, with factor $\int gt/^2$. In this regard
gives correct statement on analogous factor for the
electron.

                                                60790

GINSBURG, V.L.

May 1947

USSR/Physics
    Doppler Effect
    Atoms

"Doppler Effect at Velocity Greater Than That of Light," V. L. Ginsburg, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 4 pp

"Dok Akad Nauk SSSR, Nova Ser" Vol LVI, No 6

Describes experiments which show that supposition that Doppler effect, during movement of an atom in a compact medium, has no value because at this time it will be ionized, is not correct.

58T95

Translation — 2514467- 30 Apr 54

SO: LETOPIS NO. 30, 1948
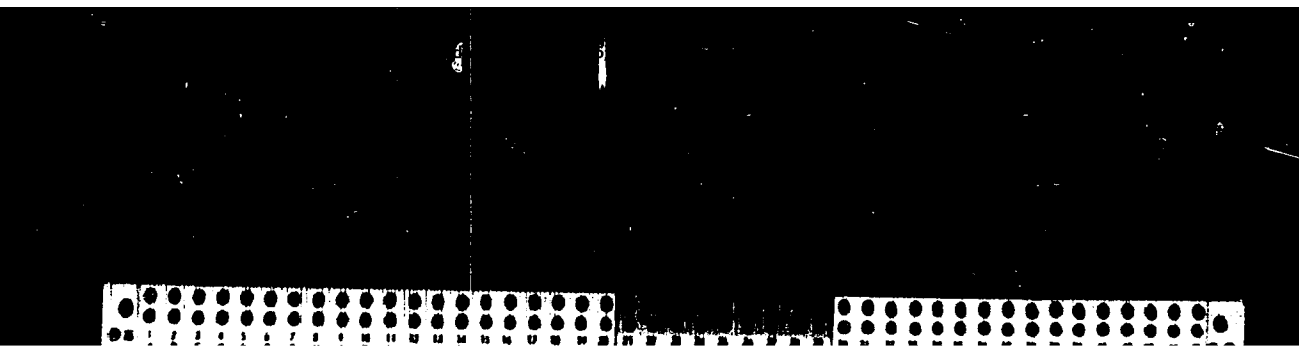
Jan/Feb 1948

USSR/Academy of Sciences
Radio

"N. D. Papaleksi and Radio Astronomy," V. L. Ginzburg,
4 pp

"Izv Akad Nauk SSSR, Ser Fiz" Vol III, No 1

Discusses Papaleksi's work on calculating distance of
the moon from earth; claims that only wartime diffi-
culties prevented Papaleksi from being the first to
achieve a radio-location contact with the moon, and
describes his work on the sun which culminated in his
sponsoring the Brazil expedition.

39T3

GINZBURG, V. L.

USSR/Physics                                    Jan 1948
    Solar Phenomena
    Radio Waves, Propagation

"New Data on Radio Emission of the Sun and Galactics,"
V. L. Ginzburg, 20 pp

"Uspekhi Fizicheskikh Nauk"  Vol XXXIV, No 1

Describes work on sun's radio intensity during eclipse,
observations of sun's radio emission at various fre-
quencies, and radio emission of galactics according to
Townes' article in "Astronomicheskiy Zhurnal" p 135,
1947.

                                        39T106

GINZBURG, V. L.                                                    PA 12/49T106

USSR/Physics                                          Apr 48
        Radio Waves - Absorption
        Mathematics, Applied

"Absorption of Micro-Radio Waves in the Atmosphere,"
V. L. Ginzburg, 11½ pp

"Uspekhi Fiz Nauk"  Vol XXXIV, No 4

Mathematical treatment of subject.  Reviews multiplet
disintegration of oxygen.  Discusses absorption
of short waves in dry air, atmosphere, rain, fog
and cloud.

                                            12/49T106

PHASE I                    TREASURE ISLAND BIBLIOGRAPHICAL REPORT            ·AID 214 - I

BOOK
                                                        Call No.: QC661.G54
   Author: GINZBURG, V. L.
   Full Title: THEORY OF RADIO-WAVE PROPAGATION IN THE IONOSPHERE
   Transliterated Title:  Teoriya rasprostraneniya radiovoln v ionosfere
Publishing Data
   Originating Agency: None
   Publishing House:  State Publishing House of Technical Theoretical Literature
                      (OGIZ)
   Date: 1949              No. pp.: 358         No. of copies: 7,000
      Editorial Staff
         Editor: None
                                               Tech. Ed.:  None
         Editor-in-Chief: None
                                               Appraiser:  None
         Others:  Leontovich, M. A., Academician, who reviewed the book and made
                  certain remarks, and Pariyskaya, Z. V., Engineer, who prepared
                  the graphics.
Text Data
   Coverage:  The book covers:  the conception of the ionosphere; dielectric constant
              and conductivity of an ionized gas; wave propagation in a non-
              homogeneous isotropic medium; reflection of radio-waves from ionosphere
              layers; wave propagation in an anisotropic medium, (under the effect
              of the earth's magnetic field); solar and galactic radiation.

                                    1/2

Teoriya rasprostraneniya radiovoln v ionosfere                    AID 214 - I

The author limits his work to the physics of the subject, using
mathematical deductions only when absolutely necessary. The book
from this point of view appears to be of a certain interest. However
it seems to be a compilation of known facts and deductions, as is
shown by the very large number of references, and not an original
concept.

Purpose:  To put the subject within reach of a broader circle of readers.
Facilities:  The Institute of Physics imeni P. N. Lebedev of the Academy of
            Sciences, USSR, and the Radio-Physics Department of the Main
            Administration of Geodetics (GGU)
No. of Russian and Slavic References:  69 out of 147 (1915-1948)
Available:  Library of Congress.

2/2

USSR/Physics                                          Jan 49
         Polarization
         Piezoelectricity

"Polarization and the Piezoeffect of Barium Titan-
ate Near the Point of Seigneto-Electric Transition,"
V. L. Ginzburg, Phys Inst imeni P. N. Lebedev, Acad
Sci USSR, 6 pp

"Zhur Eksper i Teoret Fiz" Vol XIX, No 1

Examines problem of polarization and peizoeffect of
barium titanate monocrystals near the point of
Seigneto-electric transition.  Also discusses prob-
lem of dispersion of dielectric constant of barium
titanate near the Curie temperature.  Submitted
7 Jul 48.

                                            30/49T95

PA 42/4975

USSR/Astronomy                                    Mar/Apr 49
    Solar Phenomena
    Radio Waves - Absorption

"The Absorption of Radio Waves in the Solar
Corona,"  V. L. Ginzburg, Phys Inst imeni
P. N. Lebedev, Acad Sci USSR, Radiophys Faculty,
Moscow State U, 13 pp

"Astron Zhur"  Vol XXVI, No 2

Examines various formulas for absorption of
radio waves in ionized gas (ionosphere, solar
corona, interstellar gas).  Gives results
of studies conducted to determine thickness
of solar corona for waves of varying frequencies
in the range 0.6 - 50 meters.
                                    42/4975

USSR/Physics - Piezoelectricity          Aug 45
                Dielectrics

"The Theory of Piezoelectric Phenomena," V. L.
Ginzburg, 36 pp

"Uspekh Fiz Nauk" Vol XXXVIII, No 4

Discusses (1) the theory of piezoelectric
phenomena without considering anisotropy and
potential, (2) the case of phase transitions
close to the critical point, (3) anisotropy of
dielectric properties and the piezo effect in
barium titanate, (4) the properties of Rochelle
salt, and (5) pyroelectrics, piezoelectrics, and
ferromagnetics.

                                    67/49T105

USSR/Physics - Helium II                                      11 Nov 49
                        Low Temperatures

"The Theory of Superfluidity and the Critical Speed
of Helium II," V. L. Ginzburg, Phys Inst imeni
Lebedev, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXIX, No 2

Present theory explains well almost all experimental
facts relative to He II.  However, one very important
phenomenon -- existence of critical speed for super-
fluid flow He II -- cannot be quantitatively explained
by the theory.  This fact seems to indicate necessity
of introducing into the theory more accurate essential

changes in its microscopic part:  the value of the
critical speed and its dependence upon the aperture's
width and temperature.  Submitted 15 Sep 49 by Acad
M. A. Leontovich.

Theory of superconductivity.  V. L. Ginsburg and L. D.
Landau (P. N. Lebedev Phys. Inst., Acad. Sci., U.S.S.R.,
Moscow).  Zhur. Eksptl. Teoret. Fiz. 20, 1064-82(1950).—
In the theory of superconductive transition in the absence
of a magnetic field, a parameter $\psi$ is introduced, formally
analogous to the spontaneous polarization in the theory of
seignettoelectrics and spontaneous magnetization in the
theory of ferromagnetism.  In analogy with the general behavior of the corresponding parameter in the theory of
transitions of the 2nd kind, the $\psi$-function of "superconducting electrons" at thermodynamic equil. becomes zero
above the crit. temp. and is different from zero below it.
This "effective wave-function" is normalized in such a way
that $|\psi|^2$ represents the concn. of superconducting electrons.
Equations are derived for the $\psi$-function and the vector
potential, and are solved for the case of a superconducting
half-space.  The theory permits, in contrast to the existing
phenomenological theory, expression of the surface tension
at the boundary of the normal and superconducting phases
in terms of the crit. magnetic field and the depth of penetration of the field into the superconductor.  That depth
depends on the field strength in strong fields, particularly
in superconductors of small dimensions.  In thin films,
the magnetic perturbation of the supercond. is a transition of the 2nd kind, and becomes a transition of the
1st kind only above a certain crit. thickness.  The external crit. magnetic field increases with decreasing thickness of the superconducting film, whereas the crit. elec.
current decreases with the thickness.          N. Thon

USSR/Radio - Wave Diffraction Astrophysics                              Apr 50

"Diffraction of Solar and Cosmic Radio Waves on the Moon,"  G. G. Getmantsev, V. L.
Ginzburg, Physicotech Inst, Gor'kiy State U, 4 pp

"Zhur Eksper i Teoret Fiz"  Vol XX, No 4

Discusses problem of diffraction of radio waves from the sun and cosmic objects by the
moon from standpoint of possibility of localizing sources of these waves.  Submitted
2 Dec 49.

PA 159T107

PA 171T83

GINZBURG, V. L.

USSR/Physics - Superconductivity            Oct 50
               Helium-II

"Present State of the Theory of Supercon-
ductivity," V. L. Ginzburg

"Uspekhi Fiz Nauk" Vol XLII, No 2, pp 169-219

Headings:  1. History. 2. Basic Experimental
Facts. 3. Old Phenomenological Theory. 4. New
Phenomenological Theory and Basic Relations.
5. Concrete Results of the New Theory. 6. Normal
Current in Superconductors. 7. Normal and
Anomalous Skin Effect in Metals.  To be con-
tinued next issue of this journal.

                                     171T83

GINZBURG, V. L.

USSR/Physics - Superconductors                    Nov 50
            Multimeter II

"Present State of the Theory of Superconductivity,"
V. L. Ginzburg

"Uspekh Fiz Nauk" Vol XLII, No 3, pp 333-361

Concluding article considers normal current in
superconductors, and normal and anomalous skin
effect in metals.  Gives extensive bibliography,
consisting of 104 references both Russian and
foreign.

                                    172T98

GINZBURG V. L.

UBSR/Physics - Radio-Wave Fading                    Aug 51

"Effect of Interelectron Collisions on Absorption
of Radiowaves in F-Layer and in the Solar Corona,"
V. L. Ginzburg, Phys Inst imeni Lebedev, Acad Sci
USSR

"Zhur Tekh Fiz" Vol XXI, No 8, pp 943-947

Discusses problem of detg concn of mols in
F-layer.  Shows that under certain circumstances,
interesting from the standpoint of F-layer and
solar corona investigations, interelectron col-
lisions do not contribute to radio-wave fading.
Submitted 31 Dec 1950.

194T99

USSR/Physics - Superconductivity                    Sep 51

"Behavior of Superconductors in High-Frequency
Field," V. L. Ginzburg, Phys Inst imeni Lebedev,
Acad Sci USSR

"Zhur Eksper i Teoret Fiz" Vol XXI, No 9, pp
979-991

Discusses eqs representing behavior of supercon-
ductors in alternating electromagnetic field.
Obtains expressions of surface impedance in super-
conduct. Treats problems of verification of elec-
tron theory of metals in normal state and heat
conductance of superconductors with account of

USSR/Physics - Superconductivity                    Sep 51
              (Contd)

convective heat transfer. Author thanks Acad L. D.
Landau for advice. Submitted 8 Sep 50.

LC                                                193T93

193T93

Mathematical Reviews
Vol. 14 No. 8
Sept. 1953
Mathematical Physics.

7-13-54

LL

Ginsburg, V. L. and Tamm, I. E. On the theory of spin.
Translated by G. Belkov. National Research Council
of Canada, Ottawa, Tech Translation TT-305, 23 pp.
(1952).
Akad. Nauk SSSR. Zurnal Ekaper. Teoret. Fiz. 17, 227–
237 (1947); these Rev. 9, 553.

GINZBURG, V. L.

Theory of Propagation of Radio Waves in the Ionosphere.  Glavpoligrafizdat, Main Polygraphic Publishing House, 358 pp, 1952.

GINZBURG, V.L.

Introduction of anisotropy into the theory of superconductivity.  Zh.
eksper. teor. Fiz. 23, No.2, 236-8 '52.                              (MLRA 5:9)
(PA 56 no.668:5480 '53)

GINZBURG, V. L.

"Problems of the Theory of Electric Fluctuations,"  Usp. Fiz. nauk 46, No 3, 1952.

MLRA August 1952

Astron/Physics - Radio Hotspots
Cosmic Rays                                               21 Jan 51

"Cosmic Rays as the Source of Galactic Radio Emission (Hot Spots)," V. L. Ginzburg, Phys Inst Imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol LXXVI, No 3, pp 377-380

Discounts thermal radiation of interstellar electrons as source of hot spots, as proposed by A. Unsold in Zn. f. Astrophys., 26, 176, 1949. Considers noteworthy new proposal that subject galactic radio emission is the Bremsstrahlung of relativistic electrons -- i.e., the electron component of cosmic

Astron/Physics - Radio Hot Spots (Contd)              21 Jan 51

-- in interstellar and circumstellar magnetic field as proposed by Alfven and Herlofson ("Phys Rev" 78,916,1950) and Klepepheuer ("Phys Rev" 79, 738, 1950). Submitted 24 Nov 50 by Acad N. A. Leontovich.

GINZBURG, V. L.

USSR/Physics - Superconductivity Theory          Sep 52

"Present Status of Theory of Superconductivity. Part
II: Microscopic Theory," V. L. Ginzburg

"Uspekhi Fiz Nauk" Vol 48, No 1, pp 25-118

Reviews general knowledge on subject, emphasizing
difficulties in creating a general theory. Criti-
cizes hypothesis of spontaneous currents and analyzes
diamagnetic hypothesis and quasimicroscopic approach
to the theory. Gives 136 references.

236T77

USSR/Physics - Superconductivity        21 Mar 52

"Behavior of Superconducting Films in a Magnetic Field," V.L. Ginzburg, Phys Inst imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 83, No 3, pp 385-388

States that the problem of the behavior of superconducting films in a magnetic field possesses first-order significance, but that until recently the theory of supercond seemed not to be in a position to give the correct picture of the behavior of superconductors in fields. Besides the remarks made earlier on this matter (see Ginzburg

227T68

and Landau, "Zhur Eksper i Teoret Fiz" 20, 1064 1950), the author indicates new works (see I.M. Lock, Proc Roy Soc 208, 391, 1951; N.V. Zavaritskiy, "Dok Ak Nauk SSSR" Vol 78, 665, 1951) which he says, are absolutely against the old theory and in qual agreement with facts. Submitted by Acad L.D. Landau 30 Jan 52.

(CA 47 no. 22: 11844 '53)

(PA Scn. 668: 1474 '53)

227T68

231760

USSR/Astronomy - Radio Stars                    11 May 52

"Interstellar Matter and Ionospheric Disturbances
Leading to Flickering of Radio Stars," V. L. Ginz-
burg, Phys Inst imeni Lebedev, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 84, No 2, pp 245-247

Subject was recently analyzed by M. Ryle and
A. Hewish (cf. M. N. Roy Soc, 110, 381, 1950).
Author states he intends to develop subject by
studying screening action of moon, which should
eclipse, at a certain time, the flow of assumed
interstellar particles to the earth, these

                                                231760

particles allegedly being responsible for ioniza-
tion of ionosphere and flickering of radio stars.
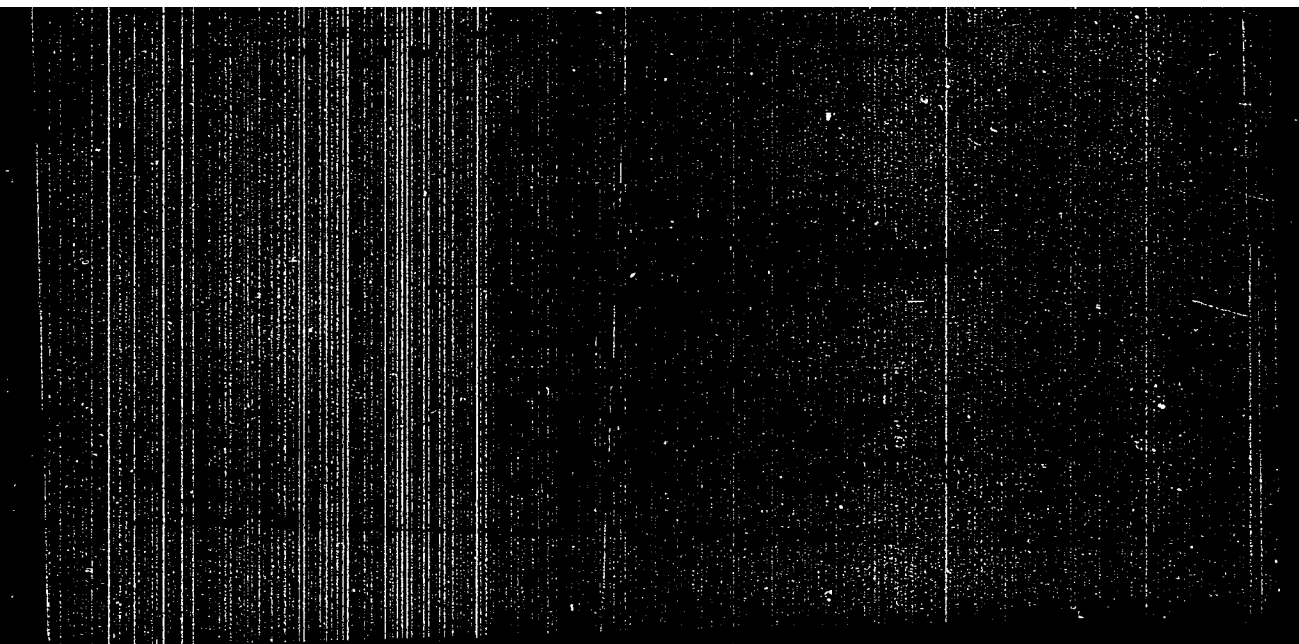Received 28 Jan 52.

231760

GINZBURG, V. L., IA. L. AL'PERT, and E. L. FEINBERG.

Rasprostranenie radiovoln. Moskva, Gostekhizdat, 1953.  883 p.,
illus., tables, diagrs.
Bibliography:  p. 870-883.  /365 references./
Title tr.:  Radio wave propagation.

QC661.A42

SO:  Aeronautical Sciences and Aviation in the Soviet Union, Library of
Congress, 1955.

GINZBURG, V.L.

Relativistic "gyration" and the theory of non-localizing
Yukawa fields. Zhur.eksp. i teor.fiz. 25 no.6:757-759 D '53.
   (Field theory)

(MLRA 7:10)

GINZBURG, V. L.

Nov 53

USSR/Nuclear Physics - Cosmic Rays'
Origin

"The Origin of Cosmic Rays and Radio-Astronomy,"
V. L. Ginzburg

Usp Fiz Nauk, Vol 51, No 3, pp 343-392

A review of current literature, Western and
Soviet, on the subjects: cosmic radio-emanation
and electron component of cosmic rays; movement
of charged particles in interstellar space; the
statistic mechanism governing the acceleration
of particles in interstellar space and in the

271254

shells of stars; theory of the solar origin of
cosmic rays; the theory that supernovae and nova
are the probable sources of cosmic rays. Cites
30 Western and 25 Soviet references: Ya. P.
Terletskiy, G. G. Getmantsev, I. S. Shklovskiy, V. V.
L. A. Artsimovich, I. Ya. Pomeranchuk, V. V.
Vladimirskiy, A. A. Sokolov, I. M. Frank, S. B.
Pikel'ner, I. M. Gordon (DAN USSR, No 3, 1953),
V. I. Gol'danskiy, A. L. Lyubimov, B. V.
Medvedev, A. A. Logunov, L. E. Gurevich, and
S. Z. Belen'kiy.

271254

...acceleration of particles
...shell of the sunspot.
...by Fermi in 1949 for
...in interstellar space is
...in the order of some hours a
...on the sun could reach
...the necessary injection energies
...and ...ons are examined.

W. J. SWIATECKI

The high efficiency for the acceleration of particles
on the sun and in stellar shells of the statisti-
cal mechanism (proposed by Fermi in 1949 for
collisions with turbulences in interstellar space) is
pointed out. In a time of the order of some hours a
particle in a prominence on the sun could reach
relativistic velocities. The necessary injection energies
for protons and electrons are estimated.

W. J. SWIATECKI

U S S R .

523.165 : 537.591.1 : 523.841.11

7076. Supernovae and novae as sources of cosmic and radio radiation. V. L. Ginzburg, Dokl. Akad. Nauk SSSR, 92, No. (1953) In Russian. English translation, U.S. National Sci. Found. NSF-tr-230.

Order of magnitude estimates of the energy flux at visible and radio wavelengths to be expected from bremsstrahlung of relativistic electrons in magnetic fields associated with novae and supernovae. Comparison with data on supernovae of A.D. 369, 1054, 1572.

W. J. SWIATECKI

AMBARTSUMYAN, V.A., akademik, redaktor; GINZBURG, V.L., redaktor; LEYKIN, G.A.,
kandidat fiziko-matematicheskikh nauk, redaktor; MASSEVICH, A.G., kandi-
dat fiziko-matematicheskikh nauk, redaktor; TERLETSKIY, Ya.P., doktor
fiziko-matematicheskikh nauk, redaktor; SHKLOVSKIY, I.S., doktor fiziko-
matematicheskikh nauk, redaktor; FRADKIN, M.I., redaktor; ALEKSEYEVA,
T.V., tekhnicheskiy redaktor.

[Transactions of the Third Conference on Problems of Cosmogony, May
14-15, 1953. Origin of cosmic rays] Trudy...soveshchaniia...14-15
maia 1953 g.; proiskhozhdenie kosmicheskikh luchei. Moskva, Izd-vo
Akademii nauk SSSR, 1954. 119 p.                              (MIRA 8:4)

1. Chlen-korrespondent AN SSSR (for Ginzburg).
   (Cosmic rays)

GINZBURG, V. L.
USSR/Astronomy

Card 1/1

Author      :   Ginzburg, V. L. Memb. Corresp. of Acad. of Sc. USSR

Title       :   Radio-Astronomy

Periodical  :   Priroda, 5, 12-21, May 1954

Abstract    :   The basic problem of radio-astronomy is the study of extraterres-
                trial radiations in the interval of from 7 mm to 30 m. The develop-
                ment of radio-astronomy considerably enlarged the part of the elec-
                tromagnetic wave spectrum used for astronomical investigations. The
                basic value of applying radio methods in astronomy is that the radio
                radiation of the sun and many other cosmic objects is usually emanated
                from zones of very weak illumination in the visible part of the spec-
                trum. The basic objects studied by radio methods are: the sun, our
                galactics as a whole and individual galactic and extragalactic nebulae.
                Radio-methods are also highly effective in the study of meteors and for
                astrophysical investigations. Another interesting radio-astronomical
                task is the radio location of the moon (pick up of radio signals sent
                from the earth and reflected by the moon). Photos.

Institution :   ....

Submitted   :   ....

GINZBURG, V. L.

Card 1/1          Pub. 43 - 5/62

Authors      :   Ginsburg, V. L., and Motulevich, G. P.

Title        :   Optical properties of metals

Periodical   :   Izv. AN SSSR, Ser. fiz. 18/6, 631-634, Nov-Dec 1954

Abstract     :   Report was submitted at the 9-th All-Union Conference on Spectroscopy
                 describing various means for studying and determining the optical proper-
                 ties of metals with the aid of spectroscopy. The parameters most important
                 in determining the characteristics of metals are listed. The instruments
                 normally employed in metal spectroscopy are described. Sixteen references:
                 5 USSR, 3 German, 1 English and 7 USA (1913-1954). Table; graph.

Institution  :   Acad. of Sc., USSR, The P. N. Lebedev Physics Institute

Submitted    :   .....

USSR/Nuclear Physics - Wave equations

Card 1/1          :  Pub 146-17/22

Author            :  Ginzburg, V. L., and Silin, V. P.

Title             :  Some remarks on relativistic wave equations with mass spectrum

Periodical        :  Zhur. eksp. i teor. fiz., 27, 116-118, Jul 1954

Abstract          :  Letter to the editor.  Analyze equations from works by H. Yukawa
                     (Phys. Rev. 91 [1953]).  A. Pais (physica, 19 [1953]) and J. Rayski
                     (Nuovo Cimento, 10, [1953]) and the reasons for the divergences in
                     computations.  11 references, including the 3 mentioned foreign.

Institution       :  Physical Institute imeni Lebedev, Acad. Sci. USSR

Submitted         :  April 19, 1954

GINZBURG, V.L.

V.N.Kessenikh's old and new errors. Zhur.eksp. i teor.fiz. 27
no.4:517-520 O '54.                              (MLRA 7:12)
        (Radio waves) (Kessenikh, V.N.)

GINZBURG, V.L.

Correspondent-Institute

Radio astronomy.  Priroda 43 no.5:12-21 My '54.  (MLRA 7:5)

1. Chlen-korrespondent Akademii nauk SSSR.  (Radio astronomy)

GINZBURG, V. L.

USSR/Physics

Card 1/1

Author      :  Ginzburg, V. L.

Title       :  Again about the application of thermodynamics to electrical
               fluctuation

Periodical  :  Usp. Fiz. Nauk, 52, Ed. 3, 494 -498, March 1954

Abstract    :  In answer to the letter by M. L. Levin (pages 486 -494) regarding
               thermodynamic investigation of electrical fluctuations the author
               accuses the latter of presenting an erroneous and false picture of
               the subject. It is emphasized that the analysis of the problem as
               presented by G. S. Gorelik is by no means complete and strict in all
               view points. On the contrary, there are moments in the limits of
               applicability of the thermodynamic approach which require further
               thorough analysis. A summary of the original Gorelik work is includ-
               ed in the letter. Eight references.

Institution :  .......

Submitted   :

GINZBURG, V.L.

Red displacement in solar and stellar spectra. Dokl. AN SSSR 97
no.4: 617-620 Ag '54.                                      (MLRA 7:9)

1. Chlen-korrespondent Akademii nauk SSSR.  2. Fizicheskiy institut
im. P.N.Lebedeva Akademii nauk SSSR.
        (Sun--Spectra)      (Stars--Spectra)

GINZBURG, V. L.

USSR/ Physics – Optics in metals

Card 1/1          : Pub. 22 – 14/44

Authors           : Ginzburg, V. L., member corresp. of the Acad. of Scs. of the USSR

Title             : About optical properties of metals

Periodical        : Dok. AN SSSR 97/6, 999-1002, Aug 21, 1954

Abstract          : A study of the optical properties of metals is described. The
                    study was intended to create a dependable theory that would
                    explain the major portion of the optical phenomena observed
                    during experiments with metals and to show that the experi-
                    mental data would not deviate from theoretical calculations.
                    Fourteen references (1912-1954).

Institute         : Physical Institute im. P. N. Lebedev of the Acad. of Scs. of the
                    USSR

Submitted         : ....

USSR/ Physics — Cosmic rays

Card 1/1 Pub. 22 – 10/56

Authors : Ginsburg, V. L., Member Correspondent of the Acad. of Scs. of the USSR

Title : On the origin of cosmic rays

Periodical : Dok. An SSSR 99/5, 703-706, Dec 11, 1954

Abstract : The current theories on the origin of cosmic rays are criticized. These theories, shared by Fermi, Morrison and others, are based on the assumption of interstellar acceleration acquired by primary particles due to their collisions in galaxies. The criticism mainly analyses Fermi's expression for an index showing the cosmic ray energy in the spectrum $\gamma = 1 + \frac{1}{\alpha T}$ (where T – the life of a particle in the galaxies, $\alpha$ – the coefficient in the equation of the particle acceleration $\frac{dE}{dt} = \alpha E \approx \frac{u^2}{c^2 \tau} = \frac{u^2 v}{c^2 l} E$) and those discrepancies and contradictions which one finds by substituting some experimental date into the above equation. Thirteen references 7-USSR (1949-1954).

Institution : The Physical Institute im. P. N. Lebedev of the Acad. of Scs. of the USSR

Submitted : ...

"The Nature of Cosmic Radioemission and the Origin of Cosmic Rays,"
paper submitted at the International Astronomical Union Radio Astronomy
Symposium, Jodrell Bank, UK, Aug 1955

A-40421 - II

GINZBURG, V.L.

534.22/.23

THE GENERAL CONNECTION BETWEEN ABSORP-
TION AND DISPERSION, V.L.Ginzburg, in Russian.
Akust. Zh. Vol. 1, No. 1, 1955, ... in application to the
... is discussed first ... and results known
... analogous formulae are derived
... absorption coefficient. Lastly
... the acoustic case from the
electromagnetic are discussed.                    C.R.S.Manders

Physics Inst. im. Lebedev, AS USSR

GINZBURG,V.L.;GRAMENITSKIY, I.N.;KASHLINSKAYA, S.Ye.;LIVSHITS, D.M.

Spectrographic determination of minor impurities in a few raw
materials, semi-finished products and pure metals in copper
and nickel production. Izv.AN SSSR.Ser.fiz.19 no.2:211-216
Mr-Ap '55.                                               (MLRA 9:1)

(Tartu--Spectrum analysis--Congresses)

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Author:  Ginzburg, V. L.

Institution:  None

Title:  On the Macroscopic Theory of Superconductivity

Abstract:  A discussion of many problems in the theory of superconductivity in constant and variable fields.  Certain experimental data on the dependence of the depth of penetration of $\delta$ on the magnetic field and on the magnitude of the surface tension between the superconducting and normal phases are not in agreement with the V. L. Ginzburg and L. D. Landau theory (Zh. eksper. i teoret. fiziki, 1950, 20, 1064). Agreement is possible if it is assumed that the characteristic charge, entering into the theory, is not equal to the charge of the electron and exceeds it in magnitude by several times.  Pippard's experiments, which give for lead a nonmonotonical behavior of the dependence of $\delta$ on the angle between the current and the tetragonal axis of the specimen, contradicts not only the Ginzburg and Landau theory, but also the London theory.  However, the experimental data themselves are still not sufficiently

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Abst Journal:  Referat Zhur - Fizika, No 12, 1956, 34429

Author:  Girzburg, V. L.

Institution:  None

Title:  On the Macroscopic Theory of Superconductivity

Original Periodical:  Zh. eksper. i teoret. fiziki, 1955, 29, No 6, 748-761

Abstract:  reliable.  Because of this, and because of many other considerations, the
author considers the equation suggested by Pippard in lieu of the London equation to
be invalid for the connection between the density of the superconduction current $v_s$
and the vector potential A of the magnetic field.  The section of the article devoted
to the behavior of superconductors in high frequency fields contains a summary of
equations relating the surface impedance, the effective conductance, and the effec-
tive dielectric constant of the metal for the general case (for the linear region,
at small fields) for the case of a superconductor.  Analysis of the numerical data,
obtained from optical investigations, leads the author to the conclusion that the
number of superconducting electrons at $T = 0$ is several times smaller then the num-
ber of conduction electrons at $T > T_k$.  In this manner, a portion of the convection

USSR/Atomic and Molecular Physics - Low Temperature Physics, D-5

Author:  Ginzburg, V. L.

Institution:  None

Title:  On the Macroscopic Theory of Superconductivity

Abstract:  electrons should change over to the bound state in the superconduction
transition.  The last section of the article discusses attempts to estimate the con-
tribution of normal electrons to the surface impedance of the superconductor under
the assumption that the theory of the anomalous skin effect is applicable to them.
The calculations made by the author using a simplified scheme (Zh. eksper. i teoret.
fiziki, 1951, 21, 979) are compared with the calculations made by A. A. Abrikosov
(Dokl. AN SSSR, 1952, 86, 43).  The difference in the results can be substantial only
in the vicinity of $T = 0$ and $T = T_k$.  In conclusion, the need for further measure-
ments of the properties of superconductors in the region of centimeter, millimeter,
and infrared waves is emphasized.

USSR/Physics - Helium II                                                    FD-2835

Card 1/1        Pub. 146 - 22/26

Author      :  Ginzburg, V. L.

Title       :  Surface energy connected with tangential discontinuity of velocity in
               helium II

Periodical  :  Zhur. eksp. i teor. fiz., 29, August 1955, 254-256

Abstract    :  The writer notes that one of the most essential problems in the
               theory of superfluidity is, as already indicated by him (ibid.,
               14, 135, 1944; DAN SSSR, 69, 161, 1949), the question of the char-
               acter of the tangential break in the velocity of the superfluid part
               of helium, $v_s$, at the boundary of the liquid with the wall, the
               presence of such as discontinuity proceeding from the fact that the
               helium atoms stick to the wall (solid body) and simultaneously the
               tangential component $v_s$ near the wall is not equal to zero from the
               macroscopic viewpoint, i.e. even in the immediate neighborhood of the
               wall (L. D. Landau, J. of Phys., 5, 71, 1941). The author thanks
               Academician L. D. Landau and Professor Ye. M. Lifshits. Ten references.

Institution :  Physics Institute im. P. N. Lebedev, Academy of Sciences USSR

Submitted   :  April 21, 1955

PIKEL'NER, S.B.: GINZBURG, V.L.; SHKLOVSKIY, I.S.

Mechanism of particle acceleration in envelopes of novae and
supernovae. Astron. zhur. 32 no.6:50) 513   N-D '55.

(MIRA 9:2)

(Stars, New)

LEVIN,M.L.; GINZBURG,V.L.

Application of thermodynamics to electric fluctuations. Usp.
fiz. nauk 56 no.1:146-148 My '55.                     (MLRA 8:6)
     (Electromagnetic theory) (Thermodynamics)

GINZBURG, V.L.; FEYNBERG, Ye.L.

Igor' Evgen'evich Tamm; on his 60th birthday. Usp.fiz.nauk 56
no.4:469-475  Ag '55.                                        (MLRA 9:1)

(Tamm, Igor' Evgen'evich, 1895- )

GINSBURG, V. L.

USSR/Physics - Metallo-optics

Card 1/? : Pub. 118 - 1/3

Authors : Ginsburg, V. L., and Motulevich, G. P.

Title : Optical properties of metals

Periodical : Usp. fiz. nauk 55/4, 469-535, Apr 1955

Abstract : A theoretical experimental analysis of the optical characteristics of metals is presented. The effective indexes of refraction - $n_{eff}(w)$, and absorption - $\chi_{eff}(w)$ - of light by metals are discussed. The methods of their determination are described, as well as the determination of the A(w), a quantity of light absorbed by metal when the light falls normally upon the metal surface; this, $A(w)=1-r(w)$, where the $r(w)$ is a coefficient of light reflection by a metal. However, only the simple cases are considered in which light, of the infra-red spectral region frequencies, is reflected by an isotropic surface of non-magnetic metals, i.e., cases in which the quantum absorption does not take place. Sixty-five references: 16 USSR, 9 German, 9 British, 24 USA and 7 French (1906-1955). Tables; diagrams; graphs.

USSR/Physics - Electron emission

Card 1/1        Pub. 22 - 11/54

Authors    : Ginzburg, V. L., Mem, Corresp. Acad. of Scs.,USSR, and Shabanskiy, V. P.

Title      : Kinetic Temperature of electrons in metals and anomalous electron emission

Periodical : Dok. AN SSSR 100/3, 445-448, Jan. 21, 1955

Abstract   : A theoretical analysis of the kinetic temperature of electrons in metals
is presented. Cases are considered in which the fo (symmetric function
of distribution) is not equal to the $f_F(t)$ (the Fermi function of
distribution), but, due to an electron collision, at certain temperatures,
equals $f_F(\Theta)$. $f_0$ for $f_F(\Theta)$, where $\Theta$ and $T$ are corresponding tem-
peratures and $\Theta > T$. Such a fact does not change much the electric con-
ductivity of a metal, but the electron emission is greatly affected by
it, as one can see from $i = A\Theta^2 e^{-x/K\Theta}$, x being the output work. Eight
references: 7 USSR and 1 English (1937-1954).

Institution : Acad. of Scs.,USSR, P. N. Lebedev Physical Institute

Submitted  : ..........

GINZBURG, V. L.

USSR/Physics - Ionosphere

Card    1/1        Pub. 22 - 10/60

Authors      :    Gershman, B. N. and Ginzburg, V. L., Memb. Corresp. of the Acad.
                  of Sci. of the USSR
Title        :    About the mechanism of the formation of ionospheric heterogeneity

Periodical   :    Dok. AN SSSR  100/4, 647-650, Feb 1, 1955

Abstract     :    Convective instability as a cause of the heterogeneity of the ionosphere
                  is discussed. Thermal conductivity, viscosity of the ionosphere and
                  magnetic field effect are considered as possible factors in the formation
                  of such an instability. Fifteen references: 5 USSR and 10 British
                  (1930-1954).

Institution  :    Physico-Technical Research Institute of the Gorkiy State University

Submitted    :    ............

GINZBURG, V.L.

Light scattering in the neighborhood of second-order phase
transition points.   Dokl. AN SSSR 105 no.2:240-243 '55. (MLRA 9:3)

1. Chlen-korrespondent AN SSSR;  2. Fizicheskiy institut imeni
P.N. Lebedeva Akademii nauk SSSR.

(Light--Scattering)

GINSBURG, V. L.,  (Moscow)

"On superconducting ferromagnetics," a paper submitted at the
International Conference on Physics of Magnetic Phenomena, Sverdlovsk,
23-31 May 56.

GINZBERG, V. L., SHKLOVSKIY, I. S.   and   FIKEL'NER, S. B.


"Radio Radiation of Discrete Sources," a report delivered at the Symposium on Radioastronomy held at the Jodell-Bank Experimental Radioastronomical Station, Manchester University, Englan, is summarized in the account of this symposium in an article by V. V. VITKEVICH in Vest. Ak. Nauk SSSR for January 1956.

Sum. 900, 26 Apr 56

GINZBURG, V.L., redaktor; LEYKIN, O.A., kandidat fiz.-mat. nauk, redaktor; CHIKHACHEV, B.M., kandidat fiz.-mat. nauk, redaktor; SHKLOVSKIY, doktor fiz.-mat. nauk; FRADKIN, M.I., redaktor; MAKUNI, Ye. V., tekhnicheskiy redaktor.

[Proceedings of the Fifth Conference on Problems of Cosmogony; radioastronomy] Trudy piatogo soveshchaniia po voprosam kosmogonii; radioastronomiia. Moskva, 1956, Izd. Akademii nauk SSSR. 567 p.

(MLRA 9:5)

1.Soveshchanie po voprosam kosmogonii. 5th, Moscow 1955.2.Chlen - korrespondent AN SSSR (for Ginzburg).
                (Radio astronomy)

Category : USSR/Radiophysics - Application of radiophysical methods                I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1987

Author   : Ginzburg, V.L., Pisareva, V.V.
Title    : On the Nature of the Fluctuations of the Intensity of Solar Radio Waves and
           of the Irregularities in the Solar Corona.

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 229-241,
           diskus. 241

Abstract : A theoretical evaluation is made of the mechanism of scattering of radio
           waves by the irregularities of the solar corona. The fluctuations in the
           intensity of the received radio waves, caused by diffraction, may be of two
           types: diffraction in the corona may make the field of the radio waves in-
           homogeneous in the coordinate system that is tied to the sun, and the rotation
           of the sun with the motion of the earth will cause fluctuations in the in-
           tensity to be observed on the earth; the diffraction pattern changes on the
           sun itself owing to the motion of corona irregularities. The following sim-
           plified situation is considered: diffraction occurs in the corona at the edge
           of the thin non-transparent semi-infinite screen. The resultant diffraction
           pattern (with a characteristic dimension $x_0 = 7000$ km for $\lambda = 1.5$ m ) will
           move relative to an observer on earth, so that at points located at various
           longitudes a shift will be observed in the patterns (with time), equal to

Card     : 1/2

GINZBURG, V. L.

Category : USSR/Radiophysics - Application of radiophysical methods     I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2000

Author   : Ginzburg, V.L.
Title    : Cosmic Radio Waves and Cosmic Rays

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 438-456 ,
           diskus. 457-467

Abstract : New data are reported concerning the nature of cosmic radio waves, and new
           materials are cited on a theory of the origin of cosmic rays, which is re-
           lated to radio astronomy (identification of the fundamental part of cosmic
           radio radiation with magnetic bremsstrahlung of electrons of cosmic rays).
           An argument in favor of such a theory is  the "radio coronas" observed by
           Baldwin (Ref. Zhur. Fiz. 1956, 23594) in the M31 nebula, confirming the gal-
           actic origin of the isotropic component of the radio waves.  The hypothesis
           that novas and supernovas are sources of cosmic rays is confirmed by the
           radio waves from the Eagle Nova of 1918, the similarity between the subsystem
           formed by sources of cosmic rays and the subsystem of the novas and supernovas,
           etc.  The latest data on cosmic rays (high-latitude cutoff, character of inter-
           actions between protons and nuclei, relationships between beams of various
           groups of nuclei, etc.) also fit completely into the picture proposed.

Card      : 1/2

Category : USSR/Radiophysics - Application of radiophysical methods

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 2000

I-12

During the discussions, I.M. Gordon deduced from energy considerations that the statistical mechanism, effective in the shells of stars, cannot be employed to explain the acceleration of electrons. The electrons are accelerated not in the shells, but in the stars themselves (particularly, in the supernovas themselves).

The balanced spectrum of the electrons in the galaxy, according to a comment made by M.I. Fradkin during the discussion, becomes steeper in the higher-energy region as a result of the radiation in the magnetic fields, and becomes less sloping in the lower- energy region as the result of the ionization losses. Accordingly, the radiation spectrum produced by these electrons will be less steep in the region of the longer waves (hundreds of meters), and steeper in the shorter-wave interval. Bibliography, 56 titles.

Card     : 2/2

Category : USSR/Radiophysics - Application of radiophysical methods                    I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2004

Author   : Ginzburg, V.L.
Title    : On the Mechanism of the Formation of Ionospheric Irregularities, Resulting
           in the Flicker of "Radio Stars."

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 512-519

Abstract : Fluctuations in the intensity and in the angle at which radio waves from
           discrete sources arrive at the earth (called the flicker of "radio stars")
           are due to ionospheric irregularities. Three mechanisms by which irregular-
           ities are formed are considered: 1) the incidence of interstellar matter,
           attracted by the sun, on the ionosphere; 2) convective instability, occuring
           in regions with a negative temperature gradient; 3) turbulization, due to
           ionospheric winds. Although the first mechanism explains the observed daily
           course of the flickering, there are many observation data to refute this
           hypothesis (flicker due to solar eclipses, relationship to ionospheric winds,
           etc.). The convective hypothesis can be assumed acceptable, if one can es-
           tablish the existence of regions with negative temperature gradients in the
           ionosphere. The proposed turbulization of the ionospheric streams encounters
           many difficulties (the small Reynolds numbers), although an argument in its
           favor is the observed correlation between the flicker and the ionospheric

Card     : 1/2

Category : USSR/Radiophysics - Application of radiophysical methods

Abs.Jour : Ref Zhur - Fizika, No 1, 1957 No 2004

I-12

winds, and the fact that ionospheric winds exist.  In view of the lack of agreement between the first hypothesis and experiment, two alternatives remain, the choice of which depends on results of further observations on the ionosphere, on the correlation between the flicker and the ionospheric winds, etc.  Bibliography, 12 titles.

Card      : 2/2

*G.INZ BURG  V.*

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

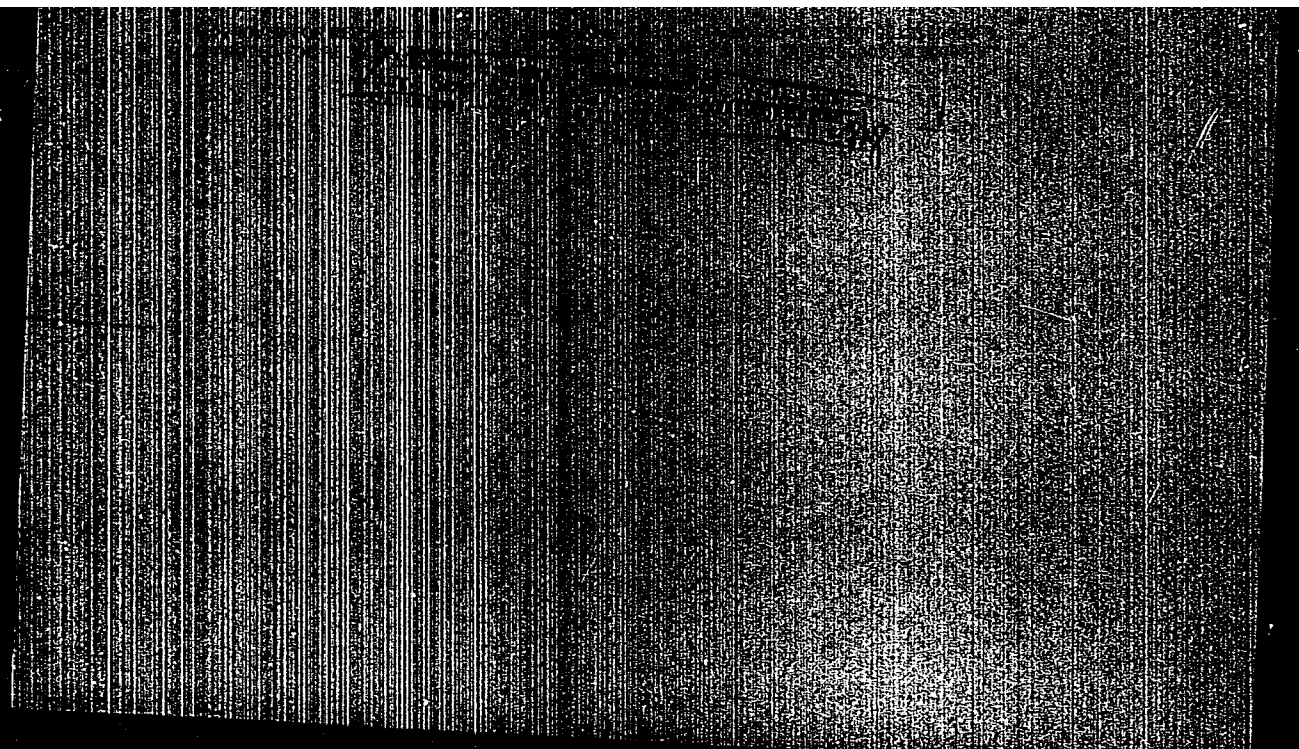Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 2010

Author   : Ginzburg, V.L.
Title    : Address at the Closing Session

Orig Pub : Tr. 5-go soveshchaniya po vopr. kosmogonii. 1955, M., AN SSSR, 1956, 562-564

Abstract : Formulation of many urgent problems that must be solved by radio astronomy,
           including the determination of the spectrum of the radio waves from the
           galaxy and from discrete sources, search for the polarization of the radi-
           ation from cosmic sources, the study of the sporadic radiation from the sun,
           intergalactic monochromatic radiation of hydrogen, etc.  It is indicated that
           it is necessary to develop radar methods for the investigation of meteors,
           the moon, the planets, and the sun, and that it is necessary to establish
           a close collaboration between radio astronomy and optical astronomy and the
           physics of cosmic rays.

Card       : 1/1

Category : USSR/Theoretical Physics - Theory of Relativity and Unified Field   B-2
Theory

Abs Jour : Ref Zhur - Fizika, No 2, 1957, No 2910

Author   : Ginzburg, V.L.
Title    : Experimental Verification of the General Relativity Theory and
Artificial Earth's Satellites.

Orig Pub : Priroda, 1956, No 9, 30-39

Abstract : No abstract

Card     : 1/1

USSR/Physics of the Atmosphere – Upper Layers of the Atmosphere.   Ionosphere   M-6

Abst Journal:   Referat Zhur – Fizika, No 12, 1956, 36222

Author:   Gershman, B. N., Ginzburg, V. L.

Institution:   None

Title:   On the Effect of the Magnetic Field on the Convective Instability
in the Atmospheres of Stars and in the Earth's Ionosphere

Original
Periodical:   Uch. zap. Gor'kovsk. un-ta, 1956, 30, 3-29

Abstract:   Analysis of the problem of the effect of the magnetic field on the
convective instability under conditions when the electric conduc-
tivity is anisotropic (exactly what occurs in the ionosphere and
under certain astrophysical conditions). It is shown that in the
earth's ionosphere, by virtue of the presence of a considerable
number of molecules, the magnetic field practically hardly changes
the Rayleigh critical number. At the same time, in a purely
electron-ion plasma, the effect of the magnetic field may be con-
siderable, although it changes if the anisotropies of the electric
and thermal conductivities are taken into account.

Card 1/1

Cat: gory : USSR/Nuclear Physics - Cosmic rays
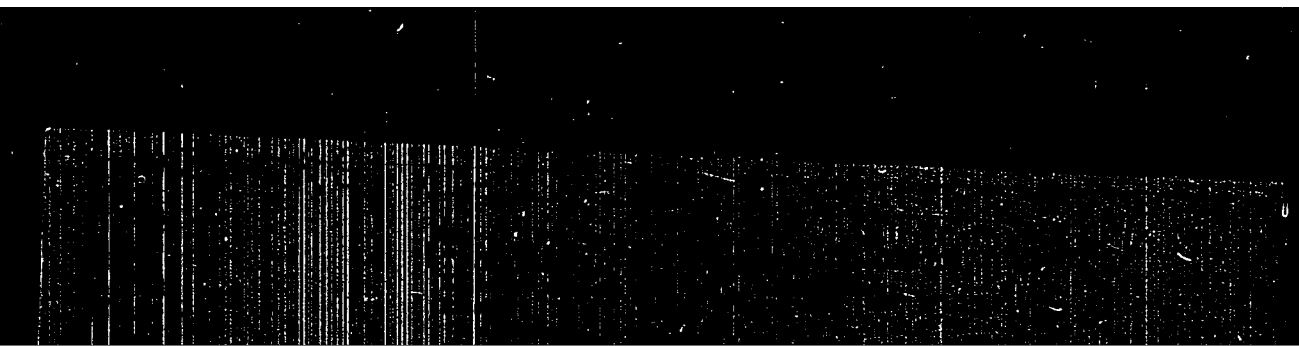
Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 615

Author    : Ginzburg, V.L.
Inst      : Phys. Inst., Acad. of Sciences USSR
Title     : On the Origin of Cosmic Rays.

Abstract : Certain new investigations are evaluated from the point of view of a
           theory, based on radio-astronomical data, developed by the author and
           others concerning the origin of cosmic rays in supernova and nova stars.
           In particular, the latest radio-astronomical investigations on the quasi-
           spherical distribution of galactic radio waves indicate a similar distribution
           of cosmic rays in the galaxy; the detection of radio waves from nova stars
           donfirms indirectly the previous assumption that cosmic rays are generated not
           only in supernovas, but also in novas; analysis of the distribution of the
           cosmic radio waves over the heavens has shown that the sources of the primary
           cosmic rays occupy a region shaped like strongly flattened spheroid with a
           radius of almost the same size as the distance between the sun and the center
           of the galaxy.  The recently established fact that the high-latitude cutoff
           in the spectrum of protons and multiple-charge nuclei occurs at the  same

Card      : 1/2

Category : USSR/Atomic and Molecular Physics - Low-temperature Physics          D-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3528

Author    : Ginzburg, V.L.
Inst      : Physics Institute, Academy of Sciences USSR
Title     : Certain Remarks Concerning the Macroscopic Theory of Superconductivity.

Orig Pub : Zh. eksperim .i teor. fiziki, 1956, 30, No 3, 593-595

Abstract : The author and Landau (Zh. eksperim. i teor. fiziki, 1950, 20, 1064)
           developed a macroscopic theory of superconductivity for the case $T_K$ -T
           $\ll T_K$ ($T_K$ is the critical temperature). The starting point of the
           theory was an expression for the free energy: $F_{s0} = F_{n0} + \propto (T)|\Psi|^2$
           $+ 1/2 \beta |\Psi|^4$, where $F_{n0}$ is the density of the free energy in the nor-
           mal state, $|\Psi|^2$ is the concentration of the "superconducting electrons,"
           and $\propto$ and $\beta$ are coefficients. It is indicated that a macroscopic theory,
           correct for all temperatures, can be derived without changing the expres-
           sion given for $F_{s0}$. However, $\propto$ and $\beta$ must now be considered as functions.
           Expressions are given for $\propto (T/T_K)$ and $\beta (T/T_K)$. All the equations
           obtained in the work by the author and by Landau and in subsequent in-
           vestigations remain in force in their previous form, so that the tem-
           perature dependence of $\propto$ and $\beta$ does not play any role in the calculations.
Card      : 1/2

Category : USSR/Atomic and Molecular Physics - Low-temperature Physics          D-5

Abs Jour : Ref Zhur - Fizika, No 2, 1957 No 3528

The values of the surface energy at the boundary between the normal and the superconducting phases and the dependence of the depth of penetration $\delta$ on the intensity of the magnetic field H, obtained on the basis of the proposed theory, are compared with Bardin's results, in which the expression for $F_{s0}$, considered for a two-liquid model of a superconductor, was used. Different results are obtained for the dependence $\delta$ (H), and this may perhaps be used to choose between the expressions for the free energy on the basis of the experimental data.

Card      : 2/2

Category : USSR/Atomic and Molecular Physics - Low Temperature Physics D-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6544

Author    : Ginzburg, V.L.
Inst      : Physics Institute, Academy of Sciences, USSR
Title     : Concerning the Blatt, Butler and Shafroth Papers on Super-
            fluidity and Superconductivity Theory.

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 6, 1151-1152

Abstract : Many critical remarks are made concerning the papers by Blatt,
           Butler and Shafroth (Referat Zhur Fizika, 1956, 28399, 28400,
           28422, 31373, 31449, 34415). It is noted that the problem of
           superfluidity and superconductivity of an ideal Bose gas was
           already considered earlier, (Ginzburg, V.L., Uspekhi fiz. nauk,
           1952, 46, 25; Referat Zhur Fizika, 1956, 10130), and has only
           methodological significance.
               It is furthermore indicated that the statement contained in
           the above papers on the finiteness of the correlation radius
           for the momenta of a pair of particles in all real systems,
           unlike the ideal Bose gas, appears to the author of this

Card      : 1/3

Category : USSR/Atomic and Molecular Physics - Low Temperature          D-5
Physics

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6344

article to be incorrect.  All the argumentation in favor
of the existence of a finite correlation radius reduces in
these papers to a remark that for a very large system there
is no probability of the existence of a correlation between
particles located at different ends of the system.  However,
for example, for any single crystal there is a correlation
in the position of the particles outside the dependence on its
dimensions; the same pertains to the "remote order" in fer-
romagnetics, etc.  The author shows that a finite correlation
radius occurs when the density matrix does not vanish at in-
finity, and that this takes place also for an ideal Bose gas
and, as follows from many considerations, for He II also for
electrons and superconductors (Landau, L.D., Lifshitz, Ye.M.
Statistical Physics, Section 129; Ginzburg, V.L., Landau, L.D.,
Zh. eksperim, i teor, fiziki, 1950, 20, 1064),  In the case
when the density matrix does not vanish at infinity, its
Fourier component contains a $\delta$-like term.  It follows from the

Card       : 2/3

Category : USSR/Atomic and Molecular Physics - Low Temperature          I-5
           Physics

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6344

works by N.N. Bogoliubov and D.N. Zubarev that for a non-
ideal Bose gas, in the case of weak interaction, the Fourier
component of the density matrix contains a $\delta$-like term.  Also
noted is the fact that the ideas concerning the unbalanced
character of superfluidity of He II, cited in one of the
above works (Referat Zhur Fizika, 1956, 20400), is unfounded.

Card      : 3/3

SUBJECT      USSR / PHYSICS              CARD 1 / 2           PA   1569
AUTHOR       GINSBURG. V L
TITLE        On Ferromagnetic Supraconductors
PERIODICAL   Zurn eksp i teor fis 31, fasc 2  202 210 (1956)
             Issued: 10 / 1956

This work aims at proving that it is practically almost impossible to determine the supraconductivity of any ferromagnetics (by means of usual methods) A massive ferromagneticum can, if conditions are normal, pass into the supra conductive state only in exceptional cases, namely only if its spontaneous magnetization (at $T = 0$) is very low ($B_0 = 4\pi M_0 \lesssim 10^3$) and its critical field strength is very high ($\gtrsim 10^3$). Nevertheless it is possible to examine the supraconductivity of ferromagnetica in exceptional cases (in thin films and possibly in massive samples with a high coercitive power) This is naturally the case only if such a supraconductivity is at all possible, if a certain masking magnetic effect (connected with the spontaneous magnetization $M_0$) is lacking

In the supraconductive state and in the case of a lacking exterior field ($H_a = 0$), $B = 0$ is true in the depth of homogeneous magnetized supraconductive ferromagneticum, whereas in a normal state $H_i = 0$, $B_i = B_0 = 4\pi M_0$ would be

true In the supraconductive state a supraconduction current $j_c$, which screens off the field of the "molecular" surface current $i_{mol}$ in the depth of the metal,

Zurn eksp i teor fis 31,fasc 2 202-210 (1956)  CARD  2 / 2        PA - 1569

flows in a thin layer near the metal surface, even in the case of a lacking exterior field

Next, the destruction of the supraconductivity of massive ferromagnetica in a magnetic field is discussed (Here "massive" refers to samples the normal measurements of which are considerably higher than ... 0^-5 cm) Among others, a homogeneously magnetized cylindrical sample, the magnetization $M$ of which is opposed to the exterior field (such a state is metastable), is investigated However, already in the case of massive samples the phenomenological theory of supraconduction (which is valid for any field and was developed by V L GINSBURG and L D LANDAU Zurn eksp i teor fis 20 1064 (1950) must be extended also to ferromagnetica

INSTITUTION: Physical Institute "P N LEBEDEV" of the Academy of Science in the USSR

SUBJECT        USSR / PHYSICS                    CARD  1 / 2           PA - 1665
AUTHOR        GINSBURG,V.L., FRADKIN,M.I.
TITLE          On the Composition of Primary Cosmic Radiation.
PERIODICAL     Zurn.eksp.i teor.fis,31,fasc.3,523-525 (1956)
               Issued:  12 / 1956

This work investigates the problem of the chemical composition of primary cosmic radiation within the framework of the theory developed by V.I.GINZBURG (several works by whom are cited). The concentration $N_i(r,t)$ of the cosmic particles of the type i can be determined from the following system of equations:

$$\partial N_i / \partial t = \nabla (D_i \nabla N_i) - N_i/T_i + \sum_{j > i} P_{ij} N_j/T_j + q_i$$

Here $q_i(\vec{r},t)$ denotes the quantity of particles of the type i per volume unit, and time unit, which are emitted into the interstellar space by the sources of cosmic radiation (novae and supernovae), $D_i(\vec{r})$ - the diffusion coefficient of cosmic radiation in interstellar space, $T_i(\vec{r})$ the life of the particles of the type i up to their spallation on the occasion of collisions with the atomic nuclei of the interstellar medium (i.e. mainly with protons), $P_{ij}$ - the quantity of particles of the type i created on the occasion of the spallation of a particle of the type j. In the case of nuclei collisions nearly in all cases will lead to the creation of nuclei of a different type, on which occasion the energy per nucleon is the same in the case of both primary and secondary nuclei. The above equation is suited for the investigation of protons of sufficiently high

energy but not of electrons.

In the case of an even distribution of the sources of cosmic radiation, diffusion is not essential and one finds  $N_i = \sum P_{ij} N_j T_i/T_j + T_i q_j$ ;

$N_M/N_H = (T_M/T_H) (q_M/q_H + P_{MH}) = 3,2$ ; $q_M/q_H = 1,33$

$N_L/N_H = (T_L/T_H) [P_{LH} + P_{LM} (q_M/q_H + P_{MH})] = 1,8$ ; $N_L/N_M = 0,56$

Here $N_p, N_\alpha, N_L, N_M, N_H$ denote the concentrations of the protons, $\alpha$ - particles; of Li-,Be-,B-nuclei; of the nuclei of C,N,O,F, and the nuclei with $Z \geqslant 10$. Here $P_{LM} = P_{LH} = 0,23$ and $P_{MH} = 0,27$ as well as $q_L = 0$ are assumed. At equilibrium it follows from these equations that $q_p/q_H = N_p T_H/N_H T_p \sim 30$. Thus it must be assumed that either the sources contain no hydrogen at all or that the acceleration of the protons is considerably below that of the particles.  At $N_L/N_M$ the above system of equations is in direct contradiction to experimental data. The solutions for $N_H, N_M$, and $N_L$ are explicitly given for a punctiform source. In consideration of diffusion as well as of the character of the distribution of the sources of cosmic radiation the problem of the composition of cosmic radiation is solved within the framework of the theory investigated here. However, insufficient knowledge of various parameters (particularly of $N_L/N_M$) requires further investigations.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the USSR

SUBJECT        USSR / PHYSICS              CARD  1 / 2        PA - 1666
AUTHOR         GINSBURG, V.L.
TITLE          On the Experimental Determination of the Instability of the
               Normal Phase in Supraconductors.
PERIODICAL     Zurn.eksp.i teor.fis,31,fasc.3,541-543 (1956)
               Issued:  12 / 1956

The utmost undercooling observed by T.E.FABER,Proc.Roy.Soc.,231,353 (1955) is
probably characteristic of an ideal metal which cannot be undercooled up to
field strengths below a certain value $H_{k_1}$. In this connection it is true for
Al that $H_{K_1} = (0,035 - 0,04).H_{KM}$. This result follows, according to the
author's opinion, immediately from the theory on supraconductivity developed
by LANDAU and GINSBURG, for the normal phase of the supraconductor remains un-
stable at certain conditions with respect to the production of intermediate
layers of the normal phase. These intermediate layers occur whenever the normal
phase finds itself in a magnetic field satisfying the following conditions:

$$H = \varkappa H_{KM} / \sqrt{2}(n+1/2), \quad n=0,1,2,3\ldots; \quad \varkappa = (\sqrt{2}e/\hbar c)H_{KM}\delta_0^2 = 2,16.10^7 H_{KM} \delta_0^2$$

Here $\delta_0$ denotes the depth of penetration of the weak magnetic field into the
supraconductor. The magnetic field can, in the normal phase, be diminished only
down to the value $H_{K_1} = \sqrt{2} \varkappa H_{KM}$. At $H > H_{K_1}$ the formation of the germs of the
superconducting phase is selected with the occurrence of a surface energy, and
thus the normal phase is metastable within the domain $H_{K_1} < H < H_{KM}$. At $H=H_{K_1}$,

however, the normal phase·is unstable and supraconductive transition is com-
pulsory. In the case of aluminium the theory is in full agreement with the ex-
periment also with respect to surface energy. In the case of Sn the limit $H_{K1}$
is not obtained.

In the case of metals with low values of $\mathcal{K}$ instability of the normal phase can
occur only with undercooling. However, with $\mathcal{K} \geqslant \mathcal{K}_K = 1/\sqrt{2}$ the normal phase
is unstable already at $H = H_{K1} \geqslant H_{KM}$, and therefore the supraconductors with
$\mathcal{K} > 1/\sqrt{2}$ must behave anomalously. According to the author's opinion this
effect occurs particularly with certain alloysSn + In (which were investi-
gated by other authors). At a concentration of indium of less than ~ 2.5%
these alloys behave like ideal supraconductors, whereupon they change their
properties abruptly.  As to the reduction of the concentration $n_s = mc^2/4\pi e^2 \delta_o^2$
with increasing concentration $N_i$ of the admixtures, the explanation of this
fact is beyond the scope of the phenomenological theory. However, if the exist-
ing qualitative notions concerning the nature of supraconductivity are taken
as a basis, the reduction of $n_s$ in the case of an increasing $N_i$ appears quite
natural.

INSTITUTION: Physical Institute "P.N.LEBEDEV" of the Academy of Science in the
             USSR

USSR/Nuclear Physics                                                  C-7

Abs Jour    :  Referat Zhur - Fizika, No 5, 1957, 11267

Author      :  Ginzburg, V.L., Fradkin, M.I.

Inst        :  Physics Institute, Academy of Sciences, USSR

Title       :  On the Composition of Primary Cosmic Rays.

Orig Pub    :  Actron. zh., 1956, 33, No 4, 579-587

Abstract    :  The authors consider the problem of the chemical composi-
               tion of the primary rays at the earth.  It is shown that
               if one takes into account the diffusion of cosmic parti-
               cles in the interstellar matter, the available experimen-
               tal data on the composition of cosmic rays can be recon-
               ciled with the concepts of the generation of these rays
               in the shells of supernova and nova stars.

Card 1/1

GINZBURG, V.L.

Experimental verification of the general theory of relativity and the
artificial earth satelites. Priroda 45 no:9:30-39  S '56.  (MIRA 9:10)

1.Chlen-korrespondent Akademii nauk SSSR.
(Space stations) (Relativity (Physics))

I-3

Category : USSR/Radiophysics - Statistical phenomena in radiophysics

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 1793

Author   : Levin, M.L., Ginzburg, V.L.
Title    : On the Application of Thermodynamics to Electrical Fluctuations

Orig Pub : Uspekhi fiz. nauk, 1956, 56, No 1, 146-148

Abstract : Last articles of a discussion (Referat. Zh. Fizika, 1954, 13 431, 13 432).
           M.L. Levin discusses in his article the example cited by V.L. Ginzburg and
           representing, in Levin's opinion, the only physical argumentation of the
           previous answer by Ginzburg (Referat. Zh. Fizika, 1954, 13432): a thin (com-
           pared with the thickness of the skin layer) conductor at the temperature of
           $0.1^\circ$K, for which the classical frequency region lies below $10^{10}$ cycles.
           Levin indicates, that, since the thickness of the skin layer $\delta$ at such tem-
           peratures is less than the mean free path $\underline{l}$ at such temperatures even for
           meter waves, it makes no sense to speak of the conductivity $\sigma$ of a thin con-
           ductor. This is why Levin considers that this example by Ginzburg is un-
           successful and does not refute his earlier statements.
               Ginzburg emphasized in his article that the basic statement contained in
           Levin's earlier articles reduces to the fact that "in the quantum frequency
           region one cannot assume the resistance to be independent of the frequency,
           even if the skin effect is not taken into account". Contradicting this,

Card     : 1/2

Category : USSR/Radiophysics - Statistical phenomena in radiophsyics

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1793

I-3

Ginzburg gives the following considerations. The quantum region corresponds to the condition $\hbar\omega \geqslant kT$. Therefore, choosing the temperature T sufficiently low, one can make the quantum region include such low frequencies $\omega$ at which the variation of R with $\omega$ is sufficiently small. Furthermore, Ginzburg indicates that Levin in his work (Referat. Zh. Fizika, 1954, 13431) did not take this effect into account, and this is why Ginzburg (Referat. Zh. Fizika, 1954, 13432) also disregarded this effect. It is Ginzburg's opinion that the allowance for the skin effect cannot change his conclusions that it is possible to assume the resistance to be independent of frequency, with sufficient accuracy, in the quantum region.

The editor's comment states that by publishing these articles the editorial staff of "Uspekhi fiz. nauk" considers the discussion on the matter of the application of thermodynamics to electric fluctuations closed.

Card     : 2/2

USSR/Theoretical Physics - Theory of Relatively and Unified Field Theory          B-2

Abst Journal  :  Referat Zhur - Fizika,  No 12,  1956,  33712

Author  :  Ginzburg, V. L.

Institution  :  None

Title  :  Experimental Verification of the General Theory of Relativity

Original
Periodical  :  Uspekhi Fiz. Nauk,  1956,  59,  No 1,  11-49

Abstract  :  Expanded treatment of a lecture delivered at the Einstein session of
Division of the Physicomathematical Sciences, Academy of Sciences USSR,
on 30 November 1955.  Contents:  Introduction;  1. Motion of perihelia
of planets and of their satellites;  2. Gravitational shift of spectral
lines;  3. Deflection of light rays passing near the sun;  4. Signifi-
cance of Einstein's general relativity theory in physics and astronomy;
Conclusion.  62 references.

Card 1/1

SUBJECT      USSR / PHYSICS              CARD  1 / 2          PA - 1427
AUTHOR       GINZBURG,V.L.
TITLE        On the Nonspherical Intensity Fluctuations of Radio Waves in
             Galaxies.
PERIODICAL   Dokl.Akad.Nauk,109, fasc. 1, 61-63 (1956)
             Issued:  9 / 1956   reviewed:  10 / 1956

At present it is assumed that the intensity fluctuations (flickering) of the dis-
crete sources of constant cosmic wave radiation are due exclusively to the ion
sphere of the earth, for this radiation requires many days already in order to
pass through the irradiating galaxy itself (three years of crabb nebula). The
author considers the existence of radio stars as most improbable, for such a
hypothetical radio star would have to have a radiation capacity that is at least
from $10^7$ to $10^8$ greater than that of the sun. Here the average level of radi-
ation is concerned which is approximately constant with respect to time.
The data serving as a basis for the work by J.S.KRAUS et al. Nature, $\underline{176}$, 304
(1955) can by no means serve as a proof of the assumption that the character of
the fluctuations is not determined by the ionosphere. If an exact proof of the
existence of nonionospheric fluctuations of discrete sources were to be proved,
the following possibilities for an explanation might be considered: Such fluctu-
ations need not necessarily be ascribed to the source but might be due to the
propagation of radio waves in the interstellar and interplanetary medium on the
way from the source to the earth. It might be a case of diffraction on a phase
screen similar to diffraction on the inhomogeneities of the ionosphere. The dif-

GINZBURG, V.L

The macroscopic theory developed by V.L.GINSBURG and L.D.LANDAU (Žurn.eksp.i teor.
fis,20, 1064 (1950)) is based upon the equations

$$\frac{1}{2m} \left( -i\hbar\nabla - \frac{e}{c}\vec{A} \right)^2 \Psi + \partial F_{so}/\partial \Psi = 0$$

$$\Delta\vec{A} = -\frac{4\pi}{c}\vec{j}_s \ , \ \text{div} \ \vec{A} = 0, \ \vec{j}_s = \frac{ie\hbar}{2m}(\Psi^*\nabla\Psi - \Psi\nabla\Psi^*) - \frac{e^2}{mc}\Psi^*\Psi\vec{A}$$

Here $|\Psi|^2$ denotes the concentration of the "supraconductive electrons", $\vec{A}$ - the
vector potential, and $F_{so}$ $(|\Psi|^2)$ - the density of the free energy in the supracon-
ductive state and in the case of a lacking field.

This theory is to be generalized for the domain of all temperatures $0 \leqslant T \leqslant T_k$.
J.BARDEEN, Phys.Rev.94, 554(1954) and V.L. GINSBURG suggested the following ex-
pressions for $F_{so}$:

$$F_{so}^{(d)} = F_{no}(t) + (H_o^2 / 8\pi) \left\{ 2t^2(1 - \sqrt{1 - |\chi|^2}) - |\chi|^2 \right\} \quad \text{and}$$

$$F_{so}^{(a)} = F_{no}(t) + (H_o^2 / 8\pi) \left\{ 2\frac{t^2 - 1}{1 + t^2} |\chi|^2 + \frac{1}{(1 + t^2)^2} |\chi|^2 \right\} \quad \text{respectively.}$$

GINZBURG, V. L., VERNOV, S. N., KURNOSOVA, L. V., RAZORENOV, L. A., and FRADKIN, M.I.

"Study of the Primary Cosmic Radiation by Using Artificial Satellites of the Earth," a paper presented at the 8th International Congress of Astronautical Congress, 6-12 Oct 1957, Barcelona.

AUTHOR

TITLE

GINZBURG, V.L., FAYN, V.M.

On the Question of Quantum Effects on the Occasion of Interaction of Electrons with   h.f. Fields in Resonators

(K voprosu o kvantovykh effektakh pri vzaimodeystvii elektronov s vysokochastotnymi polyami v rezonatorakh. Russian)

PERIODICAL

ABSTRACT

The problem of the quantum effects on the occasion of the passage of electrons through a hollow resonator is investigated. First the problem is treated as purely classical. The investigation is then carried out with regard to the quantum field, for which the formula of H. Nyquist (Phys. Rev., 1928, Vol 32, pp 110) is used. The authors show that this calculation is sufficient only for the determination of the energy gradient $(\Delta K_T)^2$ . But in order to obtain the function of the energy distribution of the electron at the resonator outlet the classical method of investigation is not sufficient. But as this method is very different from that used in the quantum theory the authors here endeavor to solve the problem by means of the introduction of canonical variables (HAMILTON method). The authors show that the simple classical calculation must be preferred. In an analogous way those cases can be investigated where the field along the way of the electron is not homogeneous. In the end the wave characteristic of the electrons are taken into account and the authors show that the elec-

Card 1/2

AUTHOR:    Ginzburg, V.L.

TITLE:    On the Diffusion of Light Near Points of Second-order Phase Transition (O rasseyanii sveta vblizi tochek fazovogo perekhoda vtorogo roda)

PERIODICAL:    Fiz. sb. L'vovsk. un-t, 1957, Nr 3 (8), pp 115-116

ABSTRACT:    Near the phase transition of the second as well as of the first order, which are close to the Curie point, relatively great fluctuations of the $\eta$ parameter, which determines the difference between the ordered and the disordered phase, take place. Upon a change in $\eta$, the refractive index also changes and in relation therewith a supplementary diffraction should be observed. This effect had been examined earlier (RZhFiz, 1958, Nr 1, abstract 2090). In the same work a mathematical formula was developed for the relationship of the light intensity J, diffused because of the fluctuations in $\eta$, to the intensity of light $J_0$ diffused because of the fluctuations of the density. On approaching the critical Curie point $J/J_0$ increases and a phenomenon similar to the critical opalescence should be
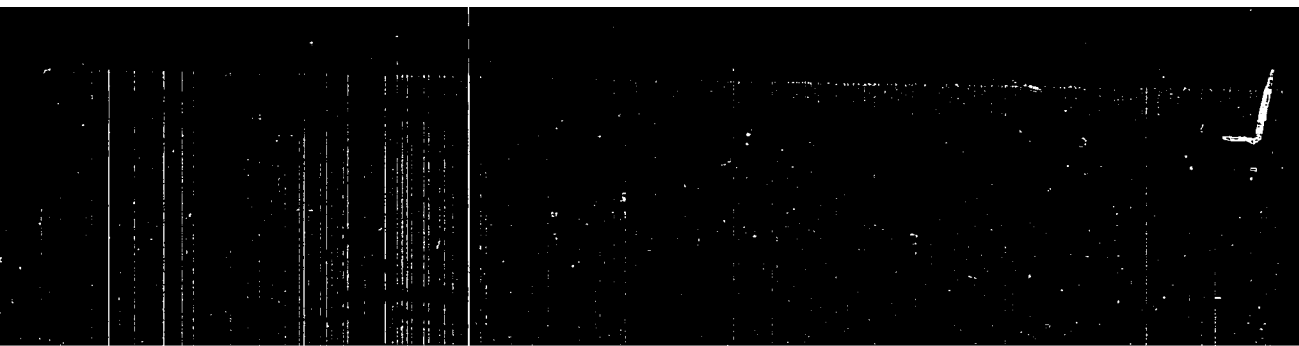
Card 1/2

On the Diffusion of Light Near Points of Second-order Phase Transition

observed. This phenomenon was observed with quartz near $\alpha \rightleftharpoons \beta$ (Kristallografiya, 1956, Vol 1, p 123). The theoretical evaluation of the expected diffusion is given and good agreement with experiment is obtained.

1. Light--Diffusion    2. Light--Intensity    3. Quartz--Applications

N.P.

Card 2/2

AUTHOR    GINZBURG, V.L.  FAYN, V.M.                                 PA - 2080

TITLE     On the Quantum Effects occurring on Interactions of Electrons with High
          Frequency Fields in Resonant Cavities (O kvantovykh effektakh pri
          vzaimodeystvii elektronov c vysokochastochnymi polyami v polykh
          rezonatorakh).

ABSTRACT   The authors investigated the following problem in classical manner: At the
          moment $A = 0$ with the kinetic energy $K_0 = mv_0^2/2$ a non-relativistical elec-
          tron enters the resonator and leaves it at the moment $t = \tau$ with the
          energy $K_\tau = mv_\tau^2/2$. For reasons of simplicity the electric field E in the
          resonator on the path of the electron is assumed to be homogeneous and
          parallel to the velocity of the electron (such a case is absolutely real).
          If $E = E_1 \cos\omega t + (E_2 + E_0) \sin\omega t$ applies, $m(dv/dt) = eE$ and $v_\tau =$
          $v_0 + (e/m\omega)\left[E_1\sin\omega t + (E_2 + E_0)(1 - \cos\omega\tau)\right]$ is obtained. Here $E_1$ and
          $E_2$ denote chance quantities and $\bar{E}_1 = \bar{E}_2 = 0$ and $\bar{E}_1^2 = \bar{E}_2^2 = \bar{V}^2/d^2$ are as-
          sumed to apply. d denotes the path to be covered by the electron (thick-
          ness of the resonator) and $\bar{V}^2$ denotes the mean square of the fluctuation-
          voltage. The averaging is carried out over the corresponding assemblies
          of the identical systems. The field in the resonator is assumed to influ-
          ence the movement of the electrons only to a small extent so that the
          terms of the order of magnitude $e^2$ may be taken to be sufficient. Under
          these circumstances $\overline{(\Delta K_\tau)^2} = e^2\bar{V}^2\left[(\sin(\omega\tau/2)/(\omega\tau/2)\right]^2$ applies. For

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PA - 2080

On the Quantum Effects occurring on Interactions of Electrons with High Frequency Fields in Resonant Cavities.

the dispersion of velocity then $\overline{(\Delta v_\tau)}^2 = \overline{(\Delta K_\tau)}^2 m^{-2} v_0^{-2}$ applies. If $\omega\tau \ll 1$, then $\overline{(\Delta K_\tau)}^2 \approx e^2 \overline{V}^2$ applies. If oscillations of different frequencies exist in the resonator, $(\Delta K_\tau)^2 = e^2 \int_0^\infty \overline{|V_\omega|^2} [\sin(\omega\tau/2)/(\omega\tau/2)]^2 d\omega$ , $\overline{V}^2 = \int_0^\infty \overline{|V_\omega|^2} d\omega$ applies. For a slightly damping resonator with the frequency $\omega_c \sim (LC)^{1/2}$ the following expression is found (proceeding from the general expression for $\overline{(\Delta K_\tau)}^2$ ): $\overline{(\Delta K_\tau)}^2 \approx \frac{e^2}{C(\omega_c)} (\frac{\hbar\omega_0}{2} + \frac{\hbar\omega_0}{e^{\hbar\omega_0/kT}})(\frac{a}{\omega_c\tau} \sin\frac{\omega\tau}{2})$ Other authors found the same results by the application of the quantum-mechanical perturbation theory, their calculations, however, are more complicated and are suited only for the range of small damping. The entire quantum-like effect in the problem of the passage of an electron through a resonator is based on the consideration of the quantum-like fluctuations of radiation in the resonator and especially of the zero oscillations with the energy $\hbar\omega/2$. (Without images)

ASSOCIATION    Physical Institute "P.N.LEBEDEV" of the Academy of Sciences of the USSR and the State University GOR'KIY.

PRESENTED BY
SUBMITTED    21. 9. 1956.
AVAILABLE    Library of Congress

Card  2/2

PA - 2053

ABSTRACT:     On September 21st 1956 SEMEN ZACHAROVIC BELEN'KIJ, a well-known
              theoretical physicist whose reputation is mainly based on his works
              on cosmic rays, died at the age of 41.  S.Z.BELEN'KIJ was born in
              Moscow on the 14.June, 1916; after his leaving examination (1931)
              he worked two years in an electric plant. From 1933 to 1938 he
              studied with great success at the physical faculty of Moscow uni-
              versity and worked from 1941 to 1943 at the Central Aero-Hydrody-
              namic Institute. He then undertook a dissertation at the Physical
              Institute of the Academy of Science of the USSR and became the
              head of one of the theoretical sectors of this institute in 1948.
              BELEN'KIJ wrote his first scientific work (on the scattering of
              X-rays) during his last university term. These works showed the
              author's aptitude for theoretical physical work. In 1938, as an
              aspirant at Moscow university, he was able to concentrate his whole
              attention on the problem I.E.TAMM had asked him to solve (theory
              of cascade showers in cosmic rays). BELEN'KIJ was able to deter-
              mine the spectrum of cascade electrons and this work served as a
              basis for his candidates' dissertation written in 1941. (Reviewer's
              comment: In the USSR there are candidates'- and doctors' disserta-

Card 1/2

In Memory of S.Z. BELEN'KIJ.                                PA - 2053

tions). In connection with the problems solved by experiments
BELEN'KIJ undertook quite a series of further investigations,
in which the development of the theory of cascade showers was
practically completed. In 1948 his monography "Cascade processes
in cosmic rays" was published. BELEN'KIJ's works on the cascade
theory are of fundamental importance. Though it is true that the
investigations of the cascade showers form the main part of
BELEN'KIJ's entire activity, they were not his only domain of re-
search; he also dealt with hydrodynamic problems as well as with
the hydrodynamic and statistical theory of the multiple produc-
tion of particles at high and superhigh energies. Recently
BELEN'KIJ dealt with the nuclear cascade processes and with the
phenomenological theory of the scattering of nucleons by nucleons
at high energies. For his merits in solving applied problems he
was awarded the Lenin order and the Stalin prize.

ASSOCIATION:    Not given.
PRESENTED BY:
SUBMITTED:
AVAILABLE:      Library of Congress.

Card 2/2

AUTHOR    GERSHMAN, B.N., GINZBURG, V.L., DENISOV, N.G.      53-4-4/7

TITLE    The Propagation of Electromagnetic Waves in a Plasma (in the Ionosphere). (Rasprostraneniye elektromagnitnykh voln v plasme (ionosfere) -Russian).

ABSTRACT    Starting out from the monograph by Ya.L.Al'pert, V.L.Ginsburg, El.Feynberg "The Propagation of Radio Waves" (Raspostraneniye rediovoln - Gostekhizdat, 1953, the paper under review deals with some problems of this field which have been clarified to a certain extent since the publication of the monograph. The consideration of the heat motion of electrons in a homogeneous medium in the magnetic field leads to the ocurrence of plasma waves, the consideration of the heat motion of ions, on the other hand, results in low-frequency magnetohydrodynamic and quasi-acoustic waves, both with dispersion. In inhomogeneous media it is possible that we have cases where the approximation of geometrical optics is no more permissible and where an interaction of waves takes place which would be independent in the homogeneous or quasi-homogeneous case. This is the case in the absence of a magnetic field at vertical incidence in the proximity of the reflection point and at oblique incidence in the proximity of the point $(\omega) = 0$, at the existence of a magnetic field at a small angle between the wave normal and the magnetic field (multiplication of the reflected radio signals), and at the beginning of the layer where the concentration of the electrons still is small. For the latter case the paper under review computes the boundary polarization of the short waves which leave the ionosphere for a certain model of the ionosphere, but it is unable to offer any new information about the ionosphere.

Card 1/1

GINZ BURG

· 53-2-2/9

AUTHOR:       GINZBURG, V.L.
TITLE:        The Origin of Cosmic Radiation. (Proiskhozhdeniye kosmicheskikh luchey, Russian)

PERIODICAL:   Uspekhi Fiz.Nauk, 1957, Vol 62, Nr 2, pp 37-98 (U.S.S.R.)

ABSTRACT:     The theory of the origin of cosmic radiation as expounded in the present paper is based upon radioastronomic and, of course, also on other experimental data. However, the present paper by no means claims to be complete either in a historical respect or with respect to experimental data. The paper is arranged as follows:
1.) The primary cosmic rays near the earth.
2.) The nature of the bremsstrahlung of cosmic radiation and the distribution of cosmic radiation in the galaxy.
3.) The motion of cosmic particles in the interstellar medium.
4.) The supernovae and the novae as sources of cosmic radiation.
Summarizing it may be said that the assumption concerning the acceleration of cosmic particles by explosions of supernovae is permitted within the framework of existing knowledge and sufficient in order to explain all known facts. It stands to reason, however, that there is as yet no guarantee that the supernovae and novae furnish the entire energy. There is further no proof against the existence of any other sources of energy or against an additional acceleration of particles in the inter-

Card 1/2