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SCIENTIFIC PAPERS

By **Nicholas Ionescu-Pallas**

Mathematical and Physical Sciences

I (1956- 1960)

1. Non-Additive Composition of the Volumes in a Non-Reactive Mixture (in Romanian). *Studii și Cercetări de Fizică*, Tom VII, nr. 2, 1956, pp. 285-290 {Submitted for publication on 22-nd Nov. 1955}.
2. **Asymptotic Properties of Real Gases and Their State Equation (in Romanian)**, *Studii și Cercetări de Fizică*, Tom VII, nr. 3, 1956, pp. 463-478 (Submitted for publication on 4-th April 1956). (Work Awarded at a Symposium of the Students' Debating Circle in May, 1954).
3. On Pure Vibrational Spectra of Diatomic Molecules with Homoeopolar Bond (in Romanian). *Studii și Cercetări de Fizică*, Tom VIII, nr. 2. 1957, pp. 107-111.
4. On the Entropy of Gaseous Mixture (in Romanian). *Studii și Cercetări de Fizică*, Tom VIII nr. 4. 1957, pp. 457-467 (Communicated at the Scientific Session of the Institute of Physics of the Romanian Academy on 26-th June 1957).
5. On the Hyperfine Structure of the (Atomic) Mercury Line Hgl 5461 A by Ion Agârbiceanu, Nicholas Ionescu - Pallas and Vasile Drăgănescu, *Revue de Physique* (Bucharest). Tom II. nr. 2, 1957. pp. 233-241 (Communicated at the Scientific Session of the Institute of Physics of the Romanian Academy on 26-th June 1957).
6. Sur la structure hyperfine de la raie Hgl 5461 A, Note de M Ion Agârbiceanu, Nicolas Ionescu Pallas et Vasile Draganescu, transmise par M. Jean Cabannes. *Comptes rendus des séances de l'Academie des Sciences, Paris*, t, 205. pp. 1054 - 1056. Séance du 23 sept. 1957,
7. **La systématique des déplacements isotopiques pour les atomes lourds. Note de M. Nicolas Ionesco-Pallas, présentée par M. Louis de Broglie (séance du 10 dec. 1958), *Comptes rendus des séances de l'Academic des Sciences*, t. 248, pp. 199 - 202, séance du 12 Janv. 1959.**
8. About the μ -Meson Spin from Ionization Bursts Data, by Ion X. Ion, Nicholas J. Ionescu - Pallas and Constance Potoceanu (Institute of Atomic Physics of the Romanian Academy, Bucharest), (ricevuto il 3 nov. 1958), *II Nuovo Cimento, Serie X, Vol. 11*, pp.' 507 - 524, 1959 Febbraio.

9. On the (State) Equation of the Debye Crystals (in Romanian), *Studii și Cercetări de Fizică*, Tom X, nr.1, 1959, pp. 75-78 (Work submitted for publication on 26-th Sept. 1958).
10. **Isotope Shift and Fermi-Segrè Formula**, by N. J. Ionescu – Pallas (Roumanian Institute for Atomic Research), *Progress of Theoretical Physics (Tokyo)*, Vol. 21, nr.4, April. 1959, pp. 655-656 (Letter to the Editor received January 22, 1959).
11. A new Derivation of the Schmidt Formula (Relativistic Fine Structure Correction; in Romanian), *Studii și Cercetări de Fizică*, Tom X, nr. 4, 1959, pp.639-642.
12. A Mono-isotopic (Spectral) Lamp Using Hg 198 (in Romanian) by Ion Agărbiceanu, V. Drăganescu (and) Nicholas J. Ionescu – Pallas, *Studii și Cercetări de Fizică*, Tom 10, nr. 2, 1959, pp.345-368 (Scientific note).
13. The Resonant Transfer of Charge and the Kinetics of Ions (in Russian), by Ion Popescu Iovitzu and Nicholas J. Ionescu – Pallas, *Journal of Technical Physics (Sankt Petersburg)*, Tom XXIX, nr. 7, 1959, pp.866-876.
14. **On Resonant Charge Transfer for Positive Ions**, by I. Popescu Iovitzu (Gaseous Electronics Laboratory, C.I.Parhon University, Bucarest) and Nicholas J. Ionescu – Pallas, (Institute of Atomic Physics of the Romanian Academy, Bucharest), *Proceedings of the Physical Society (London)*, Vol. LXXV, pp. 807-809, 1960 (received 12-th August, 1959).
15. **Nuclear Magnetic Moments (Derived) from Hyperfine Structure Data**, *The Physical Review (USA)*, Vol.117, nr.2, pp. 505-510, Jan.15, 1960 (received, June 1, 1959).
16. **The Nuclear Compressibility (Derived) from Isotope Shift Data** by Nicholas J. Ionescu – Pallas, (Institute of Atomic Research, Bucharest), *Il Nuovo Cimento, Serie X*, Vol. 15, pp. 323-333, 1960 (received 20-th June, 1958).
17. Selective Filling of the Zeeman Levels in the Atoms of the Alkali Metals, *Studii și Cercetări de Fizică*, Tom XI, nr.3, 1960, pp. 585-596 (in Romanian) and *Revue de Physique*, Tom V, nr. 3-4, 1960, pp. 325-336, (in Russian).
18. **Détermination du moment magnétique nucléaire de ^{199}Hg en partant de la structure hyperfine de la raie $\text{Hg } 5461\text{\AA}$** , note de MM. I. Agărbiceanu, N. Ionescu-Pallas, V. Drăganescu, N. Comaniciu, et. V. Tatu, présentée par M. Gustave Ribaud, *Comptes Rendus des séances de l'Académie des Sciences, Paris*, Tom 250, 1960, pp. 317-318.

II (1961-1965)

19. Theory of isotope Shift in Heavy Atoms, *Annalen der Physik (Leipzig)*, Vol. 8, nr. 1-2, 1961, pp. 9-27 (received 18-th Aug. 1960).
20. Deriving the Nuclear Magnetic Moment of the Mercury 199 Isotope from the Hyperfine Structure of the Line Hg 5461Å by Ion Agârbiceanu, Laurențiu Blânaru, Vasile Drăgănescu, Nicholas J. Ionescu-Pallas, Nicolae Comaniciu and Vasile Tatu (in Russian), *Journal of Optics and Spectroscopy (Moscow)*, Tome 10, nr. 3, 1961, pp. 297-300.
21. Calculating the Effective Quantum Numbers of Heavy Atoms (in Romanian), *Studii și Cercetări de Fizică*, Tom XII, nr. 3, 1961, pp. 613-623.
22. Contributions à la théorie statistique des noyaux lourds, *Revue de Physique*, Tom VI, nr. 4, 1961, pp. 441-455.
23. Electronic Wave Function in the Neighbourhood of Nucleus (in Romanian), *Comunicările Academiei Republicii Populare Române*, Tom 11, nr. 10, 1961, pp. 1155-1161 (Communication presented by Acad. Șerban Țiteica, in the Session on 6-th May 1961).
24. Relativistic Extensions of the Hyperfine Structure (in Romanian), *Studii și Cercetări de Fizică*, Tom XIII, nr. 1, 1962, pp. 101-104.
25. Theory of Second Order Isotope Shift, *Annalen der Physik (Leipzig)*, Tome 10, nr. 3-4, 1962, pp. 121-140, (received 13-th Dec. 1961).
26. Su una nuova dimostrazione della variazione della massa in rapporto alla velocità, Nota di Nicolas Jean Ionescu-Pallas, presentata dal Socio B (runo) Finzi. *Accademia Nazionale dei Lincei, Rendiconti della Classe di Scienze fisiche, matematiche e naturali*, Serie VIII, vol. XXXIII, fasc. 5, Nov. 1962, pp. 289-291.
27. Peuplement sélectif des niveaux de Zeeman dans les atomes alcalins II, par Nicolas Ionescu-Pallas et George-Victor Velculescu, *Revue de Physique*, Tom VIII, nr. 1, 1963, pp. 47-58.
28. Conséquences dynamiques de la relativité, *Revue de Physique*, Tom VIII, nr. 3, 1963, pp. 309-337.
29. On a Certain 5-Dimensional Extension of the Relativistic Physics (in Romanian) by H(arry) Hafner and N.J.Ionescu-Pallas, *Studii și Cercetări de Fizică*, Tom XIV, nr. 3, 1963, pp. 277-287.
30. Sul concetto di Massa nella teoria della relatività, Nota di Nicolas Ionescu-Pallas, presentata dal Socio B (runo) Finzi. *Accademia Nazionale dei Lincei, Rendiconti della Classe di Scienze fisiche, matematiche e naturali*, Serie VIII, vol. XXXIV, fasc. 4, Aprile 1963, pp. 403-406.

31. The Doppler-Fizeau Effect (in Romanian), *Studii și Cercetări de Fizică*, Tom XIV, nr. 6, 1963, pp. 857-866 (Work of Synthesis including some original elements).
32. **Estimation of Nuclear Distorsion from Isotope Shift Data**, *Physics Letters (Amsterdam)*, Vol. 6, nr. 1, 15 Aug., 1963, pp. 93-94.
33. On the Principle of the Light Velocity Constancy in Special Relativity (in Romanian) Note by H(array) Hafner and N.J. Ionescu-Pallas, *Studii și Cercetări Științifice, Fizică și Științe Tehnice*, Acad. R.P.R., Filiala Iași, Tom XIV, nr. 1, 1963, pp. 193-197.
34. **Contributions a l'étude des Lasers aux gas**, par I. Agârbiceanu, A. Agafitei, L. Blănaru, N.J. Ionescu-Pallas, I.M. Popescu, V. Vasiliu et V.G. Velculescu (An abstract of the work was published in the Proceedings of the 3-rd International Conference on Quantum Electronics, Paris, February, 1963).
35. On a (Certain) Extension of Electrodynamics and Mechanics in a 5-Dimensional Space (in Romanian) by H(array) Hafner and N.J. Ionescu-Pallas, *Studii și Cercetări de Fizică*, Tom XIV, nr. 6, 1963, pp. 797-804.
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37. Une nouvelle méthode d'évaluation semi-classique des phases de diffusion, *Revue Roumaine de Physique*, Tom 9, nr. 9, 1964, pp. 837-844.
38. **Inverting the population of (Atomic) Levels in Gaseous Media (in Russian) by Nicholas Ionescu-Pallas and George-Victor Velculescu**, *Revue Roumaine de Physique*, Tom 9, nr. 6, 1964, pp. 623-627 and *Journal of Optics and Spectroscopy (Moscow)*, Tom XVII, nr. , 1964, pp. 139-141 (received, 13-th August, 1963).
39. The hyperfine and isotopic structure of the (Atomic) Barium BaI Line 5535 Å (in Russian) by V. Drăgănescu, N. Comaniciu, V. S. Tatu, and N. J. Ionescu-Pallas, *Journal of Optics and Spectroscopy (Moscow)*, Tom XVI, nr. 2, 1964, pp. 182-186.
40. **Quantum States of a Relativistic Rotator**, by H(array) Hafner and N.J. Ionescu-Pallas, *Acta Physica Austriaca*, Vol. XVIII, nr. 1, 1964, pp. 38-41.
41. The Scale of Absolute Temperatures and the Concept of Absolute Zero (in Romanian), *Revista de Fizică și Chimie, Seria A*, Vol. 1, nr. 11, Nov. 1964, pp. 438-442 (Synthesis).
42. **Theory of Mesic Atoms**, *Annalen der Physik (Leipzig)*, Vol 15, nr. 3-4, 1965, pp. 144-149.
43. New Aspects Concerning the Connection between Physics and Geometry (in Romanian) by H(array) Hafner and N.J. Ionescu-Pallas, *Revista de Fizică și Chimie*,

Vol. II, nr. 7, Iulie 1965, pp. 241-250 (A synthesis of some original works, exploring the consequences of postulating a bi-dimensional space of time. A non-conventional tachionic approach avant la lettre).

III 1966 – 1970

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45. Analysis of a Complex Gamma Spectrum, by Constantza Ionescu and N.J. Ionescu-Pallas, Revue Roumaine de Physique, Tome 11, nr.4, 1966, pp. 349-356.
46. Mouvement d'une particule à spin $\frac{1}{2}$ dans un champ central arbitraire à spin entier. Note de M. Nicolas J. Ionescu-Pallas, transmise par M. Horia Hulubei, Comptes rendus Acad. Sciences, Paris, Tom 262, 18 avril 1966, pp. 1029-1031 (séance du 14 mars 1966).
47. Semi-Classical Evaluation of some Atomic Quantities, Revue Roumaine de Physique, Tome 11, nr. 5, 1966, pp. 359-367.
48. Détermination des moments quadrupolaires intrinsèques du Baryum par des mesures de déplacements isotopiques. Note de M.M. Nicolae Comaniciu, Vasile Drăgănescu, Nicolae Ionescu-Pallas et Vasile Tatu, transmise par M. Horia Hulubei, Comptes rendus Acad. Sciences Paris, tom 262, 16 mai 1966, pp. 1355-1358 (séance du 18 avril 1966).
49. La théorie améliorée de la structure hyperfine, Note de M. Nicolas Ionescu-Pallas, transmise par Horia Hulubei, , Comptes rendus Acad. Sciences Paris, tom 263, 11 juillet 1966, pp. 99-102 (séance du 13 juin 1966).
50. Explicit Formulas for Atomic Lifetimes, Revue Roumaine de Physique, Tome 11, nr. 7, 1966, pp. 643-647.
51. Isotope Shifts and Intrinsic Deformations in Ba, by N. Comaniciu, V. Drăgănescu, Nicolae Ionescu-Pallas and V. Tatu, Revue Roumaine de Physique, Tome 11, nr. 8, 1966, pp. 669-676.
52. Introductory Chapters of Tensor Algebra and Some Physical Applications (in Romanian) by H(array) Hafner and Nicholas Ionescu-Pallas, Revista de Fizică și Chimie. Seria A, Vol. IV, nr. 3, Martie 1967, pp. 88-103 (Synthesis).
53. Relativistic Wave Equation for Plane Motion, Revue Roumaine de Physique, Tome 12, nr. 4, 1967, pp. 327-336 (Dedicated to the 70-th Birthday Anniversary of Professor Horia Hulubei).

54. Proprietăți globale des noyaux déduites de déplacements isotopiques et structures hyperfines, par Nicolas Ionesco-Pallas (Journées nucléaires Franco-Roumaines, Mai 1967, Bucharest, FR 67/Ph F-3 , 6 pag.).
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56. **Relativistic Schrödinger Equation for a Particle with Arbitrary Spin** by **Nicholas J. Ionesco-Pallas**, **Journal of the Franklin Institute**, Vol. 284, nr. 4, Oct. 1967, pp. 243-250 (and Preprint, Inst. Atomic Phys., Theor. Phys., 65, 1968), (Work appreciated by Gerard Pétiau).
57. Approssimazione della funzione di errori, a cura di Nicolas J. Ionescu-Pallas, Preprint, Institute for Atomic Physics, Theoretical physics, 64, 1967, 11 pages.
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59. **Optical Methods in Nuclear Physics, Lectures held at the Institute of Atomic Physics, Second Division (Radiation and Plasma), Laboratory A, by Nicholas J. Ionescu-Pallas, (1967, May-July, 76 pag., Manuscriptum)**
- 1) **Classical Theory of the Hyperfine Splitting**
 - 2) **Hyperfine Interaction Energy and the Equations of the Spining Electron**
 - 3) **Dirac Equation and the Hyperfine Structure**
 - 4) **Zeeman Effect**
 - 5) **Calculating the Radial Integrals**
 - 6) **Spin-Orbit Coupling**
 - 7) **Magnetic Interaction of Intermediate Intensity**
 - 8) **Spin Reversal**
 - 9) **Magnetic Resonance for Arbitrary Spin**
 - 10) **Bloch-type Resonance**
60. Approssimazione della funzione di Laguerre a cura di Nicolas Ionescu-Pallas, Preprint, Institute for Atomic Physics, Theor. Phys. 71, 1968, 6 pag.
61. **Going over from Classical to Quantum Mechanics I, (in Romanian), Studii și Cercetări de Fizică, Tom 20, nr. 3, 1968, pp. 215-220.**
62. **A Relativistic Wave Equation for $\frac{1}{2}$ Spin Particle, Revue Roumaine de Physique, Tome 13, nr. 5, 1968, pp. 461-469.**
63. **Electrodynamics of Moving Bodies and the Relativity Theory (in Romanian)** Preprint, Institute of Atomic Physics, Theor. Phys., 72, 1968, 20 pag. (A

resistivity 4-vector is introduced. See also : Self-consistent representations of the Electromagnetic Field, *Studii și Cercetări de Fizică*, Tom 24, nr. 9, 1972, pp. 1043-1059).

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65. **Search for a Fundamental Wave Equation, Revue Roumain de Physique, Tome 13, nr. 9, 1968, pp. 811-813,** (A non-linear extension of the Relativistic Schroödinger Equation for Arbitrary Spin, of the Heisenberg type, is proposed in view of explaining some inner symmetries of matter. Communication held at the Symposium for Quantum Electrodynamics in Cargèse (Corsica) on July 10, 1967).
66. **Obtaining Neutrons by Releasing the Deuterium Synthesis Reaction with the Aid of a Giant Pulse Laser (in Romanian). Preprint, Institute of Atomic Physics, Nuclear Reactions, 26, 1968, 9 pag.**
67. **Going over from Classical to Quantum Mechanics II, The spin Concept (in Romanian),** *Studii și Cercetări de Fizică*, Tom 20, nr. 10, 1968, pp. 1045-1057.
68. **Going over from Classical to Quantum Mechanics III, The relativistic Theory of the Irreducible Spinors (in Romanian),** *Studii și Cercetări de Fizică*, Tom 21, nr. 1, 1969, pp. 9-20.
69. **Going over from Classical to Quantum Mechanics, IV, The Energy Concept, (in Romanian),** *Studii și Cercetări de Fizică*, Tom 21, nr. 2, 1969, pp. 121-126.
70. **Nuclear Models (in Romanian),** *Revista de Fizică și Chimie, Seria A, Tom VI, nr. 4, Aprilie 1969, pp.121-125 (Synthesis).*
71. **Contributions to Isotope Shift Theory in Atomic Spectra by Nicholas J. Ionescu-Pallas (Dissertation for obtaining the Doctor's Degree in Physical Science, under the leadership of. Prof. Ion Agârbiceanu, C.M.A.) Preprint, Institute of Atomic Physics, 1969, 60 pag. +11 fig.,** (Work shared in two parts, having 6 and 7 sections respectively).
72. **Relativistic Schrödinger Equation for a Particle with Arbitrary Spin II, Preprint, Institute of Atomic Physics, Theor. Phys., 75, 1969, 18 pag.** (See also : *Revue Roumaine de Physique, Tome 18, nr. 4, 1973, pp. 419-436*) (Work appreciated by Fred Hoyle and Jayant V. Narlikar).
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74. Estimating the Quantum Penetrabilities, by Nicholas Ionescu-Pallas, Institute for Atomic Physics, Bucharest, Proceedings of the International School on Nuclear Theoretical Physics, Predeal Romania, 1969, September, pp. 555-561.
75. **Almost Classical Wave Equation, Revue Roumain de Physique, Tome 14, nr. 9, 1969, pp. 895-902** (Dedicated to the 70-th Birthday Anniversary of Prof. Theodor V. Ionescu).
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79. **Fundamentals of Macroscopic Electrodynamics II, (in Romanian), Revista de Fizică și Chimie, Seria A, vol. VII, nr. 11, 1970, pp. 419-428.**
80. **Generalizing the Dirac Equation, Revue Roumaine de Physique, Tome 15, nr. 3, 1970, pp. 397-401.**
81. **Entering upon the Spinor Concept from a Vectorial Standpoint, Revue Roumaine de Physique, Tome 15, nr. 5, 1970, pp. 593-601.**
82. (Improved) Least Square Method, (in Romanian), Studii și Cercetări de Fizică, Tom 22, nr. 5, 1970, pp. 579-582.
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1971 - 1975

86. Improved Theory of Nuclear Compressibility and Its Applications to the Isotope Shifts Problem, *Revue Roumaine de Physique*, Tome 16, nr. 1, 1971, pp. 3-10, (See also: Proceedings of the Symposium on Atomic Spectroscopy, Hannover, 14-th July, 1970).
87. Fundamentals of Macroscopic Electrodynamics III, (in Romanian), *Revista de Fizică și Chimie, Seria A*, vol. VIII, nr. 3, 1971, pp. 95-106.
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91. Symmetrical Theory of Electricity and Magnetism, *Revue Roumaine de Physique*, Tome 17, nr. 3, 1972, pp. 269-279 (Derivation of the Maxwell Eqs. coming from the interaction between electric currents).
92. Tehebysheff-type Formulas for Lorentz and Gauss Convolutions (in Romanian) *Studii și Cercetări Matematice*, Tom 24, nr. 9, 1972, pp. 1413-1420.
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99. The Lagrangean Aspect of the Onicescu Invariantive Mechanics by Liviu Sofonea and Nicholas Ionescu-Pallas, Revue Roumaine de Physique, Tome 18, nr. 3, 1973, pp. 293-311.
100. **Relativistic Schrödinger Equation for a Particle with Arbitrary Spin II, Revue Roumaine de Physique, Tome 18, nr. 4, 1973, pp. 419-436,** (Dedicated to Prof. Șerban Titeica on the occasion of his 65-th Birthday Anniversary).
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103. Mathematical Processing of Empirical Data. Integrations and Convolutions, (in Romanian), Studii și Cercetări de Fizică, Tom 25, nr. 5, 1973, pp. 563-582.
104. **Coulombian Transparency in a Hot Infinite Deuterium Plasma, Accounting for the Finite Size of the Deuterons, by Ion N. Mihăilescu and Nicholas Ionescu-Pallas, Revue Roumaine de Physique, Tome 18, nr. 6, 1973, pp. 793-798.**
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108. **Elements of Theoretical Mechanics – Classical and Relativistic (in Romanian) Fascicle 1 of the Course on Laser Physics held at the Institute for**

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Atomic Physics, Plasma & Radiation Division, May 1973, 50 pages (Preprint Institute for Atomic Physics).

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