

**INTERNATIONAL COMMITTEE FOR THE NOBEL PRIZE  
NOMINATION OF PROFESSOR RUGGERO MARIA SANTILLI**

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Edit. Manager, *Hadronic J., Hadronic J. Supplement, Algebras, Groups and Geometry*

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Tarpon Springs, 03-14-98

Professor NAGEL BENGT  
Chairman  
Nobel Committee for Physics  
P. O. Box 50005  
S-104 05 STOCKHOLM, Sweden

Dear Professor Nagel ,

I here respectfully submit the Nomination of Prof. Ruggero Maria Santilli for the Nobel Prize in Physics. I would appreciate this Nomination to be considered as standing and valid for future years. I would also appreciate whether the 1998 Nomination to be initiated by your Committee in the event possible and otherwise needed. Similar Nominations have been and will be separately and independently submitted to you by members of our Committee and possibly others.

The best documentation of this Nomination is the detailed report dated March 3, 1998, which was sent by Prof. Santilli to you as a fellow scientist, together with a collection of his recent papers. A copy of this letter is enclosed in a form proof-read and controlled by my Editorial staff whose sole significant variation over the version you received has been the addition of references [1,2,3] on the current, rather serious, widespread and unreassuring problems of scientific ethics in our physics community which should be taken in due account by your Honorable Committee.

Please note that various members of our Committee have suggested the publication of the enclosed letter by Prof. Santilli to you in the forthcoming *Fundamental Open Problems in Science at the Turn of the Millennium* (the Proceedings of the Beijing Workshop held in August 1997). In the event you have any objection against the publication of Prof. Santilli's letter, please let me know not later than June 1, 1998.

I believe that you received a sufficient number of recent papers by Prof. Santilli. I shall therefore solely enclose the paper I selected for this Nomination, as identified below. Nevertheless, I took the liberty of identifying at the end of this letter as Ref.s [a, b, ...] the monographs directly related to this nomination which were previously shipped to your Committee per our knowledge, as well as the monographs which, to our knowledge, are not yet in your possession. The latter have been sent to you via separate parcel post. If any monograph is missing, please do not hesitate to let me know, and I shall gladly send you complimentary copies.

Prof. Santilli's basic discoveries are numerous and their selection for this

Nomination is rather difficult. An outline over those previously received by you (prepared from various material, mostly from recent papers) appears recommendable.

To begin, it should be noted by the Nobel Committee that, as first established by Newton, there cannot be a truly basic advancement in physics without new mathematics. In full awareness of this historical teaching, Prof. Santilli first achieved a series of structural generalizations of contemporary mathematics which he called *isomathematics, genomathematics, hypermathematics and their isoduals* (see the memoir published in the Italian mathematics journal *Rendiconti Circolo Matematico Palermo, Suppl. # 42*, pages 1-87, 1996, Paper 2 in the collection you received). These new mathematics were developed as a pre-requisite for his discoveries in physics, chemistry, biology and other sciences. According to a review of monograph [i], "these achievements are "unprecedented in the history of physics". In fact, numerous physicists have discovered specific new methods within the structure of conventional mathematics, but I know of no physicist in history, and certainly no Nobel Laureate, who has discovered a number of structural generalizations of the pre-existing mathematics comparable to those by Prof. Santilli in diversifications and implications, as a pre-requisite for discoveries in physics.

After having identified the novelty in mathematical methods, Prof. Santilli's physical discoveries can be divided into five different groups.

**GROUP 1: DISCOVERY OF HADRONIC MECHANICS.** It is appropriate here to recall the first Nomination of Prof. Santilli for the Nobel Prize in Physics received by your Committee back in 1985 on Prof. Santilli's discovery of the new mechanics he called "hadronic mechanics". This first Nomination is more valid than ever and should be considered as standing by the Committee. In fact, we know today that hadronic mechanics is the *only* axiomatically consistent broadening of quantum mechanics achieved in this century among numerous attempts (see, e.g., Paper 7 and 8 of the collection you received). Moreover, hadronic mechanics is today supported by novel applications and experimental verifications in particle physics (such as the new model of structure of the neutral pion and of the neutron with physical constituents; the first quark model with a real confinement; the first exact-numerical representation of the Bose-Einstein condensation from first axiomatic principles without unknown parameters; the first exact fit of the experimental data on the behavior of the meanlife of the neutral kaon with energy; and others), nuclear physics (the first exact-numerical representation of total nuclear magnetic moments; the first prediction of the stimulated decay of the neutron; new means for recycling nuclear waste; and others), astrophysics (the exact-numerical representation of the large differences in the cosmological redshift between quasars and associated galaxies when physically connected; the first and only known numerical representation of the quasar internal red and blue shift; and others); superconductivity (the first achievement of the *attractive* force between the *identical* electrons of the Cooper pair in outstanding agreement with experimental data; and others); chemistry (the first achievement of a novel *attractive* force among the *neutral* atoms of a molecular bond; the first interpretation why the hydrogen and water molecules have only two Hydrogen atoms; the first exact representation of the molecular binding energy without politically motivated parameters of unknown physical origin; and others), biology (the first axiomatically consistent representation of *irreversible-nonconservative* biological systems; the first geometric representation of the flow of liquids in the non-moving interiors of plants; the first exact geometric representation of the *growth* of sea shells

in time and others).

**GROUP 2: DISCOVERY OF THE ISOGALILEAN AND GENOGALILEAN RELATIVITIES.** Among the additional Nominations you received for Prof. Santilli's Nobel Prize in Physics, it is also appropriate to quote here the 1992 Nominations for the discovery of the Lie-isotopic and Lie-admissible generalizations of Galilei's relativity for classical dynamical systems within physical media. These Nominations too are more valid than ever, they should therefore be considered as standing by your Committee, and they are of such dimension to merit a Nobel Prize per se. In fact, Prof. Santilli constructed the first structural generalizations of Galilei's relativity whose physical consistency was proved since the earlier work by admitting the conventional relativity for point-like systems in vacuum (exterior systems). More recently, the new relativities have been proved to be *the only ones which are as axiomatically consistent and invariant as the original relativity* (see Papers 7 and 26 of the collection you received). Moreover, Santilli's new isogalilean and genogalilean relativities have recently permitted the discovery of the *only* known structural generalizations of Newton's fundamental equations of motion in *Newtonian* mechanics, which represent extended, nonspherical and deformable particles under unrestricted, nonlinear, nonlocal and nonhamiltonian forces (first discovered by Prof. Santilli in memoir 2 of the collection you received). Novel practical applications in classical mechanics are now emerging, such as the first optimization via a variational principle of *nonlocal and nonhamiltonian systems* (such as actual shapes of extended objects moving within a resistive fluid, and others). The *mandatory* nature of the new mathematics here emerges in all its light. In fact, the transition from Newton's point-like particles under action-at-a-distance/potential forces to Santilli's extended objects under local-potential and nonlocal-nonhamiltonian forces due to the medium requires the necessary identification of the new topology. Moreover, in exactly the same way as Newton had to invent the differential calculus to express his equation, Prof. Santilli too had to discover his novel iso- and geno-differential calculus as a necessary condition for the very formulation of the new equations themselves.

**GROUP 3: DISCOVERY OF THE ISOSPECIAL AND GENOSPECIAL RELATIVITIES.** An additional fundamental discovery by Prof. Santilli is the novel scientific edifice known as isotopies of the Minkowskian geometry (Paper 10), of the Poincaré symmetry (Paper 3) and of the special relativity (see monographs [f]). When inspected by real scientists without preconceived idea of the final character of Einstein's special relativity, Santilli's new isospecial relativity emerges as possessing applications, verifications and implications so vast to prevent a simplistic synthesis in this letter. In fact, the novel isospecial relativity is directly universal in the sense of being applicable to all possible signature-preserving nonlinear, nonlocal and nonlagrangian broadening of the special relativity directly in the frame of the experimenter (direct universality). Moreover, the new relativity is the only one to be as invariant as the original one among all broadening attempted throughout this century. To mention only one among many applications and implications, the new isospecial relativity extends the applicability of the conventional Einstein axioms to *arbitrary* local speeds of light, thus breaking for the first time in an axiomatically correct way the "barrier" of the speed of light and permitting quantitative representations of the superluminal speeds measured on our Earth as well as in astrophysical events. It is a truism to say that all novel applications, such as the laboratory synthesis of the

neutron from protons and electrons only (Paper 21) are a direct consequence of the new isospecial relativity, and so are the new means for recycling nuclear waste, the new model of structure of hadrons with physical constituents, and others.

**GROUP 4: DISCOVERY OF THE NEW CLASSICAL AND OPERATOR ISODUAL THEORY OF ANTIMATTER.** One of the most visible unbalances of the physics of this century is the evident disparity between the treatment of matter and antimatter. In fact, matter is treated at *all* levels, from Newton to second quantization, while antimatter is treated *only* at the level of *second quantization*. Yet, distant galaxies and quasars could indeed be made up of antimatter, thus requiring *full equivalence* in the treatment of matter and antimatter beginning at the *Newtonian* level. Another momentous discovery by Prof. Santilli has been the resolution of this century old disparity. The prior need to identify *new mathematics* emerged quite strongly in this case too. In fact, the *classical* treatment of antimatter requires the construction of a new mathematics which is anti-isomorphic to the conventional mathematics at all levels of treatment. This additional new mathematics was discovered by Prof. Santilli via his "isodual map" which essentially consist in reversing the *sign* of the basic unit,  $+1 \rightarrow -1$ , and then reconstructing the entire mathematics with respect to the latter, *negative definite unit*, thus including the discovery of yet new numbers, new spaces, new algebras, new topologies, etc. The new isodual mathematics then permitted Prof. Santilli to discover yet new Newton's equations, the Newton-Santilli isodual equations for the description of antimatter (see again paper 2 of the collection), with corresponding formulations for all remaining aspects, such as isodual Lagrange's and Hamilton's equations, isodual quantization, isodual quantum mechanics, etc (see paper 27). Intriguingly, Santilli's new isodual theory of antimatter emerged as existing in the very structure of Dirac's equation, although it was not recognized as such by Dirac because of the lack of the new mathematics, thus illustrating again the importance of *new mathematics* for the appropriate representation of *new physical settings*. It should be stressed that Santilli's isodual theory of antimatter has been proved to be equivalent to charge conjugation at the operator level and to be absolutely compatible with *all* available experimental data on antimatter at *all* levels of study, including classical mechanics, first and second quantization. The only aspect still unresolved because of lack of *experimental* data is the behavior of antimatter under gravity in which the new theory has far reaching implications, such as: the first prediction of a new photon emitted by antimatter; the first prediction of antigravity experienced by antimatter in the field of matter which resolved the existing objections; the first prediction of a spacetime machine verifying causality; and others.

**GROUP 5: DISCOVERY OF NEW THEORIES OF GRAVITATION AND COSMOLOGY** To achieve a meaningful appraisal of Prof. Santilli's discoveries in physics, one must also consider his very original and innovative advances in gravitation which include: 1) the proof that all theory with curvature do not possess invariant units of time, space, energy, etc., thus being inapplicable to real measurements (Paper 8); 2) the isominkowskian reformulation of gravity which preserves Einstein's field equations, yet resolves the preceding inconsistencies (Paper 10); 3) the achievement of the first and only known axiomatically consistent operator formulation of gravity verifying the abstract axiom of conventional relativistic quantum mechanics (paper 8); 4) the achievement of the first and only known axiomatically

consistent inclusion of gravity in unified gauge theories of electroweak interactions via the embedding of gravity in the unit of gauge theories (Paper 23); 5) a basically novel cosmology called by Prof. Santilli isoselfdual for certain technical reasons (see the memoir in the Proceedings of the International Workshop on Modern Modified Theories of Gravitation and Cosmology which was not included in the collection you received).

While other scientists may issue other Nominations, I here submit a standing Nomination of Prof. Ruggero Maria Santilli for the Nobel Prize in Physics, beginning if possible for 1998, this Nomination then continuing in subsequent years, for his discovery of the first axiomatically consistent unification of gravitation and electroweak interactions in classical and operator mechanics as well as for matter and antimatter, as per enclosed paper published in *Foundations of Physics Letters*, Vol. 10, pages 307-327, 1997.

It is a truism to say that the latter discovery does indeed deserve, alone, a Nobel Prize in Physics, independently from all other discoveries by Prof. Santilli. In fact, the unification of gravitation and electromagnetic interactions has been attempted and failed by numerous qualified physicists throughout this century beginning with Albert Einstein; the additional unification of gravitation and quantum mechanics has also been attempted and failed throughout this century by some of the best minds; and the inclusion of antimatter in any classical aspect of the preceding attempts has remained afflicted by truly huge physical and mathematical inconsistencies. These occurrences establish the historical significance of the discovery.

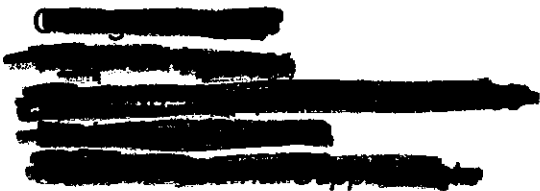
Prof. Santilli first identified the origin of the inconsistencies of the preceding attempts as being structural insufficiencies in the underlying *mathematics*; he then constructed the appropriate broader mathematics for matter and that for antimatter in vacuum; he then constructed the yet broader mathematics for matter and antimatter in interior, nonconservative and irreversible conditions; he then proved the existence of an axiomatically consistent unification of gravitation with all other known interactions in both classical and quantum mechanics and for both matter and antimatter in exterior or interior conditions which is essentially based on the embedding of gravity in generalized realization of the *unit* of other theories; Prof. Santilli finally achieved an ultimate synthesis of this scientific edifice via its reduction to a primitive, ultimate symmetry, the Poincaré-Santilli iso isosymmetry and its isodual which, for the first time in the history of physics, characterizes gravitation via invariance laws, as an evident necessary condition for its unification to other interactions already admitting said invariance laws.

We should finally mention that Santilli's grand unification implies a new isocosmology with far reaching characteristics, such equal distributions of matter and antimatter in the universe (as a limit case), with corresponding *null* total physical characteristics of time, energy, linear momentum, etc. This Honorable Committee should note that this is the first time in history of science that the entire universe is reduced to a fundamental symmetry which is ultimately isomorphic to the Poincaré symmetry and its isodual image, thus implying a novel geometric unification of the special and general relativity at *all* levels of study, from a local classical or quantum world to the entire universe.

It seems evident that this Honorable Committee will have difficulties in identifying another discovery in the second half of this century that can be compared to the above discovery on true scientific grounds.

I remain at your disposal for any additional information you may need. Thank you for your consideration.

Yours, Truly



### Monographs apparently in the possession of the Nobel Committee

- [a] R. M. Santilli, *Foundations of Theoretical Mechanics*, Vol. I (1978) and II (1982), Springer-Verlag, Heidelberg-New York.
- [b] R. M. Santilli, *Isotopic Generalizations of Galilei's and Einstein's Relativities*, Vols. I and II, Hadronic Press, Florida, 1991.
- [c] R. M. Santilli, *Lie-Admissible Approach to the Hadronic Structure*, Vol. I (1978) and II (1982), Hadronic Press, Massachusetts.
- [d] A. K. Aringazin, A. Jannussis, N. Nishioka, D. Lopez and B. Veljanosky, *Santilli's Lie-Isotopic Generalization of Galilei's and Einstein's Relativities*, Kostarakis Publisher, Athens, Greece, 1991
- [e] D. Sourlas and G. Tsagas, *Mathematical Foundations of the Lie-Santilli Theory*, Ukraine Academy of Sciences, Kiev, 1992.
- [f] R. M. Santilli, *Il Grande Grido, Ethical Probe of Einstein's Followers in the USA: An Insider's View*, Alpha Publishing, Newtonville, Massachusetts, 1984.
- [g] R. M. Santilli, *Documentation of il Grande Grido*, Volumes I, II and III, Alpha Publishing, Newtonville, Massachusetts, 1985.
- [h] G. F. Weiss, *Scientific, Ethical and Accountability Problems in Einstein's Gravitation*, Societa' Editrice Andromeda, Bologna, Italy, 1991.

### Monographs separately shipped to the Nobel Committee

- [i] R. M. Santilli, *Elements of Hadronic Mechanics*, Vol.s I and II, 2nd Ed. 1995, Ukraine Academy of Sciences, Kiev.
- [j] R. M. Santilli, *Isotopic, Genotopic and Hyperstructural Methods in Theoretical Biology*, Ukraine Academy of Sciences, Kiev, 1996.
- [k] J. V. Kadeisvili, *Santilli's Isotopies of Contemporary Algebras, Geometries and Relativities*, 2nd ed., 1997, Ukraine Academy of Sciences, Kiev.