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The Secretariat
The Rolex Awards for Enterprise
PO Box 695, 1211 Geneva 1
Switzerland

THE ROLEX AWARDS FOR ENTERPRISE

OFFICIAL ENTRY FORM

SECTION 1

Name of Entrant: Surname Mr/Mrs/Miss SCHULZ POQUET

First names JUAN JOAQUIN

Address Bolivia 242, 1651 San Andres (Bs.As.), Argentina

Tel. No.: Day 33-1505

Night 755-1764

I declare to the best of my knowledge and belief that all the statements and particulars made with regard to this entry are true and I agree that this entry and declaration form the basis of an agreement with Montres Rolex S.A. under the rules and conditions set out for the Rolex Awards for Enterprise, copy of which I have received together with the official entry form.
I hereby certify to be the sole and true author of the project submitted herewith and that to the best of my knowledge there are no third parties' rights infringed.

Signature of Entrant: _____

Date: March 30, 1977

N. B. Only one entry may be submitted by any one person or group

Entries should be typewritten in English only on one side of the pages of the Official Entry form. Every effort should be made to present the project so that it may be judged on the basis of what is written on these sheets. If extra materials seem essential to a full understanding of a proposed project, they may be sent and will be kept in the Rolex Awards for Enterprise office, where they may be consulted by Selection Committee members wishing to do so.

SECTION 2

PERSONAL DETAILS

a. Name: Juan Joaquín Schulz Poquet

b. Date of birth: April 4, 1939

c. Nationality: Spaniard

d. Present occupation. Job description and position if applicable:

Purchases Manager of Hiram Walker S.A.

I am responsible for all the purchases made by the Company for its production as beverages manufacturer.

e. Education and qualifications with institutions and dates where applicable:

Bachellor (High School) Colegio Nacional Mariano Acosta Bs.As. 1956

Industrial Engineer, Universidad Nacional de Buenos Aires, 1969

SECTION 3

PROJECT DESCRIPTION

a. Give an explanatory title or *short* description of your proposed project:

Optical experiment to prove or refute the validity of the second postulate of Einstein's Special Relativity Theory. That postulate states that light propagates at a constant speed "c", for any reference system, independently from the movement between the observer and the source of light.

b. Under what field of Enterprise do you classify this project?

X Applied Sciences and Invention : This is not perhaps the most suitable classification, as the proper one would be pure sciences.

Exploration and Discovery

The Environment

c. Write a detailed description of your proposed project including a description of any special techniques you might wish to employ. This description should be full enough for the selection committee to be able to judge entries up to the short-list stage.

You may be required to furnish further details if your entry reaches the short-list.

I am aware of the great diffusion the Relativity Theory now has and its mandatory use to calculate cosmical phenomena and the nearly total coincidence between the results afforded by astronomic observations and atomic physics laboratory tests on one hand and the conclusions of the said theory on the other. But understand that the validity of its conclusions may be fundamentally due to these two factors:

1) Casual quantitative coincidence of the geometric-algebraic formulae of this theory and natural phenomena.
2) Valid hypothesis, with all its philosophical implications of a dominant pattern in the Universe, light, with the propagation speed of which all the facts of the universe must be compared absolutely.

I believe that what up to now has been achieved through experimentation are facts belonging to factor 1), while none have been conclusive with regard to factor 2). In that field there only have been refutations and counter-refutations, according to the point of view of each author. This is fundamentally due to the fact that interference phenomena have been used, in which the variables wavelength (λ), frequency (ν) and light speed are linked by the

formula $\lambda = \frac{C}{\nu}$, and, when there are variations in them these can be explained in a different manner, according to whether it is agreed that one or the other does not vary. That is the case of the Doppler effect, which may be interpreted as a variation of λ or ν if we leave C fixed, but which can also be explained as a variation of ν and C, fixing λ, etc.

In the present project we abstract from this type of phenomena and simply measure the speed of light, using the classical Foucault or Michelson method, of the rotary mirror, but with a fundamental difference: the use of a light source external to Earth, which at the same time, is dual.

In the proximity of a full moon, there is a time, when the sun is coming up, when both the Sun and the Moon may be seen simultaneously in opposition on both horizons, the West and East horizon. (See Fig. 2 in enclosed copy).

Fig. 1 is a scheme of the location of an observer at the Ecuator under those circumstances. Calling the Earth's tangent velocity v and C the velocity of the light emitted by the Sun, neglecting the effects of the translation of the Moon and Earth in the direction of the rays tangent to the Earth, the observer would see sunlight arriving at a speed of c+v, and the light of the Moon at c-v.

If a semi-mirror (beam splitter) is conveniently interleaved between the observer and the Sun, so that the mirror reflects the light of the Moon, and the images of both the Sun and the Moon are superimposed (Fig. 2), the semi-mirror will reflect (if adequately built) part of the sun rays, so that the intensities of both images will be of the same order of magnitude. This semi-mirror will allows us to join artificially on one point two light sources with different emission speeds.

We shall now see what may happen if we submit the corresponding light beams to Foucault's rotary mirror (I choose this to represent the process better in a scheme, but any other improved system could be used, Michelson's for example) (See Fig. 3).

It can be easily proven that the displacement d of the image of S, while the mirror A is static, called "C", and the image of S when the mirror rotates at angular velocity, C_1, may be calculated with the formula

$\Phi(\omega)$

$$d = \frac{4\omega D \cdot F}{c} \qquad (1)$$

But this is the displacement of the image of a source emitting light at a speed C. As our source emits light at two speeds, another image C_2 will be formed at the same instant, as a consequence of the delay suffered in the trajectory 2D by the other ray.

The definitive phenomenon will be that together with the displacement of both images, there will be a relative sliding Δd between both, or, in other terms, that while one image moved to C_1 the other one moved to C_2.

Let's see what is the value of this relative sliding, Δd:

(2) $$\Delta d = \frac{4\omega DF}{c-v} - \frac{4\omega DF}{c+v} = 4\omega D \cdot F \cdot \frac{2v}{c^2\left(1 - \frac{v^2}{c^2}\right)}$$

Neglecting the value $\frac{v^2}{c^2}$ in the denominator,

(3) $$\Delta d = \frac{8\omega DFv}{c^2}$$

If for $\omega = 2\pi n$ p s we choose $n = \frac{1000}{seg}$, D=F=1km and we take v=400 m/seg.

(We take into account that actually v must be $v = v_e \cos\varphi$, being v_e the tangent speed of the Earth and φ the angle of hour inclination of the Sun and the Moon at the instant of the observation).

Solving (3) we arrive to: d = 0.2233 mm, deviation which may be noted using an adequate telescope L.

To increase the accuracy of the observation we should increase the values of D and F conveniently, within practical limits.

This experiment can also be applied superimposing the images of planets and stars conveniently chosen and thus evidence (or not) their different speeds with respect to the Earth.
The description of the experiment is completely elementary and schematic, and the dimensions quoted can be varied according to practical convenience.
As can be understood from the description of the experiment, I believe the results will be positive, that is to say, that the difference of speed of both light sources will be evidenced.
I have been working on the development of a theory which arrives at the same practical results as Einstein's, but within the boundaries of classical Mechanics. The sin of which the latter is guilty is not taking into account the high speeds which may be acquired by celestial bodies or atomic and subatomic particles and that the different force fields of Physics (gravitatory, electric, magnetic, etc.) have a propagation speed. Consequently, the speed of a particle must be related to that of the field to which it is subject, in the same manner that to calculate the force received by a Sail boat under the action of the wind, it is necessary to take into account the relative speed of the boat with regard to the wind driving it.

The development of this concept(and other which are beyond the scope of this paper) explain the phenomena of particles at great speeds and their relationship with the quotient v/c and v^2/c^2 so frequently encountered in the formulas of The Theory of Relativity. But it is precisely to be able to choose between one or the other that I consider it important to conduct experiments as the one I have proposed.

d. Names, addresses, telephone numbers and a brief outline of at least three individuals competent to act as references for your Enterprise project, and willing to provide information to the Secretariat if necessary. The references that you give may be used by the Secretariat in evaluating the validity of your submission. Additionally, of course, the Selection Committee has its own sources of information and may call upon outside advisors in assessing your proposal.

After analyzing different possibilities, I recently thought (I am writing this in the early hours of March 30, 1977) of the experiment about which I am writing. So I was not able to obtain any references due to the absolute lack of time. I request you kindly grant me an extension to be able to fulfil this point.

e. Please give details of any books, papers, photographs, films and other material published or held by the entrant, that may help in assessing your project.

SECTION 4

PROJECT DETAILS

a. Expected duration of project (start date and date of expected completion). These dates can be approximate and will not be treated as final or binding.

A compilation of a complete list of instruments may demand between 3 and 4 months. The experiment in itself is immediate as it only requires a cloudless clear night, and a full moon.

b. Amount and nature of any additional contributions toward this project, for instance if you are receiving or expecting aid from a university or other organisation or individual, please give details:

I may receive technical support and instruments from the Universities of Buenos Aires and La Plata. If I should be considered the winner, I would surely also receive contributions from private institutes and companies.

c. Previous grants received for this project, grants now available, or applications to other organisations which are now pending, stating whether they are additional to your request for the Rolex Enterprise Award (i.e. if one of them is granted, will it make this award application unnecessary?) If you have had previous grants for any project, please list these grants:

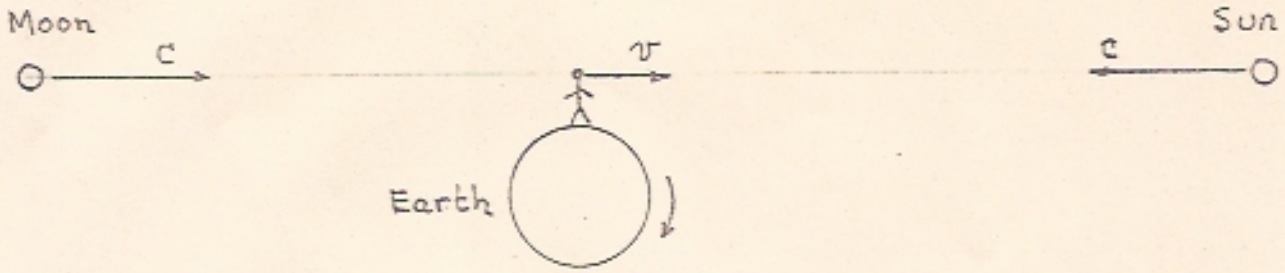

Fig. 1

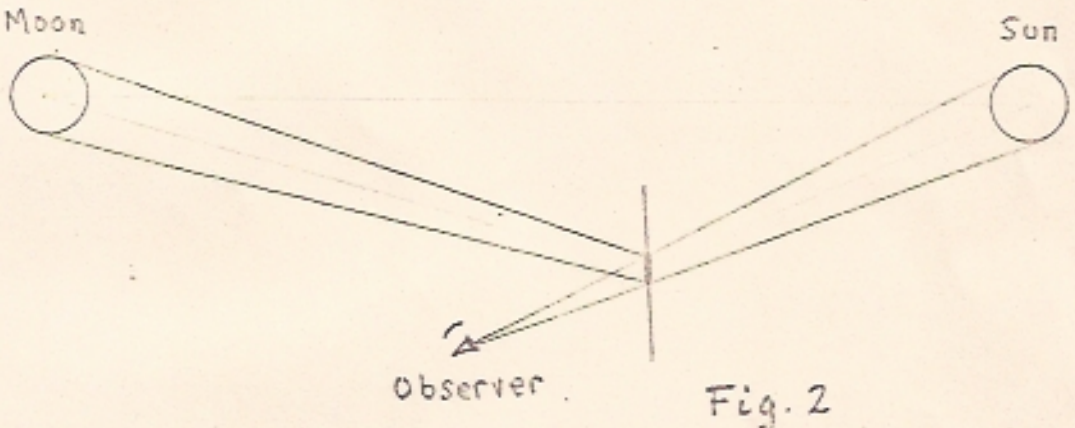

Fig. 2

Fig. 3