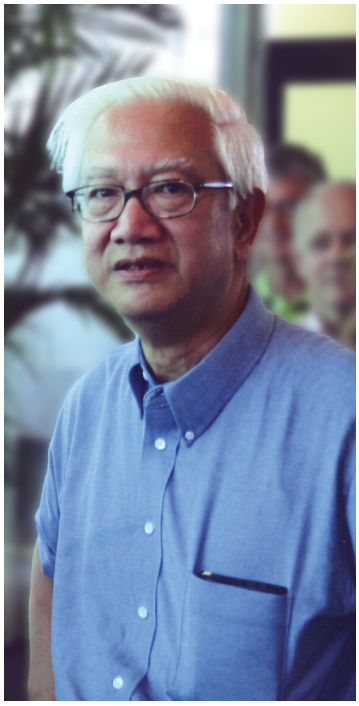
John Alexander Tjon
1937 - 20 September 2010



John Alexander Tjon, a giant in the field of few-body systems, passed away suddenly on 20 September 2010 in Bilthoven, The Netherlands.

Born on 7 December 1937 in Paramaribo, the capital of Surinam, which was at the time a Dutch colony, John received his education in The Netherlands. In 1964 he received his PhD at Utrecht University under the guidance of Professor Nico van Kampen, of statistical physics renown, with a dissertation on the quantum-statistical theory of spin systems.

Soon after he began work on the theoretical treatment of few-nucleon systems using exact methods for solving the equations describing their quantum dynamics, a new line of research for which he became rightly famous.

His most cited work is the solution of the Faddeev equations for the bound state of three nucleons using local two-body interactions. This work, published in 1969 and done together with his graduate student, Rudi Malfliet, became a benchmark in the few-body community. Before that time, separable interactions had been widely used because they simplified the calculations.

With the advent of accurate experiments on the electromagnetic interactions of very light nuclei at high momentum transfers, the need of a covariant treatment of few-body systems and electromagnetic currents became urgent. In a pioneering paper written with Ahmadzadeh and already published in 1966, Tjon had studied possible relativistic generalizations of the Faddeev equations and a year later he began publishing on the use of the Bethe-Salpeter equation for two-nucleon systems.

The relativistic description of few-body systems, in particular in nuclear physics, but also in other hadronic systems, became the most important theme of his work in the following years. Realizing that covariant descriptions are not limited to the Bethe-Salpeter equation, he studied several quasi-potential equations for their usefulness in nuclear physics and, together with Yuri Simonov, he applied the Feynman-Schwinger representation in field theory as a tool to derive effective Hamiltonians to be used in QCD. Later, with his graduate

student, Taco Nieuwenhuis, he used this technique to compare ladder and generalized ladder sums in scalar field theories, showing for the first time the numerical importance of crossed ladder diagrams in nonperturbative calculations.

In the 80's and 90's he became interested to understand the relativistic approach to proton scattering by nuclei. The experimental data for spin observables were explained nicely by use of a relativistic potential in the Dirac equation. Tjon and collaborators connected this with his work on the relativistic treatment of the nucleon-nucleon interaction in order to provide theoretical underpinnings to the potential used in proton scattering.

His most recent work was again concerned with electromagnetic processes. Different methods to determine the ratio of the proton's electric to its magnetic form factor gave different results. Tjon realized that the commonly used one-photon exchange approximation in electromagnetic interactions could be responsible for the discrepancy, and performed with several co-workers a calculation of the two-photon amplitude. This intuition proved right, as the two-photon correction entered differently into the two experimental determinations and it accounted for most of the discrepancy. His latest published paper applies the same method to the electric form factor of the pion.

Appointed associate professor of theoretical physics at Utrecht University in 1967 and full professor in 1971, John became the teacher of numerous students. He took a lively interest in the work of his students. In particular, his style of supervising graduate students was exemplary: while encouraging them to explore their own interests, he closely watched their progress, giving them the best possible advice.

John was sought as a collaborator, not only for his feeling for interesting problems beyond the frontier, but also for his technical mastery at solving complex problems. He was a kind person with a firm belief in scientific integrity and honesty, and was an acknowledged leader in his field. In 1997 John Tjon was elected member of the Royal Netherlands Academy of Arts and Sciences.

John was a passionate physicist. The few-body community, his colleagues, his friends, and his family miss him greatly.

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