SYMPOSIUM VLADIMIR JURKO GLASER
Ruđer Bošković Institute
October 20, 2015
Lecture hall in the first wing

V. J. Glaser was the first Head of Division of Theoretical Physics at RBI from 1955 until 1957, when he went to CERN and from 1959 until 1984 he was the permanent member of Theoretical Division at CERN. He passed away in 1984.

Vladimir Glaser wrote the first book about quantum electrodynamics in Croatian ("Kovarijantna kvantna elektrodinamika", 1955, JAZU, Zagreb), which is one of the first such monographs in the world.

His works, especially the 1973 paper "The role of locality in perturbation theory", related to renormalization known as Epstein-Glaser renormalization, are being frequently cited in the area of theoretical and mathematical physics even today, after almost 50 years.

Program:
11:00	Opening – Ž. Crljen, Head of Theoretical Physics Division
11:05	N. Bilić: Introductory word about V. Glaser
11:30	P. Blanchard: Selected pieces of V. Glaser's typical publications
12.30	Discussion
12:45	Lunch break
14:15	J. Gracia-Bondia: A case study in Epstein-Glaser renormalization
15:15	Coffee

Abstracts:

Philippe Blanchard (Uni. Bielefeld, Germany): ***Selected pieces of V. Glaser's typical publications***

Mathematics is the product of the free human mind while physics is a natural science with just a goal namely uncovering the structure of matter. The role of mathematics in physics was always taken by physicists with mixed feeling of admiration and irritation. Mathematics was never more useful than it is today as an essential tool in achieving progress for the expression of their pertinent concepts and results in quantum physics and quantum field theory. V. Glaser was a great mathematical physicist and used both disciplines with an exceptional clarity and elegance.

In my talk I shall try to describe some examples who illustrate Jurko's remarkable skill.

Contents
- Stability of matter
- Semi-classical limit
- Axiomatic QFT (analyticity properties, from Euclidean to Wightman formulation)
- Higgs potential and supersymmetric theories

J. Gracia-Bondia (Uni. Zaragoza, Spain): **A case study in Epstein-Glaser renormalization**

In almost every book of quantum field theory (QFT) one finds the neat
formula for the scattering matrix. However, every practitioner knows that this is only the
beginning of trouble, since the expression is not really defined: the (in)famous ultraviolet
divergences of QFT originate in this fact. The virtue of Epstein-Glaser (EG) renormalization
is that it deals with the problem by the methods of distribution theory, in such a way that all
quantities appearing in the calculations are mathematically well defined.
Formula for scattering matrix is perturbative, and its essential complications, as well as the
method of their solution, are already evident at second order. So we shall proceed
by a particularly instructive second-order case study, to wit, the Compton effect for spinless
particles. Typically, at second order we encounter tree graphs as well as loop graphs.
In EG renormalization, the distinction between them is to some extent erased.
This is illustrated in the model at hand, leading to quantum gauge invariance.
If time allows, we would also tackle the basic loop graph for vacuum
polarization in our scalar electrodynamics model by the EG procedures.

*Symposium is organized by Group for Theoretical and Mathematical Physics (led by Stjepan
Meljanac), Division of Theoretical Physics.*