

Laudatio for Jürg Fröhlich for the Poincaré Prize 2009

by K Hepp, ETH Zürich

When I was asked to give the laudatio for Jürg Fröhlich for his Poincaré Prize 2009 I immediately accepted this honor without realizing my total incompetence, having worked as a neuroscientist for the second half of my life. How could I give to this expert audience nontrivial insights, for instance about the connection between 'Random Walks, Critical Phenomena, and Triviality in Quantum Field Theory', about which topic Jürg is so proud that he and his collaborators have devoted to it an advanced monograph (Springer 1992), well known to many graduate students here? Nevertheless I will try to do my best for the proceedings of this congress , at least by correctly spelling most of the key words.

Among people in this audience I probably know Jürg for the longest time. With the help of G Felder and GM Graf, and the support of W Beiglböck, I was recently taken by Jürg on 'A Journey through Statistical Physics', in the task of editing an impressive Selecta Volume (Springer, 2009) which you should all admire at the Springer book exhibit.

Jürg Fröhlich was born on July 4, 1946 at Schaffhausen in northern Switzerland. From 1965 to 1972 he studied mathematics and physics at the ETH Zürich and obtained there with honors a Diploma and a PhD in physics, with R Schrader and myself as midwives and R Jost and M Fierz as grandparents. Already in this period Jürg showed an intriguing complexity: As a brilliant student he felt infinitely old, charged by a load problems to keep him busy till to the end of his life. Still, as you can see, he is incredibly young even now!

Moreover, although he is internationally widely visible as a famous lecturer at congresses and summer schools, he always lived in the deep infrared, in his PhD thesis on the infrared problem in E Nelson's model, later when deriving with B Simon and T Spencer the powerful infrared bounds in statistical mechanics and quantum field theories, and today when analysing nonrelativistic quantum electrodynamics, as you will hear in A Pizzo's invited talk at this conference.

Jürg's Wanderjahre from 1972 to 1982 were probably the most beautiful period of his life. He got married to Eva Schubert and has two daughters. His peregrinations took him first to J-P Eckmann in Geneva, then to A Jaffe at Harvard University, then to E Lieb, E

Nelson, E Seiler, T Spencer, B Simon and A Wightman at Princeton, and finally as 'professeur permanent' to the IHES near Paris. In the fall of 1982 he started as the successor of R Jost in the Physics Department of ETH Zürich, to which he kept his fidelity.

Characteristic for Jürg's style is the attention to mathematical precision combined with a solid physical motivation. While it is hopeless to deduce in a mathematically rigorous way the behavior of a real physical system from the basic laws, Jürg has obtained many interesting limiting laws using powerful mathematical theories, by introducing ideas from quantum field theory into statistical mechanics and condensed matter physics. Helpful was his insight that research in physics is most fruitful and entertaining as a collective enterprise. This can be seen in the list of more than 144 co-authors in more than 284 publications, as counted by A Jaffe for his wonderful slide-show 'Constructive Jürg', a highly valuable Internet download.

When we edited the Selecta Volume we asked ourselves what of the Alpine landscape of Jürg's oeuvre we should include and where we should locate the highest peaks. For me the papers 'The Kosterlitz-Thouless Transition in Two-Dimensional Abelian Spin Systems and

the Coulomb Gas' and the 'Absence of Diffusion in the Anderson Tight Binding Model for Large Disorder or Low Energy' are definitely of 'Matterhorn' format. Both were climbed together with T Spencer 'in winter and without gloves', as A Connes would say. As a neurobiologist living on treacherous ground I also enjoyed the acrobatics leading from Chern-Simons gauge theory to quantum Hall systems in a collaboration with T Kerler.

Jürg's work has been internationally recognized by many prizes: the 'Latsis Prize' of the SNF, the 'Heineman Prize' of the APS, the Swiss 'M Benoist Prize', the German 'Max-Planck Medal' and now the 'Poincaré Medal'. He has honorable affiliations with the IHES in Paris and the University of Zürich.

Since 1982 he 'has been struggling with trying to fulfil the diverse obligations and duties of an ETH professor, with varying success', as he modestly described it. This is a profound understatement: Jürg has been instrumental for creating a 'Center for Theoretical Studies' at the ETH Institute for Theoretical Physics, he has been a powerful Chairman of the ETH Physics Department for many years of institutional turmoil and, by combining insights from old age with the fervour of the 68-generation, he has aided the governors of ETH

to permit us to do meaningful work, also in mathematical physics.

Jürg is carried by the principle of Confucius of the unity of knowledge and action, as formulated by Wang Yangming (1472-1529) in the early 16th century in China: 'Knowing is the intent of acting and acting is the work of knowing. Knowing is the beginning of acting and acting is the completion of knowing'.

Congratulations and thank you, Jürg!

Klaus Hepp