

Winter Schools of Theoretical Physics in Karpacz

In search for winter, snow, and ... science

(Piotr Garbaczewski)

The 60th anniversary celebration of Karpacz Winter Schools has been scheduled for the second half of May 2024, when Spring is in full swing and summer glimpses often happen. And basically (presently at least, climate changes follow) there is no winter, nor snow around, except for the top of Sniezka mountain (1604 m).

That appeals to personal memories of the fairly distant past. My first encounter with the School, in February 1969, happened during the third year of physics studies in Wroclaw. The reason was the Kindergarten of Theoretical Physics, organised with great commitment by Bernard Jancewicz. We had young Warsaw physics students in the company – J. Mostowski and K. Wódkiewicz, pushing us to inferiority complex- they had legendary courses of modern analysis given by K. Maurin, and we did not. Kindergarten participants could follow great lectures on gravitation by M. Demianski. Clearly, skiing and the night bridge competitions (not forgetting about wine) have been compulsory elements of students' life. This was the first time I had ski on my legs.



In reference to the present May 2024 anniversary, I have special early summer memories. In the first half of June 1975, on profesor Jan Łopuszanski order, I have organized an ephemeral Wrocław-Karlsruhe School for Young Scientists in „Samotnia” shelter home in the heart of Karkonosze mountains (with revisit in Fulpmes, Austria in April 1976). With some hard efforts (politics !), in the last moment, 7 days before the scheduled beginning, we have secured Polish visas for six bright students of the Julius Wess group. Among them we had Martin Sohnius and Hermann Nicolai. Victor N. Popov (Faddeev-Popov ghosts) gave us special invited lectures on path integration methods in gauge theories. He was an exquisite chess player, and a great surprise (completely accidental, but not without some imagination) has happened, I was once a winner. Together with Jan Rzewuski as our outdoor leader, we had an opportunity to run „chocolate slaloms” (skiing on the late spring snow, in the full sun, with possible stops and downfalls in the chocolate-colored mud) in the cirque of the Little Lake above „Samotnia”. A part of this memory is that Martin Sohnius has been in the process of an intense collaboration with Rudolf Haag and Jan Łopuszanski, whose outcome was the H-Ł-S theorem (see Wiki) on central supersymmetric charges.

Coming back to Winter Schools proper, an attendance in many of them was a natural obligation combined with pleasure, for most of scientific employees in the Institute of Theoretical Physics of Wrocław University, younger and senior ones.

To give a glimpse of the Schools meaning to us (in Wrocław) and the growing reputation of Winter Schools in the theoretical physics community in Poland and abroad, let me make a glimpse of 1978 15th School (organized by W. Karwowski) on „Mathematical aspects of quantum field theory”. Who was among the lecturers ?... J. Łopuszański, H. Borchers, J. Klauder, J. Fröhlich, K. Osterwalder, G. Jona-Lasinio, A. Barut, K. Pohlmeyer, D. Buchholz. On the group photo you can find future ITP professors: me, K. Redlich, Z. Popowicz, Z. Haba.



In the coming years, I have written my own part in the history of Winter Schools, as the director, co-director, co-organizer and the lecture volumes editor of five of them. They reflect my personal (and in part these of the co-organizers) scientific interests and their evolution from about 1991 to 2015.

Under the personal badge „Nonlinear dynamics, Stochastics, Chaos”, I have on the record schools: 1991- „Nonlinear Fields: Classical, Random Semiclassical” (with Z. Popowicz), 1995- „Chaos: The interplay between stochastic and deterministic behavior” (with M. Wolf and A. Weron), 2002- „Dynamics of dissipation” (with R. Olkiewicz), and an organisational/editorial contribution to schools 2010-”Quantum dynamics and information” and 2015- „Irreversible dynamics: Nonlinear, nonlocal and non-Markovian manifestations”.

I am particularly fond of the 1995 and 2002 schools, whose proceedings have been published in the Springer Lecture Notes in Physics series. These volumes, in addition to hard-cover originals, have received the soft-cover editions, respectively in 2013 and 2010, and are currently available on-line.

To identify some of reasons for the Schools reputation, excerpts of external opinions about these exemplary volumes are worth citing.

Concerning the year 1995 School, R. Blümel (Freiburg) has written: „In my opinion the book is essential reading for anyone who wants to become or stay up to date in the modern developments of chaos and quantum chaology”.

The year 2002 School has received a recommendation: „The value of this volume is that it helps to give students and other researchers a view of the big picture in non-equilibrium statistical physics”.

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