

PREFACE

This special volume of *Acta Physica Polonica B* has been prepared to celebrate the 100th anniversary of our journal established in 1920 by the Polish Physical Society. It was a difficult time then, not even two years since the end of World War I and the reestablishment of the Polish state. The Polish Physical Society itself was founded in the same year and immediately set up a scientific journal entitled *Comptes Rendus des Séances de la Société Polonaise de Physique* (*Sprawozdania i Prace Polskiego Towarzystwa Fizycznego*). It took, however, three years before the first volume including the articles submitted in 1920–21 would be printed. Since then, the journal was published on a more or less regular basis until 1932 when the Editorial Committee decided to change its name to *Acta Physica Polonica*.

Initially, *Acta Physica Polonica* published articles in Polish with abstracts in French, German or English. Later, full articles in these three languages were also accepted. In the meantime, in 1936, the seat of the Editorial Committee moved to Wilno (today's Vilnius in Lithuania, but then a part of Poland) until the outbreak of World War II.

After the War, the journal was reestablished in Kraków and the first volume was printed in 1947. The journal was published initially as a quarterly and finally, since 1961, as a monthly. In 1970, *Acta Physica Polonica* was split into two series, *A* and *B*, the first one covering as of today, general physics, atomic and molecular physics, condensed matter, optics and quantum optics, quantum information, biophysics and applied physics, and the second one publishing articles in general and mathematical physics, particle physics and field theory, nuclear physics, theory of relativity and astrophysics, and statistical physics. Both series were still published in Kraków until 1991 when *Acta Physica Polonica A* moved to Warszawa.

Today *Acta Physica Polonica B* (*APP B*) is published in Kraków by the Jagiellonian University in cooperation with the Polish Academy of Arts and Sciences. Since 1999 all current and past articles have been freely available on an open access basis, and since 2014 the journal has been partially supported by the SCOAP³ consortium located at CERN. In 2008, responding to the request from the organizers of the conferences in physics topics covered by *APP B*, the Proceedings Series was established, and is published as a quarterly.

The present volume is a collection of articles prepared by the members of the International Editorial Council (IEC), former editors of *Acta Physica Polonica B* and invited guest authors. We have also received a very emotional and moving contribution by Martinus Veltman, the Nobel Laureate and a member of the IEC, but also a friend and a frequent lecturer at the Cracow School of Theoretical Physics, and the author of the two most quoted articles published in *APP B*: «Second Threshold in Weak Interactions» and «The Infrared–Ultraviolet Connection» that gained more than 900 and 700 citations, respectively. Given the fact that our journal was floating over the waves of world history spanned by two wars and the decay of communism, we decided to include this short story, submitted by professor Veltman:

In this note I will try to show why I have sympathy for anything Polish. I have to go back to 1944–1945 when The Netherlands were partly free, partly still occupied by the Germans. That situation persisted from September 1944 till May 1945. At that time I was living in the free part, liberated by the allied troops of which the Polish troops were a significant part. So, as a 13-year-old boy I came into contact with Polish soldiers.

I do not remember too much of that time, except the names of one Polish soldier (Roman Paskowski) and his friend, Hendrik. Unfortunately, Hendrik got killed at some point, near Breda. Of course, since the Polish could not go back home (it being occupied by the Russians) many actually remained in the Netherlands, in particular in Breda. They are still very strong there. Breda is not very far from Waalwijk, where I lived.

Of the many things that I learned from Roman I forgot most, except the Polish word for ashtray (popielniczka). You would be astonished to know how one can suggest a big knowledge of Polish knowing only one word.

In some real way I still feel indebted to the Polish. Being an editor is a very small way to pay back for what the Polish have done for us.

Martin Veltman.

The volume consists of eight contributions that, we hope, you will find interesting both scientifically and, in some cases, historically. The first contribution, by Andrzej Białas, chairman of the IEC, contains his personal reminiscences on one of his most quoted articles on the wounded nucleon model, completed in 1976 in collaboration with Wiesław Czyż and Marek Bleszyński. Today, when relativistic heavy-ion collisions are the top priorities at CERN and in Brookhaven, this model serves as a benchmark when looking for the quark–gluon plasma. This article is based on a talk given at the Jan Kochanowski University in Kielce at the celebration for the Honorary Doctorate presented to Peter Seyboth, who, together with Marek Gaździcki

and Mark Gorenstein, is the author of the second article in this volume devoted to the search for critical structures in heavy-ion collisions. Next, the article by Larry McLerran, a member of the IEC and the Honorary Doctor of the Jagiellonian University, is devoted to a different aspect of nuclear physics, namely to the properties of nuclear matter in extreme conditions in connection with neutron star physics. The particle physics thread of this volume is completed by the paper of Alan Martin, a member of IEC, and Mikhail Ryskin on the determination of parton densities that are of utmost importance in predicting particle yields for present high-energy experiments investigating properties of the Higgs boson and searching for the New Physics beyond Standard Model.

The next two articles follow the legacy of Marian Smoluchowski, former Rector of the Jagiellonian University and the author of seminal papers on Brownian motions. Andrzej Fuliński, a chemist and a physicist, and a former editor of *APP B* is the author of the review on fractional Brownian motions. This review is followed by the article by Peter Hänggi, Jerzy Łuczka and Jakub Spiechowicz that addresses non-equilibrium anomalous transport phenomena. In 2019, Professor Hänggi received the prestigious Polish–German Marian Smoluchowski–Emil Warburg award, in recognition of his contribution to the studies of fluctuations in statistical physics in equilibrated and in unequilibrated systems. This award was presented to professor Hänggi at the 45th Congress of Polish Physicists by Józef Spałek, the Chairman of the Organizing Committee, and the author of the next contribution to this special issue of *APP B*, in which the author discusses some of the fundamental topics related to the physics of strongly correlated fermions. This article is based on a special lecture presented by professor Spałek at the Congress on the occasion of receiving the Marian Smoluchowski Medal in Physics.

We close with the article by Andrzej Staruszkiewicz, former Chief Editor of *APP B*, where he addresses a certain technical problem of the quantum theory of the Coulomb field, which, however, leads towards a novel formulation of the probabilistic interpretation of quantum mechanics.

We hope that you will find this special volume of *Acta Physica Polonica B* interesting and stimulating. We would like to thank all the authors that contributed to this issue and we invite all readers to contribute to the next volumes of our journal in the beginning of the next (hopefully) 100, or possibly more, years in service to the physics community.

On behalf of the Editorial Committee
Michał Przaszłowicz
Chief Editor