Jan Kwieciński 1938–2003

Jan Kwieciński, head of the Department of Theoretical Physics at the Henryk Niewodniczański Institute of Nuclear Physics in Cracow, Poland, died unexpectedly on 29 August 2003.

Jan graduated from the Jagiellonian University in Cracow in 1960 with a degree in theoretical physics. He then devoted his entire scientific career to the Institute of Nuclear Physics, which was created in 1955 by Henryk Niewodniczański. There he joined the theory group formed by Wiesław Czyż. The group later transformed into a department, which was headed by Jan from 1988 until his death.

From the beginning Jan was a very independent researcher with a strong mathematical background. As Czyż recalls: “At first I made an attempt to introduce him to some simple problems in nuclear physics, but I quickly realized that he was ‘a cat who walks his own path.’” The theory of strong interactions was the major focus of Jan’s research. His early work concentrated on the analytical properties of amplitudes for high-energy hadron collisions. He successfully applied Reggeon calculus to the dual theory of the scattering matrix and high-energy nuclear collisions. Soon after the formulation of quantum chromodynamics (QCD), he studied the Regge limit of QCD, which he successfully applied to the description of semi-hard processes. In 1980 he wrote a seminal paper on a three-gluon exchange with odd charge parity, where he derived the odderon equation now widely known as the BKP (Bartels–Kwieciński–Praszalowicz) equation.

The last 15 years of Jan’s scientific activity were dominated by the physics of deep-inelastic scattering at small values of the Bjorken variable x. His papers with Alan Martin were vital for the experimental programme at HERA in DESY. Jan was one of the first to understand the implications of the increase of gluon density at small x on the behaviour of the total cross-sections such as in the structure function F2 or the minijet cross-section. He also pioneered studies of nonlinear parton shadowing effects. Recently, with his Cracow collaborators, he discovered a new type of scaling in deep-inelastic scattering at small x.

Jan’s scientific work was strongly valued by experimentalists, who were always eager to enter into discussions and collaborate with him. Together with experimentalist Barbara Badolek he wrote important papers on nucleon structure functions at low Q2, spin structure functions and nuclear shadowing. In the last few years he mostly worked on projects oriented towards the future, such as cosmic-neutrino interactions at the highest energies and the application of unintegrated parton distributions to Higgs production at the LHC.

Jan formed collaborations with physicists in many physics institutes around the world, and made lengthy visits to several of them. In particular he had a long and fruitful collaboration with the University of Durham in the UK, where he was a visiting professor. In all these places he made many friends, who were impressed by the depth of his theoretical insight into current experimental results.

In recognition of his scientific achievements Jan was elected a member of the Polish Academy of Arts and Sciences and the Polish Academy of Science. Grey College of the University of Durham also awarded him an honorary fellowship. In addition, he was a member of the editorial boards of Acta Physica Polonica B and the European Physical Journal C.

Jan was also an inspirational teacher. His enthusiasm and competence attracted many research students, both in Cracow and the other places he visited. He was always generous to people, full of trust and respect, and ignited others with his enthusiasm. His gentleness in treating people led one of his English friends to say about him: “absolutely the kindest man I have ever met in my whole life.”

Jan had three great passions in life: physics, music and mountains. He was a keen pianist and members of Grey College can fondly recall his performances, which were sometimes played in a duet. Jan was also a fervent mountain hiker and skier. His long-lasting love of mountains ended on a mountain trail. He is sorely missed.

Krzysztof Golec-Biernat and Leonard Leśniak, Institute of Nuclear Physics in Cracow.