

Inside Story

The phys–math magnet in central Siberia

A unique physics and maths boarding school located in Siberia's famous Akademgorodok is still going strong after 55 years.

The Phys–Math School in Novosibirsk's Akademgorodok region began with the first all-Siberian physics and mathematics Olympiad in 1962. Well-known mathematician and creator of Akademgorodok, Mikhail Lavrentiev, called it an expedition for talent, and aimed to open a boarding school for the brightest students. Lavrentiev was convinced that future scientists should be trained from the school's bench, and his vision took hold.

While the organisation of the Phys–Math School continued over the autumn of 1962, its birthday is 23 January 1963 when the school officially opened its doors and the first lectures were delivered. These could hardly be called lectures in the usual sense – they were stories told by prominent scientists, interleaved with experimental demonstrations and discussions about the most recent scientific results. The teaching process in the school reproduced that of the neighbouring Novosibirsk State University, giving students a solid base for a scientific career, says Vladimir Shiltsev, who is a 1982 graduate of the Phys–Math School and now director of the accelerator-physics centre at Fermilab in the US.

Developing the teaching approaches in the first days of the Phys–Math School was a wonderful process of co-operation between scientists and pupils. The American Physical Society's 2016 Robert R Wilson Prize recipient and 1964 school graduate Vasilii Parkhomchuk, famous for his work on electron cooling, recalls that the lectures in the school were taught by such professors as Gersh Budker (the founder of the Institute for Nuclear Physics, now called Budker INP). However, Parkhomchuk, who is now head of the lab at INP, says that, looking back at that time, the teachers did not know how to



(Clockwise from top left) The Phys–Math School in Novosibirsk, Russia. Students deriving formulae during a class. Graduates of the 1963 class.

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teach from a pedagogical point of view – they themselves were learning by doing. Professors and students “went to school” together, making it a magnificent collaboration and part of the brilliant programme envisaged by Lavrentiev and his colleagues.

The history of the Novosibirsk Phys–Math School is connected to many developments in high-energy and accelerator physics, and also to CERN. These connections are via personalities – graduates of the school who became known or influenced the creation of facilities at CERN, like the LEAR electron cooling system, which was inspired by a visit by a CERN team to Novosibirsk and their interaction with the INP team. The Siberian school, like CERN, is a magnet that attracts the brightest minds into science. Mastering

the ability of young scientists to find the key physical effects related to a complicated physical phenomena and then to make relevant estimations – such as working out in a few lines what happens when an asteroid strikes a planet – is one of the key training approaches of the school. Indeed, the school has served as a model for training in other parts of the world.

Today there are 500 pupils in the school, educated by more than 260 highly qualified teachers and academics. A total of 15,000 students have graduated since the school's creation, 25 per cent of which have PhDs and around 500 have DSc degrees. There are around 25 students per class and pupils can spend one, two or three of their last years of high school there. Competition is strong, with candidates first being invited to a summer school based on results of physics Olympiads and only the best performers are then invited to the Phys–Math School.

So congratulations to the Novosibirsk Phys–Math School at the start of the new academic year – a year in which it will celebrate its 55th birthday – and wishing it continued success for many years to come.

● Andrei Seryi, John Adams Institute, UK.

Image credits (clockwise from top): Phys–Math School; V Parkhomchuk