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### **Report on lesson learned and Internationalization of the NICA experiment collaborations**

A major objective of the CREMLIN proposal was the development of a prototype silicon detector system for the BM@N experiment at the Nuclotron, which is regarded as a “Phase 0” project both for the “Compressed Baryonic Matter” (CBM) experiment at FAIR and for the “Multi-Purpose-Detector” (MPD) experiment at NICA. The detector development was jointly performed by groups from the international CBM collaboration, and scientists from JINR and from Russian universities, which are also members of the CBM collaboration. The common activities included various tasks: the design and realization of detector modules based on double-sided micro-strip silicon sensors, the construction of ultra-low mass carbon support structures, the development of a novel free-streaming frontend electronics, and the development of software packages for simulation, reconstruction and data analysis. These joint activities intensified tremendously the cooperation of the involved groups including the exchange of know-how. Many young people from different countries received an in-depth training in state-of-the art detector technology and software development. For this project, new infrastructures including special clean rooms have been built at JINR, equipped with modern instrumentation for silicon detector tests and assembly.

CREMLIN has supported organization of three mini workshops on the subject of the WP3 taken place at VB LHEP which turned out to be very useful for establishing good work contacts between experts from Germany and Russia working together on challenging technical issues. CREMLIN has made it possible also to undertake business trips of Russian researchers to CERN to discuss additionally these items with the best world experts in the field working at CERN on similar subjects. These contacts, as well as attendance of the workshops organized by the CREMLIN coordinators on other work packages, broadened our understanding of how the research is organized in EU.

Meanwhile, CBM member groups from Germany, Poland, Czech Republic, Hungary and France have declared their interest in the upcoming experiments at JINR. In fact, the CREMLIN project allowed to bundle the resources, created large synergies, and, finally, was an important first step towards the internationalization of the NICA experiment collaborations.

In April 2018 the first meeting of the BM@N and the MPD collaborations took place at JINR. In total, 220 scientists from 19 countries worldwide participated in the discussions. As a result of the meeting, the collaborations were officially founded and bylaws were adopted. The board of institutions appointed search committees for spokespersons and board chairs, who will be elected at the upcoming collaboration meetings in October 2018. The organization of the meetings was facilitated by the new User Office which provided access permission to the institute in a non-bureaucratic way.

Moreover, the Joint Institute is in the process to improve its infrastructure for visiting scientists from other countries further in order to be prepared to host a larger number of users, which will be participating in the coming years in the preparation and execution of experiments at the new NICA accelerator facility.