

REPORT OF THE **SPD** PROJECT LEADER AT JINR

Alexey Guskov, JINR

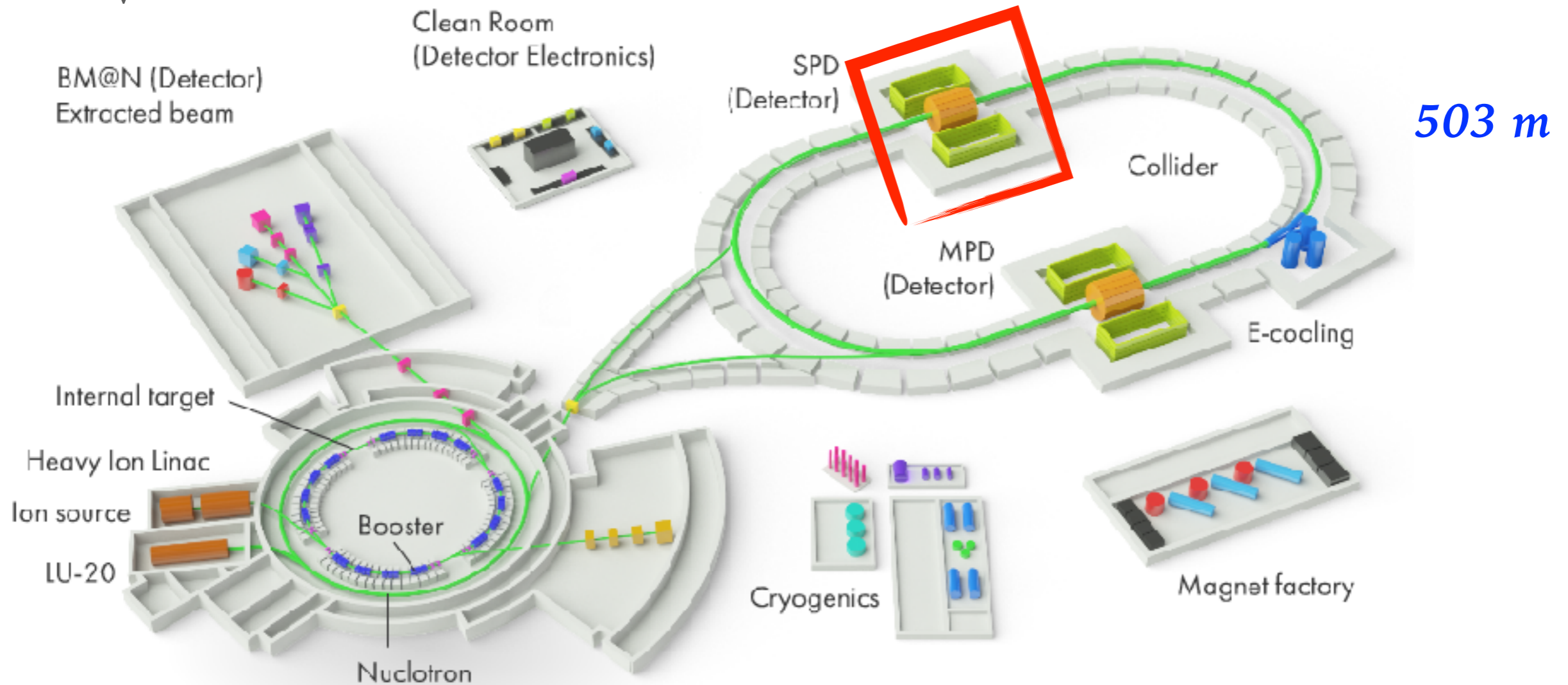
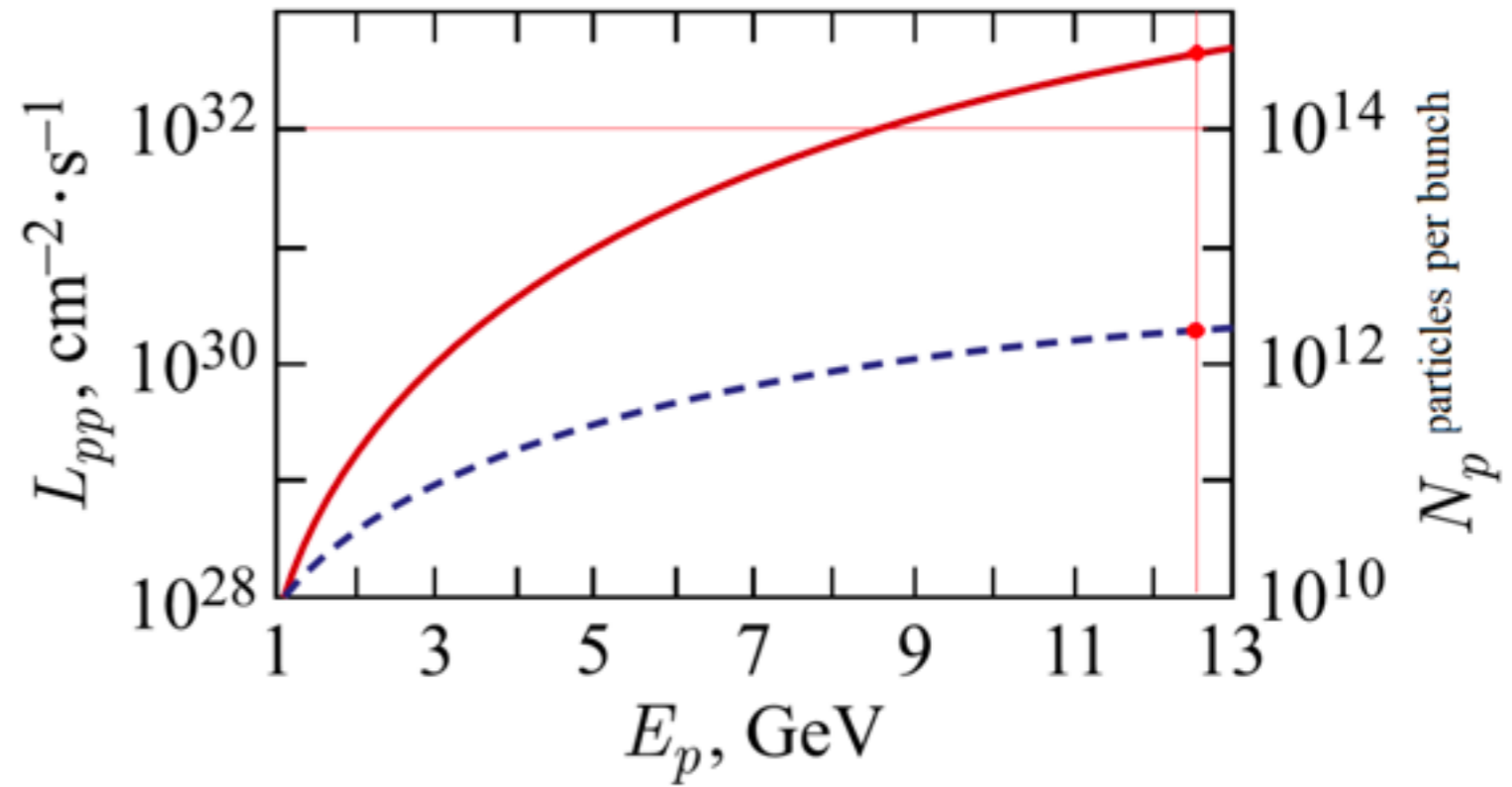
SPD AT NICA

NICA - Nuclotron-based Ion Collider fAcility

$p^\uparrow p^\uparrow : \sqrt{s} \leq 27 \text{ GeV}$

$d^\uparrow d^\uparrow : \sqrt{s} \leq 13.5 \text{ GeV}$ **U, L, T**

$d^\uparrow p^\uparrow : \sqrt{s} \leq 19 \text{ GeV}$ **|P| > 70%**



SPD INTERNATIONAL COLLABORATION



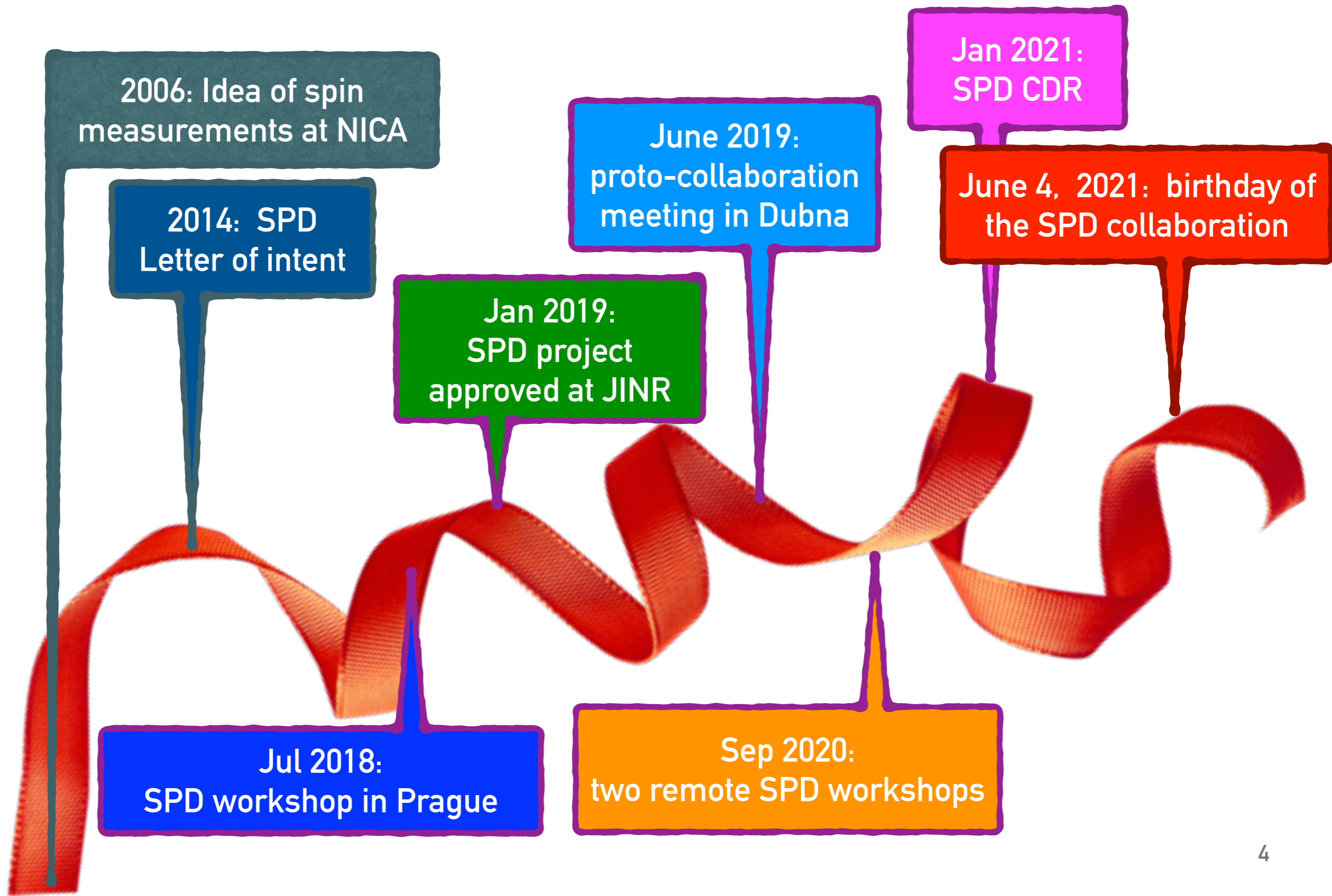
32 institutes from 14 states, ~300 members

The SPD international collaboration is forming actively

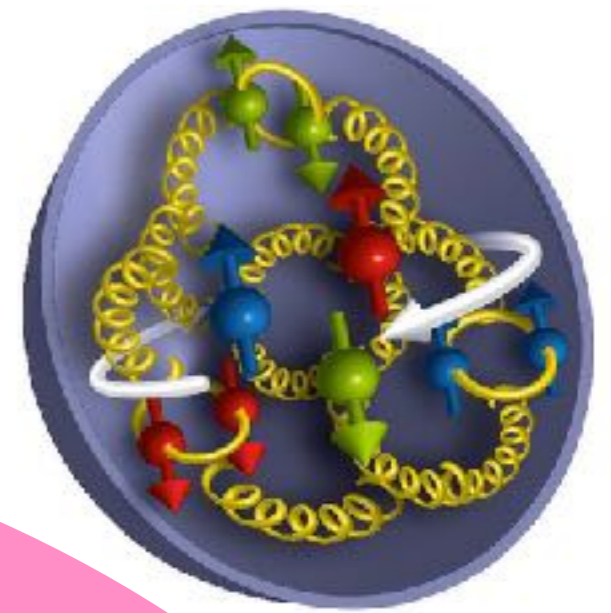


*June, 4 -
birthday of the SPD
collaboration*

BRIEF HISTORY OF THE SPD PROJECT



CONCEPT OF THE **SPD** PHYSICS PROGRAM



SPD - a universal facility for comprehensive study of gluon content in proton and deuteron at large x

Charmonia

Prompt photons

Open charm

Other spin-related phenomena

Other physics

SPD Physics Program

JPPNP: 103858

Model 3G

pp. 1–43 (col. fig: NIL)

ARTICLE IN PRESS

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Review

On the physics potential to study the gluon content of proton and deuteron at NICA SPD

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[arXiv:2011.15005](https://arxiv.org/abs/2011.15005)

SPD Physics Program

Prepared for Physics of Elementary Particles and Atomic Nuclei. Theory

Possible studies at the first stage of the NICA collider operation
with polarized and unpolarized proton and deuteron beams

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V. Bunichev², O. D. Dalkarov³, R. El-Kholy⁴, A. Galoyan⁵, A. V. Guskov⁶,
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A. D. Kovalenko⁵, V. P. Ladygin⁵, A. B. Larionov^{14,15}, A. I. L'vov³, A. I. Milstein^{10,11},
V. A. Nikitin⁵, N. N. Nikolaev^{16,26}, A. S. Popov¹⁰, V. V. Polyanskiy³,
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SPD Conceptual Design Report

**CDR was presented on the meeting of the JINR Program Advisory Committee
for particle physics on Jan, 18**

JOINT INSTITUTE FOR NUCLEAR RESEARCH



February 3, 2021

Conceptual design of the Spin Physics Detector

Version 1.0

The SPD proto-collaboration^{*}

[arXiv:2102.00442](https://arxiv.org/abs/2102.00442)

PAC recommendations

V. Conceptual design report for the SPD experiment

The PAC heard the presentation of the Conceptual Design Report (CDR) for the SPD experiment made by A. Guskov. The main goal of the experiment is to study the polarized gluon structure of proton and deuteron in the production of charmonium, open charm and direct photons. At its initial stage, SPD is supposed to focus on various unpolarized and spin-dependent effects in interactions of protons, deuterons and light nuclei. The SPD facility is meant as a universal 4π -detector for registration and identification of secondary particles at high luminosity.

Recommendation. The PAC thanks the SPD (proto-)collaboration for the preparation of the comprehensive CDR and recommends the NICA management to appoint an appropriate detector advisory committee (DAC) for a thorough review of the CDR and its subsequent evolution into an SPD TDR (Technical Design Report). The PAC encourages the team to pursue every effort to form an international collaboration, find adequate resources and attract students and young scientists.

SPD DETECTOR ADVISORY COMMITTEE



**Andrea Bressan, INFN/
University of Trieste
chair**



**Peter Hristov,
CERN**



**Pasquale di Nezza,
INFN, Frascati**

DAC was formed by the end of April

FIRST MEETING WITH SPD DAC: 26.5.21

Meeting of the SPD-DAC with the SPD collaboration for a first presentation/discussion

📅 Wednesday 26 May 2021, 09:00 → 10:30 Europe/Moscow

📍 Zoom

👤 Andrea Bressan

09:00 → 09:30 **SPD project at JINR: physics goal**

Speaker: Alexey Guskov (JINR)

📎 SPD_project_DAC_...

09:30 → 10:00 **Polarized beams at NICA**

Speaker: Vladimir LADYGIN (VBLHEP, JINR)

📎 VLadygin_DAC_Ma...

10:00 → 10:30 **SPD experimental setup**

Speaker: Alexander Korzenev (JINR, LHEP)

📎 DAC_26May2021_...

<https://indico.jinr.ru/event/2166/>

ORGANIZATIONAL CHANGES

SPD Interim Steering Committee

— *was formed at JINR in the beginning of 2018*

- **Afanasiev Leonid**
- **Alexeev Gennady**
- **Anosov Vladimir**
- **Baldine Anton**
- **Gavrishchuk Oleg**
- **Guskov Alexey**
- **Enik Temur**
- **Ivanov Artem**
- **Korzenev Alexander**
- **Koulikov Anatoly**
- **Kovalenko Alexander**
- **Ladygin Vladimir**
- **Livanov Alexey**
- **Nagaycev Alexander**
- **Rogachevsky Oleg**
- **Teryaev Oleg**
- **Tsenov Rumen**
- **Zamyatin Nikolay**
- **Zhemchugov Alexey**

At the end of March 2021 it handed over the power to the SPD collaboration bodies:

Executive Board

and

Technical Board

OUR ACTIVITIES

- monthly **Physic & MC meetings** (since March 2020). Starting from 2021 - **in English!** 115 talks, non-JINR talks - 33%
- weekly **Software meetings** - **in English!**
- weekly **Hardware meetings**

IF YOU WANT TO CONTRIBUTE

to physics case & physics MC \implies **contact A. Guskov**

to simulation/reconstruction software and data processing \implies **contact A. Zhemchugov**

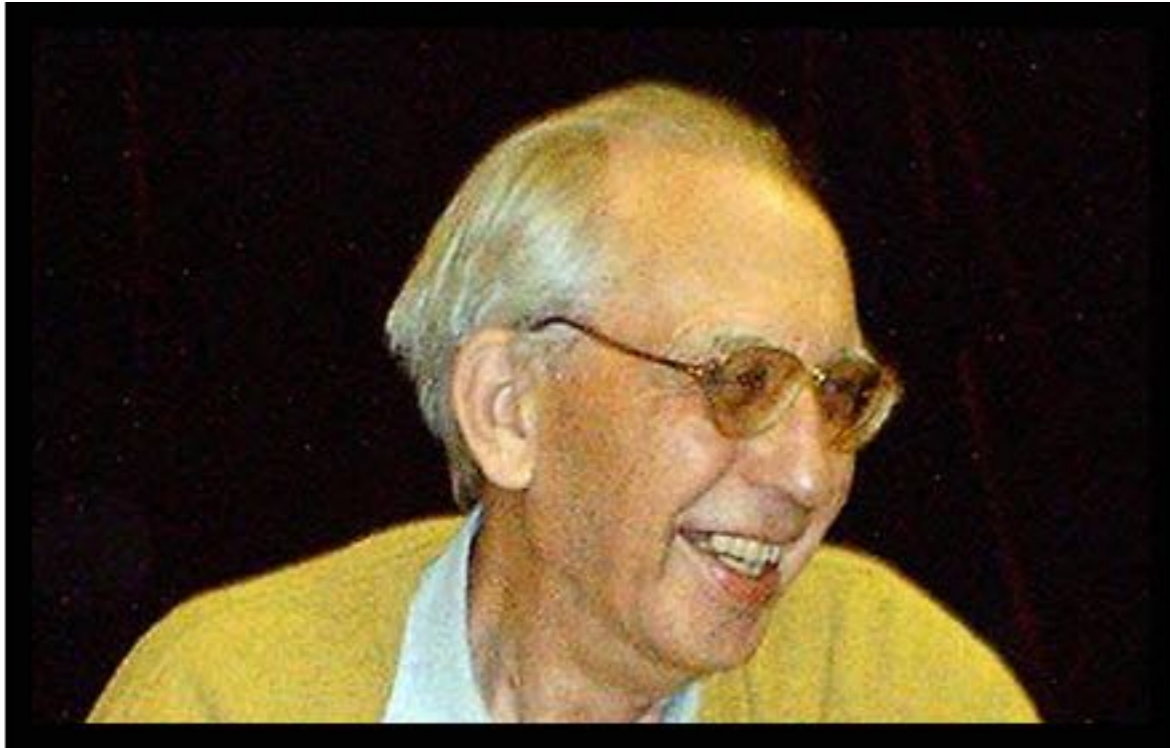
to development of detector hardware, electronics, DAQ \implies **contact A. Korzenev** and **corresponding detector expert**

to involve new people, groups or students \implies **contact A. Guskov**

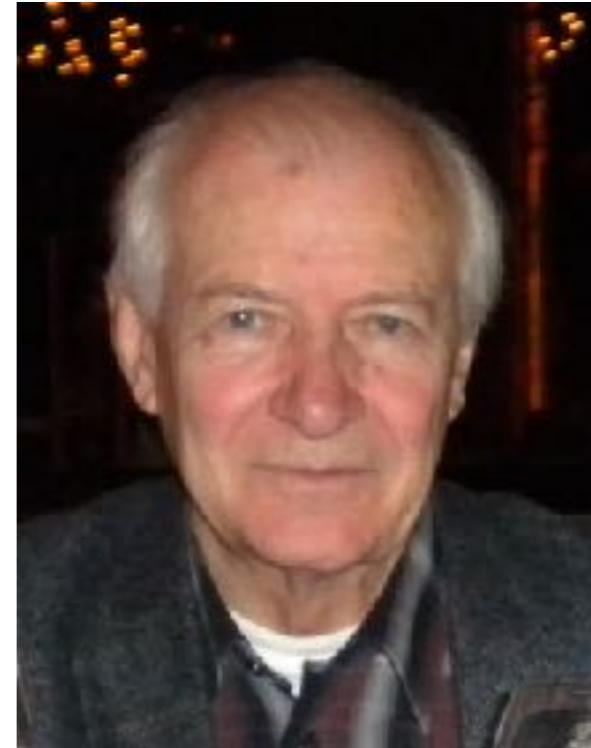
THIS YEAR PLANS AND PRIORITIES

- Interaction with SPD DAC
- Preparation of the SPD Technical Design Project (has to be presented at PAC PP meeting in Jan, 2022)
- Continuing to form the Collaboration
- Prolongation of the SPD project at JINR
- Detector R&D and beam tests

SAD NEWS



Anatoly Efremov
26.12.1933 – 01.01.2021



Alexandr Kovalenko
31.10.1944 – 31.03.2021

OPPORTUNITIES FOR COLLABORATION

We are open for new collaborators!

Physics

Detectors

Electronics

Software development

Machine learning algorithms

DAQ

Testing facilities

Computing and Big Data

Monte Carlo simulation

Slow control and monitoring

Magnet and magnetic measurements

...

SUMMARY

- SPD successfully started as an international collaboration
- We have a long way to go. It will be difficult but interesting
- We are open for new collaborators

