



NRC KI – PNPI's and SPbPU's interests in SPD

Victor Kim

**Petersburg Nuclear Physics Institute (NRC KI – PNPI, Gatchina)
of National Research Center «Kurchatov Institute»**

St. Petersburg Polytechnic University (SPbPU, St. Petersburg)



NRC KI – PNPI and SPbPU

NRC KI – PNPI (~ 2000 employees), located at Gatchina near St. Petersburg

PNPI High Energy Physics Division (~ 250 employees)
in high energy and nuclear physics experiments:
important contributions to hardware and physics analysis

CERN: ATLAS (Straw TRT), CMS (Muon Endcap CSC), ALICE, LHCb (CSC), UA9, ISOLDE

BNL: PHENIX

DESY: HERMES, OLYMPUS

FERMILAB: D0 (Muon system readout), SELEX

PSI: MuCap, MuSun

GSI: IKAR

Upcoming:

FAIR: R3B, CBM, PANDA

LHC: ATLAS (Muon system TGC), CMS, ALICE, LHCb detectors upgrade

CERN BDF: SHiP R&D (Straw Tracker: tubes, digital readout, gas system)

St. Petersburg Polytechnic University (SPbPU): PHENIX, ALICE*, SHiP R&D, ...



Straw Tracker: R&D, production, ...

Muon system: ?

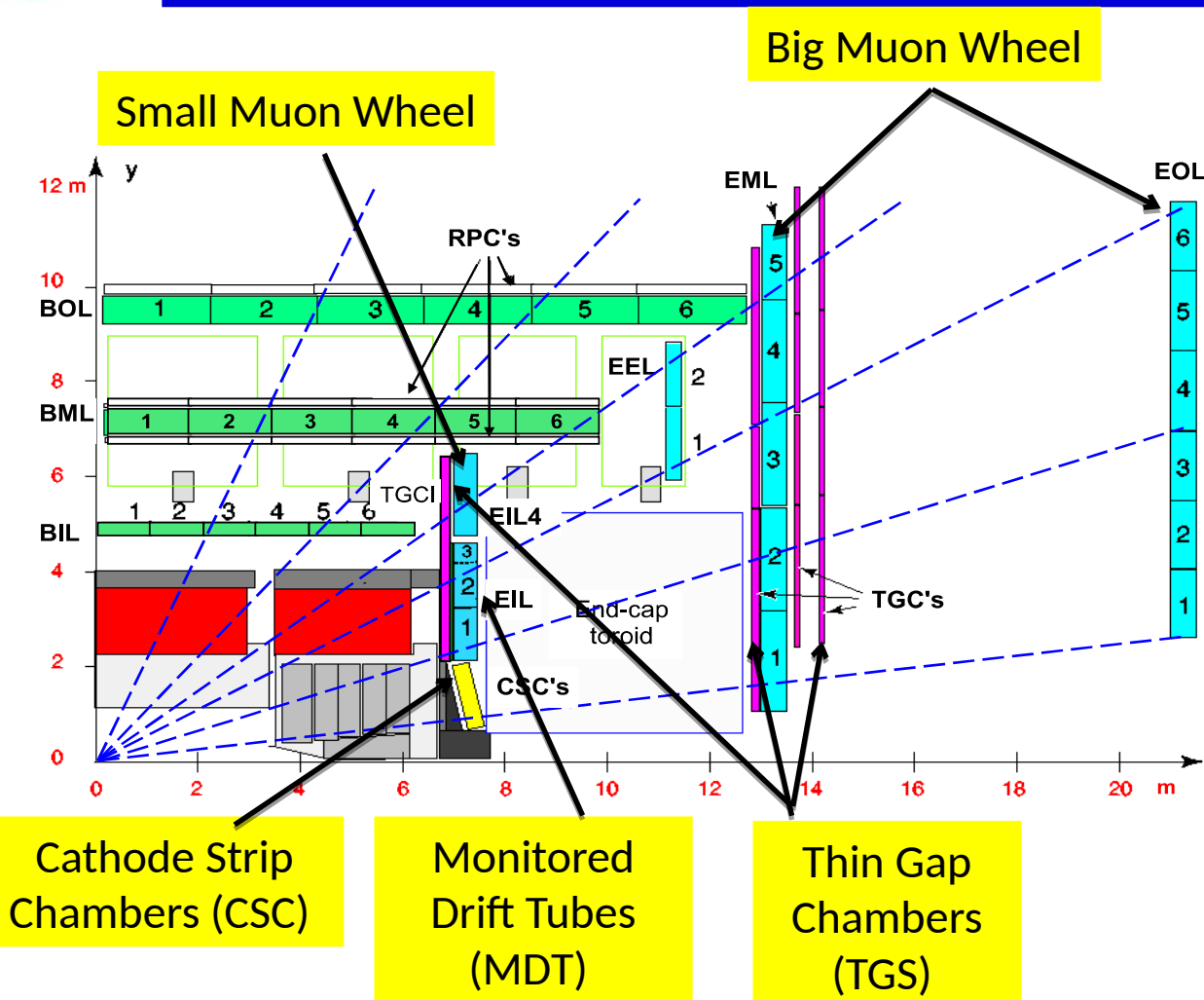
Physics: exotic resonances, high-pT physics, ...



Backup



New small muon wheels (NSW)

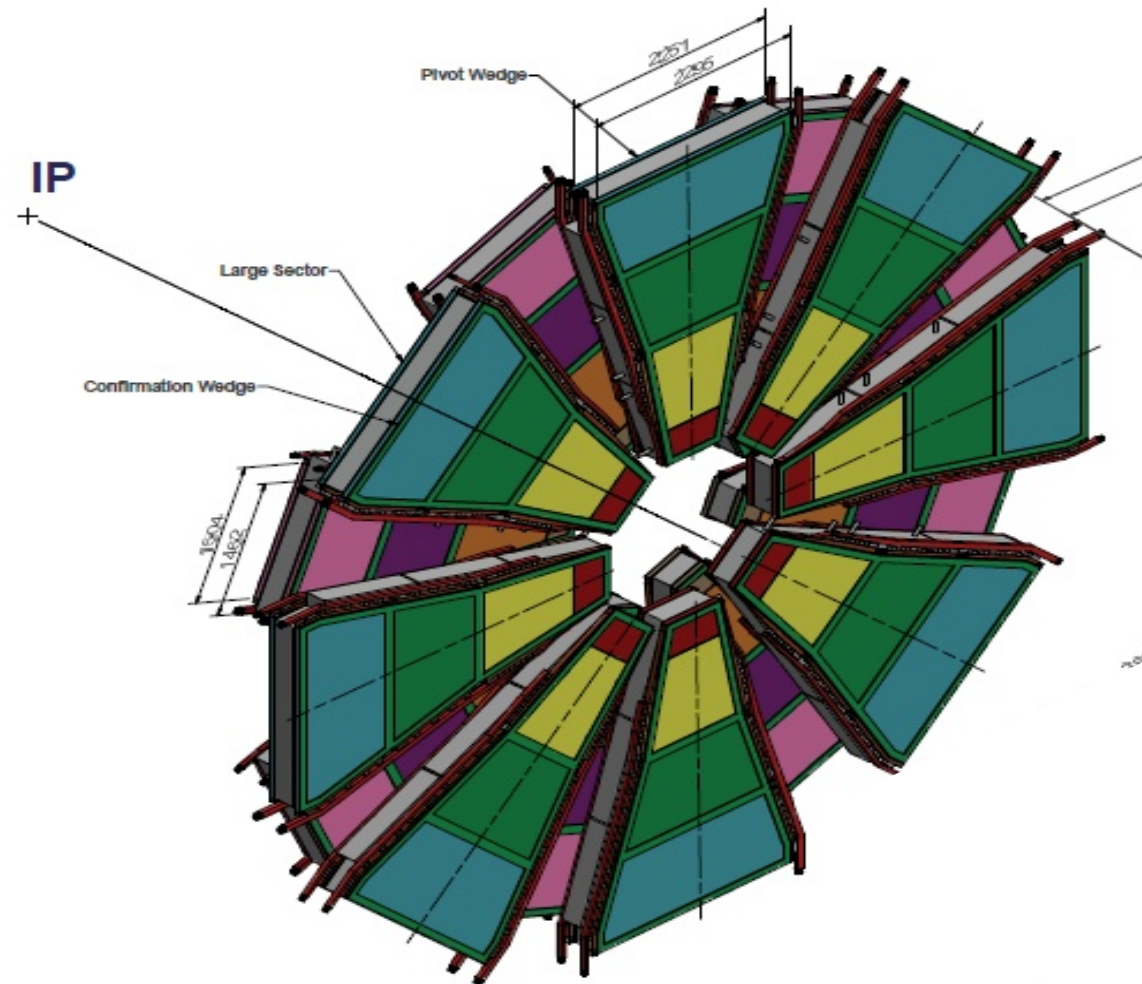


- NSW placed :
 $z \approx \pm 7\text{m}$ и
 $R < 1 \div 6\text{m}$
- $|\eta| = 1.3 \div 2.0$
CSC (R& φ)
- $|\eta| = 2. \div 2.7$
MDT (R) + TGC (φ)



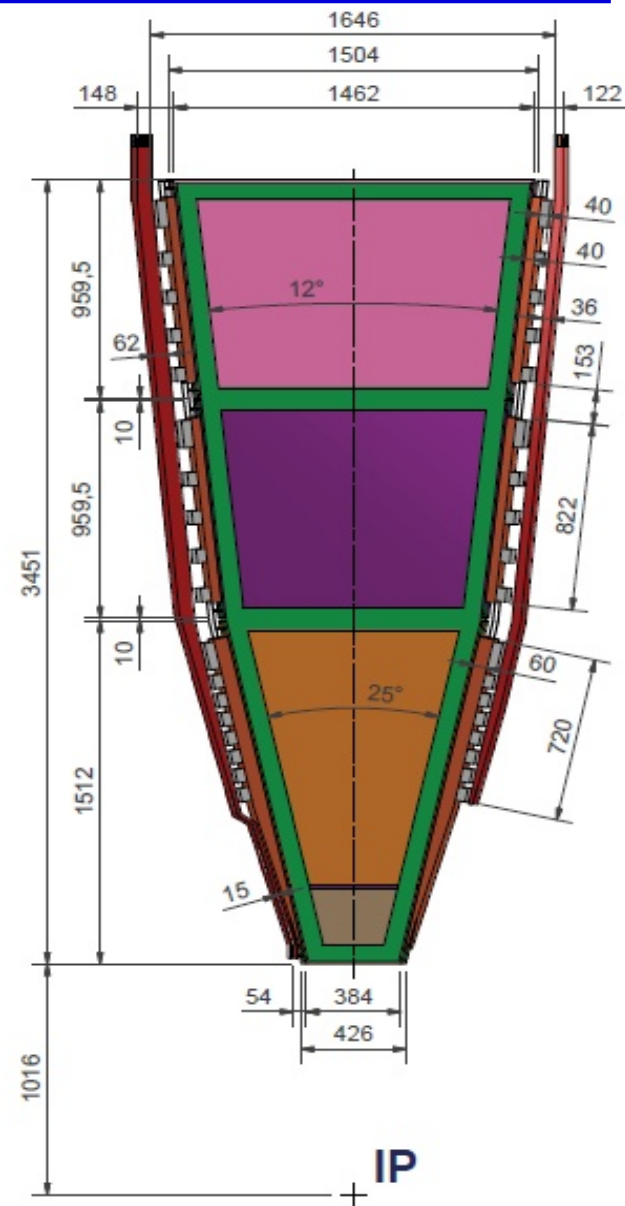
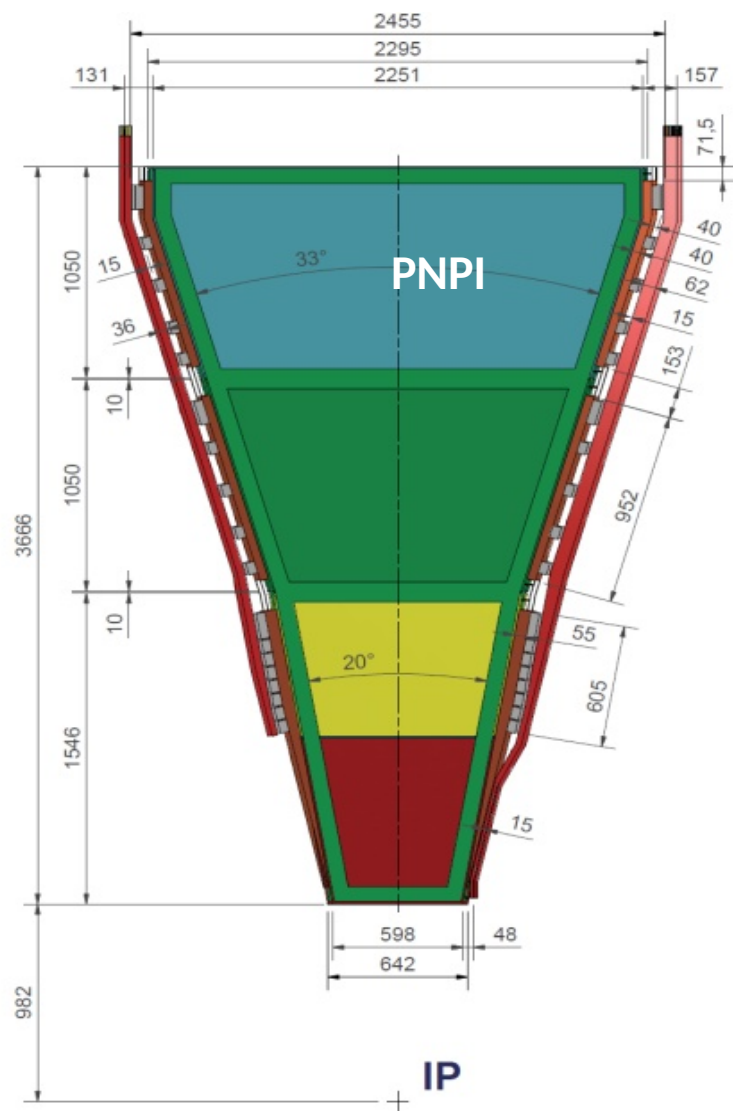
New Small Wheel

- ❑ The NSW detector consists of two detector technologies: small-strip thin gap chambers (sTGC) and Micromegas (MM)
- ❑
- ❑ 16 Sectors per wheel (8 large, 8 small)
- ❑
- ❑ $R=3.64$ m $\Delta Z=30$ cm
- ❑
- ❑ A sandwich arrangement of sTGC-MM-MM-sTGC is used to maximize the distance between the two sTGCs multilayers (quadruplets) for improved track segment angular resolution at the trigger level





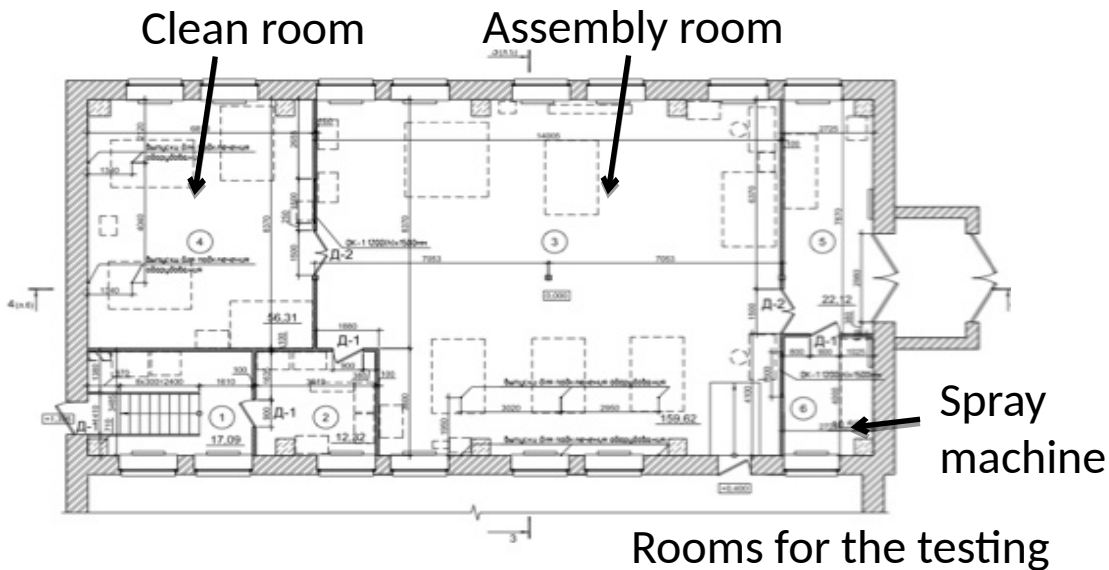
sTGS





Assembly hall & Clean rooms

Scheme of assembly hall and clean rooms

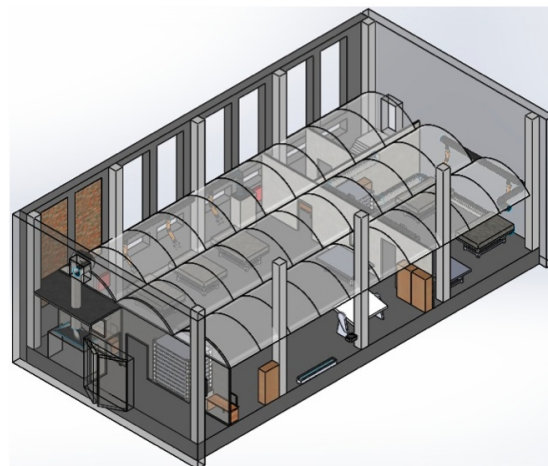


- For sTGC production institute allocated assembly hall 280 m² + two nearby rooms (65 m²) for testing of the assembled quadruplets
- The assembly hall renovation is completed at the end of April 2015.
- Inside assembly hall constructed clean rooms (completed in December 2015).

Assembly hall after renovation



Clean rooms project



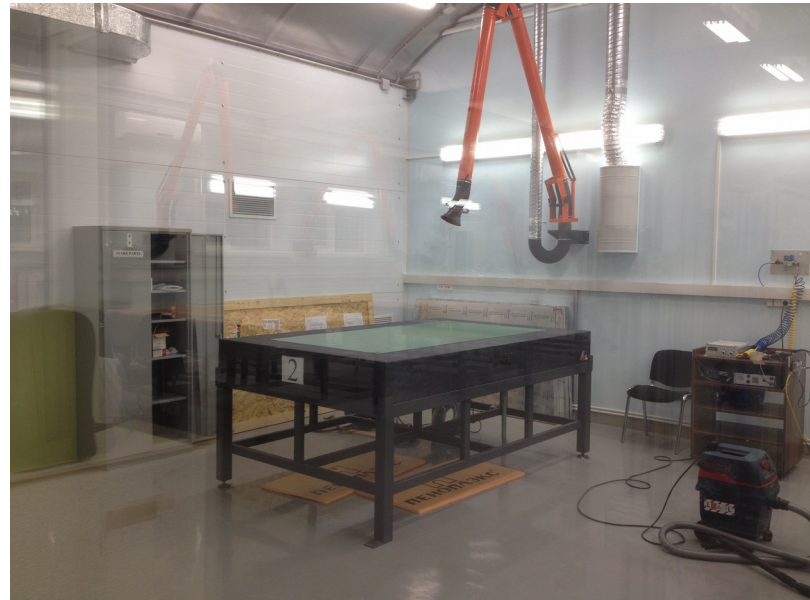
Clean rooms inside assembly hall





Clean rooms

- ❑ Photos with the general view of clean rooms.
- ❑ Seen:
 - installed granite tables
 - (In total PNPI has 5 granite tables. Partially they still closed by protection)
 - winding machine





SUMMARY

- ❑ PNPI has an experienced team to participate in SHiP straw detector manufacturing program
- ❑ PNPI has the industrial and technological base to participate in the SHiP project
- ❑ To develop straw manufacturing technological line PNPI needs:
 - Technology of straw production by welding

OUTLOOK

- PNPI can participate in production of SHiP straw detector:
 - up to 50% straw manufacturing: 25000 - 30 000 straw
 - participation in detector assembling and installation
 - read-out electronics R&D
 - cabling