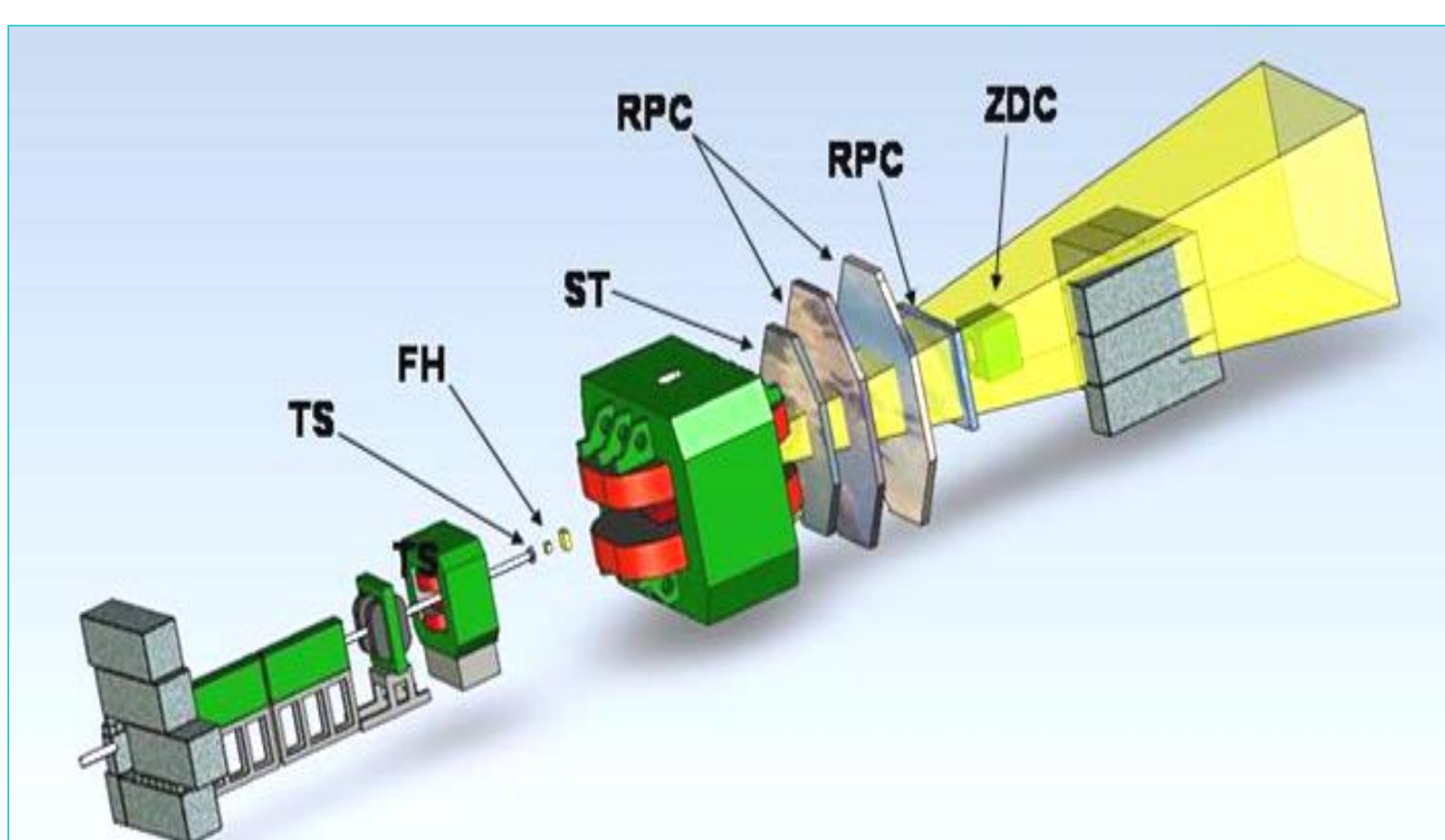


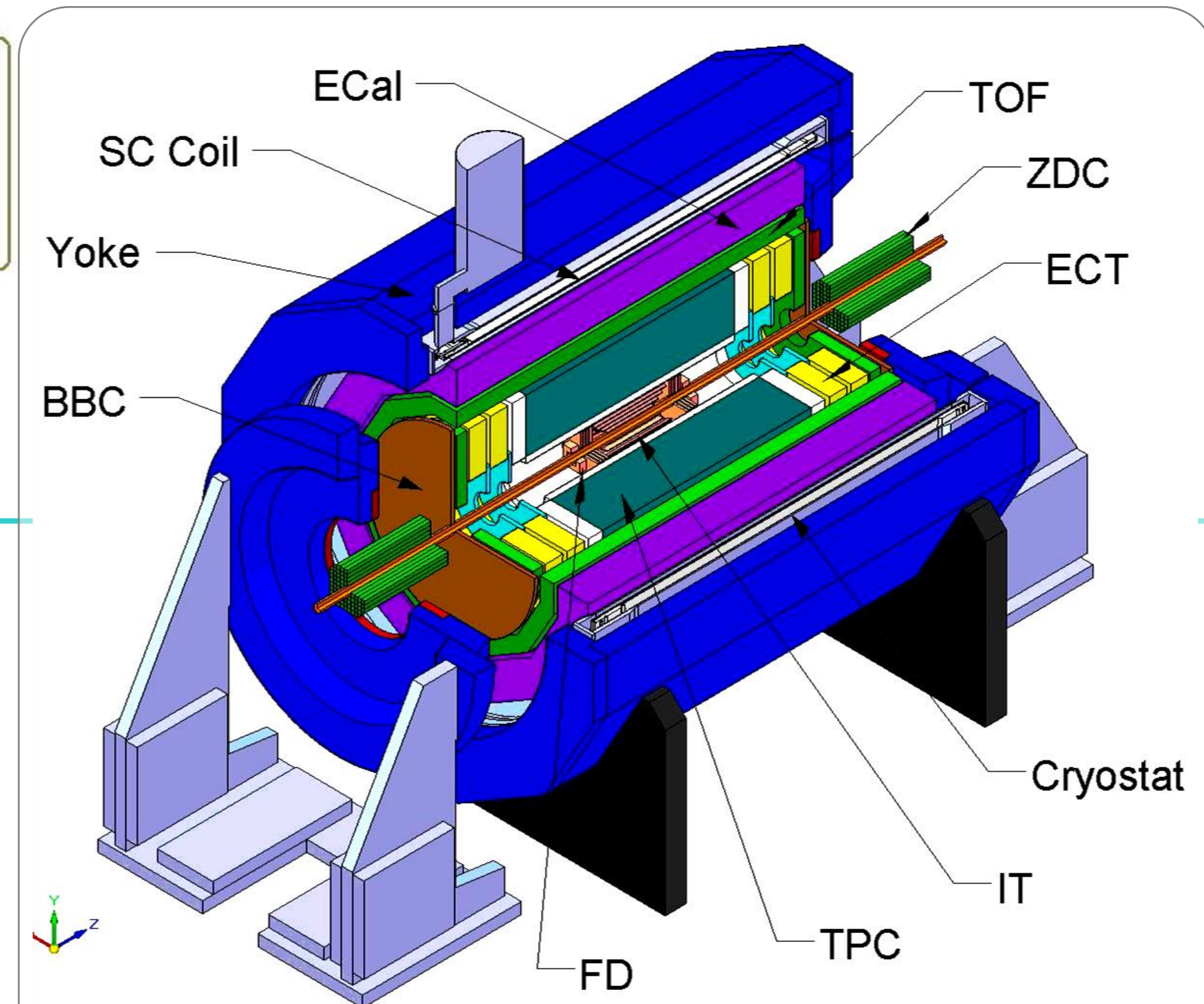
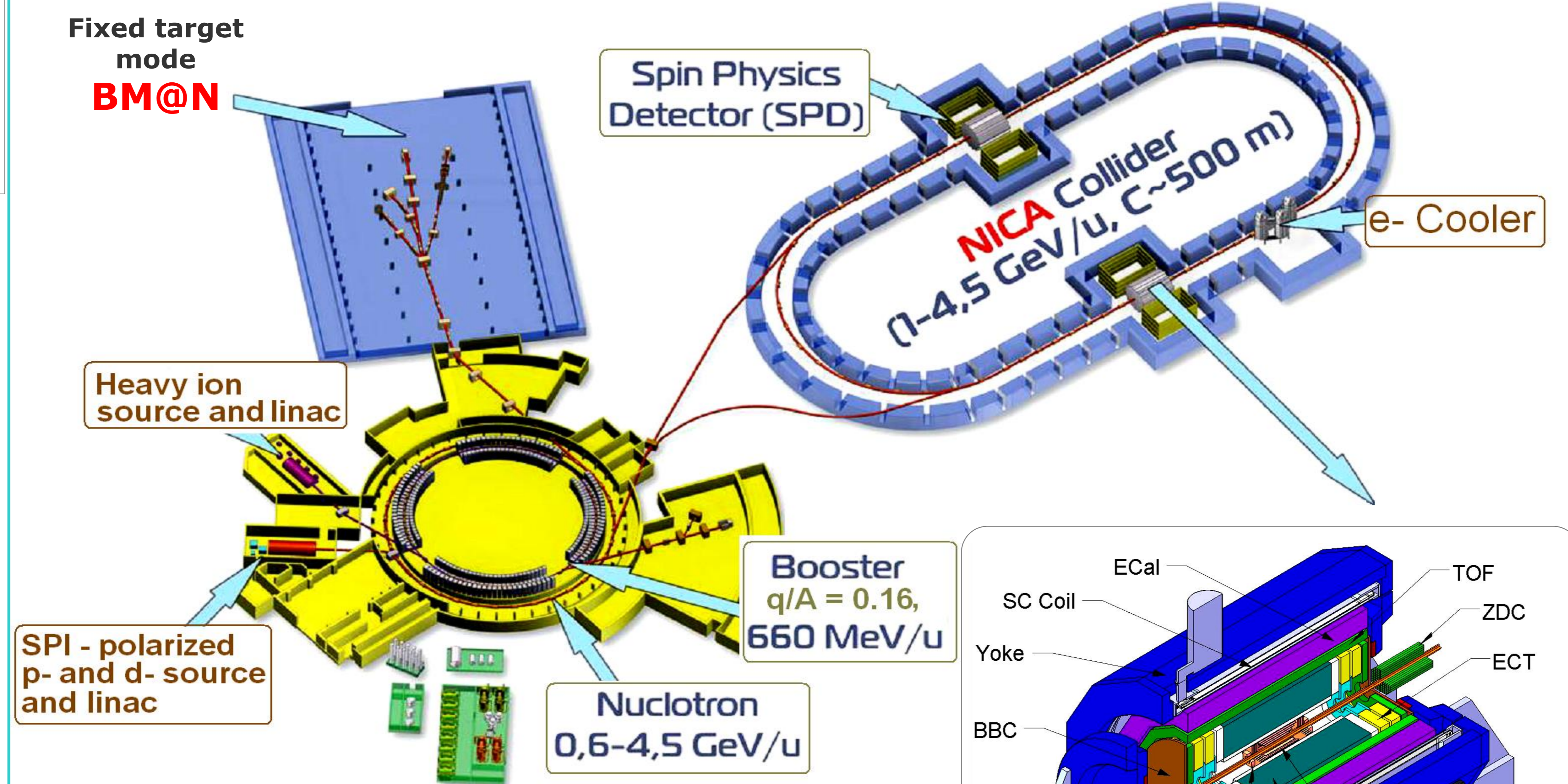
Abstract: the main goal of the project is the studying of hot and dense strongly interacting matter in heavy ion collisions at c.m. energies of $\sqrt{s_{NN}} = 4 - 11$ GeV at average luminosity of $10^{27} \text{ cm}^{-2}\text{s}^{-1}$ (scaled to $\sqrt{s_{NN}} = 9$ GeV for Au79+). Basic experimental setup is multi-purpose detector MPD. The NICA program also foresees the further spin physics research with colliding polarized proton and deuteron beams at the energies up to $\sqrt{s} = 26$ GeV and $\sqrt{s_{NN}} = 13$ GeV for p - and d - mode respectively. Average luminosity of $1 \cdot 10^{32} \text{ cm}^{-2}\text{s}^{-1}$ (pp - collisions at $\sqrt{s} = 26$ GeV) is expected.

The NICA research program will be started at fixed target mode using the new spectrometer BM@N and heavy ion beams in energy range from 1.5 to 5.8 GeV/u.

Composition of the Spectrometer



Physics program was discussed elsewhere and presented at the site **Start of the setup commissioning is planned for 2015**



SC Magnet: 0.5 T; Tracking: TPC; Particle ID: TOF, ECAL, TPC; T0, Triggering: FFD; Centrality, Event plane: ZDC.

MPD advantages:

- Hermeticity, homogenous acceptance (2π in azimuth), low material budget;
- Good tracking performance and powerful PID (hadrons, e, γ)
- High event rate capability and careful event characterization

NICA-MPD Physics plan (Stage1):

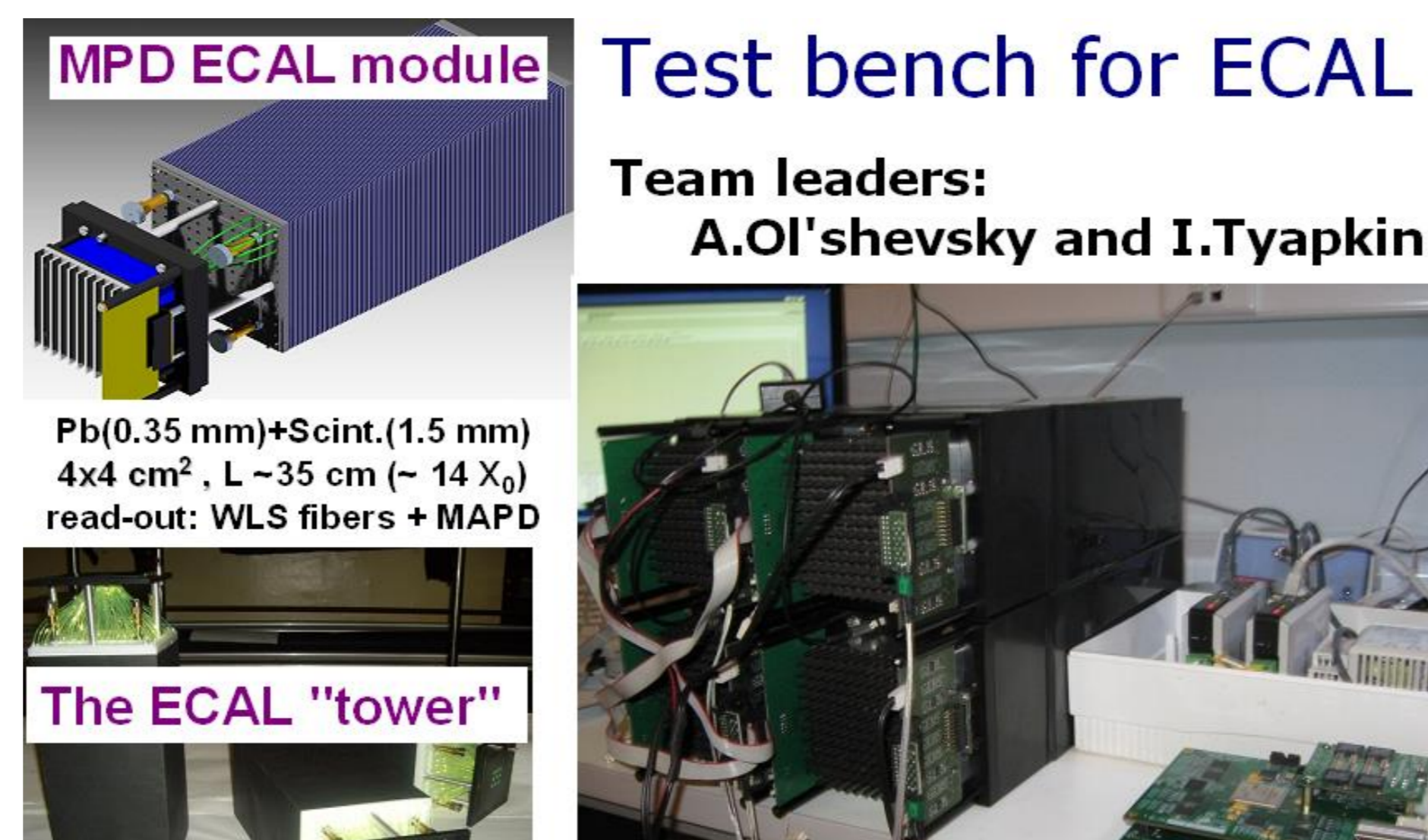
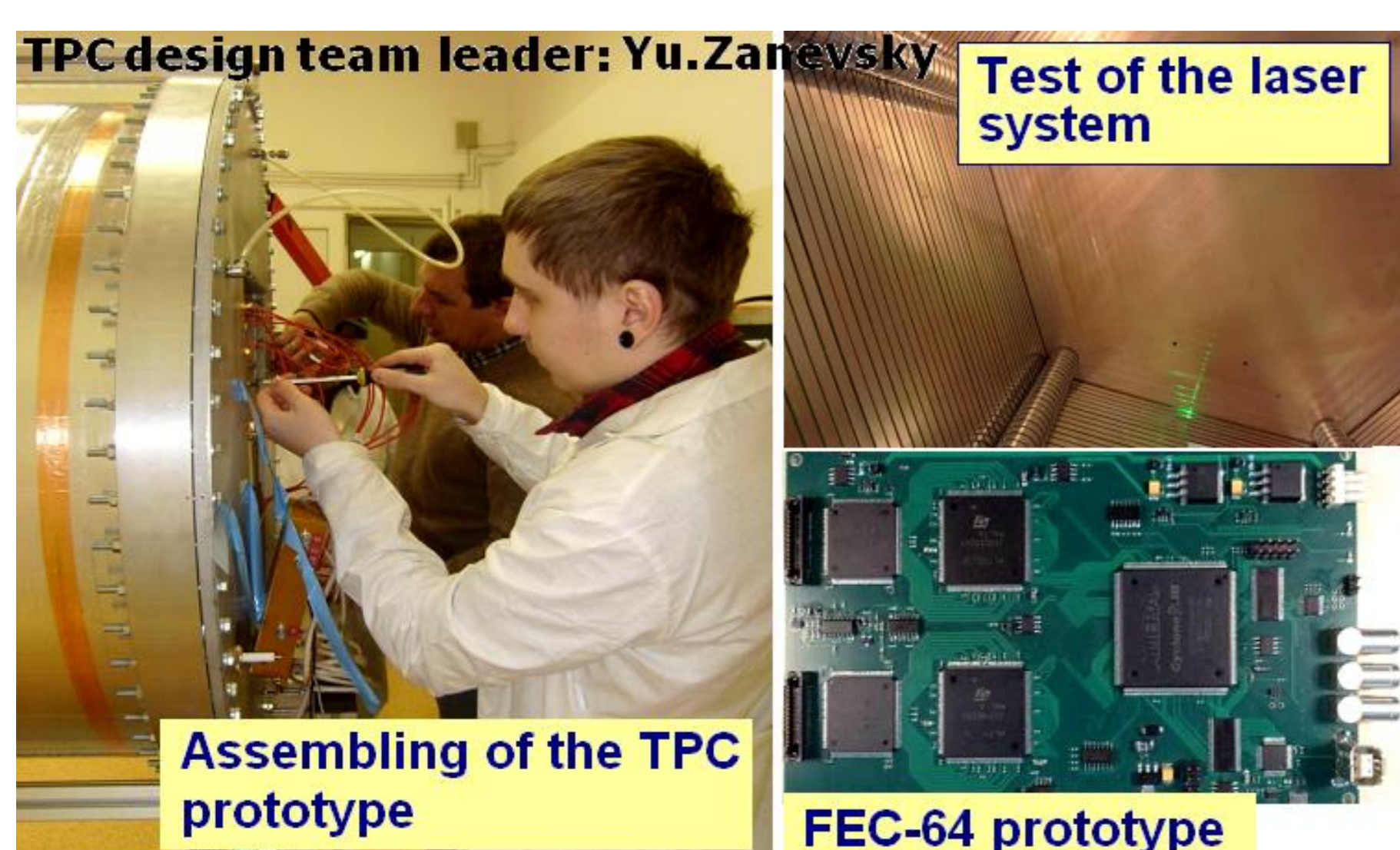
As the first physics measurements: an energy-system size scan will be performed at NICA-MPD with the chosen beam species varying the collisions energy from 4 to 11 GeV in steps of 1-2 GeV. **Measurements of hadrons** (p, K, (anti)p, (anti)hyperons, light (anti)nuclei and dilepton spectra as a function of energy, system size, centrality, p_T , rapidity and azimuthal angle.

Beam	Luminosity ($\text{cm}^{-2} \text{c}^{-1}$)		Data sample per 1 week at $\sqrt{s} = 4$ GeV
	$\sqrt{s}=4$ GeV	$\sqrt{s}=11$ GeV	
^{12}C	$4 \cdot 10^{28}$	$2 \cdot 10^{29}$	$1.5 \cdot 10^{10}$
^{64}Cu	$6 \cdot 10^{27}$	$3.5 \cdot 10^{28}$	$5 \cdot 10^9$
^{124}Xe	$8 \cdot 10^{26}$	$6 \cdot 10^{27}$	$1 \cdot 10^9$
^{197}Au	$1.5 \cdot 10^{26}$	10^{27}	$3 \cdot 10^8$

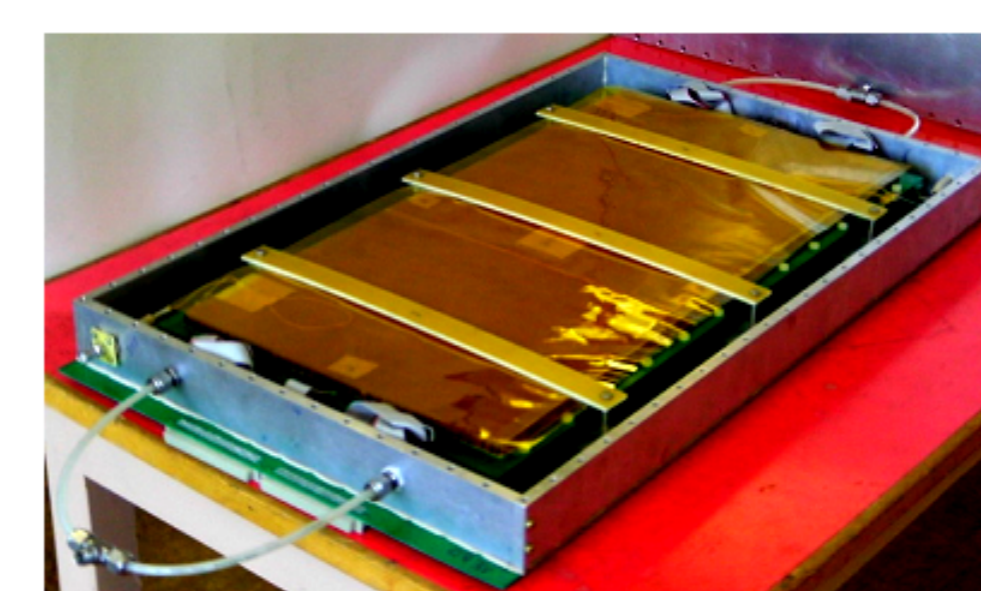
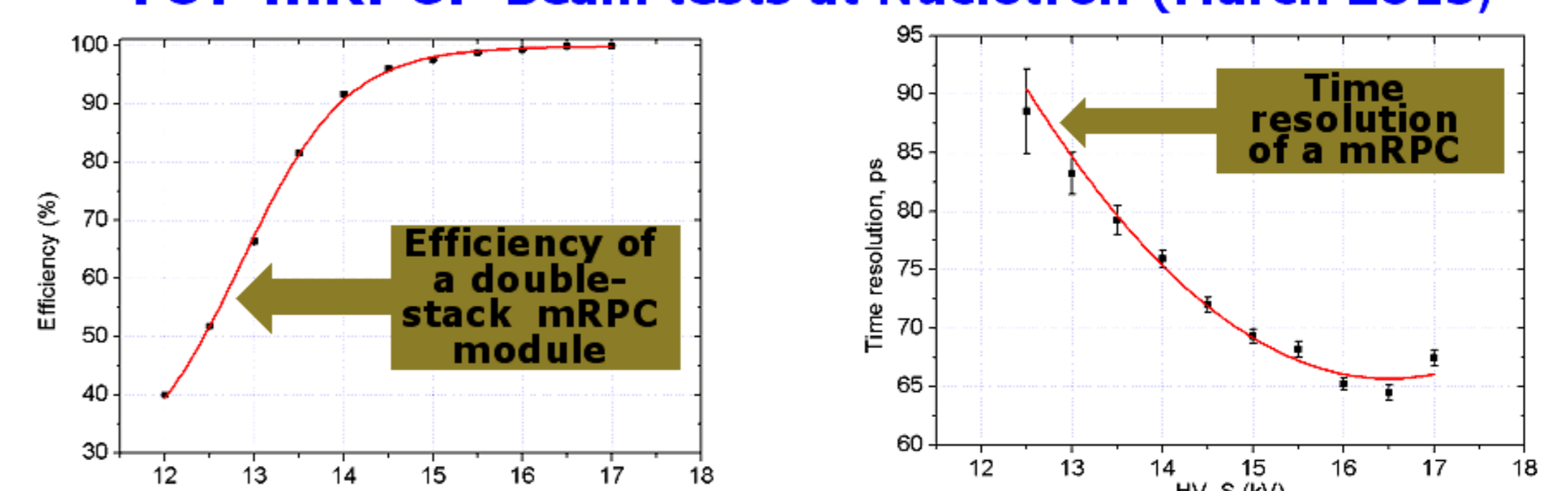
The search strategy:

- Scanning the chosen energy interval trying to find the peculiarities associated with the QCD critical end point (CEP);
- Detailed study of the LMR dilepton enhancement in the unexplored region of the highest baryon density. If an indication for dropping mass found \rightarrow detailed look in this region.

MPD Elements Prototyping and Tests



TOF mRPC. Beam tests at Nuclotron (March 2013)



- Timing resolution $\sigma < 70$ ps achieved for a double-stack mRPC module.
 - The resolution does not depend on coordinate.
 - Results of the beam tests will be published soon.
- JINR + Beijing (China)
Team leader - V. Golovatyuk

Summary: The NICA facility design and construction is in progress. The realization schedule foresees staging of the accelerators manufacturing/assembling and the MPD components as well. Development of the accelerator part of the project was presented more detailed at the IPAC 2013. This paper illustrate some recent results from the MPD detectors R&D program. The main goal of the team is to start the facility commissioning in 2017.