Division: Theory of Elementary Particles

Staff:
prof. dr hab. Krzysztof Redlich (head)
prof. dr hab. David Blaschke
prof. dr hab. Ludwik Turko
dr Chihiro Sasaki, prof. Uwr
dr Tobias Fischer
dr Thomas Klähn
dr Pok Man Lo

PhD students:
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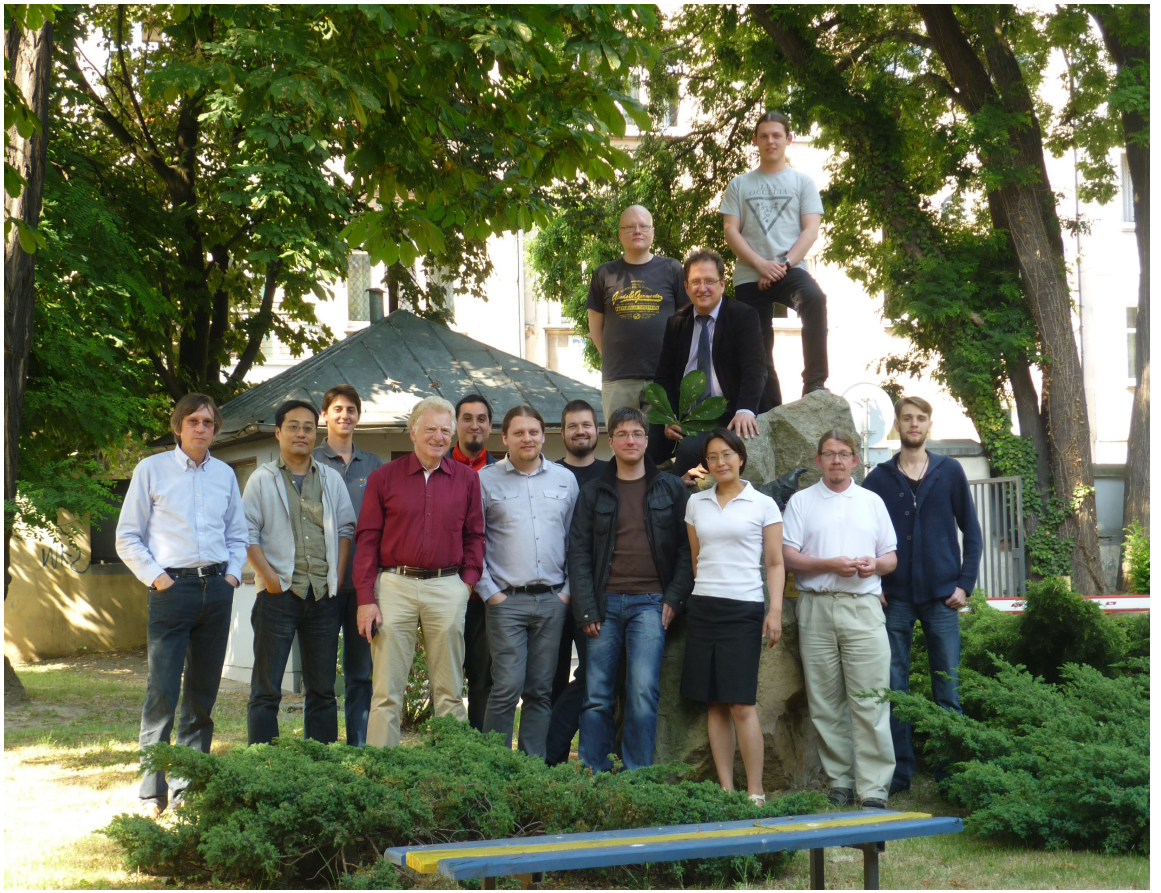
Dipl.-phys. Aleksandr Dubinin
mgr Łukasz Juchnowski
mgr Michał Marczenko

Master students:
Alaksiej Kachanovich
Mark Kaltenborn
Maciej Lewicki
Michał Naskręt
Michał Szymański

+many visitors from 4 continents

Current NCN research projects:
Maestro (2), Opus (4), Sonata (1)

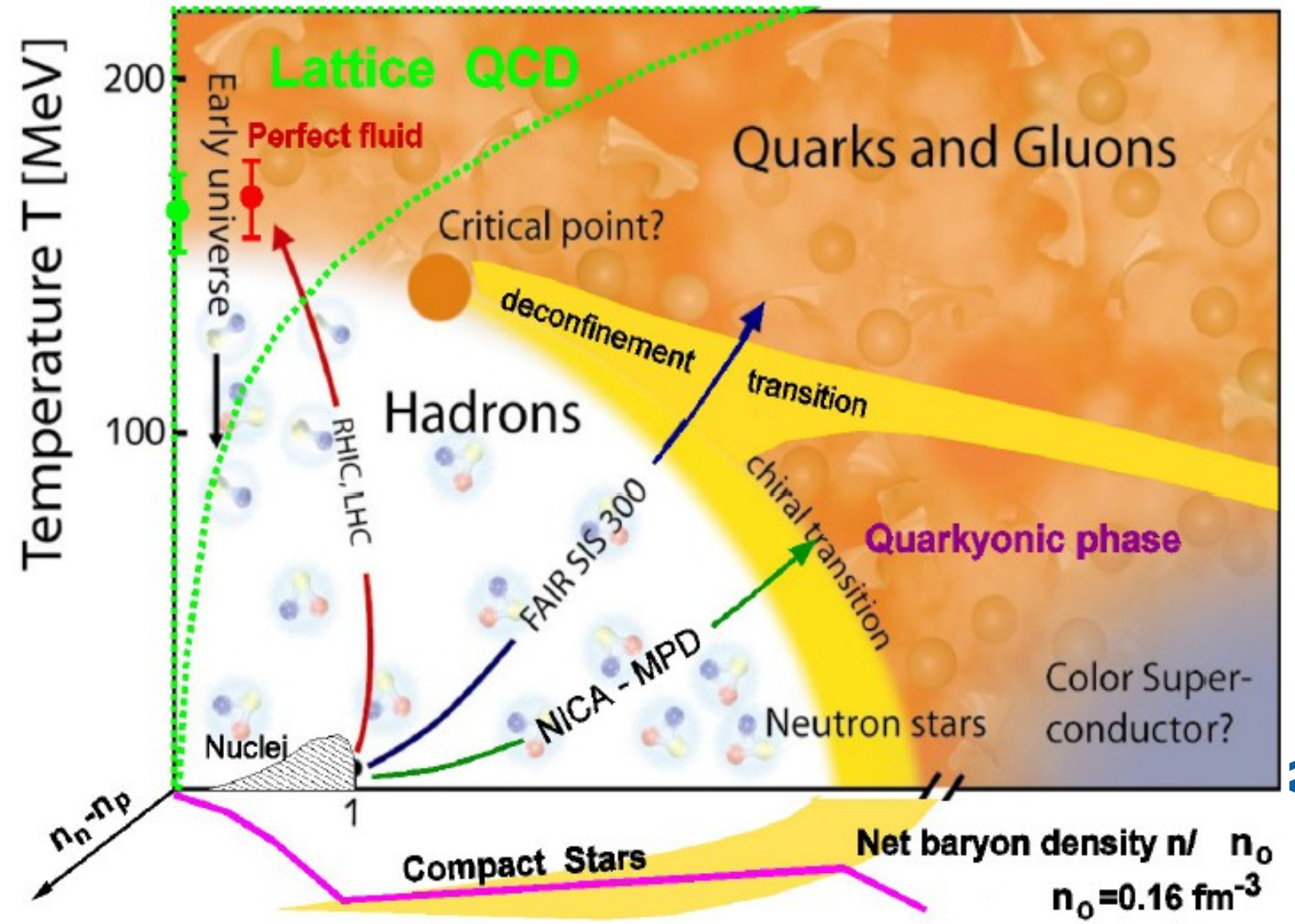


Main research topics:

- Quantum field theory under extreme conditions
- Physics of ultra-relativistic heavy-ion collisions
- Physics of compact stars and supernovae

Publications in 2010-2015: 241 (98 with ALICE Collab.)

Division: Theory of Elementary Particles - Collaborations



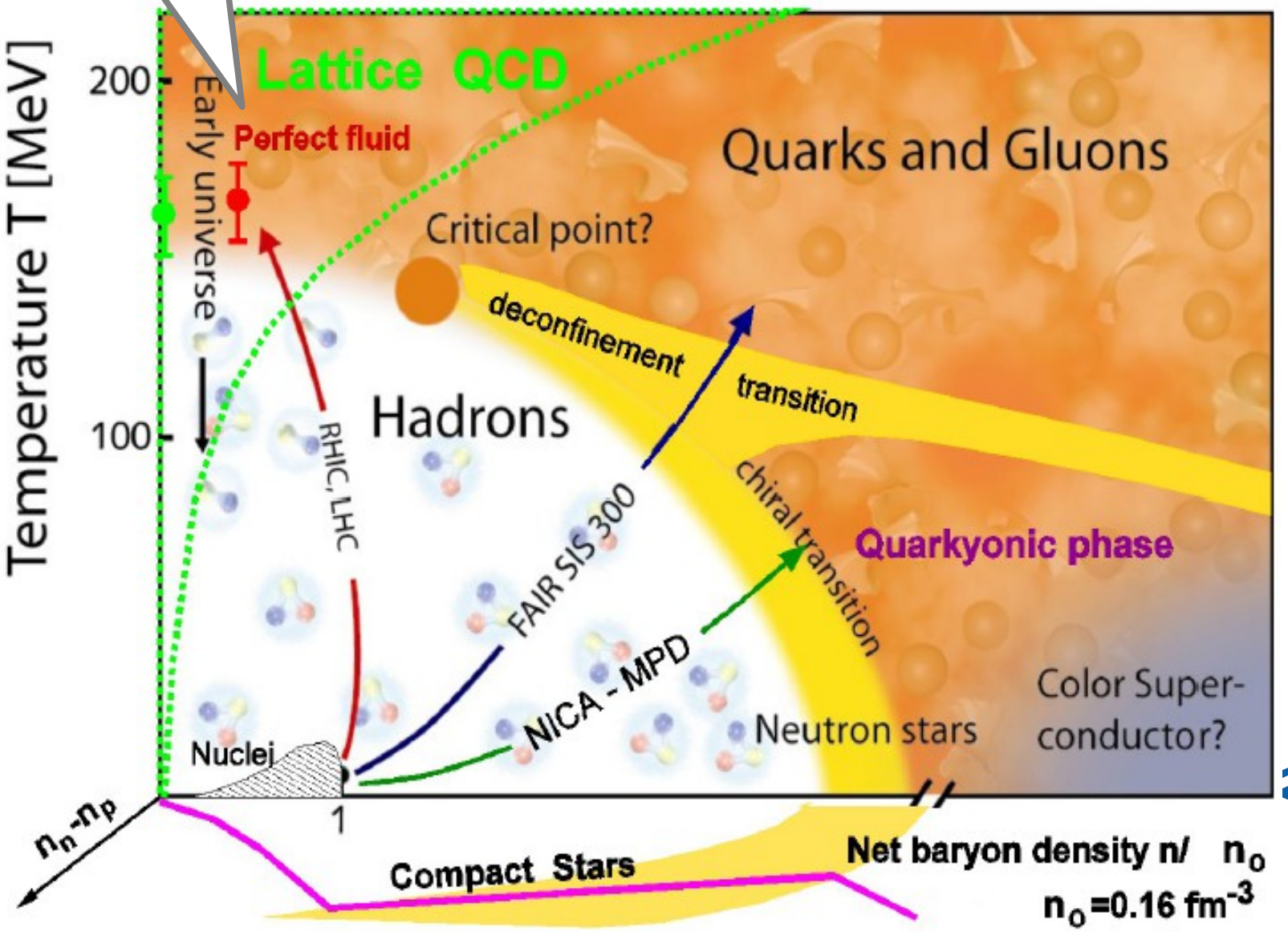
Division: Theory of Elementary Particles - Collaborations

CERN ALICE

CERN SHINE NA61

FAIR HIC for FAIR Helmholtz International Center

NAVI



JINR DUBNA

NICA

comp star

cost EUROPEAN COOPERATION IN SCIENCE AND TECHNOLOGY

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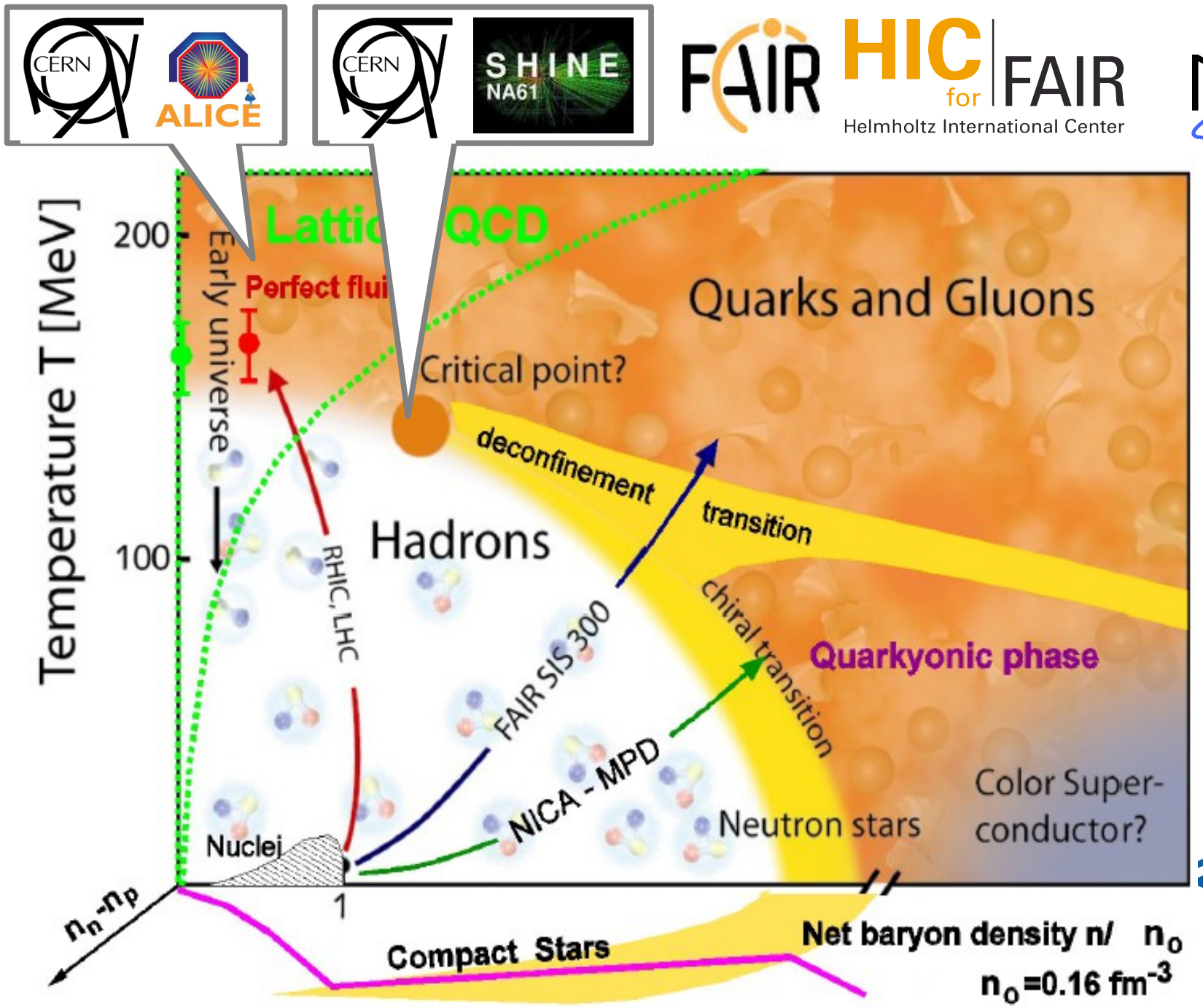

FAIR

HIC for FAIR
Helmholtz International Center

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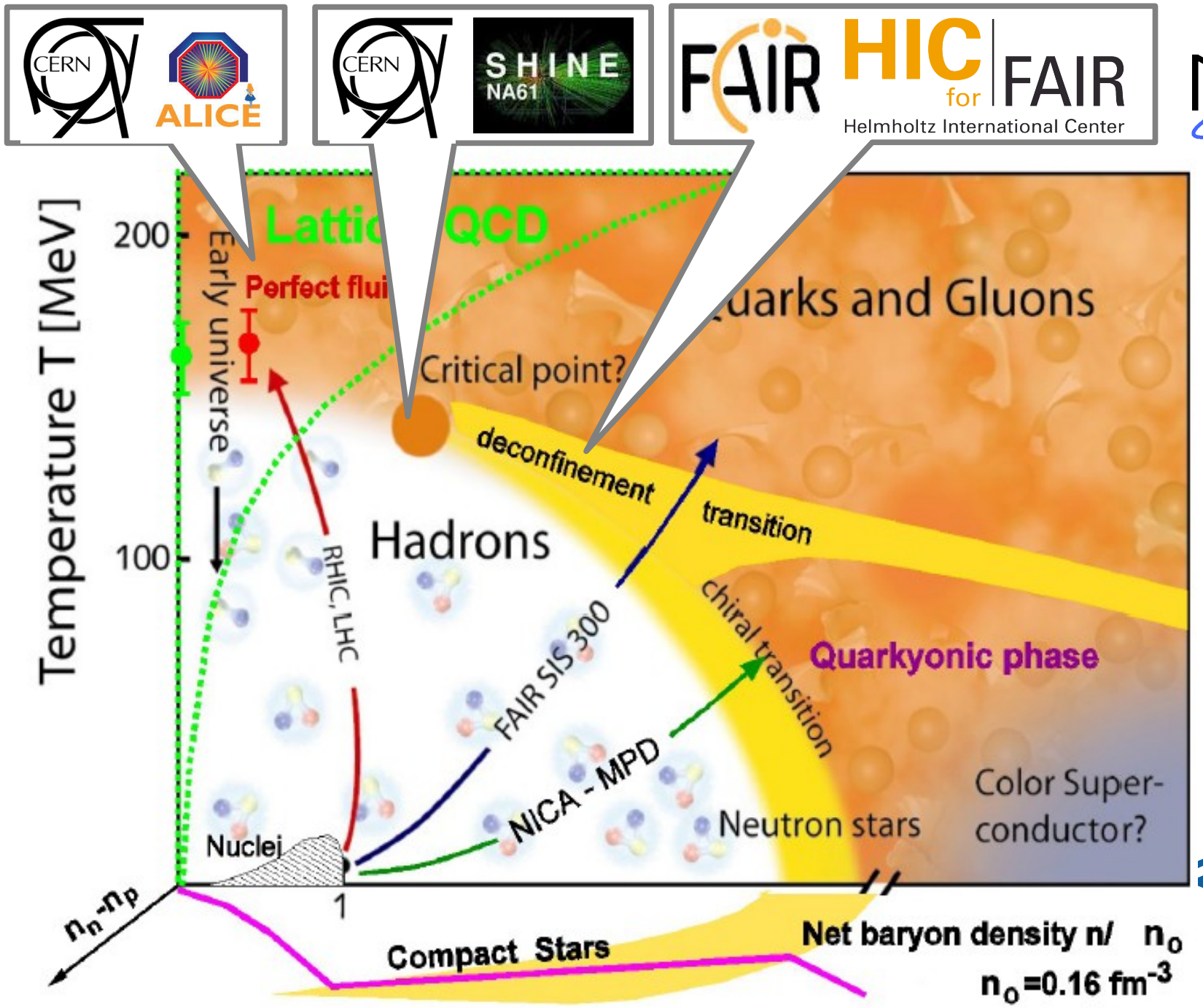

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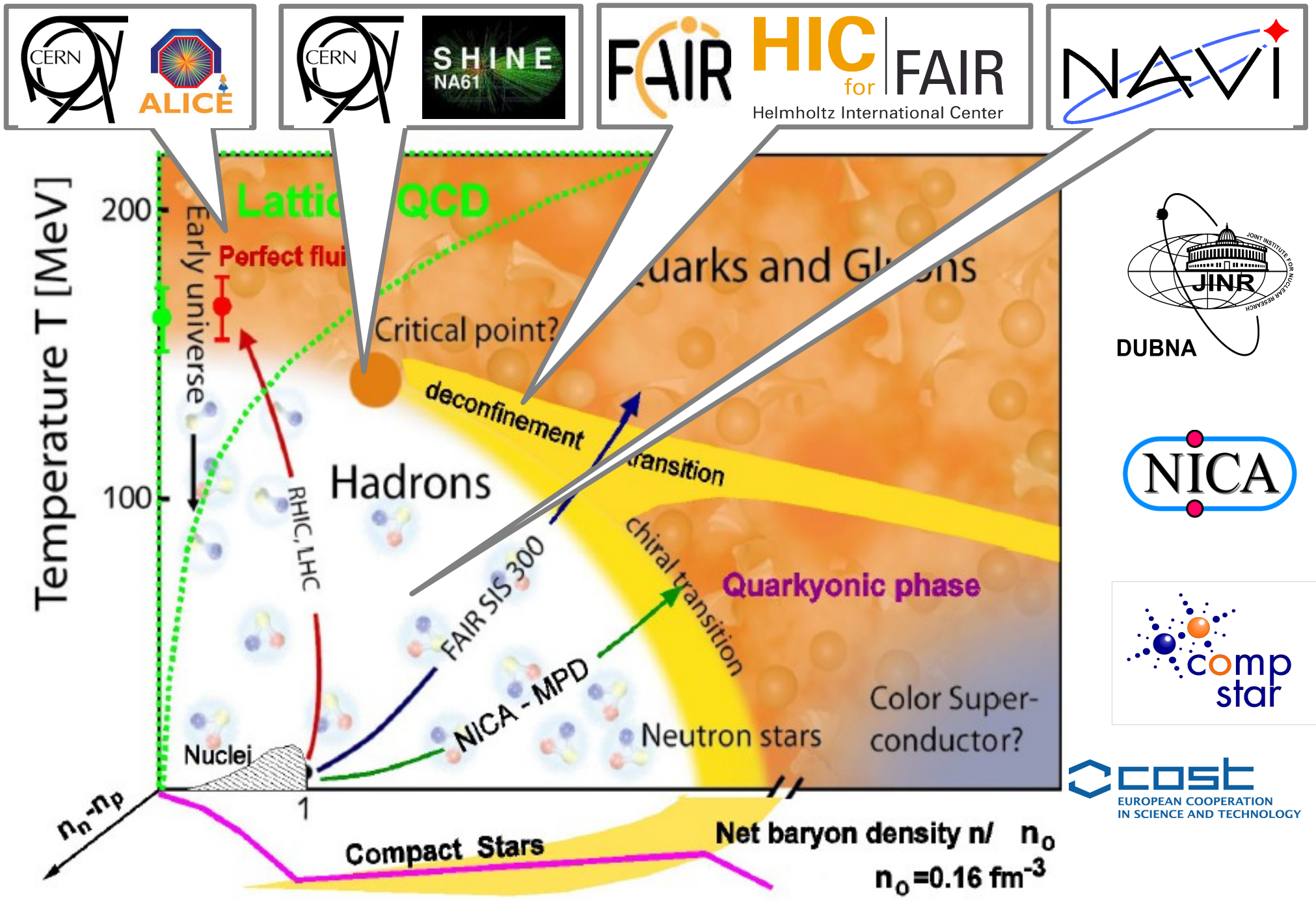

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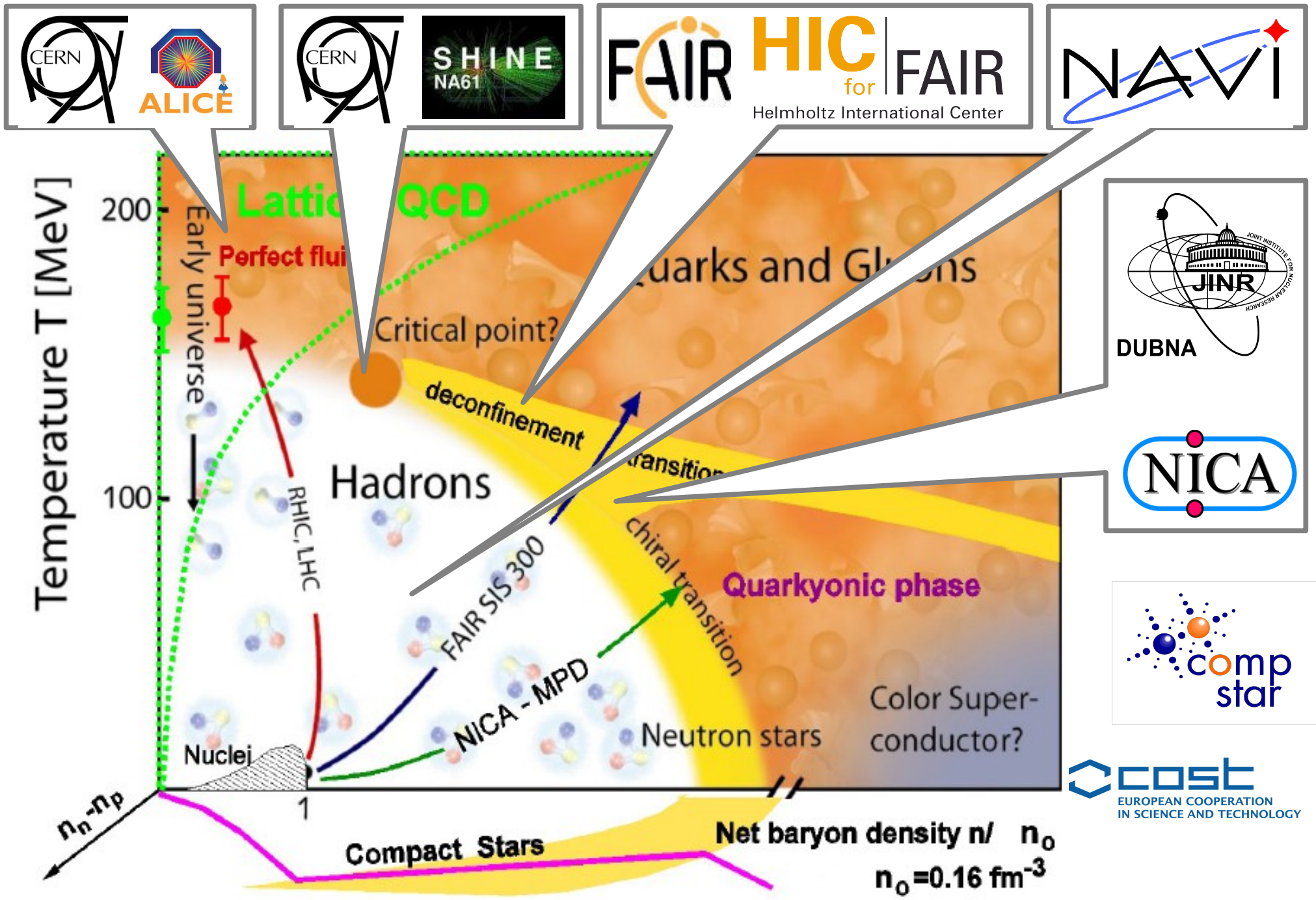
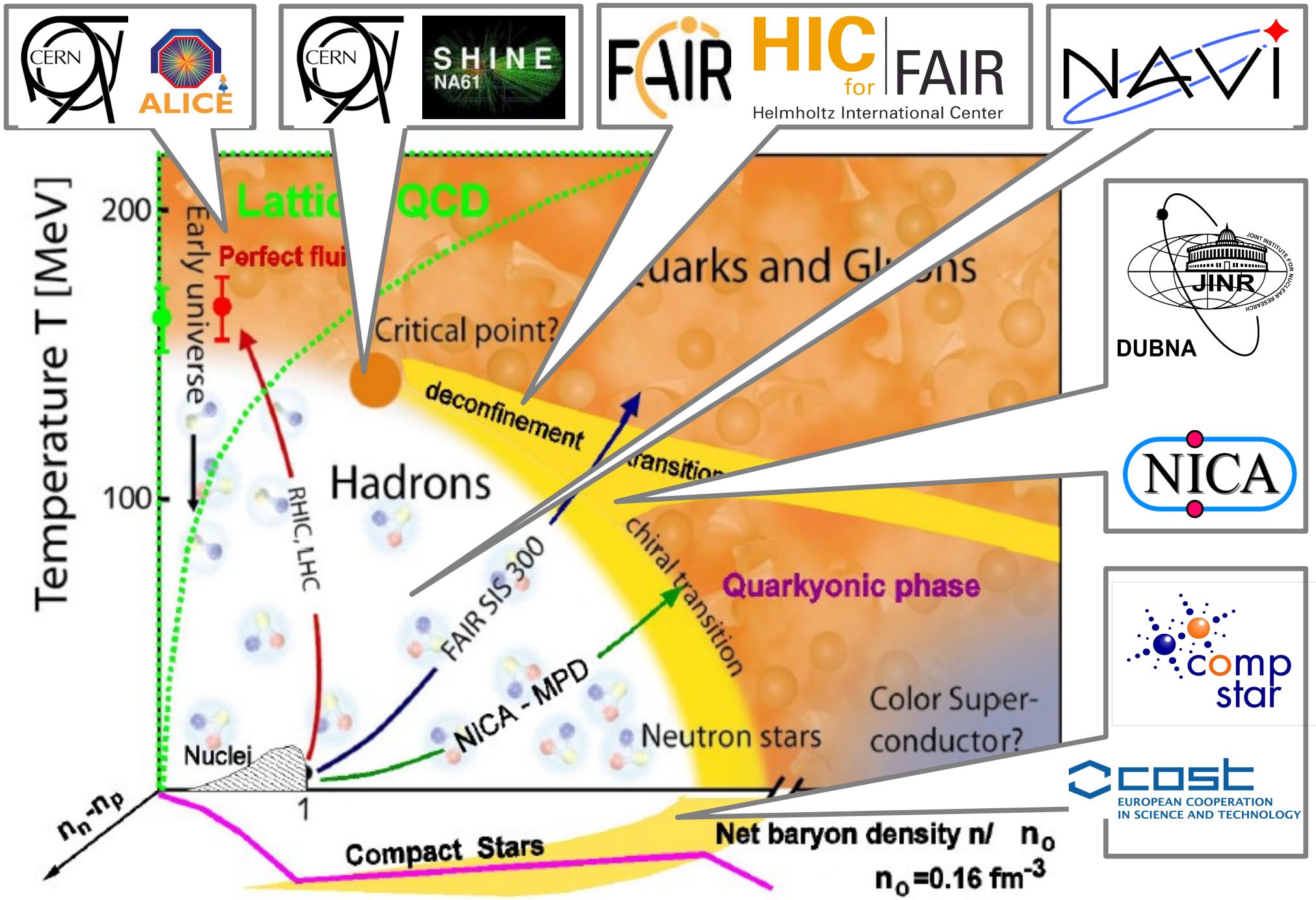


Division: Theory of Elementary Particles - Collaborations



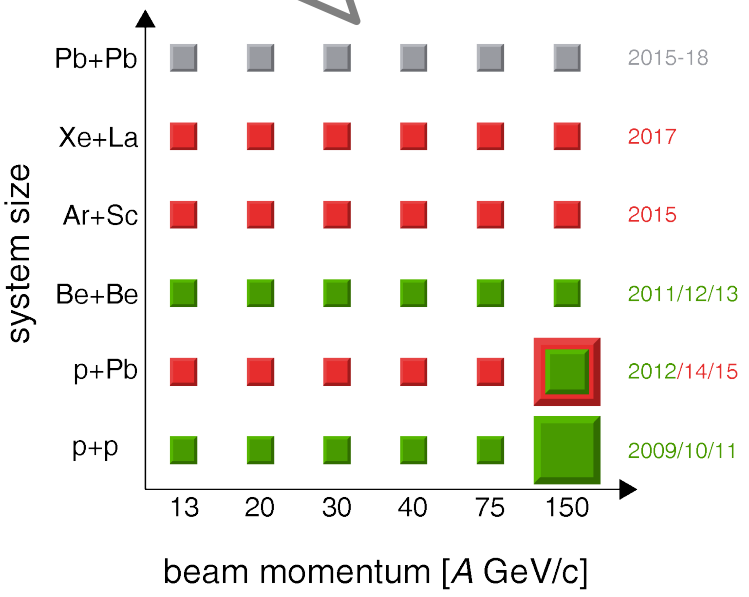
Division: Theory of Elementary Particles

Collaboration with CERN Experiment NA61/SHINE since 2011

Goals of the experiment:

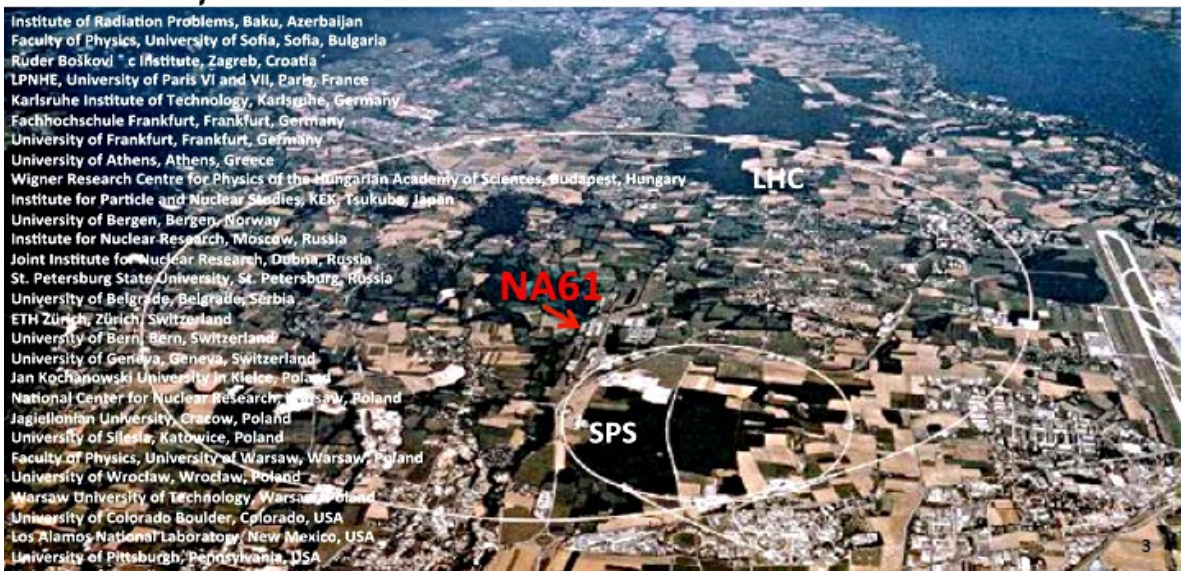
- study of the properties of the onset of deconfinement and the search for the critical point of strongly interacting matter with nucleus-nucleus, proton-proton and proton-lead collisions at six collision momenta
- Precise hadron production measurements for calibrating neutrino beams at J-PARC, Japan and Fermilab, US. Proton/pion-carbon and proton/pion-(replica target) interactions recorded
- Precise hadron production measurements for reliable simulations of cosmic-ray air showers in the Pierre Auger Observatory and KASCADE experiments

Energy and system size scan for Finding the QCD critical endpoint



NA61/SHINE Collaboration

- SPS Heavy Ion and Neutrino Experiment (SHINE)
- Located at the Super Proton Synchrotron (SPS)
- 140 Physicists from 14 countries and 28 institutions



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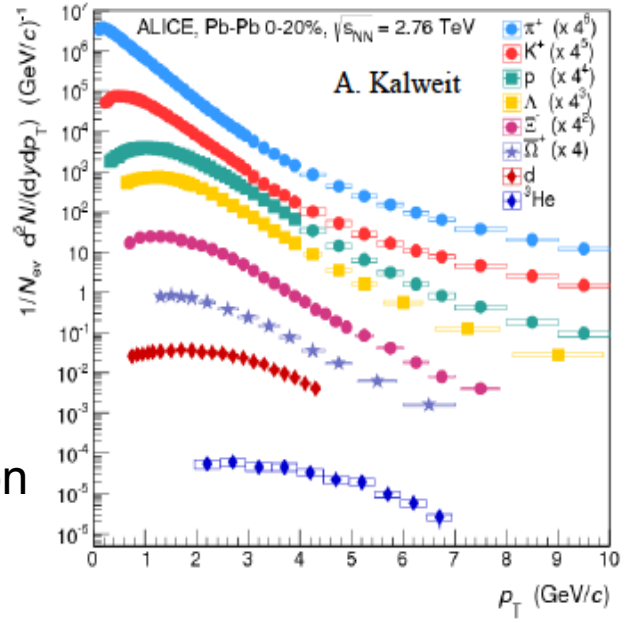
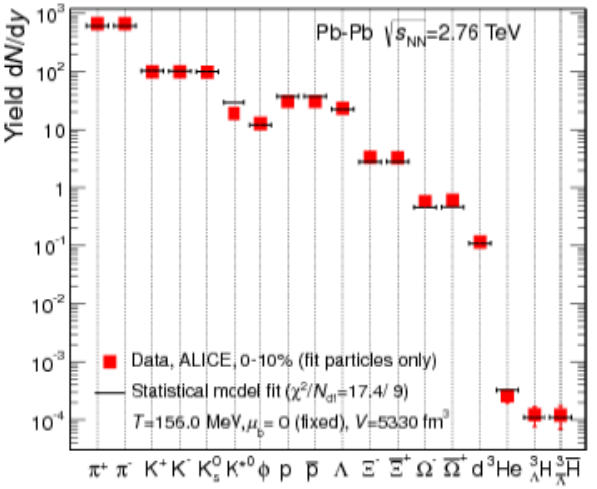
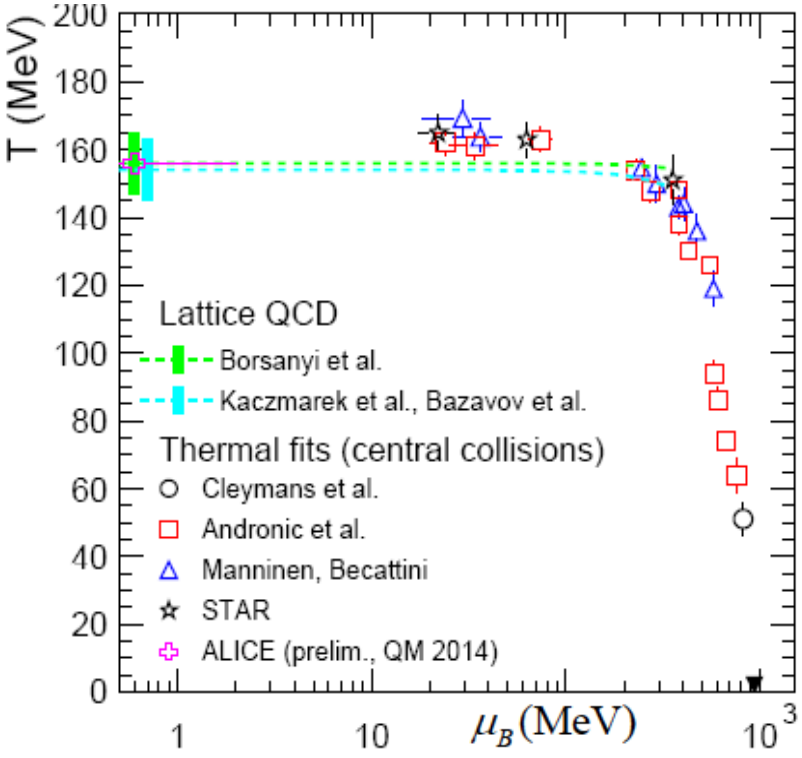
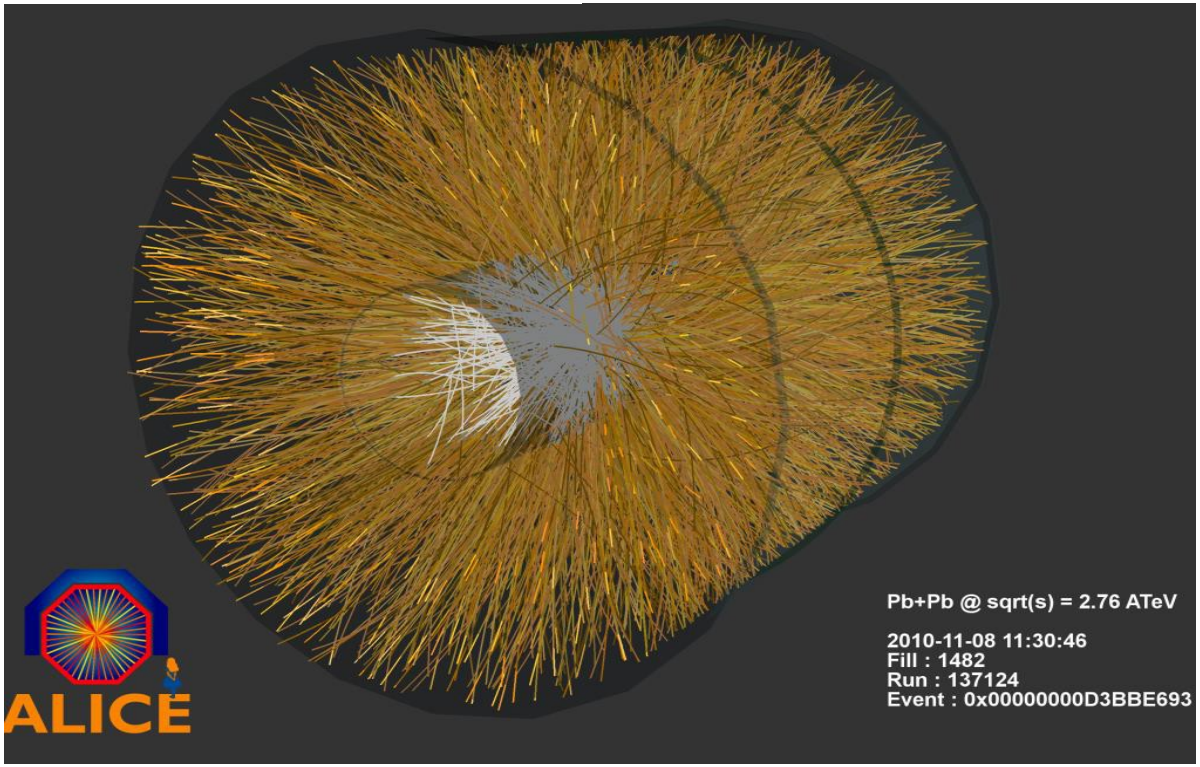
Collaboration with ALICE @ CERN

- excellent particle identification
- high statistics data allow new level unprecendented accuracy
- multihadron production near the QCD phase boundary challenges our understanding of the process of nonequilibrium QGP hadronization
- confirmation of lattice QCD theory









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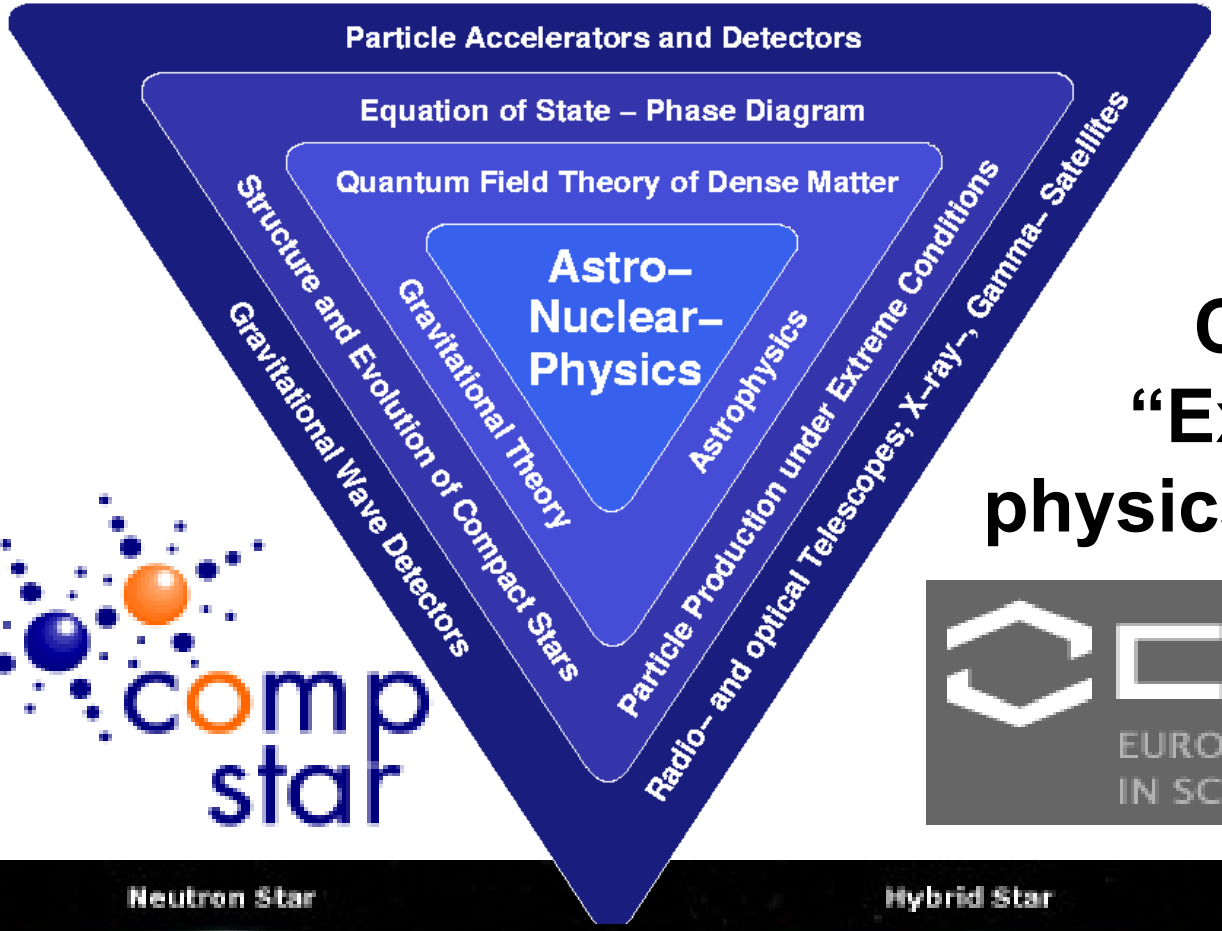

NICA

JINR
DUBNA

NewCompStar

COST Action MP1304: "Exploring fundamental physics with compact stars"

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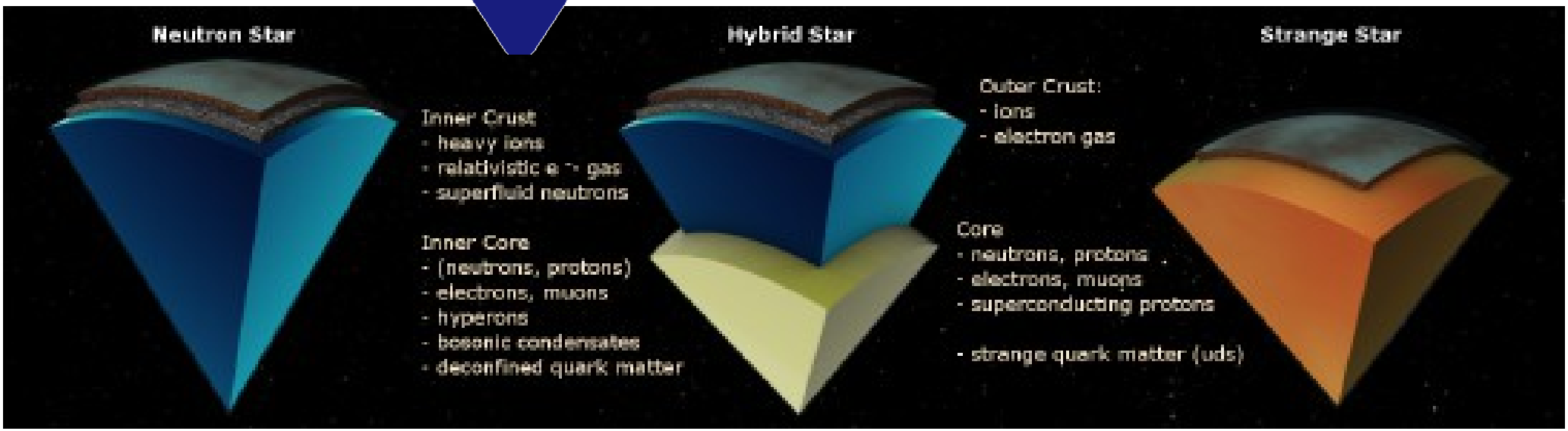
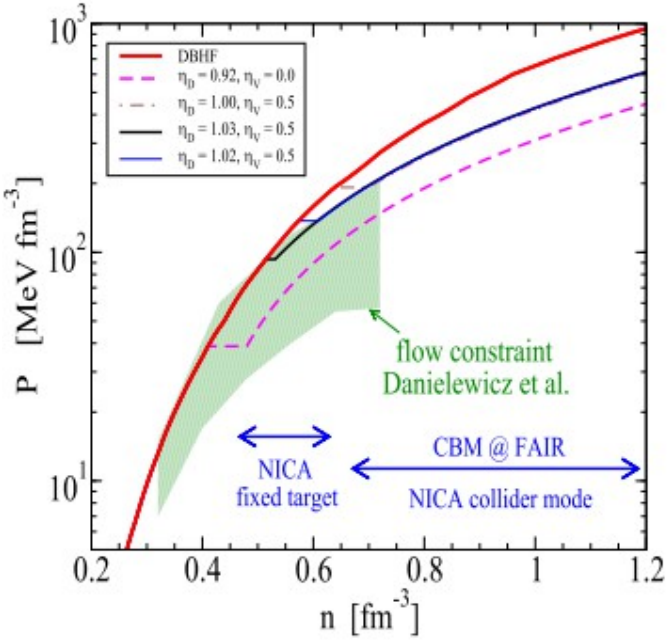


Division: Theory of Elementary Particles

Collaboration with NICA – MPD Collaboration at JINR Dubna
and COST Action MP1304 “NewCompStar”

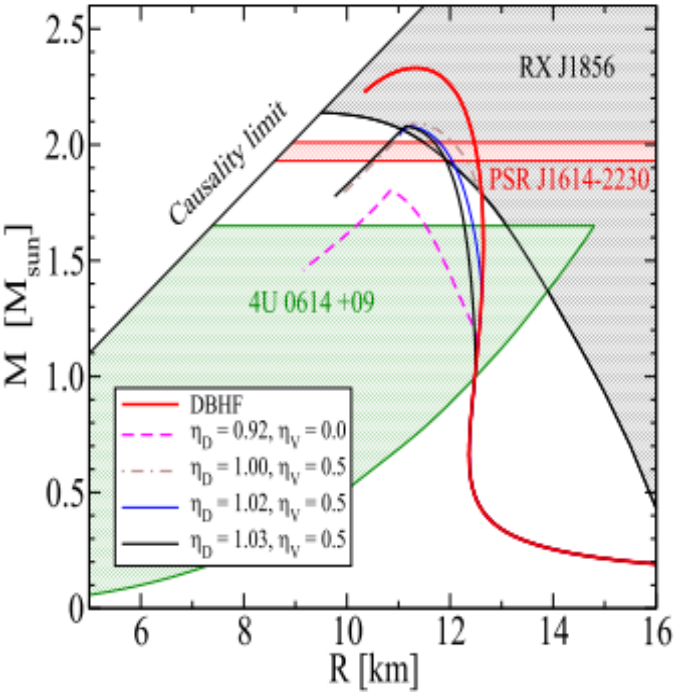
Heavy-Ion Collisions



- stiff EoS (at flow limit)
- low ncrit (at NICA fixT)
- soft EoS (dashed line)

- high Mmax (J1614-2230)
- low Monset (all NS hybrid)
- excluded (J1614-2230)

Compact Stars



28 member countries

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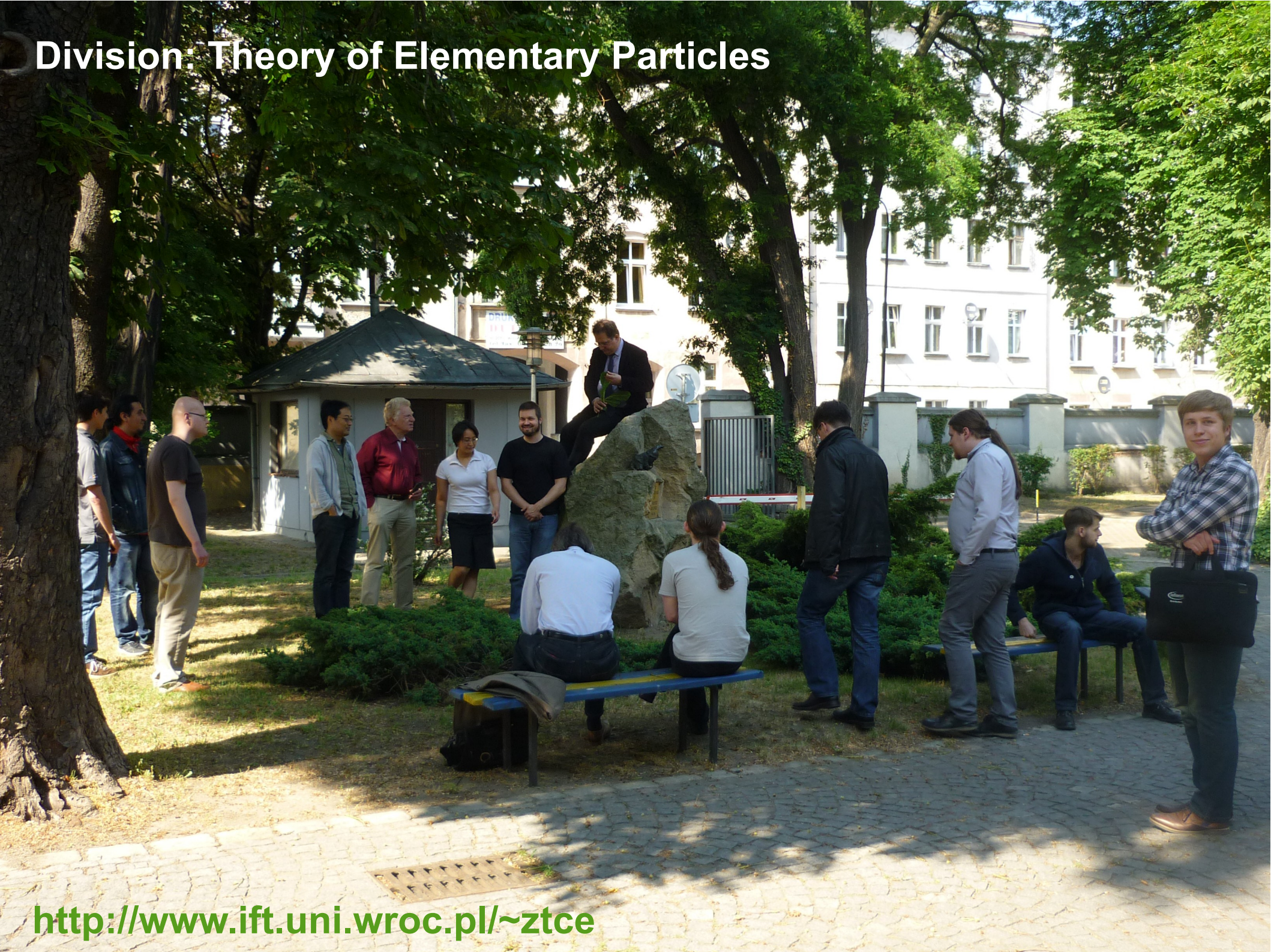

http://www.ift.uni.wroc.pl/~ztce