

Gravitational Waves & Neutron Stars - Discussion Session -

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JINR Dubna & MEPhI Moscow, Russia & University of Wroclaw, Poland

1. Jo van den Brand: “Gravitational waves measurements”
2. Luciano Rezzolla “From gravitational-wave spectroscopy to nuclear EOS”
3. Thomas Klähn: “Strange-quark matter in neutron stars?”
4. Stefan Schramm: “Dense and warm matter in compact stars ...”
5. David Blaschke:”Discussion”

17th International Conference on
**Strangeness in
Quark Matter**



Universiteit Utrecht

10-15 July 2017
Utrecht, the Netherlands



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Uniwersytet
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Russian
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Discussion:

H. Stroebele: How likely is it that s-quarks (and no s-bar) exist and survive in neutron stars in a QGP or in hyperons. How large is then the ratio $s/(u+d)$ in neutron stars and in the universe?

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It is not impossible that there is no strangeness in the Universe except for particle collision Experiments! See talk by T. Klähn

Arguments:

Onset of hypernuclear matter could be preceded by that of (two-flavor) quark matter.

Strange quarks are likely to appear sequentially (at $T=0$) due to their larger mass.

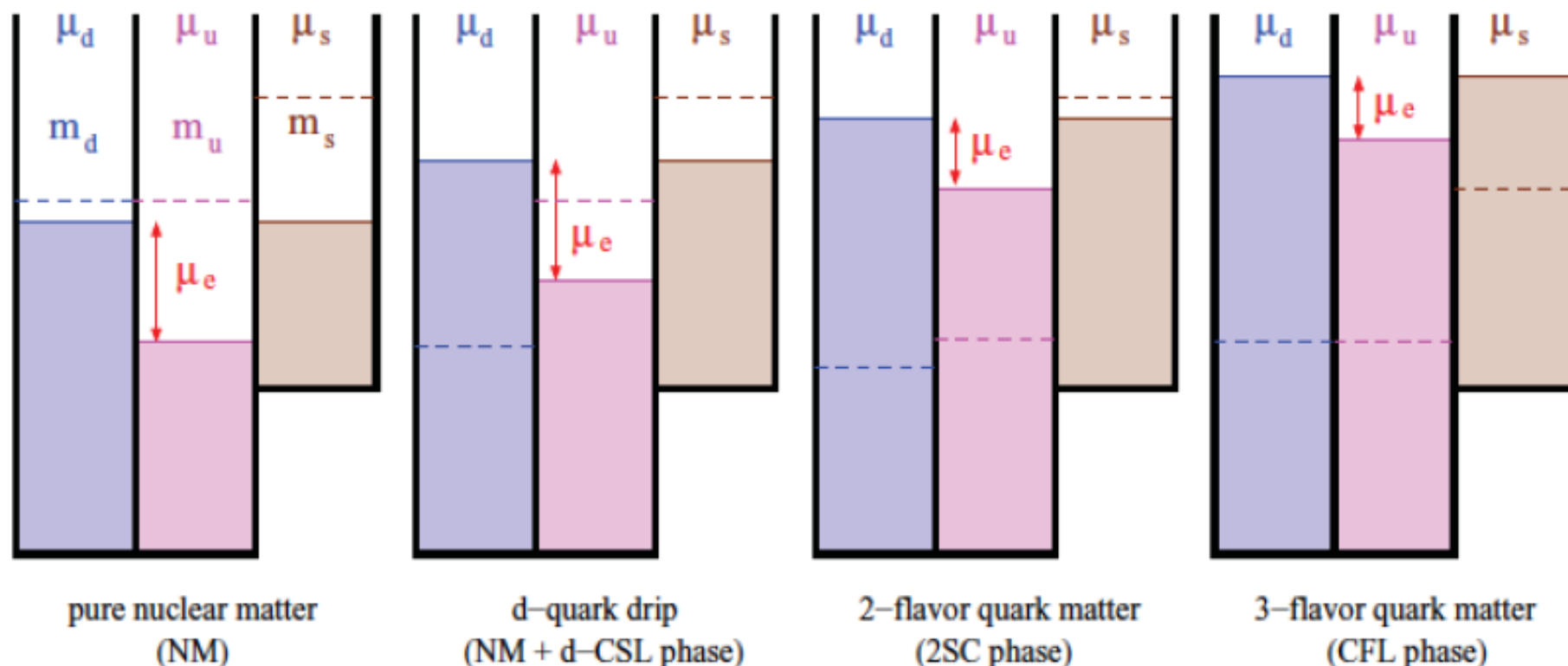
Once strangeness degree of freedom appears in quark matter, the EoS is softened and compact stars become unstable against gravitational collapse.

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There could also be single flavor quark matter, mixed with nuclear matter (d-quark dripline)

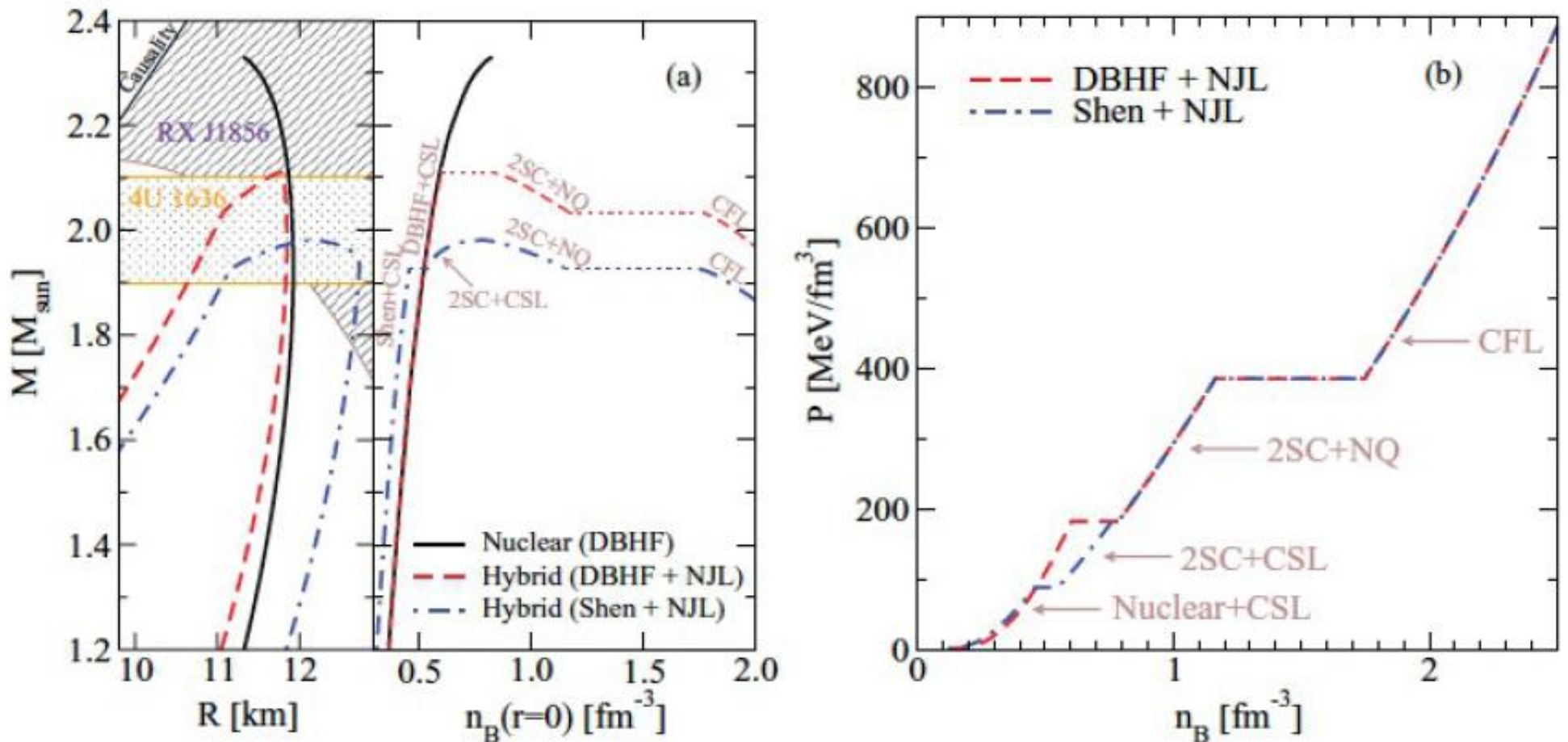
Increasing density \longrightarrow



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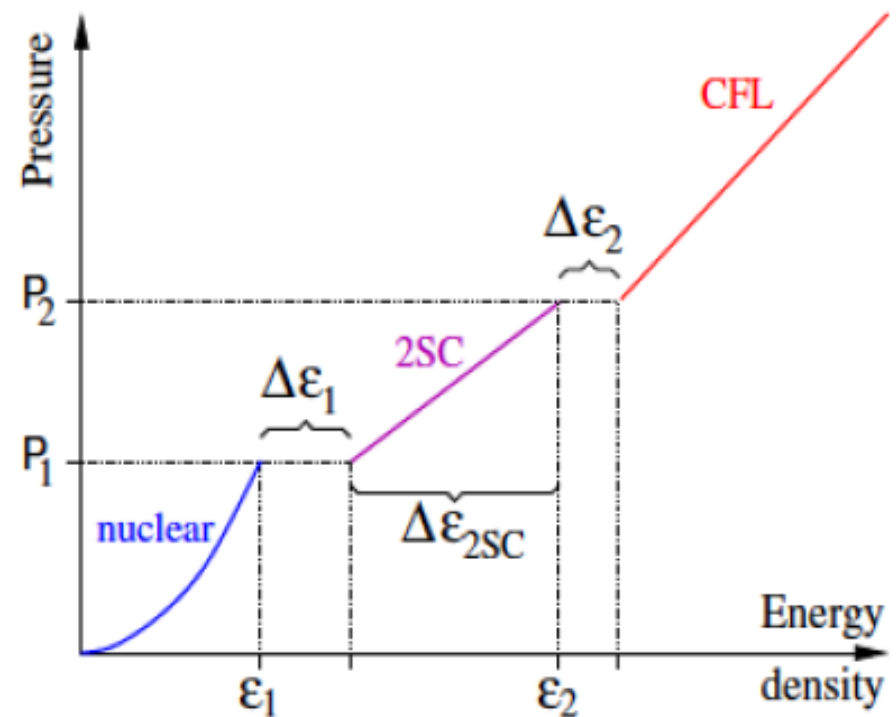
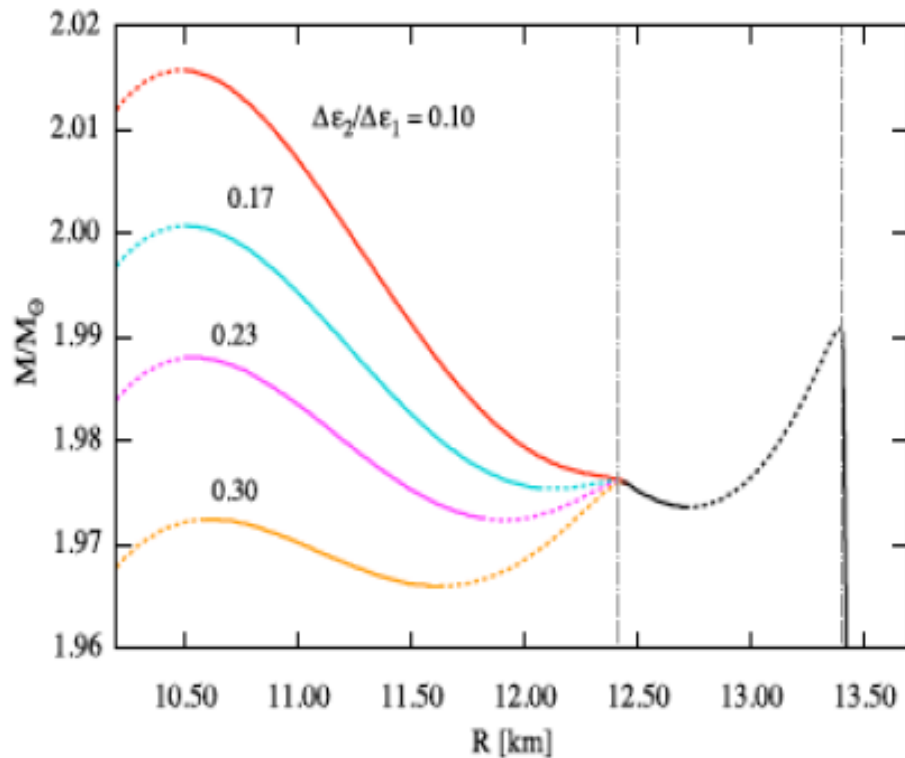


Discussion:

Measuring Mass vs. Radius



Equation of state



High-mass twins:

D. Blaschke et al., PoS CPOD 2013

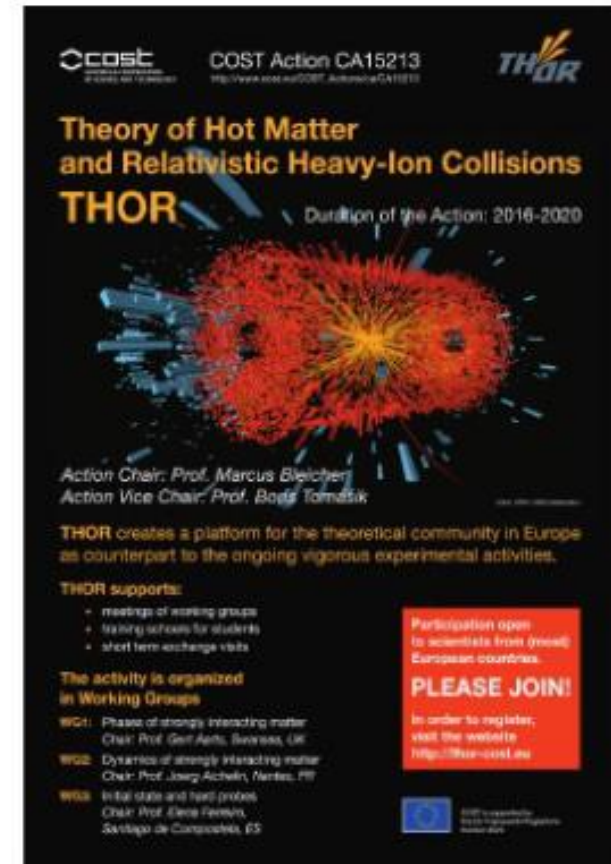
S. Benic et al., A&A 577 (2015) A50

High-mass triples:

M. Alford and A. Sedrakian, arxiv:1706.01592

Advertisement:

- **THOR EU COST Action CA15213**
 - Theory of Hot Matter and Relativistic Heavy Ion Collisions
<http://thor-cost.eu>
- **NewCompStar EU COST Action MP1304**
 - Theory of Compact Stars (ending 2017)
<http://compstar.uni-frankfurt.de>
- **PHAROS EU COST Action CA16214**
 - The multi-messenger physics and astrophysics of neutron stars



The poster for THOR COST Action CA15213 features a central image of a heavy-ion collision, showing a red and orange fireball with blue tracks. The text is arranged around this central image, providing details about the action's goals, support, and organizational structure.

cost COST Action CA15213
<http://www.thor-cost.eu>

THOR Theory of Hot Matter and Relativistic Heavy-Ion Collisions
Duration of the Action: 2016-2020

Action Chair: Prof. Marcus Bleicher
Action Vice Chair: Prof. Bogdan Tomalík

THOR creates a platform for the theoretical community in Europe as counterpart to the ongoing vigorous experimental activities.

THOR supports:

- meetings of working groups
- training schools for students
- short term exchange visits


The activity is organized in Working Groups

WG1: Phases of strongly interacting matter
Chair: Prof. Gert Aarts, Swansea, UK

WG2: Dynamics of strongly interacting matter
Chair: Prof. Joerg Aichelin, Nantes, FR

WG3: Initial state and hadron probes
Chair: Prof. Elena Fermi, Santiago de Compostela, ES

Participation open to scientists from (most) European countries.
PLEASE JOIN!
In order to register, visit the website <http://thor-cost.eu>

 COST is supported by the European Union

6th International Workshop on

Compact Stars in the QCD Phase Diagram VI

(Cosmic matter in heavy-ion collision laboratories?)

Dates: 26.-29. September 2017

Venue: Dubna, Russian Federation

Organizers: D. Blaschke, H. Grigorian

Website: <http://www.quarknova.ca/CSQCD.html>

<http://theor.jinr.ru/meetings/2017> (t.b.u.)

Previous meetings:

Copenhagen (2001), Beijing (2009), Guaruya (2012), Prerow (2014),
Gran Sasso (2016)

Topics:

- QCD phase diagram for HIC vs. Astrophysics
- Quark deconfinement in HIC vs. supernovae, neutron stars and their mergers
- Strangeness in HIC and in compact stars
- ...



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