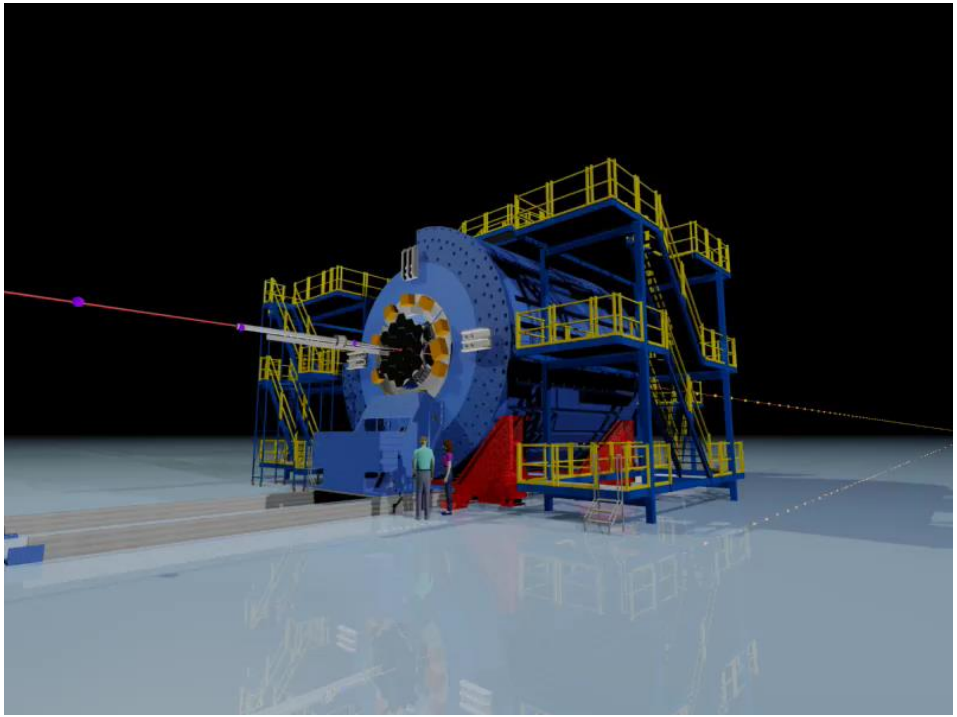
2015 KOBE JAPAN

STAR Overview

Frank Geurts

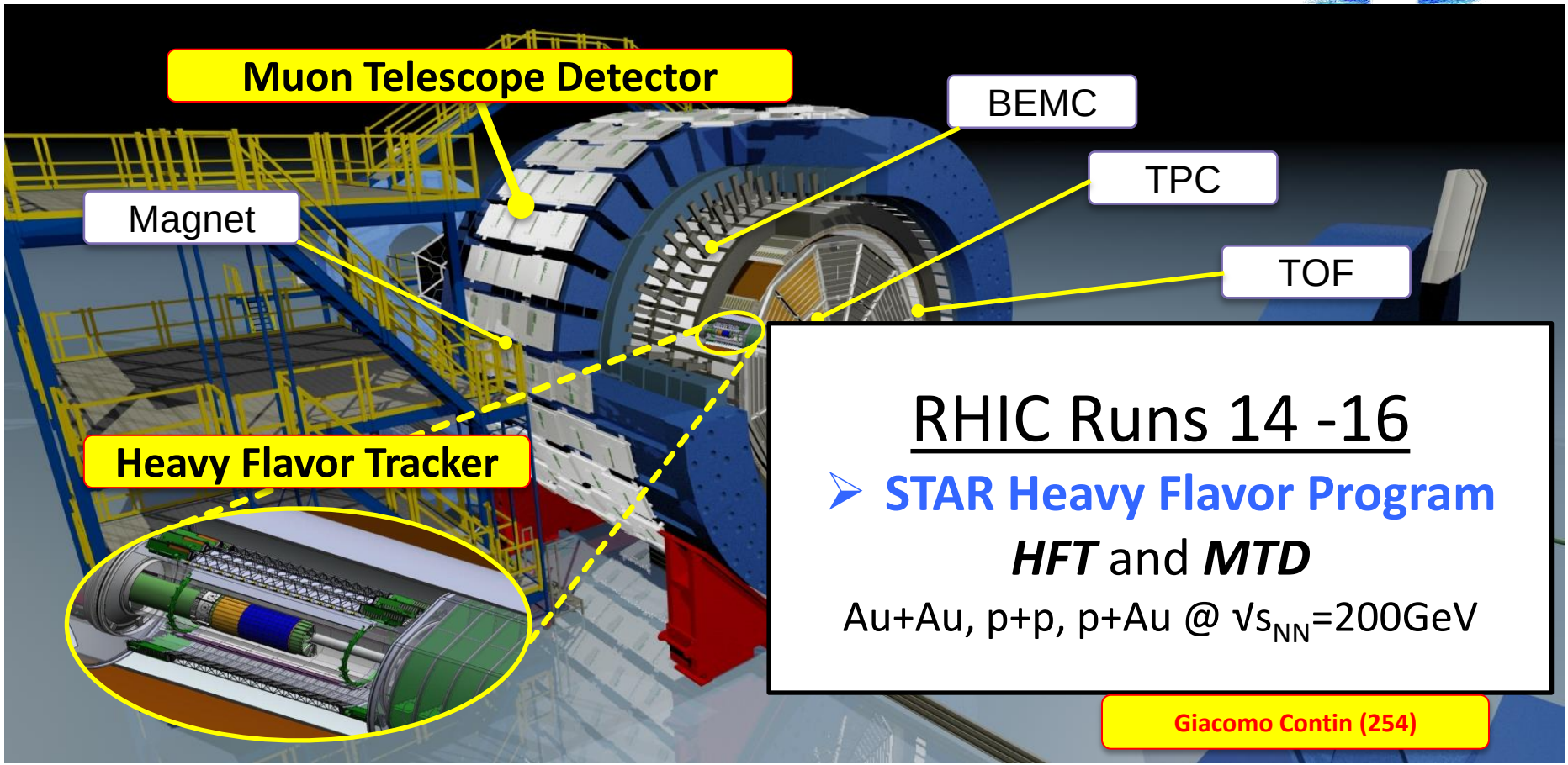
(Rice University)

for the STAR Collaboration



courtesy Alex Schmah

The Solenoidal Tracker at RHIC



RHIC Runs 14 -16

- **STAR Heavy Flavor Program**

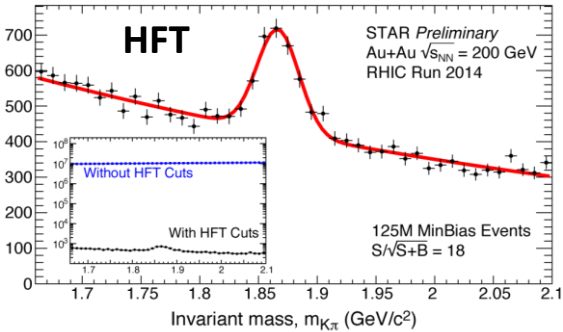
HFT and ***MTD***

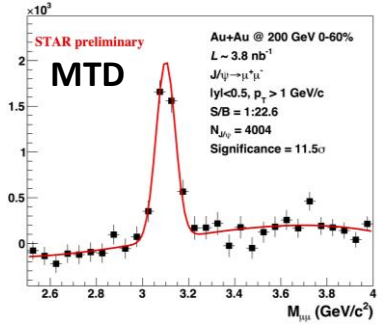
Au+Au, p+p, p+Au @ $\sqrt{s_{NN}}$=200GeV

Giacomo Contin (254)

➢ Heavy Flavors … first results from *HFT* and *MTD*!!

- Thermalization and modification of charm at RHIC?
  - D^0, $D^{\pm}$ elliptic flow -- **Michael Lomnitz (493)**
  - D^0 nuclear modification factor – **Guannan Xie (523)**
- Modification of charm in the medium: How about $D_S^{\pm}$? -- **Md Nasim (221)**
  - strangeness enhancement reflected in an enhanced R_{AA} compared to the other D's?
  - effects of expected early freeze-out in a reduced elliptic flow?
- Results from semi-leptonic channels – **Xiaozhi Bai (496)**
  - new p+p cross section measurements, R_{AA} in Au+Au and U+U
- Quarkonia – suppression, a complicated story … – **Rongrong Ma (274), Barbara Trzeciak (497)**
  - measure J/ψ nuclear modification
  - disentangle production/regeneration mechanisms: J/ψ non-zero v_2 at low momentum
  - to the *bottom* of it: explore different Y states
  - make sure to understand "the basics": J/ψ and Y production and polarization in p+p





➢ Jets – study energy loss in the medium

- Surface *vs.* volume emission – **Nihar Sahoo (251)**
  - compare medium effect for γ_{dir}-hadron and π^0-hadron; we do not see less suppression for π^0-h when compared to γ_{dir}-h. Push I_{AA} (z_T) measurements to lower z_T
- Quantifying medium properties – **Peter Jacobs (311)**
  - recoil jets suggest less out-of-cone energy transport at RHIC than LHC

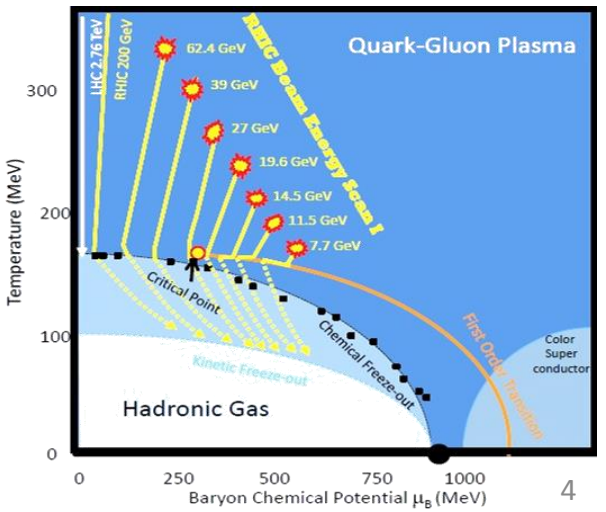
➢ New Results for 14.5GeV :: fill in the large μ_B gap

- Higher moments of net particle distributions: -- **Jochen Thaeder (153)**
  - new results for net-*Q*, net-*K*, and net-*p*; indications of non-monotonic behavior
- v_1 for identified particles – **Prashanth Shanmuganthan (398)**
  - study the interplay between baryon transport and hydrodynamic expansion; can theory reproduce this?
- The ridge, v_2^2, and v_3^2 from di-hadron correlations – **Liao Song (258)**
  - apparent non-monotonicity of v_3^2/v_2^2 and v_3^2/n_{ch} similar in shape to net-*p* dv_1/dy; 1st order phase transition?
- Bulk properties vs. energy, centrality – **Vipul Bairathi (492), Daniel Brandenburg (606), Chris Flores (320)**
  - v_2, chemical & kinetic freeze-out
  - energy dependence of strange baryon-meson ratios
  - rapidity density measurements and the Dale plot
- Hadron suppression and nuclear modification
  - centrality dependence of high-p_T suppression– **Stephen Horvat (323)**
  - identified particle R_{CP} – **Daniel Brandenburg (606)**

➢ Chiral Symmetries

- BES dielectron measurement – **Shuai Yang (290)**
  - acceptance corrected, life-time comparison: BES and U+U
- Charge-dependent directed flow in Cu+Au – **Takafumi Niida (263)**
  - can asymmetric systems result in large initial electric fields?
  - relevant to test chiral-magnetic effect and waves.

$\sqrt{s_{NN}}$(GeV)	7.7	11.5	14.5	19.6	27	39
μ_B (MeV)	420	315	260	205	155	115



STAR Posters

… where you have all the time, and find all the experts!

Chiral Symmetries

- Charge Asymmetry Correlations to Search for Chiral Magnetic Effect from BES (123)
- Systematic searches for chiral magnetic effect and chiral vortical effect (948)

Beam Energy Results

- Net-K results from BES (127)
- Search for critical parton density fluctuations through baryon clustering (103)
- Energy and centrality dependence of identified particle elliptic flow (833)
- Beam Energy Dependence of Deuteron Prod. (130)
- Production of light nuclei (105)
- STAR Au+Au fixed target results (116)

Quarkonia

- Non-Prompt J/ψ Measurements (626)
- J/ψ polarization measurement in p+p collisions at 500 GeV (624)
- Y measurements in p+p collisions at 500 GeV (613)

Open Heavy Flavor

- Two-particle correlation measurement of D^0 meson elliptic anisotropy (521)
- $D_S^{\pm}$ meson production in Au+Au collisions (569)
- Λ_C^+ baryon production in Au+Au collisions (555)
- Measurements of heavy flavor electron production (567)
- Measuring Charm and Bottom Productions in Semi-leptonic Channels (542)
- Measurement of semileptonic decays of open heavy flavor hadrons in p+p and Au+Au (505)
- Heavy Flavor Triggered Azimuthal Correlations in p+p at 500 GeV (533)

Jets & U+U

- Characterizing the away-side jet, devoid of flow background, via 2-particle and 3-particle correlations (412)
- Strangeness production in U+U (560)
- Electrons from heavy flavor decays in central U+U (517)

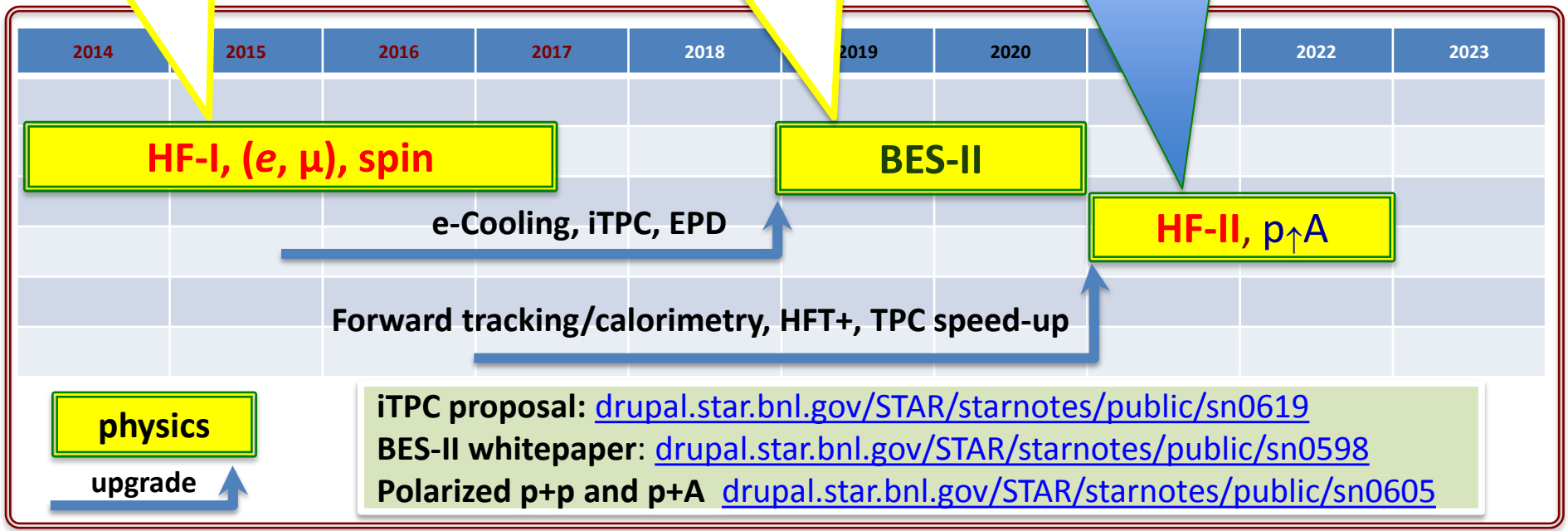
STAR Future Plans

Completing the RHIC Mission

- charm
-dilepton
sQGP properties

- QCD phase structure
- Critical Point

AA: B, Λ_C, jet, γ-jet, 3D correl.
p↑A: CNM, proton structure



iTPC proposal: drupal.star.bnl.gov/STAR/starnotes/public/sn0619
BES-II whitepaper: drupal.star.bnl.gov/STAR/starnotes/public/sn0598
Polarized p+p and p+A drupal.star.bnl.gov/STAR/starnotes/public/sn0605

The STAR Collaboration

5 continents
11 countries
57 institutes
583 collaborators

ありがとう

http://www.star.bnl.gov/central/collaboration

STAR Speakers & Sessions

Monday

- 11:15a Daniel Brandenburg (606) – Open HF & Strangeness
- 2:30p Jochen Thaeder (153) – Correlations & Fluctuations I
- 3:10p Guannan Xie (523) – Open HF & Strangeness II
- 5:00p Takafumi Niida (263) – Initial State Physics & Approach to Equilibrium

Tuesday (AM)

- 9:00 Michael Lomnitz (493) – Collective Dynamics I
- 9:20 Prashanth Shanmuganthan (398) – Collective Dynamics
- 11:10 Md Nasim (221) – Open HF & Strangeness IV
- 11:30 Nihar Sahoo (251) – Jets & High p_T Hadrons III
- 11:30 Xiaozhi Bai (496) – Open HF & Strangeness IV
- 11:50 Chris Flores (320) – Collective Dynamics II

Tuesday (PM)

- 2:40p Liao Song (258) – Correlations & Fluctuations IV
- 3:00p Peter Jacobs (311) – Jets & High pT Hadrons IV
- 3:00p Giacomo Contin (254) – Future Exp. Fac., Upgr.

Wednesday

- 9:40a Vipul Bairathi (492)- Collective Dynamics III
- 9:40a Barbara Trzeciak (497) – Quarkonia III
- 10:50a Rongrong Ma (274) – Quarkonia IV
- 11:10a Shuai Yang (290) – Electromagnetic Probes II
- 11:50a Steven Horvat (323) – Baryon Rich QCD Matter

Thursday

- 11:30a Mustafa Mustafa (60) – Plenary II