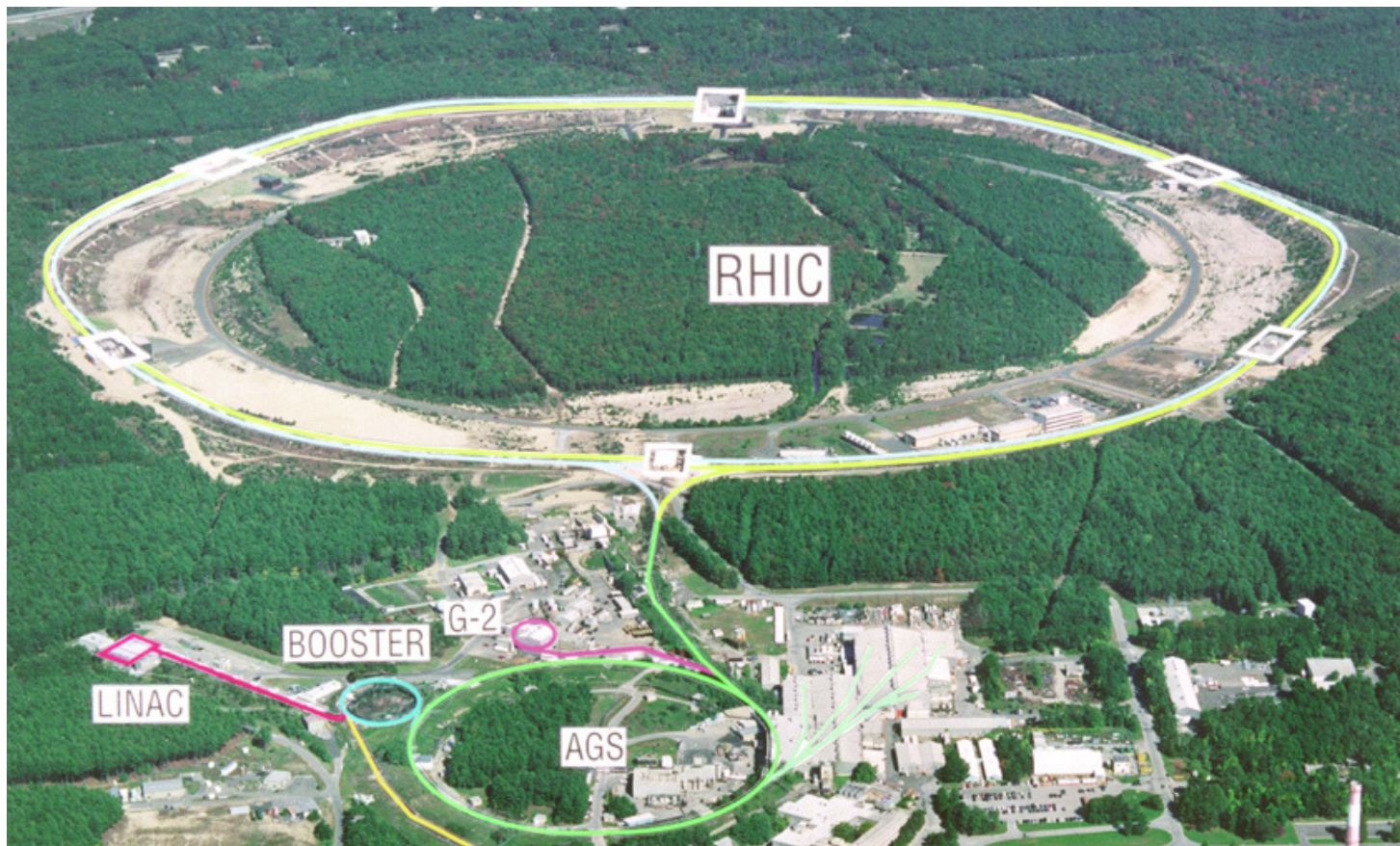
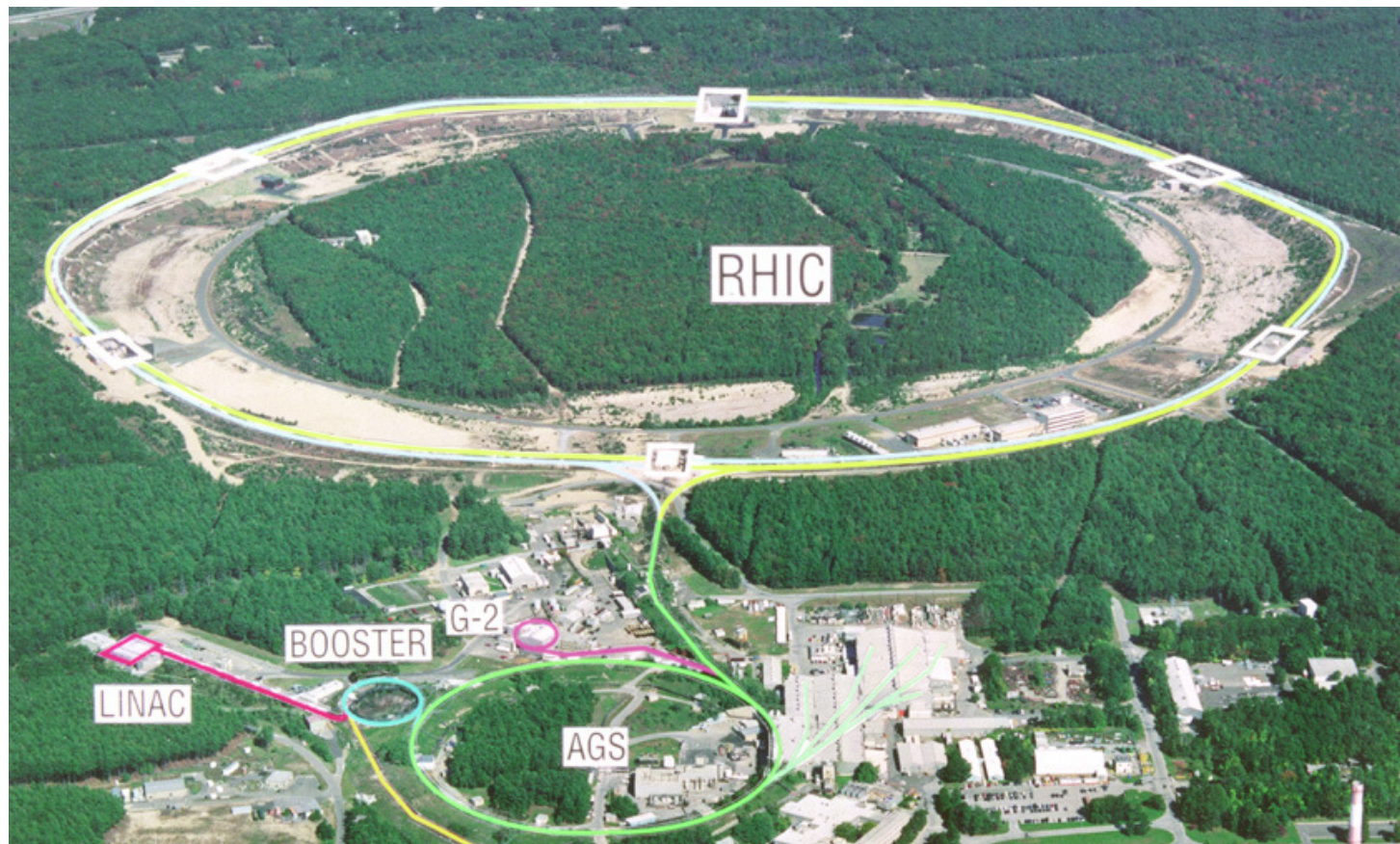


# What has RHIC told us about the equation of state?



How does RHIC connect to other fields like cosmology and condensed matter physics?



# A Standard Model

Should be flexible and practical to implement.

Discussions began during visit  
to Duke in March 2004.

# Theory Outline

1. Hard parton scattering and jet production.
2. Generation of classical gluon field by large momentum partons that have not scattered (color glass condensate).
3. Decay of classical gluon fields via particle production.
4. Matching to relativistic viscous fluid dynamics in 3+1 dimensions.
5. Phase transition or crossover from quarks and gluons to hadrons.
6. Rescattering of hadrons followed by freestreaming to the detectors.



# From Hard Scattering to Classical Color Fields to Quark Gluon Plasma

**Joe Kapusta**

University of Minnesota

*in collaboration with R. Fries, C Nonaka, Y. Li  
(Minnesota); S. A. Bass, B. Müller (Duke)*

**2<sup>nd</sup> Joint DNP Meeting of the APS and JPS  
Maui, Hawaii September 22, 2005**

# Physics at RHIC

**Joe Kapusta**

University of Minnesota



Colloquium at the University of Washington  
22 May 2006

An approach to model  
the collisions from first  
impact until the last  
hadronic scattering.

Duke (Bass, Muller)

Minnesota (Fries, Kapusta, Li)

Nagoya (Nonaka)

# Physics at RHIC

**Joe Kapusta**

University of Minnesota



Argonne National Laboratory  
25 February 2008



An approach to model  
the collisions from first  
impact until the last  
hadronic scattering.

Duke (Bass, Muller)

Nagoya (Nonaka)

Texas A&M (Fries)

Iowa (Li)

Minnesota (Kapusta)