

# Statistical Field Theory

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- **Cosenza** (Domenico Giuliano):
- **Firenze** (Andrea Cappelli)
- **Genova** (Nicodemo Magnoli)
- **Milano** (Sergio Caracciolo)
- **Pisa** (Enore Guadagnini)
- **Torino** (Roberto Tateo)
- **Trieste** (Giuseppe Mussardo)

# Projects for the next three years

Two main research lines:

- Study of QCD and other strongly coupled LGTs, in particular in extreme condition (high temperature and/or density, strong external magnetic field...).
  
- Study of Conformal Field Theories in two and three dimensions, with a particular attention to the application to Condensed Matter Systems

## QCD projects:

- Study of the QCD contribution to the photon production rate in the Quark Gluon Plasma (QGP) following the approach discussed in Phys. Rev. Lett. 112 (2014) 16, 162001: "Lattice Study of the Jet Quenching Parameter"
- Study of the behaviour of QGP in strong external magnetic fields using the non-equilibrium approach discussed in in Phys. Rev. D94 (2016) no.3, 034503 "Jarzynskis theorem for lattice gauge theory".  
(Work in collaboration with M. D'Elia and the Pisa group)

- Study of the running of the QCD coupling constant with the Schrödinger functional approach, using again the Jarzynski's theorem non-equilibrium approach
- Study of the QCD equation of State
- Extension of non-equilibrium methods to finite density QCD, as a way to overcome the sign problem.

## CFT projects:

- Study of the thermodynamic Casimir effect in  $d = 2$  e  $d = 3$  systems near the critical point, and comparison with existing experimental results.
- Study of the lattice discretization of quantum gravity in less than four dimensions.

# National and International Collaborations

- **Pisa** (Massimo D'Elia and collaborators)
- **Regensburg** (A. Schaefer)
- **Helsinki** (K. Rummukainen)
- **Plymouth** (A. Rago)
- **Swansea** (B. Lucini)
- **Berlin** (M. Hasenbusch)