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## The holographic glass bead game : from superconductivity to time machines

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### Citation

Bagrov, A. (2015, September 23). *The holographic glass bead game : from superconductivity to time machines*. *Casimir PhD Series*. Retrieved from <https://hdl.handle.net/1887/35436>

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**Issue Date:** 2015-09-23

# Stellingen

behorende bij het proefschrift

*“The holographic glass bead game: from superconductivity to time machines”*

- I. The conventional holographic dictionary for correlation functions requires modifications if the dual bulk fields are coupled.  
This thesis, Chapter 2.
- II. The simplest holographic model of BCS-like superconductivity has  $p + ip$  symmetry of pairing due to a bulk analogue of the Rashba splitting inherent for holographic fermionic theories at finite density.  
This thesis, Chapter 2.
- III. At a finite chemical potential in the colliding shock waves model of relativistic heavy ions the energetic threshold of the deconfinement phase transition is increased.  
This thesis, Chapter 3.
- IV. In certain cases evolution of a non-causal field theory can be self-consistent and controllable without any need to impose additional constraints.  
This thesis, Chapter 4.
- V. A hard wall termination of the geometry makes little sense when Einstein’s equations are involved, so a geometric infrared regulator is needed.  
A. Allais, J. McGreevy: *“How to construct a gravitating quantum electron star”*,  
Phys.Rev. D88 (2013) 6, 066006
- VI. In holographic Bose-Fermi systems scalar condensates can cause Fermi surfaces to smear out.  
F. Nitti, G. Policastro, T. Vanel: *“Polarized solutions and Fermi surfaces in holographic Bose-Fermi systems”*, JHEP 1412 (2014) 027
- VII. The thermalization time of the medium decreases when the chemical potential is increased.  
E. Caceres, A. Kundu, D. Yang: *“Jet Quenching and Holographic Thermalization with a Chemical Potential”*, Phys.Rev. D88 (2013) 6, 066006
- VIII. Precisely the same entanglement exists between the fields within the future and past light cone as between the left and right Rindler wedges.  
S.J. Olson, T.C. Ralph: *“Entanglement between the future and past in the quantum vacuum”*, Phys.Rev.Lett. 106 (2011) 110404.”
- IX. The main goal of science is to search for new languages that would naturally make complicated open problems trivial rather than just to solve the problems.