

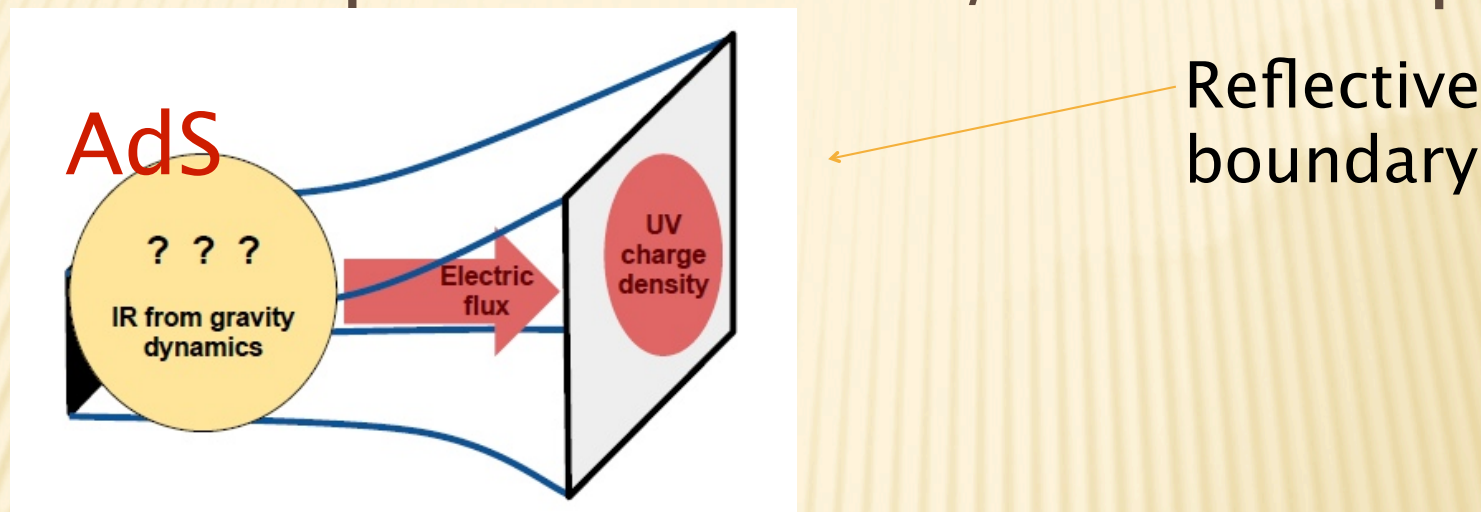
TOWARDS A FERMIONIC PHASE DIAGRAM

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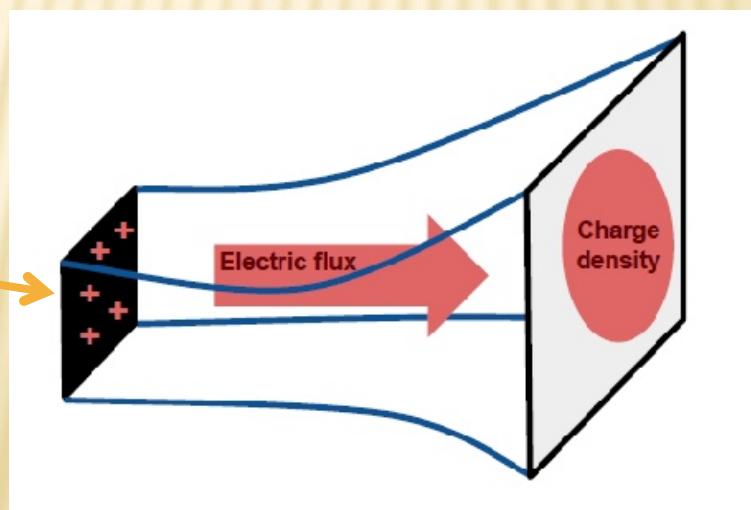
HOLOGRAPHIC PHASES, RN-SOLUTION

- ✦ Central question in AdS/CMT: Box physics

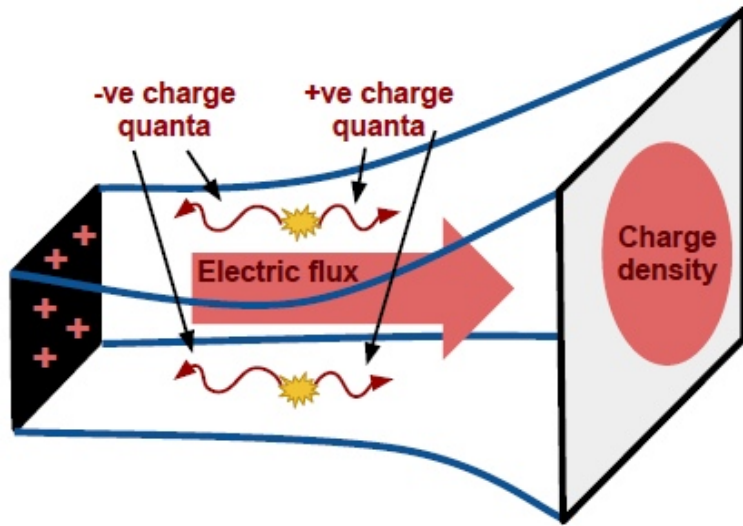


- ✦ "Simplest solution": charged RN-black hole

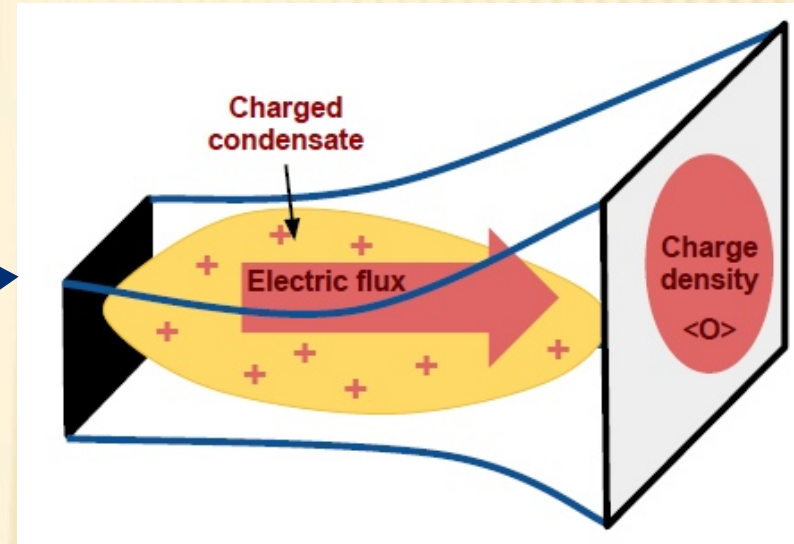
Charged
BH
horizon



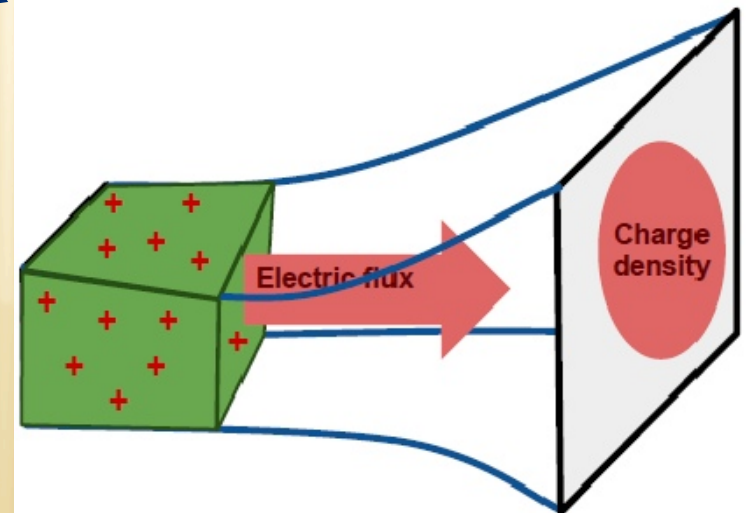
INSTABILITIES OF RN-BLACK HOLE



Bosons



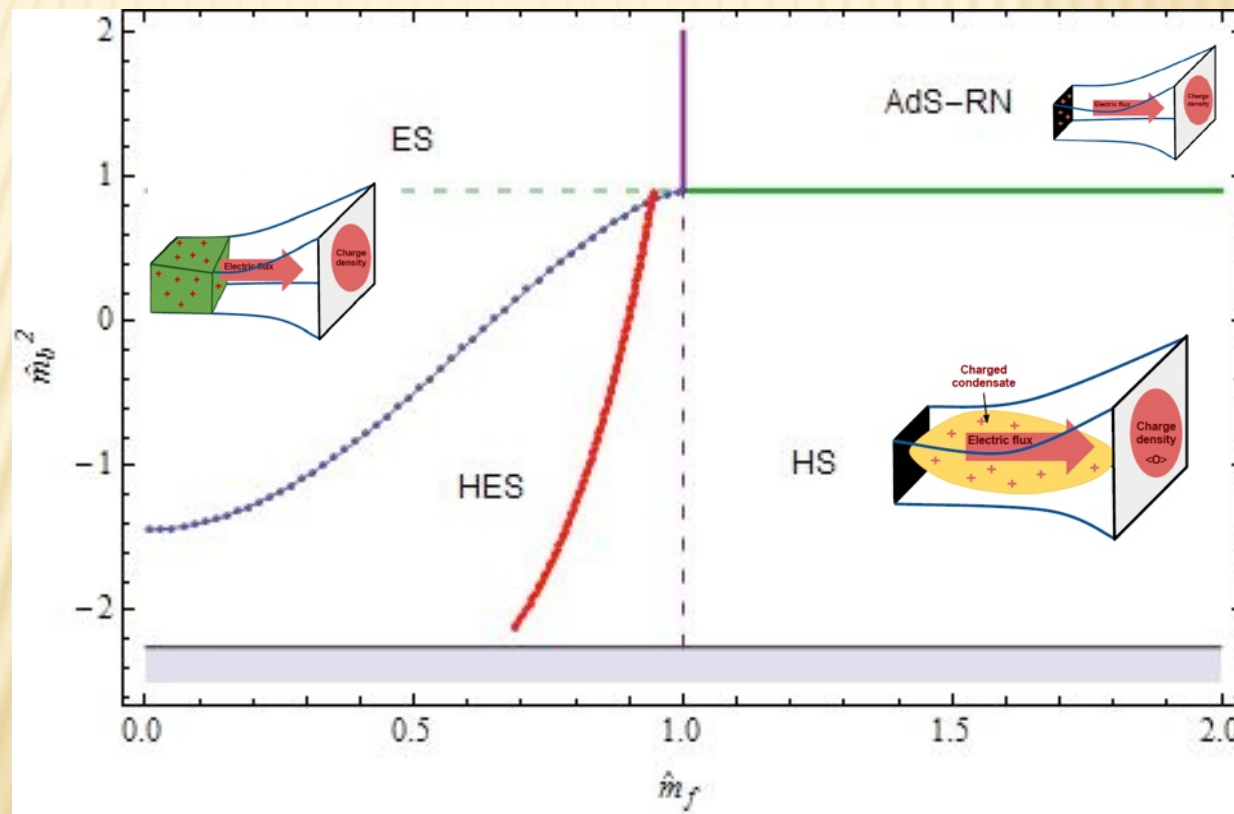
Fermions



SYSTEMATIC PHASE DIAGRAM



Boson mass–Fermion mass phase diagram Fluid Limit



Yan Liu, Koenraad Schalm, Ya-Wen

SELF-CONSISTENT FERMION EOM

Bosonic field
configuratio

$$n_\mu \phi$$



Fermionic
normalizable
mode with
 $E(\text{norm}) < \mu$



Fermionic
current
coupled to the
bosonic fields



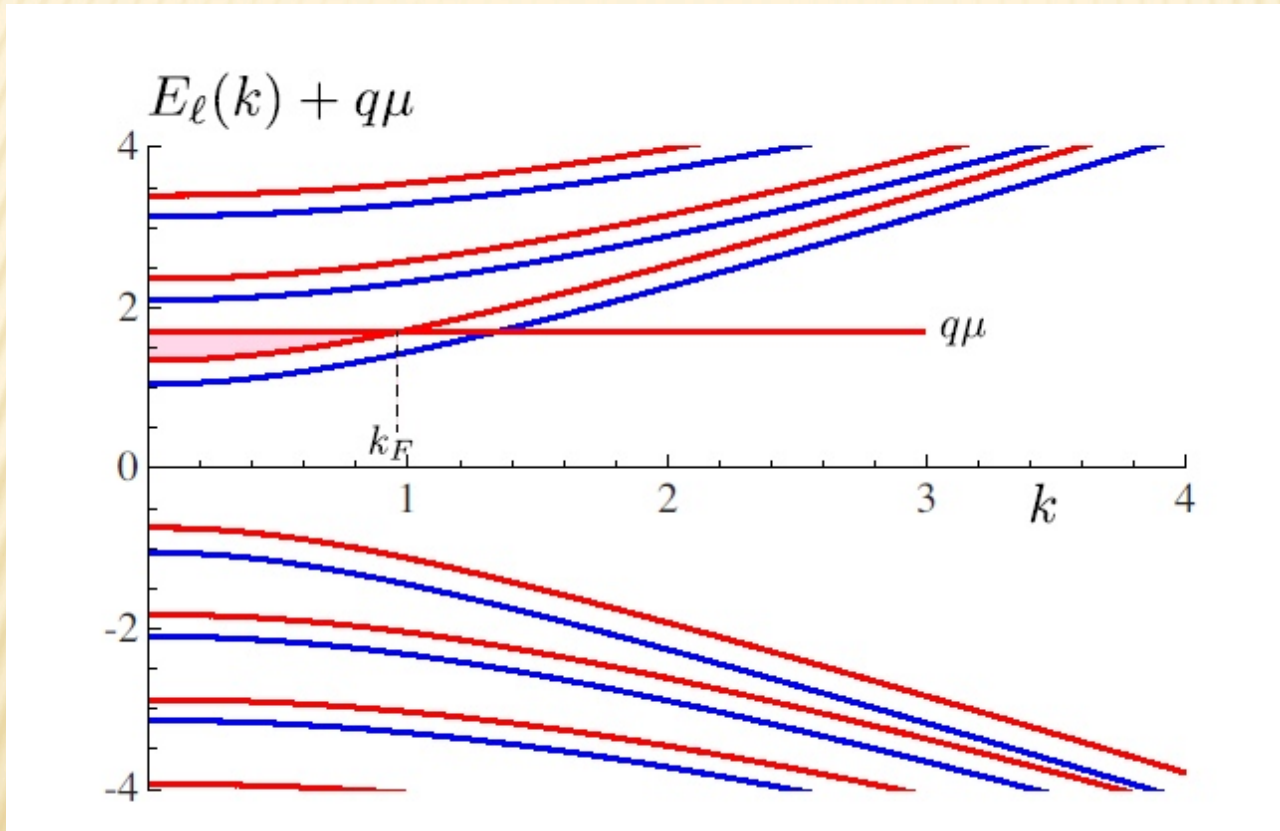
Backreactio
n

Non-local
dynamics!

SELF CONSISTENT SOLUTION

AdS hard-wall setup

Dynamical fermion
+ gauge field



S. Sachdev Physical Review D 84, 066009
(2011)

MAJORANA SCALAR-FERMION COUPLING

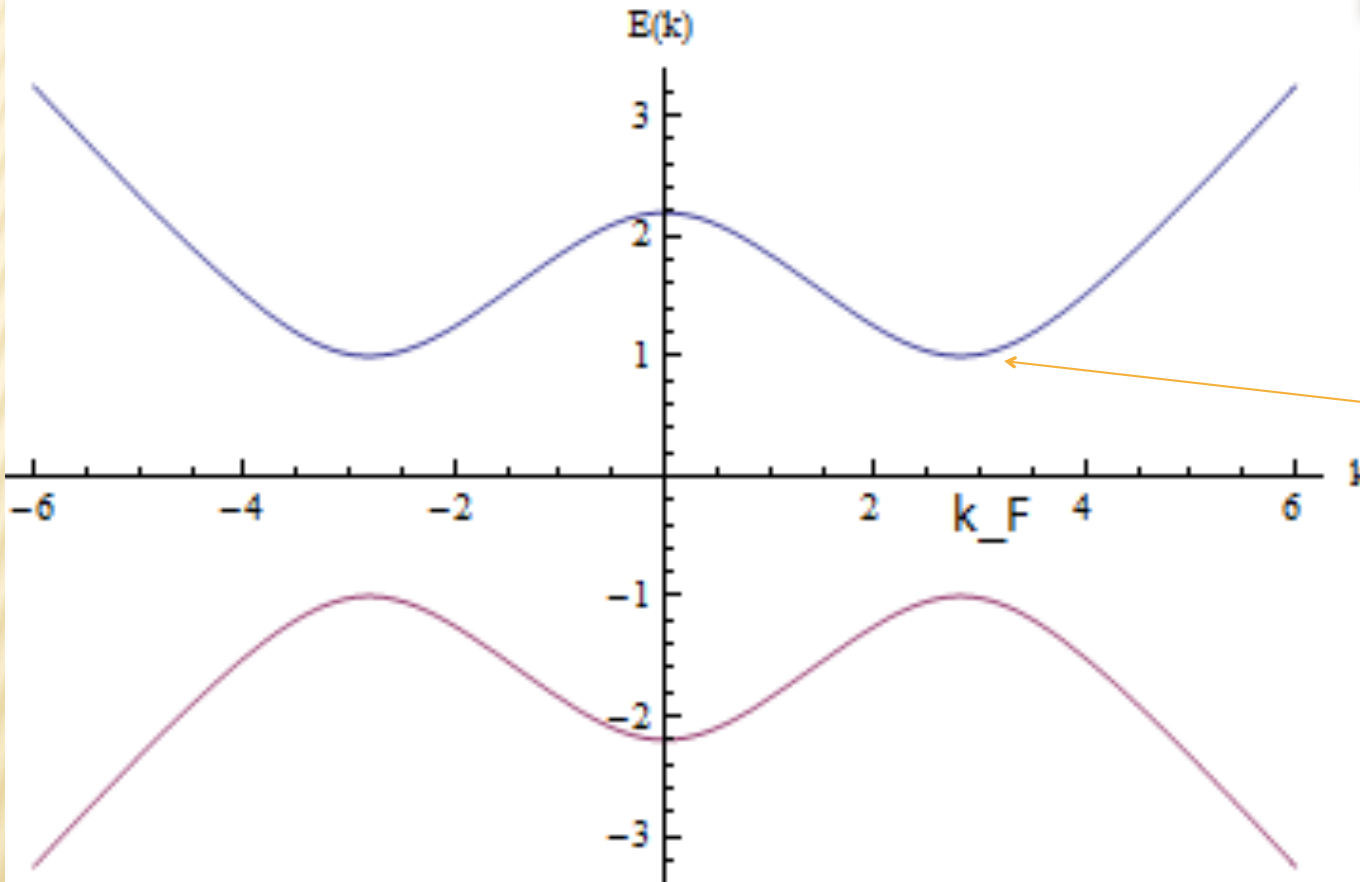


Step #1

Fixed Scalar background



Gap-like behaviour



Andrey Bagrov, Koenraad Schalm, BM