



Prof. Dr. Umut Gürsoy

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30 sene evvel ...

- 1995 İTÜ Elektrik Mühendisliği öğrenci

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- İTÜ'de ÇAP icat oldu
- Fizik Mühendisliğinde de öğrenci oldu

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$$\mathcal{L} = -\frac{1}{4} F_{\mu\nu}^a F^{a\mu\nu} + \frac{1}{8} \epsilon_{\mu\nu\rho\sigma} F^{a\rho\sigma} F^{a\mu\nu}$$



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Eğitim

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- 1997 İTÜ mezuniyet (3.97/4.00)
 - Danışman: A. Erzan

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 - Konformal Alan Teorisi (2 makale)
 - 1999-2000 Feza Gürsey Enstitüsü
 - C. Saçlıođlu ile bozonik sicim teorisi (1 Makale)
 - 2000-2005 MIT Doktora
 - Danışman: D. Freedman
 - Sicim teorisi, ayar teorisi - kütle çekim ilişkisi (8 makale)

Avrupa günleri

-
- 2005-2008 Ecole Normale Supérieure PostDoc
 - 2008-2010 Utrecht Uni PostDoc
 - 2010-2012 CERN PostDoc
 - 2012-2017 Utrecht Uni Assist Prof.
 - 2017-2025 Utrecht Uni Assoc Prof.
 - 2025 Utrecht Uni **Full Prof.**

Türkiye ile bağı



Strings, Branes and Supergravity
Koç Üni. Ağustos 2011



Kasım 2014

-
- Bilim Akademisi Üyesi
 - Türkiye'den pek çok öğrenciye destek
 - Seminer, toplantı, ziyaret vs.
 - 2018 MSGSÜ sabbatical

Akademik başarılar

2022 **ENW-XL grant**, 3M research grant “Probing the phase diagram of Quantum Chromodynamics”; shared by 10 PIs from Utrecht U., UvA and U. Groningen; funding for 1 PhD student and 2 shared postdocs on my part; NWO, The Netherlands, August 2022.

2021 **VICI grant**, 1.8M personal research grant “A theory of waves for an ocean of quarks”, NWO, The Netherlands, April 2021.

2017 **FOM vrij programma**, 2.7M research grant “Scanning new horizons”, shared among 12 PIs from Utrecht University, University of Amsterdam, Leiden University and University of Groningen; FOM, The Netherlands, April 2017.

2017 **CONACyT PhD funding**, CONACyT (National Council for Science and Technology of Mexico), 4-year PhD funding for Domingo Gallegos.

2015 **Research in Paris**, grant for visit and collaboration at Institut Henri Poincare, Paris.

2015 **TUBITAK PhD funding**, TUBITAK (Sci. Tech. Research Council of Turkey) grant to co-supervise a PhD student, Tuna Demircik.

2014 **Best Teacher of the year**, Physics Department, Utrecht University, Master, 1st place.

2013-2019 **D-ITP Postdoc Funding**, Delta Institute for Theoretical Physics, grant for hiring 4 postdocs.

2012 **VIDI grant**, Innovational Research Incentives Scheme, NWO, The Netherlands.

2012 **Ernest Rutherford STFC 5-year Fellowship** at Imperial College STFC, U.K. (Declined by the applicant in favor of Faculty position in Utrecht).

2010 **Postdoctoral fellowship**, CERN Theory Division.

2010 **Humboldt Fellowship** at MPI, Munich.
The Humboldt Foundation, Germany, (Declined by the applicant in favor of CERN).

2006-2008 **Marie Curie Intra-European Fellowship**,
Research Directorate-General of the European Community, Brussels, Belgium.

2000-2005 **Research Fellowship**
Massachusetts Institute of Technology, Cambridge, USA.

1997-1999 **Feinberg Graduate Fellowship**
Weizmann Institute of Science, Rehovot, Israel.

Yayın sayısı > 80

Atıf ~ 5000

Postdoc > 10

Doktora öğrencisi > 10

Master öğrencisi > 35

Exploring improved holographic theories for QCD: Part II

#1

U. Gursoy (Ecole Polytechnique, CPHT and Ecole Normale Supérieure), E. Kiritsis (Ecole Polytechnique, CPHT and Crete U.), F. Nitti (Ecole Polytechnique, CPHT) (Jul, 2007)

Published in: *JHEP* 02 (2008) 019 • e-Print: [0707.1349](#) [hep-th]

[pdf](#) [DOI](#) [cite](#) [claim](#) [reference search](#) [544 citations](#)

Exploring improved holographic theories for QCD: Part I

#2

U. Gursoy (Ecole Polytechnique, CPHT and Ecole Normale Supérieure), E. Kiritsis (Ecole Polytechnique, CPHT and Crete U.) (Jul, 2007)

Published in: *JHEP* 02 (2008) 032 • e-Print: [0707.1324](#) [hep-th]

[pdf](#) [DOI](#) [cite](#) [claim](#) [reference search](#) [528 citations](#)

Holography and Thermodynamics of 5D Dilaton-gravity

#3

U. Gursoy (Utrecht U.), E. Kiritsis (Crete U.), L. Mazzanti (Ecole Polytechnique, CPHT), F. Nitti (APC, Paris) (Dec, 2008)

Published in: *JHEP* 05 (2009) 033 • e-Print: [0812.0792](#) [hep-th]

[pdf](#) [DOI](#) [cite](#) [claim](#) [reference search](#) [312 citations](#)

Magnetohydrodynamics, charged currents and directed flow in heavy ion collisions

#4

Umut Gursoy (Utrecht U.), Dmitri Kharzeev (Brookhaven and SUNY, Stony Brook), Krishna Rajagopal (MIT, Cambridge, CTP) (Jan 15, 2014)

Published in: *Phys.Rev.C* 89 (2014) 5, 054905 • e-Print: [1401.3805](#) [hep-ph]

[pdf](#) [DOI](#) [cite](#) [claim](#) [reference search](#) [303 citations](#)

Deconfinement and Gluon Plasma Dynamics in Improved Holographic QCD

#5

Umut Gursoy (Ecole Polytechnique, CPHT), Elias Kiritsis (Ecole Polytechnique, CPHT and Crete U.), Liuba Mazzanti (Ecole Polytechnique, CPHT), Francesco Nitti (Ecole Polytechnique, CPHT) (Apr, 2008)

Published in: *Phys.Rev.Lett.* 101 (2008) 181601 • e-Print: [0804.0899](#) [hep-th]

[pdf](#) [DOI](#) [cite](#) [claim](#) [reference search](#) [231 citations](#)

SPRINGER BRIEFS IN PHYSICS

Umut Gursoy

Holography and Magnetically Induced Phenomena in QCD

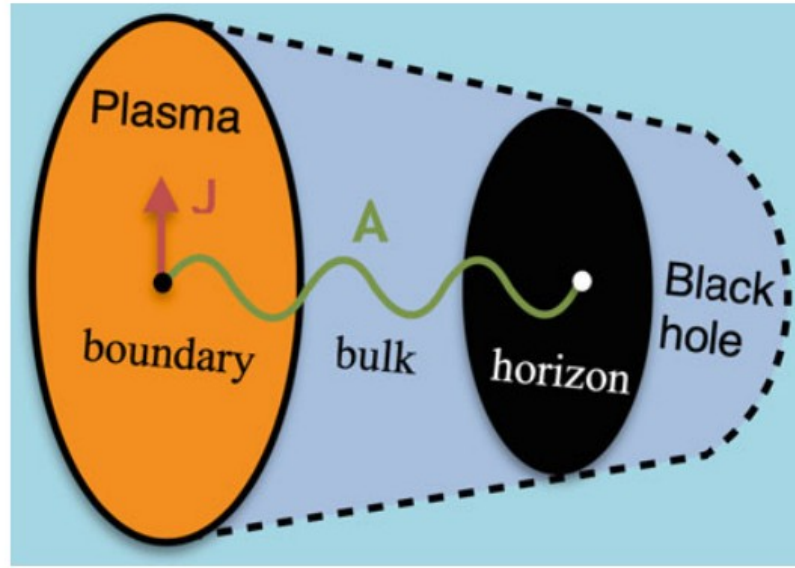


Fig. 1.2 Holographic correspondence posits an equivalence between string theory—which approximates to Einstein’s general relativity coupled to matter fields at low energies—in the bulk of a 5 dimensional hypothetical space with a black hole at the center and quantum field theory of a fluid on the boundary of this space [11–13]. Originally formulated in IIB string theory on 5 dimensional Anti-de-Sitter spacetime and maximally supersymmetric Yang–Mills theory [11], this equivalence has, since then, been applied to realistic systems, such as the quark-gluon plasma. Concretely, it maps collective flow in the plasma—here denoted by current J at the black point—to fluctuations near the horizon—at the white point—through propagation of bulk wave, A , toward black hole. Universal properties of horizon geometry then lead to constraints on transport in the plasma

5 boyutta Einstein + Madde \longleftrightarrow QCD

$$S = M_p^2 N^2 \int \sqrt{-g} \left(R - \frac{4}{3(\partial\Phi)^2 + V(\Phi)} \right) + \dots$$

$$ds^2 = e^{2A(r)} (dr^2 + \eta_{\mu\nu} dx^\mu dx^\nu)$$

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$$ds^2 = e^{2A(r)} (dr^2 + \eta_{\mu\nu} dx^\mu dx^\nu)$$

$$\beta(\lambda) = \frac{d\lambda}{d \ln E} < 0$$

$$\ln \lambda = \Phi \quad , \quad \ln E = A$$

-
- Kuark-gluon plazması
 - Holografik tekniklerin yoğun madde fiziğine uygulamaları

Öngörüler hala ATLAS deneyinde çalışılıyor !

